

## 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 Denmark

Questions	Responses
1. Please indicate the organizations responsible for valuation of properties for property taxation purposes?	The county assessor and Property Tax Administrator is responsible for valuing all real and personal property. Directorate of assessments (denmark)
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.	Properties of foreign assets not operating as permanent establishments, admin and business, trade centres, non residential buildings, residential buildings and premises.
3. Please mention value type (e.g. market value, tax value, capital value) used by responsible organization for property taxation?	<p>'Value' is described in the International Valuation Standards as: ... an economic concept referring to the monetary relationship between goods and services available for purchase and those who buy and sell them (General valuation concepts and principles 4.5)</p> <p>Market value = Valuers of real property adopt the definition used by the International Valuation Standards Council (IVSC)External Link: ... the estimated amount for which an asset should exchange on the date of valuation between a willing buyer and a willing seller in an arm's length transaction, after proper marketing, wherein the parties had each acted knowledgeably, prudently and without compulsion.</p> <p>Tax value = percentage of its fair market value</p> <p>Capital value = improved capital value or unimproved capital value. Improved capital value is value of both the land and buildings or improvements of land. Unimproved land will be only values of land only</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?	there are four basic registers of real properties - 1) the Cadastral register 2) the Land register (Land Book) 3) the Building and Dwelling Register 4) the Property Valuation register
5. Which methods are applied for collecting market data needed for valuation?	The valuation of real property is determined according to professionally accepted mass appraisal techniques,

	<p>including but not limited to the following:</p> <p>(1) comparing sales of properties with known or recognized values, taking into account location, zoning, and current functional use (also known as the sales comparison approach); (2) the income approach; and (3) the cost approach.</p> <p>The sales statistics are published by Internet pages (<a href="http://www.skat.dk">www.skat.dk</a>) since 2004 twice a year (formerly was published a 100-page book two times a year as well). The purpose is to inform the public and the Regional Tax Office (before valuation committees) about the trends in property prices. Only open market sales are included. The statistical tables will show the number of open market sales, the average property value, the average sales price and the average difference between the sales price and the property value</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>there are four basic registers of real properties -</p> <ul style="list-style-type: none"> <li>5) the Cadastral register</li> <li>6) the Land register (Land Book)</li> <li>7) the Building and Dwelling Register</li> <li>8) the Property Valuation register</li> </ul>
<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.</p>	<p>IPD Denmark Annual Property database profile is giving valuation information, however valuation results are on internet since 1999. However the reports with valuation information is regularly published. For example the IPD Denmark Annual Property Index employs only fully revalued assets from that database.</p>
<p>8. How frequently are general revaluations made?</p>	<p>A general valuation of all properties in Denmark was previously carried out every four years. In the years in between the general valuations the valuations were updated using factors reflecting the price index development. By 1st January 1996 the 20th general valuation in Denmark took place. Since 1998 annual valuations have been introduced to replace the 4-year valuation system. years period 1903 - 80 every 4 years 1981 - 97 every 4 years indexation in other years 1998 - 2002 every year 2003 - every 2 years indexation in other years dwellings one year business and agric. next year</p>
<p>9. Is there a system of indexation affecting property value between regular revaluations?</p>	<p>In the years in between the general valuations the valuations were updated</p>

	using factors reflecting the price index development
10. Do taxpayers have a right to appeal against the appraised values? If yes, please indicate how disputes are resolved.	appeals can be made with a deadline: 3 months after notification Levels of appeals 7 Regional appeal boards National Tax Appeal Board Court system - only legal questions. Valuation authority makes informal processing of appeals ( Refundable fee for appeals to National Tax Appeal Board Costs of advisor refunded if appeal is successful

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
<p>1. Do you have a (computer aided) mass appraisal system in your country? If yes, please indicate also responsible authorities.</p>	<p>The Property Value System, which was introduced in 1981 as well as the LVS, is similar to the systems called Computer Assisted Mass Appraisal (CAMA) in the USA. Based on statistical analyses of the declares sales prices they estimate models that are used to calculate property values.</p>
<p>2. Is there any other use of the mass appraisal system than property taxation?</p>	<p>yes for market indices and understanding the trends in the market prices.</p>
<p>3. Which CAD/GIS/CAMA (Computer-aided design / Geographic information system / Computer Assisted Mass Appraisal) software packages are used in mass appraisal?</p>	<p>CAD/GIS/CAMA all three are used. From 2005 first use of GIS.</p>
<p>4. Which geographical or spatial datasets are used in mass appraisal? Please describe the source of these datasets.</p>	<p>The building and dwelling register Kommune data Real property data system Planning Register Personal Data Register Land Register Properties are assessed mainly through use of sales data, but combined with the income approach for property types being rented with infrequent sales, and the cost approach is used for the remaining types of properties</p>
<p>5. Which geographic or spatial analysis methods (e.g. visibility analysis, proximity analysis) are applied in mass appraisal?</p>	<p>visibility and proximity both are used in the analysis</p>
<p>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.</p>	<p>3D situations involve the right of superficies or the use of easements. These rights can be spatially defined in titles or deeds by means of plans and cross sections, and in some countries also in 2D on the cadastral map (e.g. Australia, Denmark). However, no cadastral registration has been found that is able to reflect the third dimension of rights as part of the cadastral geographical data set and hence mass appraisal. If it include condominium , they are recorded in land registry and property value system. The property value system is used for one two three family houses, freehold flats and summer houses - that is 75% of the properties.</p>
	<p>Danish cadastre does not contain any information on 3D situations: • information on different types of land use on one parcel cannot be maintained: only the main use of a</p>

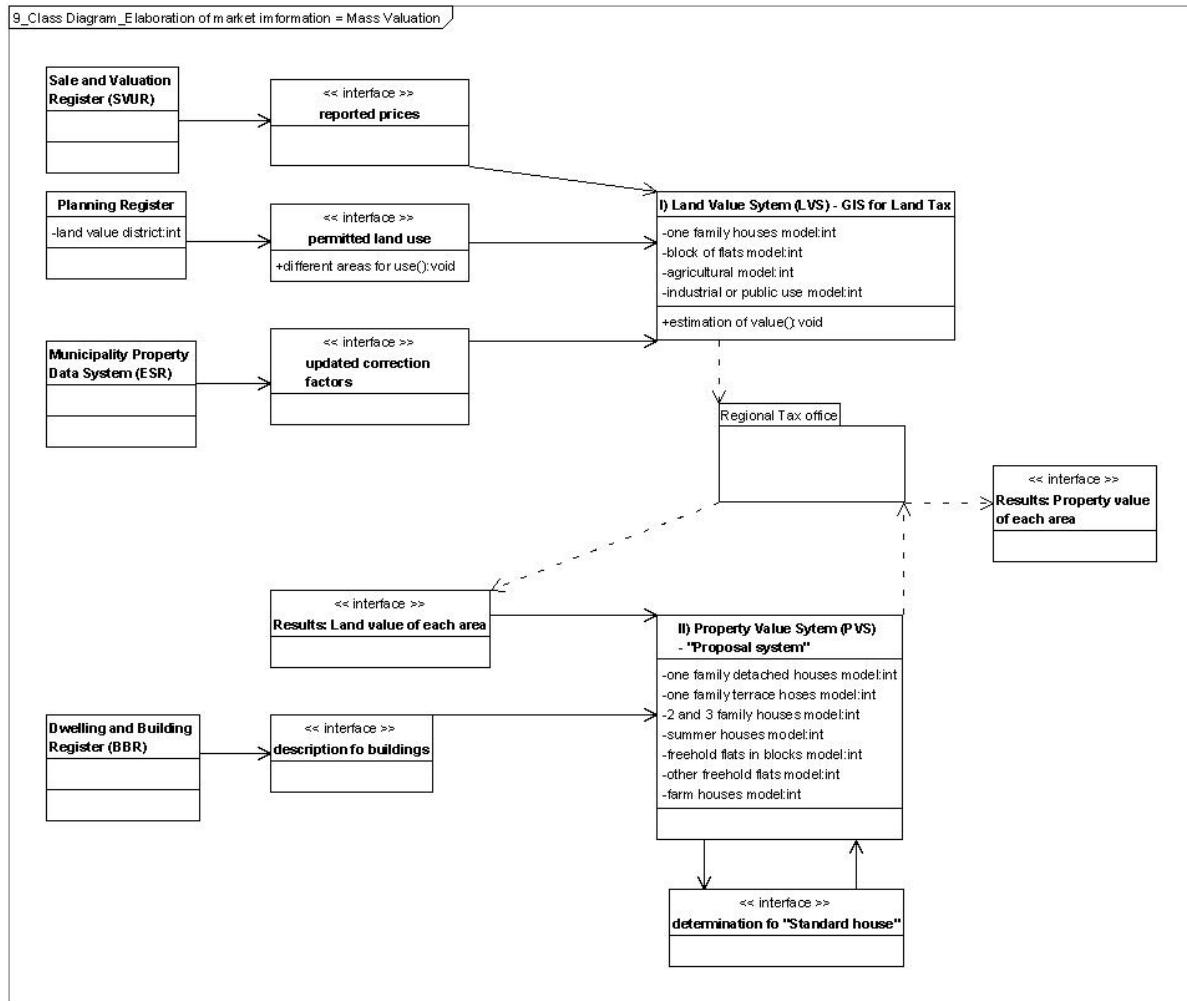
	<p>parcel is maintained; • information on rights and subjects of rights on parcels is not maintained, with the exception of public restrictions (protected forest areas, dune protection zones, coast protection zones, polluted land parcels); • the existence of an apartment cannot be known from the cadastral registration.</p>
7. Is there any relationship between the CAMA system and other public registers (e.g. cadastre, land registry, building registry, ..)?	<p>Yes, CAMA is linked to Planning Register Personal Data Register Land Register, Cadastre Register.</p> <p>Advanced computer-assisted mass appraisal (CAMA) and tax administration systems, linked with computerized cadastral system, and Building and Dwelling system (BBR), used for identification of comparable sales</p>
8. Please describe the statistical models (e.g. additive, multiplicative) applied in mass appraisal according to type or functions of properties?	<p>In Denmark, modeling is one of the central government's valuation approaches. They have amassed a database of sales transactions complete with property characteristics dating back to the 1960s. Their multiple regression-based system, which mirrors that of American CAMA systems, has been in place since 1981, and is used to value roughly 75% of all properties.</p>
9. Please indicate statistical analysis methods (e.g. multiple regression analysis, artificial neural network) applied in mass appraisal?	<p>Their multiple regression-based system, which mirrors that of American CAMA systems, has been in place since 1981, and is used to value roughly 75% of all properties.</p>
10. Which legal characteristics (e.g. property rights) are used as variables in mass appraisal models? Please describe the source of these characteristics.	
11. 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.	<p>The land value system is applied for all properties. Each valuation circle is divided into "land value district" with different permitted land use. The information about permitted land use is transferred to the land value system from the plan register .</p> <p>cbd and non cbd area rural, urban, agricultural etc</p>
12. 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.	<p>nearness to the river, traffic connection / infrastructure parking space parks and green areas age of building within a district shopping centers markets retails traffic noise and pollution playgrounds cultural, entertainment and sport points prestige planned future development distance from cbd etc</p>
13. 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>Identification (plot number) Location Land description (area, permitted use) Building description (area, age, materials, quality) Taxpayer (not essential)</p>
14. Does the mass appraisal system applied in your country have a performance analysis stage (e.g. 'ratio	<p>In the years in between the general</p>

<p>study')? If yes, please describe the indicators used in the performance analysis.</p>	<p>valuations the valuations were updated using factors reflecting the price index development.</p> <p>Some indicators are - location factor, ground floor, top floor, elevator, selling price, appraised value</p>
<p>15. Please indicate whether single property appraisal is applied for improving accuracy of mass appraisal estimations.</p>	<p>Reassessment is performed every second year for half the property stock. In between: indexation based on sales data monitoring, and ongoing maintenance of the database of property attributes</p>

### Section C. Questions for single property valuation procedures

Questions	Responses
<p>1. Which valuation methods are used for single property appraisal? Please relate valuation methods with the type of valuation objects (e.g. sales comparison approach for unimproved parcels).</p>	<p>Valuation models to the individual properties are developed centrally, but applied by the municipalities</p> <p>Valuation registration, also maintained by municipalities, to record valuation on single properties, which may themselves be units in the building and dwelling registration. The valuation registration assists authorities in calculating and collecting property taxes. The Ministry of Economic and Business Affairs is responsible for both the building and dwelling registration and the valuation registration.</p>
<p>2. Which geographical or spatial datasets are used for single property appraisal? Please describe the source(s) of these datasets.</p>	<p>Properties are assessed mainly through use of sales data, but combined with the income approach for property types being rented with infrequent sales, and the cost approach is used for the remaining types of properties. The geographic and spatial datasets in Denmark are for example related to Logical Data Model for the Property Domain which are model-based infrastructures providing greater transparency for developers and users, however they have no or very little knowledge of spatial data. So for development of property data infrastructure for valuation, develop skills in Spatial Data Infrastructures (note: <a href="http://www.joinup.eu">www.joinup.eu</a>) like in EU also in public administration (e.g. via EIPA.eu)</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>one family detached houses one family terrace houses ½ family family houses summer houses freehold flat in blocks other freehold flats farm houses</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>cbd and non cbd area rural, urban, agricultural etc</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</p>	<p>nearness to the river, traffic connection / infrastructure parking space parks and green areas age of building within a district shopping centers markets retails traffic noise</p>

these characteristics.	and pollution playgrounds cultural,
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.	Identification (plot number) Location Land description (area, permitted use) Building description (area, age, materials, quality) Taxpayer (not essential). Disregard factors like baths, patio , thatched roofs etc
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.	Sales and valuation register (SVUR) Building and dwelling register
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.	planning register
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.	Municipality property data system (ESR)



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

Questions X..Y have been answered by	Respondent
1. Name	Manohar Velpuri
2. Affiliation / position	FIG commission 9, Vice chair
3. Country	Denmark
4. E-mail	manohar.velpuri@gmail.com
5. Comments	<p>Sources :</p> <ol style="list-style-type: none"> <li>1) Modelling real estate taxation and valuation - The case of Denmark</li> <li>2) Development of Danish Valuation System by Anders Muller and Maria Ramirez Hjortenberg Property Valuation in Copenhagen Ministry of Taxation, Denmark</li> <li>3) Description of Danish property Valuation and Tax system - Draft 3 (published on 12/9/2016)</li> </ol>

	4) Effective and sustainable systems for valuing property for taxation : a comparison Richard Almy, Gloudemans, Jacobs & Denne, United States
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<b>Questions Z..A</b> have been answered by	<b>Respondent</b>
1. Name	Erik Stubkjær
2. Affiliation / position	Emeritus Associate Professor The Faculty of Engineering and Science Department of Development and Planning
3. Country	Denmark
4. E-mail	est@plan.aau.dk
5. Comments	<p>Q B14- difficult to understand , instead replace it with “Does valuation legislation prescribe an investigation into the general quality of the mass appraisal system?”</p> <p>Q C1 -Not all single property valuations are performed by authorities. The large majority are being performed by valuers/ estate agents in the context of real property sale.</p>