

## 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 Singapore

Questions	Responses
<p>1. Please indicate the organizations responsible for valuation of properties for property taxation purposes?</p>	<p>Property Tax is collected by the IRAS (inland revenue authority of singapore)</p> <p>The valuation is carried by a registered valuer with Singapore institute of surveyors and valuers</p>
<p>2. What are the objects of valuation for property taxation (e.g. unimproved parcel, building)?</p>	<p>.</p> <p>In determining the AV of a building, IRAS considers: rentals of similar or comparable properties in the vicinity; the size of the property; location of the property; the condition of the property; and other relevant physical attributes.</p>
<p>3. Please define value type (e.g. market value, tax value, capital value) used for property taxation?</p>	<p>Property tax rates on owner-occupied and non-owner occupied residential properties are applied on a progressive scale. All other properties continue to be taxed at 10% of the Annual Value.</p> <p>The way the AV is determined is the same regardless of whether the property is owner-occupied, vacant or rented out. The property tax payable is derived by subsequently applying the relevant tax rate (%) on the AV</p> <p>Singapore follows the IVSC standards. Also some of the guidelines to fit for the purpose are defined by the Valuation and general practise division, Singapore institute of valuers and surveyors.</p> <p>The AV of buildings is the estimated gross annual rent of the property if it were to be rented out , excluding furniture, furnishings and maintenance fees. It is determined based on estimated market rentals of similar or comparable properties.</p>
<p>4. Please explain how public registry datasets (e.g. cadastre, land registry, building registry) are used in valuation procedures?</p>	<p>HDB (Housing development board) offices has a building registry</p> <p>Similarly the office also holds the data for commercial units.</p> <p>For every change in the use of property</p>

	<p>from residential to non-residential it needs to be updated in iras.</p> <p>The AV of land and development sites is determined at 5% of the estimated freehold market value. This applies to both vacant land and land under construction.</p> <p>Specialised properties are properties that are rarely rented out such as refineries, petrochemical and power plants. The AV of specialised properties may be assessed using the following methods: Statutory Formula The AV of the property may be determined based on 5% of the freehold capital value</p>
<p>5. Which methods are applied for collecting market data needed for valuation?</p>	<p>Changes in the market rental values of comparable properties.</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>Yes, Housing development board has the database. 28 Housing and Development Board datasets.</p> <p>Prior to March 2012, data is based on date of approval for the resale transactions. For March 2012 onwards, the data is based on date of registration.</p> <p>Characteristics available are -</p> <ul style="list-style-type: none"> <li>town</li> <li>flat_type</li> <li>block</li> <li>street_name</li> <li>storey_range</li> <li>floor_area_sqmf</li> <li>flat_model</li> <li>lease_commence_date</li> <li>Price.</li> </ul> <p>Source(s): Housing and Development Board  <a href="https://data.gov.sg/organization/64ee9e7b-4a0d-412a-bc2a-384057ecec9f?organization=housing-and-development-board">https://data.gov.sg/organization/64ee9e7b-4a0d-412a-bc2a-384057ecec9f?organization=housing-and-development-board</a></p> <p>Licence : Singapore Open Data Licence  Frequency : Monthly  Coverage : January 1, 1990 to January 31, 2017  Last Updated: February 8, 2017, 09:08</p>

	Created : September 22, 2015, 15:05
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 e-Valuation List is an online service that you may use to search the annual value and the name(s) of owner(s) of a property. You can find out the annual value of the current year and up to past five years. The owner of a property can find the current AV of his properties at no cost by logging into mytax.iras.gov.sg . The owner does not need to use the e-Valuation List service to find out the AV of his own properties.
8. How frequently are general revaluations made?	IRAS reviews the AV of properties yearly to reflect the changes in the market rental values of comparable properties.
9. Is there a system of indexation affecting property value between regular revaluations?	IRAS reviews the AV of properties yearly to reflect the changes in the market rental values of comparable properties. The AV will be amended if the latest market rent data no longer support your existing AV. If your property undergoes physical change that could materially affect its rental value, IRAS will also revise your AV from the date of change. IRAS will send property owners a Valuation Notice informing them of any upward or downward adjustment to the AV and the date when it is to take effect
10. Do taxpayers have a right to appeal against the appraised values? If yes, please indicate how disputes are resolved.  source : <a href="http://www.sisv.org.sg/Services/ValuationAppeal/ValuationAppeal-ApplicationForm.pdf">http://www.sisv.org.sg/Services/ValuationAppeal/ValuationAppeal-ApplicationForm.pdf</a>	Yes, appellant can either submit the request in IRAS or SISV  All disputes are resolved based on the request submitted by appellant.  SISV will assign the request for the review of valuation of the *subject flat to any of its panel of appointed valuers in its sole and absolute discretion.  - The Appellant must undertake to allow access to the Valuation Review Panel members to conduct a valuation site inspection (when necessary).  -No new valuation request for the *subject flat will be processed by HDB once an appeal is made. Upon the review by SISV, there will be a three-month lock in period from date of the certificate of valuation, HDB will not accept any requests for valuation of the

- The Appellant by submitting his appeal for a review of the valuation is deemed to accept the decision by the SISV Valuation Review Panel. Unless the duly appointed Valuation Review Panel requests for the attendance of the Appellant for a hearing, the Appellant shall not be entitled to seek any attendance before the said Valuation Review Panel. The Valuation Review Panel has the sole and absolute discretion to consider the merits of each appeal on such basis as it deems fit.

- The decision on the value of the \*subject flat as reviewed by the SISV Valuation Review Panel is deemed to be final and will override all other previous valuations. No further appeal shall lie from such decision.

- A Certificate of Valuation Review ("Certificate") shall be issued to the Appellant about 12 calendar days from receipt of the Appeal. SISV shall not entertain any request for an earlier date. A copy of the Certificate shall be extended to HDB.

- A duplicate copy of the Certificate may be purchased from the SISV at \$100 (inclusive of GST) each with the consent of the Lessee.

- The Certificate shall not be used as evidence in any court proceedings and the valuers who are involved in the review of the said valuation shall not be responsible for any consequences of the use of the reviewed value except for the purpose of obtaining mortgage loan or withdrawal of CPF savings by purchaser of the \*subject flat.

- All rights of the reviewed valuation are assigned to SISV. The outcome of the review will be forwarded to HDB.

- Non-compliance of any of the Terms and Conditions will render the application as null and void. The fees paid will not be refunded.

- No party who is not a party to the proceedings shall have any rights to enforce the Appeal.

- SISV nor any members of the Valuation Review Panel shall not be liable or

	<p>responsible to the Appellant nor shall the Appellant have any claim against any decision made by the Valuation Review Panel.</p> <p>- SISV shall, in consultation with the HDB, be fully entitled to amend the Terms and Conditions as they deem fit from time to time, and such amended Terms and Conditions shall continue to bind all Appellants hereunder.</p>
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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

Questions	Responses
1. Do you have a (computer aided) mass appraisal system in your country? If yes, please indicate also responsible authorities.	IRAS reviews the AV of properties yearly to reflect the changes in the market rental values of comparable properties.
2. Is there any other use of the mass appraisal system than property taxation?	Adaptive procedure, which estimates the selling price of real estate by processing sale transactions one at time in the sequence in which the sales took place
3. Which CAD/GIS/CAMA (Computer-aided design / Geographic information system / Computer Assisted Mass Appraisal) software packages are used in mass appraisal?	Comparable sales analysis in which the system selects comparables closest to the subject obviating the necessity of an appraiser having to search through sales data to find comparables and adjust them for comparability  Automated valuation (AV)models for Mass Appraisal for local taxes by government
4. Which geographical or spatial datasets are used in mass appraisal? Please describe the source of these datasets.	general model provides sufficient accuracy when producing valuations. The AV models based on sub-markets, namely, “location” and “type of flats” produced reasonable levels of accuracy, although more variables could be added to the “type of flats” model to improve its reliability.  source of datasets : <a href="https://data.gov.sg/">https://data.gov.sg/</a>
5. Which geographic or spatial analysis methods (e.g. visibility analysis, proximity analysis) are applied in mass appraisal?	a hedonic price model is used to estimate housing price. The variables adopted include floor area of the housing unit, floor level of the housing unit, age, distance from central business district and distance from the mass rapid transit station.
6. Is three-dimensional (3D) data used in mass appraisal? Please describe source of 3D data (e.g. floor plans).	yes AV models include 3D visualisations The source of the 3D data is source of datasets : <a href="https://data.gov.sg/">https://data.gov.sg/</a>
7. Is there any relationship between the CAMA system and other public registers (e.g. cadastre, land registry, building registry, ..)?	yes all the CAMA systems are integrated to the housing development board registry. and in turn it is linked to IRAS
8. Please describe the statistical models (e.g. additive, multiplicative) applied in mass appraisal according to type or functions of properties?	Multiplicative models are applied in mass appraisal in the AV models.
9. Please indicate statistical analysis methods (e.g. multiple regression analysis, artificial neural network) applied in mass appraisal?	AV models involves multiple regression analysis and also artificial networks.
10. Which legal characteristics (e.g. property rights) are used as variables in mass appraisal models? Please describe the source of these characteristics.	legal characteristics like mortgages are used during the AV model in mass appraisal. Although it is claimed as fledgling stage some of the big 4 banks are relying on this methodology
11. Which land use characteristics (e.g. land use zones) are	cbd and non cbd area

<p>used as variables in mass appraisal models? Please describe the source(s) of these characteristics.</p>	
<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>	<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, distance from the mrt etc</p>
<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>	<p>Identification (plot number) Location Land description (area, permitted use) Building description (area, age, materials, quality) Taxpayer (not essential)</p>
<p>14. Does the mass appraisal system applied in your country have a performance analysis stage (e.g. ‘ratio study’)? If yes, please describe the indicators used in the performance analysis.</p>	<p>IRAS reviews the AV of properties yearly to reflect the changes in the market rental values of comparable properties. The AV will be amended if the latest market rent data no longer support your existing AV. If your property undergoes physical change that could materially affect its rental value, IRAS will also revise your AV from the date of change. IRAS will send property owners a Valuation Notice informing them of any upward or downward adjustment to the AV and the date when it is to take effect</p>
<p>15. Please indicate whether single property appraisal is applied for improving accuracy of mass appraisal estimations.</p>	<p>IRAS reviews the AV of properties yearly to reflect the changes in the market rental values of comparable properties. so single property appraisal is done only when there is change of the usage of the property and has been notified after change.</p>



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

Questions	Responses
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).	yes hedonic models with AV
2. Which geographical or spatial datasets are used for single property appraisal? Please describe the source(s) of these datasets.	<a href="https://data.gov.sg/organization/housing-and-development-board">https://data.gov.sg/organization/housing-and-development-board</a>
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.	Mortgages <a href="https://data.gov.sg/organization/housing-and-development-board">https://data.gov.sg/organization/housing-and-development-board</a>
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.	cbd and non cbd area
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.	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
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)
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.	<a href="https://data.gov.sg/organization/housing-and-development-board">https://data.gov.sg/organization/housing-and-development-board</a>
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.	<a href="https://data.gov.sg/organization/housing-and-development-board">https://data.gov.sg/organization/housing-and-development-board</a>
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.	<a href="https://data.gov.sg/organization/housing-and-development-board">https://data.gov.sg/organization/housing-and-development-board</a>

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

<b>Questions X..Y</b> have been answered by	<b>Respondent</b>
1. Name	Manohar Velpuri
2. Affiliation / position	FIG commission 9, Vice chair
3. Country	Denmark
4. E-mail	manohar.velpuri@gmail.com
5. Comments	Sources : <a href="http://www.iras.com">www.iras.com</a> <a href="http://www.data.gov.sg">www.data.gov.sg</a>

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