

2012 CEEI – Floor Area Methodology - Residential, Commercial, and Industrial Buildings

1.1. Protocol and Guiding Principles

In order to improve understanding of the building characteristics at a neighbourhood level, the BC Assessment Building Information Reports have been analysed and summarized to provide total floor area values for each building category at the Census Tract level (where available) and for all Municipalities that receive a CEEI Report as well as the remaining unincorporated areas of the province. There is an additional report to summarise this information based on the Islands Trust Local Trust Areas.

1.2. Components Included and Excluded

Elements of the BC Assessment Building Information Report such as the Actual Use Code (AUC), four categories of Floor Area and Year Built information are extracted and interpreted to develop summaries with a consistent categorization of buildings and floor area both grouped by Building Eras that reflect significant changes in construction that affect energy efficiency.

1.2.1. Methodology

All buildings are assigned to one of the standard building categories as listed in Table 1. Based on the Year Built information, buildings are then assigned to a Building Era (Table 2). These are the main categorizations within which floor area values are summarised. It should be noted, that because BC Assessment's role is to value property for the assessment of taxes, there are different ways Floor Area is assigned depending on the building type and some buildings do not have a Floor Area value at all. Table 3 contains an explanation of the different types of floor area. The Floor Area Supporting Indicator summaries group all these floor areas together and as such, must be used with an understanding that different building types have different contributing floor area values.

After buildings have been categorized, assigned to a Building Era and the four different floor area values have been collated into one floor area attribute, as described above each BC Assessment record is allocated to a Census Tract, Municipality or Regional District Unincorporated Area. A first attempt to assign building information to a spatial location is based on the location of Assessment records as represented in the Assessment Fabric and Census boundaries GIS layers. If a BC Assessment record is not represented in the Assessment Fabric, it cannot be related spatially to a Census Boundary Unit and is assigned to a Municipality or Unincorporated Area based on the BC Assessment Jurisdiction number gathered from the Building Information Report.

1.2.2. Mixed use

There are 3 BC Assessment AUCs (055 – Multi-Family (Minimal Commercial, 202 – Store(s) and Living Quarters and 203 – Stores and/or Office With Apartments) that identify mixed use buildings and there are also two other attributes ('Occupancy' and 'Unit of Measure') which provide further detail on what types of use occur; i.e. Commercial or Residential. As defined by BC Assessment, 'Occupancy' is a category of like improvements (e.g. Auxiliary Shopping Centre Occupancies) and 'Unit of Measure' is a further refinement only used for the Commercial building sector (e.g. Restaurant/Pubs GLA). Where possible these uses are defined and the building is assigned to its proper category. For example:

- if part of the mixed use building is a town house, and this was known, then the floor area would be assigned to a sub-category of ‘mixed-use residential’ and a category of ‘mixed-use’;
- if part of the mixed use building is composed of retail shopping units, then the floor area would be assigned to a sub-category of ‘mixed-use commercial’ and a category of ‘mixed-use’;
- if the detailed information is not available, the buildings and associated floor area remain within the mixed use category and are assigned the ‘mixed-use commercial’ sub-category because the utilities assign these types of buildings to the commercial category by default.

1.2.3. Building Subsectors, Categories and Subcategories

In 2012, a working group of representatives from the province, Natural Resources Canada, BC Local Governments, Fortis BC and BC Hydro developed a set of standardised categories to facilitate collaboration in energy and emissions reduction planning (Table 1).

Table 1. Standard Building Categories

Sub-sector	Categories	Sub-categories
Residential	<i>Single family</i>	<i>Moveable dwelling</i>
		<i>Single detached</i>
		<i>Single detached with suite</i>
	<i>Multi-family</i>	<i>Single attached - duplex</i>
		<i>Single attached - row, townhouse</i>
		<i>Low-rise apartment</i>
		<i>Hi-rise apartment</i>
	<i>Mixed-use</i>	<i>Mixed-use residential</i>
	<i>Other residential</i>	<i>Seasonal dwelling</i>
		<i>Other residential</i>
<i>Outbuilding (added based on more detailed BC Assessment information)</i>		
<i>Parking</i>		
Commercial and Industrial	<i>Office and retail</i>	<i>Office and retail</i>
	<i>Office</i>	<i>Office – large</i>
		<i>Office – medium</i>
		<i>Office – small</i>
	<i>Healthcare</i>	<i>Hospital</i>
		<i>Care facility</i>
	<i>Education</i>	<i>Education</i>
	<i>Retail</i>	<i>Shopping centre</i>
		<i>Retail strip</i>
		<i>Big box</i>
		<i>Retail – other</i>
		<i>Food – retail</i>
	<i>Accommodation</i>	<i>Hotel</i>
		<i>Medium hotel/motel</i>
		<i>Accommodation - other</i>
	<i>Restaurant/Pub</i>	<i>Restaurant/Pub</i>
		<i>Fast food</i>
	<i>Warehouse</i>	<i>Closed warehouse</i>
		<i>Open warehouse</i>
		<i>Refrigerated warehouse</i>
<i>Mixed-use</i>	<i>Mixed-use commercial</i>	
<i>Other - commercial/industrial</i>	<i>Other – farm</i>	
	<i>Other - information and cultural services</i>	
	<i>Other - arts, entertainment and recreation</i>	

Sub-sector	Categories	Sub-categories
		<i>Outbuilding (added based on more detailed BC Assessment information)</i>
		<i>Parking</i>
		<i>Other - commercial/industrial</i>
	<i>Industrial</i>	<i>Industrial</i>

1.2.4. Building Eras

Buildings constructed in different eras were assigned to three significant building eras (Table 2), guided by a methodology developed by Natural Resources Canada for a City of Prince George community energy mapping project. This assignment reflects the influence of building vintage on energy use efficiency per square meter.

Table 2. Building Eras assigned

Building Era	Construction Year	Rationale
1	< 1976	Minimal standards for insulation
2	1976 <= and < 2006	Enhanced standards for insulation
3	> 2006	Improved standards for overall energy efficiency

1.2.5. Floor Area Types

BC Assessment collects floor area values in square feet differently for different building types (Table3).

Table 3. Description of Floor Area Types from BC Assessment Building Information Report User Manual

Strata Unit Area	Strata unit area in square foot measure. Applicable for Commercial Buildings where Unit of Measure is STRLA, SIC Strata or SIC Units (strata residential and strata commercial properties only). <i>Note: where there are commercial and main building rows for strata properties, the commercial rows will have the most relevant data for strata properties.</i>	The value in this field is specific to the building or use represented in this row.
Total Floor Area (GBA)	Applicable for Residential or Commercial buildings. The total constructed area of a building. This area is computed by measuring to the outside finished surface of permanent outer building walls. It includes all enclosed floor areas of the building including basements, mechanical rooms etc. GBA is only quoted by Landlords and Property Managers when an entire building is leased to a single tenant.	Data is repeated for every row per roll number when referring to a single building.
Total Floor Area (GLA)	Applicable for Commercial Buildings. Office and retail may be included in this category. In general GLA will be equivalent to Floor Rentable Area as defined by BOMA. Floor Rentable Area is the gross measured area of a floor less the area of major vertical penetrations (e.g. ventilation shaft, elevator shafts & stairs). Total Building GLA is equivalent to Building Rentable Area or sum of all Floor Rentable Areas. Common areas are not included.	The value in this field is specific to the building or use represented in this row.
Total Floor Area (NLA)	Applicable for Commercial Buildings with specific unit of measure values. Retail and industrial may be included in this category. Generally referred to as store area. This area is computed by measuring the area enclosed by: the building line in case of the street frontage; (include recessed entrances and exclude bay windows extending outside building line) the finished surface of the store side of corridors and other permanent walls; and the centre of partitions that separate the store area from adjoining store areas. Common areas are not included.	The value in this field is specific to the building or use represented in this row.

1.3. Data Sources

BC Assessment provides the Building Information Report. The GIS Assessment Fabric Layer also originates from BC Assessment and is obtained from the Integrated Cadastral Information Society. GIS Census Boundaries are downloaded from the Stats Canada website.

1.4. Confidentiality Issues

This summary report is not compiled from confidential data. In order to access the source information, anyone can search BCA records for information on a single property in British Columbia. Acquiring larger amounts of information from BCA is possible at a cost. The GIS Assessment Fabric Layer is commonly used by local governments, consultants and researchers for planning. This layer is available to organisations that enter into an agreement with the Integrated Cadastral Information Society, an organisation that coordinates the use of this and other provincial and other GIS datasets. The Stats Canada GIS boundaries are freely available.

1.5. Data Accuracy

Issue #1: Not all Assessment records in the Building Information Report are represented in the GIS Assessment Fabric and therefore cannot be assigned to a Census Boundary Unit such as a Census Tract, Municipality or Regional District based on spatial location. This issue can be somewhat mitigated by assigning an Assessment record to a Municipality and Regional District based on its Jurisdiction code when it cannot be located spatially. One present caveat is that some Jurisdiction numbers occur in more than one Regional District (See Table 4). In the cases where a Jurisdiction is shared between more than one Regional District, there may be some records that cannot be located with the GIS layers and may be inadvertently assigned to one Regional District rather than the other – in this table, when a record cannot be located spatially, it is assigned to the Regional District listed in column 2.

Records in Table 4 with a percent spatial match greater than 99% are allocated to a Regional District almost exclusively based on the spatial location of the BC Assessment record and therefore there is minimal chance of an Assessment record being allocated incorrectly due to the Jurisdiction existing in more than one Regional District in the Building Information Report. For records in Table 4 with a less accurate percent spatial match, an evaluation of potentially placing an Assessment record in an incorrect Regional District was conducted by identifying the Land District each record exists in and assessing if this Land District is also shared by both Regional Districts. A shared Land District would indicate a potential for allocating an Assessment record to the wrong RD, whereas a Land District which is not shared would indicate an accurate allocation of the Assessment record. This review concluded that the possibility for a larger number of records being allocated incorrectly where there is no spatial representation in the Assessment Fabric exists only for Jurisdictions 727 and 752.

This issue will be solved in the next iteration of the Building Information Report when a unique Regional District code is assigned to each Assessment record so each record can be allocated to their proper Regional District. Additionally, as the BC Assessment Fabric improves its spatial representation in rural areas, the percent spatial match will also improve.

Table 4. Jurisdictions that occur in more than one Regional District

Jur	Regional District	2 nd Regional District	% Spatial Match	Potential Incorrect RD Allocation
727	Cariboo	Thompson-Nicola	61%	Possible due to shared Land Districts
756	Bulkley-Nechako	Thompson-Nicola	60%	Minimal due to non-shared Land Districts

787	Kitimat-Stikine	Thompson-Nicola	56%	Minimal due to non-shared Land Districts
769	Nanaimo	Powell River	99.7%	Minimal due to accurate spatial match
715	Central Okanagan	Okanagan-Similkameen	99.6%	Minimal due to accurate spatial match
789	Columbia-Shuswap	North Okanagan	99.5%	Minimal due to accurate spatial match
752	Skeena-Queen Charlotte	Kitimat-Stikine	56%	Possible due to shared Land Districts
710	Columbia-Shuswap	Central Kootenay	99.5%	Minimal due to accurate spatial match

Issue #2: An Assessment record may be inadvertently allocated to a neighbouring Census Unit because the Census Unit spatial boundaries are less accurate than the Assessment Fabric and when boundaries deviate slightly, (especially in the case of small parcels), the spatial location of an Assessment record within the Assessment Fabric may occur in a neighbouring Census Unit instead of the correct one. Each Assessment record is assigned to the Census Unit in which the centre point of its boundaries (centroid) resides. A review of potentially incorrect allocations of Assessment records was conducted for the Capital Regional District. It was found that greater than 99% of records were allocated to the correct Census Unit when cross compared with the Jurisdiction they belong to in the BC Assessment.

The reason to locate all Assessment records based on Census Units instead of Jurisdictions listed in the BC Assessment Building Information Report is to be able to align information from the BC Assessment Building Information Report with socio-economic information from census reports and to be able to allocate the BC Assessment building information to Census Units of smaller geographical size such as Census Tracts.

1.6. Planned Improvements

A request will be made to BC Assessment for subsequent Building Information Reports to include a two-digit code for a Regional District and Islands Trust Local Area (if applicable) and a six digit postal code to better assign Assessment records to the correct jurisdictions when they cannot be located with the Assessment Fabric GIS layer.