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2019 BOMA BEST National Green Building Report

> Building Photo: 330 St. Mary Avenue, Winnipeg, MB, I.G. Investment Management, Ltd., as Trustee For Investors Real Property Fund

# <u>Another</u> <u>Strong Year</u>

#### Welcome to the 2019 BOMA BEST National Green Building Report!

In this report, we provide performance details on all the buildings that were certified between April 1, 2017 and March 30, 2018 – referred to as the 2017 *data set*. This year's report provides the first-ever analysis of buildings completing BOMA BEST 3.0, the brand new assessment released on a new online portal in September 2016.

For a summary of building performance in 2017, download the <u>Key Findings</u>.





↑ Seton Gatewway, Calgary, AB First Capital Realty Inc./ FCR Management Services LP

 Palliser South, Calgary, AB Aspen Properties

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## **Overall Certifications**

BOMA BEST Sustainable Buildings is North America's largest environmental assessment and certification program with 7331 certifications and recertifications achieved since its launch in 2008.

608 new certifications were achieved in 2017.

Figure 1







In 2017, BOMA Canada launched BOMA BEST 3.0 replacing Version 2 (v2). This led to an increase in certifications in 2016 prior to the new release, resulting in fewer certifications in 2017.

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#### Figure 3 Number of 2017 Certifications by Region (All Levels)



# J

#### NAVIGATE

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Table 2

(All Levels)

Number of 2017 Certifications by Stream

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Table 1				
Number of 2017 Certifications by Stream and Region (All Levels)	Province	2017 Portfolio Certifications	2017 Single Certifications	Total
	British Columbia	62	19	81
	Alberta	69	20	89
	Saskatchewan	22	9	31
	Manitoba	5	3	8
	Ontario	176	55	231
	Quebec	88	27	115
	Nova Scotia	14	1	15
	New Brunswick	21	2	23
	P.E.I.	3	0	3
	Newfoundland & Labrador	12	0	12
	The Territories	0	0	0

472

136

608

TOTAL CERTIFICATIONS

Portfolio Certifications		Single Certifications	
Early Adopters	4	Early Adopters	14
New Portfolio Certifications	136	New Single Building Certifications	122
"Inherited" Portfolio Certifications	332		
Total Portfolio Certifications	472	Total Single Certifications	136
TOTAL 2017 CERTIFICATIONS		608	

#### Figure 4

Distribution of 2017 Certifications by Property Type



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Number of 2017 Certifications by Property Type and Level

In BOMA BEST 3.0, the scoring threshold for Certified, Bronze and Silver levels have changed. This change was implemented to encourage buildings to seek opportunities to improve performance – and consequently, their certification level – over time.

	Certified	Bronze	Silver	Gold	Platinum
Office	104	2	63	44	32
Universal	22		15	9	2
Enclosed Shopping Cemntre	4	1	7	13	6
Light Industrial	102		11	17	1
Open Air Retail	87	6	5	6	1
Multi-Res	45		1		
Health Care			1	1	



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## Scores & Performance

#### DATA SET

The analysis that follows is based on the "usable" dataset, as listed in Table 4. This means certain buildings have been excluded as they did not meet our inclusion criteria. For more information on the inclusion criteria, please consult the Methodology section.

#### Table 4

Number of Buildings Included in the Performance Analysis, by Region and Property Type

Province	Office	Universal	Enclosed Shopping Centre	Light Industrial / Open Air Retail	MURB	Health Care	Grand Total
British Columbia	15	2	2	2	0	0	21
Alberta	11	1	4	11	0	1	28
Saskatchewan	6	10	0	0	0	0	16
Manitoba	1	0	1	1	0	0	3
Ontario	41	6	6	0	1	0	54
Quebec	21	5	5	4	0	0	35
Nova Scotia & New Brunswick/P.E.I.	2	0	1	0	0	0	3
Newfoundland & Labrador	0	0	0	0	0	0	0
Northwest & Yukon Territories	0	0	0	0	0	0	0
GRAND TOTAL	97	24	19	18	1	1	160

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Distribution of Certification Level Achieved for Buildings Included in Performance Analysis



#### RECERTIFICATION

#### Figure 6

Percentage Change in Level of Certification Achieved at Recertification



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#### Table 5

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Improvement at Recertification of Certified Level Buildings

Level at Recertification	Number of Buildings	Percentage
Bronze	1	11%
Silver	7	78%
Gold	0	0%
Platinum	1	11%

78% of buildings that originally obtained a Certified Level have now increased their level to Silver. Silver buildings on average save \$630,000 per year on water consumption costs compared to the 2012 National Average.

### **RESILIENCE**

For the first time, BOMA BEST is exploring the vulnerability of buildings to the impacts of short-term and long-term extreme climate risks, such as flooding. BOMA Canada is proud to introduce the **<u>Resilience Brief</u>** to assist the industry in this important area.

Questions now exist to assess short-term and long-term preparations. Specifically:

Has a resilience or business continuity plan been prepared for the building that includes the following components?

- A long-term climate change risk assessment
- An adaptation plan based on assessed **long-term** climate risks
- A **short-term** hazard assessment
- Plans to safeguard against potential **short-term** hazards



#### Figure 7

Figure 9

Type – Office

Resilience Performance

by Region and Activity

Resilience Performance by Property Type and Activity Type



 Enclosed Shopping Centre • Light Industrial Universal Office / Öpen Air Retail

100

#### Figure 8

Resilience Performance by Certification Level and Activity Type - Office



• Silver • Gold



81% 80 74% 72% **RESPONSE RATE (%)** 60% 60 40% 40% 40 34% 34% 19% 20 11% 0 Long-term assessment Long-term planning Short-term assessment Short-term planning British Columbia Alberta • Saskatchewan • Ontario • Quebec

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## Performance by property type

#### **OFFICE BUILDINGS**

Figure 10

Figure 11

Score (%)

Average Category

by Certification

Level - Office

#### **Category Performance**



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#### Figure 12

#### **STRENGTHS AND OPPORTUNITIES – OFFICE**

This figure highlights areas where buildings are performing strongly (average category score above 67%) or where opportunities exist for improvement (average category score below 33%).



#### Figure 13

Energy Category Scores (%) by Region – Office



#### **Energy Use Intensity**

#### Figure 14

Annual Energy Use Intensity (ekWh/ft²/yr) – Office



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# 19.9 27.7 32.8 24.2 27.6

Annual Energy Use Intensity (ekWh/ft²/yr) by Region – Office

#### Figure 17

Figure 15

Energy Use Intensity (ekWh/ft²/yr) and Energy Score (%) by Certification Level – Office



#### Figure 16

Annual Percentage Reduction in Energy Use Intensity Compared to 2008 – Office



This figure shows the percentage reduction in EUI each year, compared to the average EUI reported in 2008.

#### Figure 18

Energy Benchmarking Tools Used – Office



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#### **ENERGY STAR Scores**

Used for the first time in BOMA BEST 3.0, the energy performance metric called ENERGY STAR Score provides an external reference that helps building owners and managers assess their consumption relative to similar buildings.

ENERGY STAR Portfolio Manager uses a 1-100 scoring system, 50 indicating median energy performance while a score of 75 or more indicates top performance. This score allows buildings to not only evaluate performance across their portfolio, but also compare their buildings nationwide. For more information on ENERGY STAR Scores, please click <u>here</u>.

#### Figure 19

Distribution of ENERGY STAR Score by Number of Buildings – Office



#### Figure 21

ENERGY STAR SCORE (RANGE)

Average ENERGY STAR Score by Certification Level – Office



#### Figure 20

Average ENERGY STAR Score by Region – Office





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#### **Energy efficiency features and EUI for Office**

#### Figure 22

Correlation between Energy Use Intensity and Energy Efficient Features by Level – Office



The response rate in the graph above is based on the following questions related to energy efficient features: 01.04.01 to 01.04.07 and 01.05.01 to 01.05.07. The response rate is defined as the number of these questions answered for points/total number of questions.

#### Figure 23

Correlation between Energy Use Intensity and Scores in the Sub-Categories of Building Systems and Operations & Maintenance - Office



ENERGY USE INTENSITY (ekWh/ft²/yr)



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BOMA BEST is being widely used as a building management tool

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#### Figure 24

Correlation between Energy Use Intensity and Energy Innovation Points Achieved – Office



We have found that building owners and managers are using BOMA BEST for two additional purposes. To teach new employees on how a building is best run and more importantly as a building management tool.

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#### Figure 25

Average Building Systems Score and Operations & Maintenance Score by Level – Office



Figure 26

Average Total of Energy Innovation Points Achieved by Level – Office



#### **Carbon Intensity**

#### Figure 27

Average Carbon Intensity  $(kgCO_2e/ft^2)$  by Certification Level for All Regions – Office



#### Opportunities for improvement – Energy

- Overall, the response rates were particularly low in the following areas:
  - Thermal imaging

 $\rightarrow$ 

- Innovative strategies such as the use of renewable natural resources onsite and sharing of real- time consumption patterns
- Platinum buildings had higher response rates in the following areas (compared to Silver buildings):
  - Sensor control for lighting fixtures
  - Formalized training programs
  - Regular re-commissioning or retro-commissioning of systems
  - Sub-metering energy systems
  - Implementation of demand control ventilation strategies
  - Peak shedding



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#### Water Use Intensity

#### Figure 28

Annual Water Use Intensity (m<sup>3</sup>/m<sup>2</sup>/yr) – Office



# Figure 29 Average Water Use Intensity (m<sup>3</sup>/m<sup>2</sup>/yr) by Region – Office

#### Figure 30

Annual Percentage Reduction in Water Use Intensity since 2008 – Office



This figure shows the percentage reduction in WUI each year, compared to the average WUI reported in 2008.



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#### Figure 31

Water Use Intensity (m³/m²/yr) by Certification Level – Office



#### Waste

#### Figure 32

Waste Diversion Rates by Number of Buildings per Region – Office



#### Opportunities for improvement – Water

- Overall, the response rates were particularly low in the following areas:
  - Maintenance for interior water features
  - Innovative strategies such as the use of non-potable water sources
- Platinum buildings had higher response rates in the following areas (compared to Silver buildings):
  - Maintenance for interior water features
  - Water damage monitoring and management
  - Sub-metering water-consuming systems
  - Potable water testing programs

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#### Figure 33

Waste Diversion Rates by Number of Buildings per Certification Level – Office



The Diversion Rate measures the proportion of all waste generated that was successfully diverted from disposal (i.e. landfill or incineration).

BOMA BEST 3.0 also contains new questions on Capture Rate. Capture Rates, assessed via the waste audit, provide an accurate way of measuring the efficacy of a building's waste diversion program. It calculates how much of the material that can be diverted (via recycling, composting, etc.) from landfill, was successfully diverted. High capture rates are preferred.

Low capture rates indicate that many materials that can be diverted are ending up in landfill. This information supports building managers as they continuously finetune the waste management process such as by improving signage at bins or by increasing collection frequency.

42% of Office buildings reported a waste diversion rate between 50-69.9%. This is consistent with the 2016 average waste diversion of 63%.

5 Office buildings reported a waste diversion rate above 90%. These buildings were located in Alberta, Ontario and Quebec.

#### Figure 34

Waste Capture Rates by Number of Buildings per Certification Level – Office



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#### Figure 35

Percentage of Implemented Waste Diversion Initiatives, by Certification Level - Office



82% of Silver Office buildings have implemented electronic communication collection initiatives as a waste diversion initiative

#### Figure 36

 $\rightarrow$ 

Percentage of Implemented Recycling Programs, by Certification Level – Office



#### **Opportunities for improvement – Water**

- Overall, the response rates were particularly low in the following areas:
  - Packaging reduction
  - Recycling programs for coffee pods and bulk packaging
  - Paper accountability system
  - Take back programs

- Platinum buildings had higher response rates in the following areas (compared to Silver buildings):
  - Diversion programs for food waste, grease and coffee pods Reuse initiatives
  - Higher capture rates



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#### **Category Performance**



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#### Figure 38

Universal

Average Category Score [%] by Certification Level - Universal



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#### **Property Types**

The Universal property type is used by all buildings that do not fit in our pre-determined categories of Office, Enclosed Shopping Centre, Light Industrial, Open Air Retail, MURB, or Health Care. As such, a variety of different building types are included in this category, making performance comparison difficult.

#### Figure 40

Most Prevalent Universal Building Types Certified in 2017

Property Type	Percentage
Office	17%
Courthouse	15%
Other Public Services	13%
Police Station	9%
Mixed Use Property	6%
Performing Arts	6%
Vocational School	6%

#### Figure 39

#### **STRENGTHS AND OPPORTUNITIES – UNIVERSAL**

This figure highlights areas where buildings are performing strongly (average category score above 67%) or where opportunities exist for improvement (average category score below 33%).



#### **Recognition For One-Of-A-Kind Buildings**

One of the challenges for unique and one-of-a-kind buildings is that they don't fit easily into any traditional building category. But saying that one has to recognize the efforts of managers and owners of these buildings who have committed to sustainability. The Universal property type is for that unique type of building including: airports, aquariums, casinos, fire stations, laboratories, museums, retail, universities, and others.

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#### **Opportunities for improvement**

#### ENERGY

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- Overall, the response rates were particularly low in the following areas:
  - Thermal imaging
- Energy benchmarking
- Escalator controls
- Tenant energy metering
- Gold buildings had higher response rates in the following areas (compared to Silver buildings):
  - Regular re-commissioning or retro-commissioning of systems
  - Exterior windows efficiency
  - Implementation of demand control ventilation strategies
  - Pump and fan motor efficiency

#### WATER

- Overall, the response rates were particularly low in the following areas:
  - Maintenance for interior features
- Tenant water metering
- Innovative strategies such as the use of non-potable water sources
- Gold buildings had higher response rates in the following areas (compared to Silver buildings):
  - Efficient toilets (4.8 LPF or less)
  - Moisture sensors for irrigation
  - Efficient lavatory and kitchen faucets (5.7 LPM or less)

#### WASTE

- Overall, the response rates were particularly low in the following areas:
  - Packaging reduction
  - Diversion programs for coffee cups and coffee pods
  - Recycling programs for bulk packaging
  - Take back programs

#### 100% of all universal buildings have a waste reduction and diversion policy.

Gold buildings had higher response rates in the following areas (compared to Silver buildings):

- Packaging reduction
- Reuse initiatives
- Recycling program for wood

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#### **ENCLOSED SHOPPING CENTRE**

#### **Category Performance**



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#### **Energy Benchmarking**

In BOMA BEST 3.0, Enclosed Shopping Centres do not receive points on the value of their EUI. Rather, they are rewarded for benchmarking their energy (even if it represents partial energy), for generating an EUI, and for having access to as many tenant meters as possible. Rewarding such activities encourages buildings to obtain complete energy data making reliable future benchmarking possible.

#### Figure 44

Energy Benchmarking Tools Used – Enclosed Shopping Centre



#### Figure 43 STRENGTHS AND OPPORTUNITIES – ENCLOSED SHOPPING CENTRE

This figure highlights areas where buildings are performing strongly (average category score above 67%) or where opportunities exist for improvement (average category score below 33%).



100% of all Silver, Gold and Platinum Universal buildings have their newly installed mechanical systems commissioned

100% of Gold and Platinum buildings implement low cost energy conservation measures (80% for Silver buildings)



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#### Waste Performance

#### Figure 45

Waste Diversion Rate by Number of Buildings per Certification Level – Enclosed Shopping Centre



100% of all Enclosed Shopping Centres have a waste reduction/ diversion policy, and a waste reduction work plan

#### Opportunities for improvement

#### ENERGY

- Overall, the response rates were particularly low in the following areas:
  - Escalator controls
  - Efficient pump and fan motors
  - Innovative strategies such as the use of renewable natural resources onsite and sharing of real- time consumption patterns
- Platinum buildings had higher response rates in the following areas (compared to Silver buildings):
  - Escalator controls
  - Efficient rooftop package units
  - Pump and fan motor efficiency
  - Exterior window efficiency

#### WATER

- Overall, the response rates were particularly low in the following areas:
  - Efficient showerheads (7.6 LPM or less)
  - Potable water testing programs
  - Innovative strategies such as the use of non-potable water sources
- Platinum buildings had higher response rates in the following areas (compared to Silver buildings):
  - Water damage monitoring and management
  - Maintenance for interior water features
  - Water systems sub-metering
  - Efficient toilets (4.8 LPF or less), urinals (1.9 LPF or less) and showerheads (7.6 LPM or less)

#### WASTE

- Overall, the response rates were particularly low in the following areas:
  - Diversion program for coffee cups and coffee pods
  - Recycling programs for furniture
  - Recycling programs for bulk packaging
- Platinum buildings had higher response rates in the following areas (compared to Silver buildings):
  - Successful reduction in the overall generation of waste
  - Recycling programs for scrap metal
  - Recycling programs for furniture
  - Recycling program for coffee cups



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#### LIGHT INDUSTRIAL / OPEN AIR RETAIL

#### **Category Performance**



Score (%) -

Average

Category

Level –



CATEGORY



CATEGORY



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#### **Energy Benchmarking**

Like Enclosed Shopping Centres (ESC), BOMA BEST does not score Light Industrial / Open Air Retail buildings based on EUI. See the ESC side bar on <u>page 27</u> for more details.

#### Figure 49

Energy Benchmarking Tools Used – Light Industrial / Open Air Retail



#### Figure 48

#### STRENGTHS AND OPPORTUNITIES – LIGHT INDUSTRIAL/OPEN AIR RETAIL

This figure highlights areas where buildings are performing strongly (average category score above 67%) or where opportunities exist for improvement (average category score below 33%).



#### Waste Performance

#### Figure 50

Waste Diversion Rate by Number of Building per Certification Level – Open Air Retail / Light Industrial



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#### Opportunities for improvement

#### ENERGY

 $\rightarrow$ 

- Overall, the response rates were particularly low in the following areas:
  - Sub-metering energy consumption
  - Regular re-commissioning or retro-commissioning of systems
  - Innovative strategies such as the use of renewable natural resources onsite and energy cogeneration systems
- Gold buildings had higher response rates in the following areas (compared to Silver buildings):
  - Tracking building performance and consumption patterns
- Implementation of low-cost energy conservation measures
- Pump and fan motor efficiency
- Efficient domestic water heating systems

#### WATER

- Overall, the response rates were particularly low in the following areas:
  - Benchmarking historical water consumption data
  - Potable water testing
  - Innovative strategies such as the use of non-potable water sources
- Gold buildings had higher response rates in the following areas (compared to Silver buildings):
  - Comparison of historical water consumption
  - Reporting a water use intensity
- Efficient lavatory and kitchen faucets (5.7 LPM or less)

#### WASTE

- Overall, the response rates were particularly low in the following areas:
  - Performing a waste audit
  - Recycling programs for coffee cups and coffee pods
  - Reduction in the overall generation of waste
  - Diversion initiatives for food waste
- Gold buildings had higher response rates in the following areas (compared to Silver buildings):
  - Recycling programs for bulk packaging
  - Waste diversion initiatives for electronic communication
  - Waste diversion initiatives for carpet tiles
  - Waste reduction and work plan communication

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# 4 – Methodology

#### **Analysis period**

- The 2019 National Green Building Report (NGBR) includes certifications awarded between April 1, 2017 to March 31, 2018. For ease of reference, buildings analyzed in this report are simply referred to as the "2017" data set.
- All buildings included in this report completed the BOMA BEST 3.0 assessment.

#### Analysis inclusion requirements

- The number of buildings included in the detailed performance analysis is 160. This is the number of certifications that met the criteria for inclusion. Additionally, only buildings that underwent a direct verification were included. In the Portfolio Stream only 20% of buildings per year are verified as such the majority of portfolio certifications are not included in the analysis.
- Buildings had to meet the following criteria to be included in the Performance analysis:
  - Achieve a score of 20% or higher (Bronze+)
  - Certify between April 1, 2017 to March 31, 2018. As such, early adopters of BOMA BEST 3.0 (buildings that certified when 3.0 was launched in September 2016 to March 31, 2017) are excluded in sections where performance scores are reported.
- Early adopters are included when reporting on overall number of certifications (the 608 data set) as are portfolio buildings that did not undergo a direct verification.
- At a national level, if fewer than 15 buildings achieved Bronze+ certification in a property type, comparisons were not performed as the data set was deemed too small to be representative. Therefore, MURB and Health Care buildings were excluded from the analysis in the 2019 NGBR.

• At a regional level, if fewer than 5 buildings achieved Bronze+ certification in a property type, performance results were not reported and instead listed as "Insufficient Data". In the table on the next page, the cells shaded in grey indicates the regions/property types where this occurred. Red numbers represent buildings that are included in the performance analysis. These include Bronze+ certifications and exclude Certified buildings and Early Adopters.

#### Performance analysis

- The word "certified" is used interchangeably in the report. Depending on the context it may refer to the minimum BOMA BEST certification level achieved, i.e. a score of 0 – 19% ("Certified"). In other cases, it refers to the group of buildings that achieved BOMA BEST certification (irrespective of their certification level achieved). The use of the word in context will infer its meaning.
- Entries with no Energy or Water Use Intensity data (EUI or WUI), or no entered value, were excluded from the analysis.
- Statistical outliers in the dataset were excluded:
  - EUI values are considered outliers if greater than 200 ekWh/ft²/yr or less than 10 ekWh/ft²/yr.
  - WUI values are considered outliers if greater than 20  $m^3/m^2/yr$  or less than 0.1  $m^3/m^2/yr.$
- In this year's report, Light Industrial and Open Air Retail property types are reported as a combined property type therefore their reported performance is an average of all Light Industrial and Open Air Retail buildings. The combined property type is noted as Light Industrial / Open Air Retail throughout the report.
- Each BOMA BEST Property Type has a different maximum number of points available for category. For reporting purposes, the maximum number of points achievable for each of the ten BOMA BEST categories was taken as the maximum points available

### ↓

#### NAVIGATE

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from each property type questionnaire. Overall percentage scores reported do not account for questions answered with N/A or for innovation questions. Percentage category scores are calculated as follows:

- Total Category Score (%) = (total category points achieved less category innovation points achieved) / (maximum category points achievable less category innovation points achieved)
- Unless specifically stated, changes to percentage scores discussed in this report are absolute, and not relative. For example, a change in score of 78% to 80% would be calculated as "80% minus 78%" and reported as +2%. This point of clarification is consistent with reporting in previous years.
- Carbon intensity is calculated on a dataset of 37 building (5 Platinum, 14 Gold, 18 Silver). Though the number of platinum buildings meets the threshold for inclusion, it may be skewing the results. Carbon intensity data was taken directly from ENERGY STAR for buildings that benchmark using that tool.

Region	Office		Univ	ersal			Shopping Light Industrial /		MU	RB	Healt	h Care		tal ovince)
British Columbia	15	17	2	2	2	3	2	5	0	1	0	0	21	28
Alberta	11	12	1	1	4	4	11	15	0	4	1	1	28	37
Saskatchewan	6	7	10	11	0	0	0	0	0	0	0	0	16	18
Manitoba	1	1	0	0	1	2	1	2	0	0	0	0	3	5
Ontario	41	59	6	8	6	7	0	8	1	38	0	0	54	120
Quebec	21	23	5	6	5	6	4	9	0	2	0	0	35	46
Nova Scotia & New Brunswick / P.E.I.	2	14	0	0	1	1	0	0	0	1	0	0	3	16
Newfoundland & Labrador	0	5	0	0	0	0	0	1	0	0	0	0	0	6
Northwest & Yukon Territories	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL (per asset class)	97	138	24	28	19	23	18	40	1	46	1	1	160	276

## 5 – List of Acronyms

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BOMA: Building Owners and Managers Association
BOMA BEST: BOMA Building Environmental Standard
<b>ekWh/ft²/yr:</b> Equivalent kilowatt hour per square foot per year
EUI: Energy Use Intensity
ESC: Enclosed Shopping Centre
<b>kgCO<sub>2</sub>e/ft²/yr:</b> Kilograms of carbon dioxide equivalent per square foot per year
LPF: Litres per flush
LPM: Litres per minute
<b>m³/m²/yr:</b> Cubic meter per square metre per year
MURB: Multi-Unit Residential Building
NGBR: National Green Building Report
NRCan: Natural Resources Canada
P.E.I.: Prince Edward Island
WUI: Water Use Intensity

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