This page has been left blank intentionally.
Quality Information

Document: Better Commercial Buildings Research
Ref: 60547027
Date: 18-Dec-2017
Prepared by: Sian Willmott, Weng Chan, Sarah Brennan
Reviewed by: Liz Johnstone

Revision History

<table>
<thead>
<tr>
<th>Rev</th>
<th>Revision Date</th>
<th>Details</th>
<th>Authorised</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10-Jul-2017</td>
<td>Draft</td>
<td>Liz Johnstone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Associate Director</td>
</tr>
<tr>
<td>1</td>
<td>29-Nov-2017</td>
<td>Final</td>
<td>Liz Johnstone</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Associate Director</td>
</tr>
</tbody>
</table>
Table of Contents

Acronyms i
Executive Summary 1
1.0 Introduction 16
1.1 Building upon the previous Next Wave report 16
1.2 Purpose and objectives of this report 16
1.3 Data analysed 16
1.4 Market overview 17
1.5 Retrofit decision making 18
1.6 Opportunities for GHG emissions reduction 19
1.7 Where are commercial buildings located? 21
2.0 Office 23
2.1 Overview 23
2.2 GFA and number of buildings 23
2.3 Spatial distribution 24
2.3.1 State wide 24
2.3.2 Regional and rural Victoria 25
2.3.3 Metropolitan Melbourne 27
2.3.4 City of Melbourne 28
2.4 Building age 29
2.5 Ownership and tenancy 30
2.6 Emissions and water use 30
2.7 Drivers for upgrades 32
2.8 Barriers for upgrades 32
2.9 Market trends 32
2.10 Case Study – Mirvac HQ, Sydney 33
2.11 Opportunities for upgrading 34
3.0 Retail 37
3.1 Overview 37
3.2 GFA and number of buildings 37
3.3 Spatial distribution 38
3.3.1 State wide 38
3.3.2 Regional and rural Victoria 39
3.3.3 Metropolitan Melbourne 42
3.3.4 City of Melbourne 44
3.4 Building age 45
3.5 Ownership and tenancy 46
3.6 Emissions and water use 46
3.7 Drivers for upgrades 46
3.8 Barriers for upgrades 47
3.9 Market trends 47
3.10 Case study – Vicinity Centres Sustainability Policy 48
3.11 Opportunities for upgrading 49
4.0 Healthcare 52
4.1 Overview 52
4.2 GFA and number of buildings 52
4.3 Spatial distribution 53
4.3.1 State wide 53
4.3.2 Regional and rural Victoria 53
4.3.3 Metropolitan Melbourne 55
4.3.4 City of Melbourne 56
4.4 Building age 57
4.5 Ownership and tenancy 58
4.6 Emissions and water use 58
4.7 Drivers for upgrades 58
4.8 Barriers for upgrades 58
List of Figures

Figure 1  GFA comparison of commercial sectors  2
Figure 2  Potential for emissions savings across different sectors  4
Figure 3  Potential for water savings across different sectors  4
Figure 4  Estimated emissions across the commercial sector  6
Figure 5  Estimated water use across the commercial sector  6
Figure 6  Estimated emissions use across the retail sector  8
Figure 7  Estimated water across the retail sector  8
Figure 8  Comparison of office and retail number of buildings against construction years  9
Figure 9  Comparison of office and retail GFA against construction years  9
Figure 10  Estimated emissions across the healthcare sector  10
Figure 11  Estimated water use across the healthcare sector  11
Figure 12  Estimated emissions across the accommodation sector  12
Figure 13  Estimated water use across the accommodation sector  13
Figure 14  Potential for emissions savings across different sectors  19
Figure 15  Potential for water savings across different sectors  20
Figure 16  Map of rural regions and regional centres  21
Figure 17  Location of NEICs and MACs  21
Figure 18  Proportion of offices across the state  24
Figure 19  Map of Victorian municipalities by total GFA – office  25
Figure 20  Total GFA and number of buildings regional and rural Victoria - office  26
Figure 21  Total GFA and number of buildings regional centres - office  26
Figure 22  Total GFA and number of buildings per metropolitan region - offices  27
Figure 23  Map of Metropolitan Melbourne municipalities by total GFA – office  27
Figure 24  GFA by precinct and PCA Grade – City of Melbourne  28
Figure 25  Number of buildings by floors above ground and PCA Grade - City of Melbourne  28
Figure 26  Year of construction of buildings - Victoria (excluding City of Melbourne) - office  29
Figure 27  Year of construction and PCA Grade - City of Melbourne  29
Figure 28  Distribution of commercial NABERS energy ratings (2010-current)  30
Figure 29  Location of commercial buildings with NABERS ratings (2010-current)  31
Figure 30  NABERS rating achieved for commercial buildings between 1000-2000m²  31
Figure 31  Building 8, 658 Church St, Richmond after refurbishment  32
Figure 32  Mirvac headquarters at 200 George St, Sydney  33
Figure 33  Estimated emissions across the commercial sector  35
Figure 34  Estimated water use across the commercial sector  35
Figure 35  Proportion of offices across the state  38
Figure 36  Map of Victorian municipalities by total GFA – retail  39
Figure 37  GFA and number of buildings rural Victoria - retail  40
Figure 38  GFA and number of buildings regional centres - retail  40
Figure 39  Number of retail buildings for different retail types distributed as areas within regional Victoria  41
Figure 40  GFA of retail buildings for different retail types distributed as areas within regional Victoria  41
Figure 41  GFA and number of buildings per metropolitan region - retail  42
Figure 42  Map of Metropolitan Melbourne municipalities by total GFA – retail  42
Figure 43  Number of retail buildings for different retail types across metropolitan Melbourne  43
Figure 44  GFA of retail buildings for different retail types across metropolitan Melbourne  43
Figure 45  Number of retail buildings by floors above ground - City of Melbourne  44
Figure 46  Year of construction - Victoria (excluding City of Melbourne) – retail  45
Figure 47  Year of construction - City of Melbourne - retail  45
Figure 48  Location of shopping centres with a NABERS rating (OEH)  46
Figure 49  Vicinity's material long-term economic, environmental, social and governance issues  47
Figure 50  Vicinity Centres Sustainability Policy  48
Figure 51  Estimated emissions use across the retail sector  49
Figure 52  Estimated water across the retail sector  50
Figure 53  Proportion of healthcare across the state
Figure 54  Map of Victorian municipalities by total GFA – healthcare
Figure 55  Total GFA and number of buildings regional and rural Victoria - healthcare
Figure 56  Total GFA and number of buildings regional centres - healthcare
Figure 57  Total GFA and number of buildings per metropolitan region - healthcare
Figure 58  Map of metropolitan municipalities by total GFA – healthcare
Figure 59  Number of Healthcare Buildings by Floors Above Ground - City of Melbourne
Figure 60  Year of construction - Victoria (excluding City of Melbourne) – healthcare
Figure 61  Healthcare Market by Construction Year - City of Melbourne
Figure 62  Ipad receptionists are becoming more common in healthcare facilities
Figure 63  Estimated emissions across the healthcare sector
Figure 64  Estimated water use across the healthcare sector
Figure 65  Proportion of accommodation across the state
Figure 66  Map of Victorian municipalities by total GFA – accommodation
Figure 67  Total GFA and number of buildings regional and rural Victoria - accommodation
Figure 68  Total GFA and number of buildings regional centres - accommodation
Figure 69  Total GFA and number of buildings per metropolitan region - accommodation
Figure 70  Map of metropolitan municipalities by total GFA – accommodation
Figure 71  Number of accommodation buildings by floors above ground - City of Melbourne
Figure 72  Year of construction - Victoria (excluding City of Melbourne) – accommodation
Figure 73  Accommodation market by construction year - City of Melbourne
Figure 74  Estimated emissions across the accommodation sector
Figure 75  Estimated water use across the accommodation sector
Figure 76  Proportion of hospitality across the state
Figure 77  Map of Victorian municipalities by total GFA – hospitality
Figure 78  Total GFA and number of buildings regional and rural Victoria - hospitality
Figure 79  Total GFA and number of buildings regional centres - hospitality
Figure 80  Total GFA and number of buildings per metropolitan region - hospitality
Figure 81  Map of metropolitan municipalities by total GFA – hospitality
Figure 82  Number of hospitality buildings by floors above ground - City of Melbourne
Figure 83  Year of construction - Victoria (excluding City of Melbourne) – hospitality
Figure 84  Year of construction - City of Melbourne - hospitality
List of Tables

Table 1  Commercial sectors size and performance summary  2
Table 2  Number of buildings and GFA by sector and location  14
Table 3  Building size - office  23
Table 4  Total GFA and number of buildings - office  24
Table 5  Size of buildings - retail  37
Table 6  GFA and number of buildings by region - retail  38
Table 7  Building size - healthcare  52
Table 8  Total GFA and number of buildings - healthcare  53
Table 9  Proportion of accommodation in City of Melbourne that is student accommodation  63
Table 10  Building size - accommodation  64
Table 11  Total GFA and number of buildings - accommodation  65
Table 12  Building size - hospitality  76
Table 13  Total GFA and number of buildings - hospitality  77
## Acronyms

<table>
<thead>
<tr>
<th>Acronyms</th>
<th>Meanings</th>
</tr>
</thead>
<tbody>
<tr>
<td>AVPCC</td>
<td>Australian Valuation Property Classification Codes</td>
</tr>
<tr>
<td>CBD</td>
<td>Commercial Building Disclosure</td>
</tr>
<tr>
<td>CLUE</td>
<td>Census of Land Use and Employment – City of Melbourne</td>
</tr>
<tr>
<td>CoM</td>
<td>City of Melbourne</td>
</tr>
<tr>
<td>GBCA</td>
<td>Green Building Council of Australia</td>
</tr>
<tr>
<td>GFA</td>
<td>Gross floor area</td>
</tr>
<tr>
<td>NABERS</td>
<td>National Australian Built Environment Rating System</td>
</tr>
<tr>
<td>NEIC</td>
<td>National Employment and Innovation Cluster</td>
</tr>
<tr>
<td>NLA</td>
<td>Net lettable area</td>
</tr>
<tr>
<td>MAC</td>
<td>Metropolitan Activity Centre</td>
</tr>
<tr>
<td>PCA Grade</td>
<td>Property Council of Australia Grade</td>
</tr>
<tr>
<td>VGV</td>
<td>Valuer-General Victoria</td>
</tr>
</tbody>
</table>
Executive Summary

Commercial buildings contribute significantly to Australia’s greenhouse gas emissions and present a significant opportunity for low cost abatement and energy efficiency. In recent years, the focus has been on office buildings, particularly existing, non-premium buildings over 2000m². In July this year, mandatory disclosure thresholds were lowered to include buildings larger than 1000m². This presents a timely opportunity to investigate the potential to improve environmental performance across a broader range of commercial buildings in addition to offices.

This report expands upon Sustainability Victoria’s Next Wave Report 2013, which identified opportunities for upgrading mid-tier office buildings; including factors affecting building performance and the potential for upgrade, such as building size, age, location and ownership. Sustainability Victoria has since delivered a number of programs (such as the Energy Efficient Office Building program) which have demonstrated the efficiency gains and emissions reductions that can be achieved when effectively targeting segments of the commercial buildings sector.

This Next Wave Refresh Report builds upon the previous research, but has expanded its scope to include commercial retail, healthcare, accommodation and hospitality buildings. The change to the Commercial Building Disclosure program’s (CBD) mandatory threshold (to 1,000m² NLA from the previous 2,000m² on 1 July, 2017) under the Building Energy Efficiency Disclosure Act (2010) has also been considered. The disclosure requirement relates to the provision of energy efficiency information when a commercial office is offered for sale or lease. Previously in Victoria, 752 office buildings (GFA > 2,000m²) were required to report on performance under the Act. These buildings comprise a total 52% of office GFA in Victoria. The revision in threshold now means that up to an additional 793 office buildings will be required to report on performance when sold or leased, bringing the GFA to 61% of Victoria’s office GFA (1,545 office buildings). Despite this, 15,027 small office buildings (< 1,000m² GFA) remain below the reporting threshold. These small buildings represent 39% of total office GFA and present opportunities for upgrading.

A key feature of this refresh is the inclusion of four other commercial building sectors being:

- Retail: shopping centres, box retail and shopping strips
- Healthcare: general practitioners, consulting suites, super clinics, but not hospitals
- Accommodation: hotels, short-stays, backpackers, motels, bed and breakfast, and student accommodation
- Hospitality: restaurants, cafes, bars and fast food outlets.

Research and energy efficiency programs and grants to date have focused on office buildings. The inclusion of additional sectors in this report provides an understanding of the environmental impact of other mid-tier buildings and where opportunities may exist to expand retrofitting programs where the CBD reporting threshold does not apply.

What are the overall opportunities for retrofitting commercial buildings?

As expected, the distribution of office buildings across the state is concentrated in the Melbourne CBD and other activity centres; with some presence in regional cities. Retail and healthcare buildings are spread more evenly throughout populated areas, with accommodation and hospitality buildings distributed widely, but more prevalent within tourism regions and the central city.

Retail, healthcare, accommodation and hospitality buildings in Victoria are much more numerous than office buildings (approximately 3.8 to 1) and are generally smaller (below 1,000m² GFA). Unlike larger commercial buildings, which tend to be owned and managed by a smaller number of companies, and concentrated in the City of Melbourne; the more diverse retail, hospitality, healthcare and accommodation buildings are further varied in location, size, age, ownership and management regimes; making the drivers for environmental upgrades less clear.

The challenge of working with smaller buildings is not dissimilar from the challenges of working with the domestic residential sector, and strategies additional to incentivising building upgrades may be required.
Table 1  Commercial sectors size and performance summary

<table>
<thead>
<tr>
<th>Commercial sector</th>
<th>Total GFA (m²)</th>
<th>Total number of buildings</th>
<th>Average NABERS Energy Star rating</th>
<th>Total emissions (millions kg CO2-e /annum)</th>
<th>Average NABERS Water Star rating</th>
<th>Total water consumption (millions L/annum)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victoria-state-wide</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office</td>
<td>12,588,338</td>
<td>16,572</td>
<td>3.13</td>
<td>1,951</td>
<td>3.56</td>
<td>7,354</td>
</tr>
<tr>
<td>Retail</td>
<td>20,671,260</td>
<td>50,322</td>
<td>3.26</td>
<td>1,027</td>
<td>2.88</td>
<td>17,017</td>
</tr>
<tr>
<td>Healthcare</td>
<td>1,141,346</td>
<td>4,456</td>
<td>50</td>
<td></td>
<td>904</td>
<td></td>
</tr>
<tr>
<td>Accommodation</td>
<td>2,368,735</td>
<td>2,548</td>
<td>3.6</td>
<td>551</td>
<td>3.25</td>
<td>6,295</td>
</tr>
<tr>
<td>Hospitality</td>
<td>2,863,232</td>
<td>5,370</td>
<td>TBC</td>
<td>TBC</td>
<td>TBC</td>
<td>TBC</td>
</tr>
</tbody>
</table>

Source: Valuer-General Victoria, NABERS and AECOM

Figure 1  GFA comparison of commercial sectors

The small and medium commercial building (SMCB) market provides challenges due to its size and diversity. While energy efficiency retrofits present opportunities to improve building performance, as well as achieve broader environmental sustainability and corporate social responsibility (CSR) objectives, SMCBs do not appear to have seen the same penetration of energy efficiency technologies as larger offices and shopping centres. This could be attributed to the split incentives between building owners and tenants, lack of customer demand (and education), difficulty in accessing funding for retrofits and the relatively lower expenditures on energy management.

As prices for energy continue to rise and the need to reduce greenhouse gas emissions becomes more pressing, the importance of energy savings across all building types will only increase; and the energy efficiency retrofit market for SMCB will also grow. The focus on larger buildings which are able

1 Average rating based on publicly available ratings for shopping centres. Different operational profiles have been assumed between “small”, “medium” and “large” retail outlets. See Section 3.6.
2 Retail emissions used as basis for calculations. See Section 4.6.
3 Average rating based on publicly available ratings for hotels.
to generate greater benefits and shorter return on investment periods must continue and be supplemented by strategies to support energy efficiency retrofits for SMCBs.

Strategies may be to encourage staged approaches rather than upfront capital-intensive investment to incrementally improve building performance, and bring forward benefits.

Opportunities could relate to:

- A focus on underperforming/ageing equipment and prioritising replacements to achieve greatest reduction in energy use;
- Building tuning to increase energy efficiency;
- Low energy lighting upgrades, which can also improve workplace comfort;
- On-site generation of renewable energy; and
- Improvements to heating and cooling systems, including the upgrade or adjustment of fan systems

Providing guidance for building owners and managers concerning manufacturers and suppliers of retrofit products and services, the costs and benefits of options available, and improving the communication of benefits to users of commercial buildings will assist to address the market barriers and drive change. Communications could explain Green Building rating systems, energy efficiency and emission reduction regulatory and policy initiatives, thresholds for mandatory disclosure and relevant building energy rating standards.

Market barriers may be best addressed via a segmented approach such as working with industry groups, targeting SMCB portfolio owners, franchise chains (or areas with significant numbers and GFA of commercial buildings), or real estate agents specialising in commercial properties.

Despite this, barriers such as split incentives, lack of green leases, perception of high capital cost, perceived reduced business continuity and the diversity of the market remain.

**What are the overall opportunities for retrofitting in each sector?**

This report identifies the size, age, type and location of commercial buildings across Victoria and, using NABERS energy and water performance data, estimates the potential benefits available through pursuing sustainability initiatives. Figure 2 and Figure 3 compare potential emissions and water savings across commercial sectors.
Figure 2  Potential for emissions savings across different sectors

Source: NABERS and AECOM calculations

Figure 3  Potential for water savings across different sectors

Source: NABERS and AECOM calculations
Office
In Victoria, 16,572 office buildings constitute 12.6M m² of GFA. Of these office buildings, 60.5% of GFA is over the revised mandatory reporting threshold of 1,000 m² and 45% of office GFA is located in the City of Melbourne. The mean energy star rating for offices is 3.13, with rural and regional Victoria performing slightly better than metropolitan Melbourne; a small (15) sample of medium sized offices (1,000-2,000m²) received a higher average rating of 3.7 stars. This is likely due to the opportunities realised through the National Green Leasing Policy for government tenants.

The upgrade of building office stock is being strongly driven by tenants; including their desire to reduce operational costs and to enhance amenity to retain staff. Drivers for building owners are similar, with aims to reduce ongoing energy and water associated with the base building services and to decrease vacancy rates in a competitive commercial market. A number of barriers to upgrading remain primarily around ownership structure and the ultimate beneficiary.

Opportunities for improving offices:

- The largest predicted emissions reduction could be achieved in buildings over 2,000m² in the City of Melbourne and buildings below 2,000m² in metropolitan Melbourne. If these buildings were raised from their current condition to a 5 Star NABERS equivalent; savings of approximately 395,000 tonnes CO₂-e/annum and 270,000 tonnes CO₂-e/annum could be realised in the City of Melbourne and metro Melbourne respectively.

- The largest predicted water savings could be made in the same areas, with 1,000 mega-litres and 730 mega-litres of savings available across the City of Melbourne and metropolitan Melbourne respectively.

- A large number of office buildings (20% of total office GFA) were constructed between the years 1980-1989; presenting an opportunity to upgrade their centralised HVAC systems (average plant life of 30years). If the upgrade of a major plant resulted in a 1 Star increase in NABERS rating, an emissions saving of 128,000 tonnes CO₂-e/annum could be realised.

- 39% of Victoria’s office GFA remains below the CBD threshold. While reaching out to and upgrading 15,027 office buildings presents a challenge, an opportunity to address this could result in savings of 447,000 tonnes CO₂-e/annum.

- Although long term, low rate financing is available from Victorian local councils under the Local Government Legislation Amendment (Environmental Upgrade Agreements) Bill 2015, other barriers for upgrading such as time and education may need to be overcome for many smaller commercial building owners to consider upgrades.

- The National Green Leasing Policy for government tenants has been effective in the upgrade/provision of a number of energy efficient buildings across Victoria. Communicating these principles across a broader range of buildings and tenants may assist in expanding the uptake of green leases.
Figure 4  Estimated emissions across the commercial sector

Source: NABERS and AECOM calculations

Figure 5  Estimated water use across the commercial sector

Source: NABERS and AECOM calculations
Retail

Retail has the highest total GFA of the sectors analysed at a total over 20M m$^2$ across more than 50,000 buildings. 31% of the retail GFA in Victoria consists of 1,313 large retail buildings (>2,000m$^2$) such as shopping centres, box retail and larger supermarkets. More than half of retail GFA is made up of approximately 47,000 small retail buildings (<1,000m$^2$), 30,000 of which are located in metropolitan Melbourne (such as strip shopping precincts and convenience stores).

The ownership profile between larger shopping centres and small retail shops varies significantly. Shopping centres are typically owned by large investment or property groups; a number of whom have programs and policies in place regarding business operation and asset sustainability. The mean NABERS energy rating across shopping centres is 3.26 stars with regional shopping centres performing slightly better than their metropolitan counterparts (3.1 stars compared to 3.6$^4$), which could be attributed to building age.

Small retail is typically tenanted with ownership structures minimising incentives to upgrade. As noted above in the office sector, targeting such a large number of buildings can be challenging when considering retrofitting.

Opportunities for improving retail:

- The largest emissions and water intensive areas for retail can be found in metro Melbourne; with predicted total greenhouse gas emissions of 629,000 tonnes CO$_2$e/annum and water use of 10,446 mega-litres per annum. The largest portion of this is within retail <1000m$^2$ at 55% of total GFA.

- Given the ownership structure of small retail, approaching large-scale tenants i.e. chain stores may be beneficial. Further steps would entail investigating the feasibility of engaging with small retail through avenues such as large retail chains, specific local councils if they have programs or plans in place for shopping precincts, or traders associations.

- Retail was the most intensive sector for water use; and given that the majority of retail centres are single storey; opportunities may exist for rainwater harvesting and reuse.

---

$^4$ Note that the data for rural and regional centres represented only 10% of the overall dataset for shopping centres.
Figure 6  Estimated emissions use across the retail sector

Source: NABERS and AECOM calculations

Figure 7  Estimated water across the retail sector

Source: NABERS and AECOM calculations
Comparison of the year of construction for office and retail buildings indicates that the bulk of the office buildings in Victoria were built primarily after 1970. The retail buildings were primarily built after 1920. This gives more opportunities for upgrading retail building stock. There are also fewer office buildings than retail buildings.

**Figure 8** Comparison of office and retail number of buildings against construction years

**Figure 9** Comparison of office and retail GFA against construction years

Source: VGV
Healthcare

87.8% of the healthcare buildings analysed[^5] are small (< 1,000m²), consisting of general practitioners, dentists, consulting suites and surgeries. They are generally located in a mix of residential buildings (generally owner operated), shopping centres and commercial- retail street precincts (tenanted); with 71% of the total healthcare GFA located in metropolitan Melbourne. These ownership models have different drivers for upgrading however, reduced operational costs appear as consistent reasoning behind upgrades. The barriers to improving healthcare facilities will not be dissimilar to office buildings.

Out of the sectors examined in the report, healthcare buildings had the smallest impact on the environment, responsible for approximately 42 tonnes CO₂-e/annum and 781megalitres/annum.

Opportunities for improving healthcare:

- Apply lessons learned from office program in terms of ownership drivers

Figure 10  Estimated emissions across the healthcare sector

[^5]: Hospitals were excluded from the analysis
There are 2,548 buildings used for commercial accommodation purposes in Victoria equating to approximately 2.3M m\(^2\) GFA. While 59% of all accommodation buildings are located in rural Victoria, the proportion of total GFA is more evenly split between City of Melbourne (39%), rural Victoria (30%) and metropolitan Melbourne (23%). GFA tends to be split between large (>2,000m\(^2\)) buildings located in the City of Melbourne and metropolitan Melbourne, and small buildings (<1,000m\(^2\)) in rural Victoria.

The publicly available data from NABERS hotel ratings provides a high level indication of how the accommodation sector is performing, with a mean energy star rating of 3.6 stars and a mean water star rating of 3.25 stars.

Ownership varies across the sector from hotel groups that own multiple chains to owner-operated bed and breakfasts and small hotels. Larger global hotel chains with buildings of over 2,000m\(^2\) in central locations are undertaking their own initiatives driven by operating costs, broader amenity upgrades, market competition, CSR, increased floorplate efficiencies and consumer choice. The performance and any initiatives undertaken by smaller operators particularly those in rural Victoria given the substantial number are largely unknown.

Student accommodation has increased in recent years, spurred on by the strong education market in Melbourne. The majority were constructed post 2000 and therefore an impact in this sector may be limited. Upgrades are generally driven by reduced operational costs and student choice for quality of accommodation.

Student accommodation comprises of 35% of the total number of buildings and 26.7% of the total GFA for Melbourne. The remaining accommodation type buildings are commercial buildings.

Opportunities for improving accommodation include:

- The largest predicted emissions use in the accommodation sector can be attributed to 60 large buildings in the City of Melbourne, responsible for an estimated 174,000 tonnes CO\(_2\)-e/annum and 1,800 megalitres of water/annum. Upgrading these buildings to an equivalent 5 Star NABERS rating could result in savings of 93,000 tonnes CO\(_2\)-e/annum and 1,150 megalitres/annum. In accordance with CLUE data;
• The second largest potential impact could be made in rural Victoria; however, the ownership structure here is more independent and a large number of buildings would need to be targeted (490,912m² over 1,391 small buildings);

• Further pursue initiatives such as government accommodation procurement policies that require staff to stay in accommodation that meets certain sustainability criteria.

Figure 12 Estimated emissions across the accommodation sector

Source: NABERS and AECOM calculations
Figure 13  Estimated water use across the accommodation sector

Source: NABERS and AECOM calculations
Hospitality

There are 5,370 hospitality buildings across the state equating to approximately 2.86M m² GFA. The majority of hospitality buildings are small (<1,000m²) and are located in metropolitan Melbourne. Of note, there are 125 large buildings primarily in metropolitan Melbourne and the City of Melbourne that constitute 21% of overall GFA (609,588m²).

There is little information relating to emissions and water use for hospitality buildings.

Table 2 below summaries the number of buildings and GFA across all sectors.

<table>
<thead>
<tr>
<th>Regions</th>
<th>Buildings</th>
<th>GFA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Office</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>10,126</td>
<td>61%</td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>2,701</td>
<td>16%</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>1,955</td>
<td>12%</td>
</tr>
<tr>
<td>Regional Centres</td>
<td>1,790</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Total buildings</strong></td>
<td><strong>16,572</strong></td>
<td><strong>12,588,338</strong></td>
</tr>
<tr>
<td>Retail</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>31,861</td>
<td>63%</td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>3,610</td>
<td>7%</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>9,248</td>
<td>18%</td>
</tr>
<tr>
<td>Regional Centres</td>
<td>5,603</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Total buildings</strong></td>
<td><strong>50,322</strong></td>
<td><strong>20,671,260</strong></td>
</tr>
<tr>
<td>Healthcare</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>3,306</td>
<td>74%</td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>57</td>
<td>1%</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>541</td>
<td>12%</td>
</tr>
<tr>
<td>Regional Centres</td>
<td>552</td>
<td>12%</td>
</tr>
<tr>
<td><strong>Total buildings</strong></td>
<td><strong>4,456</strong></td>
<td><strong>1,141,346</strong></td>
</tr>
<tr>
<td>Accommodation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>538</td>
<td>21%</td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>254</td>
<td>10%</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>1501</td>
<td>59%</td>
</tr>
<tr>
<td>Regional Centres</td>
<td>255</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total buildings</strong></td>
<td><strong>2,548</strong></td>
<td><strong>2,368,735</strong></td>
</tr>
<tr>
<td>Hospitality</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>2,877</td>
<td>54%</td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>634</td>
<td>12%</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>1,227</td>
<td>23%</td>
</tr>
<tr>
<td>Regional Centres</td>
<td>632</td>
<td>12%</td>
</tr>
<tr>
<td><strong>Total buildings</strong></td>
<td><strong>5,370</strong></td>
<td><strong>2,863,232</strong></td>
</tr>
</tbody>
</table>

Source: Valuer-General Victoria and AECOM
1.0 Introduction
1.0 Introduction

1.1 Building upon the previous Next Wave report

Commercial buildings contribute significantly to Australia’s greenhouse gas emissions and represent a significant portion of the low cost abatement and energy efficiency opportunities in Australia.

To support building upgrades to improve energy efficiency, in 2012 Sustainability Victoria published ‘The Next Wave: Retrofitting Victoria’s Office Buildings’. The report analysed the mid-tier office market, comprising buildings of PCA grade B, C and D. Subsequently, sustainability in the mid-tier office market has been a growing focus for industry and government, with various commercial building programs targeting the mid-tier market.

The previous Next Wave report provided an important evidence base for identifying where the greatest opportunities for GHG emissions reduction were in the mid-tier office sector. Since then, gains made in reducing office building emissions have proven the effectiveness of retrofitting mid-tier buildings. Sustainability Victoria’s Energy Efficient Office Buildings Program showed that average benefits from building tuning and energy efficiency measures included energy savings of up to 29%, an improvement of 1 Star NABERS Energy rating and less than three-year payback on efficiency investment\(^1\). There remain significant upgrade opportunities for mid-tier commercial offices, as well as broader opportunities across small and medium commercial buildings (SMCB) within and beyond the office sector.

1.2 Purpose and objectives of this report

This paper builds upon the original ‘The Next Wave’ 2012 report. It provides an overview of the Victorian commercial buildings sector and has been expanded to take into account changes in mandatory reporting thresholds for office buildings. It also includes an additional four commercial sectors.

The report considers recent changes in the Commercial Building Disclosure (CBD) mandatory disclosure threshold of \(1,000\text{m}^2\) NLA, down from the previous \(2,000\text{m}^2\) threshold. The disclosure requirement relates to the requirement to provide energy efficiency information when a commercial office is offered for sale or lease.

This update has been expanded to include four other commercial sectors being: retail, healthcare, accommodation and hospitality. The lessons and practices established through retrofitting office buildings (and for the residential sector) can then be expanded into other commercial sectors that make up a large proportion of Victoria’s building stock, targeted to where the greatest emissions reduction and energy and water savings are possible.

The research will assist to address gaps in the market and in decision-making about how to effectively transition the commercial sector in Victoria to carbon neutrality.

The report is structured according to the five commercial sectors investigated, as trends and areas for upgrade tend to be sector specific. Each section identifies the GFA and number of buildings, their spatial distribution, age, ownership and tenancy, market trends and discussion of the drivers and barriers to upgrading, making recommendations for where upgrading should be targeted to support improved environmental performance.

1.3 Data analysed

A number of data sets have been utilised in the analysis for this report. The primary data set used was the Valuer-General Victoria (VGV) rating and property data, tailored to each market location and sector (see Table 2).

- **Valuer-General Victoria** – state-wide property and rating data set


18-Dec-2017
Prepared for – Sustainability Victoria – ABN: 62 019 854 067
- **Census of Land Use and Employment (CLUE)** - City of Melbourne only data. CLUE data segments different building types for geographical locations for commercial uses within the city.
- **PCA Office Quality Grade** matrix (Metro) - applicable to metropolitan offices only
- **NABERS** - historical publically available rating data for Victoria for each commercial sector

### Table 2  Building uses included in commercial buildings sector analysis

<table>
<thead>
<tr>
<th>Commercial sector</th>
<th>Uses included</th>
<th>Uses not included</th>
</tr>
</thead>
<tbody>
<tr>
<td>Office</td>
<td>Low rise and multi-level</td>
<td>Special purpose buildings</td>
</tr>
<tr>
<td>Retail</td>
<td>Retail single occupancy, multiple occupancy,</td>
<td>Service stations, bottle shops, licensed retail</td>
</tr>
<tr>
<td></td>
<td>mixed use, shopping centres and bulky goods</td>
<td></td>
</tr>
<tr>
<td>Healthcare</td>
<td>Health clinics, doctors surgeries</td>
<td>Hospitals, crematoriums, brothels, vets</td>
</tr>
<tr>
<td>Accommodation</td>
<td>Hotels, short-stay, backpackers, student</td>
<td>Residential, aged-care accommodation, retirement villages, residential premises</td>
</tr>
<tr>
<td></td>
<td>accommodation, motels</td>
<td>used for short-stays, caravan parks and camping grounds</td>
</tr>
<tr>
<td>Hospitality</td>
<td>Restaurants, cafes and coffee shops, bars,</td>
<td>fast food</td>
</tr>
<tr>
<td></td>
<td>bars, fast food</td>
<td></td>
</tr>
</tbody>
</table>

Source: Valuer-General Victoria and AECOM

Since 2012, a number of the data sets used have changed. The main change was to the small area boundaries for CLUE data. A consequential change to methodology was necessitated by the expanded scope, minimising the usefulness of drawing longitudinal comparisons for office buildings. Previously the VGV dataset included all buildings containing any office space as office buildings. Many of these buildings are predominately retail, or a mix of commercial uses. Therefore, to be more accurate the updated report only includes as offices buildings those buildings where offices are the dominant use. This causes the analysis to suggest that the number of office buildings have declined since 2012, while the GFA has increased.

The Next Wave Report identified an office building as any building containing an office use, regardless of the scale of that use relative to other uses in that building. With the expanded scope of this report, this approach would result in double counting, making direct comparison difficult for some areas of this analysis.

CLUE and VGV data was not able to be easily reconciled, and so for all state-wide and regional analyses, VGV data is used.

### 1.4 Market overview

It is necessary to understand the nature and spatial distribution of commercial buildings, as well as policy and market drivers and barriers to be able to answer the two key questions:

1. What are the attributes and locations of the commercial buildings most impacted by the change in the mandatory reporting threshold?
2. What are the greatest opportunities for GHG emissions reduction across the expanded scope of commercial building sectors?

*Policy, regulatory and market drivers*

Recent years have seen increasing global, federal, state and local efforts to drive greater building efficiencies. Notably, Australia ratified the Paris agreement on 10 November 2016; setting a target to reduce emissions by 26-28 per cent below 2005 levels by 2030. In February 2017, the Victorian government amended the *Climate Change Act* to specify a target for Victoria to be carbon neutral by
2050. The commercial building sector is identified in the Victorian Government Climate Change Framework as a key sector to focus on in the transition to carbon neutrality. In June 2017, the Victorian State government legislated a series of five-yearly interim emissions targets to achieve the goal of net zero emissions by 2050. Both the Paris Agreement and State Government’s emissions targets act as powerful market signals and support awareness and action.

Increased awareness and transparency (such as for supply chains) are seeing more ethical consumption and shareholder pressure on companies to set, monitor and report on both sustainability and corporate social responsibilities (CSR), driving capital investment in upgrades and supporting behaviour change.

With the build environment industry seeking to better align with international best practices, groups such as the Australian Sustainable Built Environment Council (ASBEC) with ClimateWorks Australia are proposing a long-term industry-led vision for how the National Construction Code can deliver energy and emissions savings, alongside financial benefits for building owners and occupants.

Their recent Issues Paper[2] notes that buildings contribute more than half of Australia’s electricity consumption and almost a quarter of national emissions and is targeting new buildings through energy requirements for new construction in building codes.

Across North America and Europe there are long-term targets of net or near zero energy buildings to drive innovation, investment and market transformation in the property and construction sectors.

1.5 Retrofit decision making

Decisions to retrofit or invest in energy saving measures are often made when buildings are sold or re-tenanted. The CBD mandatory reporting threshold has been effective in raising awareness among commercial office building owners and tenants, and in improving the transparency of buildings performance.

As the size of buildings impacted by mandatory reporting decreases, the number of buildings and the number of building owners impacted increases. Retrofits of larger office and other commercial buildings remain where the biggest gains can be made, but the need to balance smaller GFA with a larger numbers of buildings suggests that smaller more cost effective energy efficiency measures not associated with retrofits are also critical to improve performance. Incremental improvements and a staged approach, as is often the case for the residential sector become important strategies. Unlike the residential sector, the number of owner-occupied buildings is significantly lower; therefore consideration of how different buildings perform, their location, ownership and incentives to upgrade is more complex.

Some of the drivers and barriers for retrofitting buildings are cross-cutting across the various commercial sectors: office, retail, healthcare, accommodation and hospitality, while others are more sector specific. These include:

- Ownership structures can split incentives between tenant and owner. It is generally easier for owner-occupiers to upgrade. Competition in some sectors (such as retail) are seeing a stronger drive for upgrading as part of broader amenity changes coming from anchor tenants and to respond to consumer demand.
- Building age: Offices built between 1960-1980 are more likely to be considered mid-tier, generally characterised by a lack of current energy efficiency considerations. Buildings constructed prior to 1960 are smaller, more distributed across Victoria and more difficult to target.
- Locational factors: the impact of climate differs across Victoria necessitating different responses
- Resilience and disaster risk reduction: to reduce the cost of damage and disruption associated with natural hazards or major events building owners and operators are looking to build redundancy into building systems and decentralise services.
- How buildings are used: Just as offices are moving to more flexible and multi-purpose spaces, retail centres are also more focussed on experience and providing broader service offerings.

1.6 Opportunities for GHG emissions reduction

With the reduction in the mandatory reporting threshold, opportunities for emissions reduction open up across Melbourne for commercial office buildings below 2000m². However, existing commercial buildings ripe for upgrading will become a small proportion of overall commercial stock in the future given estimated construction and repurposing. High-level estimations undertaken by ClimateWorks indicate that commercial buildings constructed after 2019 could constitute a quarter of commercial building stock by 2030, with the new build share rising to 59% of commercial floor space by 2050.

Across other sectors, retrofitting efforts should generally be driven by sector specific arrangements, and where a concentration of building type occurs (such as strip shops in Boroondara or Stonnington) a more place based approach may be effective if driven by a local council, with trader association and developer support.

Outside of the commercial office sector, there is a potential for up to 300,000 tonnes CO₂-e/annum to be saved if buildings were upgraded to a 4 Star equivalent NABERS rating or 765,000 tonnes CO₂-e/annum if upgraded to a 5 Star equivalent NABERS rating. Similarly 7000-13000 mega-litres of water could be saved per annum.

Figure 14 Potential for emissions savings across different sectors

Source: NABERS and AECOM
Figure 15  Potential for water savings across different sectors

Source: NABERS and AECOM
1.7 Where are commercial buildings located?

Figure 16 shows Victoria’s rural local government areas, rural regions, and regional centres. Figure 17 shows metropolitan regions in Melbourne.

**Figure 16** Map of rural regions and regional centres

**Figure 17** Location of NEICs and MACs

---

**Greater Melbourne Regions**

---

**Victorian Regions**
2.0  Office

2.1  Overview

The majority of office buildings are located in metropolitan Melbourne (61% of all office buildings), while almost half of the state’s total office GFA is located within the City of Melbourne (48%) reflecting the number of large buildings within the central city.

2.2  GFA and number of buildings

There are 16,572 office buildings across the state of Victoria equating to around 12.6M m$^2$ of GFA (see Table 4). The majority (15,027 or 90.7%) of office buildings are small (<1,000m$^2$) (see Table 3). 63% of small office buildings are located in metropolitan Melbourne (9,396 buildings) (see Table 16 in Appendix A). The majority of office buildings (76%) in the City of Melbourne also tend to be small but only account for 18% of office GFA in the City of Melbourne due to the presence of large office buildings.

Table 3  Building size- office

<table>
<thead>
<tr>
<th>Building Sizes</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 1,000 m$^2$</td>
<td>1,000 m$^2$ - 2,000 m$^2$</td>
<td>&gt; 2,000 m$^2$</td>
</tr>
<tr>
<td>No of buildings</td>
<td>15,027</td>
<td>90.7%</td>
<td>793</td>
</tr>
<tr>
<td>GFA (m$^2$)</td>
<td>4,969,882</td>
<td>39.5%</td>
<td>1,132,836</td>
</tr>
</tbody>
</table>

Source: Valuer General Victoria

Table 16 in Appendix A shows that:

- 34.9% of GFA consists of 390 large buildings in the City of Melbourne (4,392,551m$^2$)
- 23.8% of GFA consists of 9,396 small offices in metropolitan Melbourne (3,000,380m$^2$)
- 14.9% of GFA consists of 311 large offices in metropolitan Melbourne (1,871,244m$^2$)

752 large buildings (< 2,000m$^2$) account for more than half of the total office GFA across the state (~ 6.5M m$^2$ of GFA). More than half of these large office buildings are located in the City of Melbourne (390 office buildings).

Large buildings of PCA Grade B-D were captured in the previous CBD threshold. The drop in the CBD threshold to 1,000m$^2$ for office buildings will potentially capture an additional 793 office buildings equating to 1.1M m$^2$ GFA pending the quality of these buildings. More than half of these offices are located in metropolitan Melbourne (419 buildings).
2.3 Spatial distribution

2.3.1 State wide

Figure 18 and Table 4 show that the majority of office buildings are located in metropolitan Melbourne (61% of all office buildings), while almost half of the state’s total office GFA is located within the City of Melbourne (48%). This reflects the number of large buildings within the central city. Figure 19 shows the spatial distribution of GFA by municipality across Victoria.

![Spatial distribution chart](image)

Figure 18  Proportion of offices across the state

<table>
<thead>
<tr>
<th>Regions</th>
<th>Buildings</th>
<th>GFA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>%</td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>10,126</td>
<td>61.1%</td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>2,701</td>
<td>16.3%</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>1,955</td>
<td>11.8%</td>
</tr>
<tr>
<td>Regional Centres</td>
<td>1,790</td>
<td>10.8%</td>
</tr>
<tr>
<td><strong>Total buildings</strong></td>
<td><strong>16,572</strong></td>
<td><strong>12,588,338</strong></td>
</tr>
</tbody>
</table>

Source: Valuer-General Victoria
2.3.2 Regional and rural Victoria

22.6% of Victoria’s office buildings are located in rural Victoria and regional (3,745 buildings). The overwhelming majority of these office buildings are small (< 1,000m$^2$) - 3,577 buildings compared to 117 medium sized (between 1,000-2,000m$^2$) and 51 large (more than 2,000m$^2$). Glenelg Hopkins is the region with the highest number of office buildings as well as the highest amount of office GFA. This is followed by the Mallee, North East and West Gippsland regions (see Figure 20). In regional and rural Victoria 48% of office buildings are located in regional centres (1,790 buildings). Larger office buildings tend to be located in regional centres. 63% of medium sized buildings (117 buildings) and 80% of large buildings (51 buildings) are located in regional centres. Greater Geelong being the largest regional centre (by population) has the highest number of offices as well as GFA. This is followed by Greater Bendigo and Ballarat (see Figure 21).

Figure 19 Map of Victorian municipalities by total GFA – office

Source: Valuer General Victoria
Figure 20  Total GFA and number of buildings regional and rural Victoria - office

![Graph showing total GFA and number of buildings regional and rural Victoria - office.](image)

Source: Valuer General Victoria

Figure 21  Total GFA and number of buildings regional centres - office

![Graph showing total GFA and number of buildings regional centres - office.](image)

Source: Valuer General Victoria
2.3.3 Metropolitan Melbourne

Metropolitan Melbourne accounts for 61% of Victoria’s office buildings and 46% of Victoria’s office GFA. Within metropolitan Melbourne, the inner eastern region has the most office buildings and total GFA. Figure 22 indicates that there are a proportion of larger sized buildings in the inner east, as well as on the city fringe and the outer east (GFA in proportion to number of buildings).

Figure 23 shows the council areas with the greatest GFA, indicating a gradient pattern whereby municipalities closer to the CBD tend to have more office GFA.

**Figure 22** Total GFA and number of buildings per metropolitan region - offices

![Figure 22](image_url)

Source: Valuer General Victoria

**Figure 23** Map of Metropolitan Melbourne municipalities by total GFA – office

*office buildings*

![Figure 23](image_url)

Source: Valuer General Victoria
2.3.4 City of Melbourne

Figure 24 shows the quantity and quality of GFA in each City of Melbourne precinct. 34% of GFA is B and C Grade. Premium and A Grade office GFA constitutes a large proportion of GFA in Docklands, Southbank and the CBD. The majority of GFA in Carlton, East Melbourne, Kensington, North Melbourne, Parkville and West Melbourne consists of B, C and D Grade buildings.

Figure 24 GFA by precinct and PCA Grade – City of Melbourne

Source: CLUE City of Melbourne 2016

Figure 25 shows that the majority of buildings in the City of Melbourne are less than 20 storeys and that these tend to be PCA Grade B or lower. The majority of buildings above 20 storeys tend to be either A Grade or premium.

Figure 25 Number of buildings by floors above ground and PCA Grade - City of Melbourne

Source: CLUE City of Melbourne 2016
2.4 Building age

Figure 26 and Figure 27 detail the number and GFA of office buildings by year of construction for each decade since Melbourne was founded in 1835. Across Victoria and the City, a large number of buildings were built between 1980 and 2009. The GFA to building ratio in Figure 26 shows office buildings have been getting taller. Figure 27 shows that the majority of Premium and A Grade buildings in the City were constructed post 1980. There are also a small number of older buildings that are A Grade and can be assumed to have been retrofitted. Also of note, is the number of B and C Grade buildings built post 2000.

Figure 26 Year of construction of buildings - Victoria (excluding City of Melbourne) - office

Source: Valuer General Victoria

Figure 27 Year of construction and PCA Grade - City of Melbourne

Source: CLUE City of Melbourne 2016
2.5 Ownership and tenancy
Ownership of office buildings includes super funds, foreign investment particularly for larger buildings in the CBD and key locations in metropolitan Melbourne. Smaller buildings in metropolitan Melbourne may also be owned by smaller individual owners. A number of office buildings are government owned including a number of those that are included in the NABERS ratings for energy and water use in regional centres.

2.6 Emissions and water use
To establish the impact that building upgrades could have on the existing building stock, the last 7 years of data (550 unique buildings) have been taken from NABERS to estimate the wider emissions and water impacts that commercial buildings may have.

The mean energy star rating across the data set was 3.13 Stars with a distribution across Victoria as shown in Figure 28 below. The number of ratings in each location is indicated in Figure 29. While the data indicates that regional office properties are outperforming their metropolitan counterparts; the number of buildings is comparatively small, with only 37 buildings with available NABERS ratings.

Figure 28 Distribution of commercial NABERS energy ratings (2010-current)

Source: NABERS 2017
On July 1 this year, the Commercial Building Disclosure Program lowered the mandatory disclosure threshold from 2000m$^2$ to 1000m$^2$; requiring owners and lessors of smaller commercial office buildings to disclose a NABERS rating when the property is marketed.

There have been 15 properties in this threshold that have reported their data this year spread across Victoria as shown in Figure 30. The mean reported rating was 3.7 Stars, comparatively higher than the average reported rating across the full data set.

**Figure 30  NABERS rating achieved for commercial buildings between 1000-2000m$^2$**

Source: NABERS 2017
2.7 **Drivers for upgrades**

Two key factors driving building owners to upgrades their buildings are both market drivers: tenant demand and reputation - demonstrated through environmental credentials and corporate social responsibility (CSR).

Tenant demand is generally influenced by the desire for:

- Reduced outgoings. Understanding that reduced outgoings for the base building can result in cheaper lease costs;
- Greater amenity. Particularly in competitive markets where retention of staff is critical to company success. 90% of employees admit their attitude to work is adversely affected by the quality of their work environment (WELL Certified).

Building owners can also be driven to upgrade their building due to:

- Environmental, sustainability and CSR reporting;
- Funding incentives, particularly for mid-tier buildings;
- Vacancy. While the B Grade market is competitive for tenants, buildings that have been refurbished are leasing more quickly. Building owners are refurbishing their stock to attract the growing number of tenants who want non-conventional office space in sought after City Fringe locations. Building 8, 658 Church, Richmond (Figure 31) is an example of this refurbishment trend, recently upgraded after high vacancy rates. Post upgrade, the space was able to be leased at a much higher rate than pre-upgrade.\(^6\)

2.8 **Barriers for upgrades**

Barriers that building owners face in initiating capital upgrades include:

- Cost and reluctance to invest without an immediate return;
- General perception that the capital cost for energy efficiency measures is high;
- Lack of knowledge: of programs, tools etc. that may exist to help in the decision process;
- Lack of knowledge on the options available for upgrading.
- Time:
  - Meaning other issues are prioritised, i.e. general maintenance;
  - Insufficient time to understand the best options to move forward with.

2.9 **Market trends**

The current market trends for offices are increasingly focussed on the people who use the space, rather than the space itself; with abundant research suggesting that healthy and flexible work spaces lead to higher productivity and greater retention of staff. These wellness drivers are underpinned by trends toward:

\(^6\) Colliers International Research and Forecast Report, Metro Office, First Half 2017
• Access to facilities and flexible spaces such as wellness centres, business lounges, café and library areas
• Access to amenities such as gymnasiums, childcare facilities etc.
• Designing or retrofiting commercial spaces for increased access to natural light, increased outside air and other indoor environment quality aspects
• End of trip facilities such as bicycle racks and change rooms (increasingly with amenities such as bicycle repair stations, towel service, hair dryers, hair straighteners, ironing facilities etc.)

This is demonstrated by more building owners interested in third party certification of building wellness, for which the WELL Building Standard offers a “framework to help improve health and well-being for everyone that visits, works in, or experiences a building.”

There is currently 1 building in Australia certified under the WELL tool, 1 pre-certified and another 33 registered; 13 of which are in Victoria (including existing buildings). This is the third highest in the world behind the United States (205 certified or registered) and China (98 certified or registered).

In addition, building developments are increasingly investing in:
• Third party operational base building sustainability rating certifications, such as Green Star Performance and NABERS ratings
• Car-sharing facilities for corporate use and electric vehicle charging stations
• Sub-metering to enable the measurement and verification of energy consumption for sustainability or CSR reporting

2.10 Case Study – Mirvac HQ, Sydney

Mirvac’s Headquarters at 200 George Street, Sydney was the first Australian building to achieve certification under the WELL Building Standard, achieving a GOLD rating.

The building already has a 6 Star Green Star Interior rating, and is targeting 6 Star Green Star Office V3 As-Built rating, a 5 Star NABERS Energy Rating and a 4 Star NABERS Water ratings.

The WELL rating resulted in:

• The incorporation of sensors throughout the tenancy to monitor air quality and create the optimal indoor air quality for employees
• Providing filtration on all taps; located not more than 30m from regular occupied spaces encouraging hydration
• Locating 75% of workstations not more than 7.5m from a window; increasing access to natural light and external views
• Artificial lighting is programmed for varying brightness and darkness at appropriate points throughout the day to maintain optimal circadian rhythms
• An internal café providing healthy food options with high nutritional value and clear labelling to help employees make informed decisions
• A dedicated health and wellness educational seminar series in which health professionals educate staff on health and wellbeing
• Weekly Pilates classes with a professional instructor; and
• 1171 plants (more than one plant per person).

2.11 Opportunities for upgrading

The emissions data available suggests that the largest impacts on water savings and emissions reductions for commercial offices could be made in:

• The largest predicted emissions reduction could be achieved in buildings over 2,000m² in the City of Melbourne and buildings below 2,000m² in metropolitan Melbourne. If these buildings were raised from their current condition to a 5 Star NABERS equivalent; savings of approximately 395,000 tonnes CO₂-e/annum and 270,000 tonnes CO₂-e/annum could be realised in the City of Melbourne and metro Melbourne respectively.

• The largest predicted water savings could be made in the same areas, with 1,000 mega-litres and 730 mega-litres of savings available across the City of Melbourne and metropolitan Melbourne respectively.

• A large number of office buildings (20% of total office GFA) were constructed between the years 1980-1989; presenting an opportunity to upgrade their centralised HVAC systems (average plant life of 30 years). If the upgrade of a major plant resulted in a 1 Star increase in NABERS rating, an emissions saving of 128,000 tonnes CO₂-e/annum could be realised.

• 39% of Victoria’s office GFA remains below the CBD threshold. While reaching out to and upgrading 15,027 office buildings presents a challenge, an opportunity to address this could result in savings of 447,000 tonnes CO₂-e/annum.

• Although long term, low rate financing is available from Victorian local councils under the Local Government Legislation Amendment (Environmental Upgrade Agreements) Bill 2015, other barriers for upgrading such as time and education may need to be overcome for many smaller commercial building owners to consider upgrades.

• The National Green Leasing Policy for government tenants has been effective in the upgrade/provision of a number of energy efficient buildings across Victoria. Communicating these principles across a broader range of buildings and tenants may assist in expanding the uptake of green leases.
Figure 33  Estimated emissions across the commercial sector

Source: NABERS and AECOM

Figure 34  Estimated water use across the commercial sector

Source: NABERS and AECOM
3.0 Retail

3.1 Overview

Shopping centres account for 38% of Australia's retail space. Regional shopping centres comprise around one quarter (26%) of the total shopping centre space; Sub regional centres contain 34%; Neighbourhood centres 31%; and CBD centres contain 4%7. Many centres are owned and managed by large, diversified property groups and attract investment from insurance groups and superannuation funds attracted to the capital stability and reliable income these properties can provide8. The remainder of Australia's retail space is made up of bulky good retailers (i.e. Harvey Norman or Bunnings) and strip shopping centres, which are generally owned by smaller market players.

The retail industry has been slow to embrace the environmental, social and financial benefits of sustainable practices, though momentum is building globally and locally.9 Generational change and growing ethical and environmental awareness is beginning to impact retailers, with many brands beginning to realise that sustained prominence in changing market conditions will not come without a shift toward positive change.

3.2 GFA and number of buildings

There are 50,322 retail buildings across Victoria which equates to 20.5M m\(^2\) of GFA. Table 5 shows that the majority (94.1%) of retail buildings are small (< 1,000m\(^2\)). However in each region, 2-4% of buildings are over 2,000m\(^2\) and account for between 18-49% of total GFA in their respective areas. The presence of large shopping centres across metropolitan Melbourne and in regional centres accounts for this.

Table 5 shows that Victoria’s retail GFA consists of:

- 57% of GFA consists of 47,349 small retail outlets (11,850,858m\(^2\))
- 31% of GFA consists of 1,313 large retail buildings (6,438,691m\(^2\))
- 14% of GFA consists of 276 medium retail buildings (2,381,711m\(^2\))

Table 5 Size of buildings - retail

<table>
<thead>
<tr>
<th>Building Sizes</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 1,000 m(^2)</td>
<td>1,000 m(^2) - 2,000 m(^2)</td>
<td>&gt; 2,000 m(^2)</td>
</tr>
<tr>
<td>No of buildings</td>
<td>47,349</td>
<td>94.1%</td>
<td>1,660</td>
</tr>
<tr>
<td>GFA (m(^2))</td>
<td>11,850,858</td>
<td>57.3%</td>
<td>2,381,711</td>
</tr>
</tbody>
</table>

Source: Valuer General Victoria

Table 17 in Appendix A shows that the following geographic clusters make large contributions to Victoria’s GFA:

- 35% is 30,067 small retail buildings in metropolitan Melbourne (7,384,302m\(^2\))
- 19% is 820 large retail buildings in metropolitan Melbourne (3,882,937m\(^2\))
- 11% is 8,810 small retail buildings in rural Victoria (2,224,284m\(^2\))
- 6.5% is small retail buildings in regional centres (1,337,495m\(^2\))

---

7 http://www.scca.org.au/industry-information/key-facts/
3.3 Spatial distribution

3.3.1 State wide

Across Victoria, Figure 35 shows that 63% of retail buildings are located in metropolitan Melbourne (31,861 buildings) while 29% are located in rural Victoria and regional centres (14,851 buildings). This reflects the expectation that a large part of the retail market will be located conveniently near where customers live.

![Figure 35](image)

Source: Valuer General Victoria

<table>
<thead>
<tr>
<th>Regions</th>
<th>Total Buildings</th>
<th>GFA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>31,861</td>
<td>63%</td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>3,610</td>
<td>7%</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>9,248</td>
<td>18%</td>
</tr>
<tr>
<td>Regional Centres</td>
<td>5,603</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Total buildings</strong></td>
<td><strong>50,322</strong></td>
<td><strong>%</strong></td>
</tr>
</tbody>
</table>

Source: Valuer General Victoria

Retail spaces calculated by this assessment can be broken down into four main categories based on the Australian Valuation Property Classification Code (AVPCC):

- Single occupancy retail premises (code 210 - 210.9) – Land with retail premises used for the sale of goods or services. This includes banks, showrooms, shops, cafes, timber yards, trade supplies, display yards, convenience stores and plant nurseries.
- Multi-occupancy retail premises (code 211 – 211.3) – Land with more than one retail premises used for the sale of goods or services, regarded as a complex and not subdivided.
- Mixed use occupation (code 212 – 212.6) – Land that includes mixed occupancies, including shops and offices, studios and workrooms regarded as a complex and not subdivided.
- Shopping centre (213 – 213.6) - Land developed with a significant retail complex comprising a number of non-subdivided retail premises, parking and associated infrastructure. Includes super regional, major regional, regional, sub-regional and neighbourhood shopping centres.
National company retail (214 – 214.4) – Land developed with a purpose built structure and normally occupied by a national company. This includes supermarket, department or discount stores and bulky good stores.

### 3.3.2 Regional and rural Victoria

29% of retail in Victoria is located in regional and rural areas (14,851 buildings). There are 9,248 retail buildings in rural Victoria and an additional 5,603 retail buildings in regional centres. This reflects the local service nature of retail.

Of those retail buildings in regional and rural Victoria, 94% are smaller than 1,000m² (13,930 buildings). Of those retail buildings over 2,000m², 207 are located in regional centres compared to 160 that are located in rural Victoria. This reflects the regional centre retail role and settlement hierarchy which services larger population and area catchments.

Figure 37 shows the breakdown of the number of buildings and total GFA per region. The North Central region has the most retail buildings, while Glenelg Hopkins and West Gippsland have the highest GFA total per region. Interestingly, seven out of ten regions have high ratios of GFA to the number of buildings. These regions include Glenelg Hopkins, West Gippsland, Wimmera, Goulburn Broken, the Mallee, Port Phillip and Western Port, and North East.

Figure 38 shows retail buildings and total GFA in each regional centre. Greater Geelong has a significantly higher number of retail buildings (2,392) and total GFA (1,188,299m²) compared to the second and third largest regional centres: Ballarat (973 buildings and 422,393m²), and Bendigo (913 buildings and 402,381m²). This reflects Geelong’s larger population. Of the five sectors in this report, retail makes up between 57-65% of total GFA in each of these regional centres.

Figure 36 Map of Victorian municipalities by total GFA – retail

Source: Valuer General Victoria
Figure 37  GFA and number of buildings rural Victoria - retail

Source: Valuer General Victoria

Figure 38  GFA and number of buildings regional centres - retail

Source: Valuer General Victoria
Figure 39 and Figure 40 show that the majority of retail in regional Victoria are single occupancy retail.

Figure 39  Number of retail buildings for different retail types distributed as areas within regional Victoria

Source: Valuer General Victoria

Figure 40  GFA of retail buildings for different retail types distributed as areas within regional Victoria

Source: Valuer General Victoria
3.3.3 Metropolitan Melbourne

63% of Victoria’s retail buildings are located in metropolitan Melbourne (31,861 buildings). The South East, Inner East and North and West all have around 8,000 retail buildings each (see Figure 41). The North and West metropolitan region has the most GFA of retail. The City Fringe has the smallest proportion of retail reflecting a smaller area size and population as well as its proximity to the CBD.

Figure 42 shows total GFA per municipality. Those municipalities that have over 500,000m$^2$ GFA, tend to have large shopping centres and/or a number of street/mixed shopping precincts.

**Figure 41** GFA and number of buildings per metropolitan region - retail

![GFA and number of buildings per metropolitan region - retail](source)

**Figure 42** Map of Metropolitan Melbourne municipalities by total GFA – retail

![Map of Metropolitan Melbourne municipalities by total GFA](source)
Figure 43 and Figure 44 show that the majority of retail in metro Melbourne are single occupancy, however there is more diversity than in regional Victoria.

Figure 43  Number of retail buildings for different retail types across metropolitan Melbourne

Source: Valuer General Victoria

Figure 44  GFA of retail buildings for different retail types across metropolitan Melbourne

Source: Valuer General Victoria
3.3.4 City of Melbourne

The City of Melbourne has 7% of the state’s retail. 3% of its buildings (126 buildings) make up 49% of the City’s total GFA reflecting the number of significant department stores and shopping complexes such as Myer, David Jones, QV, Emporium, and Melbourne Central. Similarly Figure 45 shows that there about 10 retail buildings of between 5-10 floors which account for about 370,000m². A significant number of retail buildings in the City are between 2-4 floors (about 340 buildings). 150 retail buildings are one floor and appear to consist of mainly small-boutique shops such as those found in arcades, lanes ways and to some extent along streets, based upon the small proportion of GFA to number of buildings.

Figure 45 Number of retail buildings by floors above ground - City of Melbourne

Source: CLUE City of Melbourne 2016
3.4 Building age

Across the state, the majority of retail buildings were constructed between 1950 and 2009. Buildings constructed between 2000 and 2019 have overall gotten larger (based upon the proportion of GFA to number of buildings). These large retail buildings are likely to include newer shopping centres.

Compared to the rest of Victoria, the bulk of the City of Melbourne’s retail buildings are older with many constructed between 1870 and 1929. Similar to patterns across the state, larger retail buildings appear to have been built in later years after 1990 and are likely to include complexes such as QV and Emporium.

Figure 46 Year of construction - Victoria (excluding City of Melbourne) – retail

Source: Valuer General Victoria

Figure 47 Year of construction - City of Melbourne - retail

Source: CLUE City of Melbourne 2016
3.5 Ownership and tenancy

Large retail centres generally operate in a model where they sell utilities back to their tenants. There is a disconnect between smaller strip shop owners and tenants; as tenants will pay leasing and billing, not unlike a residential customer.

3.6 Emissions and water use

Publicly available NABERS information has been used as an indication of energy and water use across the wider retail sector. The majority of the NABERS rated centres (48 individual premises) were located in metropolitan Melbourne (full regional distribution shown in Figure 48 with GLAs ranging from 14,000m² to 144,000m² with an average GLA of 55,250m²).

Figure 48 Location of shopping centres with a NABERS rating (OEH)

The average energy and water ratings achieved for shopping centres throughout Victoria were 3.26 and 2.9 stars respectively. As was the case for the office sector, regional shopping centres outperform the metropolitan Melbourne and City of Melbourne shopping centres (3.6 compared to 3.1); however, the data set for this area was again small. Medium-large retailer tenancy use is not included; whereas smaller retailer tenancy use is due to the ownership model.

The average NABERS water rating across the dataset was 2.9 Stars.

3.7 Drivers for upgrades

With retail centres generally operating a model where they sell utilities back to their tenants, there can be a disconnect between investing in and benefitting from reducing outgoings. This disconnect can also apply in smaller strip centres between tenants and owners, as tenants lease will include outgoings, not unlike a residential tenant. Drivers for upgrades in the retail space can include:

- Changes in consumer behaviour; including less time spent shopping and greater access to online consumerism
- Returns to stakeholders, many of whom are large diversified funds
- Operational efficiencies and subsequent reductions in operating costs
- Tenants demand for higher quality space; particularly larger chain stores/operators such as larger clothing retailers and banks
• Competition. More than 377,000m\(^2\) of shopping centre supply is expected to come online in Victoria through to 2021, boosted by projects such as Chadstone Shopping Centre, Westfield Knox, Highpoint Shopping Centre, and Westfield Doncaster. This activity has also translated across the CBD, where landlords have been adding value to their assets to keep up with the competition from their suburban counterparts.

• Increased dwell time. Shopping centre landlords continue to be focused on refurbishments and expansions of their dining and entertainment precincts in an aim to increase dwell time and create memorable user experiences.

Figure 49 demonstrates the market issues that Vicinity (a large owner of retail assets) faces and their importance to both internal and external stakeholders. Issues with the strongest links to sustainability have been highlighted, demonstrating that climate change resilience and energy and carbon emissions are becoming a larger focus both internally and externally. Beyond the immediate realm of sustainability, changes in consumer behaviour and market dynamics are the biggest issues to be overcome and therefore the biggest drivers for upgrade.

**Figure 49** Vicinity’s material long-term economic, environmental, social and governance issues

3.8 **Barriers for upgrades**

Due to different ownership profiles, the drivers for owners to upgrade smaller strip shops are often different to those for shopping centres. Similar to a residential ownership/rental structure, all outgoings in retail not connected by common area are paid for by the tenant. Therefore, without tenant demand for higher quality space, desire to upgrade is almost non-existent.

3.9 **Market trends**

There has been an influx of divestment strategies by major players including GPT, Mirvac, QIC, Scentre Group and Vicinity Centres over the last financial year, who are now reinvesting capital into redeveloping their existing trophy assets, with the aim of attracting tenant demand from prominent retail brands and boosting potential income streams through new leasing opportunities. In light of this flurry in shopping centre redevelopment activity from their suburban counterparts, landlords in the CBD have been working on setting their point of difference and adding value to assets through refurbishments. Aesthetic appeal, advanced architectural design, access to major streets, digital...
innovation, diverse food retail offerings, ecofriendly settings, visitor mobility and the optimisation of space are various factors that are being taken into consideration. However, landlords are still driven largely by ensuring efficient building operations and appropriate life cycle management. As such sustainability is less mature in the retail market than in the office market.

### 3.10 Case study – Vicinity Centres Sustainability Policy

Given the range of drivers presented for upgrading retail space, shopping centres lead the way in building upgrades in the retail sector, with many beginning to understand market drivers for sustainability.

Vicinity Centres are the second largest owner (by square meter) of shopping centres in Australia, with approximately 2.8 million m² of GLA in their portfolio (Scentre Group, 3.4 million m²)\(^{11}\)

Across their portfolio, Vicinity has identified a number of strategic enablers to address their shared value drivers of community significance, low carbon and climate resilience. These are:

- **People**: Strategy to build a diverse, highly engaged and capable workforce
- **Capital and partnerships**: Strategy to work with suppliers to incorporate better environmental and labour practices into procurement contracts as well as inform tenants about minimum sustainability requirements and best in fitouts, refurbishments and ongoing management
- **Digital**: Strategy to create a seamlessly integrated physical and digital retail platform to understand real-time insights into asset operation and drive operational efficiencies
- **Operational excellence**: Strategy to identify, monitor and manage material sustainability risks and opportunities
- **Managing our environmental impact**: Strategy to drive year-on-year improvements in resource efficiency including energy, water and waste reduction targets for each centre.

Using the above strategic enablers, Vicinity has achieved the following outcomes across their portfolio:

- **Green Star Performance**: Achieved a 2 Star average across its portfolio in 2016 and is aiming to achieve 3 Star average in the next 12 months
- **Energy/Emissions**: Achieved an average NABERS energy rating of 3.4 Stars (56% of lettable area), 319 MJ/m² energy intensity and 76 kg CO₂-e/m²
- **Water**: Achieved an average NABERS water rating of 2.9 Stars (50% of lettable area) and a 1 kL/m² water intensity
- **Waste**: Developed waste management plans across all centres to improve recycling and recovery rates. Achieved 35% diversion from waste in 2016
- **Other**: Recently upgraded building management systems across their portfolio in order to optimise HVAC systems to save energy.

Vicinity is not alone in their sustainability drive, with Scentre group currently averaging a NABERS energy rating of 3.5 across their portfolio. In addition to this, they have committed to 5 MWh of added solar capacity by 2020 and a 49% reduction in operational waste.

---

\(^{10}\) Colliers report for Melbourne CBD (2016 – second half, 2017 – first half)

3.11 Opportunities for upgrading

Figure 51 and Figure 52 illustrate estimated emission and water use across the retail sector in Victoria. Based upon these figures and other information, opportunities for improving retail include:

- The largest emissions and water intensive areas for retail can be found in metro Melbourne; with predicted total greenhouse gas emissions of 629,000 tonnes CO2-e/annum and water use of 10,446 mega-litres per annum. The largest portion of this is within retail <1000m² at 55% of total GFA.

- Given the ownership structure of small retail, approaching large-scale tenants i.e. chain stores may be beneficial. Further steps would entail investigating the feasibility of engaging with small retail through avenues such as large retail chains, specific local councils if they have programs or plans in place for shopping precincts, or traders associations.

- Retail was the most intensive sector for water use; and given that the majority of retail centres are single storey; opportunities may exist for rainwater harvesting and reuse.

- Due to ownership models, shopping centres and box retailers present the greatest strategic opportunity as they are owned majority by a few large investment funds. Their larger scale also means that a large impact can be made from a single upgrade.

Figure 51 Estimated emissions use across the retail sector

Source: NABERS and AECOM calculations
Figure 52  Estimated water across the retail sector

Source: NABERS and AECOM calculations
4.0 Healthcare
4.0 Healthcare

4.1 Overview

There are a few different ownership structures in the healthcare sector which can be distinguished from one another as follows:

- Own and operate model – typically converted standalone residential buildings, but sometimes small purpose built facilities;
- Retail shopping centre model – rented space in larger centre (i.e. optometrist) (see retail for drivers and barriers for upgrades);
- Retail strip shop model – rented space in strip shop (see retail for drivers and barriers for upgrades).

4.2 GFA and number of buildings

There are 4,456 healthcare buildings across the state of Victoria equating to just over 1M m² of GFA. Table 7 shows that of Victoria’s healthcare GFA:

- 87.8% of GFA consists of 4,368 small healthcare buildings (1,002,188 m²)
- 8.5% of GFA consists of 74 medium healthcare buildings (96,764 m²)
- 3.7% of GFA consists of 14 large healthcare buildings (42,394 m²)

Table 7 Building size - healthcare

<table>
<thead>
<tr>
<th>Building Sizes</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 1,000 m²</td>
<td>1,000 m² - 2,000 m²</td>
<td>&gt; 2,000 m²</td>
</tr>
<tr>
<td>No of buildings</td>
<td>4,368</td>
<td>74</td>
<td>14</td>
</tr>
<tr>
<td>GFA (m²)</td>
<td>1,002,188</td>
<td>96,764</td>
<td>42,394</td>
</tr>
</tbody>
</table>

Source: Valuer General Victoria

The majority of healthcare buildings are small (98%). Only 74 buildings (or 2%) are of medium size. 44 of these 74 medium buildings are located in metropolitan Melbourne, 13 in rural Victoria and 15 in regional centres. Only two are located in the City of Melbourne. An additional 14 healthcare buildings are large having GFA of over 2,000m². 11 of those 14 buildings are located in metropolitan Melbourne, while 2 are located in rural Victoria and 1 is located in a regional centre (see Table 18 in Appendix A).
4.3 Spatial distribution

4.3.1 State wide

Figure 53 and Table 8 show that 74% of healthcare buildings are located in metropolitan Melbourne (3,306 buildings), while 12% are located in regional centres (552 buildings) a further 12% are located in rural Victoria (541 buildings), and only 1% are located in the City of Melbourne (57 buildings).

![Figure 53 Proportion of healthcare across the state](image)

<table>
<thead>
<tr>
<th>Regions</th>
<th>Total Buildings</th>
<th>GFA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>3,306</td>
<td>74%</td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>57</td>
<td>1%</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>541</td>
<td>12%</td>
</tr>
<tr>
<td>Regional Centres</td>
<td>552</td>
<td>12%</td>
</tr>
<tr>
<td><strong>Total buildings</strong></td>
<td><strong>4,456</strong></td>
<td><strong>1,141,346</strong></td>
</tr>
</tbody>
</table>

Source: Valuer General Victoria

4.3.2 Regional and rural Victoria

In rural Victoria, there are 541 healthcare buildings equating to 152,321m² of total GFA (or 13% of the state’s total healthcare GFA) (see Table 8). 97% of healthcare buildings in rural Victoria are small (<1,000m²). Regional and rural facilities do however appear to include a number of medium sized facilities (compared to their counterparts in metropolitan Melbourne which overall are smaller). This possibly reflects centralisation policies of healthcare in regional centres.

Seven of the 10 rural regions have similar numbers of healthcare buildings (between 60 and 73 buildings each). Three municipalities have significantly less healthcare facilities. These are Corangamite, East Gippsland and Wimmera (Figure 55).

The GFA per municipality in Figure 54 shows that healthcare tends to be located in municipalities with regional centres (i.e. those municipalities with between 10-50,000m² GFA). There is less than 10,000m² GFA in other rural municipalities. Many of the regional centres have hospitals and medical precincts that serve large regions. Smaller specialist facilities and consulting suites co-locate with these large hospitals and would be bolstering overall healthcare GFA in these municipalities.

Figure 55 shows that Greater Geelong has the largest share of healthcare (58,332m²), followed by Ballarat (31,936m²), Bendigo (35,523m²), Latrobe (18,376m²) and Shepparton (10,234m²).
Figure 54  Map of Victorian municipalities by total GFA – healthcare

Source: Valuer General Victoria

Figure 55  Total GFA and number of buildings regional and rural Victoria - healthcare

Source: Valuer General Victoria
4.3.3 Metropolitan Melbourne

74% of Victoria’s healthcare buildings are located in Metropolitan Melbourne (3,306 buildings). 98% of these are small and constitute 89% of healthcare GFA in metropolitan Melbourne (see Table 15 in Appendix A). Figure 58 shows that healthcare GFA is mostly evenly spread across municipalities in metropolitan Melbourne, with all but three municipalities having total healthcare facility GFA’s of between 10-50,000m². Coupled with the fact that 98% of metropolitan healthcare facilities are less than 1,000m², it would be reasonable to assume that many are general practitioners, dental clinics, radiology clinics and other small medical facilities as well as specialists consulting rooms that may be located close to hospitals. 44 buildings are of medium size being between 1,000-2,000m². There are 11 large healthcare facilities (> 2,000m²).

Source: Valuer General Victoria
4.3.4 City of Melbourne

Despite the presence of a number of large hospitals, the City of Melbourne has 57 healthcare buildings representing only 1% of the state’s total healthcare buildings and 2% of total GFA equating to 22,207m$^2$. Similar to other areas, 96% of the City’s healthcare buildings are small (< 1,000m$^2$). These small healthcare facilities represent 88% of the total healthcare GFA in the City. Two buildings are of medium size and represent a combined 12% of total healthcare GFA in the City or 2,699m$^2$. Figure 59 also indicates that there are 2-3 buildings with 11-30 storeys which may account for the proportionally large GFA of this small group of buildings (note CLUE data). There are no large healthcare buildings in the City of Melbourne.
Figure 59  Number of Healthcare Buildings by Floors Above Ground - City of Melbourne

Source: CLUE City of Melbourne 2016

4.4  Building age

Figure 60 shows when healthcare buildings were constructed across the state. The majority of buildings that are used for healthcare were constructed between 1950 and 1989. As small healthcare facilities are often housed in a range of buildings it is likely that many of these buildings constructed between 1950 and 1989 were originally constructed for other uses such as retail or residential and have been repurposed for healthcare at some point preceding. Other smaller peaks of construction occurred between 1920-1929 and 2000-2009. There appears to be a number of buildings constructed post 2000 that are comparatively larger and may account for some of the larger buildings such as super clinics in metropolitan Melbourne.

Figure 61 shows that there are broadly three distinct groups of buildings in the City of Melbourne: those built between 1850-1919 with two substantial construction spikes between 1870-1879 and 1890-1899. These buildings have small GFAs. Between 1920 and 1939 the size of buildings increased. Post 1950 less buildings have been constructed, but those that have are much larger than previous eras.

Figure 60  Year of construction - Victoria (excluding City of Melbourne) – healthcare

Source: Valuer General Victoria
4.5 Ownership and tenancy

There is a disconnect between tenant and owner. See retail.

4.6 Emissions and water use

As per ownership and tenancy, emissions and water use for healthcare facilities are not to dissimilar from retail. Therefore, metrics for retail have been applied across this sector to provide a better understanding of the level of impact the sector has on overall emissions and water use.

4.7 Drivers for upgrades

See retail for drivers for upgrades for retail shopping centre and retail strip model ownership models.

For own and operate healthcare models; drivers for upgrade include the following:

- Building age and functionality
- Market pressure and competition – a facilities appearance and function can have a considerable effect on the decision of a patient to choose that provider
- Reduced operational costs; and
- Advances and changes in technology – upgrading of medical equipment.

4.8 Barriers for upgrades

See retail for drivers for upgrades for retail shopping centre and retail strip model ownership models.

For own and operate healthcare models; barriers for upgrades will not be dissimilar to the office market; cost, knowledge and time.

4.9 Market Trends

An ageing population has (and will continue to) put a strain on the healthcare system. Market trends in healthcare are now centred on providing high quality care for a growing number of patients. In doing so, there is an increasing trend toward reducing the need for patients to attend on-site facilities, boosted by advancements in technology and home doctor services.
Technology

Technology is ever increasing across all sectors; and our reliance on it to do our every day jobs even more so. In the healthcare sector, we are seeing an increase in the following technology trends:

- **Wearables**
  
  With a growing number of baby boomers in need of regular care and obesity rates increasing, technology such as wearable watches/monitors etc. can provide patient data to a doctor without them visiting a clinic. This allows doctors and nurses to assess patient’s health remotely. Google and DexCom are currently working on discrete and unobtrusive wearable continuous glucose monitoring systems that would notify both patient and healthcare professional when levels make a dangerous change. 

- **Online doctors**
  
  Australia has seen an increase in doctor services available online; providing services without ever seeing a patient in person. This allows doctors to work and provide advice and scripts remotely.

- **Digital receptionists**
  
  Many small healthcare clinics are beginning to provide iPads at their front desk for patients with an appointment to sign in, alter details etc., replacing the traditional receptionist role. There are multiple receptionist iPad apps available for purchase online.

**Home healthcare**

Recent widespread marketing has led to a rising number of people using home doctor services available throughout Australia. Most home doctors will visit outside of normal trading hours (weeknights, weekends and public holidays) every day of the year and bulkbill for patients on the Medicare scheme. Home healthcare, like online doctors, negates the need for a permanent office space.

---

4.10 Opportunities for upgrading

The largest predicted emissions and water savings across the healthcare sector are in Metro Melbourne facilities <1000m². As per the retail sector, the ownership structure here (anecdotal) is multiple independents. However, the owners in the sector are more likely an owner operator model and therefore their ability to make emissions and water savings is greater (i.e. owner operators have full control over their development and are able to implement sustainability solutions such as large building fabric upgrades, renewable energy and water harvesting).

Figure 63 Estimated emissions across the healthcare sector

Source: NABERS and AECOM
Figure 64 Estimated water use across the healthcare sector
5.0 Accommodation
5.0 Accommodation

5.1 Overview

Accommodation in Victoria is varied requiring different building types, sizes and locations. Large chain hotels tend to be located in central locations such as the Melbourne CBD and activity centres such as the Novotel in Glen Waverley. Smaller chains such as Ibis and Holiday Inn can also be found in regional centres. Backpackers are concentrated around inner suburbs of Melbourne with less found in regional centres and other popular areas of Victoria. Regional centres tend to have a mix of motels, smaller hotels and bed and breakfasts. Bed and Breakfasts and other boutique accommodation options constitute the majority accommodation options in rural Victoria.

AirBnB also play a considerable role in the accommodation sector, but has not been included in this analysis as buildings are typically the hosts’ primary residence or are difficult to differentiate from other residential uses.

The strength of Victoria’s education sector attracts many students from overseas and interstate which has resulted in considerable student accommodation being constructed within proximity to key tertiary facilities. Table 9 shows the proportion of accommodation in the City of Melbourne that is student accommodation.

The variation in buildings and ownership structures across the varying accommodation options will affect the drivers and strategies used to upgrade buildings.

Table 9  Proportion of accommodation in City of Melbourne that is student accommodation

<table>
<thead>
<tr>
<th>Precinct</th>
<th>% of Buildings</th>
<th>% NLA</th>
<th>% GFA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carlton</td>
<td>71.4%</td>
<td>83.1%</td>
<td>82.9%</td>
</tr>
<tr>
<td>Docklands</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>East Melbourne</td>
<td>5.0%</td>
<td>1.7%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Kensington</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Melbourne (CBD)</td>
<td>9.6%</td>
<td>10.0%</td>
<td>9.8%</td>
</tr>
<tr>
<td>Melbourne (Remainder)</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>North Melbourne</td>
<td>57.1%</td>
<td>74.5%</td>
<td>74.8%</td>
</tr>
<tr>
<td>Parkville</td>
<td>73.3%</td>
<td>94.9%</td>
<td>93.9%</td>
</tr>
<tr>
<td>Port Melbourne</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>South Yarra</td>
<td>25.0%</td>
<td>52.0%</td>
<td>50.9%</td>
</tr>
<tr>
<td>Southbank</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>West Melbourne (Industrial)</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>West Melbourne (Residential)</td>
<td>20.0%</td>
<td>15.8%</td>
<td>14.7%</td>
</tr>
</tbody>
</table>

Source: CLUE and VGV
5.2 GFA and number of buildings

There are 2,548 buildings used for commercial accommodation purposes across Victoria equating to approximately 2.3M m² GFA. Table 10 shows that the portion of GFA tends to be across buildings that are:

- small (2,198 buildings equating to 1M m² GFA)
- large (163 buildings equating to 1.1M m² GFA).

In comparison a total of 187 medium sized buildings only make up 263,595m² GFA.

Table 10 Building size- accommodation

<table>
<thead>
<tr>
<th>Building Sizes</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>No of buildings</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GFA (m²)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>&lt; 1,000 m²</th>
<th>1,000 m² - 2,000 m²</th>
<th>&gt; 2,000 m²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>2,198</td>
<td>187</td>
<td>163</td>
</tr>
<tr>
<td>Medium</td>
<td>1,007,522</td>
<td>263,595</td>
<td>1,097,618</td>
</tr>
<tr>
<td>Large</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Valuer General Victoria

Table 18 in Appendix A shows that of the total 2,268,735 m² GFA across the state:

- 681,770m² consists of 60 large buildings in the City of Melbourne
- 490,912m² consists of 1,391 small buildings in rural Victoria
- 248,773m² consists of 54 medium buildings in metropolitan Melbourne
- 225,804m² consists of 179 small buildings in City of Melbourne
- 210,797m² consists of 423 small buildings in metropolitan Melbourne

63% of small buildings are located in rural Victoria (1,391 buildings). 36% of large buildings are located in the City of Melbourne (60 buildings) and 33% are located in metropolitan Melbourne (54 buildings).

5.3 Spatial distribution

5.3.1 State wide

Figure 65 and Table 11 show that while 59% of all accommodation buildings are located in rural Victoria, the proportion of total GFA is more evenly split between City of Melbourne (39%), rural Victoria (30%) and metropolitan Melbourne (23%). This can be attributed to the large number of small buildings in rural Victoria, a small group of large hotels, backpackers and student accommodation in the City of Melbourne, and a mix of large and medium sized accommodations in metropolitan Melbourne.

Figure 65 Proportion of accommodation across the state

![Figure 65](image)

Source: Valuer General Victoria

Table 11 Total GFA and number of buildings - accommodation

<table>
<thead>
<tr>
<th>Regions</th>
<th>Total Buildings</th>
<th>GFA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>538</td>
<td>21%</td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>254</td>
<td>10%</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>1501</td>
<td>59%</td>
</tr>
<tr>
<td>Regional Centres</td>
<td>255</td>
<td>10%</td>
</tr>
<tr>
<td><strong>Total buildings</strong></td>
<td><strong>2,548</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Valuer General Victoria
5.3.2 Regional and rural Victoria

Accommodation in regional and rural Victoria combined comprises 69% of all accommodation buildings across the state, but only accounts for 38% of total GFA. This is due to the dominance of small buildings such as bed and breakfasts (a combined total of 1,596 small buildings out of 1,756 total buildings).

There are a combined total of 111 medium sized buildings (150,987m$^2$) and 49 large buildings (167,075m$^2$) in regional and rural Victoria. 69% and 67% of these are located in rural Victoria respectively. The GFA to building ratios in Figure 67 indicate that some of these medium sized and larger buildings are likely to be located in Corangamite (includes Queenscliff, Surf Coast and Geelong), Glenelg Hopkins, Mallee, and Port Phillip and Western Port regions. While small accommodation buildings occur across all regions, smaller buildings tend to comprise a larger proportion of total GFA in East Gippsland, Goulburn Broken, North Central, North East and West Gippsland.

Figure 66 Map of Victorian municipalities by total GFA –accommodation

Source: Valuer General Victoria

Figure 68 shows that Greater Geelong has the most GFA of accommodation, while Greater Bendigo has more buildings but these tend to be smaller on average.
Figure 67  Total GFA and number of buildings regional and rural Victoria - accommodation

Source: Valuer General Victoria

Figure 68  Total GFA and number of buildings regional centres - accommodation

Source: Valuer General Victoria
5.3.3 Metropolitan Melbourne

Accommodation in metropolitan Melbourne accounts for 21% of all accommodation buildings across the state and 23% of total GFA across the state. GFA in metropolitan Melbourne tends to be made up of either small or large buildings. The total GFA split by building size is:

- 45% of GFA consists of 54 large accommodation buildings (248,773 m² GFA)
- 38% of GFA consists of 423 small accommodation buildings (210,797 m² GFA)
- 17% of GFA consists of 61 medium sized accommodation buildings (90,865 m² GFA)

Figure 69 shows that there are larger groupings of accommodation buildings in the outer east and south east metropolitan regions. The GFA to building ratios in this figure indicate that medium sized and larger buildings are likely to be located in the City Fringe (i.e. St Kilda, Albert Park), Inner-East (i.e. Carlton, Richmond, Parkville) and North and West (i.e. Sunshine, Footscray, Tullamarine). While smaller accommodation buildings appear to make up a large proportion of accommodation in the outer East (i.e. Mornington Peninsula). Overall, Port Phillip and Morning Peninsula are the two municipalities with more than 50,000 m² of GFA (see Figure 70).

Figure 69 Total GFA and number of buildings per metropolitan region - accommodation

Source: Valuer General Victoria
Figure 70  Map of metropolitan municipalities by total GFA – accommodation

**accommodation buildings**

Source: Valuer General Victoria
5.3.4 City of Melbourne

The City of Melbourne has 10% of Victoria's total accommodation buildings (254 buildings) but this equates to 39% of Victoria's GFA (929,317m$^2$). Large buildings such as hotels, student accommodation and possibly backpackers dominate total GFA within the City. The total GFA split by building size is:

- 73% of GFA consists of 60 large buildings (681,770m$^2$ GFA)
- 24% of GFA consists of 179 small buildings (225,804m$^2$ GFA)
- Only 2% of GFA consists of 15 medium sized buildings (21,743m$^2$ GFA)

Figure 71 Number of accommodation buildings by floors above ground - City of Melbourne

Source: CLUE City of Melbourne 2016
5.4 Building age

Figure 72 shows that most accommodation buildings have been built post 1960 with larger buildings built post 2000. Compared to other sectors accommodation buildings tend to be new likely reflecting a higher value on amenity. Figure 73 reflects similar construction patterns noting that there are proportionally more older buildings in the City of Melbourne.

Figure 72 Year of construction - Victoria (excluding City of Melbourne) – accommodation

Figure 73 Accommodation market by construction year - City of Melbourne
5.5 Emissions and water use

To ascertain how the accommodation market is performing, a NABERS dataset (hotels rated since 2010 in Victoria) was used as a guideline for emissions and water use.

The data set totalled 11 hotels, predominantly in the City of Melbourne (or on the city fringe); achieving an average NABERS rating of 3.6 for energy and 3.25 for water. The total impact of emissions and water use across the accommodation sector can be predicted.\(^{14}\)

InterContinental Hotels Group has its own toolkit, Green Engage, which it is rolling out across all its brands; setting greenhouse gas reduction and water use reduction targets per development.

5.6 Drivers for upgrades

Hotels

With ever growing competition on the market by shared economy business such as airbnb; and an ever increasing tourism market (International visitors to Victoria spent $7.3 billion in the year ending March 2017, representing year-on-year growth of 7.8%. Visitor nights grew to reach 66.6 million\(^{15}\).), competition represents the biggest driver for upgrades in this industry.

Other drivers include:

- Reduced operational costs;
- Corporate social responsibility (both of the hotel chain and of the occupant) - Global hotel chains can be driven by their global CSR requirements. Increasingly, however, large firms are committing to wider CSR goals and in doing so, restrict their business travel to hotels who will meet those needs;
- Increased floorplate efficiencies – smaller rooms equate to more total rooms and a greater return on investment.

Hostels

Similar to hotels, in the hostel single room market, competition is tough, with many Airbnb's able to match or beat the nightly price. The customer driver here is often different however, with many travellers choosing to stay in hostels for their social nature. In Melbourne, they can also be tenanted long term by new migrants and travellers on working visas; for which multi-bed rooms offer the most competitive rate. Upgrades in this space therefore are generally driven by cost (reduced operational cost and increased floorplate efficiencies).

Student Accommodation

Universities are inherently reliant on research funding opportunities and student intake in order to function in a capacity that allows new opportunities, developments and innovation to continue. The provision of top quality student accommodation can be a deciding factor when students come to choosing a university to attend.

Generation Z (those born mid 1990s-early 2000s) have been found to be much more environmentally conscious than previous generations, having grown up and been educated during the environmental era. This has put pressure on activities undertaken by corporations, government agencies and non-for-profit organisations, along with behaviours seen in communities and households. Universities are no exception, with many students now weighing up their future university’s commitment to sustainability. The 2016 Princeton Review found that 61% of the 10,000 students surveyed would have their application decision influenced based on the information about a school’s commitment to the environment.

Like other accommodation types, the owner-operator model is also driven by reduced operational costs.

---

\(^{14}\) Assumes room-hotel floor plate efficiency of 75%, room size of 30m\(^2\) and an average hotel star rating of 3 Stars (the higher the hotel star rating, the greater emissions allowance)

\(^{15}\) http://www.tourism.vic.gov.au/research/international-research/international-visitation.html
5.7 Barriers for upgrades

The main barriers for accommodation developments include:

- Lack of capital funding (preference for spending money to increase floor plate efficiencies, materialistic upgrades, i.e. upgrades likely to attract further customers);
- Historically low energy costs and therefore perceived prolonged paybacks for undertaking energy efficiency upgrades; and
- Disruption to customers and likely reduced accommodation rates for compensation.

5.8 Market trends

Like shopping centres, the larger market players are being driven by their sustainability and CSR objectives and to reduce overall operational costs.

Research that AccorHotels undertook with customers last year found that guests were looking for sustainable hotels; particularly in relation to better waste management and reduced energy consumption. AccorHotels has a global policy strategy in place “Planet 21”, which focuses on CSR across people and planet; with one of its goals to achieve carbon neutral buildings. In Australia, its hotels (Sofitel, Grand Mercure, Novotel, Mercure and Ibis) installed more than two megawatts of solar in 2016. It has also cut food waste by more than 30 per cent across all its Australian hotels.

Other initiatives include:

- Incorporation of electric vehicle charge points (currently in 9 of its Australian hotels);
- Use of eco-labelled cleaning products;
- Working with suppliers to drive ethical and eco procurement; and
- A strong focus on workplace wellbeing and diversity.

The Marriott Group (operations include Sheraton Hotels) has committed to working towards 17 of the UN Sustainable Development Goals. Initiatives have included:

- 142 buildings either registered for LEED Certification or already certified by 2015;
- More than 275 electric vehicle charging stations installed globally;
- Goal to reduce energy use across its portfolio by 20 per cent by 2020; and
- Many of its hotels report on carbon footprint, energy consumption, water usage and waste generation for both room bookings and event bookings through the Carbon Accounting Company’s Green Hotels Global tool and environmental performance database.

Increasingly, customers are asking for sustainability information. The Global Business Travel Association now has a standardised request for proposal that includes metrics such as carbon footprint, water usage per room and sustainability features such as bike racks and the use of eco cleaning practices.

5.9 Opportunities for upgrading

The total impact of emissions and water use across the accommodation sector can be predicted as demonstrated below.\(^{16}\)

The biggest predicted impact in emissions and water savings could therefore be seen in

- The City of Melbourne for accommodation buildings >2000m\(^2\)
- Rural Victoria for accommodation buildings <1000m\(^2\)

As per other sectors, the ownership model will differ both based on location and total building size, with the easiest target large hotel chains such as AccorHotels. Smaller accommodation (i.e. in rural

---

\(^{16}\) Assumes room-hotel floor plate efficiency of 75%, room size of 30m\(^2\) and an average hotel star rating of 3 Stars (the higher the hotel star rating, the greater emissions allowance)
Victoria) are likely independently owned small motels and bed and breakfasts and therefore more difficult to impact in the short term and on a larger scale.

Figure 74  Estimated emissions across the accommodation sector

![Graph showing emissions across accommodation sectors](image)

Source: NABERS and AECOM

Figure 75  Estimated water use across the accommodation sector

![Graph showing water use across accommodation sectors](image)

Source: NABERS and AECOM
6.0 Hospitality
6.0 Hospitality

6.1 Overview
Hospitality includes restaurants, cafes, coffee shops, bars and fast food outlets. These uses tend to operate from stand-alone buildings often in strip shopping centres or as part of larger shopping centres (unable to separate). They can be both owner-operated and leased often through franchise models.

6.2 GFA and number of buildings
There are 5,370 hospitality buildings across the state equating to approximately 2.86M m² GFA. Table 12 shows that Victoria’s hospitality GFA is split in the following way:

- Small (4,809 buildings equating to 1,586,490m² GFA)
- Large (165 buildings equating to 740,169m² GFA)
- Medium (396 buildings equating to 536,573m² GFA)

Table 12 Building size - hospitality

<table>
<thead>
<tr>
<th>Building Sizes</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 1,000 m²</td>
<td>1,000 m² - 2,000 m²</td>
<td>&gt; 2,000 m²</td>
</tr>
<tr>
<td>No of buildings</td>
<td>4,809</td>
<td>396</td>
<td>165</td>
</tr>
<tr>
<td>GFA (m²)</td>
<td>1,586,490</td>
<td>536,573</td>
<td>740,169</td>
</tr>
</tbody>
</table>

Source: Valuer General Victoria

Table 14 in Appendix A details that of the total 2,863,232 m² GFA across the state:

- 782,655m² consists of 2,544 small buildings in metropolitan Melbourne
- 413,184m² consists of 1,112 small buildings in rural Victoria
- 376,394m² consists of 113 large buildings in metropolitan Melbourne
- 303,276m² consists of 220 medium buildings in metropolitan Melbourne

52% of small and 68% of large buildings are located in metropolitan Melbourne (2,544 buildings and 113 buildings respectively).
6.3 Spatial distribution

6.3.1 State wide

Figure 76 and Table 13 show that more than half of Victoria’s hospitality buildings (2,877 buildings or 54%) and GFA (1,462,325 m² or 51%) are located in metropolitan Melbourne. Almost a quarter of hospitality buildings are located in rural Victoria (1,227 buildings or 23%).

Figure 76 Proportion of hospitality across the state

Table 13 Total GFA and number of buildings - hospitality

<table>
<thead>
<tr>
<th>Regions</th>
<th>Total Buildings</th>
<th>GFA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>2,877</td>
<td>54%</td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>634</td>
<td>12%</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>1,227</td>
<td>23%</td>
</tr>
<tr>
<td>Regional Centres</td>
<td>632</td>
<td>12%</td>
</tr>
<tr>
<td><strong>Total buildings</strong></td>
<td><strong>5,370</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Source: Valuer General Victoria
6.3.2 Rural Victoria and regional centres

Hospitality in regional and rural Victoria comprises 35% of all accommodation buildings (1,859) in Victoria, and accounts for 32% of total GFA (917,585m²). 66% of hospitality in regional and rural Victoria is located in rural Victoria.

Hospitality buildings in regional and rural Victoria are predominantly small (90% of all buildings).

Figure 77 shows that most rural and regional municipalities have either less than 10,000m² GFA or between 10-50,000m² GFA. The exceptions are Greater Bendigo, Ballarat and Latrobe which have between 50-100,000m², and Greater Geelong and Queenscliffe which have between 100-500,000m² GFA.

12% of Victoria’s hospitality buildings are located in regional centres (632 buildings). 89% of these buildings are small (562 buildings) (<1,000m²). Greater Geelong has the most buildings (252 buildings) and GFA (123,364m²), followed by Greater Bendigo (144 buildings and 69,878m²) and Ballarat (115 buildings and 58,488m²).

Figure 77 Map of Victorian municipalities by total GFA – hospitality

Source: Valuer General Victoria
Figure 78  Total GFA and number of buildings regional and rural Victoria - hospitality

Source: Valuer General Victoria

Figure 79  Total GFA and number of buildings regional centres - hospitality

Source: Valuer General Victoria
6.3.3 Metropolitan Melbourne

54% of hospitality buildings (2,877) and 51% of total GFA (1,462,325 m²) are located in metropolitan Melbourne. Hospitality buildings in metropolitan Melbourne are predominantly small (88% of buildings). While comparatively large (4%) and medium (8%) buildings, contribute to 25% and 21% of total GFA respectively. Hospitality total GFA in metropolitan Melbourne is comprised of:

- 54% of GFA consists of 2,544 small buildings (782,655 m²)
- 25% of GFA consists of 13 large buildings (376,394 m²)
- 21% of GFA consists of 220 medium buildings (303,276 m²).

Figure 80 and Figure 81 show the spatial distribution of hospitality across the metropolitan area by sub-region and municipality. The inner city and city fringe municipalities of Melbourne, Port Phillip and Yarra have the highest concentrations of total GFA, with all having more than 500,000 m² GFA. Municipalities with moderate total GFA of between 50-100,000 m² are: Hume, Whittlesea, Brimbank, Moonee Valley, Moreland, Darebin, Boroondara, Whitehorse, Greater Dandenong and Mornington Peninsula.

Figure 80 Total GFA and number of buildings per metropolitan region - hospitality

Source: Valuer General Victoria
Figure 81 Map of metropolitan municipalities by total GFA – hospitality

**hospitality buildings**

Source: Valuer General Victoria
6.3.4 City of Melbourne

The City of Melbourne has 12% of the state’s total hospitality buildings (634 buildings) and a slightly higher share – 17% of total GFA in the state (483,322 m²). Similar to other areas, the majority of buildings are small (93%), however these small buildings only contribute to 43% of total GFA in the City. There are 12 large buildings that make up 48% of total GFA in the City. Table 20 shows that GFA consists of the following:

- 48% of GFA consists of 12 large buildings (233,194 m² GFA)
- 93% of GFA consists of 591 small buildings (207,295 m² GFA)
- 9% of GFA consists of 31 medium buildings (42,833 m² GFA)

Figure 82 shows that the majority of hospitality buildings in the City of Melbourne are between 2-4 storeys.

**Figure 82 Number of hospitality buildings by floors above ground - City of Melbourne**

Source: CLUE City of Melbourne 2016
6.4 Building age

Figure 83 shows the year of construction of hospitality buildings in Victoria. There has been a marked increase in the number of buildings and GFA constructed between 1960 and 2009. In contrast Figure 84 shows that a larger proportion of hospitality buildings in the City of Melbourne are older being mainly constructed between 1860 and 1929. In recent years a number of larger buildings have been constructed in the City of Melbourne.

Figure 83  Year of construction - Victoria (excluding City of Melbourne) – hospitality

Source: Valuer General Victoria

Figure 84  Year of construction - City of Melbourne - hospitality

Source: CLUE City of Melbourne 2016
6.5 Emissions and water use
Emissions and water use were unable to be calculated due to lack of data.

6.6 Drivers for upgrades
Drivers and upgrades include:

- Government strategies. The City of Melbourne has a retail and hospitality strategy 2013-2017 which asks local businesses for policies regarding packaging, waste management, food sourcing (lower food miles, purchasing locally or direct from farmers and urban agriculture) and energy efficiency
- Competition. According to the City of Melbourne, total annual expenditure in the CBD has risen 16 per cent since 2013 to $3.03 billion with food and beverage making up approximately 80 per cent of retail transactions
- Green marketing to attract eco-minded customers

6.7 Barriers for upgrades
Based upon the data analysed for this report, barriers to upgrades were not identified. It is recommended that further analysis of the hospitality sector document such barriers.

6.8 Market trends
In many areas, there is scope to treat waste as a resource, improve recycling rates and reduce business and societal costs by reducing the amount of waste generated. The City of Melbourne and the Metropolitan Waste and Resource Recovery Group are working with businesses in Degraves Street on a demonstration shared recycling program that diverts recyclables and organic waste to a recycling facility in Ross House.

As above further analysis of market trends is recommended to support future strategies that target the hospitality sector.

6.9 Opportunities for upgrading
While examples of precinct waste management (such as that in Degraves Street) demonstrate the potential for reducing resource consumption of the hospitality industry, further analysis is required to fully understand where the key opportunities are to upgrade.
7.0 Next Steps
7.0 Next steps

The small and medium commercial building (SMCB) market is clearly challenging due to its size and diversity. While energy efficiency retrofits present opportunities to improve building performance and save energy, as well as achieve broader environmental sustainability and corporate social responsibility (CSR) objectives, SMCBs do not appear to have seen the same penetration of energy efficiency technologies as larger offices and shopping centres can demonstrate.

This may be due to the split incentives between building owners and tenants, lack of customer demand (and education), difficulty in accessing funding for retrofits and the relatively lower expenditures on energy management.

As prices for energy continue to rise, and the need to reduce greenhouse gas emissions becomes more pressing, the importance of energy savings across all building types will only increase, and the energy efficiency retrofit market for SMCB will also grow. The focus on larger buildings able to generate greater benefits and shorter return on investment periods must continue, supplemented by strategies to support energy efficiency retrofits for SMCBs.

Strategies may be to encourage staged approaches rather than upfront capital-intensive investment to incrementally improve building performance, and bring forward benefits.

Opportunities could relate to:

- A focus on underperforming equipment and prioritising replacements to achieve greatest reduction in energy use
- Building tuning to increase energy efficiency
- Low energy lighting upgrades, which can also improve workplace comfort
- On-site generation of renewable energy
- Improvements to heating and cooling systems, including the upgrade or adjustment of fan systems

Providing guidance for building owners and managers about the manufacturers and suppliers of retrofit products and services, the costs and benefits of options available, and improving the communication of benefits to users of commercial buildings will assist to address the market barriers and drive change.

Communications could explain Green Building rating systems, energy efficiency and emission reduction regulatory and policy initiatives, thresholds for mandatory disclosure and relevant building energy rating standards.

The relatively higher environmental performance of commercial buildings (office) across regional Victoria is likely due to the opportunities realised through the National Green Leasing Policy for government tenants. Communicating these principles across a broader range of buildings and tenants may assist in expanding the uptake of green leases.

A segmented approach to work with industry groups or to target SMCB portfolio owners, franchise chains or areas with significant numbers and GFA of commercial buildings or real estate agents specialising in commercial properties is likely to be more effective in addressing market barriers.

Despite this, barriers such as split incentives, lack of green leases, perception of high cost and disruption, the diversity of the market and access to capital funding will remain.
8.0 Acknowledgements
8.0 Acknowledgements

AECOM and Sustainability Victoria would like to acknowledge the people and organisations that gave their time and assisted with data and insight regarding commercial buildings in Victoria.

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Contact</th>
</tr>
</thead>
</table>
| Valuer-General Victoria                           | Lucy Kennedy | Manager Valuation Data  
Doug Marcina | Spatial Information Manager |
| City of Melbourne – Clue Data                     | Christabel McCarthy | Senior Research Advisor | Smart City Office |
| NABERS Administrators -NSW Department of Environment and Heritage | Dennis Lee | Head of Technical Standards  
Nichola Nicholson | NABERS Information Analyst |
| Municipal Association of Victoria (MAV)           | Emlyn Breese | Planning and Environment Policy Officer |
| Department of Environment, Land, Water and Planning | Peter Elliott | Data Officer for Plan Melbourne  
David Matthews | Policy Officer |
| 1200 Buildings Program, City of Melbourne         | Judith Landsberg | Team Leader |
| Strategy Policy Research                          | Phillip Harrington | Principal |
9.0 References and further resources

Key data sources

City of Melbourne. *Census of Land Use and Employment (CLUE)* website


Other


https://www.scentregroup.com/about-us/sustainability
Appendix A

Data tables
### Appendix A  Data tables

#### Valuer-General of Victoria building use (AVPCC) categories

**Table 14  VGV data categories used and exclusions/inclusions**

<table>
<thead>
<tr>
<th>Commercial buildings</th>
<th>Updated report</th>
<th>Comment/clarification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Office</strong></td>
<td>220</td>
<td></td>
</tr>
<tr>
<td></td>
<td>221 – low rise</td>
<td>Excluded 223 – special purpose buildings</td>
</tr>
<tr>
<td></td>
<td>222 - multi level</td>
<td></td>
</tr>
<tr>
<td><strong>Shopping centres /retail</strong></td>
<td>210 – retail (single occupancy)</td>
<td>Excluded 215, 216, 217, 218, Service Station; Bottle shop / licensed retail</td>
</tr>
<tr>
<td></td>
<td>211 – Retail (multiple occupancy)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>212 – Mixed Use</td>
<td></td>
</tr>
<tr>
<td></td>
<td>213 – Shopping Centres</td>
<td></td>
</tr>
<tr>
<td><strong>Hospitals/medical centre</strong></td>
<td>270 – health surgery</td>
<td>Exclude 272,273, 275 - Vets, Brothels, crematorium</td>
</tr>
<tr>
<td></td>
<td>271 – health clinic</td>
<td></td>
</tr>
<tr>
<td><strong>Supermarket</strong></td>
<td>214 – National company retail</td>
<td>Includes bulky goods (214.4)</td>
</tr>
</tbody>
</table>

Source: AECOM and Valuer-General Victoria
Table 15  Victorian commercial buildings- total GFA and total number of buildings per sector

<table>
<thead>
<tr>
<th>Commercial sector</th>
<th>Total GFA (m²)</th>
<th>Total number of buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Victoria-state-wide</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office</td>
<td>13,221,782</td>
<td>16,618</td>
</tr>
<tr>
<td>Retail</td>
<td>21,040,555</td>
<td>50,586</td>
</tr>
<tr>
<td>Healthcare</td>
<td>1,141,343</td>
<td>4,468</td>
</tr>
<tr>
<td>Accommodation</td>
<td>2,498,283</td>
<td>2,668</td>
</tr>
<tr>
<td>Hospitality</td>
<td>2,863,228</td>
<td>5,410</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40,765,191</strong></td>
<td><strong>63,132</strong></td>
</tr>
<tr>
<td><strong>City of Melbourne</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office</td>
<td>6,314,892</td>
<td>2,711</td>
</tr>
<tr>
<td>Retail</td>
<td>2,533,744</td>
<td>3,626</td>
</tr>
<tr>
<td>Healthcare</td>
<td>22,207</td>
<td>58</td>
</tr>
<tr>
<td>Accommodation</td>
<td>1,058,866</td>
<td>258</td>
</tr>
<tr>
<td>Hospitality</td>
<td>483,322</td>
<td>634</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10,413,031</strong></td>
<td><strong>7,287</strong></td>
</tr>
<tr>
<td><strong>Metropolitan Melbourne (excl CoM)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office</td>
<td>5,464,255</td>
<td>10,127</td>
</tr>
<tr>
<td>Retail</td>
<td>12,701,550</td>
<td>31,904</td>
</tr>
<tr>
<td>Healthcare</td>
<td>812,416</td>
<td>3,306</td>
</tr>
<tr>
<td>Accommodation</td>
<td>550,435</td>
<td>557</td>
</tr>
<tr>
<td>Hospitality</td>
<td>1,462,324</td>
<td>2,887</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20,990,980</strong></td>
<td><strong>48,781</strong></td>
</tr>
<tr>
<td><strong>Rural and regional Victoria</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office</td>
<td>1,442,635</td>
<td>3,780</td>
</tr>
<tr>
<td>Retail</td>
<td>5,805,262</td>
<td>15,056</td>
</tr>
<tr>
<td>Healthcare</td>
<td>306,720</td>
<td>1,104</td>
</tr>
<tr>
<td>Accommodation</td>
<td>888,982</td>
<td>1,853</td>
</tr>
<tr>
<td>Hospitality</td>
<td>917,583</td>
<td>1,889</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9,361,182</strong></td>
<td><strong>23,682</strong></td>
</tr>
</tbody>
</table>

Source: Valuer-General Victoria *CoM figures are from VGV
Table 16  Office total GFA and number of buildings by size category

<table>
<thead>
<tr>
<th>Regions</th>
<th>Number of Buildings</th>
<th>GFA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 1,000 m²</td>
<td>1,000 m² - 2,000 m²</td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>9,396</td>
<td>419</td>
</tr>
<tr>
<td></td>
<td>76%</td>
<td>10%</td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>2,054</td>
<td>257</td>
</tr>
<tr>
<td></td>
<td>76%</td>
<td>10%</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>1,902</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>97%</td>
<td>2%</td>
</tr>
<tr>
<td>Regional Centres</td>
<td>1,675</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>94%</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Total buildings</strong></td>
<td><strong>15,027</strong></td>
<td><strong>793</strong></td>
</tr>
<tr>
<td></td>
<td><strong>1,545</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Valuer-General Victoria
### Table 17 Retail total GFA and number of buildings by region

<table>
<thead>
<tr>
<th>Regions</th>
<th>Number of Buildings</th>
<th>GFA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 1,000 m²</td>
<td>1,000 m² - 2,000 m²</td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>30,067</td>
<td>94%</td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>3,352</td>
<td>93%</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>8,810</td>
<td>95%</td>
</tr>
<tr>
<td>Regional Centres</td>
<td>5,120</td>
<td>91%</td>
</tr>
<tr>
<td><strong>Total buildings</strong></td>
<td>47,349</td>
<td>1,660</td>
</tr>
<tr>
<td></td>
<td>50,322</td>
<td>20,671,260</td>
</tr>
</tbody>
</table>

Source: Valuer General Victoria
<table>
<thead>
<tr>
<th>Regions</th>
<th>Number of Buildings</th>
<th>GFA</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 1,000 m²</td>
<td></td>
<td>1,000 m² - 2,000 m²</td>
<td>&gt; 2,000 m²</td>
<td>&lt; 1,000 m²</td>
<td>1,000 m² - 2,000 m²</td>
<td>&lt; 1,000 m²</td>
<td></td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>3,251</td>
<td>98%</td>
<td>44</td>
<td>1%</td>
<td>11</td>
<td>3,251</td>
<td>98%</td>
<td>44</td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>55</td>
<td>96%</td>
<td>2</td>
<td>4%</td>
<td>0</td>
<td>55</td>
<td>96%</td>
<td>2</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>526</td>
<td>97%</td>
<td>13</td>
<td>2%</td>
<td>2</td>
<td>526</td>
<td>97%</td>
<td>13</td>
</tr>
<tr>
<td>Regional Centres</td>
<td>536</td>
<td>97%</td>
<td>15</td>
<td>3%</td>
<td>1</td>
<td>536</td>
<td>97%</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total buildings</strong></td>
<td><strong>4,368</strong></td>
<td></td>
<td><strong>74</strong></td>
<td><strong>14</strong></td>
<td><strong>1,002,188</strong></td>
<td><strong>96,764</strong></td>
<td><strong>4,368</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Valuer General Victoria
### Table 19  Accommodation total GFA and number of buildings by region

<table>
<thead>
<tr>
<th>Regions</th>
<th>Number of Buildings</th>
<th>GFA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 1,000 m²</td>
<td>1,000 m² - 2,000 m²</td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>423</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>79%</td>
<td>11%</td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>179</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>70%</td>
<td>6%</td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>1,391</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td>93%</td>
<td>5%</td>
</tr>
<tr>
<td>Regional Centres</td>
<td>205</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>80%</td>
<td>13%</td>
</tr>
<tr>
<td>Total buildings</td>
<td>2,198</td>
<td>187</td>
</tr>
</tbody>
</table>

Source: Valuer General Victoria
### Table 20 Hospitality total GFA and number of buildings by region

<table>
<thead>
<tr>
<th>Regions</th>
<th>Number of Buildings</th>
<th>Number of Buildings</th>
<th>Number of Buildings</th>
<th>Number of Buildings</th>
<th>Number of Buildings</th>
<th>Number of Buildings</th>
<th>Number of Buildings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt; 1,000 m²</td>
<td>1,000 m² - 2,000 m²</td>
<td>&gt; 2,000 m²</td>
<td>&lt; 1,000 m²</td>
<td>1,000 m² - 2,000 m²</td>
<td>&gt; 2,000 m²</td>
<td></td>
</tr>
<tr>
<td>Metro Melbourne</td>
<td>2,544 88%</td>
<td>220 8%</td>
<td>113 4%</td>
<td>782,655 54%</td>
<td>303,276 21%</td>
<td>376,394 25%</td>
<td></td>
</tr>
<tr>
<td>City of Melbourne</td>
<td>591 93%</td>
<td>31 5%</td>
<td>12 2%</td>
<td>207,295 43%</td>
<td>42,833 9%</td>
<td>233,194 48%</td>
<td></td>
</tr>
<tr>
<td>Rural Victoria</td>
<td>1,112 90%</td>
<td>96 8%</td>
<td>19 2%</td>
<td>413,184 69%</td>
<td>122,842 20%</td>
<td>66,941 11%</td>
<td></td>
</tr>
<tr>
<td>Regional Centres</td>
<td>562 89%</td>
<td>49 8%</td>
<td>21 3%</td>
<td>183,356 58%</td>
<td>67,622 21%</td>
<td>63,640 21%</td>
<td></td>
</tr>
<tr>
<td><strong>Total buildings</strong></td>
<td><strong>4,809</strong></td>
<td><strong>396</strong></td>
<td><strong>165</strong></td>
<td><strong>1,586,490</strong></td>
<td><strong>536,573</strong></td>
<td><strong>740,169</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Valuer General Victoria