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Interactions Between Residential and Office Towers in Melbourne

墨尔本的高层住宅楼和办公楼的内在联系



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Abstract

Cities interact with commercial real estate forces using spatial and construction models which may become more or less viable with time. Melbourne is an interesting case-study to understand this connection: the Central Business District (CBD) is transforming from a commercial high-rise cluster into a city living district where new super-slender residential towers are growing at an unprecedented rate and this residential boom is creating planning concerns for crowding out of office space from the CBD. This paper analyses some of the built-form implications surrounding the existing and planned tall buildings in Melbourne. The tallest office buildings in Melbourne are likely to become soon unsustainably dated and obsolete unless they are subject to structural interventions. The urban form of the inner city, its land use, and the prevailing typological characters and age of its existing office buildings suggest that a process of progressive substitution of office developments by residential towers in Melbourne's CBD has become and it may possibly increase in the near future.

Keywords: Melbourne, Central Business District, Planning, Residential Boom, Office Buildings Typology.

摘要

城市中应用空间和建筑相结合的商业地产模型，其可行性或多或少会随时间改变。墨尔本是个很好的案例，它可以帮助我们去了解其内在的联系。墨尔本的中央商务区的高层商务楼逐渐被更多迅速增加的高层住宅楼所淹没。这个趋势让城市规划者考虑高层住宅在未来可能替代写字楼在中央商务区的地位。本文对一些影响墨尔本现有和计划建成的高层建筑进行了分析。通过分析发现，墨尔本的高层办公大楼很有可能会很快出现过时，遭受废弃，并无法继续维持下去，除非它们受到结构性的干预。城区的城市形式，其土地使用，和流行的建筑风格，现存的办公楼的老化，都预示着高层住宅楼的蓬勃兴起，在未来，很有可能取代现有的办公楼。

关键词: 墨尔本, 中央商务区, 规划, 住宅激增, 办公楼类型

Melbourne's Tall Residential Boom

The central city of Melbourne is subject to an unprecedented boom of tall residential developments. According to the latest Census of Land Use and Employment (Melbourne City Research 2013a) the residential use of land of the inner city has surpassed office use which account respectively for 18.4% and 17.7% of the overall built space. Between 2002 and 2012 residential apartments, which account for 75% of the overall inner city dwellings, have more than doubled. Recent monitoring of the construction development activity indicates that in Melbourne by 2015 there will be over 27,000 apartments completed or under construction. This would account to a growth of more than 60% of the stock registered by the latest census.

By comparison the recent production of office space in Melbourne may appear to have been sluggish, but it has grown significantly and to some extent it has continued even after the Global Financial Crisis. In the decade 2002-2012 the let office space in the inner city area

墨尔本高层住宅楼的繁荣

墨尔本市中心深受迅速发展的高层住宅楼的影响。根据最近的土地使用和雇用数据统计 (墨尔本城市研究2013) 发现，住宅用地超过了商业用地，分别占总用地的18.4%和17.7%。从2002到2012，公寓住宅数量不止翻了一倍，占了城区总建筑的75%。最近的施工建设将预计在2015，墨尔本的已建成和在建公寓将超过27000套。

通过比较发现最近墨尔本的办公空间处于低迷时期，但是仍有显著的增长，在某种程度上，这种情况在全球经济危机后继续增长着。在2002到2012的十年期间，城区的办公面积增长了27%，从原来的4100000 m²到现在的超过5200000 m²。在同时期，空置率从原来的12.9%下降到10%，在2008达到最低点 (8.1%)。自从2002，市中心的办公楼从原有的2700000 m²增长到现有的大约3100000。但是相比全部的城区，市中心的办公楼几乎占了总数的一半。实际上，从2010到2012期间，根据统计报告，市中心的空间率在2012达到了三个百分点，高于整个城区的平均空置率。从2002到2012，市中心西部的Docklands的重建吸

has grown by 27% from approximately 4,100,000 m² to over 5,200,000 m² of space and during the same period the vacancy rate has dropped from 12.9% to 10% after reaching its lowest in 2008 at 8.1%. Since 2002 the office space of the CBD has grown from over 2,700,000 m² to approximately 3,100,000 m² but if compared to the entire inner city, the CBD has produced office space at almost half the pace in comparison to the entire city. In fact there are recent signals of contraction in the CBD, where office space has declined by 1.5% between 2010 and 2012 and where, according to the Census, the vacancy rate in 2012 was three points of percentage higher than the average of the entire city. During the period 2002-2012 the redevelopment of the Docklands to the west of the CBD has absorbed over 450,000 m² of new office development becoming the newest business district of Melbourne where the vacancy rate has decreased steadily since 2006 (Melbourne City Research 2013a and 2013b).

This is the large picture for inner Melbourne. For the historical Central Business District, the area which corresponds with the city's settlement grid, the entity of the residential boom is more pronounced than elsewhere. In the CBD there are currently more than 40 residential developments of tall building significance under way at the time of writing (See Figure 1). The City of Melbourne has reported with its Development Activity Monitor that in late 2013 there was almost 13,000 dwellings under construction and expected to be completed by 2017. Almost 60% of this development activity is concentrated in the Central Business District area, and the rest, in order of magnitude, is in Southbank, Carlton, and Docklands.

The historical CBD of Melbourne remains still the center of gravity for speculative urban development in Victoria. Arguably the recent explosion of residential developments is an indirect demonstration of the missed opportunity to decentralize high density tall developments from the CBD to the Docklands and in some part also to the inner-city suburbs and the figures of the Census validate a trend of change for the use of land from commercial to residential in the inner city. Office space remains however the largest destination of use in the CBD to date and the City of Melbourne has reported in late 2013 that the premium office space of this area was almost entirely occupied (Melbourne City Research 2013b).

These numeric considerations give an opportunity to reflect on the broad trends which are likely to interest the production of tall buildings in Melbourne for the near future. The Central Business District is becoming less "business" and more "mixed" with residential and retail development likely to become more conspicuous in the future while the Docklands to the west of the CBD are gradually absorbing most of the new office development but not with equal strength the demand for retail and for residential space. The emergence of residential developments is currently perceived as a boom and these facts have recently reached local and international media coverage. Media reports peaked with the Victorian Planning Minister "Super-Tuesday" announcement last December when five different large tower developments with a total of 2000 apartments have been approved in a single day. These reports and other sources indicate that these developments are encouraged by pouring of capitals coming from South-East Asia and China (Gough 2014). Data from local real estate databases confirms that a significant number of these developments are also happening on land purchased by overseas investors from these regions (RP Data 2014).

Many aspects of this sudden growth still remain to be assessed in terms of planning, social and environmental sustainability, space quality of apartment types and further local debate and research

引了450000 m²的新办公楼的落成，使之成为一个新兴的中央商务区，而其的空置率从2006年开始降低(墨尔本城市研究2013a和2013b)。

这是墨尔本城区的概况。住宅的繁荣在老的中央商务区显得更加明显。在市中心，现有40个住宅楼正处在开发状态(详见图1)。据发展监控报道，墨尔本在2013年终将有13000个在建住宅，预计于2017年完工。其中有将近60%的开发项目是在中央商业区，另外的主要是在Southbank, Carlton,和Docklands。

墨尔本老的中央商务区仍然是维多利亚州城市发展的核心区域。市中心迅速增长的住宅楼间接地论证了分散城市密度，把高层住宅楼分散到Docklands及市郊的机会的错失。统计数据论证了城市中心用地将从商业为主转为住宅为主。截止2013年，办公用地仍然占据着是墨尔本市中心最主要的地位(墨尔本城市研究2013)。

这些数字反映了墨尔本未来高层建筑的走势：中央商务区将从以商业为主转为商业住宅相结合，而CBD以西的Docklands将逐渐形成一个新的商业中心。墨尔本住宅的兴起也吸引了国内外媒体的关注。维多利亚州的规划部长在去年12月的“超级星期二”上公布五个高层住宅楼，共2000个公寓在同一天内获得审批通过。这些报道和其它资料都表明墨尔本高层住宅的发展将吸引越来越多的海外投资商，尤其是东南亚和中国，投资澳洲的土地和住宅。

这种突然迅速增长的情况在许多方面仍然有待规划、社会和环境可持续发展的评估。公寓类型、质量及地方进行进一步的讨论和研究。除了资源的供应力，住宅的急速发展也导致很少的时间去反应和解释。墨尔本的城市规划局和维多利亚的城市规划局之间对于如何发展超过25000m²的总楼面积存在着意见分歧。先前对过度开发的一些高层住宅楼的反对意见已经得到CBD的文件批文。

现有土地使用和高层建筑是促进因素

虽然对于墨尔本历史建筑的兴趣还在持续，但是什么才是驱动高层建筑楼迅速在CBD发展的因素呢？

最明显的原因是经济特质：就现有市场而言，住宅的投资回报率较高，这不仅仅在墨尔本，在全球都是这个状况。在同时，Docklands是个开发商业区的好地段，它缓解了CBD高层办公楼自90年代中期开始的压力。

其它原因是墨尔本CBD的固有的建筑形态和先前的土地使用状况，但这些都并非主要的。CBD大量的土地是用作商业建筑，基本建于19世纪60年代到90年代中期(见图1)。这些办公大楼可以分为两种类型：一种是建于19世纪50到60年代的楼层允许值为20层的老式矩形或块状填充板式的建筑(见图2)，另一种是30到40层之间高度为200到250m的高层建筑(见图3)。这些矩形高层建筑形成了墨尔本的天线和地标，实际上，墨尔本70%的高层建筑都属于这个类型。这些矩形高层建筑中独立式的主要建成于1970年，裙房式的主要建成于19世纪80年代中期。墨尔本最初的矩形高层建筑的模式来自美国，然后现在吸纳了各种国际建筑风格(脚注1)。其建筑特点：尺寸非常具体，恰如其分地满足网格格式的城市规划。这些高楼的平面图普遍都是非常精确的40m * 40m或接近于这个。它们的租赁深度范围从10到12m，其典型的楼板面积相对较小，可租赁面积为1300m²到1500 m²。这些办公大楼占据着城市网格的转角，大部分位于CBD的东南面随着Collins街和Bourke街延伸。

现有的商业高层建筑已经占领了城市最好的区域和角落，逐渐增长的高层住宅楼将填补剩下的城市空间。阐明墨尔本当今的建筑形式很重要。虽然高层住宅楼相比办公大楼的占地面积少，但

is likely to occur. Despite the open source availability of data, this residential boom is occurring at such a speed to leave little time of reaction and interpretation. In this dynamic context there are conflicting views between the planning authority of the City of Melbourne and the State's planning authorities of Victoria which have the key decisional powers for projects of over 25,000 sq m gross floor area. The former has recently posed objections on grounds of overdevelopment for several of the recent tall residential buildings which have been approved for the CBD by the latter.

Existing Use of Land and Tall Building Types as Contributing Factors

While this interest of development for the historical grid of Melbourne carries on, what are the causes which are contributing to the growth of this unprecedented residential wave of tall buildings in the CBD?

The most apparent reasons are of contingent economic character. There is a market perception that residential apartment developments have better returns at the moment, not only in Melbourne but also in other parts of the world. The Docklands in the meantime have taken a good slice of the commercial office developments of the city leaving the CBD relatively less under pressure for tall office building developments since the mid-1990s.

Other reasons are inherent in the urban morphology of Melbourne's CBD and in the pre-existing use of land and these aspects are not secondary. A large part of the sites of the CBD are occupied by commercial office building developments which have been built mostly between the 1960s and the mid-1990s (See Figure 1). These office buildings can be divided into two broadly prevalent typological families. Older rectangular corner or mid-block infill slabs of maximum 20 floors built mostly in the 1950s and 1960s (See Figure 2) and square plan towers of 30 to 40 floors of up to 200-250 meter in height (See Figure 3). These square towers currently form the bulk of Melbourne's skyline and in fact 14 out of 20 of the tallest buildings in Melbourne belong to this typological family. The square plan towers of Melbourne are either free-standing when completed in the 1970s or built over podiums when completed from the mid-1980s onwards. The model of the square office tower in Melbourne is American in its origin and it is rooted – by means of models and people – to the global diffusion of the International Style¹. The architectural characteristics of the local type are however

¹The square plan office tower is not simply a local phenomenon of Melbourne but a global one and it has notorious precedents and parallels worldwide. The first examples which come to mind are the New York World Trade Center, the Standard Oil Building in Chicago, One Boston Place or the Tenneco Headquarters in Houston and many more. In the case of Melbourne there is also a source of North-American influence which mixed with local conditions and industry has played a role for the local diffusion of this model. The source of influence goes back to the ubiquitous work Skidmore Owings and Merrill and I.M. Pei and Cobb. Both firms have actively worked in Melbourne as designers respectively of AMP Square (1962-68) and Collins Place (1968-1981) while Minoru Yamasaki and Pietro Belluschi are also known to have travelled, established contacts and promoted their projects in Melbourne during the 1960s. Bruce Graham and Fazlur Kahn of the Chicago office of SOM also played a role of significant influence collaborating with the local firm of Yuncken Freeman for the structural concept of BHP House.

¹墨尔本的方形高层办公大楼现象并不是个先例，而是一个全球化现象。其不好的声誉也是全球皆知。最熟悉的例子就是纽约世贸中心，还有芝加哥的标准油大厦，波士顿广场，休斯顿的天纳克总部，等等。就墨尔本而言，现在的现象也是受到了很多北美的影响，加之当地的行业环境所造成的。这影响的源头可以追溯到Skidmore Owings Merrill和I.M. Pei Cobb。这两家设计公司都分别在墨尔本的AMP广场（1962年-1968年）和科林斯（1868年-1981年）活跃过，而Minoru Yamasaki和Pietro Belluschi所创立的联系也都被公认为是对他们1960年项目的促进。在SOM在芝加哥的公司，Bruce Graham和Fazlur Kahn起到了相当重要的作用，他们联合了当地的Yuncken Freeman公司完成BHP房子的结构概念设计。

是其仍能改变城市的建筑容貌。许多即将在两到五年内建成的住宅楼不仅是细长型而是超级细长的类型。最新的一些三维参数表明摩天大楼有其得天独厚的优势。矩形的细长的高层办公大楼已在墨尔本很盛行，其优点是让租赁最大化，且提供高质量的空间和开阔的视野。在经济和操作上适合19世纪七八十年代的工作场所。在Collins上的ANZ大楼，由I.M. Pei和Henry Cobb设计于19世纪60年代末，其纵横比为1:5。墨尔本的商务大楼的容积率在过去为10比1至12比1之间。这些密度经常被作为增强公共领域。最近提出的超细长大楼的提议往往发生在小块上，如1000m²，其容积率已经增长到60:1，超细长大楼纵横比从1:8到铅笔薄般的1:12。

这一点都不意外发生在建筑体制完善的墨尔本。这些大楼结构看做是建筑本身的服务结构。在本质上，最近的住宅楼是CBD商务楼剩下的可利用土地空间的简单挤压。



Figure 1. Map of Melbourne CBD comparing sites currently occupied by large office towers red with location of recent proposals for residential towers. Recent residential development proposals are shown in blue. Existing square plan office towers are shown in red and other tall office towers in orange. Although there is a clear prevalence of residential proposals in the northern and north-western blocks of the grid, some residential proposals are starting to appear in proximity of existing office clusters by replacing smaller and older office developments. (Source: Giorgio Marfella)

图1.在墨尔本CBD的地图上，红色标注了现有的大型方形高层办公楼，蓝色标注了已提议的高层住宅楼，橘黄色标注了其他的高层办公楼。虽然大部分高层住宅楼都在城市的北部和西北部，但是有一些住宅在现有的办公楼群里出现，它们取代了那些过小或过旧的商业楼（来源：Giorgio Marfella）。



Figure 2. Corner office slabs built in the Melbourne grid during the 1950s and 1960s. From left to right: 330 Collins Street, formerly Colonial Mutual Life Building, built in 1958-63 and 435-55 Collins Street, formerly National Mutual Life Building built in 1962-65: several office buildings of this older generation are becoming object of redevelopment and in some instances of demolition and replacement by residential developments. (Source: National Library of Victoria, Sievers Collection).

图2.角落办公板在19世纪50年代和60年代流行。从左往右，分别是330 Collins Street和之前的Colonial Mutual Life大楼，分别建于1958-63和1962-65。这一代的几个办公大楼正成为重建和拆除的对象，极有可能被住宅楼所替代（来源：维多利亚国家图书馆，西弗斯集合）。

dimensionally very specific and respond fittingly to the scale of the grid of the city. These towers have a floor plan that is generally exactly or almost exactly square and which is not far from an ideal footprint of 40 x 40 metre. Their leasing depths range from 10 to 12 m and the typical floor plate sizes are relatively small ranging between 1,300 sq m and 1,500 sq m metre of lettable area. These office towers occupy most of the larger consolidated corner sites of the grid and they are located in the areas which have traditionally being zoned for clusters of skyscrapers at the south-western and south-eastern ends of the CBD along the east-west axis of Collins Street and Bourke Street.

This existing pattern of land use which sees most of the best corner sites already occupied by the towers of the twentieth century is one of the primary reasons which have encouraged the development of slender residential towers which are located instead on smaller left-over sites. It is worth to clarify what is the meaning of slender in the context of Melbourne today. While residential towers tend to have a smaller footprint than office towers the existing stock of the square office towers can serve as a yardstick of comparison to appreciate how the skyline of Melbourne is about to change. Many of the residential towers to be built in the CBD of Melbourne in the next two to five years are not simply slender but rather super-slender types. The dimensional parameters of some of these latest generation skyscrapers define their extraordinary traits. The square plan office towers of Melbourne which prevail as the tallest in Melbourne were already a product of slenderness which maximized rental value offering quality space with all-round open views and in an economically and practically efficient floor plan suitable for the workplace markets of the 1970s and 1980s. The ANZ tower of Collins Place, for example, designed in the late 1960s by I.M. Pei and Henry Cobb, has aspect ratio of 1:5. In terms of plot ratio the commercial office towers of Melbourne built in the past were in the order of 10 to 1 to 12 to 1 and these densities were often granted on large consolidated sites within a planning framework of bonuses in return for public realm enhancements. Recent proposals of super-slender towers occur instead often on small parcels, in the order of 1,000 sq m and have plot ratios which in some cases reach up to 60 to 1 and tower slenderness ranging from 1 to 8 up to pencil thin proportions of 1 to 12.

It should come by no surprise that these constructions are happening in Melbourne where the self-climbing systems of concrete form-work have traditionally been a technology of robust local know-how. These towers are conceived structurally as a service core which has become the building itself. In essence the recent residential buildings are simple extrusions of the narrow sites of the CBD left-over by the previous commercial office booms which have progressively occupied the best sites since the 1960s.

Office Crowding Out Scenarios and the Current State of Office Towers in the CBD

It is yet to be understood if the lessons learnt by these typologies and the innovative vitality of the local building industry will find a direct influence also for the next generation of office buildings. It is unlikely that these super-slender know-how lessons may be of use if the current trend for larger office floor plates with at least 2,000 sq m of net lettable area continues to prevail for the production of office buildings. This sudden boom of super-slenders follows the global trend of residential towers becoming more present in the skylines worldwide. Melbourne however is by contrast with world trends, still significantly

办公大楼排挤出CBD的可能性

如果能从现有的建筑类型上获得创新的经验，这将对未来的办公大楼建设带来有益的影响。如果现有2000平米的净可出租面积的办公大楼在未来建成的趋势，那么这个经验就不会过时。这种迅速繁荣的超细长住宅大楼在全球都很风靡。墨尔本相比之下，除Collins区域外，其他地方的高层商务楼仍然孤立的伫立着。

迅速发展的住宅楼可能是导致办公大楼逐渐退出墨尔本CBD的一个主要因素 (Birrell和Healy 2013)。这些建于19世纪五六十年代的高楼逐渐变得过时。如果没有适当的规划和监控，墨尔本CBD现存的高层办公楼将被高层住宅楼所取代。有如下几点理由：

现有的高层办公楼逐渐不在孤立，而是与新兴的新的住宅楼相结合 (见图4)。这也涉及到一个悖论，在未来数十年，CBD的高层办公楼可能会出现萎靡的状态。潜在的，办公楼的股价会随着楼房的老化，周边高层的兴起而降低。然而，这需要对现有城市住宅热潮、影响和障碍有更好的了解和分析。

一些现有的矩形办公楼有着相对适度的租期长度和品质。然而，这些方面的优势在当地市场变得不在那么吸引。在短期内，仍有一些过时的商业办公楼。对于大型无障碍地块的青睐仍在流行，然而商业开发逐渐转向Docklands。提议重新开发的整个433-455 Collins街就是一个信号，新的开发包括对过时的现存办公楼的拆除。这些拆除工作有些已经在墨尔本发生。

19世纪70年代至90年代建成的办公楼由于不满足现有的能源效率标准而处于整修阶段，有些几经接近其生命周期。尽管最近很多在CBD的高层办公楼都升级了机械服务，但执行水平还是低于能源消费的规定。除了结构性和昂贵的外墙外，新的市场环境会导致这些老办公大楼的拆除。然而考虑到最高的办公楼作为市中心的核心，在预算内升级其系统可能是最有效的解决办法。如果目前的住宅市场持续繁荣，那么把办公楼转向住宅楼是个很好的选择。

总结

墨尔本住宅发展的最新景气现象预示着商务楼和住宅楼的紧密联系，但住宅楼的质量和密度还有待进一步的监视。在踏入新的商业楼的开发之前，城市规划可进行设计、可持续发展、方便用户



Figure 3. The Central Business District of Melbourne has the highest concentration of tall square plan office towers in Australia: these towers are the backbone of Melbourne's skyline today and were built mostly in the period between the late 1960s and the early mid 1990s (Source: Giorgio Marfella)

图3. 墨尔本的中央商务区有着澳大利亚最集中的高层方形办公楼，这些大楼很多成为现在墨尔本的地标，它们主要建于19世纪60年代晚期到90年代早期 (来源: Giorgio Marfella)。

orphan of large scale mixed use towers with the only notable exception of the office-hotel tower of the Collins Tower at Collins Place.

While this impetus of extraordinary development carries on, there are concerns that the residential boom may have the side effect of “crowding out” office space from the CBD (Birrell and Healy 2013). The stock of square plan office towers of the CBD, at this point in time is starting to take historical connotations and in the context of a highly speculatively driven city like Melbourne these towers are likely to become obsolete as it is already happening for the slab towers built in the 1950s and 1960s. In the absence of adequate planning controls and political direction to do otherwise, the state of the existing tallest office buildings in the CBD has therefore the potential to facilitate the process of substitution of office buildings with residential towers. These are some of the reasons why this could happen:

The current tall office building stock is becoming less isolated and towering in height – when not at times overshadowed by new residential neighbors (See Figure 4) - by the growing taller residential developments. This could lead to the paradox that the office towers that have contributed to the obliteration of entire blocks of the earlier CBD may be perceived in the next decades as an under-development of land. There is a potential for this office stock to be perceived as less prestigious when it has become older and less tall in relation to its context. However this could and should be better understood with the tools of an urban analysis to establish all implications in terms of views, overshadowing and obstructions introduced by the currently ongoing residential boom.

Some of the key strong-points of the existing square plan office towers are the quality space with relatively modest leasing depths (10-11m) and subsequent views to all cardinal points. However these aspects have become less appealing in the local market which continues to demand large campus floor plans. Locally in the short-term, there is still a perception of square plan towers as a relatively obsolete product for commercial offices. The preference for larger unobstructed campus plans seems to prevail while the focus for commercial developments continues to shift to the Docklands seeking larger but less tall office buildings. The proposed redevelopment of the entire block of 433-455 Collins Street is a signal that new developments which include the demolition of large existing office buildings considered typologically obsolete can become a new trend of development once market conditions become more favorable for office developments and numerous operations of demolition of large tall buildings have already happened in the past in Melbourne².

The building envelopes of the existing office towers of the 1970-1990s periods are obsolete by current energy efficiency standards and recent refurbishing projects have proved that these buildings are approaching the end of their life cycle. Despite recent upgrading of mechanical services many of the tallest office buildings of the CBD still perform under optimum energy consumption requirements. It is possible that, unless structural and expensive improvements involving their Façades are contemplated, new market conditions may determine demolishing these old towers as the only feasible outcome in the near future. However given the level of consistency of the tallest office buildings stock as center-core tall square plan towers there is an avenue to



Figure 4. Prima Tower (left) and 318 Abode Russell Street (right) are two of the earliest towers of the residential apartment boom which is bound to interest Melbourne until the end of the decade. (Source: Giorgio Marfella)

图4. Prima Tower (左) 和318 Abode Russell Street (右) 是两个墨尔本早期的高层住宅楼，这个建筑风格风靡了十年 (来源: Giorgio Marfella)。

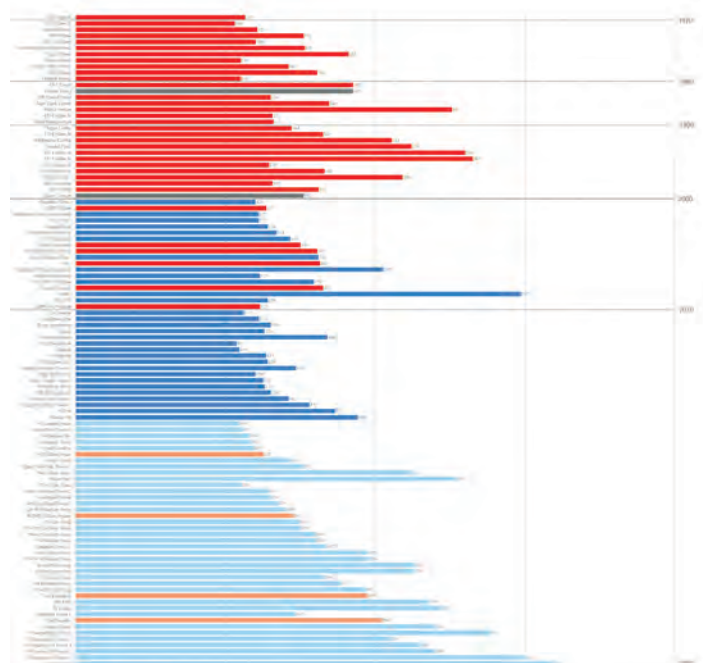


Table 1. Chronological progression of the tallest buildings in Melbourne, including the most recent development proposals; existing office buildings in red and forthcoming in orange; residential buildings in blue and forthcoming in light blue (Source: Giorgio Marfella; Data: CTBUH, Skyscraper Center)

表1. 展现了墨尔本高层建筑的时间排序，包括最近提议的开发项目。红色表示现有的办公楼，橘黄色表示即将建成的办公楼；蓝色表示现有的住宅楼，浅蓝表示即将建成的办公楼 (来源: Giorgio Marfella; 数据: 世界高楼协会，摩天大楼中心)。

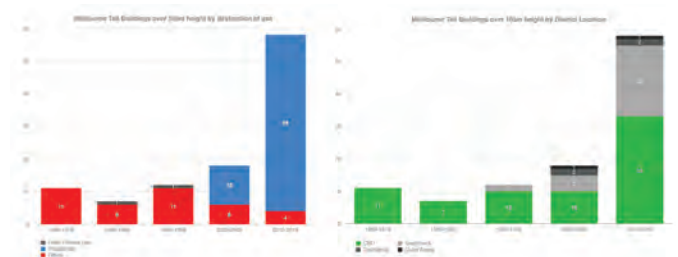


Table 2. Office versus residential tall buildings in Melbourne: temporal analysis (Source: Giorgio Marfella)

表2. 墨尔本高层办公楼与住宅楼的对比: 区域分析 (来源: Giorgio Marfella)

² The 99m tall CRA Building for example, was once the tallest building in Melbourne between 1961 and 1969. It was demolished in 1987 to be replaced by 101 Collins Street, currently the second tallest office tower in Melbourne.

² 以99米高的CRA大厦为例，它曾是墨尔本在1961至1969期间最高的大楼。它在1987年被拆毁，取代它的101 Collins Street现在成为墨尔本的第二高建筑。

consider the upgrading of the envelopes as the most efficient way to bring the energy consumption in line with better targets. Given the relatively modest depths combined with views all-round the conversion for some of these square plan office towers to residential use could also be an avenue to be explored by developers if the current residential market demand continues to be strong.

Conclusions

The latest boom of residential developments in Melbourne signals that there is a very high interest to develop the historical city grid as a mixed use district but the quality and the hyper-density of many of these residential developments is under scrutiny. Before embarking into a new generation of commercial office developments the city now has an opportunity to implement directions on design, sustainability, and user-friendly standards of workplace and to reassess the current quest for larger and larger floor plates versus new office models based not just on open plan but also on environmental quality. The auspice is not simply to see new projects with higher NABERS ratings but also to seek a social sustainability which is inclusive of considerations for mixed use, daylight, natural ventilation, building reuse and adaptation, and which looks beyond the alternating cycle of residential versus commercial development which as local history shows are periodically driven to oversupply. The most recent transformations in act should serve for the industry to explore commercial feasibilities with more courage. According to the most recent analysis by the Property Council of Australia the current office market in Melbourne does not have a negative outlook. However there are factors of urban form, pre-existing occupation of land and existing typological character which suggest that alarms for uncontrolled replacement of office buildings with residential speculative developments in the CBD are founded. The local authorities have an opportunity to implement strategies for the upgrade, conversion, redevelopment, and/or the sustainable replacement of the majority of the existing tallest office buildings of the CBD. These future growth strategies could be easily developed by being tailored for a specific type of tall office building, the square plan tower, the model which accounts for the large majority of office space offered by the tallest office buildings in Melbourne. Melbourne also has an opportunity to encourage sustainably new quality workplace developments as a measure to counter balance the sudden spur apartment developments of the CBD.

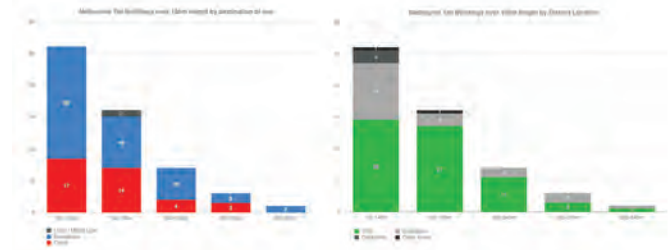


Table 3. Office versus residential tall buildings in Melbourne: building height analysis (Source: Giorgio Marfella)
表3.墨尔本高层办公楼与住宅楼的对比: 建筑高度的比较 (来源: Giorgio Marfella)

使用标准方面重新评估, 使得新的建筑模型在计划实行的同时, 也保证了环境质量。这不仅仅是简单的考虑新项目的评价等级高, 而是寻求一个社会的可持续发展。这包括结合自然光, 自然通风, 建筑再利用及实用性等的综合考虑。从办公楼和住宅楼发展的交替周期来看, 目前的市场供过于求。最新的行动变革应该为业界开拓更多的勇气和商业可行性。根据澳大利亚财产局的最新分析表明当前的商业建筑市场仍旧是健康的。然而城市形态因素、预期存在占领的土地和现有的建筑风格建议对一些不受控制的随意更换房屋使用的进行监控。地方当局有机会以实施战略升级、转换、重建和可持续发展更换绝大多数CBD现有高层办公建筑。这些未来的增长战略, 可能很容易针对特定类型的高层办公大楼、广场规划来制定, 这个模式适用于办公楼占了主要地段的墨尔本。墨尔本CBD依旧有机会鼓励可持续发展的商业楼去平衡迅速发展的住宅楼。

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