



CTBUH Research Paper

ctbuh.org/papers

Title: High-Rise Harmony – Legal Issues Unique to Tall Buildings

Authors: Victor Madeira Filho, Founding Partner, MVA
Arthur Wellington, Law Clerk, Thornton Tomasetti

Subjects: Construction
Property Ownership/Management

Keywords: Construction
Legal
Residential

Publication Date: 2014

Original Publication: CTBUH 2014 Shanghai Conference Proceedings

Paper Type:

1. Book chapter/Part chapter
2. Journal paper
3. **Conference proceeding**
4. Unpublished conference paper
5. Magazine article
6. Unpublished

© Council on Tall Buildings and Urban Habitat / Victor Madeira Filho; Arthur Wellington

High-Rise Harmony – Legal Issues Unique to Tall Buildings

高层建筑的和谐性——高层建筑独有的法律问题



Victor Madeira Filho



Arthur D. Wellington

Victor Madeira Filho & Arthur D. Wellington

Madeira Valentim & Alem Advogados
Al. Gabriel Monteiro da Silva, 1970
São Paulo, Brazil
01442-001

tel (电话): +551130644900
fax (传真): +551130640006
email (电子邮箱): victor.madeira@mvalaw.com.br;
AWellington@ThorntonTomasetti.com
www.mvalaw.com.br

Victor Madeira Filho, founding partner of MVA Advogados, is recognized by the construction industry as one of the most prominent Brazilian lawyers in the area of Construction Law. In Brazil, since 2009 he has consistently rated as a leading Brazilian lawyer in the construction, mining and steel sectors by several prestigious publications. Victor is an experienced attorney highly specialized in complex construction disputes, construction contracts negotiation, construction contracts compliance, public bids and PPPs and mainly focused in logistics, energy, mining, steel, cement and real estate projects. In addition to his construction practice, Victor represents landowners and private equity real estate funds on commercial and residential real estate complex transactions and litigation matters.

作为MVA Advogados的创始合伙人，维克多·马德拉·菲尔霍是巴西建筑业公认的最著名建筑法律师之一。2009年以来，他被多家知名媒体连年评为巴西建筑、矿业和钢铁行业主要律师。作为一名律师，维克多在复杂性的工程纠纷、建筑合同谈判、建筑合同合规、公开招标和公共私营伙伴等领域具有丰富的经验，他主要关注物流、能源、矿业、钢铁、水泥和房地产项目等领域。维克多除了关注建筑案例外，还代表土地所有人和私募地产基金会从事商业和住宅地产方面的复杂交易，以及履行诉讼事务。

Arthur ('Duke') Wellington joined Thornton Tomasetti in 2005, after graduating from Lehigh University with a bachelor's degree in Civil and Environmental Engineering. In 2010, he earned a J.D. degree from Chicago-Kent College of Law and joined Thornton Tomasetti's Legal Department. He advises management and worldwide technical staff on risk management, contract negotiation, claims defense, and compliance. He oversaw the legal aspects of opening new offices in New Zealand, Brazil, and Vietnam. Arthur is a licensed Structural Engineer in Illinois and is admitted to the bar in Illinois and New York.

亚瑟（“杜克”）惠灵顿于2005年加入Thornton Tomasetti。他毕业于利哈伊大学，并获得土木与环境工程学士学位。2010年，他获得了芝加哥肯特法学院法学博士学位，并就职于Thornton Tomasetti的法律部。他为管理层和公司分布全球的技术人员提供风险管理、合同谈判、索赔辩护和合规等方面的建议。他负责监督公司在新西兰、巴西和越南新开设办事处时涉及的法律事务。亚瑟是伊利诺斯州的注册建筑师，并在伊利诺斯州和纽约担任执业律师。

Abstract

This article aims to discuss the construction of tall buildings in both emerging and established urban centers, highlighting aspects related to large urban centers and raising the points of impact from such constructions in the cities. Since there is a vast content on the subject, this article will bring reflections specifically about the verticalization of constructions in Brazil, divided ownership of property (and some reflections), neighborhood rights, the limits imposed to construction due to airspace, and some social issues arising from the construction of skyscrapers and large condominiums. These legal concepts in Brazil will be compared against the United States, where high-rise urban living has been prevalent for a longer time and the legal system has adapted to address similar issues. Finally, we will discuss the new construction models and the potential future of the cities, as a result of new trends and concepts.

Keywords: Brazil; United States; Construction; Skyscrapers; Condominiums, Nuisance, Law

摘要

本文旨在讨论新兴和已建城市中心高层建筑的兴建问题，重点关注了大城市中心涉及的相关问题，以及这些建筑物给所在城市带来的各种影响。由于该主题涉及内容广泛，因此，本文主要对巴西建筑的垂直化发展这一课题，从财产所有权(及其影响)、邻里权利、建筑物高度限制、摩天大楼和大型公寓带来的社会问题等方面进行了探讨。众所周知，美国的高层建筑兴建很早，而且，美国拥有较好的适用法律体系，因此，我们对巴西和美国的有关法律概念进行了对比。最后，我们对于城市中可能出现的新型建筑模式和未来发展等新趋势和新概念进行了探讨。

关键词: 巴西; 美国, 建筑; 摩天大楼; 公寓, 损害, 法律

Introduction

More of humanity is living in high-density environments than at any time in history, and the trend is towards further urbanization of the world's population¹. Living in close proximity to others leads to incredible efficiency in the use of the world's resources, promotes creativity and collaboration, and allows for ever-greater specialization of individual talents (as the effort of sustaining one's habitat is shared with others).

However, proximity also brings friction between neighbors and disputes among cohabitants. The purpose and function of law is to resolve disputes and preserve societal harmony. Of course, occupants of high-rise buildings experience many of the same societal conflicts as people who live in other building types do, but there are some issues unique to high-rise construction that legal systems worldwide will need to address. A selected set of these issues will be discussed in this paper.

介绍

目前，高密度居住在一起的人类数量比历史上的任何时期都要多¹。未来的发展趋势是世界人口的进一步城市化。这种密集化居住方式极大提高了世界资源的利用效率，促进了人类的创造力和协作性，实现了个人才能的更加专业化分工(这是因为人们要与他人分享居住地所导致的)。

然而，这种近距离居住现象也导致了邻里之间不断发生摩擦，以及混居人之间的争端不断出现。对此，法律的目的和功能就是在解决这些纠纷和维护社会和谐。当然，高层建筑居住人员也会经历居住在其他建筑内人员所面临的相同问题，但是，高层建筑居住人员面临着全球法律体系亟待解决的一些特有难题。本文选择并探讨了其中的一些问题。

巴西: 高层建筑的发展历史和现状

20世纪30年代，随着新建筑技术的不断涌现(如电梯和钢筋混凝土)以及主要城市人口数量的增加，巴西在里约热内卢市建造了拉美地区的第一座摩天大楼。这座命

¹ DESA, p. ix

Brazil: History and Current Status of Verticalization

In the 1930s, amid the emergence of new technologies (e.g. elevator and reinforced concrete) and the increase of population in major Brazilian cities, the first skyscraper was built in Latin America, located in the city of Rio de Janeiro. The building “A Noite” [The Night] was built by a major newspaper at the time, A Noite, and hosted, since its completion, the most important radio station in the country, Rádio Nacional (see Figure 1).

Products of the industrial developing world and symbols of capitalism, skyscrapers emerged in Brazil motivated both by government actions based on urban plans (such as the city of Rio de Janeiro), and by private initiatives (such as the city of São Paulo).

To understand the differences between the vertical growth of Brazilian cities over time, it is necessary to observe the protective legislation of each community, such as the rules to environmental protection, to health and urban development, specified respectively in the City Statute, in the Master Plan and the Building Code of the Municipality.

Although high-rise buildings have different origins and motivation in different locations, it is possible to identify common legal points with regard to construction in large urban centers, where skyscrapers are located, as we will further discuss below.

Legal Issue 1: The Subdivision of Property/Ownership of Real Estate Properties and Related Expenses (Rights of Co-Owners)

Although buildings are not an exclusive phenomenon of the modern era, the subdivision of these properties into apartments and the increase in their extension are considered innovations of the twentieth century, with some basic, informal precursors found in European history². In this context, multi-ownership condominiums (also known as “horizontal property”) emerged in Brazil’s major cities, providing more and better housing to the growing population.

Thus, it was pending regulation by Brazilian law, which occurred in a more complex way only in 1964 (with the enactment of Law No. 4591) which provided for condominiums in buildings and real estate developments.

Among other specifications, law 4591 identified the common areas in the condominium, which represent the conjunction of the exclusive property and common property, the latter being unsusceptible to division or sale by any resident.

According to the applicable Brazilian law, within the condominium it is necessary to establish rules of social behavior, through Internal Rules, which must be followed by everyone (tenants and visitors) in order to maintain peaceful living.

With regard to the division of expenses by the building occupants, Law No. 4.591/64 imposes an obligation for the tenants to agree on the payment of expenses of the condominium, divided as follows: (i) costing, which are intended for the maintenance of common services (salary of employees, rate of consumption of water and electricity, taxes, insurance, cleaning supplies); and (ii) extraordinary, which are intended for innovations for the benefit of the condominium (useful and voluptuous improvements).

² Bennett, p. 249

² 贝内特, 第249页



Figure 1. “A Noite” [The Night]: the first skyscraper built in Latin America. Source: (“Primeiro arranha-céu do Brasil, edifício A Noite é tombado pelo Iphan”. Picture: Collection of “Rádio Nacional do Rio de Janeiro”. <http://www.ebc.com.br/sobre-a-ebc/sala-de-imprensa/2013/04/primeiro-arranha-ceu-do-brasil-edificio-a-noite-e-tombado-pelo>) 图示1. “A Noite” [The Night]: 建于拉丁美洲的第一座摩天大楼 来源: (“Primeiro arranha-céu do Brasil, edifício A Noite é tombado pelo Iphan”. 图片: Collection of “Rádio Nacional do Rio de Janeiro” 集锦. <http://www.ebc.com.br/sobre-a-ebc/sala-de-imprensa/2013/04/primeiro-arranha-ceu-do-brasil-edificio-a-noite-e-tombado-pelo>)

名为“A Noite” (意为“今夜”)的建筑物是由当时的一家主要报纸 (A Noite) 为巴西最重要的广播电台 (Rádio Nacional) 兴建的 (见图1)。

在政府城镇化计划 (比如里约热内卢市) 和私人项目 (比如圣保罗市) 的双重刺激下, 作为新兴工业化国家和资本主义象征的摩天大楼开始在巴西出现。

要了解不同时期巴西城市建筑的垂直化发展情况, 我们有必要观察和了解适用于社区的保障立法情况, 比如城市法令、总体规划和市政建筑法规中涉及环保、健康和城市发展等方面的内容。

虽然高层建筑在不同地区的起源和发展动机都各不相同, 但是, 我们仍然可以找到摩天大楼所处的那些大型城市建筑法律法规方面的共同点。我们在下文会对此进行探讨。

法律问题1: 房产所有权区分以及相关费用(共有人的权利)

虽然这些建筑物的出现并不是当今时代的特有现象, 但是, 将这些财产区分为公寓式建筑以及它们分布范围的不断扩展, 却是20世纪的创新。人们可以从欧洲历史上找到它的基本发展前兆和脉络。²在这种背景下, 多人共有的公寓 (也称为“水平化资产”) 开始在巴西的一些主要城市出现, 它们为数量不断增长的人口提供了更多和更为舒适的居住条件。

但是, 适用于这种复杂建筑物的法律直至1964年才出现。当时巴西制定了第4591号法律, 明确了公寓式建筑和房地产开发的相关事宜。

第4591号法律以及其他一些同类法律规范, 明确了公寓式建筑公有区域以及独有财产和公共财产的分界点, 而后者恰恰是有关部门和居民在出售房产时的争议焦点。

根据巴西现行适用法律规定, 公寓内部有必要制定通用的社会行为规则, 我们称之为内部规则。为了维持和谐的居住环境, 公寓内的每个人 (不论是住房还是访客) 都要遵守这些规则。

对于公寓内住户的费用分摊问题, 第4.591/64号法律强制规定, 租户必须同意支付公寓的下列费用: (i) 公寓公共服务设施的维护费用 (包括员工工资, 水电费用, 以及税务、保险和清洁用品费用);

In addition, the so-called Condominium Covenant determined the quota and the payment method of contributions by the residents, which measured the proportion of ideal land area allocated to each apartment and/or by the specific needs of each building - even if the use of certain equipment and/or services occurs differently among the residents³.

At this point, it is worth mentioning a trend in the current scenario of the Brazilian real estate market: the increased number of residential condominiums with the provision of 'pay per use' services. To make life easier for residents, some buildings offer this system, which include outsourced housekeeping services, child recreation, pet services and "personal trainers", for example.

The expenses from the use of these services are not related to condominium contributions being charged separately, but rather being charged directly by the service providers to each one of the residents utilizing the services. The concept behind this trend includes the convenience and safety offered to residents.

In the United States, the laws applicable to shared ownership are almost entirely established at the state level⁴. Early approaches to shared ownership of property, starting almost exclusively in New York City in the 1920's, resembled corporations of which the residents were shareholders. This form still exists today, known as a cooperative or "co-op"⁵.

The popularity of urban living grew in the United States in the post-war period. Legislation originating from Puerto Rico⁶ was bolstered by approval from the federal government's mortgage lending program in 1961. By 1969, all states had a law allowing condominiums and addressing the legal issues of shared ownership in detail⁷.

The popularity of living in a shared environment, whether in Brazil, the United States, or elsewhere, requires the adoption of modern property laws so that residents can be comfortable that disputes among owners will be resolved fairly. Residents (and their mortgage lender!) must also have confidence that their investment in the property is safe. Brazil and the United States have successfully updated their laws to meet the public demand for concentrated urban living; other countries who are experiencing this demand will need to update their legal framework as well.

³ FILHO, Rubens Carmo Elias. As Despesas do Condomínio Edifício. Ed. Revista dos Tribunais. P.107

³菲尔霍, 罗本斯·卡尔莫·埃利亚斯. As Despesas do Condomínio Edifício. Ed. Revista dos Tribunais. 第107页

⁴The primary involvement of federal law would be with respect to civil rights; i.e., the prevention of improper discrimination against home purchasers. The primary applicable federal laws start with the Civil Rights Act of 1964 and the Fair Housing Act of 1968, as well as the Americans with Disabilities Act of 1990. These issues are not unique to high-rise buildings and will not be discussed further in this paper.

⁴联邦法律主要明确了居民的民事权利, 比如: 防止对房屋购买人的不正当歧视。在这一方面, 适用的联邦法律主要是1964年民事权利法案、1968年公平住房法案和1990年美国残疾人法案。这些问题并不是高层建筑面临的独特问题, 因此, 本文对之不作进一步探讨。

⁵ Siegler & Levy, p. 12.

⁵西格勒&列维, 第12页

⁶ The Horizontal Property Act of Puerto Rico (1958). "Horizontal" refers to the division of a building into horizontal strata or layers above the ground.

⁶波多黎各水平式房产法案(1958年)。“水平式”指将建筑物按照地平面以上的水平层或层面进行区分。

⁷ Bennett, p. 257.

⁷贝内特, 第257页

和(ii)为公寓住民福祉之目的, 更新和创新服务设施的特别费用(比如对设施进行有益的美观改进)。

此外,这个所谓的公寓公约对于居民摊付费用的数额和支付也做出了明确规定。它明确了每一住房应摊的区域面积和/或每一公寓建筑的具体需要—即使在居民使用这些设备和/或享有这些服务的情况不同时, 也应当如此³。

对于这一点, 我们需要特别指出当前巴西房地产市场出现的一个趋势: 越来越多的住宅式公寓实行了“按用付费”规定。为使居民生活更为容易,一些公寓管理部门向居民们提供了这种服务模式, 它涵盖了诸如家政外包服务、儿童娱乐、宠物服务和“私人教练”等服务内容。

上述这些服务费用与居民担负的公寓其它收费是无关的, 它们是由服务提供者直接向享受这些服务的居民收取的。这一趋势背后暗藏的服务理念是给居民提供便利和安全。

在美国, 适用于共享所有权的法律几乎都是由州一级政府⁴制定的。纽约市在20世纪20年代制定了关于共享所有权的早期管理方法。该方法把居住在一起的居民看作是一家共有公司的不同股东。这种管理模式今天仍然在实行, 并称之为合作模式或“合作社”模式⁵。

战后, 居住在城市的美国人口数量不断增长。1961年的联邦政府抵押贷款项目批准了这种起源于波多黎各⁶的法律。到1969年, 美国所有的州都制定了相关法律, 允许群居式公寓存在, 以及从法律细节上明确了公寓式建筑的共享所有权问题⁷。

1联邦法律主要明确了居民的民事权利, 比如: 防止对房屋购买人的不正当歧视。在这一方面, 适用的联邦法律主要是1964年民事权利法案、1968年公平住房法案和1990年美国残疾人法案。这些问题并不是高层建筑面临的独特问题, 因此, 本文对之不作进一步探讨。

对于居住在共享环境内的居民, 无论他们是在巴西、美国还是在其他任何地方,都需要遵守现代的产权法律, 以便公平解决业主之间发生的纠纷, 确保居民们能够舒适地居住在一起。居民们(以及他们的抵押贷款银行)还必须对他们在该房产的投资安全状况抱有信心。巴西和美国为了满足公众群居式城市生活的需要, 已经成功更新了有关法律; 其它有同样需要的国家也要更新他们自己的法律框架。

法律问题2:社区权利(邻里权利)

当人们以更大密度居住在一起时, 邻里之间发生摩擦的机会自然会增多。为解决这一问题, 巴西和美国制定了不同的法律框架。

巴西—民事法

为了协调邻里之间利益和保证居民生活(包括一般大众, 而不仅指居民之间)的和谐, 巴西法律对于产权做出了一些强制性限定。

在这种背景下, 巴西民事权利法规明确限定了邻里之间的权利。为了防止损坏公共财产, 以及对于社区和私人聚会等问题, 该法规从公有和私人性质两个方面都制定了相关限制规定。

邻里之间关系涉及的各方面问题包括: 财产的不当使用(损害到邻居); 周围树木; 道路使用权; 电缆和管线通路; 水域; 建筑物边界以及堤堰使用权; 建筑权利(一般来讲, 居民们可以建造不被行政法规禁止的一切建筑)。

Legal Issue 2: Neighborhood Rights (Rights of Neighbors)

When people live in greater density, there are naturally more chances for friction between neighbors. Brazil and the United States have different legal frameworks to address this.

Brazil – Civil Law

In order to conciliate the interests between neighbors and keep society living in harmony, in general, and not only among residents, the Brazilian law has been improving with regard to the imposition of limitations on property rights.

In this context, the Neighborhood Rights as specified in the Brazilian Civil Code brings both limitations of public and private nature, in order to prevent damage to public property, the community and private parties.

Among the modalities specific to the neighborhood relations, are: the abnormal use of the property (harmful to neighbors); the surrounding trees; right of way; the passage of cables and pipes; waters; the boundaries between buildings and the right of weir; and the right to build (as a rule, everything that is not forbidden by administrative rules can be built).

It is worth noting that, in neighborhood relations, all individuals involved have identical and reciprocal rights and obligations, because each can be viewed in their role as the owner of property, as well as a neighbor of property that is owned by someone else.

Therefore, in case of breach of the legally assigned neighborhood rights, the Brazilian law provides specific legal measures that can be used by those who feel harmed, such as the denunciation of new work, demolition action, action of forced passage, among others.

United States – Common Law

While Brazil, as a Civil Law country spells out the rights of neighbors in detail in a formal civil code, Common Law countries such as the United States take a more complicated, yet more flexible approach.

Instead of attempting to write a code of rights that covers all disputes, in a Common Law legal system a basic framework is established, which judges apply to any dispute that is brought to them. Gradually, as cases are decided, standards emerge which can be applied to new cases. When circumstances change, judges can freely change the old rule so that new disputes are resolved fairly.

For example: In the United States, the law of “nuisance” would most likely apply to a dispute between neighbors. The established framework, in basic terms, is that a nuisance is a “substantial and unreasonable interference with a party’s use or enjoyment of its land.”

Under this system, if a judge were presented with a situation where a neighbor claimed that a high-rise building was causing a negative effect (for example, by changing the local wind patterns or by concentrating the light of the sun) the judge would apply the basic framework and then decide whether the interference was truly “substantial and unreasonable” by looking at past cases where a similar nuisance was claimed. It is the role of the attorney to argue which past cases are most similar to the present situation, and should therefore be viewed as the best guidance on the claimed nuisance. If the judge agrees a nuisance exists, he or she can award damages (money) to the neighbor to compensate for the nuisance, or order that the interference be mitigated (see Figure 2).

值得注意的是，邻里关系涉及到的所有人都要承担相同和相互的权利和义务，因为他们每个人既是该财产的所有人，同时也是该财产其他所有人的邻居。

因此，对于那些违反社区分配的合法权利情形，巴西法律规定了合法权益受损人可以采取具体的法律措施来维护自身的合法权利，比如：谴责或者要求拆除新建建筑物，强制开辟通道以及要求采取其它措施。

美国—共同法

作为实行民事法系的国家，巴西法律详细阐述了邻里之间的权利；而遵循共同法系的美国却采取了更为复杂和更加灵活的不同方法。

美国不是试图编写一个能够涵盖所有纠纷权利的法规，而是在共同法体系下制定了一个基本法律的构成，并由法官运用到因其导致的任何纠纷和争议上。随着案例得到不断判定，逐渐形成了裁决标准。这些裁决标准会不断运用到新案例中。当案例所处环境发生改变时，法官为了公平解决新的纠纷，可以自由改变老的裁决规则。

例如：在美国，涉及“损害”的法律很可能会运用到解决邻里之间的纠纷上。从现有法律框架基本条款上讲，“损害”指对于他人使用或者享有其土地权利导致的“实质性和不合理干涉”。

在这种法律体系下，如果法官在面对一位居民声称某一高层建筑对他造成了负面影响时(例如，改变了当地风向或者造成了光照集中问题)，这名法官可以运用基本的法律框架，并参照过去发生的同类损害情形，决定上述干涉是否真正是“实质性的和不合理的”。律师的作用主要是说明过去的哪些情形是最符合当前情况的，以及以往有哪些案例可以作为目前损害情形判决的最佳指导和参照。如果该名法官认为，过去的的确是存在这样的损害情形，那么，他或她就可以裁决利益受损的邻居获得相应的损害赔偿(金钱)，或者，做出减轻该干涉和损害的裁决决定(见图2)。

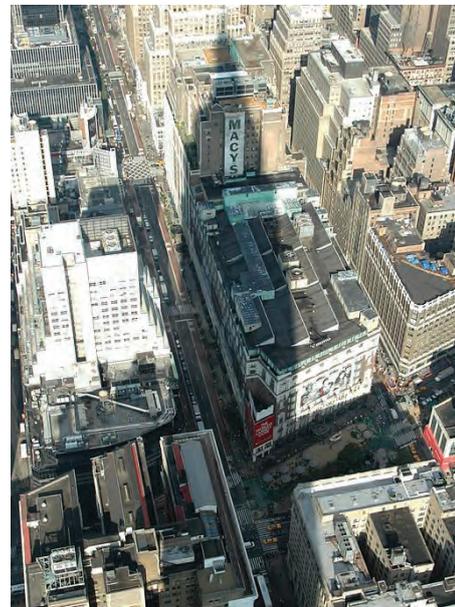


Figure 2. Shadow cast by a tall building on its neighbors several blocks away. A potential nuisance? (Typically, predictable impacts of buildings such as shadows are addressed through a planning and public hearing process prior to construction. As a result, it is more common for unintended or unpredicted effects to lead to a claim of nuisance. Source: (“Shadow on Macy’s”, Michael Elleray, Flickr/Wikimedia Commons. CC-BY-2.0 (<http://creativecommons.org/licenses/by/2.0>))

图示2. 一幢高层建筑对数个街以外的相邻区域投下的阴影。这是否构成潜在的滋扰？(通常情况下，建筑物的可预见性影响(如阴影)通过施工之前的规划和公共听证加以解决。其结果是，因滋扰问题而导致索赔的意外或不可预见的影响更为常见。来源：“Shadow on Macy’s”, Michael Elleray, Flickr/Wikimedia Commons. CC-BY-2.0 (<http://creativecommons.org/licenses/by/2.0>))

Legal Issue 3: Airspace and Aviation (Rights of Broader Society)

There are other legal rules that affect (and potentially restrict) high-rise buildings for the benefit of society in general. An example of this is aviation regulations.

Brazilian law restricts the height of skyscrapers in certain areas of the cities, for the safety of air navigation, aerospace navigation and airport infrastructure. It is in this context that the Brazilian Aeronautical Code (Law No. 7.565/86) imposes special restrictions to properties neighboring aerodromes, as specified in the Aerodromes Protection Zone Basic Plan.

Aiming to avoid causing difficulties to aircraft operations or interfere with the signals of radio navigation aids, or even hindering the visibility of visual aids, the Brazilian law establishes penalties to natural or legal entities who commit the infringement of “deploying any building or any real estate development in area subject to special restrictions, in breach of these” (Article 302, VI, letter g of CBA), for example.

At this point, it is worth mentioning that the height of buildings erected in these regions should be lower than in other parts of the city. Therefore, the construction of skyscrapers is always a very well analyzed issue. In this regard, it is worth mentioning the case that became known in the city of São Paulo as “Espigão da Tucumã” [Spike of Tucumã], for being a building located on this street, located in the district of Jardim Villa Europa, which is near Congonhas Airport (CGH). Due to suspicions of irregularity, the works were embargoed.

After 15 years of struggles, Comar 4 (Air Command of São Paulo 4), Aeronautics entity responsible for the region of São Paulo, concluded that, despite being way above its original height, the 116-meter building (30 meters more than the initial project) was not interfering with the aircraft route. Thus, after eliminating the suspicions of irregularities and several reforms in the property, the “occupancy permit” was granted by the Municipality of São Paulo.

Similarly, in the United States, federal and local regulations will control a land-owner’s right to build a high-rise that could affect aviation. It is not only the builders of megatall towers that need to be concerned about this; shorter buildings may still interfere with (or be disturbed by) low altitude traffic such as helicopters (see Figures 3 and 4).

In any jurisdiction, the key is clarity and transparency in the law. Anywhere structures might be built to such height that they affect aviation, the law must be easy to access and understand, so that property owners understand what they are allowed to build, and make their building plans in compliance with the law.

Legal Issue 4: Social Issues

Beyond the subject of neighborhood relations between property owners, when analyzing the construction of a skyscraper, the demographic and social changes caused by the construction of a large building should be taken into consideration, since all vertical developments have the ability to increase the circulation of people in the region.

This change enables not only the opening of new businesses and job opportunities, but also impacts the local traffic of motor vehicles, in the obstruction of aesthetics, the social disturbance of the neighborhood, and the safety both within and in the vicinity of large buildings. These aspects and reflections should be subject to specific analysis prior to the construction of large buildings. There are many

法律问题3:空域和航空(更广义的社会权利)

为了保障一般性的社会权利，巴西还制定了其他一些能够影响(和潜在限制)高层建筑的法律法规。航空法就是其中的一个例子。

为了确保航空安全和保障机场基础设施的安全运行需要，巴西法律对城市某些区域的摩天大楼高度作出了限定。正是在这种背景下，巴西航空法规(第7.565/86号)对机场附近的建筑物规定了具体的限制条件，有关内容可以参见该航空法规的“保护区基本计划”部分。

为了保障飞机飞行安全和避免干扰无线电导航信号，以及为了保证飞行员视野，巴西法律对自然或法人的有关违犯情形会处以惩罚，比如：违反上述法规(第302款，VI,CBA)规定，在特别限制区建造任何建筑物或开发任何房地产。



Figure 3. “Espigão da Tucumã” [Spike of Tucumã]: 116-meter building (30 meters more than the initial project). Source: (“Depois de 15 anos, espigão da Tucumã ganha habite-se”. Picture: Fernando Moraes/Veja São Paulo. <http://vejasp.abril.com.br/materia/espigao-da-tucuma-ganha-habite-se-apos-15-anos>)
图示3.“Espigão da Tucumã” [Spike of Tucumã]: 116米高的大厦(比最初计划高出30米)。来源: (“Depois de 15 anos, espigão da Tucumã ganha habite-se”. Picture: Fernando Moraes/Veja São Paulo. <http://vejasp.abril.com.br/materia/espigao-da-tucuma-ganha-habite-se-apos-15-anos>)

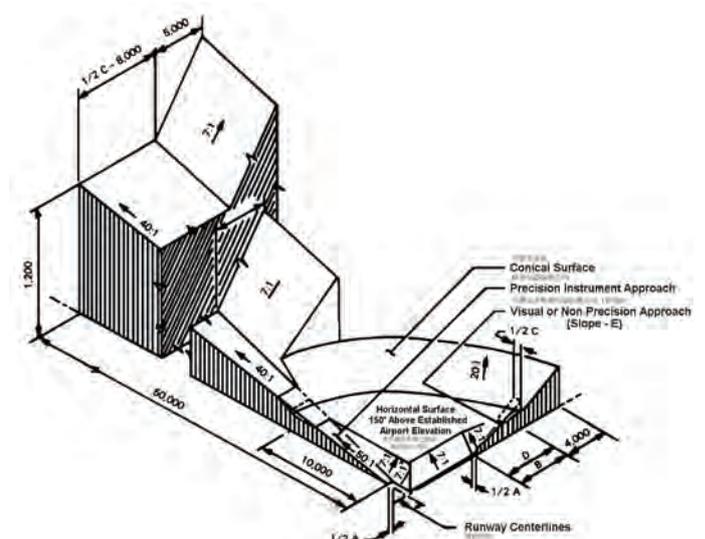


Figure 4. Diagram of areas near airport runways in which the US government recommends or requires identification of obstructions. This is a representation of one of many US aviation regulations applicable to tall structures. Source: (<http://www.ngs.noaa.gov/AERO/oisspec.html>).
图示4.美国政府建议或要求的机场跑道附近的障碍物识别区域示意图。这是美国适用于高层建筑结构的众多航空规定范例之一。来源: (<http://www.ngs.noaa.gov/AERO/oisspec.html>).

examples of failures to be found, in many countries, since high-rise residential construction became popular.

With regard to the insecurity caused by violence in large cities, for example, it can be said that it has influenced the creation of new housing models, reflected in large residential gated condominiums with lots of attractions (mini cities). In this housing model, condominiums are formed not only by residential but also commercial skyscrapers, which often are located in an entire block, fully fenced, closing parts of the city off exclusively for the use of its residents and visitors.

These private developments, intended for consumption, leisure and specific trade/service activities, reveal the fragmentation of the urban space, where real fortified enclaves are created within the city, access to which is controlled and limited to those recognized as equal.

On the other hand, the assumption considered for over two decades that the more walls and fences the more safety and less theft, has been constantly contradicted. According to Police Department of Investigation of Equity Crimes, in each month of 2012 there were, on average, two group attacks in luxury condos in São Paulo. The existence of high walls and fortified structures only hid the crimes in action, which is ironic when we consider that the intention was to use them as a protection for residents.

In the United States and elsewhere, a similar issue has been seen in high-rise buildings. Starting in the 1950's and 1960's, in many United States cities, an effort to provide housing for low-income residents led to the construction of low quality, high density, high-rise apartment buildings. Although the social causes are beyond the scope of this paper, these buildings became notorious as havens for crime. Just as was seen with walled-off blocks in São Paulo, a high-rise building can act as a fortress that overwhelms the efforts by the police to maintain law and order⁸ (see Figure 5).

If a high-rise building is built but not maintained, or social forces make dense urban living unsafe, then Sustainable Vertical Urbanism can't succeed. Builders of high-rise buildings should celebrate their successes while also making sure to learn from failures, including failures that arise out of broader social causes.



Figure 5. Robert Taylor Homes, Chicago, Illinois. Twenty-eight buildings, sixteen stories each. Constructed 1961-1962, demolition completed 2007. Photo from June, 1967. Source: (Wikimedia Commons)

图示5. 伊利诺伊州芝加哥市罗伯特·泰勒之家。二十八幢大楼，每幢为十六层。建于1961-1962年并于2007年拆除。图片摄于1967年6月。来源: (Wikimedia Commons)

⁸ USA TODAY
⁸ 今日美国报

对于该点，值得一提的是，在这些区域内所建建筑物的高度必须低于该城市其它区域建筑物的高度。因此，摩天大楼在建造前必须要进行全面分析。在这个方面，我们需要特别指出圣保罗市“Espigao da Tucuma”(Tucuma针楼)的例子。该建筑物规划位置在雅尔丁欧式别墅区，处于孔戈尼亚斯机场 (GGH) 机场附近。由于涉嫌违反了有关法规，该建筑物的建造工作被迫终止。

在经过长达15年的艰苦斗争后，主管圣保罗地区航空事务的Comar4(圣保罗第4空军司令部)和航空公司才做出结论，尽管这座高达116米的大楼(超出原设计高度30米)超出了限定高度，但是，它不会对飞机的飞行路线造成干扰。在排除了该建筑物违规嫌疑和该建筑物修改了原有设计规划后，圣保罗市政府才最终给该建筑物颁发了“土地使用许可证”。

同样在美国，联邦和地方法规对于土地所有人在其领地内建造可能影响到航空安全的高层建筑的权力也施加了诸多控制。不仅超高建筑物的建造人要符合这些限制规定，可能干扰低空飞行器如直升机飞行的较低建筑物也要符合以上限制规定(见图3、4)。

不论任何司法体系，最关键的是它要保持法律的清晰界定和透明度。对于任何可能影响航空飞行的建筑物，有关法律都必须易于参照和理解，以便业主们能够清晰知道他们能被允许建造什么建筑物，以及他们的建筑规划是否符合有关法律的规定。

法律问题4: 社会问题

除了对业主涉及到的邻里关系这一主题进行探讨外，我们在分析建造摩天大楼这一问题时，还要考虑到建造大型建筑物可能带来的人口和社会影响，因为所有垂直化建造的建筑物都可能大幅增加该地区的人口流量。

这种变化一方面会带来新的商业企业和就业机会;另一方面，它还会影响到当地的机动车交通流量，改变当地的整体美观，可能导致社区混乱以及危害这些大型建筑物内部和附近区域的安全。在大型建筑物建造之前，必须对上述的各种影响和方面都要进行具体分析。自从高层住宅建筑在许多国家流行以来，出现过很多这方面的失败例子。

大城市暴力因素导致的不安全状况也可能对创建这一房屋建设新模式带来一定影响，这些大型住宅式公寓本身就具有诸多特点(比如自身构成了迷你型城市)。在这种这种房屋建造模式下，这些大型公寓不仅形成了住宅区，也包括了商业摩天大楼。它们通常位于整个街区中心，被完全隔离，形成了仅供内部居民和游客使用、脱离了整个城市的封闭板块。

这些由私人开发的，主要用于消费、休闲和特定贸易/服务活动的板块，使城市空间日益破碎化，形成了城市内部的一个个强化城堡，控制和限制外部那些平等人员进入。

另一方面，过去20多年来，人们都以为，墙和篱笆建得越多，安全就会得到更好保证，盗窃案也会更少发生，但是，这种假设在实际生活中的效果却是截然相反的。根据警方财物犯罪调查部门的统计数据，圣保罗豪华公寓区在2012年每个月内平均都会发生2起集团式犯罪活动。可见，高墙和建筑物强化结构的存在只会更好地隐藏犯罪行为。而颇具讽刺意味的是，人们当初在建造这些高墙和强化结构时，却把它们当成了保护所住居民的有效手段和措施。

美国和其他一些地方的高层建筑也出现了类似问题。在20世纪50年代至60年代的时间里，美国许多城市为了给低收入居民提供住房，建造了许多低质量、高密度的高层公寓建筑。虽然对于社会原因的讨论已经超出了本文的论述范围，但是，实际上，这些建

Cities of the Future

Amid the aspects mentioned, according to market research conducted by technology companies, homebuilders and newspapers, there are two major trend lines for the development of construction and the future of Brazilian cities:

1. Green Future: emergence of more ecological concepts also related to skyscrapers, marked by the construction not only of immense towers powered by solar panels, but also suspended gardens and oxygen generators, without, however, excluding the construction of low houses and small structures; and
2. Technological future: housing and workplaces marked by an immense amount of technologies that are useful in a day-to-day context included in skyscrapers of immeasurable, fortified and allegedly safe structures.

Despite the differences, both lines converge with respect to the search for decreasing inner space, as opposed to the innovations that emerged in the previous century. According to a survey conducted for BBC Brazil by the Brazilian Company of Heritage Studies - EMBRAESP, in 2012, a total of 2,818 residential units of less than 35 square meters were launched in São Paulo, an increase of over 16 times in comparison with 2008, when there was a total of approximately 169 units.

Given that the coefficients of construction, given by the Master Plans for each municipality, determine the constructive potential of each land, allowing the construction of "x" times its area, the smaller the area of the apartment, the greater the possible height of the building, and therefore, the greater the chance of building a skyscraper.

Thus, the probability of emergence of residential skyscrapers is much larger than that of large commercial buildings, due to the reduced size of apartments.

Conclusion

Therefore, by analyzing the process of verticalization of constructions in Brazil and its reflections, it is concluded that the protection of public interest and the preservation of social harmony is present in the branch of Construction Law, and that increased urban concentrations and the pursuit of social welfare are factors that drive new trends.

It is believed that the cities of the future will contemplate the ideal of a world that is technological and environmentally sustainable at the same time, and will increasingly feature tall buildings, whether residential or commercial, aimed at optimizing the use of public and private spaces.

As the examples above have shown, countries and cities that expect high-rise buildings to proliferate must have a legal system adapted to handle the new issues that arise. Occupants must be safe and they must have clear and fair rules to protect their investment and govern their relationship with neighbors. Builders must clearly understand the restrictions and liabilities that apply to them. A legal system that is up-to-date on these issues is a critical necessity for sustainable vertical urbanism.

筑物的确成为了臭名昭著的犯罪“天堂”。让我们看看圣保罗市高墙林立街区背后发生的事吧，这些高层建筑实际上已经成为了一个个城堡，在防碍着警察为维护法律和秩序付诸的种种努力⁸。（见图5）

如果高层建筑在建造之后不能保持好的法律秩序，或者不能使密集居住在此处的民众安全生活在那里，那么，可持续垂直化城市发展项目就肯定不会获得成功。高层建筑建造商们在庆祝他们取得成功的同时，还要从失败中，尤其从高层建筑带来的广泛社会问题中获取相应教训。

未来的城市

除上文提到的各方面外，有关技术公司、房屋建筑商和报纸进行的市场调查还发现，巴西未来城市和建造方面还面临着两个主要发展趋势：

1. 绿色的未来：在建造摩天大楼时会采纳更多的生态概念，比如：使用太阳能电池板供电，建造顶层花园和设置环管制氧设施；此外，还不要排斥低矮房屋和小型建筑的建造；和
2. 技术的未来：在住房和工作场所建造中采用大量的有利于日常生活的技术，会给摩天大楼带来不可估量的、加强的安全结构和保障。

虽然存在着种种差异，但是上述的两个未来发展趋势都聚集于如何找到减少内部空间的方法。这一方法与上世纪推出的所谓创新方法是截然相反的。按照巴西遗产研究公司(EMBRAESP)为英国广播公司巴西分公司所做的一项调查显示，截止到2012年，圣保罗市启动的内部空间少于35平方米的居民区数量共计为2818个，与2008年相比增加了16倍。2008年，其总计数量大约为169个。

建筑系数以及市政府制定的主要建筑规划决定着每块土地的建筑潜力，以及该区允许建造的"x"倍面积大小的建筑规模，所以，公寓面积越小，建筑物会越高，摩天大楼的建造机率就会越大。

因此，由于要减少公寓面积，住宅型摩天大楼出现的概率会远远高于大型商业建筑的出现概率。

结论

因此，通过上述对于巴西建筑垂直化发展及其影响的分析，我们可以得出结论，建筑法律法规必须既要考虑到保护好公共利益和维护社会和谐，也要充分考虑到决定未来发展趋势的城市集中化程度和保障社会福利等问题。

据信，未来的城市不但可以同时实现技术和环境可持续发展两方面的世界理想，而且，还会增加能够优化公共和私人空间使用效率的高层建筑(不论它们是住宅还是商业建筑)的数量。

正如上述案例所示，不论是国家还是城市，都在希望增加高层建筑的建造数量，但是他们必须能够制定出一个能够应对由此产生的各种新问题的法律体系。这个法律体系一定要使居民们感到安全，能够建立用于保护他们投资的明确公平规则，管理好他们与邻里的关系。建筑商必须能够清楚地理解他们面对的各种限制以及应当承担的各种责任。而且，这个法律系统还必须是可持续更新的，以便能够应付城市持续性垂直发展进程带来的新需要。