The Shape of Global Wealth
Slender Towers from New York to Seattle

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A thesis
submitted in partial fulfillment of the requirements for the
degree of

Master of Architecture
University of Washington
2016

Committee:
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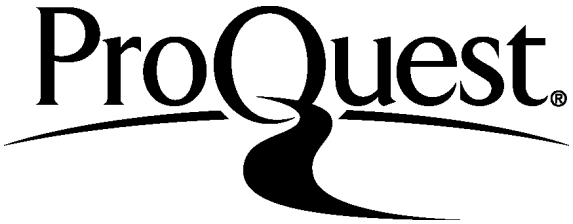
Program authorized to offer Degree:
Architecture



University of Washington

Abstract

The Shape of Global Wealth
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With the financialization of a major segment of the world economy, the built environment has, in turn, experienced a new level of commodification. For the super rich, residential real estate promises strong return on investment, safe sheltering of funds outside the home country, and in most cases, a view. In Manhattan this development has recently taken physical form in the very tall slender tower. With extraordinary values predicated on location, views, and exclusivity, these buildings are shaped by careful manipulation of zoning and building codes, supported by innovative structural solutions, presented in enticing renderings, all to maximize profit potential. Application of new building technologies allows designers to create buildings with very high floor areas (FAR) on very small sites while maximizing height and, consequently, unit prices.

This thesis explores this phenomenon as a built manifestation of global processes and local influences based on current developments in New York City. It transfers its findings to Seattle, which is growing in prominence in the international real estate market, as a physical location in which to explore the potential opportunities allowed by local building and zoning code that could shape a new typology of ultra-luxury real estate in the city. Projecting into the near future, this project manifests itself as a slender residential tower that embodies and embraces both the legal and physical gymnastics undertaken in its design.

Acknowledgments

Jeffrey Ochsner and Gundula Proksch. Thank you for your excellent guidance, wisdom, support, and encouragement through the whole thesis process - from the first incongruent and disjointed thoughts through final documentation.

My studio peers. Thank you for constant inspiration, feedback, and criticism.

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A History of Skyscrapers


CNN

History

The history of thin residential towers begins with the history of the skyscraper. The skyscraper is a building type that grew out of a potent mix of economic and social phenomena, was enabled by technological invention and advancement, and shaped, at least in New York City, by a series of prescriptive zoning resolutions through the years.

Land Value

The value of land is an essential factor in the birth of skyscrapers. At the most basic level the repetition of floors is a simple strategy to maximize the rentable area of a building, and the repetition can be repeated until the desired area is created.

A skyscraper is "a machine that makes the land pay" [1]

[1] Cass Gilbert

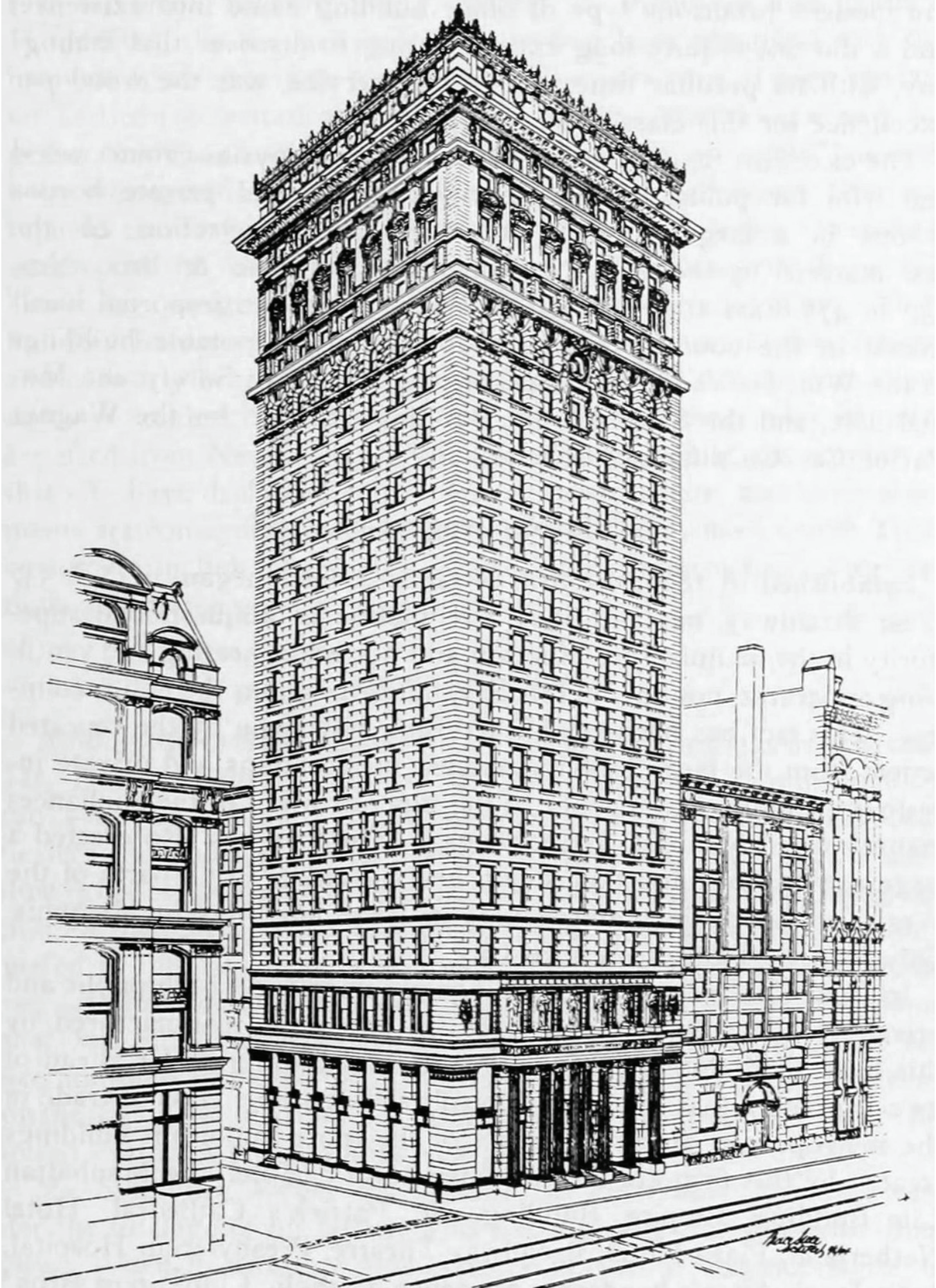
The impetus to build multiple floors is tempered by the additional cost of constructing those floors. This additional cost of construction is overcome by the high value of land, and the opportunity for corresponding profits from rent. The replication of the ground vertically makes financial sense the more expensive the ground being replicated is.

In Manhattan, the proximity to the various commercial and financial centers was the principal driver of the value of a property.

"the value of proximity in business produced a spiral of increased land costs, premium rents, and taller buildings." [2]

[2] Willis, Form Follows Finance, 35

fig. 1 Bruce Price, American Surety Building, New York, 1896



Large parcels of land were difficult to purchase, or to assemble in Manhattan and developers turned to height as a way to maximize their profit potential. The boundaries of Manhattan (both real and perceived), as an island bounded by two rivers, also played a major factor in the value of the land. There is only a limited amount of land on which to build, and this scarcity drove increased costs.

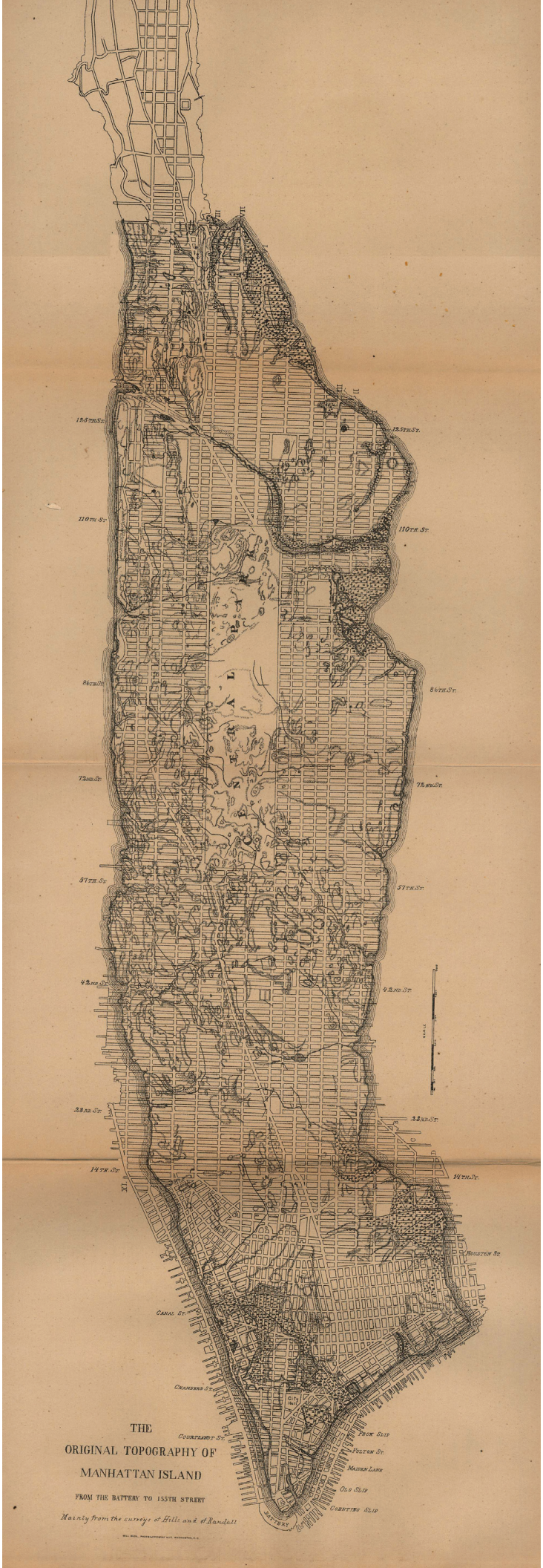
> *"For whatever reasons – the vitality of its commercial environment, the urge to advertise, or the waterbound confines of Lower Manhattan – the pressures to multiply the value of land by stacking story upon story were enormous."* [3]

Although there was a demand for space and density in high value areas of Manhattan, buildings were limited in height by the accessibility and consequently, the value of their top floors.

Elevators

High property values alone were not enough to give birth to the skyscraper, it was only with the invention of the elevator, and the effortless vertical travel it allowed that they could be built. Prior to the implementation of the elevator, buildings generally were built with six or fewer floors. The two lowest floors were often used for commercial purposes, with the floors above reserved for residences. Elevators had been in existence for decades in various forms and uses before the 1850's, but safety concerns, primarily a method to stop cars from free falling, prevented their widespread adoption into residential and

fig. 2 Map of Manhattan


125TH ST.
110TH ST.
86TH ST.
72ND ST.
57TH ST.
42ND ST.
23RD ST.
14TH ST.
HOUSTON ST.
CANAL ST.
CHAMBERS ST.
COURTLANDT ST.
FRONT SLIP
FULTON ST.
MAIDEN LANE
OLD SLIP
CORTLANDT SLIP
BATTERY
THE
ORIGINAL TOPOGRAPHY OF
MANHATTAN ISLAND
FROM THE BATTERY TO 155TH STREET
Mainly from the surveys of Hills and of Randall

commercial buildings. In 1852 Elisha Otis invented the Safety Elevator, which included a revolutionary method of stopping the free fall of elevator cabs. This measure of safety led to the broad implementation of the elevator over the coming years, thereby opening the opportunity of working and living above the sixth floor.

In addition to allowing buildings to be taller, the elevator also enabled these tall buildings to serve singularly as commercial space as the simplified vertical circulation essentially made every floor equally accessible and connected. No longer were floors above the second unfit for commercial use, as the elevator made access to upper stories as simple as ground floor access.

Structure and Technology

Elevators allowed buildings to expand vertically, but only to the limits of their load bearing masonry structure. In the 1870's the introduction of wrought iron as a structural component allowed buildings to be built taller than their masonry structured counterparts, although metal frame construction was not allowed in New York City until 1889 [4]. The advancement from wrought iron to steel frame structure brought another leap forward in building heights. Towers in Manhattan met and passed the 300 foot height barrier in 1890. With the introduction metal frame construction, the facades of the building were freed from load bearing, and the introduction of curtain wall technology allowed lighter and stronger buildings to be built even higher.

Advances in climate control, plumbing, and electric lighting

[4] Willis, Form Follows Finance, 9

fig. 3 Elisha Otis' Safety Elevator

technology helped contribute to the comfort and functionality of these newly accessible spaces. The technological advances of structural steel, fireproofing, elevators, and curtain wall technology coalesced into the first true skyscrapers that were designed and built in the late 1880's and early 1890's. These skyscrapers did not initially take the form of the tower commonly known today, instead they were simple and ruthlessly efficient zero lot line buildings, described as

> *"the brutal skyward extrusion of whatever site the developer has managed to assemble."* [5]

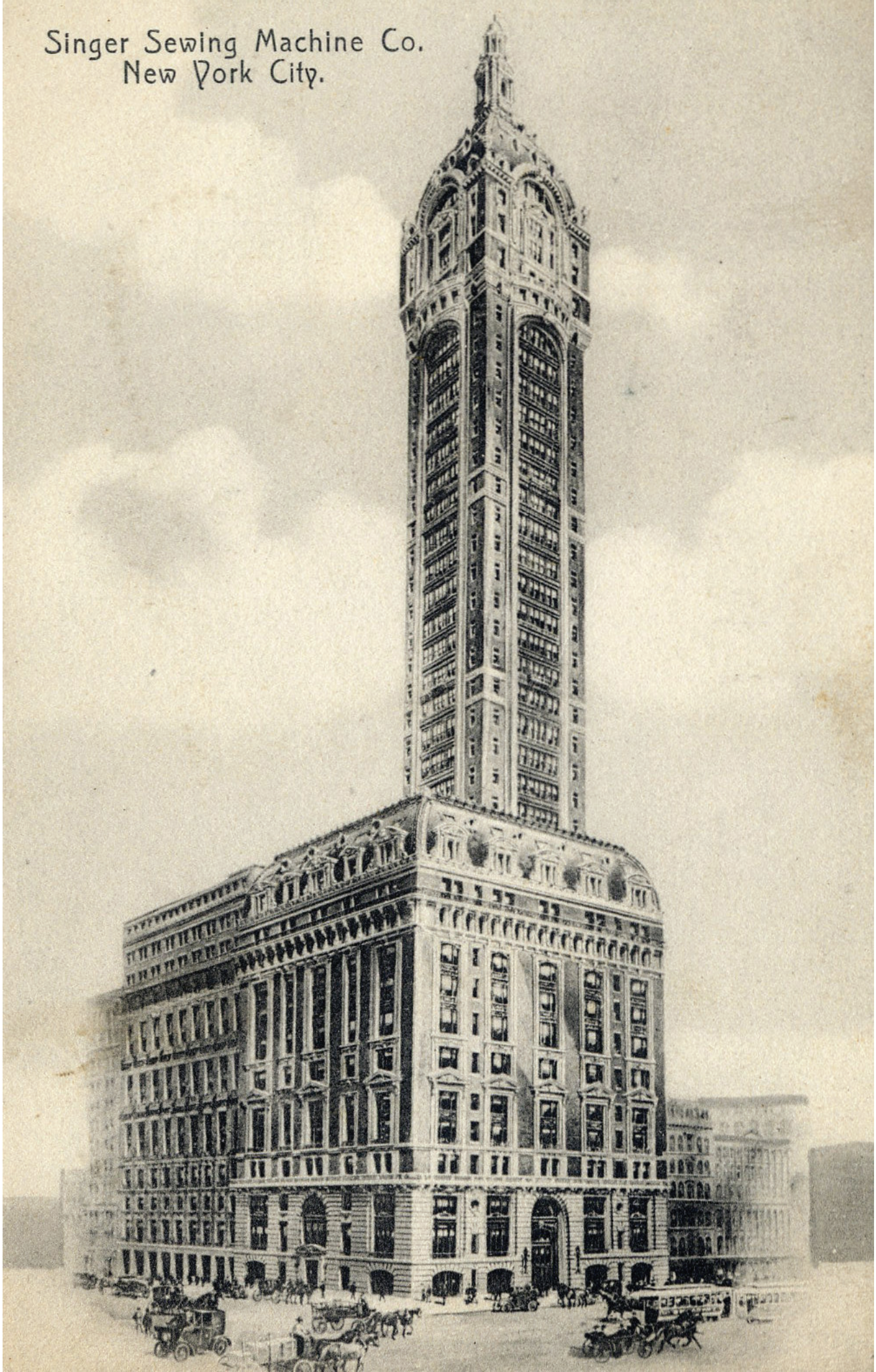
[5] Koolhaas, Delirious, 88

These massive buildings were the product of the desires of the market for large quantities of commercial space, and the advances of building technology that enabled individual buildings to meet these needs by expanding vertically.

1916 Zoning Resolution

Towers in New York City continued to be built at an ever-increasing pace. The Equitable Building, designed by Ernest Graham, was completed in 1915; at the time of completion it was the largest office building in the world by volume, rising straight up from the sidewalk and neighboring property lines for the entirety of its 538 foot height. By virtue of its bulk, the Equitable Building permanently cast shadows on the streets below and on neighboring buildings. There was widespread concern about the effects of this type of building on access to light and air, and in 1916 New York City passed its first comprehensive zoning

fig. 4 Ernest Flagg, Singer Building, New York, 1908


Singer Sewing Machine Co.
New York City.

ordinance both describing the maximum envelope of buildings, and dividing the city into residential and industrial districts.

The 1916 Zoning Resolution described the maximum buildable envelope of a building through a series of setbacks at different heights, defined by a fixed angle drawn from the center of the street. The intention of the resolution was to guarantee access to light and air to the street below. The 1916 Zoning Resolution also described a tower occupying no more than 25% of the lot area in plan, rising from the center of the site. Notably these towers were not bound by any maximum height. The 1916 Zoning Ordinance immediately transformed the architecture of New York's high-rise buildings through the "wedding cake" form adopted by most buildings from the era. The form prescribed by the 1916 Zoning Resolution is a

> *"back-dated birth certificate that lends retroactive legitimacy to the Skyscraper."* [6]

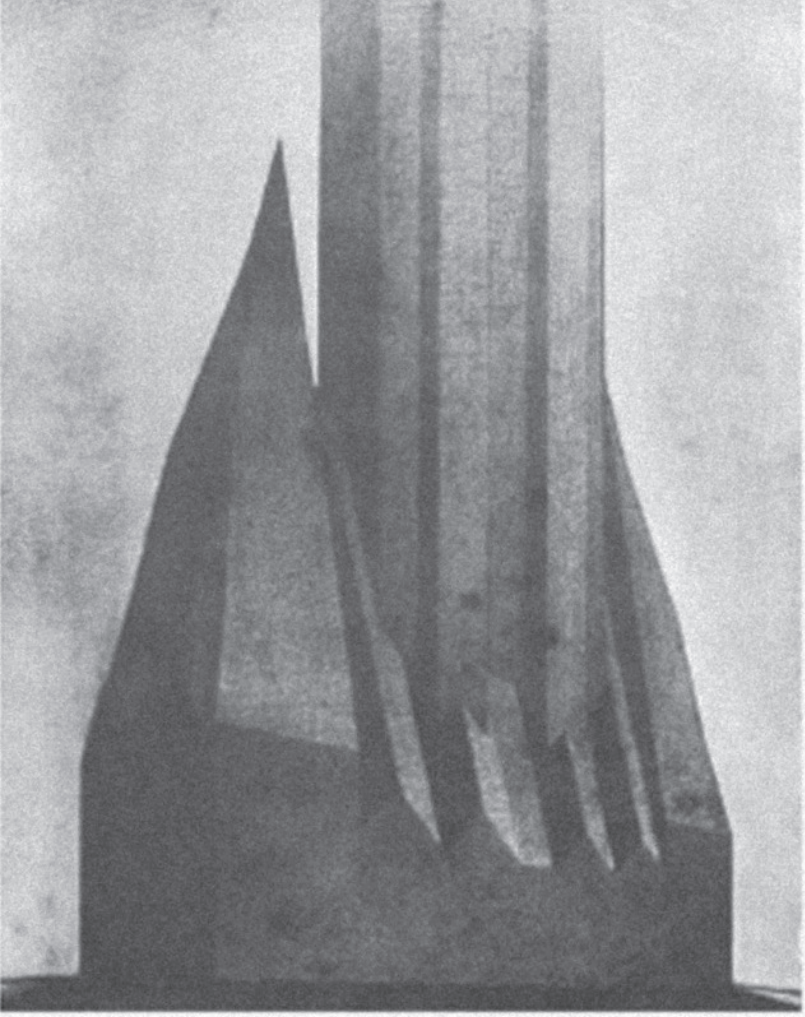
[6] Koolhaas, Delirious, 108

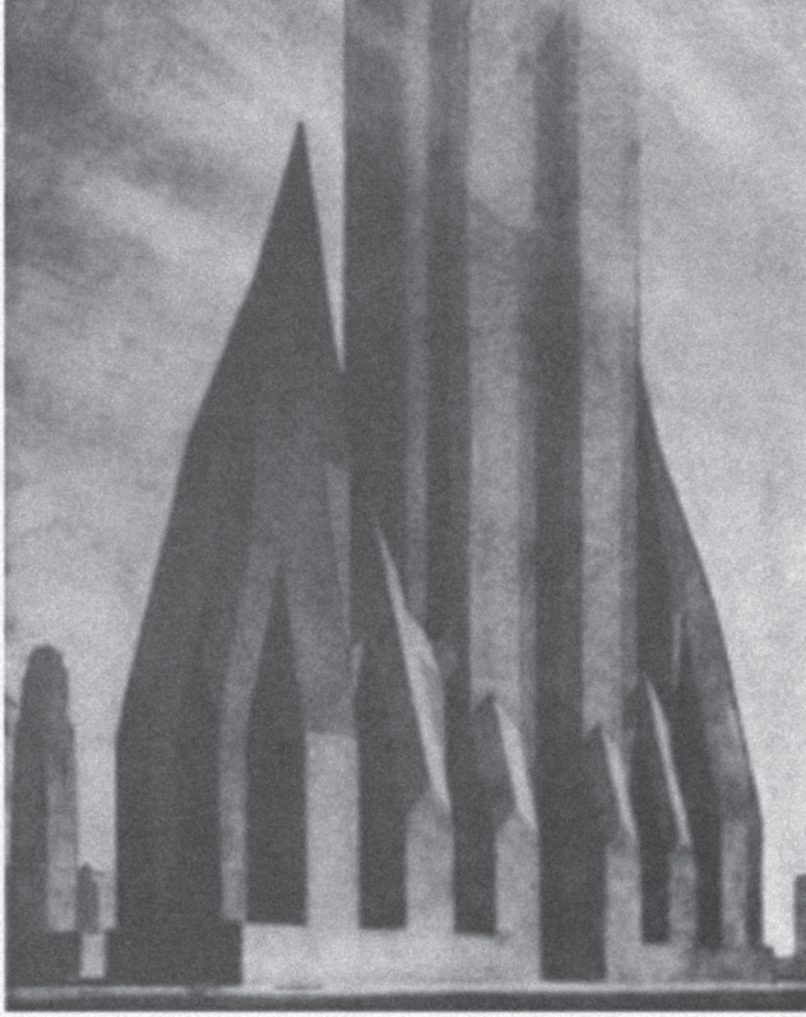
By taking the tower as an inevitability and developing the zoning regulations around it, the 1916 Zoning Resolution set the stage for the tower to be Manhattan's defining architectural statement.

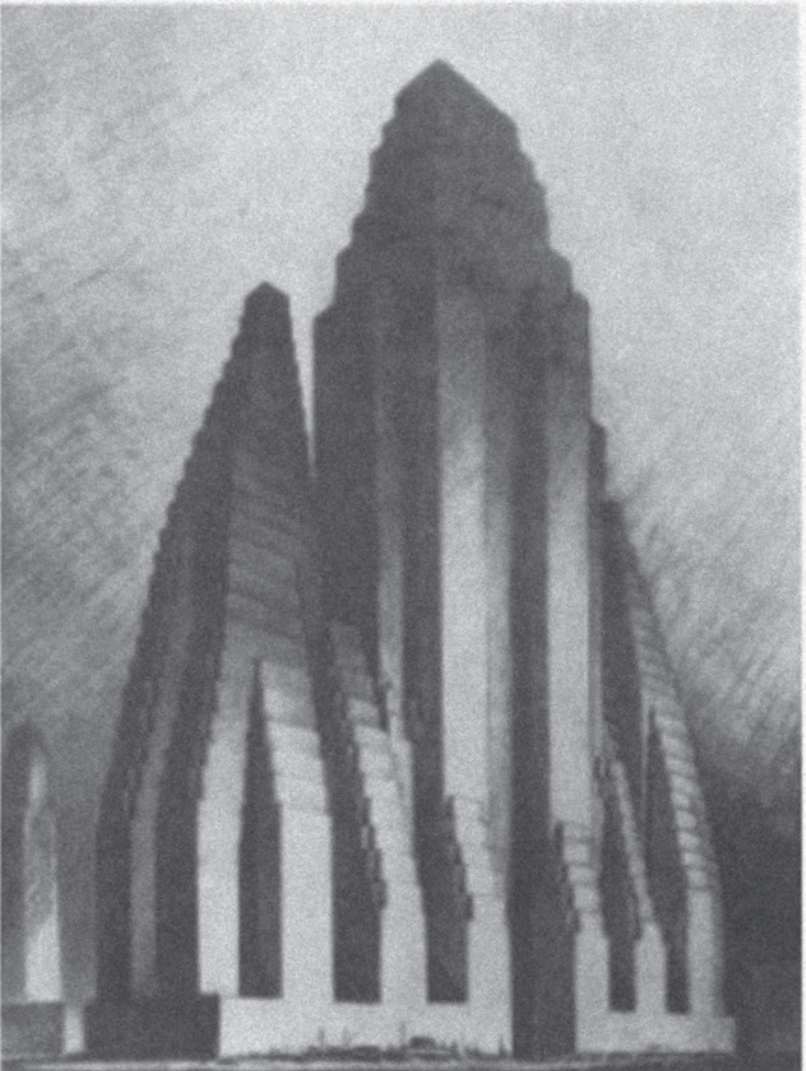
Fluorescent Lights and Air Conditioning

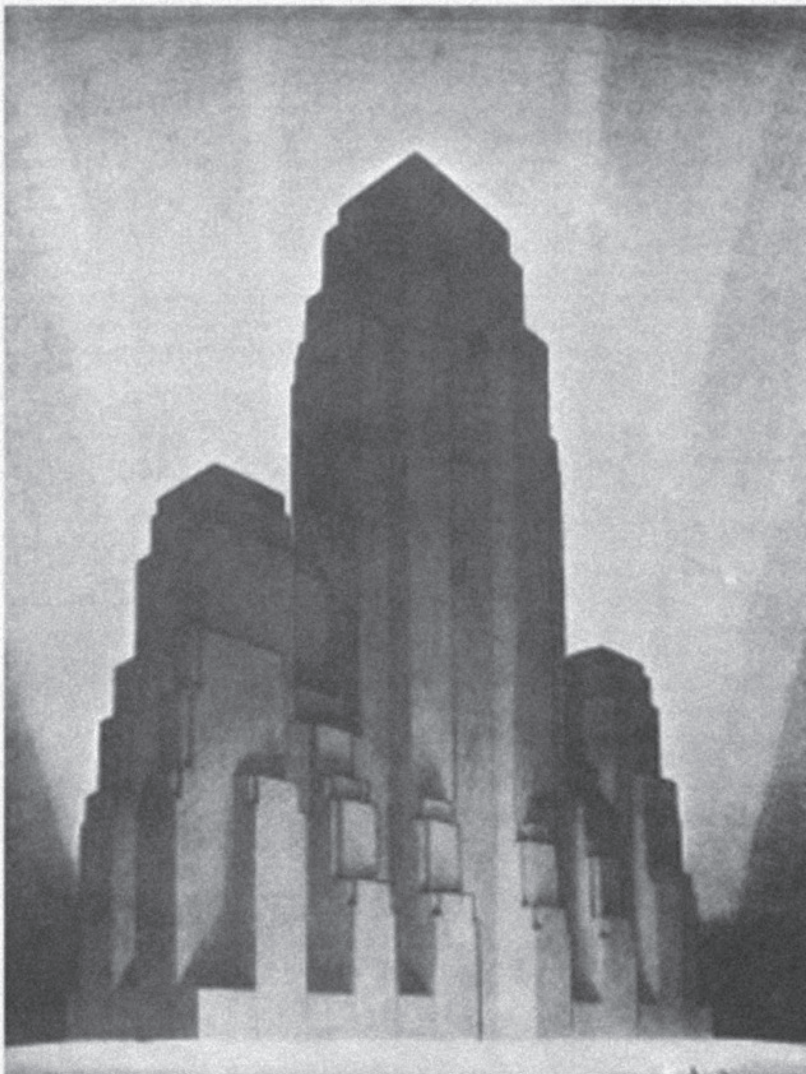
Access to natural daylight was a determining factor in the form of commercial skyscrapers until the 1940's and the introduction of fluorescent lighting. Prior to fluorescent lights, a shallow floor plate,

fig. 5 Hugh Ferriss, Metropolis of Tomorrow, 1929









defined by access to daylight, shaped commercial space. This space was usually no more than 28 feet from the exterior walls to the central circulation core. Additionally ceiling heights were generally between 10 and 12 feet high to maximize daylight penetration to the core of the building. Deeper floor plates, or lower ceiling heights limited the functionality and desirability of the space, and rents dropped accordingly.

> *"It is better business to construct less building, and have shallow offices well lighted, than to have more building with deep spaces poorly lighted. In other words, it is better to have less space – less capital investment – permanently rented at a high figure than too much space partially rented at a lower figure."* [7]

[7] Harvey Wiley Corbet

Lower quality space cost almost as much as high quality space to build, but rented for only half as much; thus, the logic was to spend more for quality space, in exchange maximizing the financial return.

With the introduction of fluorescent lights, the shape of the floor plate changed dramatically. No longer was office space limited to 28 feet from exterior wall to core; fluorescent lights could light any space efficiently with minimal heat gain. Air conditioning and more efficient thermal controls also eliminated the need for operable windows to control the building's climate. Together air conditioning and fluorescent lights dramatically changed the way skyscrapers were designed, and largely disconnected form from environmental function.

fig. 6 Kahn and Jacobs, 425 Park Avenue, New York, 1957


NO
PARKING

1961 Zoning Resolution

In New York City, the 1916 Zoning Resolution governed buildings until the city reformed the ordinance in 1961. The 1961 Zoning Resolution, influenced by the Seagram Building designed by Mies van der Rohe, moved away from describing the maximum envelope of a building through a series of setbacks, and instead moved to a system based primarily on Floor Area Ratio or FAR. FAR defined the maximum bulk of the building as a ratio between the area of the lot, and the number of times that area could be repeated vertically. For example a building with a maximum allowable FAR of 5 could build a five story building to the lot line, or a ten story building that had a footprint equal to half the lot. The maximum allowable FAR is determined by the building's zoning and usage.

The 1961 Zoning Resolution also described a series of FAR bonuses available to developers for the inclusion of publicly accessible plazas on the street, low income housing, and other public amenities like connections to transportation infrastructure. Additionally the 1961 Zoning Resolution introduced the concept of Transferrable Development Rights, or TDRs. TDRs allowed buildings that were not utilizing their maximum allowable FAR to sell that development area to adjacent parcels. The 1961 Zoning Resolution also introduced the concept of building "as-of-right", enabling developers to build anything they chose as long as they owned adequate development rights in the form of FAR.

"in order to allow the system to function, it established the

fig. 7 Mies van der Rohe, Seagram Building, New York, 1958

principle of 'as-of-right', which allows property owners to design and build whatever they wish without a public review process, so long as they follow the rules for their lots." [8]

[8] Willis, Logic of Luxury 1.0, 361

As a result, most buildings in New York City do not go through public review of any kind before construction begins.

The 1961 Zoning Resolution resulted in buildings pulling back from the edges of their sites in order to receive bonus FAR for providing public plazas, while stretching their allowable FAR higher into the sky, thereby increasing profits. The International Style tower with a public plaza became the standard for corporate skyscrapers in Manhattan, and the public plaza became emblematic of these towers.

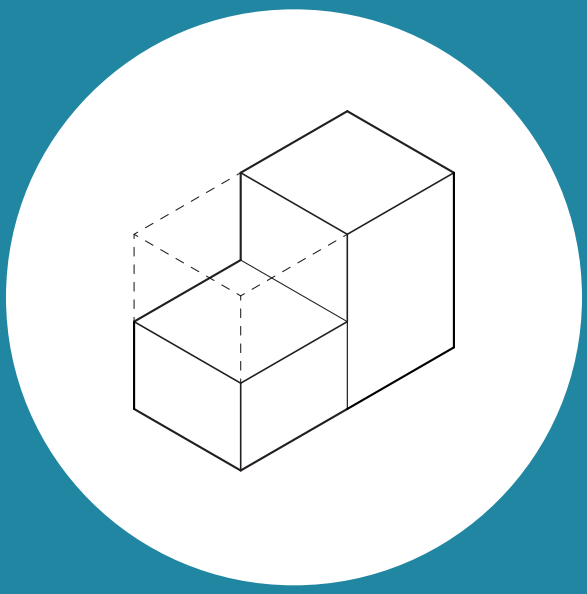
"these monoliths indulged in the luxury of open space." [9]

[9] Willis, Form Follows Finance, 141

Changes in Use

Skyscrapers have changed over time and adapted new program elements that were not part of the first generation of towers. The 1916 Zoning Resolution primarily described the form of commercial buildings, allowing a tower of infinite height. The same Resolution also capped residential buildings at 90 foot tall. Hotels were considered commercial buildings by the zoning code, and, therefore, were not bound to a 90 foot height limit, and many took advantage of the ability to build tall. At this time luxury hotels were often used as long term or permanent residences for wealthy New Yorkers. These residential hotels were desirable as a simpler alternative to maintaining a private residence,

Unused FAR



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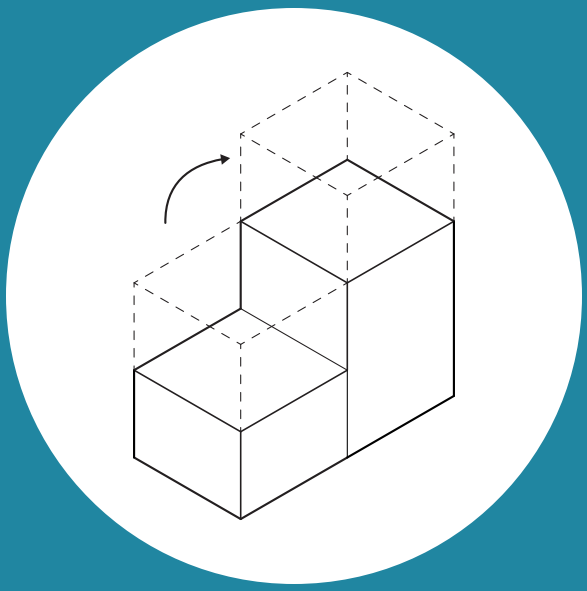


Additional buildable volume

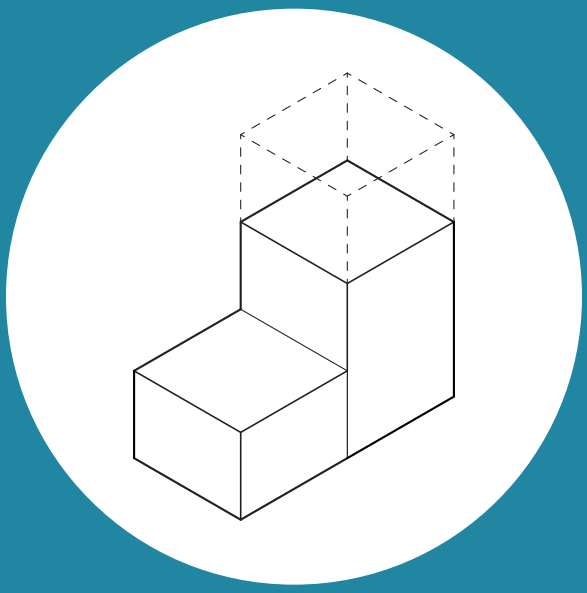


fig. 8 Diagram of TDRs

along with their expanded amenities, views, and location. These tall residence hotels mark the first instances of high-rise living in New York City.

In 1929 the Multiple Dwellings Law permitted high-rise residential towers to be built in the city, allowing permanent residences instead of "temporary" residences in high-rise hotels. This shift in patterns of habitation by wealthy New Yorkers from mansion to residence hotel to residential apartment is described as a

> *"greater accumulations of individual units, that, however combined, do not surrender their independence."* [10]

[10] Koolhaas, Delirious, 143

Privacy and amenity soon became essential parts of a successful luxury residence in Manhattan, in addition to a desirable location.

The pattern of consolidating housing and amenities proved to be a continuing trend, with residential co-ops being the preferred model of ownership in Manhattan. The co-op model works as a corporation, in which residents purchase a share in the co-op to secure a residence instead of purchasing the space directly. The passage of the Condominium Act in 1964 allowed the private ownership of residential units in larger complexes which was previously illegal.

The opportunity to purchase individual condominiums along with the 1961 Zoning Ordinance ushered in a new wave of high-rise residential skyscrapers in the 1970's. Many of these skyscrapers were built in the International Style and were mixed use developments often including office and retail space in addition to condos.

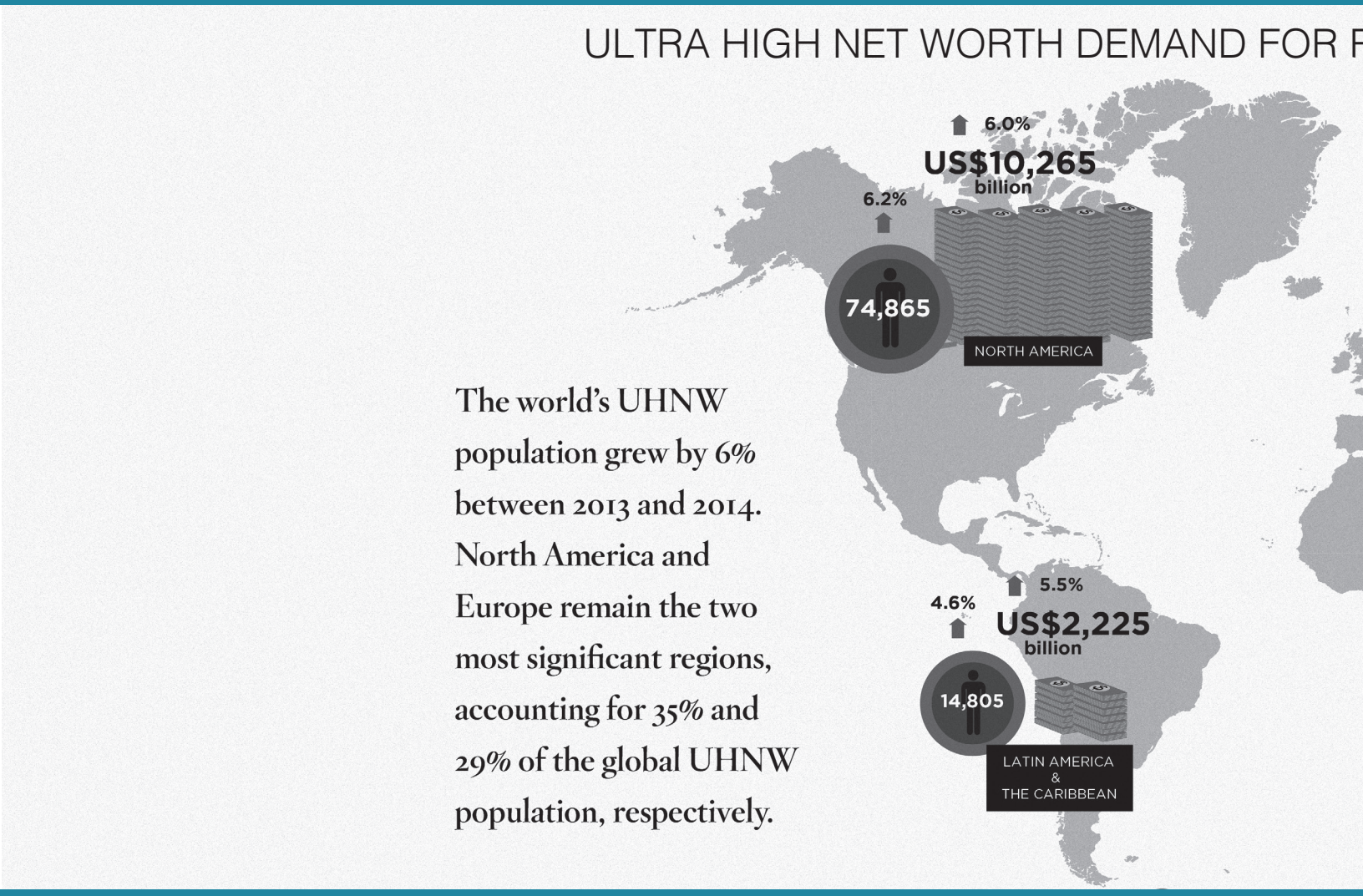
fig. 9 Residential towers along Central Park

Synthesis

Skyscrapers are the product of a desire to make the greatest possible profit out of a valuable parcel of land. The desire to build tall is enabled by building technologies that allow construction, circulation, and comfort of habitation at increasing heights. Skyscrapers in Manhattan have taken distinctive forms over the years, and these forms are largely the result of zoning regulations, building technology, and the economics of construction and speculative development. Over time the skyscraper has been used as a tool and symbol of commerce. Only relatively recently have towers come to serve residential programs as enabled by the adoption of new laws. The skyscraper is a powerful yet flexible building type that is shaped dramatically by economics, technology, and zoning regulations.

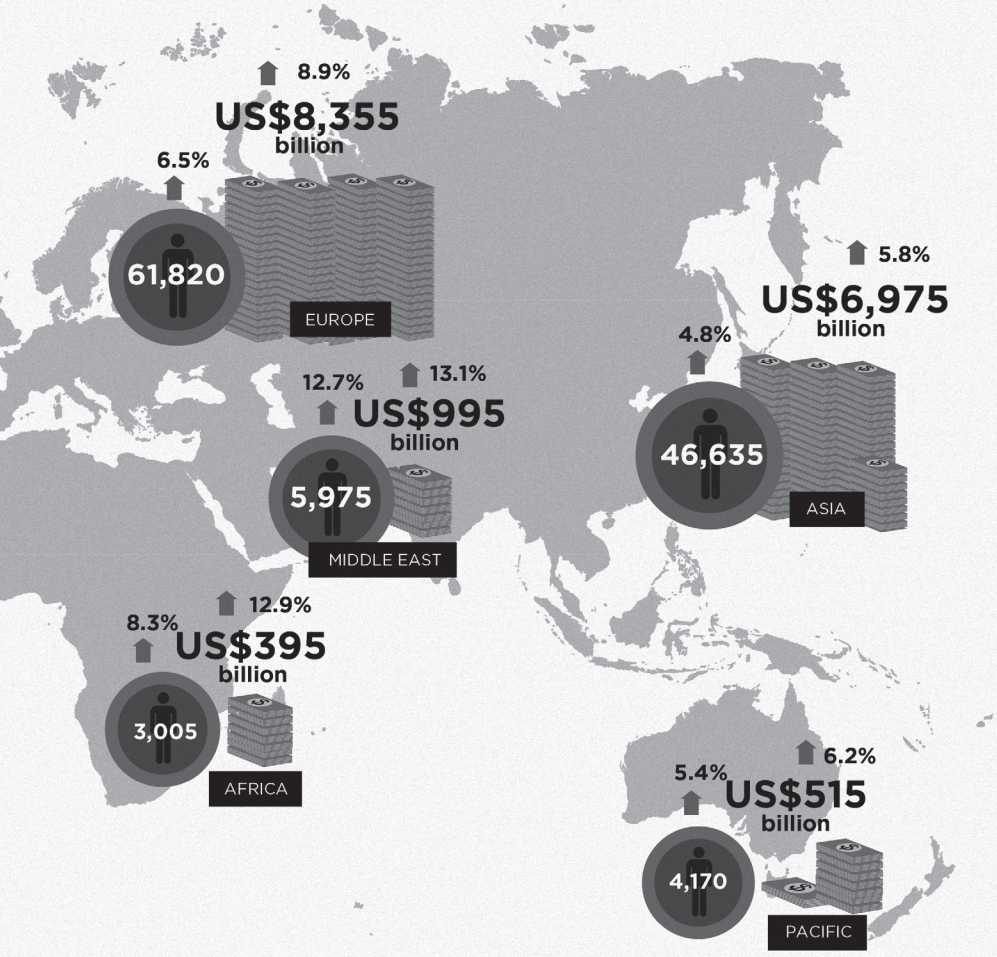
fig. 10 Costas Kondylis, Trump World Tower, New York, 2001

Current Economic Factors



The world's UHNW population grew by 6% between 2013 and 2014. North America and Europe remain the two most significant regions, accounting for 35% and 29% of the global UHNW population, respectively.

RESIDENTIAL PROPERTY: GROWING FAST



Current Economic Factors

The current demand for luxury high-rise residences in Manhattan and other locations is driven by economic forces operating at both the global and local scales. A number of local factors and regulations, as well as their various loopholes and ambiguities, directly influence the expression of these economic forces in the built form. The intersection of all these factors results in towers where zoning and building codes are pushed to the extreme due to extreme financial pressure and the application of new building technologies.

Global Capital

There has always been a wealthy class of international investors who wield power and influence for their own benefit. This group of super rich has recently experienced a dramatic shift in its makeup and level of influence through a series of global trends and national events. The deregulation of the 1970s, the opening of former state-controlled economies, and the 2008 economic crisis all directly shaped the investment approaches of this international super class. The shift in power has had significant effects on the global economy, as well as the function of real estate within it.

Deregulation, privatization, and the opening of state economies had the effect of benefiting people who were positioned to capitalize on new opportunities. People in positions of power were suddenly able to make huge sums of money from sectors of the economy

that had previously been controlled by the government. The new wealth accumulated among relatively few people, creating a new class of millionaires and billionaires at an exponential rate. Deregulation and privatization gave way to consolidation in short time; private corporations also became bigger, controlling even larger shares of the global economy.

Additionally, investment in derivatives, and other financial instruments grew as a segment of the global economy. Global production came to be controlled by fewer people, and more of the world economy is based on investment and trade of financial instruments as opposed to physical products themselves.

> *"The importance of real capital has diminished greatly as new financial tools subsume it, a process that has been described as the 'financialization' of the economy; economic performance is increasingly tied to complex financial systems rather than physical output."* [11]

[11] Zaera-Polo, 129

The international super rich have become their own class, no longer tied to physical production, or to physical place.

Free from connection to any physical location, these people and the companies they control are able to leverage cities and countries against each other to create the most desirable environment to grow their business and their personal wealth. They can directly affect national economic policy through the benefits or consequences of moving their business and investments, and the associated jobs and wealth. These

people and the organizations they control often are instrumental in shaping the very rules they are supposed to follow. In this way, the power of capital has overcome the power of the nation.

In 2008 the world economy nearly collapsed under the revelation or realization that many of the financial instruments that then made up the world economy were built on unstable (or non-existent) grounds. To halt a chain reaction of financial collapses, national governments provided massive bailouts tied to increased regulations. However, the people influencing the regulations were often the same people who were supposed to be following them, again highlighting power these massive enterprises have over the world's governments. The recovery from the economic crisis of 2008 has been marked distinctly by the growing financial inequality of the world's super rich compared to the rest of the world's population.

The aftermath of the 2008 crisis has resulted in a class of international millionaires and billionaires who are no longer tied to one place of residence or a simple nationality. As a group they hold massive amounts of power over both the global economy and the economic policies of governments. As a result of playing by their own rules, they are accumulating wealth at an accelerating pace, and are free to spend or invest it where and how they choose.

Real Estate Investment Trusts

Real estate investment trusts (REITs) are a special type of real estate investment. Similar to buying shares of stock, an REIT allows

Growth rate of top global wealth, 1987-2013

Average real growth rate per year (after deduction of inflation)

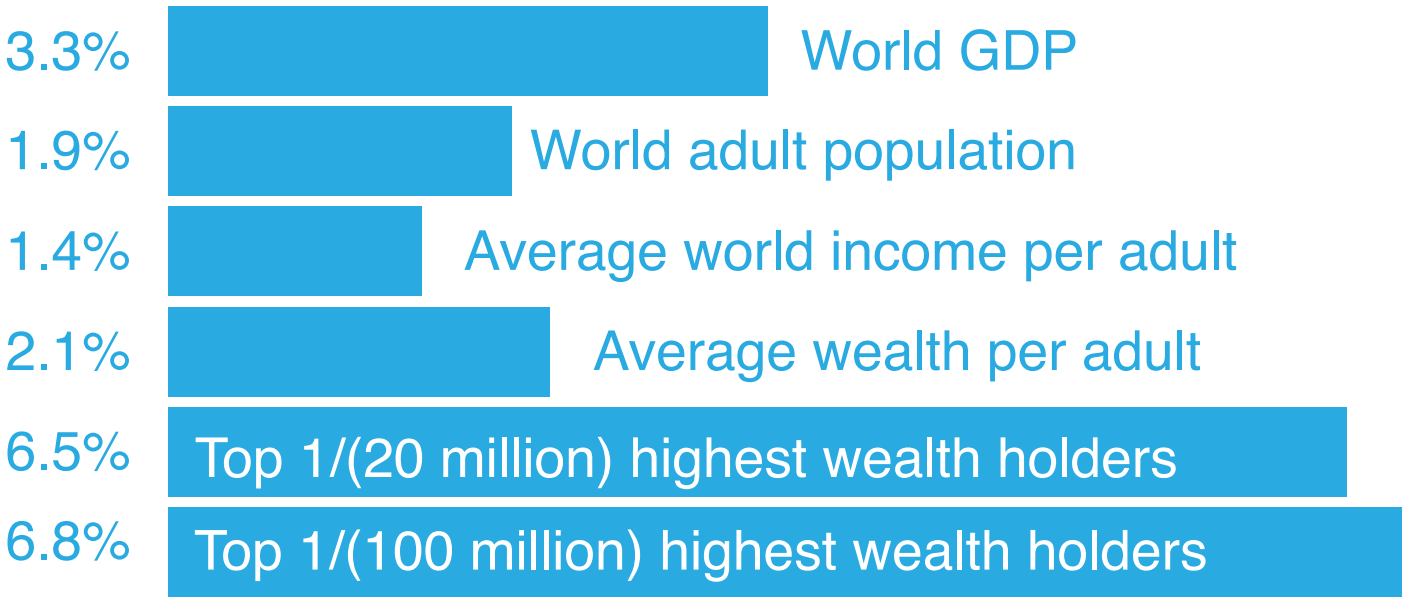


fig. 11 Growth rates of wealth

someone to buy shares in company, which owns and operates a variety of revenue-generating buildings. Instead of buying an entire building outright, REITs sidestep the logistics involved with direct ownership, while also “lowering the bar” to entry to the speculative real estate market. The pattern of real estate ownership and responsibility to the shareholders of REITs has a distinct effect on the design and construction of new buildings. This new responsibility developers have to their shareholders effects how developers conduct their business. This often means streamlining design services, and the result is that every design decision comes down to producing stable and predictable profits in order to serve shareholders.

> *“Thus, in several sectors of the built environment, appeal to investors and rate of return have become the most important aspects of a project’s feasibility. The result is an imperative for predictable results and an aversion to risk from which arises a pervasive ethos of genericism heavily restricted by global industry standards of development and construction.”* [12]

[12] Zaera-Polo, 129

Unsurprisingly, REITs look to invest in properties and areas that have the highest potential for return on investment, prioritizing certain types of development over others.

> *“These trends have led to substantial physical consequences, from increases in the scale of development to the intensification of urban inequality due to prioritization of areas deemed more desirable for development.”* [13]

REITs have contributed to the commodification of design, buildings, and the city as a whole, over and above the traditional developer paradigm. Many of the slender residential towers recently built in Manhattan have been financed through REITs, taking advantage of the huge potential for profit and reinforcing their status primarily as financial instruments, while also accelerating urban inequality.

Owner-Occupied Real Estate

Owner-occupied real estate is a unique portfolio piece of the international super rich. Owner-occupied real estate is considered to be any residential property that is purchased with the purpose of personal use and habitation. There are 211,275 ultra high net worth (UHNW) individuals globally in 2015, defined by Wealth-X[14] as having $30 million or more in assets. These UHNW individuals own an average of 2.7 properties for personal occupation. In total these properties are worth a combined value of $2.9 trillion USD spread among 570,442 residences globally, each with an average value of $5 million USD.

[14] Wealth-X

As categorized by Wealth-X, these personal properties have been purchased for three primary reasons: emotional, proximity to business, and practical value. Emotion is the easiest to understand: the feeling of proud ownership, a beautiful view, or a comfortable and desirable location. Proximity to business is based largely on any business with which the UHNW individual might be associated, but could also be proximity to any number of business amenities provided by global cities or regional business hubs. The third reason listed, practical value, is

often related to other issues less familiar to typical home buyers. These practical factors often involve real estate speculation, tax avoidance, or offshore sheltering of funds.

With the growing number of international UHNW individuals, the market for ultra luxurious residences will continue to grow. New York City provides a unique mix of emotional appeal, business amenities, and practical uses for the super rich, and has the highest concentration of UHNW residences in the world. It follows that there will continue to be a strong local market for ultra expensive investment properties in New York and an expanding market in other world cities.

Rate of Personal Wealth Creation

The rate of international UHNW individuals is rising at an unprecedented rate. There were 2325 billionaires worldwide as of 2015. That population is projected to grow to 3800 billionaires by 2020, or almost 10% a year over the next five years. This trend is in line with the projected growth of all UHNW individuals at between 6 and 7 percent per year, bringing a population of 211,275 in 2015 up to ~289,465 in 2020. Most of these UHNW individuals are based in the US, with the UK coming in second. These countries are experiencing moderate growth in their UHNW class, but the 6-7% projected growth is fueled primarily by growth in emerging or recently opened global markets.

The intense growth in the international super class is concentrated primarily in Asia. China is producing billionaires at an exponential rate, up to a total of 335 in 2015. This number is dramatized

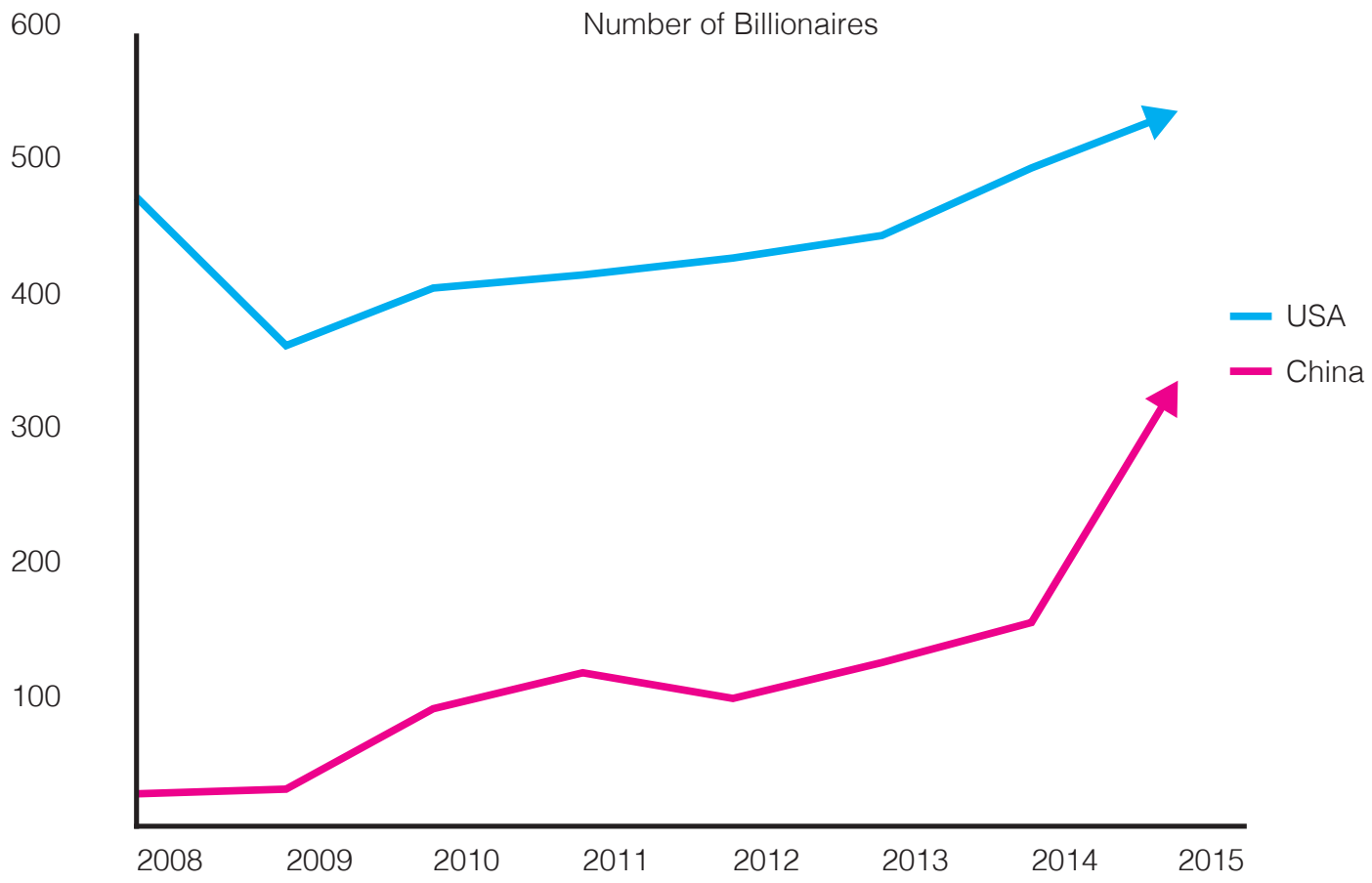


fig. 12 Growth in number of billionaires

by the fact that there were only 10 billionaires in China less than a decade ago. China is a standout in terms of recent private wealth accumulation, but countries like Russia and India also have a rapidly growing elite financial class who are contributing to the growing population of UHNW individuals globally.

If each of the additional UHNW individuals created between 2015 and 2020 purchase just one new residence each, a total of ~78,000 residences worth an average of $5 million USD each will be required by 2020. With this intense demand for luxury accommodation, many UHNW individuals may opt for cities outside the top tier cities of New York, London, Singapore, and Hong Kong.

Current Shaping Factors

Current Shaping Factors

The proliferation of slender residential towers is made possible primarily by the availability of capital and the demand to invest in real estate. In one scenario, investors are funding development of these luxury towers through REITs, and in another, UHNW individuals from the United States and abroad are purchasing units in slender towers for personal use. The opportunity for profits made possible by developing these properties means that buildings that satisfy the tastes and needs of the global super class get built, but the money does not prescribe the form of the building itself. The slender form that these towers take in Manhattan may be unique to that city, and is the result of a set of factors including the location of the building site, zoning codes, construction technology, and building codes.

More specifically, the financial pressures behind the developments pushes these different factors to their limits in an effort to maximize profit, resulting in these urban spires. It is the loopholes, oversights, and opportunities in these codes and technologies that give these towers their distinctive form, not the will of the architects responsible for designing them.

Location

Of primary importance when explaining slender residential towers in New York City are certain aspects that make them especially desirable and therefore developable. Location is one of the most important

fig. 13 Locations of slender residential towers

factors in determining the potential value of a residential development. Certain areas of Manhattan have become especially lucrative for the development of slender residential towers, due to availability of property and air rights, proximity to high-end amenities, and historically desirable locations. Central Park South, the neighborhood around Madison Square, and the area between Tribeca and the Financial District are three of the most established and desirable neighborhoods for these developments.

Central Park South is currently the neighborhood with the highest concentration of slender residential towers both built and in construction, with the majority of the towers located along 57th Street West. This area is experiencing a concentrated surge of development primarily due to proximity to Central Park and the value offered by a view of the park.

> *"Whether on Park Avenue or mid-block on 53rd Street, the raison d'étre of these super-slender towers is to maximize the number of units with commanding views of Central Park."* [15]

[15] Willis, Logic of Luxury 1.0, 361

A Central Park view will boost the sale price of a condominium unit anywhere from 20 to 50 percent, depending on the quality of the view.[16] There are building height limits established by special Central Park zoning directly adjacent to the park, along with historic preservation districts to the east and west of the park, all limiting development in those areas. This results in the streets to the south of the park as the only opportunity to build tall enough to maximize the value of the view, explaining the current pattern of development of towers in this specific location.

[16] Gross

fig. 14 Central Park view from One57

The area adjacent to Madison Square saw construction of the first tower, known as One Madison, in the new wave of slender residential towers in Manhattan. In addition to conventional measures of desirability, the neighborhood is a hotspot for development because there is a relatively high FAR allowed by the neighborhood zoning. The result is there is less need for developers to purchase air rights from many neighboring parcels to build tall, as towers can be built tall on their own lot with the allowed FAR. The generous zoning allowance also means that there are many buildings in the area that have excess air rights to sell. Madison Square has seen less development than Central Park South primarily because the views, while still impressive, do not command the same value. Towers in this neighborhood likely will not be able to ask the $100 million plus prices for penthouses of their counterparts near Central Park, but this is balanced by the lower cost of land and air in the neighborhood, and the demand for luxury and exclusivity at a slightly lower price point.

The south end of Manhattan between Tribeca and the Financial District is the third neighborhood that has attracted the development of slender residential towers. This neighborhood is unique, trading on proximity to Tribeca, one of the most wealthy and desirable neighborhoods in Manhattan but one that is limited by historic preservation zoning. Closer to Tribeca developers have found small slivers of land not constrained by preservation rules, and have managed to assemble development rights. Farther south in the area surrounding City Hall Park and Zuccotti Park, developers have been encouraged by

fig. 15 Rendering of slender towers south of Central Park

the financial success of the New York by Gehry development, and have invested in luxury real estate in the neighborhood that has seen little residential development in recent history. The proximity to Wall Street, and the financial center of the United States also plays a role in the cachet of these towers.

Zoning and FAR

One of the primary drivers of slenderness and height in these new residential towers is FAR, and the calculated exploitation of the opportunities and weaknesses of FAR-based zoning. Developers use the zoning code to their benefit through strategies such as the purchase of Transferable Development Rights or “air rights,” inclusion of FAR bonuses based on providing low-income housing or public plazas, the ability to construct “as-of-right,” and the lack of recognition of height in calculating FAR. These different factors combine in specific ways to dramatically influence the shape of luxury residential development in Manhattan.

FAR allows developers to construct a building of any form as long as it does not exceed the maximum envelope allowed by the zoning code. In expensive or desirable areas, developers can use this lack of prescription in the zoning code to their advantage by building a tower with small floor plates on a large lot, spreading the allowed FAR over as many floors is feasible and maximizing height. For example a building built on 25% of a lot that is zoned for a maximum FAR of 16 would be able to build 64 floors, quite a jump in vertical scale from a building that otherwise might only be built with half as many floors.

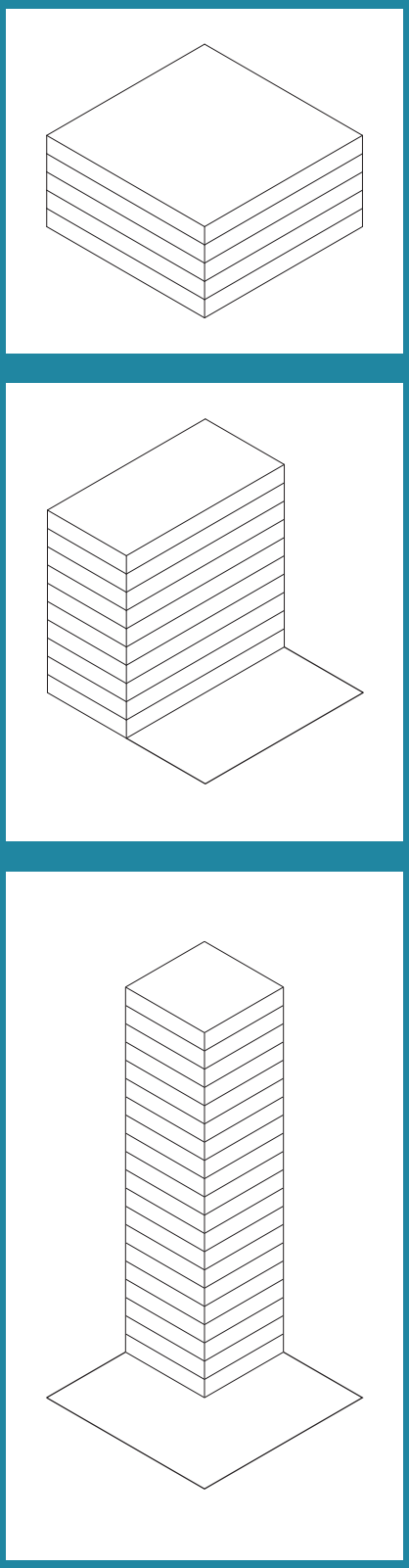


fig. 16 Manipulation of FAR

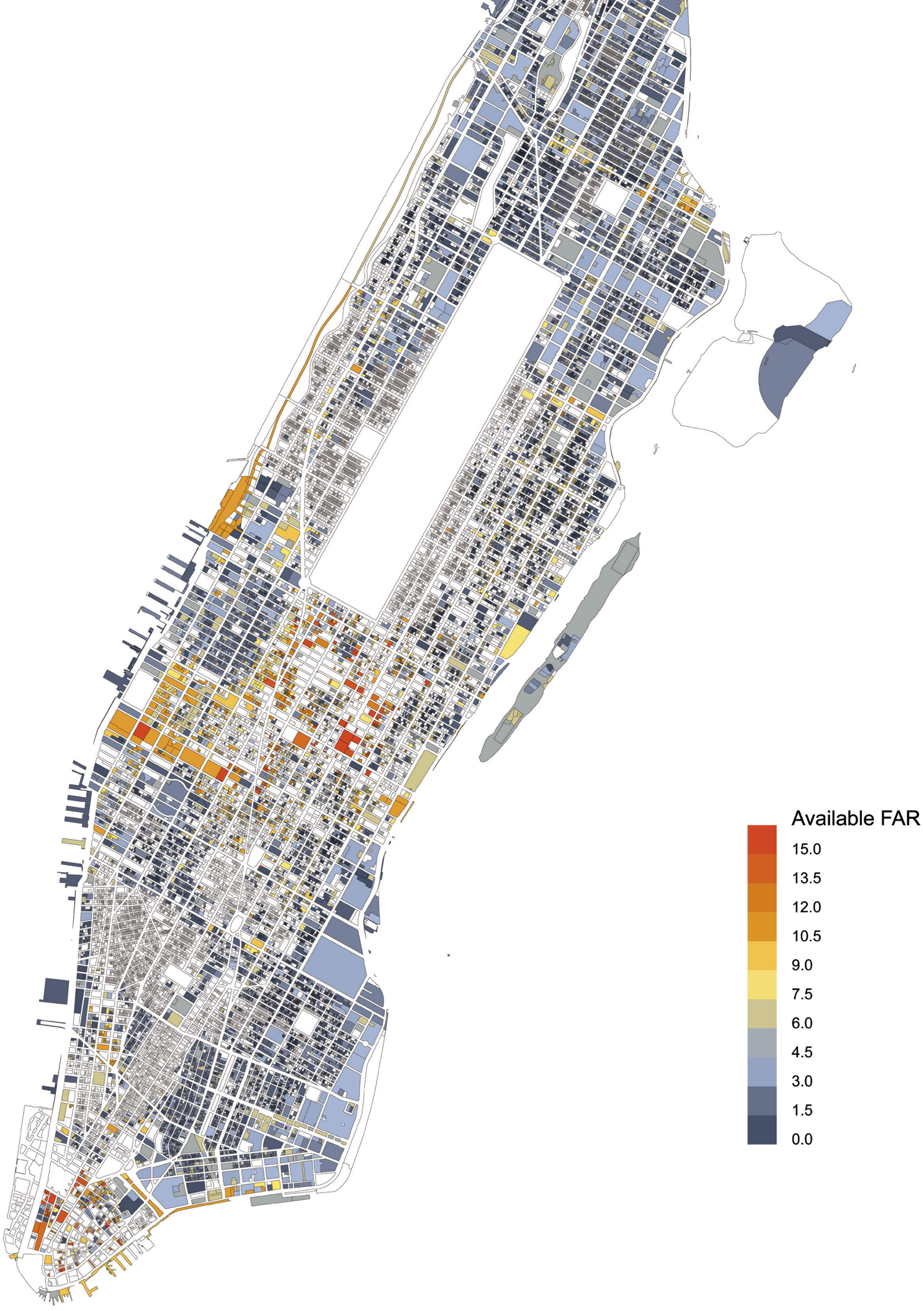
The strategy of using small floor plates to maximize height has two distinct advantages for residential towers. The first advantage is that the small floor plate creates exclusivity; many buildings have only one or two units per floor. The variety of views, especially a coveted 360-degree view, and the exclusivity of owning either half or the entire floor carry a premium price. The second advantage is that building tall increases the number of floors with expensive views. The more units with premium views, the higher the potential return on investment.

Transferable Development Rights

The 1961 Zoning Resolution aimed to define a building's maximum envelope by defining a maximum floor area ratio based on site zoning and building function. The Zoning Resolution also allowed the transfer of unused development rights, or "air rights" to neighboring parcels, allowing buildings that were not built to their maximum allowed envelope to monetize their unused development area through sale. The process of buying and selling air rights has become an important part of slender residential tower development by allowing developers to amass large quantities of development rights on sites that are zoned for lower density.

Air Rights are purchased through private negotiations, and go through no official city review. This is important to developers as keeping negotiations secret can strengthen their position while negotiating deals. It also keeps the owners and residents of surrounding buildings unaware of potential development going up around them, preventing public outcry or negative publicity for the developer and the project.

fig. 17 Unbuilt FAR in Manhattan


Available FAR
15.0
13.5
12.0
10.5
9.0
7.5
6.0
4.5
3.0
1.5
0.0

The most common type of air rights transfer is a zoning lot merger. In a zoning lot merger neighboring parcels enter into an agreement to be considered one parcel for the sake of calculating built FAR. In this scenario, the extra area of the building purchasing the air rights cancels out the unused development area of the selling building. This mode of transfer of TDRs requires the two lots be adjacent, so the location of both parcels is incredibly important. Zoning lot mergers can get around the issue of adjacency by negotiating for multiple parcels to enter into a single zoning lot merger, effectively passing the air rights along a chain of neighboring buildings to the receiving parcel. These agreements can be extremely effective for transferring air rights, but they can also be incredibly complex and difficult to negotiate as one missing piece in the chain of zoning lot mergers makes the transfer impossible.

The second type of air rights transfer is a Landmark Transfer. A Landmark Transfer allows a building determined to be a protected Landmark to sell its unused development rights to a receiving lot. The difference between a Landmark Transfer and a Zoning Lot Merger is that a Landmark Transfer can transfer TDRs to any parcel on the block, and in special cases, across streets. Landmark Transfers are much less common than Zoning Lot Mergers because they trigger a Uniform Land Use Review Process (ULURP). Not only is the ULURP process long and costly for developers, it also can stop development or significantly change the form of a building that goes through the process. New York City also only has about 80 landmark buildings. For these reasons, Landmark Transfers are rare; instead, developers will try to negotiate a

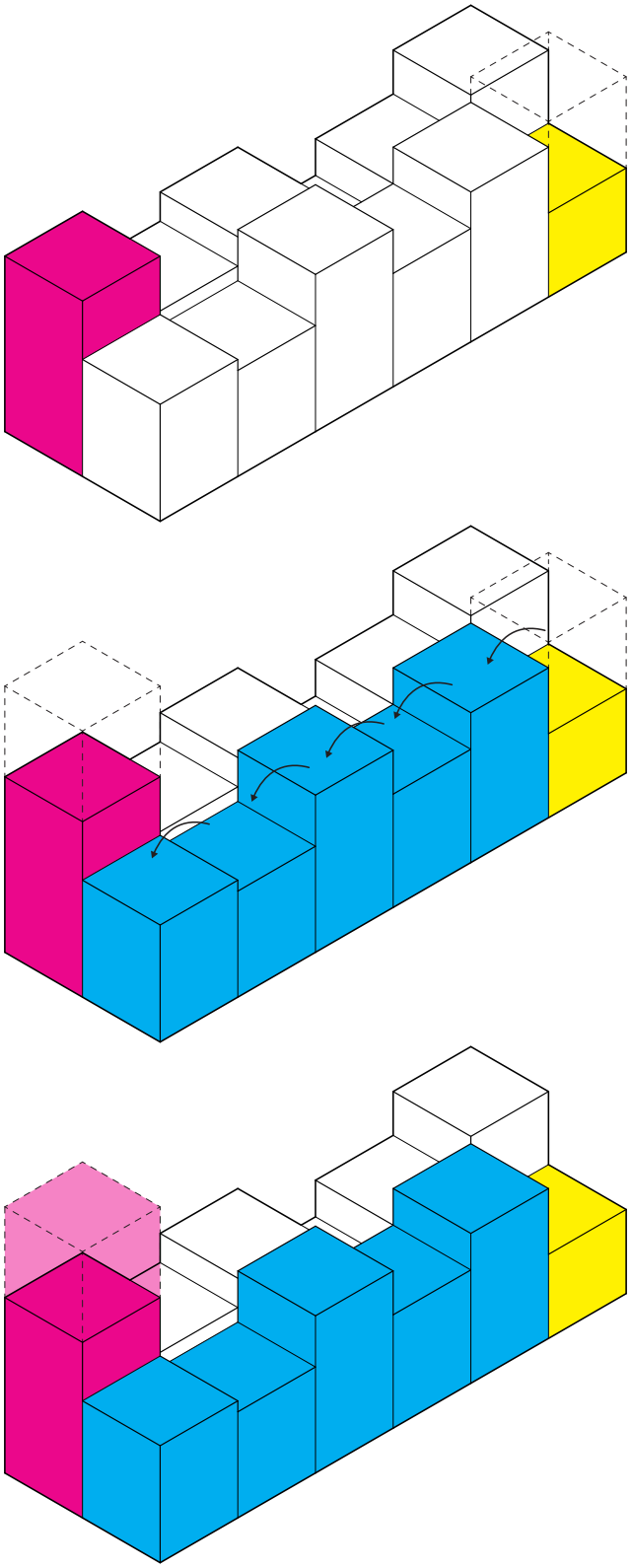


fig. 18 Arms Length Transfer of FAR

Zoning Lot Merger with the landmarked building instead, making every effort to avoid public review.

The final method of development rights transfer is the Special Purpose District Transfer. This method of transfer involves specially zoned districts that can transfer unused development rights to other areas that have been designated as receiving districts. The Special Purpose District that has been instrumental in the development of slender residential towers is the Special Midtown District, intended to protect Broadway Theatres. In the Special Midtown District, specific theatres are able to sell their unused air rights; with the stipulation the property remains a theatre in perpetuity. The development rights can be sold to almost any receiving parcel between 6th and 8th Avenues, and 40th to 57th Streets. This area coincides with the vast majority of slender residential towers in development and construction south of Central Park.

Egress Stairs

The design of fire stairs has become an integral factor in the form of slender residential towers in New York City. By pushing this element of the building, constrained by building codes, to its maximum allowed efficiency, a series of other benefits and opportunities are created. It is significant that this push for efficiency, and the resultant benefits, are very specific to this type of tower as the price per sq. ft. of the residential units is high enough to change the logic of what is actually considered efficient.

In a slightly bizarre set of circumstances, standard scissor stair

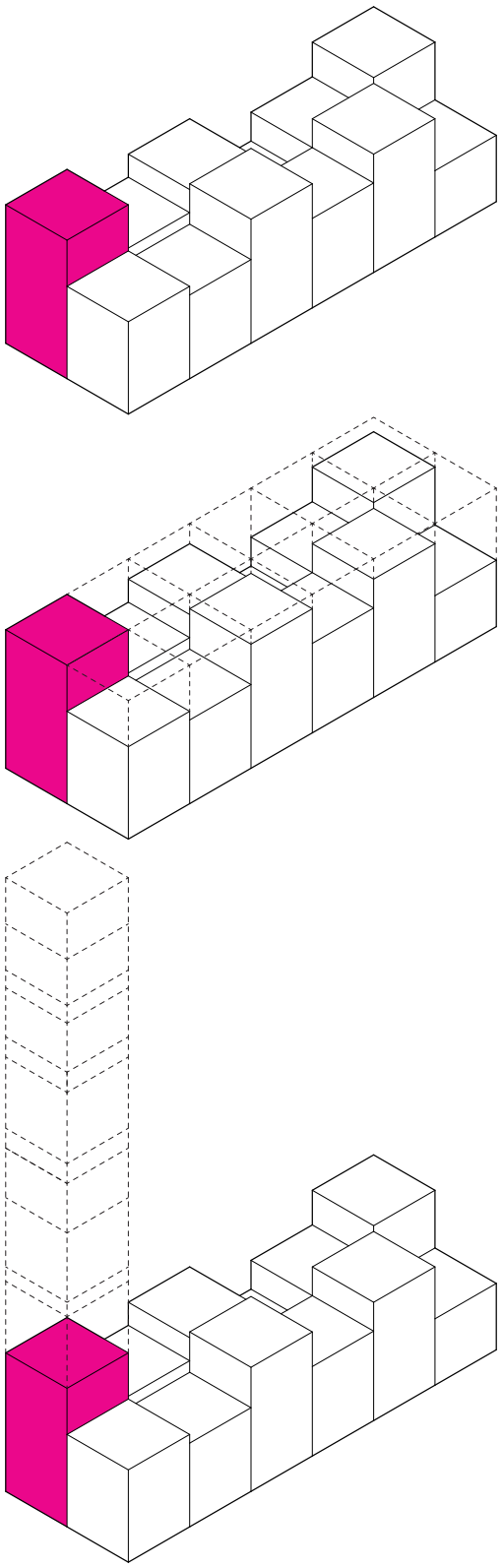


fig. 19 Accumulation of excess FAR from one block

design can achieve both cost saving, and money-making outcomes through a specific design approach. The optimal scissor stair is essentially the longest run of egress stairs without a landing allowed by the building code. Landings take up space, and constraining the stair to having only landings at the top and bottom of the longest run maximizes efficiency. The optimized scissor stair also uses the highest rise to run ratio allowed by the code, maximizing the height gained over the length of the stair. Finally, the optimal scissor stair uses the minimum allowed head height in the staircase, keeping the construction as compact as possible. The result of this efficiency in design is a staircase that rises 7'9" over its length. Doubled, this scissor stair achieves a 15'6" floor-to-floor height. This 15'6" height has become the new standard floor-to-floor height of slender residential towers in Manhattan.

This optimal scissors stair design saves money by minimizing the area of the floor plate dedicated to egress stairs. At anywhere from $3,000-$12,000 per sq. ft. sale price of the condominiums, any space savings in the building core has a nearly exponential effect on profitability. This scissor stair design also saves money by allowing prefabrication of a single stair module that can be repeated throughout the tower. Prefabrication allows the stairs to be built extremely thin in depth, allowing the minimum head height clearance defined by code.

The optimal scissor stair design has the profit-producing effect of raising each floor an additional three feet higher, to 15'- 6", than the standard of 12'- 6" in New York City residential towers. This adds spaciousness but makes no change in FAR.

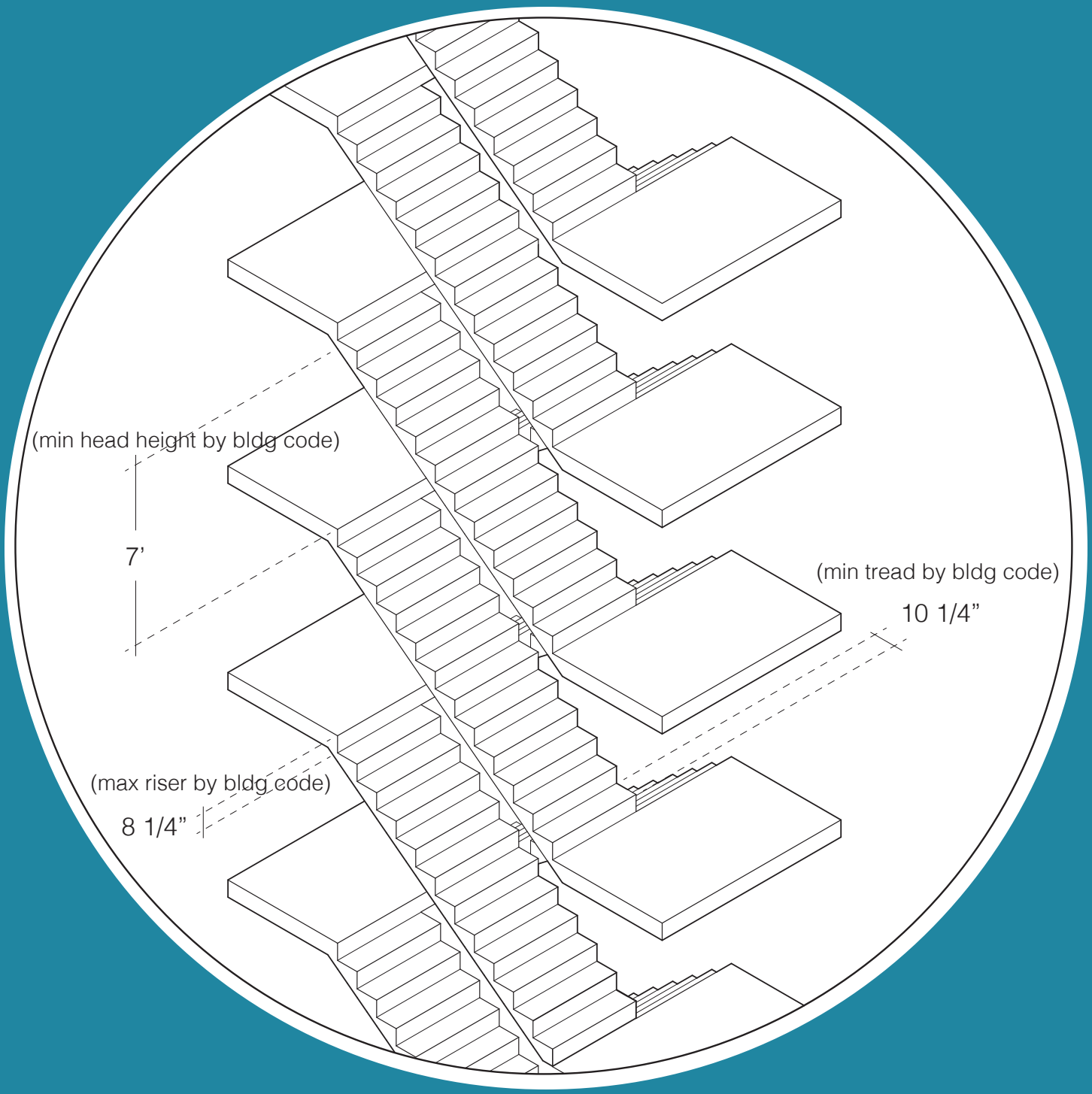


fig. 20 Axon of optimized scissor stair

"This additional 3 ft. – almost 25 percent more air between floors – also cumulatively increases the tower's full height, for example, from 1,000 ft. to 1,250 ft., thereby lifting more apartments into the sky." [17]

[17] Willis, Logic of Luxury 1.0, 362

While there is additional cost for structure and construction with this boost in floor-to-floor height, the three foot-per-floor bonus multiplied across the whole tower has the effect of raising units higher, claiming better views and higher sale prices for even more units.

"This costly approach gives rise to what I have termed 'the logic of luxury'. Spending more on design and construction and creating exclusivity can reap exceptional profits." [18]

[18] Willis, Logic of Luxury 1.0, 361

Technology Now

Recent building technology has allowed buildings to be built taller and thinner, pushing slenderness to a new extreme that could not have been achieved 25 years ago. Extremely high-strength concrete, tuned mass dampers, and new construction techniques allow tall buildings to be built on tiny footprints, circumventing the intentions of FAR based zoning.

All the slender residential towers studied in this thesis use concrete as the primary structural material, although they may use it in different ways. Many use high-strength concrete for the core with floor plates that span clear to the curtain wall, another benefit of small floor plates. Others use load-bearing walls as a way to stabilize the tower. Some

utilize vertically, post-tensioned shear wall construction, which is a new application of post-tensioning technology. Almost universally, super high-strength concrete is used near the base of the towers.

The structural integrity of the towers is not the most complicated problem to solve in realizing such a slender tower; it is actually movement and acceleration of the tower itself produced by wind that must be addressed. Tuned mass dampers and slosh dampers are required to minimize the acceleration of the towers due to wind loads. Tuned mass dampers have been used in skyscrapers in the United States for more than 40 years, but the small floor area available for movement in these new slender towers has forced innovation. Very compact tuned mass dampers have been developed to maximize efficiency within the cramped working area. At least one tower has taken the novel approach of spreading tuned mass dampers throughout the height of the building, instead of having dampers only at the top of the tower, thus allowing each to be much smaller.

The ability to solve the problems of tall and slender towers has been available for several decades, but it is only with the relatively recent surge in minimum condo prices, above a base of $3,000 per square foot in Manhattan, that it has made sense to apply all these technologies in buildings.

> *"Sophisticated engineering has made these spindles possible, but it is soaring condominium sale prices, in part driven by an excited international market for real estate investment, that explains their recent proliferation."* [19]

[19] Willis, Logic of Luxury 1.0, 364

Synthesis

The immense financial opportunity for development of ultra high-end condominiums in Manhattan has given rise to a series of slender residential towers. This financial opportunity allows buildings to be designed and built in ways not foreseen, or accounted for by FAR based zoning regulations and the ability to build “as-of-right”. The amassing of air rights, either by purchasing them directly, or through the purchase and demolition of multiple existing buildings, has allowed towers to be built that exceed their zoned FAR allowance by substantial amounts. The technology to build tall and slender has allowed these towers to turn those development rights into spires, further emphasizing their disparity from their surroundings. Through the development of the slender residential tower as a type, new strategies to maximize efficiency of the building, both in regards to construction and profitability have been discovered. The cycle of financial pressure enabling new technologies to be integrated into buildings that in turn enable buildings to push building and zoning codes to the extreme has reached a pinnacle in the slender residential towers of New York City. The ability to build tall and slender towers has many benefits to the developer, but it is only recently that the cost to benefit ratio of incorporating the expensive technologies that enable slender towers to be built has made financial sense.

fig. 21 Rendering of slender residential towers on W 57th

Case Studies

One Madison

One Madison was proposed in 2005 by two first-time New York City developers, Marc Jacobs and Ira Shapiro, operating together under the title of Slazer Enterprises. They approached the architecture firm Cetra/Ruddy to design an ambitious tower on a through block site spanning from 22nd Street to 23rd Street across from Madison Square Park. The site was assembled from three separate lots. 20 and 22 E. 23rd Street were purchased for a combined $36.4 million in 2006. The third property, 24 E. 23rd Street was purchased in 2007 for $16.8 million. Additionally air rights were purchased from the buildings immediately adjacent to the east and west of the site on 23rd Street. To finance construction initially, Slazer Enterprises took out a total of $100 million in mortgages from Credite Suisse subsidiary Column Financial.

Work on the tower started in 2006 with the demolition of the existing buildings, site preparations, and beginning of construction on the foundation. The building rose steadily through 2007, despite slow sales of its condominium units. Slazer Enterprises searched for funding to continue construction, and turned to an unorthodox scheme of promising units in exchange for construction funding. In 2008 the housing bubble burst, with the building still incomplete. Slazer Enterprises continued with construction while desperately searching for any funding available. By 2009 Slazer Enterprises was facing numerous lawsuits related to failure to repay short-term loans, and failure to provide promised units. In 2010 creditors started foreclosure proceedings on the still incomplete tower.

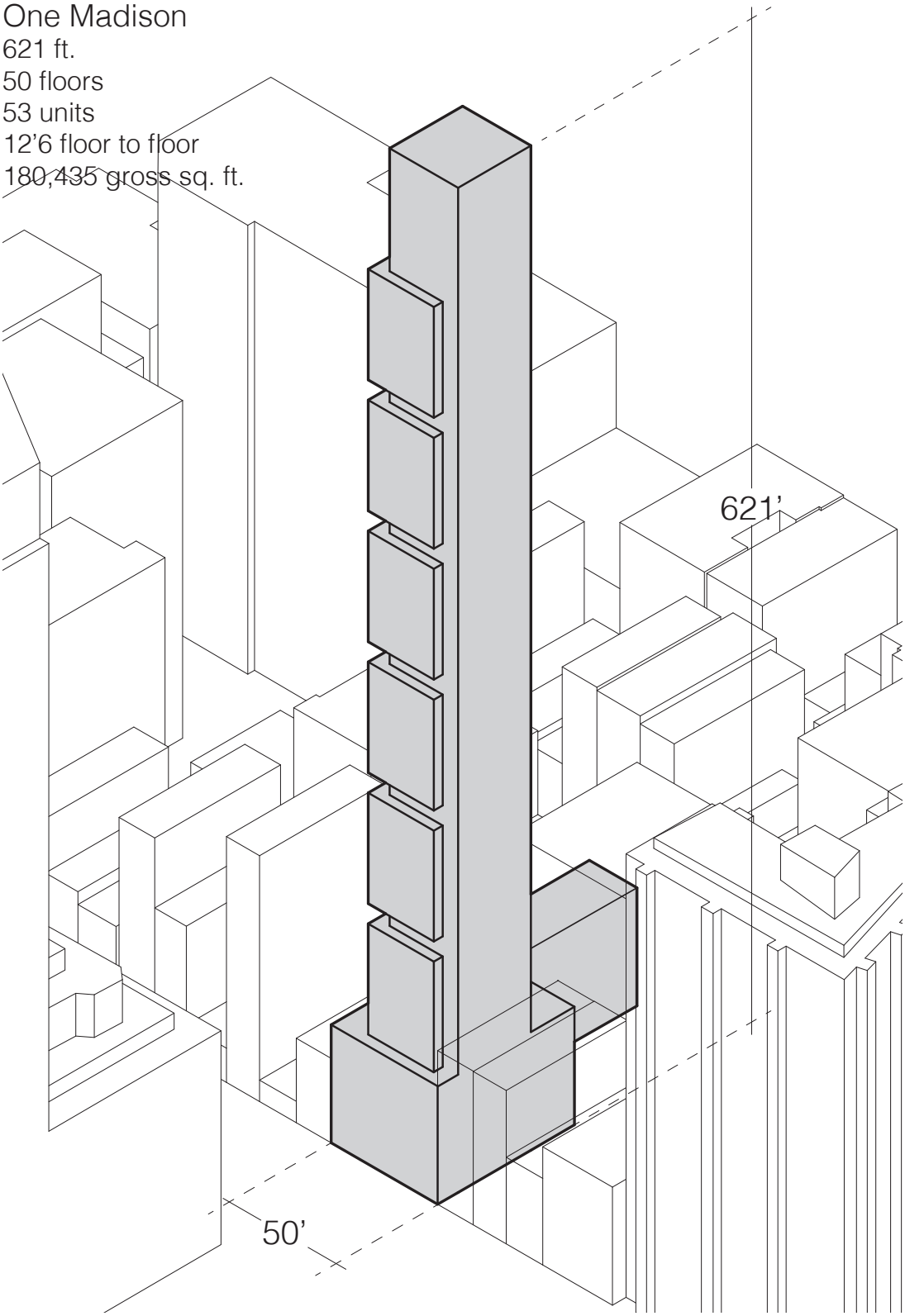


fig. 22 One Madison axon

Related Companies, HFZ, and CIM group each positioned themselves to take ownership of the tower, but reached an agreement to collectively buy the tower out of bankruptcy in 2012. Construction restarted under the new ownership, and the newly completed units hit the market in 2013 with dramatically higher prices than the initial offering six years earlier.

The tower was pioneering both in form and in price. One Madison was the first slender residential tower of its generation built in Manhattan. The strategy of designing a tower with a small footprint on a large site and using purchased air rights to build tall had never been attempted at this scale. In many ways this building was the prototype for future slender residential towers in Manhattan. It proved that success could be achieved not through pure efficiency, but strategic excess. The height and small floor plates are the antithesis of efficiency, but the price of the units rose exponentially based on those factors.

From a design standpoint One Madison made some smart decisions, but also left opportunity for future innovation. The placement of the vertical circulation along the façade was a strategy not repeated by later towers, as it prevented true “360” views, along with preventing continuous circulation around the floor plate. One Madison also did not utilize a floor-to-floor height based on the efficiency of the egress stairs, opting for the prior standard ~12’- 6” floor-to-floor height. These innovations in design and efficiency would be made in later buildings, but the foundation of the slender residential tower as a type started with One Madison.

fig. 23 Cetra/Ruddy, One Madison, New York, 2013

One57

One57 is a building that took almost two decades to develop, design, and build. Extell Development had assembled properties and development rights on the block bordered by West 57th and 58th Streets between 7th Avenue and Avenue of the Americas since the late 1990s. Initially the site was planned for a ~300,000 square foot five-star hotel standing roughly 400 ft. tall, but as Extell accumulated development rights (Extell owned over 1,600,000 square feet of development rights on the block, purchased through more than ten separate transactions over a decade) plans changed.

Inspired by both rising demand and rising cost of ultra-luxury condominiums, the development was restructured to become a super tall tower containing both a hotel and 135 condominium units. Using One Madison, 15 Central Park West, and the Time Warner Center as precedents in price, One57 positioned itself as a development exclusively for the ultra-wealthy. With the cheapest condominiums listed at $3 million dollars, and often selling for up to 35% above listing price, One57 fulfilled that promise.

Although One57 is a tall slender residential tower, it is not a fully developed example of the type. One57 uses a hotel on the lower 20 floors to lift more condominiums into unobstructed Central Park views, as opposed to using an exaggerated floor-to-floor height to maximize views. The hotel requires the use of more development area on lower floors, substantially larger floor plates, and extra elevators – all made possible

One57
1005 ft.
73 floors
135 units
13’ floor to floor
853,567 gross sq.ft.

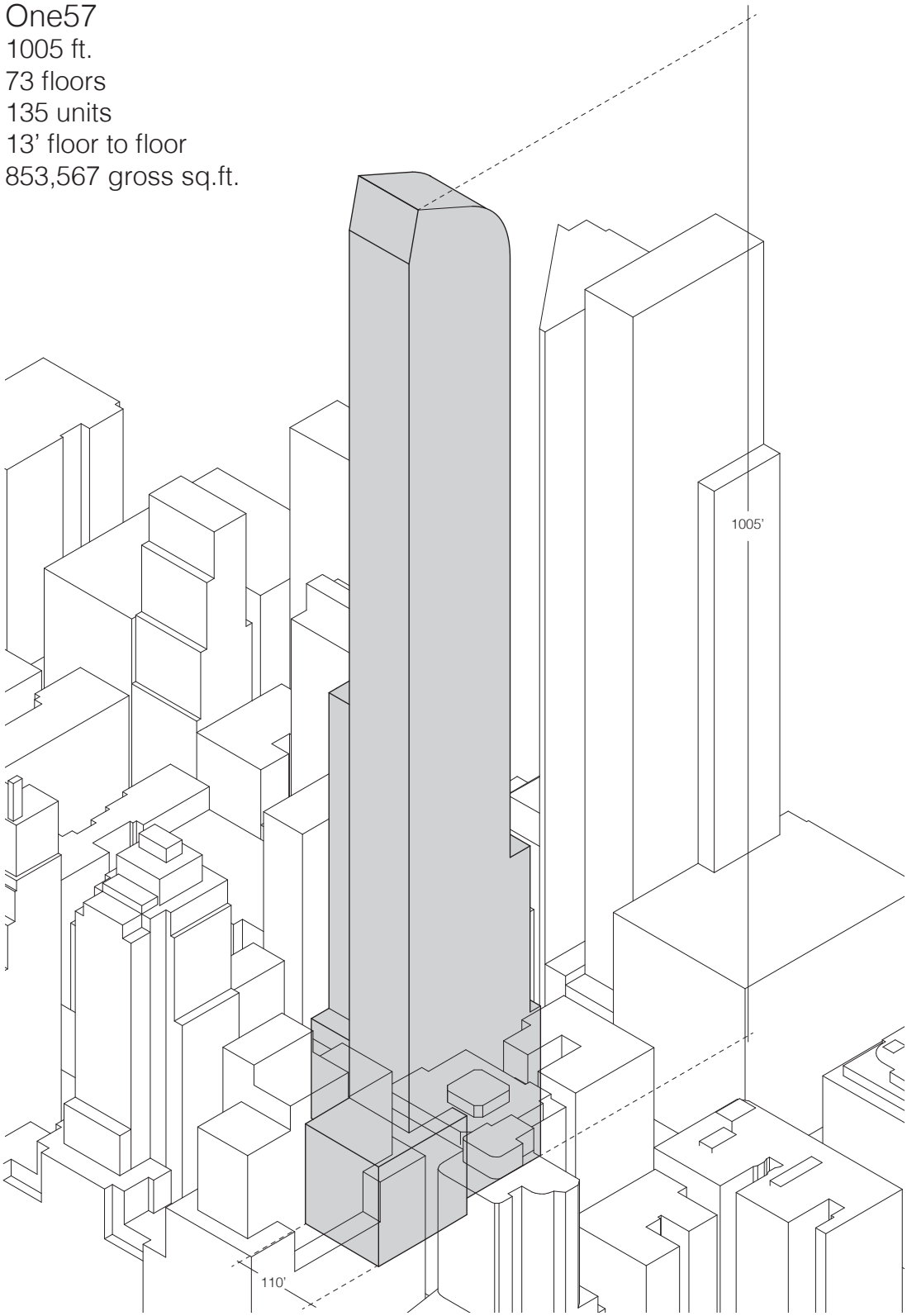


fig. 24 One57 axon

by the amount of development rights owned by Extell, but not typical of more recent slender residential towers. One57 also has as many as six condominiums per floor on the lower condiminium levels, which also is not typical of later slender residential towers. Although under developed compared to later examples of the slender residential tower, One57 was a trendsetter both in design and in pricing. The financial success of One 57 established the legitimacy of this development both for Extell and for other Manhattan developers.

fig. 25 Christian de Portzamparc, One57, New York, 2014

432 Park Avenue

432 Park Avenue was the project of Harry Macklowe of Macklowe Properties. Initially proposed as a 70 floor mixed-use condominium tower, by the time the tower started construction, the design had transformed into an 88 story tower standing a staggering 1396 feet tall.

The groundwork for the development of 432 Park Avenue started with the purchase of the Drake Hotel for $440 million in 2006. Macklowe Properties then purchased five pre-war properties on 57th Street that bordered the Drake Hotel site, creating a single large through-block site. In 2007 the economics of Midtown were such that office space was comanding the highest rents. Initially the Macklowe Properties project, operating under the title of 440 Park, was slated to be a mixed-use tower with both office and condominiums rising 70 floors. The Drake Hotel was demolished in 2007 to prepare for construction of the new building. With the downturn of the economy in 2008, the 440 Park project was put on hold, and the former Drake Hotel site sat empty, and as a result Macklowe Properties was overleveraged and in survival mode. In September 2011 the project came back to life. Macklowe Properties' ownership of the project was bought out by a developer new to Manhattan, CIM Group, giving the project a second life.

In the five years between the clearing of the Drake Hotel site and the construction of the foundation, the economics of building in Midtown Manhattan along 57th Street had changed. Encouraged by the successes of both One57 and One Madison, the project moved

432 Park Avenue

1396 ft.
88 floors
104 units
15’6 floor to floor
750,004 gross sq.ft.

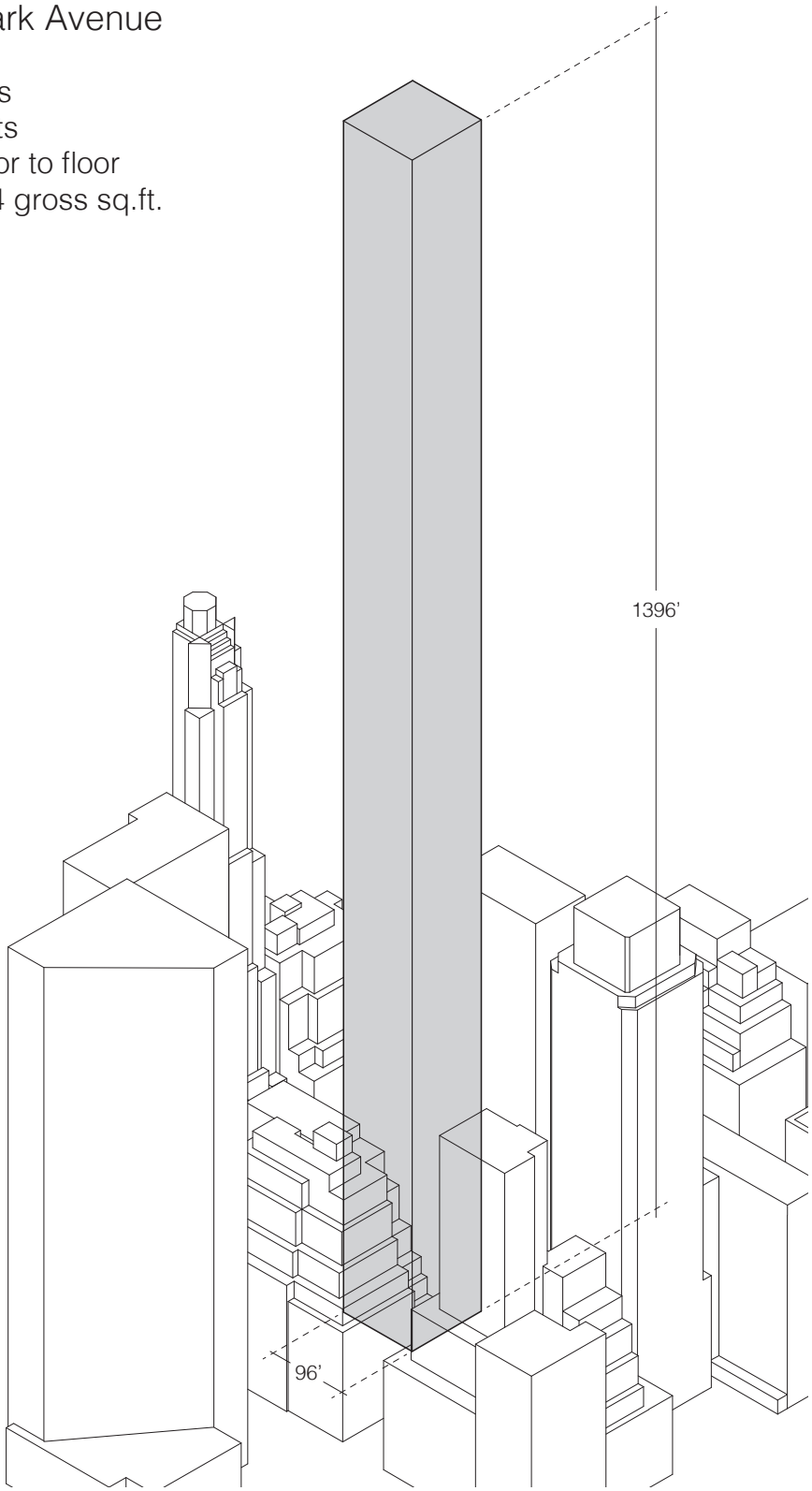


fig. 26 432 Park Avenue axon

forward as a luxury condominium tower designed by Rafael Viñoly. Refining the model created by those previous slender towers, 432 Park Avenue pushed the strategy of efficiency through excess to a new level. The most definitive example of this is the egress stairs that push the boundaries of the building code to maximize plan efficiency, and also result in a luxurious 15'6 floor-to-floor height. With the advantage of having a relatively large parcel of land, 432 Park Avenue also took advantage of the FAR bonus allowed to developers for providing a public plaza space boosting development space and height. Finally, 432 Park Avenue includes a two-story retail building on Park Avenue. The novel part of this building is that it houses the chiller plant for the tower on its roof, maintaining the required streetwall on Park Avenue using minimal development area to do so.

fig. 27 Rafael Viñoly, 432 Park Avenue, New York, 2015


MetLife

Seattle

Why Seattle

Seattle is a city with a growing reputation internationally as a place to invest in real estate. According to the CBRE Global Investor Survey 2015, Seattle is the ninth most popular city internationally for global real estate investment. With Los Angeles ranking eighth and Paris ranking tenth in the survey, Seattle has established itself as a world-class city for real estate investment.

Interest in Seattle is driven by both internal and external factors. Outside investors are attracted to Seattle because it is home to a number of large international corporations like Boeing, Starbucks, Amazon, and Microsoft. These companies provide the foundation for a stable and diverse local economy that gives investors greater confidence. Seattle is also becoming more popular for investment as other world cities become prohibitively expensive, forcing some investors to look for better values elsewhere. While the cost of housing in Seattle may be at an all time high, housing is still a relative bargain when comparing Seattle to the cost of comparable residences in other popular West Coast cities like San Francisco, Los Angeles, and Vancouver. In addition Seattle is well liked for its connection to nature, and the broad perception of Seattle as a “green” city.

EB-5

A common way to earn a visa and a path to United States citizenship is the Immigrant Investor Program, commonly referred to as

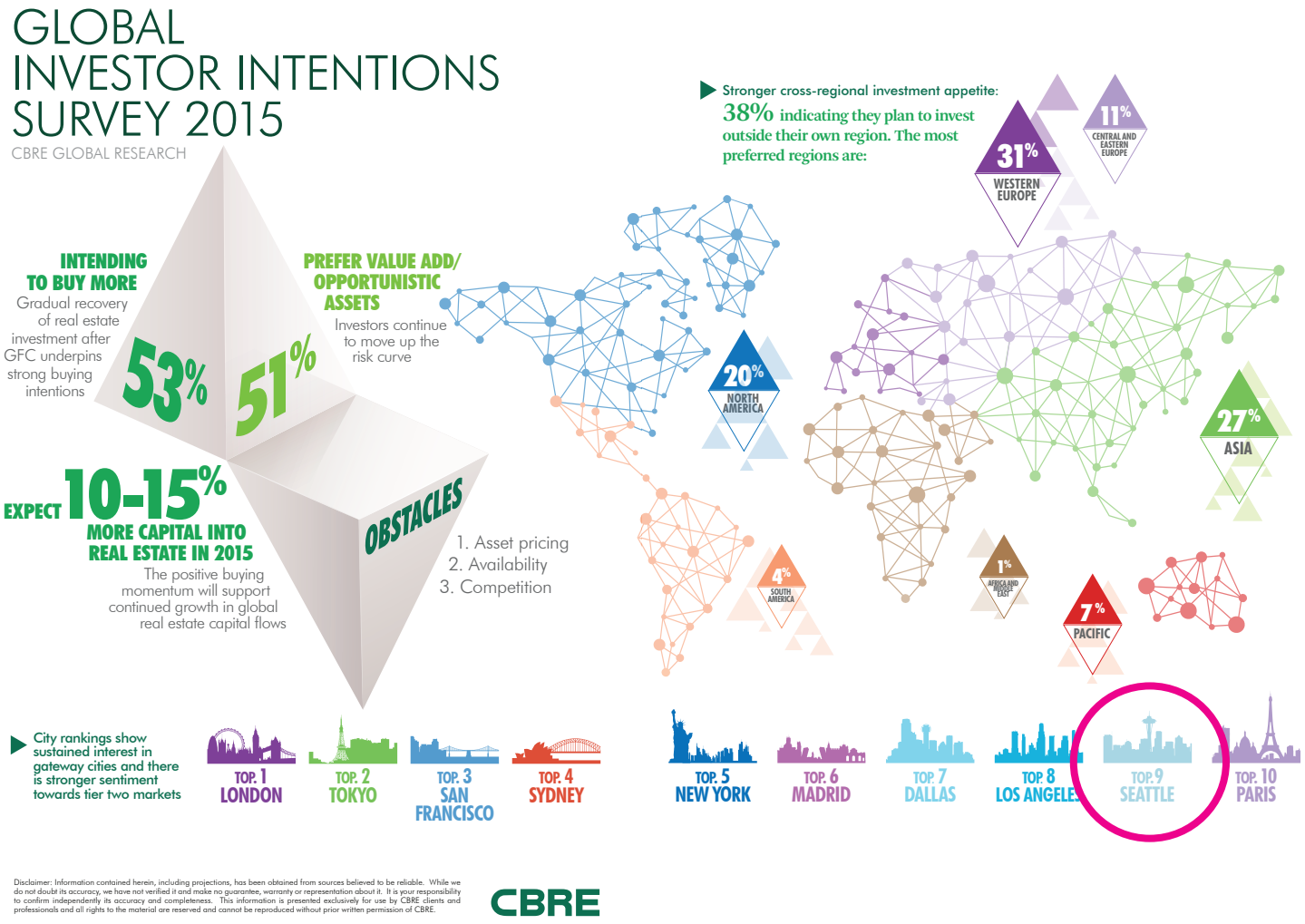


fig. 28 CBRE investor survey infographic

the EB-5 program. The major requirement for an EB-5 visa application is a large capital investment into job creating ventures in specific geographic areas, resulting in the creation of ten full-time jobs. Often time these investments are made in income-producing real estate. At the end of two years the investor needs to prove that the entire promised investment was paid out, and that ten jobs were created. If these requirements are satisfied, a Green Card is issued. This system serves both to fund the development of income-producing real estate, and to entice wealthy foreign investors who are looking for a residence in the United States. This program could be seen as something that drives its own demand – that is to say that a residential project sponsored by an EB-5 visa could also provide residences for other EB-5 recipients immigrating to the same area.

Seattle – Vancouver Connection

Vancouver has long been a destination for international real estate investment from Asia. Both personal residences and large-scale real estate investment were driven by geographic proximity to Asia and by a program that allowed foreign investors to secure a visa through a loan to Canadian Government. Known as the Immigrant Investor Program, many investors preferred this program to the United States' EB-5 program because the financial barrier to entry was lower, and the investment was not at risk in the Canadian system. However, Canada's Immigrant Investment Program was cancelled in 2015, and investors looking for a visa have shifted their attention to the United States. Seattle's proximity

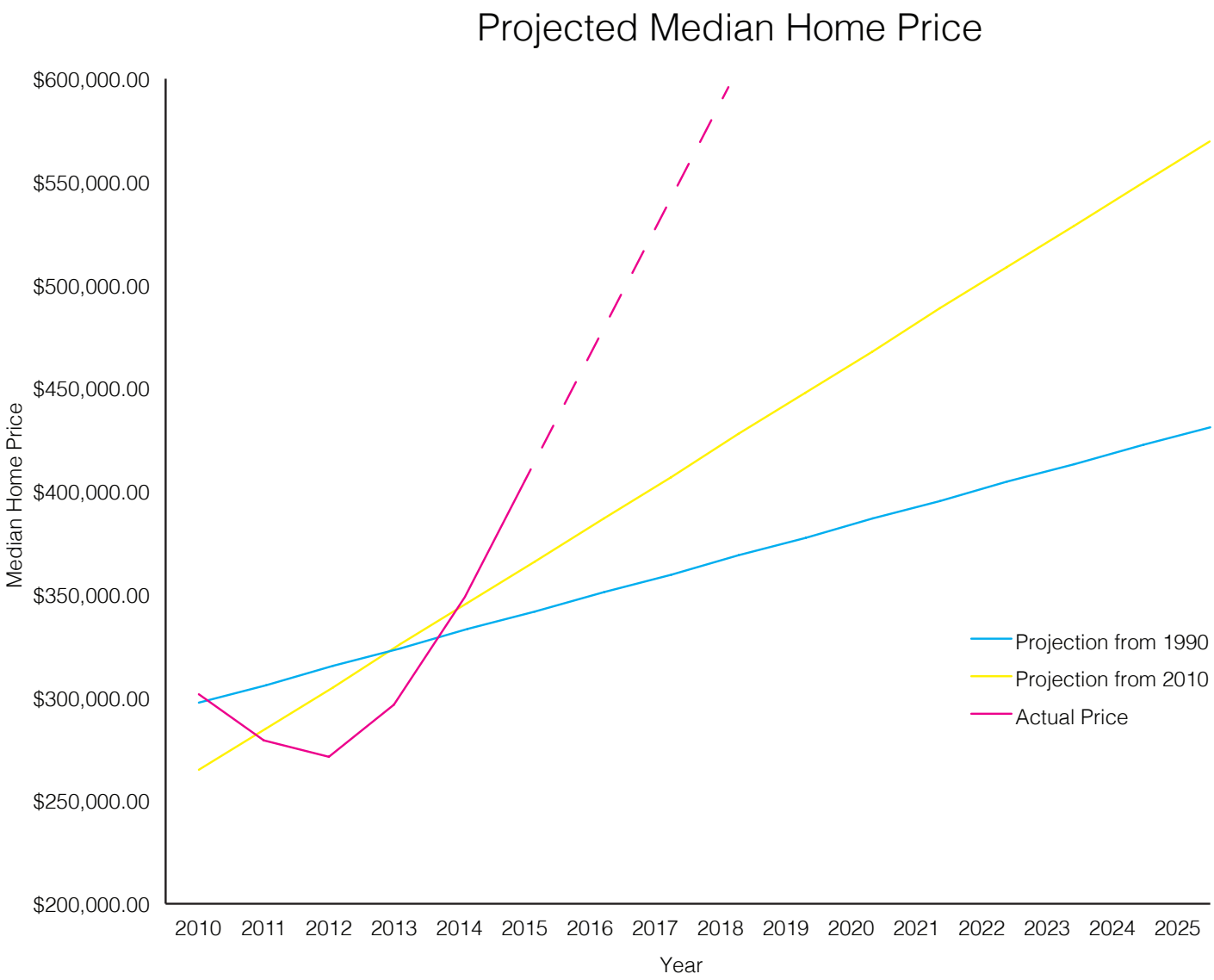


fig. 29 Seattle median home prices

to Vancouver has earned it attention as Vancouver's successor in Asian investment tied to the receipt of a visa.

Surging Housing Prices

The cost of housing in Seattle has been rising rapidly since 2010, after recovering from the shock of the 2008 crisis. The median cost of housing in Seattle has surpassed the all time high set in 2008, prior to the recession, and shows no immediate signs of slowing down. This strong market for housing is predicated on the combination of low available supply, and high demand across many housing types. The low supply of housing is a result of the lag of the construction industry to build in response to demand, and issues related to land use and zoning across large swaths of Seattle including the Growth Management Act which limits suburban sprawl. The demand for housing is raised by a strong job market, especially high paying tech jobs that allow more people to enter the housing market, increasing demand on the limited available supply.

These factors coalesce to form a climate which is attractive to real estate investment in Seattle, especially from a growing number of foreign investors. Seattle is in a unique position as both a target for raw investment dollars from a growing pool of developers funded by REITs and other financial instruments, but also as a location for owner occupied real estate investment. Despite the surge of investment, construction still lags behind demand. Demand is expected to show continued growth in the Seattle metro region, prompting further investment.

fig. 30 Seattle Luxury Living magazine

Urban Analysis

Slender Towers Sites

Seattle has recently and rapidly become a target for international real estate speculation. Many of the same factors that drive the development of slender towers in New York City are driving luxury residential development in Seattle. Seattle is geographically limited in many similar ways to Manhattan, and it is further restricted politically in ways that Manhattan is not. Seattle's downtown office core, or DOC1 is straddled between the waterfront, and Puget Sound to the west, and to Interstate 5 and a steep ridge to the east. An area comprised of just eight Avenues running predominantly north-south, and nine streets running predominantly east-west; only thirty five blocks occupy the Downtown Office Core zone. Seattle's land use code, which limits residential buildings based primarily on maximum height, is uniquely liberal with regulating building heights in the DOC1. In most of Seattle the maximum height allowed by the land use code is relatively low, but in more dense zones residential buildings are capped at roughly 400 feet.

In the DOC1, residential buildings have no formal restrictions on height imposed by the city. The DOC1 does sit in the "Outer Transitional Surface Airport Overlay District," which means that maximum building height is subject to review by the Federal Aviation Administration (FAA) with the city only approving proposals approved by an FAA review. The FAA has a nationwide restriction on buildings over 2000 ft. tall, but that height is lowered in many instances due to proximity to airports. In Seattle's DOC1, proximity to Boeing Field restricts building heights

fig. 31 DOC1 analysis map

to around 950 ft. tall without FAA review, though buildings can request additional height allowance through further FAA review.

The city does impose fees to developers for development area built over the base residential height in the DOC1 zone. The developer pays $21.68 per sf. of built space above the 450 ft. base height into a Low Income Housing Fund, which is often partnered with a housing oriented non-profit organization in the city. Residential space is not considered part of FAR calculations in Seattle so the intent of this fee is to allow taller mixed-use buildings with both residential and commercial space for a modest fee to support low income housing elsewhere.

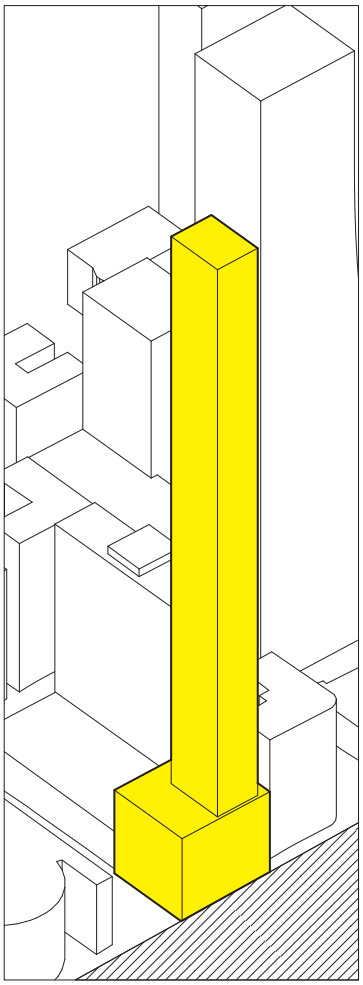
Although there is no height restriction in the DOC1, there are relatively few parcels on which to build. This area is further reduced if when existing buildings which are unlikely to be developed in the near future, and other factors are taken into account.

Close analysis of the current state of development in Seattle's DOC1 reveals that there are relatively few sites that would be possible to be developed as slender residential towers in the near future. With residential unit prices in much of Seattle's downtown heavily predicated on views of the Puget Sound, finding a site with unobstructed views - and more importantly - views which are unlikely to be blocked by future development is of primary importance. Working under the assumption that buildings over 20 stories, civic and cultural buildings, sites currently in development, and protected Landmark buildings are unlikely to be demolished for the development of a slender residential tower, the remaining parcels in Seattle's DOC1 zone were analyzed for views,

immediate context, and current use. Based on this analysis five sites were chosen for preliminary evaluation as possible sites for a slender residential tower.

The conclusion that there are so few potentially viable sites for this type of development in Seattle is surprising, but it supports the underlying idea that the imposed scarcity of space drives this new and opportunistic development. The idea that the force of capital can manifest itself as a building that overcomes the various restrictions and limitations of both the site itself and the city as a whole in new and unforeseen ways to form a new building typology is central to this thesis. The scarcity of potential sites, and the success of projects currently in development could fuel this new pattern of development adapting to different sites and regulations as the typology develops in Seattle.

1300 3rd Ave.



view rose with planned development

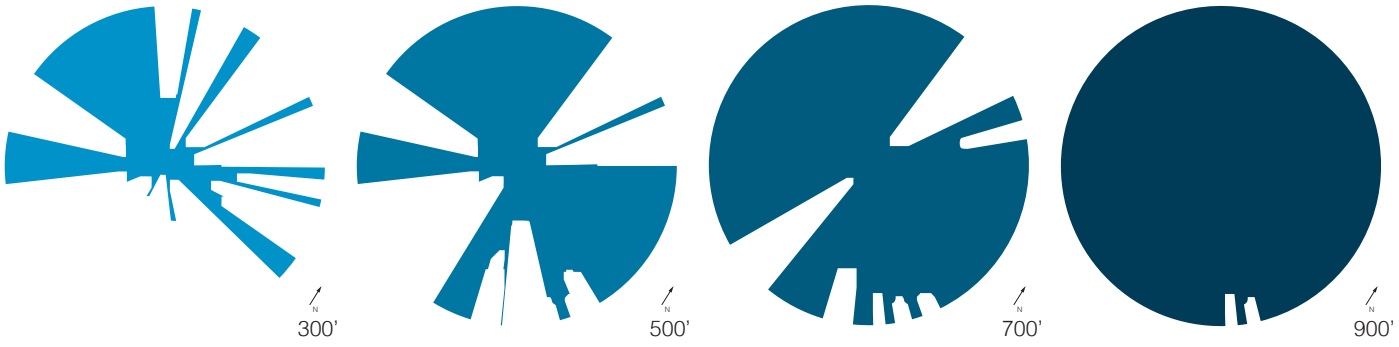


fig. 32 1300 3rd Ave. analysis

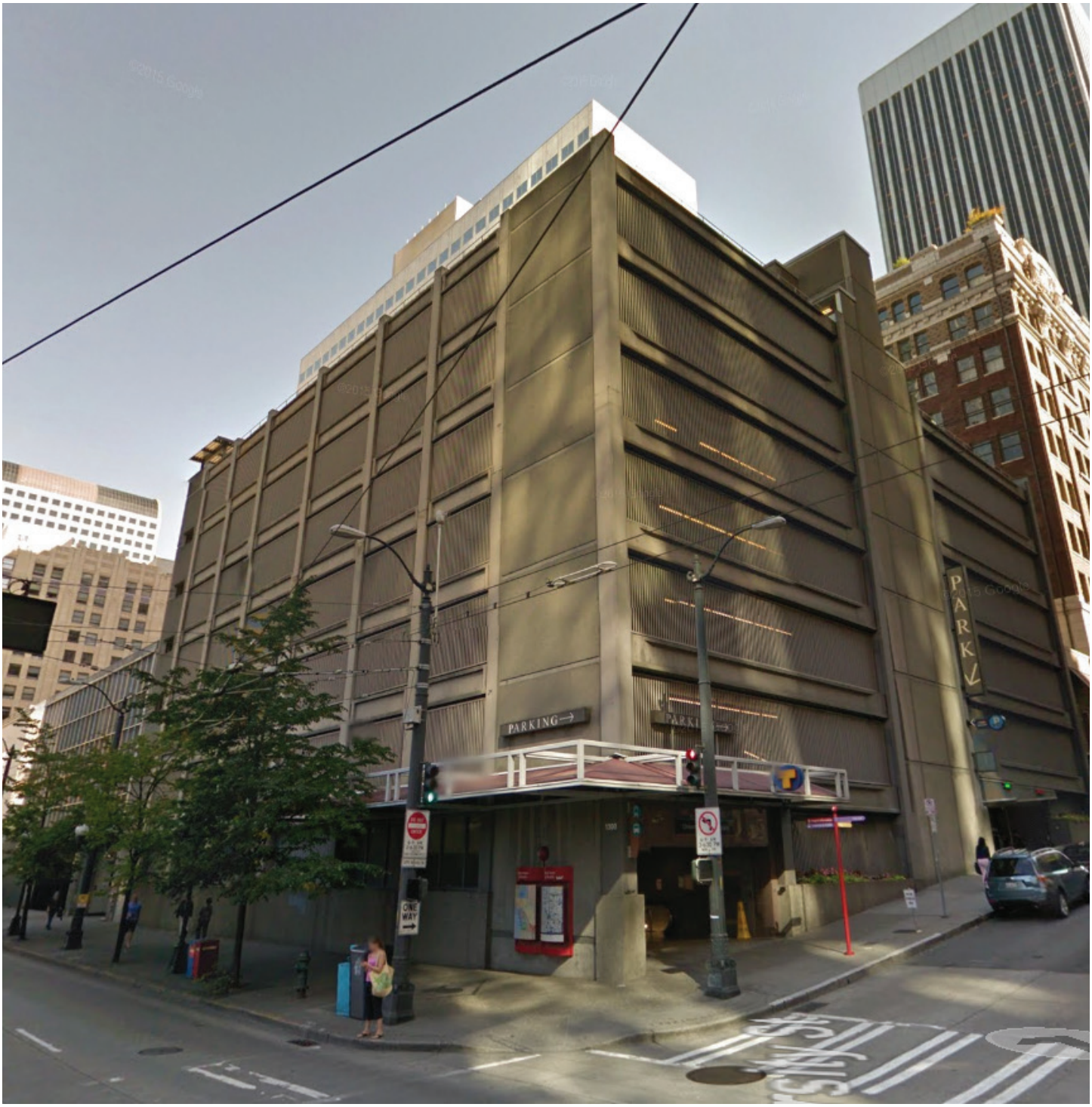
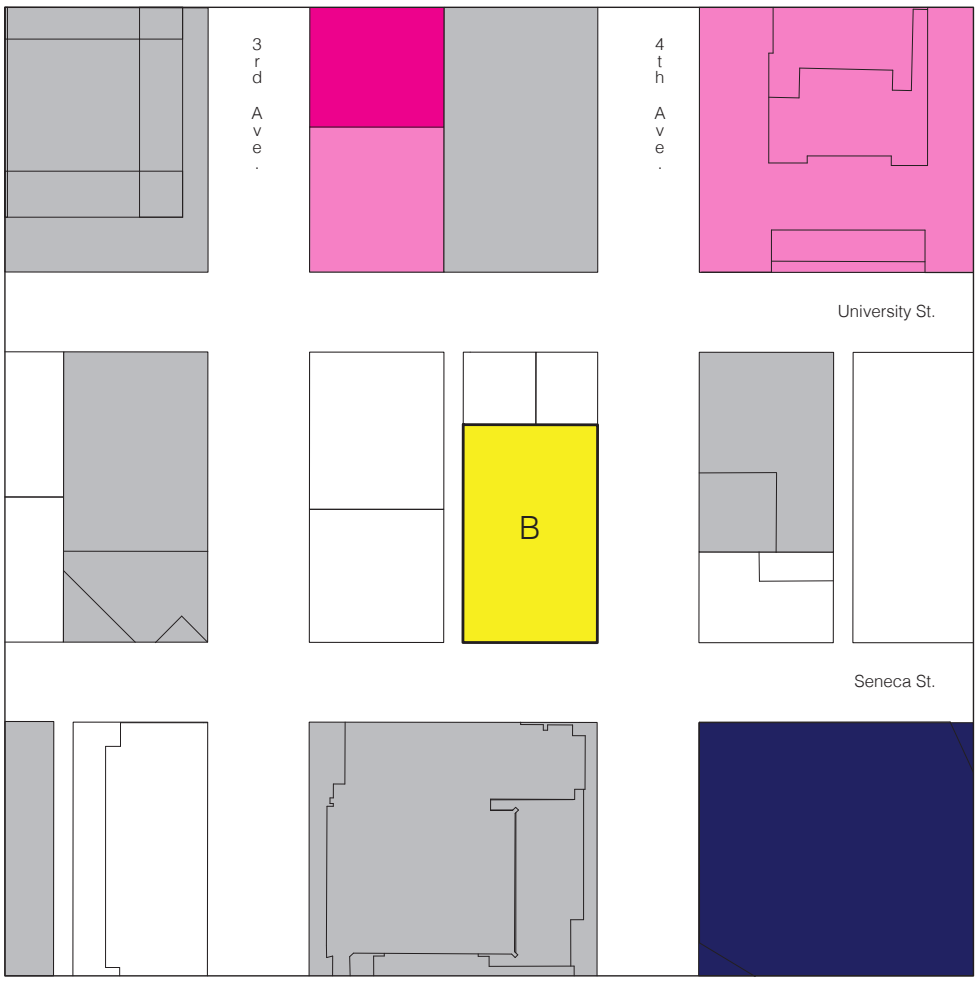
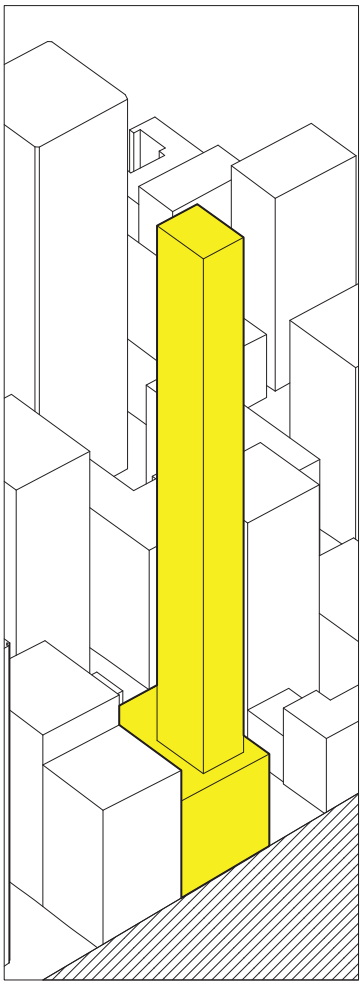


fig. 33 1300 3rd Ave. existing condition

1101 4th Ave.





view rose with planned development

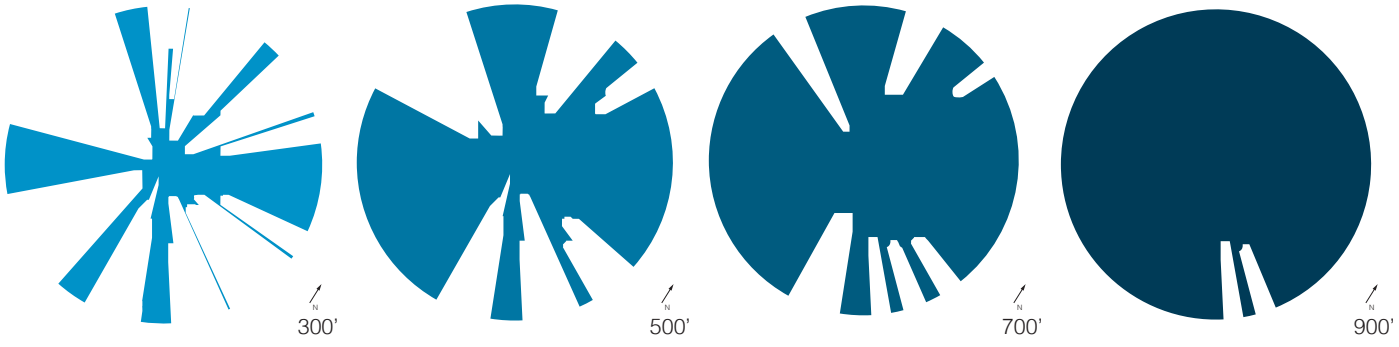
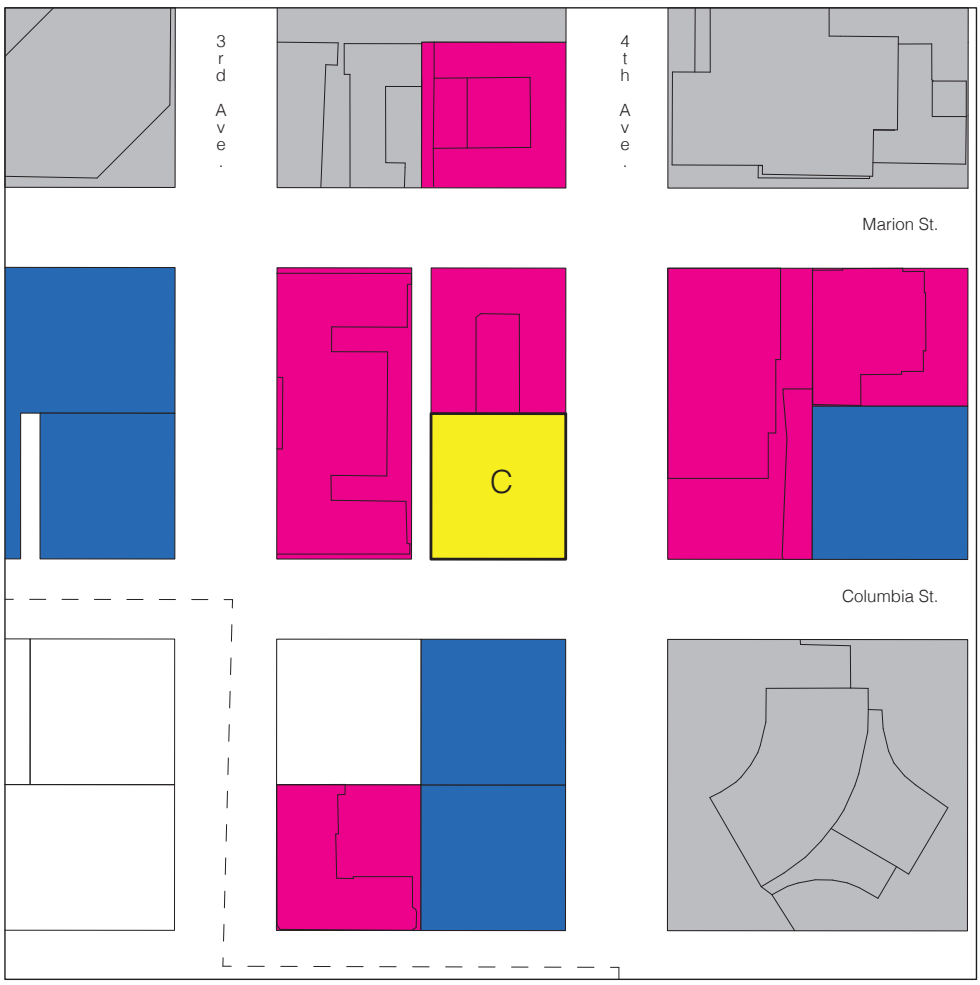
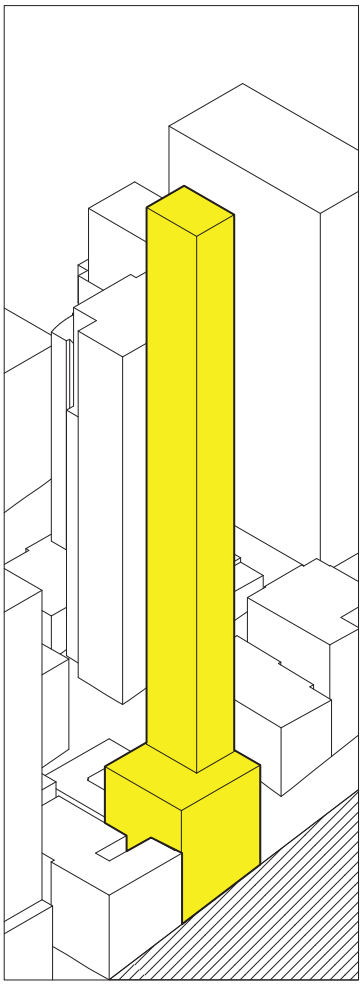


fig. 34 1101 4th Ave. analysis

fig. 35 1101 4th Ave. existing condition

807 4th Ave.





view rose with planned development

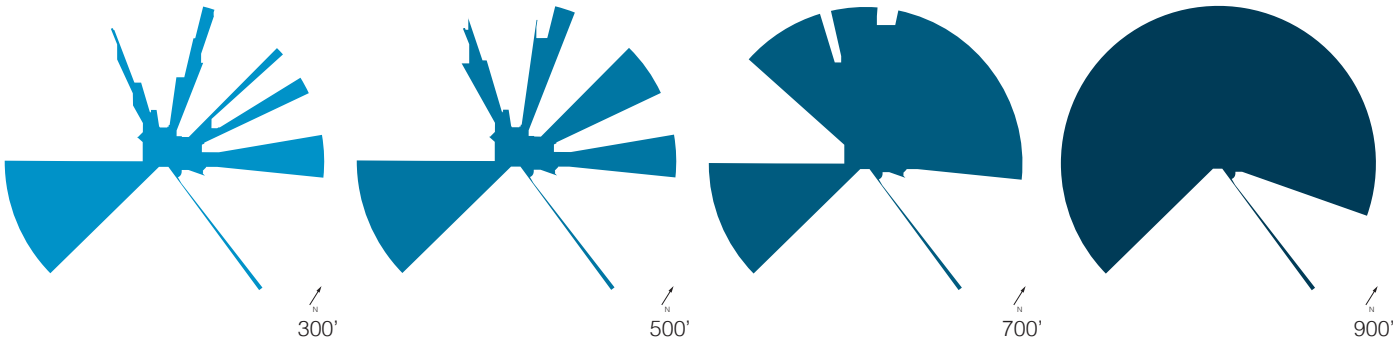
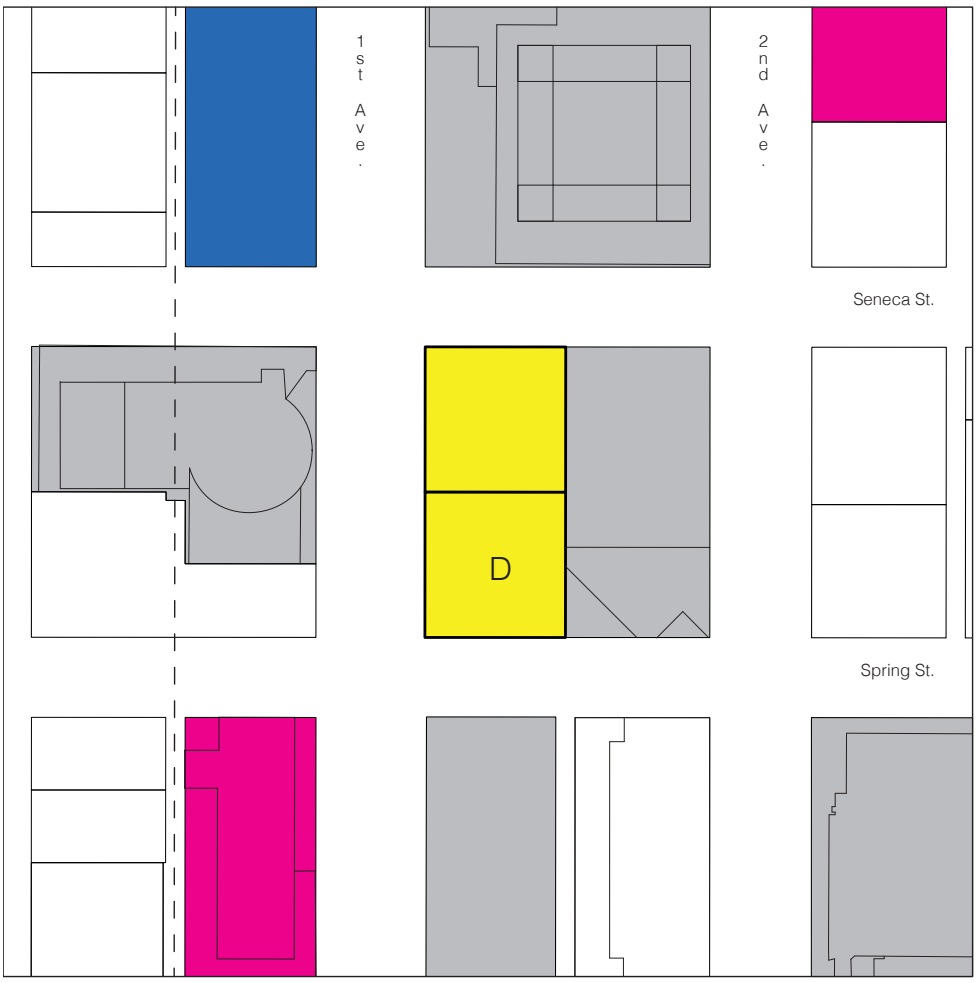
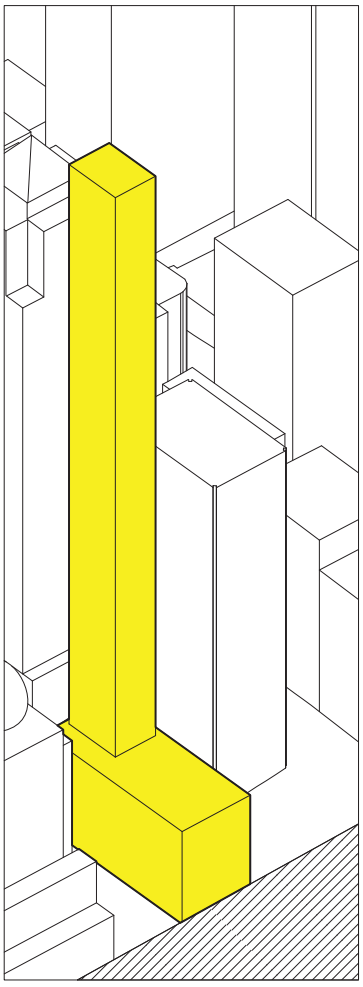


fig. 36 807 4th Ave. analysis

fig. 37 807 4th Ave. existing condition

1100 2nd Ave.





view rose with planned development

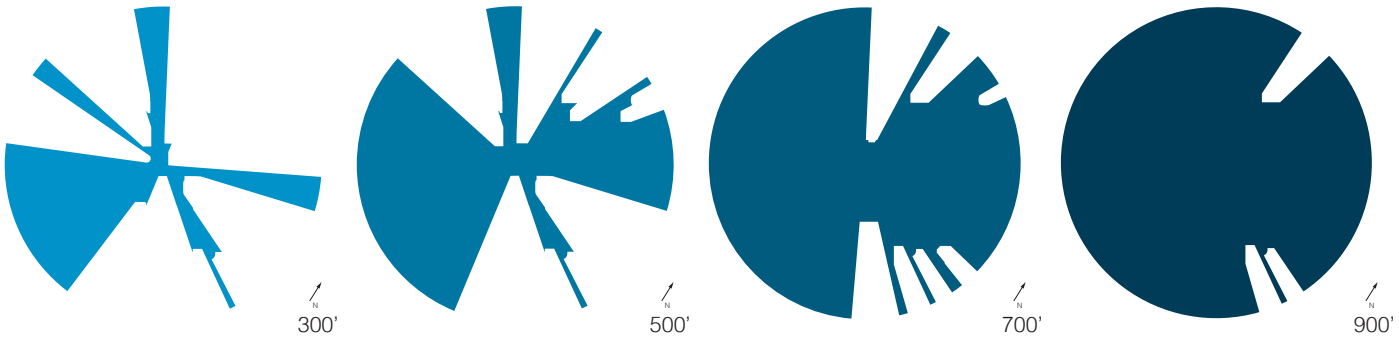
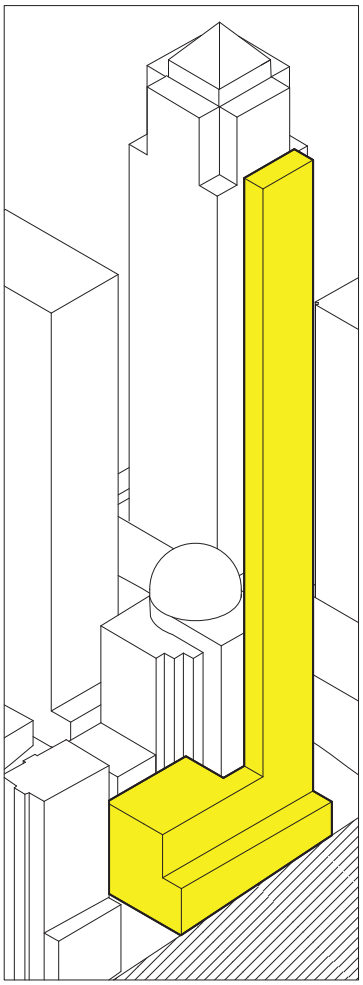


fig. 38 1100 2nd Ave. analysis

fig. 39 1100 2nd Ave. existing condition

1101 2nd Ave.



view rose with planned development

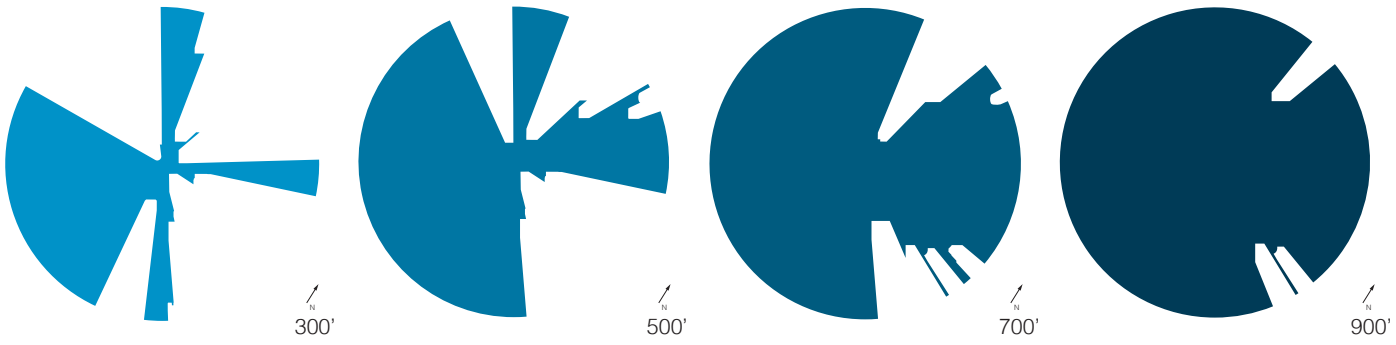


fig. 40 1101 2nd Ave. analysis

fig. 41 1101 2nd Ave. existing condition

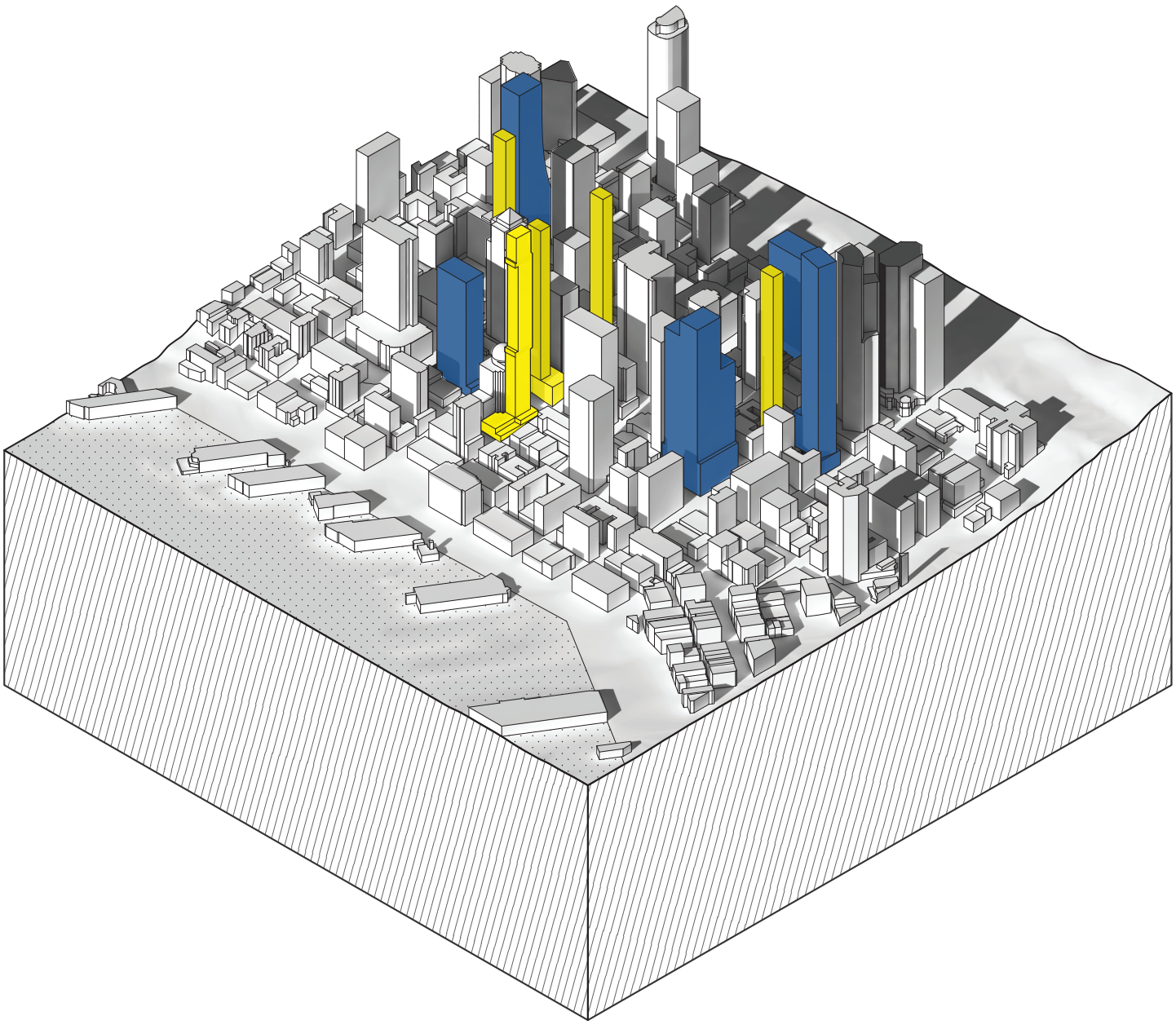


fig. 42 Axon of sites and proposed development in DOC1

Design Response

Design Response

The site chosen for this thesis design provided the benefits of protected views, proximity to other existing luxury residences and amenities, and was a challenging site legally and physically - emblematic of a site passed over for easier and more straightforward developments, and thus perfect as a test case for the legal and physical gymnastics which this type of development embodies. The chosen site, 1101 2nd Avenue is an oddly shaped parcel that sits mostly in the DMC zone, but contains a relatively small 60 ft. by 118 ft. area in the DOC1 zone, which allows unlimited height. While a site with a 60' minimum dimension allows a typically sized floor plate, this site has the extra burden of a required view corridor setback that effectively limits the tower to a maximum width of 30 ft. Another unique characteristic is a small sliver of the site, roughly 8' wide and 53' long that also occupies the DOC1 zone. This small slice of the site results from the history of the block, and the way that the land use zones are measured and assigned. Originally a 16' wide alley cut through the block, but when parcels on the block were merged the alley was vacated to allow larger developments. With the land use zones extending to the center of the former alleyway, this particular parcel ends up with an unusual shaped lot with an even more unusual zoning. These zoning oddities are something that restrict a more traditional or straightforward development of the site, but they also enable a development which has the funding to turn the restrictions into opportunities.

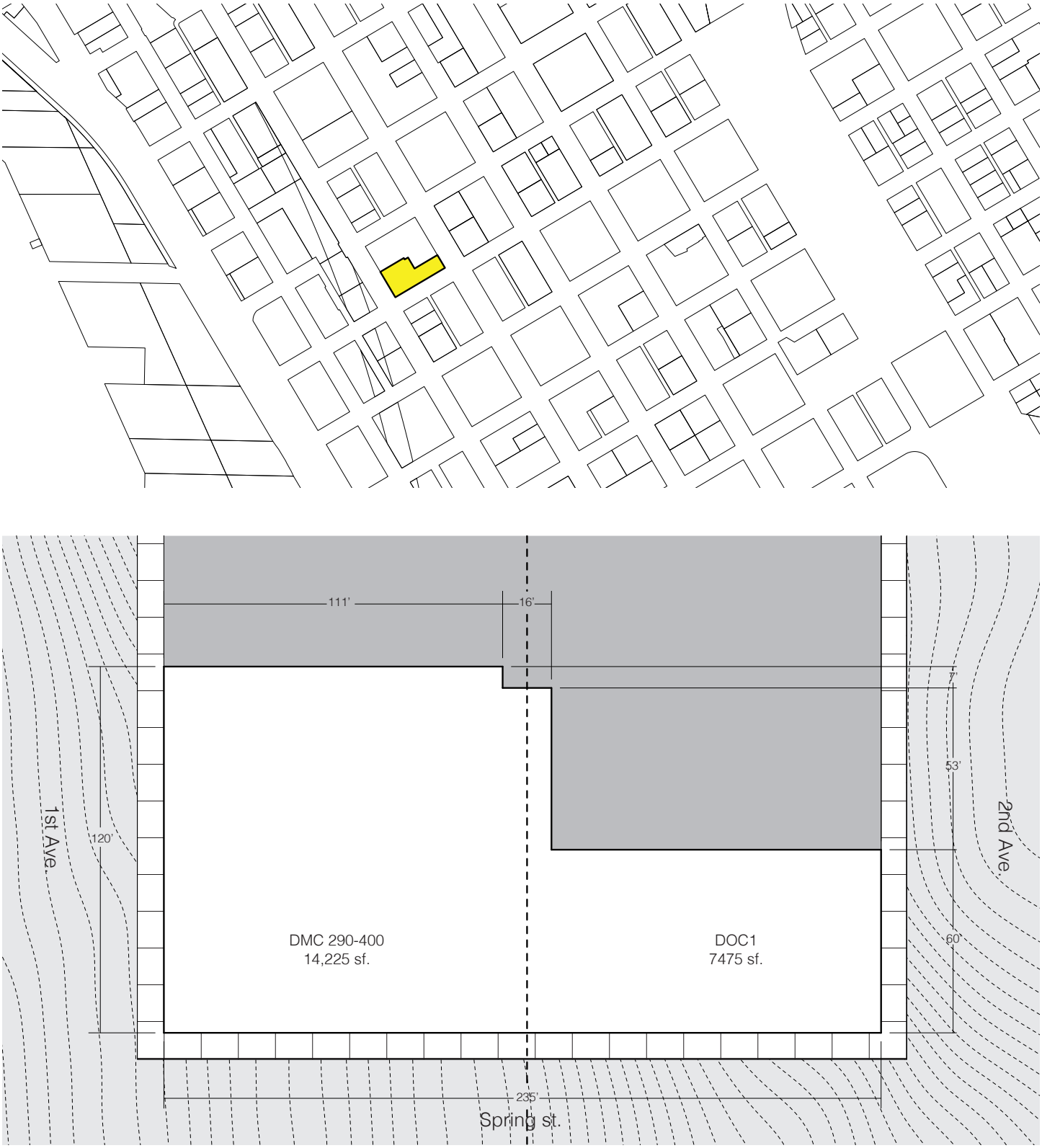


fig. 43 Site plan of 1101 2nd Ave.

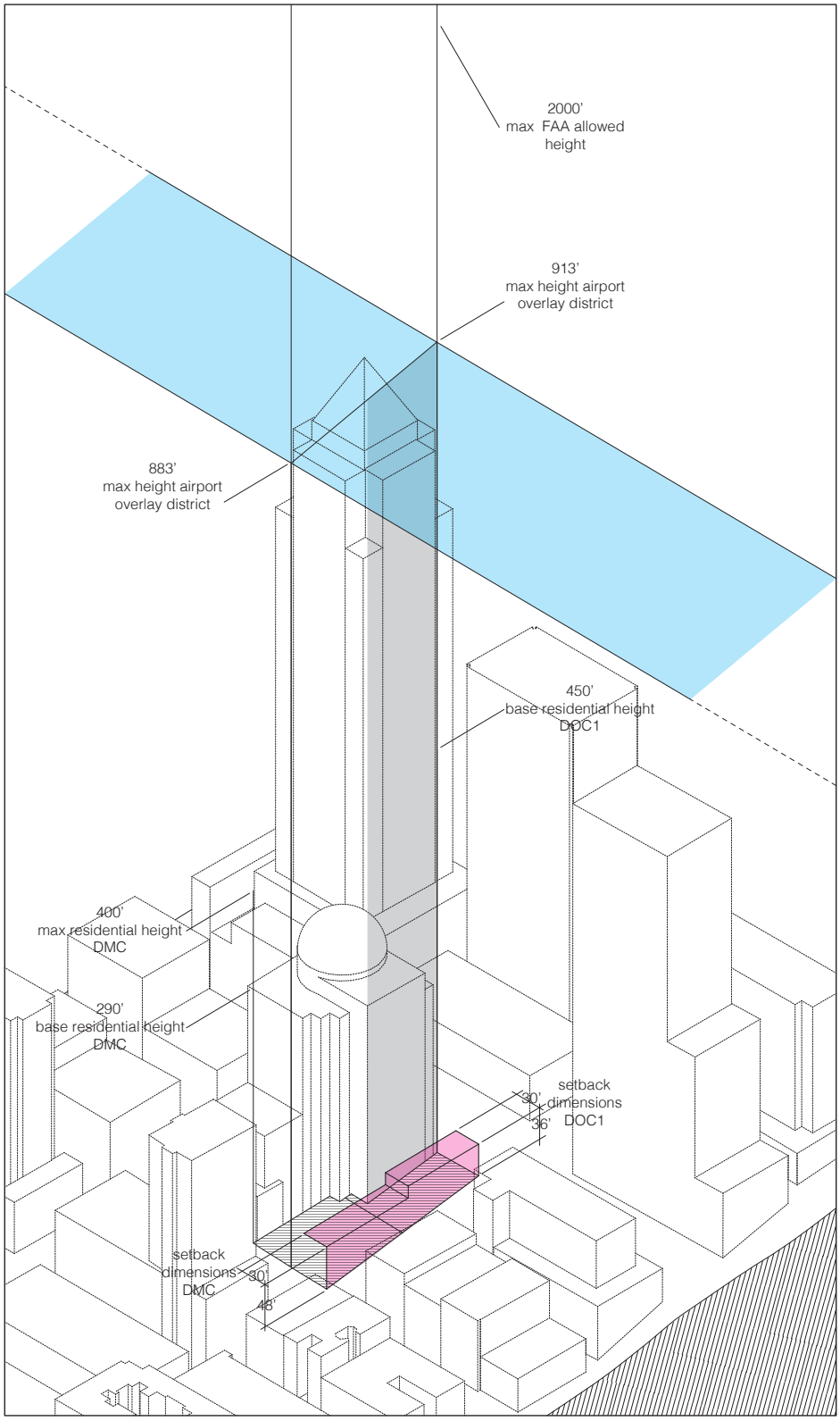


fig. 44 1101 2nd Ave. constraints axon

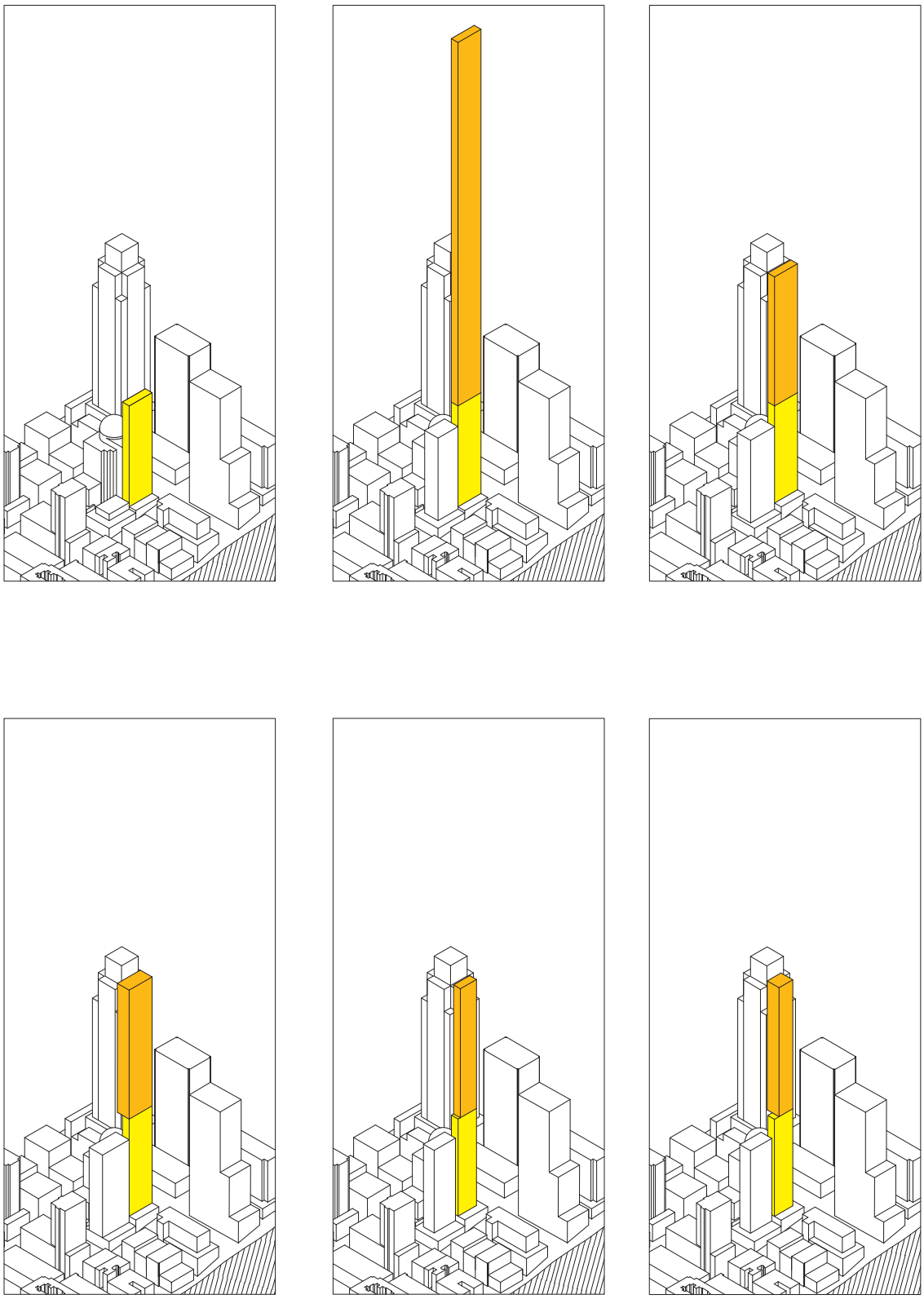


fig. 45 Axon of 1101 2nd Ave. massing studies

The design for the tower and podium evolved constantly through an exploratory design, with multiple iterations of a scheme resembling stacked boxes. A low, flat podium with a courtyard at the center gradually evolved into a larger mass with a long atrium stretching from 1st Avenue to 2nd Avenue connecting both street entrances and the entrance from the car court on Spring S`treet. This atrium opens up vertically to a series of balconies connecting the vertical circulation of the tower with the amenity spaces provided on the various levels of the podium mass. This interconnection allows occupants to see and to be seen as they move through the public amenity areas of the tower, and ties the various spaces and programs together.

Based on analysis of luxury residential buildings in both Seattle and New York City a list of amenity spaces was generated. The goal of this analysis was to distill the programmatic elements that define the highest tier of luxury and exclusivity from Manhattan, and to introduce these symbols to Seattle as a way to both create an aura of exclusivity, and to speculate on the future of developments in Seattle exclusively targeting an increasingly wealthy clientele.

What became clear through the research was that exclusivity and privacy were important and recurring themes throughout the design, development, sale, and use of the slender residential tower. As a case in point, the inclusion of a porte-cochere or a car court in the design of luxury residential towers is based on maximizing both privacy and

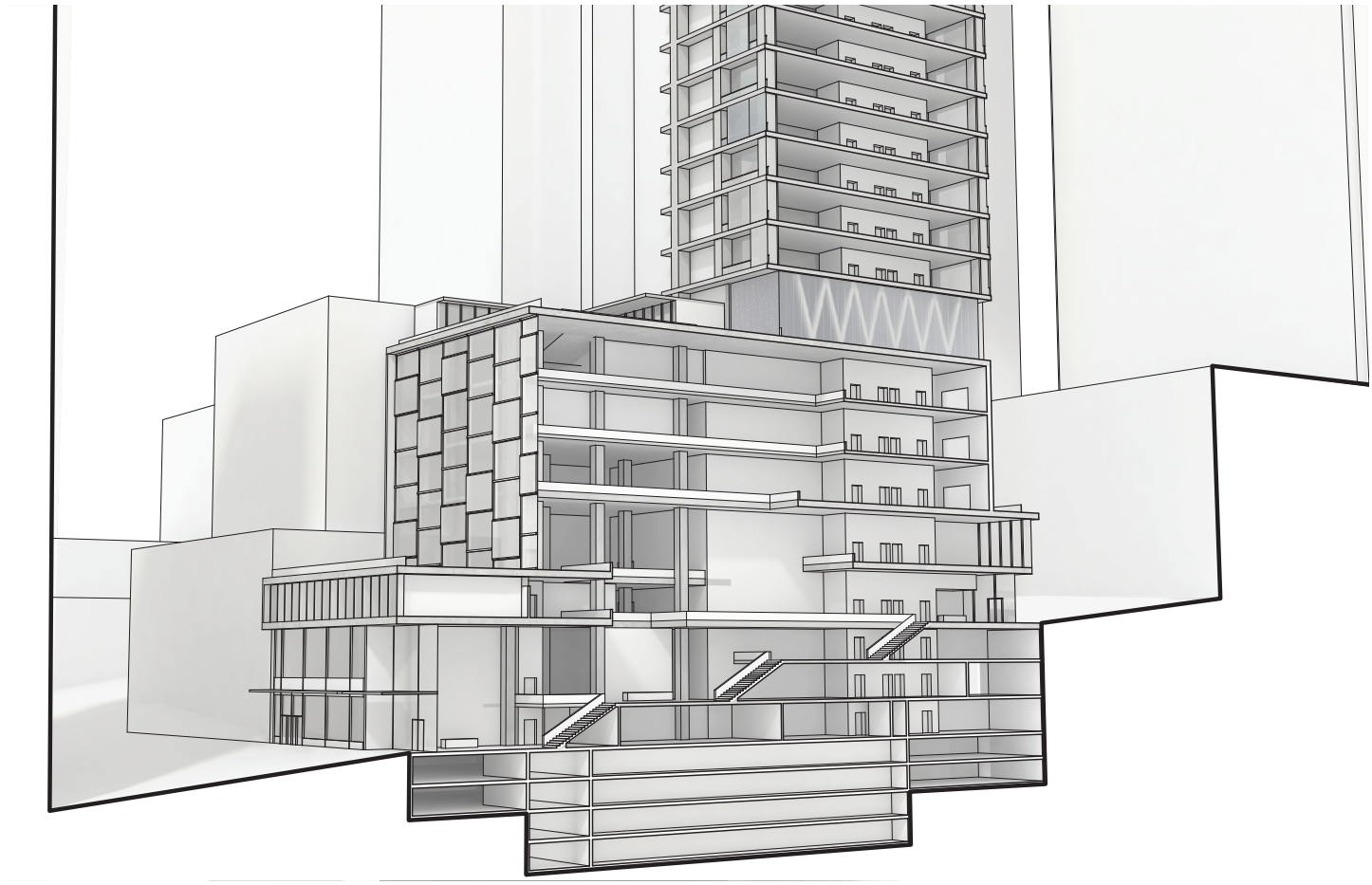
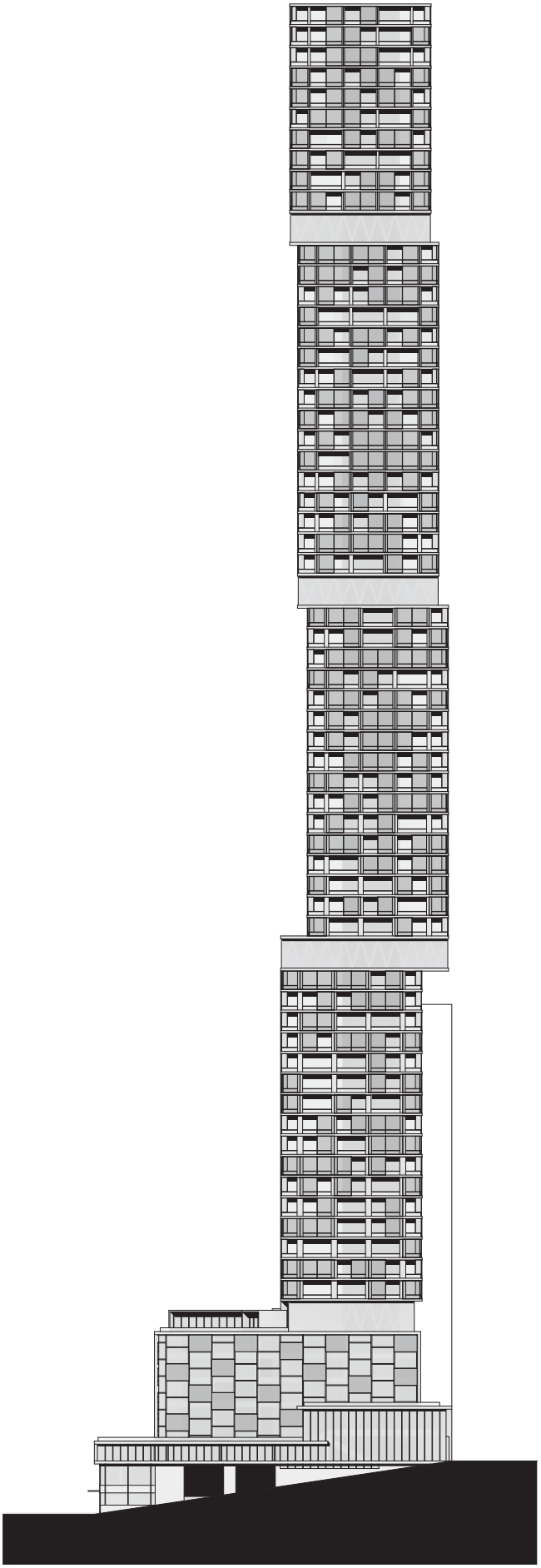


fig. 46 Section perspective of atrium space

exclusivity. A porte-cochere allows the user to maximize their comfort and privacy through the entire process of entering the building. There is no need to step foot in the public space of the street or the sidewalk - the user is transported seamlessly from the privacy of the car to the privacy of the building. The porte-cochere also capitalizes on the value of exclusivity. While most residential buildings have some form of integrated parking, there is a “cachet” associated with the ability to leave ones’ car at a grand entrance (with the valet parking the car). Removing any personal interaction with the banal world of the parking garage further reinforces the seamless luxury afforded by the tower.

Additional programming elements in the podium of the tower such as a high end restaurant, preferably one headed by a celebrity chef, and small retail spaces filled by designer boutiques, serve to further define the tower as a hub of luxury in the city. These public amenity spaces are important to broaden the appeal of the tower, and to provide additional services to the residents above, and to activate the adjacent public realm.

fig. 48 South elevation
fig. 49 East elevation



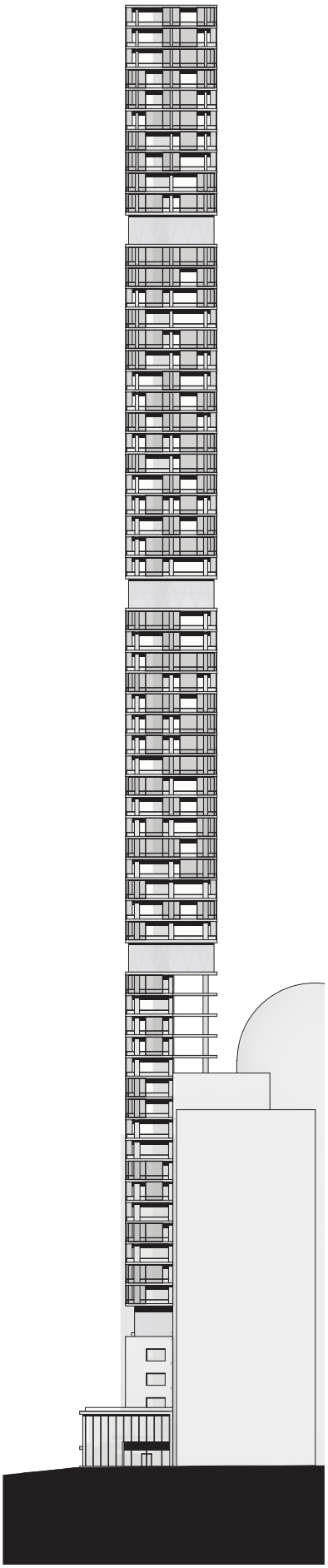


fig. 50 Perspective through atrium

fig. 51 Perspective through atrium

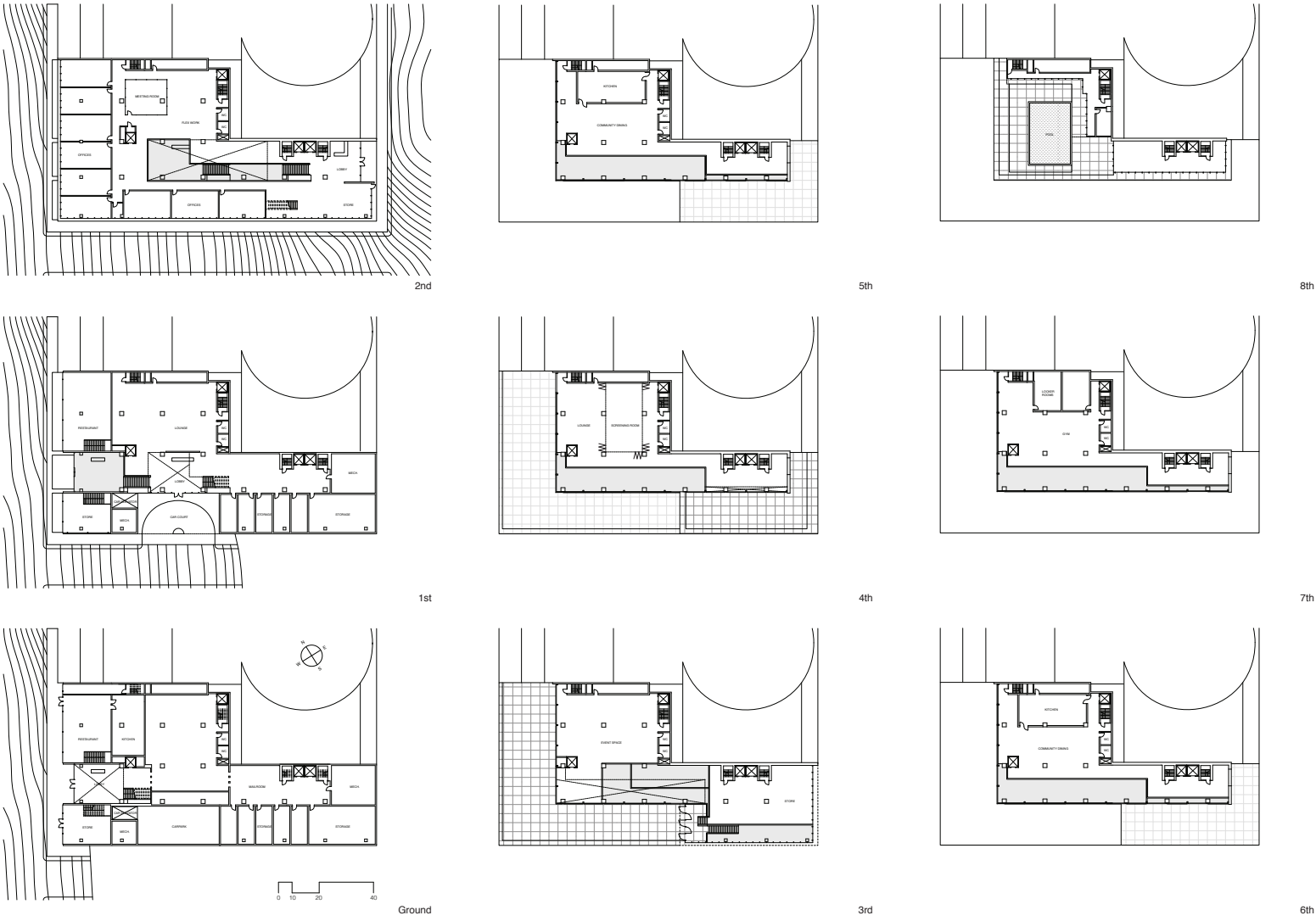


fig. 52 Podium floor plans

fig. 53 Section 1

fig. 54 Section 2

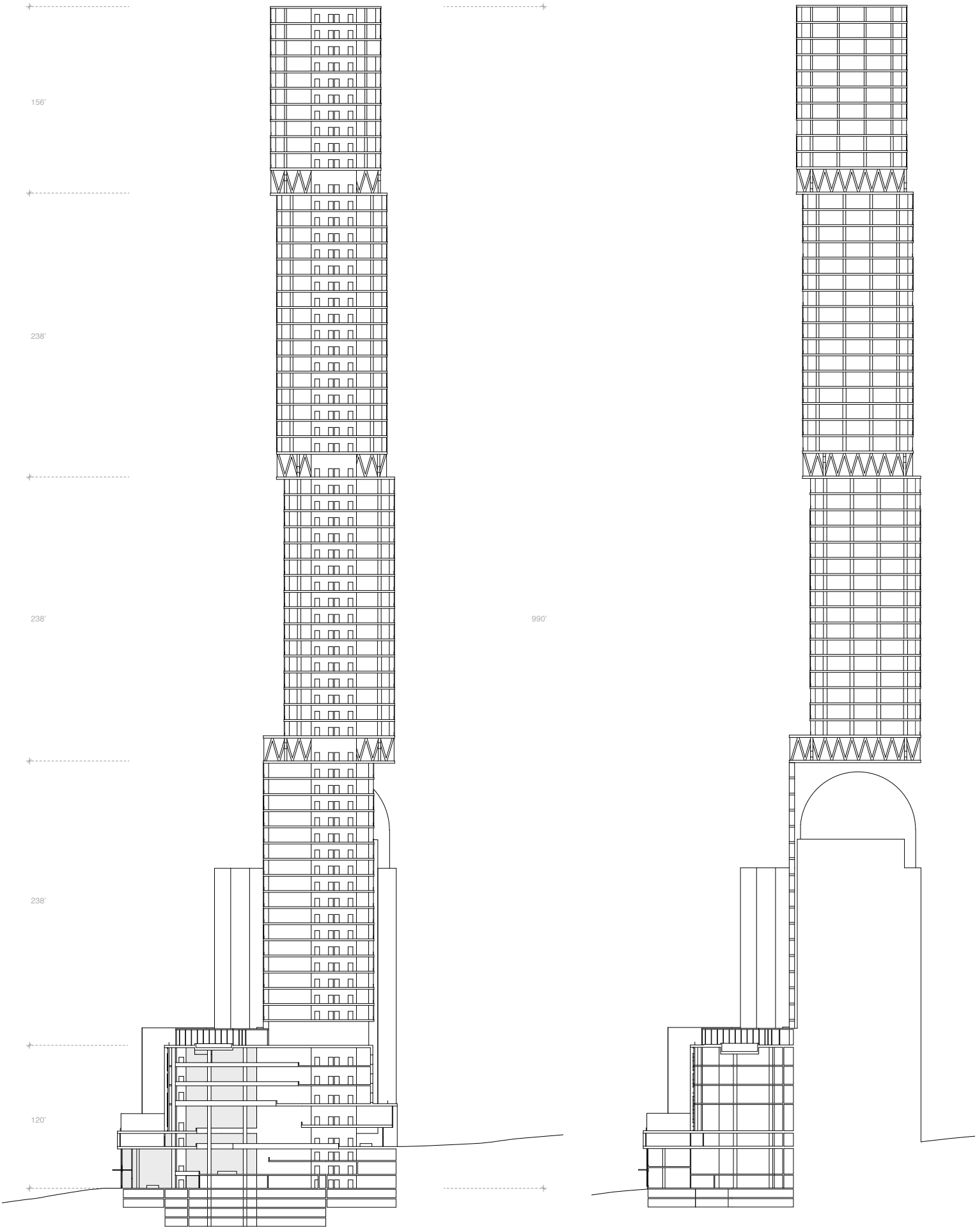
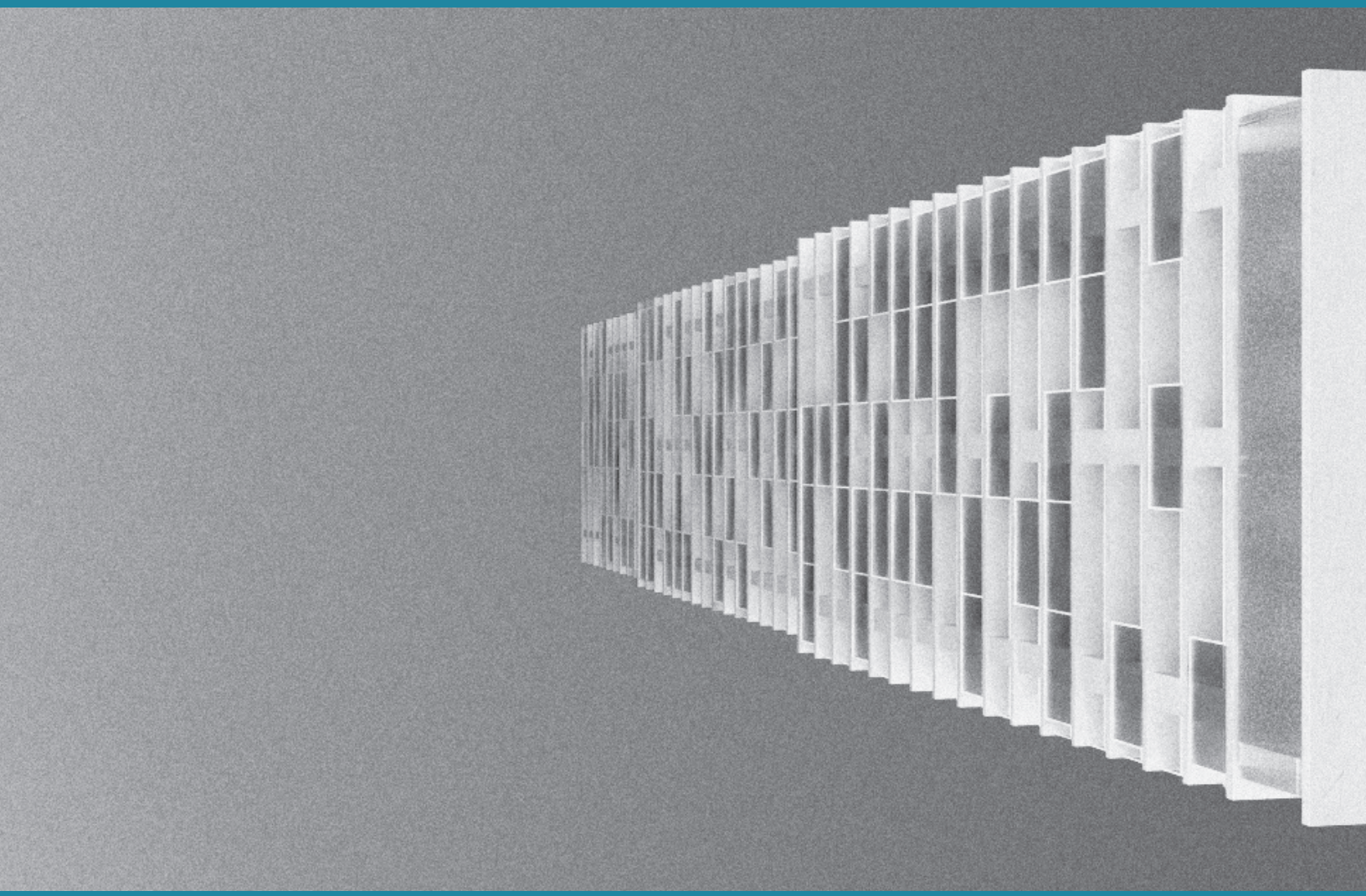
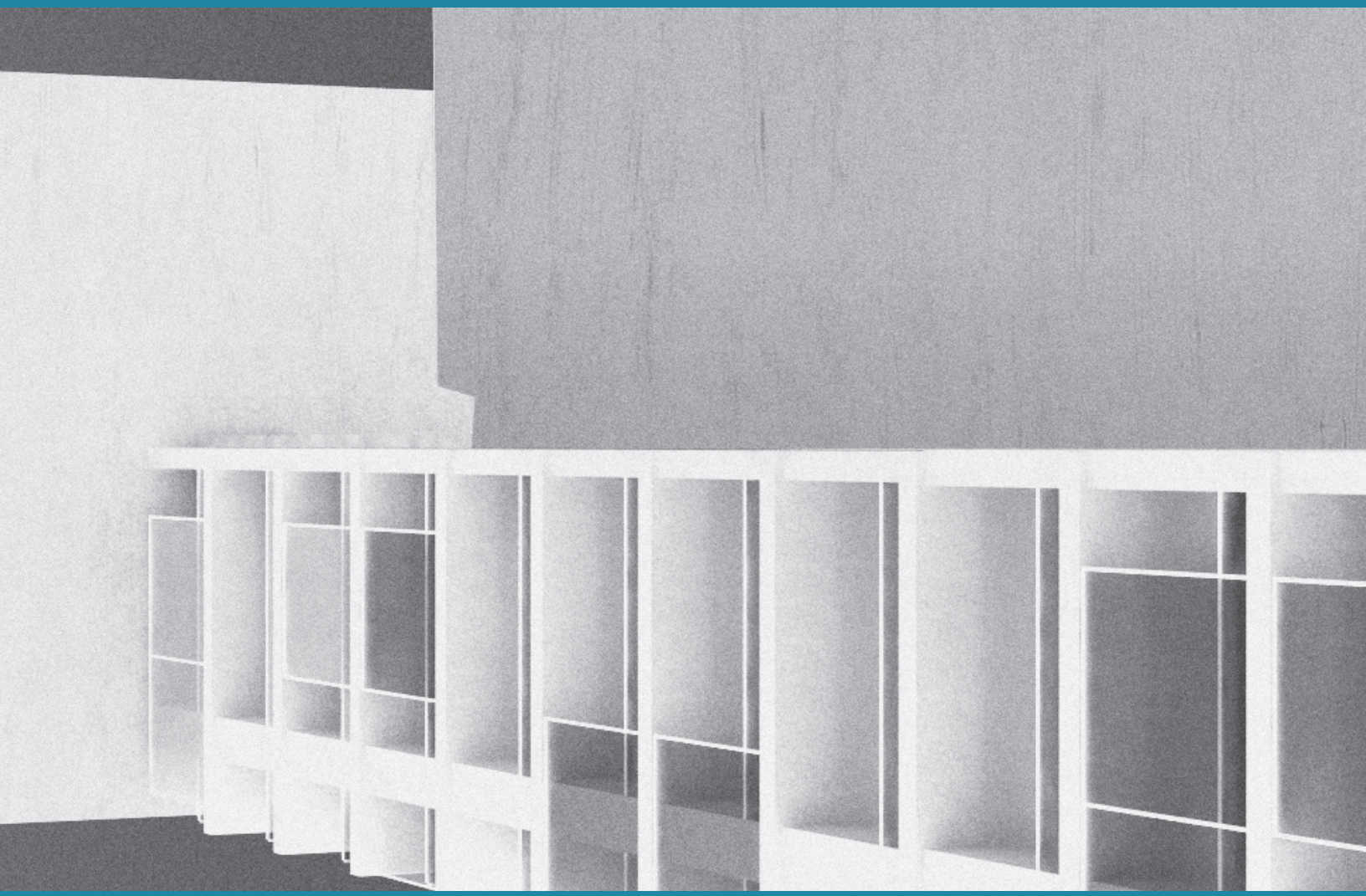

156'
238'
238'
238'
120'
990'

fig. 55 Perspective from penthouse

Conclusions





Future Urban Outcomes

Considering the possible proliferation of slender residential towers in Seattle raises questions about impacts of these developments on the city. Reaction to this projection has two distinctly different arguments, both positive and negative.

The first argument in support of this pattern of development is that increased residential density in the downtown zones will improve the livability and activity of the area creating a “24 hour” neighborhood in a part of the city that has been largely vacant outside of the normal nine-to-five business hours. Additionally, the fees paid to the city for the development rights over 450’ for each tower would be a boon to the Low Income Housing Fund, enabling more people to continue to live in Seattle that may otherwise be forced out by rising housing costs. Finally, the addition of downtown living that mimics the patterns and comforts of suburban living could draw residents and investors away from the more common patterns of high end development in Seattle which include building on green sites in the suburbs, or demolishing existing houses in the city to build much larger and much more expensive homes. Preserving unbuilt sites in the outlying areas of the Seattle metropolitan region has the benefit of protecting natural green space, and it also cuts down on all of the negative aspects that come with urban sprawl including a drastic increase in commuting by car. Finally, the preservation of existing residences in the city by focusing new development downtown leaves a lower barrier to entry for homebuyers who might otherwise be forced to rent. All of these factors come together to frame slender tower

fig. 56 Perspective from water

developments in a positive light. If money, development, and the wealthy are coming to Seattle, concentrating them in parts of the city such as downtown is the best scenario. The residential density and financial boost to low income housing, as well as minimizing the effect of development in other areas, are all reasons to support the development of slender residential towers in downtown Seattle.

The counter arguments against the development of slender residential towers present a critique of the bureaucratic response to the development or a theoretical disagreement to the underlying issues represented by towers that serve the wealthy, than to any argument about the spatial or urban impacts of these towers. One negative response to slender residential towers has to do with the city undervaluing the cost of residential development rights, and the opinion that the low-income housing fees are much too low. Seattle city planners have admitted that the zoning rules for the DOC1 are skewed heavily to incentivize residential development, and many people see this policy as the city undervaluing some of its most valuable spatial assets, and selling them for too little. A rough calculation shows that the tower proposed in this thesis would pay $4.5 million in low-income housing fees, a cost that could be easily recouped through the sale of a single condominium unit. So, while the fact that there is a fee paid by the developer is generally positive, the cost-to-benefit ratio seems to favor the developer too strongly. Another criticism of slender towers has to do with their power as symbols. The idea that these towers are both based on and a physical embodiment of broad global economic inequality often elicits

a more emotional response than other patterns of development. While these towers do not cause income inequality, they become the physical projection of this inequality in the urban realm, and that projection holds power. Seattle has only recently and rapidly become a city of considerable wealth on the global stage, and this transformation is at odds with many peoples' views of an egalitarian city. In addition to objections based on inequality, the view that Seattle is not a type of city that should have this level of wealth and this type of development is broadly held.

Code Issues and Updates

This thesis exploration found that a few land use and building code changes could make the development of slender residential towers in Seattle more feasible and much more equitable.

One primary change would be an update to Seattle's building code to allow scissor stairs to serve as two means of egress. This change to the code would shift the economics of the core to floor-plate ratio that is so essential to the development of slender residential towers. Scissor stairs could be limited to buildings with relatively small floor plates, by establishing an allowance based on the gross area of a floor plate, a maximum diagonal dimension, or a combination of both, to limit these stairs only to buildings where they would be effective means of egress. They could also be allowed only in residential buildings, so that office buildings that might have a much higher number of people relative to the floor area would still require two separate stairs. This change would

likely have the benefit of allowing more high-rise residential development in Seattle, and it could also shift the economics of sites that under the current rules would not be feasible for a profitable development. This change would likely allow smaller sites to be developed, which could help to preserve more older buildings. Fewer sites in Seattle's downtown zones would be left under-developed or neglected, and the additional residential units on the market could help alleviate the intense demand Seattle is currently experiencing.

Another important update to the land use code would focus on fees paid for low-income housing. Under the current rules, the money paid into the fund to support low-income housing has no geographic requirements relative to the development that paid for it. This often means the money goes to build new low-income housing far outside the area that generated the funding. Requiring the money paid by a developer to build low-income housing within a certain distance of the project that generated the funds would help prevent the displacement of people reliant on low-income housing to the outskirts of Seattle. Allowing people from broader economic backgrounds to live together in the same area could assuage concerns over these exclusive developments happening in Seattle.

The Final Word

There is a level of cognitive dissonance encountered by arguments for and/or against the development of slender residential towers in Seattle. They are both wealth inequality spatialized and an influx of life and activity in an otherwise homogeneous business district; both

preserving outlying areas from development, and a symbol of Seattle's rapid change from sleepy fishing town to a global city. This thesis has attempted to sift through the issues raised by these buildings and to present both sides of the argument without defaulting to simplistic judgments of good or bad. In effect, this thesis aimed to embrace the cognitive dissonance as a vehicle to critically think and reflect on issues stretching from the scale of global economic policies to the individual building. This thesis does not try to answer questions as much as it seeks to present a broad view of the issues embodied in this pattern of development, and to serve as a framework in which to reflect and consider society's morals and values across these issues.

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