Thoughts on Urban Verticalization. Going Up and Building High for the Future City: Learning from Israel and Beyond.

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From utopia to reality: Urban vertical aspiration and the evolution of the city

Urban verticalization has shaped most cities around the world in the 20th century, playing a big part in the conception, creation and expansion of the Metropolis and the new cityscape that continuously aims for the sky. The vertical city as a concept has been provoking the creativity of architects and planners for over a century, mainly as the solution to the urban challenges that emerged after the industrial revolution, a time when the city was being rapidly transformed, and a new socioeconomic model appeared together with the new era.

The intense vertical growth of our cities in the 20th century has formed the way our cities look and function, ultimately it has shaped what we consider as the modern city and urbanity, as well as the way we imagine the city of the future. Aesthetics aside, vertical building agglomeration has been a widespread solution to the growing demand for various different spaces in many cities of various scales all around the world. The evolution of the high-rise has had a huge impact on the image and experience of the city, shaping both the cities' skylines, but also ground level neighborhoods and public spaces, impacting how people move and interact within the urban setting.

Data and the city

Currently, architects and planners are called to respond to issues of migration and integration, facing challenges such as rapid urbanization, climate change, capitalism and pandemics. In response to this, in the era of information, we, planners and designers, take advantage of technology and data to help us manage urban risk and design resilient neighborhoods and cities that are responsive to these issues. Through our work we investigate how we can use data in various aspects of urban planning, which will uniform the research, and will help us gain a better understanding of the needs of the communities and areas that are to be developed. Data offers a pool of information that helps us create sustainable smart neighborhoods, improving the quality of urban life while providing opportunities for all.

High-rise development – a creation of capitalism

Undeniably the high rise has become an icon of capitalism, being synonymous with economic prosperity and ambition. Capitalism by definition is a financial operating system. High-rise development has always been a tool for capitalism to duplicate the ground and extract better revenue from each piece of land. From a more symbolic view, the high-rise became also an icon of progress and technology, a methodology to show strength and pride. Notably, the new ground zero WTC 1 tower by SOM was built higher than its predecessor, and to the symbolic height of 1776 feet to show the world that America returned stronger and taller.

During the 20th century the high-rise structure followed the need to maximize the plot's area by extending vertically, duplicating the ground as a typical floor. At the same time, it missed the opportunity to maximize its potential and properly assess vertical spaces in order to identify and utilize the new possibilities that come with this new space arrangement. However, structural engineering advancement and new technologies together with the growth and integration of infrastructure, sustainability and community-led initiatives, allowed architecture to rethink verti-

cal possibilities and reevaluate its urban and ecological impact.

Nowadays, the high-rise typology has a new responsibility: due to the climate crisis, densification has become the need of the hour and the high-rise has the potential to help create more sustainable urban environments. First though, we need to rethink a few issues in the core of the typology of vertical architecture, such as the typical floor, the program repetition, the relationship and interface with its surroundings and the facade, to name a few.

Infrastructure and vertical development

One of the key issues of our cities today is the development and growth of infrastructure. As our cities grow and expand all around the world, while in many cases, such as in Israel, new cities are being born to accommodate a growing population, it means that new urban territories need to rethink the design of infrastructure, its vertical possibilities and its integration within the urban fabric.

We realize that in the contemporary urban setting, infrastructure – whether it is an empty territory in anticipation to be developed or an existing urban setting with its complexities and density, it has a pivotal role in the urban development and particularly in urban verticality. Notably, HQ Architects are currently developing several multi-modal Transportation Hubs in and around Tel Aviv, where we work on how to integrate large scale infrastructure developments while working within densely populated built environments. In these cases, vertical development is not only desirable but it is the only way forward, while having to integrate various mixed uses, provide quality public spaces for both the residents, the local community who see and experience the transformation of their neighborhood, for business people who work in the area, as well as ensure that the transportation hubs are efficient and provide a pleasant and efficient traveler experience. Moreover, transportation overbuild presents several solutions to the urban density and to the challenge of large scale infrastructure interventions in a dense urban environment.

Transportation Hubs – a vertical meeting point of departure or a destination?

Transportation Hubs are often buildings that present a vertical spatial synthesis due to the programs they need to incorporate, as they have to interconnect multiple modes of transportation, and ultimately improve the efficiency and speed of movement, providing clear way-finding and fast and smooth transit for passengers. The transportation Hub, independent of its scale, has traditionally some retail attached to it, from a sole metro station to an inter-modal inner/ intercity hub, there is always some retail use that is incorporated as it needs to cater for travelers' needs. Transportation Hubs are the backbone of urban life, and as cities grow bigger so do they, resulting in more complex and dense structures, presenting programmatic diversity and complexity. They also present an exciting challenge on how to make not just efficient transit spaces but also spaces that are both efficient and enjoyable, and in many cases they can become a destination in their own right.

Can Transportation Hubs – a chance for underground verticality?

'If the 20th century is largely agreed to have witnessed a decentring of the underground from our imaginations – as Western eyes and minds were turned up and out (…) – there is ample evidence within and beyond geography that a new wave of going underground is beginning to swell' (Hawkins, 2019, 2, in Lidsky, 2022, 67).

'...Regarded as an effective and sustainable solution to address the issues of climate change and land scarcity, underground planning has increasingly gained credibility as an option for future urban expansion. Therefore, if yesterday's concept of verticality revolved around the idea of looking upwards and building skyscrapers, contemporary urban challenges are now driving it to open up to other perspectives and envision "groundscrapers" downwards (Labbé, 2016, 14, in Lidsky, 2022, 68).

While high-rise buildings are still likely to dominate the skyline in the near horizon, underground spaces seem to have a promising future ahead of them. As such, as new initiatives give up on conquering the skylines and move towards the exploration of subsoils, can the future of our cities be written underground? Could exploring the subsurface become a credible alternative to the outwards and upwards visions of the city?'[1]

Transportation hubs due to their nature, usually incorporating several different levels to accommodate different transit uses, they extend in different layers and depths, both vertically and horizontally. Therefore, in this case we are presented with the possibility to explore the verticalization downwards, where several programs are extended below ground, freeing up valuable space on the ground flour, hence creating milder building volumes with a smaller footprint, while increasing public spaces and green pockets' availability. In an attempt to explore underground urbanization, the transportation hub seems to be a great vehicle to explore the underground verticalization. Can the overbuild that follows transportation architecture and engineering flip underground? We believe that architecture and urban planning needs to explore more the urban expansion both towards the sky and towards the underground. Obviously the underground usage is more limited to the programs it can accommodate. These programs include functions such as transportation, digital infrastructure and underground farming, yet it can plays crucial role in shaping the underground living conditions, as well as the public urban space above ground.

Case study: Petah Tikva Transportation Hub

The Petah Tikva Transportation Hub is a building that integrates various programs in different levels, designed to reach a balance between the need of the passenger to reach the platform as fast and efficiently as possible, and the developer's desire to encourage the visitor's journey through the retail space. The transportation hub is located at the intersection of Petah Tikva's central streets connecting the old and the new city and connecting the city with other major cities such as Tel Aviv. By utilizing the natural topography of the site, the structure keeps a continuous connection with nearby urban focal points such as

the main street intersection, as well as work, retail and entertainment areas. This allows for quick and convenient entrances for all users of the complex, including buses, light rail, train, taxis, bicycles and private cars dropping off passengers. The design provides clear and articulate circulation and a sense of orientation for passengers reaching their platforms efficiently, as well as having easy access to retail space in the Hub.

By breaking the massive rectangular shape into smaller fractions, HQ Architects enable the creation of squares, urban spaces and retail facades towards the surrounding streets. The design turns the retail spaces to face outwards and connect with the city. The building's extroverted design also creates urban spaces suitable for socializing outside the building, serving both the surrounding streets and the city.

The new Transportation Hub will rejuvenate the old city center providing it with a new, dynamic transport environment. The Hub will also accommodate much needed office and retail spaces suitable to the growing metropolitan city of Petah Tikva, while enhancing passengers' experience and comfort.

Vertical urbanity: integration, intensity & interaction

Mixed use environments – connectivity, social and spatial interaction.

Urban vertical development in highly populated cities presents high intensity, both spatial and programmatic. As the result of that, we need to rethink what a planning area means in a vertical development, which is different from the usual low scale development. This vertical urban setting suggests a highly integrated environment where transportation, infrastructure, residential, commercial, public and civic use, retail, and various other programs coexist and cross interact, presenting a highly dense mixed – use environment. On top of the above, we need to take into consideration additional uses that service the city and its residents, which enhance connectivity within the urban setting. These include pedestrian uses (over and underground) as well as infrastructure and inter-modal hubs, which add another level of complexity on the inter-connectivity of the vertical development. It is, if you like, a mini city within a city.

Re-imagining vertical ownership in 3D

With the growth of urban verticalization it is essential to not just re-imagine structural and architectural solutions but there is a series of other surrounding matters that need to be addressed, including issues of ownership and the relevant legal context. Questions such as the following, quickly arise: Can the public own properties on upper levels? How do we accommodate both private and public usage in vertical environments? How do we create a safe and operative way that the general public can climb up, and enjoy different functions on several floors up on a private tall building? These are questions that we need to provide answers to, in order to ensure that vertical urbanization maximizes its capacity to provide integrated environments that cater for various societal groups, adding to the socioeconomic diversity and richness of our cities.

We have been investigating some of these issues through some of our projects, such as the recently completed Bezalel Academy of Art & Design New Campus in Jerusalem, (in collaboration with SANAA), where the building offers an open route and several areas, including cafe, and gallery spaces for the public to use freely. There are several other tall buildings in our portfolio where we have explored this concept of integrated public usage within privately owned high-rise, providing several spaces that are open to the public, integrating several a wide range of uses including and social care spaces such as kindergarten, leisure and entertainment, open air areas, among others. Accommodating 3D ownership in urban verticalization will soon become an essential element in the growth of our cities, where private use overlaps with private ownership creating a mixed-use environment that resembles the one we are used to meet on the ground level. Once public entities stop looking at the tall development as fully private, the typology will change from super efficient "duplication of the site" to a 3D urban environment offering free and public functions on top of privately owned spaces.

*Case study: Givatayim City Hall – vertical mixed use with an open public roo*f

Consolidating activities from 16 different municipal buildings currently scattered around the city, the new Givatayim City Hall focused on the municipality's interaction with the public. The building's programs are categorized based on levels of accessibility to the public, and introduce the concept of the "Urban Salon", while it allows public access to the open public roof, creating a mixed use environment that accommodates different private and public uses in the heart of the city.

Located next to the historical city hall building, the project is a new building which unites all of the municipal departments into a complex that is clear and accessible to the citizen. The building consists of seven floors above the ground, the first five floors are occupied by the municipality and the upper two levels are planned for office letting. On the ground floor is planned an open coffee space and a public square at the street level – making a smooth transition between the exterior and the interiors of the building.

The building will include a wide variety of functions including the municipal office, the city administrative functions, the archives, the waiting areas, an urban center, a service center for the residents, a plenary hall and an emergency control center (first basement floor).

The public spaces concentrate all the services and activities. The program is not only organized according to departments, but also by means of accessibility to the user, enabling direct communication between citizens and the authorities. This scheme enables the municipal departments to organize effectively along with the building – the circulation leads visitors along with the public program without interruptions.

Tall buildings: Lifespan and demolition, the long-term impact

One aspect of vertical urbanization that is usually ignored is the lifespan of tall buildings, which is an average of 50 years, and what happens when we need to either renew or demolish them? What is the impact of the disposal of tall buildings in the urban

fabric and our cities? We believe this is a pressing issue that we are already pushing us to think through the challenges of a limited lifespan of buildings, as well as posing questions regarding the impact of demolition and building methods. In Tel Aviv for example, we can see that the city is suffering tremendously in this area with renewal interventions taking place in buildings of much lower scale, such as 4-5 stories high. What happens when several skyscrapers need to be renewed or demolished in a city? Can we foresee what the impact to our cities and quality of life in the next 50 – 60 years, will be when we will need to renew or demolish buildings of much greater scale and durability? Is the city doomed to be a never-ending construction site?

While construction standards are continuously raised to meet several requirements and high engineering standards in response to resilience to natural and human phenomena including earthquakes, terrorism etc., we need to seriously question what will be the consequences of demolishing tall buildings. There are buildings in Tel Aviv, which are of massive in scale – not only in height but also width and urban footprint, such as the old Central Station, which cannot be demolished due to its largess and construction. This is a challenge that we need to deal with today, in order to be prepared to take action in the next decades. Thinking about a building's demolition or how it will be handled in the future years should be part of its sustainable identity and it is something that architects bad engineers need to consider while they design it.

Case study: Soho Tel Aviv. Integrating live, work and hospitality spaces to cater for a varied demographic in the heart of Tel Aviv

The high density that verticalization suggests has a great effect in the creation of various programs and how they are organized and interact within the same structure. In the case of one of our projects, the Soho Tel Aviv Boutique Hotel, we created a mixed use residential and hospitality building, which promotes a socioeconomic ecosystem that embraces community and sharing. The 24 story building introduces a variety of housing typologies with various micro-units and shared facilities that allows different communities to live side-by-side in the heart of the city. Soho Tel Aviv sits in an empty space, currently a parking lot in the center of Tel Aviv. The idea of having a hotel in this area stems from the work that is currently happening at the triangle of Montefiore neighborhood and the market as well as the entire surrounding area which is undergoing a face-lift as part of the Tel Aviv municipality's vision to make it the next business area of the city, both in terms of high-rise construction, infrastructure and public transport (both underground and overground).

This new hotel and office tower, unlike the hotel strip along the city's coastline which is mainly tourist oriented, will cater for business oriented people traveling to and working in the business center in this area. The building comprises a set of hotel, leisure and business oriented spaces. The tower building incorporates a lobby, a lounge space and backyard on the ground floor level, as well as gym facilities on the lower ground floor. The building aims to include 248 rooms total and shared office spaces within the hotel operation. It contains approximately 2,000 m² of office space, 248 hotel units, an outdoor pool on the 10th floor and a rooftop bar on the 24rth floor offering great views over Tel Aviv. Each floor will have 22 rooms. The building will also include underground parking and storage spaces. Adjusting to the new needs of the area and business center, the hotel offers a wide variety of spaces in order to accommodate the different needs of a versatile and demanding international clientele. In this spirit, the hotel rooms are split between two categories: Short-term rooms, with a typical room size of 11.9 m², which are located in the lower body of the tower, whereas the Mid-term rooms situated on the upper floors, offer a mix of different spaces ranging between 20 m² – 35 m².

The building's facade is constructed of 5 different cubes stuck irregularly on top of each other, in order to create spaces which are tailored to the needs of each program contained within the cubes. Each cube features specific window openings, varying in sizes suitable for the room size of the relevant floor. The facade of the lower part in which the hotel contains the short-term room, features a unique set of bowl-shaped windows that extend towards the outside. This window design enlarges the size of the room and creates a comfortable vibe in the interior by extending the room towards the city.

Case study: HaHarash Tower. Vertical multi-use interactivity

The 24,079 m² multi-use high-rise tower incorporates a wide range of different uses including a hotel, office spaces, residential apartments and a Sky Lobby designed to host communal and leisure activities overlooking the city. The multi-use building is located in Tel Aviv, in a prime location situated close to the Haganah Station and the Ayalon Highway, and will contain a hotel, residential and office space and a raised lobby space. The building is a synthesis of program diversity from underground to the top. On the ground level it features an open air area which contains accessibility areas such as drop off for cars and escalators. The eight storeys high hotel, sits right above the ground level.

On top of the hotel floors sits the sky lobby – a unique raised lobby space, which includes a wide range of communal and leisure areas and serves as the main infrastructure landing core, serving all areas of the building. The lobby features gym facilities, an indoor pool, a restaurant/cafe. The building is almost 'cut' in the middle by the Sky Lobby, a space which is being moved from its usual ground floor position and is being raised in the middle of the building, providing a lobby of great views and a unique feel. Above the lobby space sits a 12 storey high commercial space and on top of it 6 storeys of residential use, featuring apartments with unparalleled views of Tel Aviv.

The design illustrates simple and clean lines where the infrastructure acts almost as an ornament to the facade. The sky lobby also differentiates from the other floors and programs which is also illustrated in the facade through its curved glass windows.

The exposed elevators from both sides of the building communicate the circulation and how the building is serviced for different uses. The tower is designed in a way that it not only communicates its complexity but it also celebrates this program-

matic and user interaction, exposing its character to the city.

Urban design – a mobilizing factor for Urban verticalization?

Vast urban growth and regeneration has introduced a set of new spaces, while also re-distributed spaces of various programs and uses, both built and open, including residential, commercial and public usage. Urban verticalization is not only about building in high density or creating the tallest structure possible, but it also responds to the quality of life in contemporary metropolises - to each one with each own urban idiosyncrasy. This includes the interaction of different layers of space, including ecology, infrastructure, mobility and culture. New urban design solutions need to provide new spaces that are both integrated and flexible, and create urban networks that can adopt to contemporary social, political and ecological conditions all around the world. Urban verticality is taking over our cities all around the world, and urban planning conditions are influencing heavily the design of tall buildings in addition to the spaces around then and between them.

As Zongjie Lin writes in the book – 'China perspectives: Vertical Urbanism – re-conceptualizimg the compact city', vertical urbanism is not just about the tall structure anymore, it has become inextricably linked to its surroundings and thus heavily contextualized. "Although the term 'compact city' appears frequently in academic accounts of sustainable urbanism as well as in professional documents for planning projects, it is often used in a manner generally linked to certain well-established principles including high-density, mixed uses, walkability and transit-oriented development (TOD)… The compact city actually possesses the power to generate dynamic forms, utilize cutting-edge technologies, address pressing environmental issues, and respond to distinctive geographical and cultural contexts – thus enabling it to challenge conventional notions of urbanism….Vertical urbanism distinguishes itself form the nostalgic idea of Neo-traditional urbanism on one hand and the static Modernist notion promoting tall buildings as dominant urban typology on the other. In contrast, it advocates physically interactive and socially engaged forms addressing the city as a multilayered and multidimensional organism."

Our experience in urban planning and regeneration suggests that high rise mixed use developments can create the right conditions for the successful development of vertical urbanization. Meanwhile, there is a growing interest in Urban verticalization integrated within transit-oriented development that are currently creating a new way of developing urbanized areas simultaneously with the development of infrastructure zones and new public spaces. The wider Tel Aviv Metropolitan area is a relevant example of how new urban development together with transit oriented development are creating new urban areas that extend the urban fabric, with a focus on urban verticalization. Thanks to the creation of new metro infrastructure and the extension of existing railway systems and their integration, new areas are being transformed and other are being born, with the high rise having a prominent role in its design and realization. Tel Aviv's urban fabric is currently undergoing a huge transformation with evident urban verticalization in many areas of the city', both in its centre and the wider metropolitan area. The inevitable urban verticalization of Tel Aviv partly relies on its intense infrastructural and transit development as well as to another key factor that little other developed countries are currently facing – the rapid population growth, with a prediction to double its population in the next 20 years. The projection fro Tel Aviv is clearly a 'city packed with skyscrapers'. "Tel Aviv has produced a major update to its master plan for the city in recent weeks in a bid to cope with an expected population growth of up to half a million residents by 2025. It proposes making the city landscape much denser, with dozens of new skyscrapers between 20 and 80 stories high. The plan would direct increased building to corridors served by rail and metro lines. In the area of the now-closed Sde Dov airport, there are plans for nearly 13,000 housing units based in multiple apartment towers."

Mobility and Transit-oriented development is influencing heavily urban development and will eventually establish urban verticalization in a faster pace than expected, as it creates integrated environments that not only produce mixed-use high rise structures but also define the very important public spaces around them, creating new neighborhoods and in some cases even new cities. HQ Architects are currently working on several transportation hubs in Tel Aviv Metropolitan that also showcase a wider urban planning ambition in order to create an integrated urban environment. One of them, in Rishon LeZion, will create a new hub that will bring heavy rail, light rail, and multiple bus routes together—a key interchange on the Ayalon Highway that dominates Metropolitan Tel Aviv. It will serve as both a transfer point and a terminal, helping to catalyze the burgeoning business districts as transit-oriented high-rise developments. The new Hub and the surrounding developments will also have as a focal point a main Plaza that will be created at the heart of the new transit focus masterplan. This is a key example on how urban verticalization of various programs – be it transit, commercial, residential etc., has a major role to play in the creation of public spaces and elevating the value of a whole urban experience and quality of living in cities.

The discussion of urban verticalization suggests a more dynamic and complex urban synthesis of just a vertical expansion of high rise structures. Therefore it is essential to include not only transit -oriented urban developments which are defined by urban verticalization – see the Canary Wharf development in east London, which created a whole new city within London that was initially built as sparsely populated financial center and gradually developed into a new compact and high density and dominated by high-rise structure London area.

Urban gardens – a new green space in the city?

Beyond transit and infrastructural development which can define the need for urban verticalization, there is another important dimension to it, that is worth investigating and taking into consideration. The growing interest in urban ecology and landscape adds another important dimension of the urban system

calling for vertical urbanization. Can the growing interest in vertical 'urban gardens' or 'urban forests' promote the growth and expansion of urban verticalization? There is a growing interest in 'urban biophilia' and the urge to reconnect the high-rise urban density with nature, in an attempt to recreate the feeling of being surrounded by nature in vertical living. It is still a concept that has not taken off massively, although there have been a few successful attempts world-widely, such as the famous Bosco Verticale in Milano by Stefano Boeri and One Central Park apartments in Sydney by French Architect Jean Nouvel, among others, both examples of high rise gardens that have fulfilled their mission, whereas there have been other examples, mainly in Asia, which they haven't passed the test of time.

In conclusion, when we discuss urban verticalization, we need to consider several other aspects that go beyond the vertical standalone structure and tall buildings. We need to see urban verticalization as a set of elements that can promote a healthy and well integrated urban environment that will not just accommodate needs of housing or mobility, but also as the future growth of cities that encourage well-being and raise the standards of everyday living.

Conclusion

The way forward -vertical urbanization: opportunities and challenges of a vertical urban future

As technology increasingly connects and optimizes cities and the urban experience, we will witness the verticalization of our cities taking over and the skyline becoming more dense. It is the time we need to investigate the capabilities of technology to influence and shape the high-rise, and how it can reach its true potential by creating sustainable, resilient and human-centric vertical architecture that responds to the needs of future living.

Surely, we see the opportunities and the exciting prospects of vertical urbanization, but we also need to face the challenges that come with it. It is essential to have an in-depth understanding of the failed examples of the not so distant past, in order to avoid future failures that can adversely impact our cities and our societies. The high rise has the potential to introduce truly innovative ways of living and shape living and public use. Also, it has the dangerous possibility of becoming a ghost of ambition, exactly as it fails to meet the needs of the rapid urban, societal and economic transformations that are taking place.

While we are designing vertical structures and exploring urban scenarios, we also need to face the challenges that could threaten the long term sustainability of such projects. It is crucial to understand the importance of designing high-rise not as a sole individual building, but as a part of an urban puzzle that will heavily influence the built environment around it, local communities and their social life, the quality and usability of public space, as well as the well-being of neighborhoods and their residents. Building for the future, also means thinking not just for the day after but for the decade after. Maintenance and resilience are key aspects in the design of vertical structures that will need to respond to climatic, demographic and socioeconomic changes. We have witnessed in the past innovative concepts of compact vertical living spaces that have failed to respond to the zeitgeist and contemporary needs. Most notably the social housing in the 60's and 70's, which failed in many places to respond to the true needs of the people it was meant to serve. Modernism promoted the duplication of the structure, which ultimately brought isolation and neglect to the buildings and urban areas, making them inhumane places to live, and failing tremendously to accomplish their mission.

We believe that data and technology can influence vertical architecture to a high degree that extends beyond engineering and structural innovation. Due to the very nature of the vertical structure, it has been vastly duplicated and copied around the world, very often without being integrated with the local urban setting and without responding to socio-economic and geopolitical particularities. Data has the power to inform us about the current needs and issues and thus, shape the vertical structure from the bottom up. It should be less about the obsession to touch the sky, but more about improving our well-being and living on the ground upwards, focusing on urban verticalization that offers smart solutions, moves away from dullness and that is playful and well-integrated. It should encourage public and social activity – not isolation, as well as well-being and health, promote and activate green and open spaces that are important to the long term sustainability of the buildings and their urban setting.

Soho Boutique Hotel Tel Aviv

Petah Tikva Office Complex

Petah Tikva Transportation Hub