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Extending the Ground: The Tall Building as Public Continuum

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This paper explores how tall buildings can operate as an extension of public space rather than only a privatized vertical architecture, using a trio-connected supertall proposal on Chicago's downtown lakefront as a design-based case study. The project was developed within a tall-building design seminar at the Yale School of Architecture led by Kyoung Sun Moon and addresses the design of a mixed-use high-rise incorporating office, residential, hotel, commercial, and public programs. Chicago's lakefront has historically functioned as a continuous public system, yet contemporary infrastructure, land scarcity, as well as coveted private developments along the waterfront have increasingly disrupted public access to the water. In response, the project proposes a vertical public ground that extends the civic logic of the waterfront upward into the tower. The design introduces three supertall towers interconnected by a large-scale public space structure serving both the tower users and the public. Instead of following the conventional solo tower model in which height correlates with increasing privacy, the project incorporates publicly accessible programs—such as museums, galleries, libraries, and indoor gardens—within a 250-meter-tall shared structure between independent hotel, office, and residential towers. A dual-core circulation system, one core mainly opens to the tower spaces and the other primarily to the shared public space structure, with exposed express elevators are employed in the public cores to make public access legible, direct, and spatially distinct from private uses. By reframing the tall building as public infrastructure, the paper argues for a new typology of vertical civic space applicable to dense urban waterfronts shaped by infrastructural constraints.

Keywords: Lakefront urbanism, Public infrastructure, Civic space, Mixed-use, Connected towers, Megatall

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1. Introduction

Chicago's lakefront has long operated as a continuous public system, where access to water is understood as a collective civic right rather than a private amenity. This vision was formalized in the Plan of Chicago (Figure 1), which framed the waterfront as accessible public ground structured by parks, promenades, and interconnected open-space networks. However, contemporary urban development—particularly the proliferation of tall buildings along valuable waterfront sites—has gradually inverted this logic. Consequently, space tends to become progressively privatized, height increases of buildings have reinforced a vertical separation between public ground and private upper levels.

When tall buildings are placed along the Lake Michigan shoreline, this condition raises a critical question: can verticality be transformed from a concern of privatization into an opportunity of creating multi-level open public spaces with great views at heights? Rather than displacing public space, tall structures may instead use their height to support additional civic programs—such as libraries, museums, and elevated parks—allowing public space to operate in a more complete and layered form while serving surrounding commercial, office, and residential uses.

Precedents of interconnected towers with limited public programs have already been established. Projects such as Marina Bay Sands, Raffles City Chongqing, and Shengzheng Tower C by Zaha under construction demonstrate how multiple towers can collectively support a large elevated platform. Yet, despite the efforts in these cases, public access still tends to diminish with height: upper-level spaces are highly commercialized, tightly controlled, and accessible only through significant economic or programmatic thresholds. This reveals a critical gap in current tall-building typologies: the absence of large-scale, genuinely public spaces embedded within the high-rise structures over their heights.

Against this backdrop, this paper asks whether tall buildings can function not only as containers of rentable private floor area, but as an extension of public ground providing structural, spatial, and organizational frameworks capable of supporting civic life in section as well as in plan.

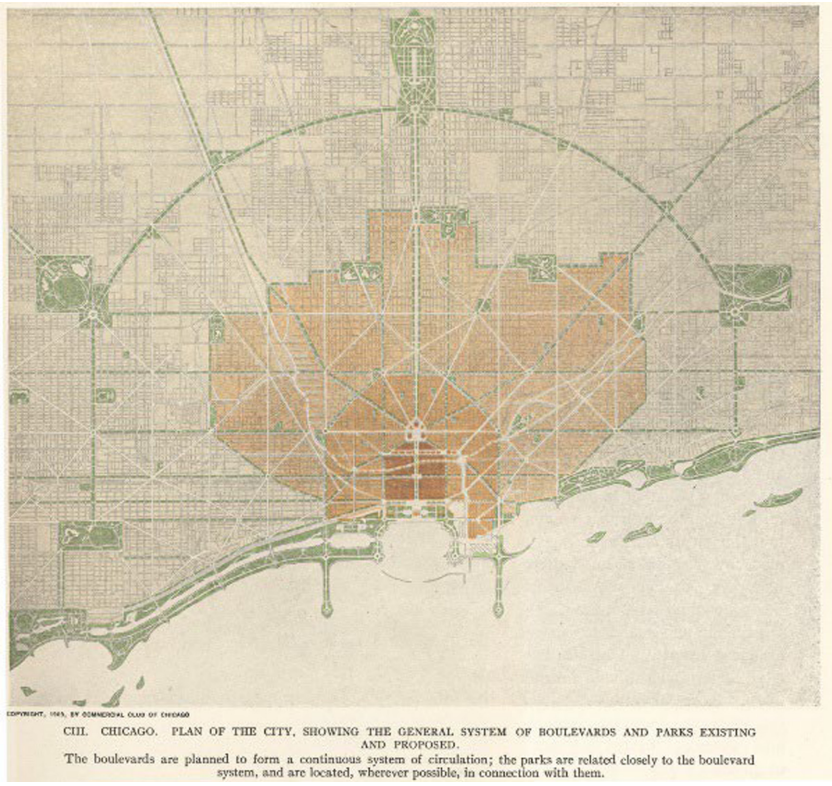


Figure 1. *Plan of Central Chicago: Parks and Boulevards* (1909), Daniel Burnham. Image source: *After Burnham.*



Figure 2. *Tower C at Shenzhen Bay Super Headquarters Base*, Shenzhen, China, designed by Zaha Hadid Architects. Rendering by Brick Visual. Image source: Zaha Hadid Architects.

2. Site and Urban Context

The project site is composed of two distinct parcels that span across Lake ShoreDrive, one of Chicago's most significant pieces of lakefront infrastructure. The western portion of the site occupies the former location of the unbuilt Chicago Spire, where new residential towers designed by SOM are under construction. The eastern portion corresponds to DuSable Park, a publicly designated site at the confluence of the Chicago River and Lake Michigan. As documented by the DuSable Heritage Association, this combined site holds significant civic and historical importance and represents one of the final opportunities to introduce new public space in downtown Chicago (DuSable Heritage Association, 2025). While Chicago's lakefront has long been reserved for public use, the presence of Lake Shore Drive acts as both a physical and civic barrier between the city and the water. The highway disrupts pedestrian continuity, fragments public space, and limits the site's ability to participate fully in the broader lakefront public system.

Despite these constraints, the site is strategically positioned within a dense network of established public amenities, including the Chicago Riverwalk, Navy Pier, and the Lakefront Trail. Together, these spaces form one of the city's most active and accessible civic landscapes. Yet their spatial continuity weakens precisely at this location, where infrastructure interrupts movement between the riverfront and the lakefront. Rather than treating the



Figure 3. Site location of DuSable Park, Near North Side, Chicago. Image source: *Alchetron*

highway as an obstacle to be removed or bypassed solely at grade, the project reframes this condition as an opportunity to rethink access to the waterfront in section.

By shifting the emphasis from horizontal continuity to vertical connectivity, the site becomes a testing ground for extending the public realm upward. This project extends the public logic of the Chicago Riverwalk vertically. Rather than treating the riverwalk as a purely horizontal civic system, the design reads its public life—movement, gathering, pause, and encounter—as a sequence that can be lifted into section. By placing towers at both sides of the Lakeshore Drive passing through the site and creating lifted multi-level civic programs between the towers, the project turns the middle part of the tall building complex into a continuation of the riverwalk's public realm, allowing public space to claim height rather than stopping at the water's edge. This approach allows waterfront access to be re-established not only through ground-level interventions, but also through elevated public spaces that reconnect the city, infrastructure, and lake within a single architectural framework.

3. Tall Building as Public Infrastructure

This project redefines the tall building as public infrastructure by treating the ground not as a fixed plane,

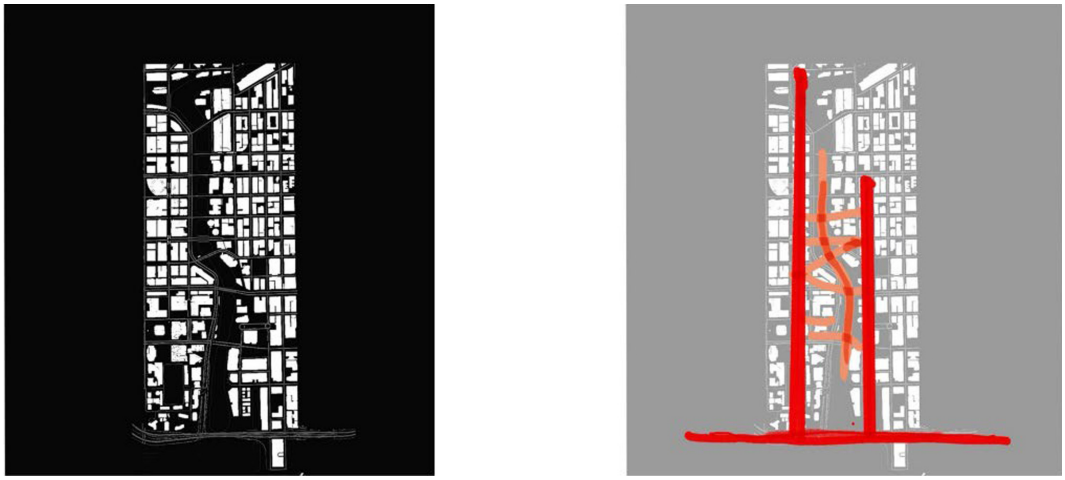


Figure 4. Left: Figure-ground study of the Chicago River context. Right: Building parti diagram illustrating the project's organizational concept.

but as a system of civic continuity extended through architecture. The proposal is organized as a three-tower system that supports a shared central public volume. Structurally, the three towers function as a stable tripod, collectively carrying an elevated civic mass suspended between them. This central volume acts as a vertical extension of the public realm embedded within the middle of the building where public and private systems intersect.

Lateral performance is a critical design determinant in tall buildings, as wind forces often govern structural configuration more than gravity loads. As height increases, lateral drift, acceleration, and occupant comfort become major concerns, requiring systems capable of efficiently controlling these. In this project, the three towers are structurally bundled and interconnected, allowing them to act collectively rather than as isolated vertical cantilevers. This integrated configuration significantly increases global stiffness by using the width of the three-tower complex as an increased lateral structural depth compared to that of the individual towers. The improved structural efficiency reduces the demand for excessive material in individual towers, leading to material savings at scale. At the magnitude of a supertall development, such efficiency translates into substantial economic benefits and measurable reductions in embodied carbon, positioning structural integration as both a financially and environmentally responsible strategy.

Programmatically, the towers remain relatively independent, housing office, hotel/service apartment, and residential uses respectively. This organization allows vertical circulation and building services to be efficiently arranged within each tower, minimizing core duplication, reducing circulation conflicts, and maximizing usable floor area, while still enabling interaction through the shared public volume. Structural systems for the towers, braced megatubes, are integrated into this organizational logic. Rather than operating as a separate technical layer, structure becomes an enabling framework that makes the suspension and accessibility of large-scale public space possible.

By linking the office, hotel, and residential towers at these shared levels, the design establishes a continuous public layer in section, allowing users from different programs to overlap without disrupting vertical efficiency. Residents can move laterally into planted gardens for daily leisure, hotel guests can access exhibition and event spaces as part of their stay, and office workers gain shared destinations for lunch breaks, informal meetings, or retreat from the workplace. Beyond these uses by the different groups of occupants, these sky-spaces accommodate various flexible civic uses for public—such as lectures, museums, libraries, convention centers, pop-up markets, community dining, and seasonal programming—transforming each connection level into an active social condenser.

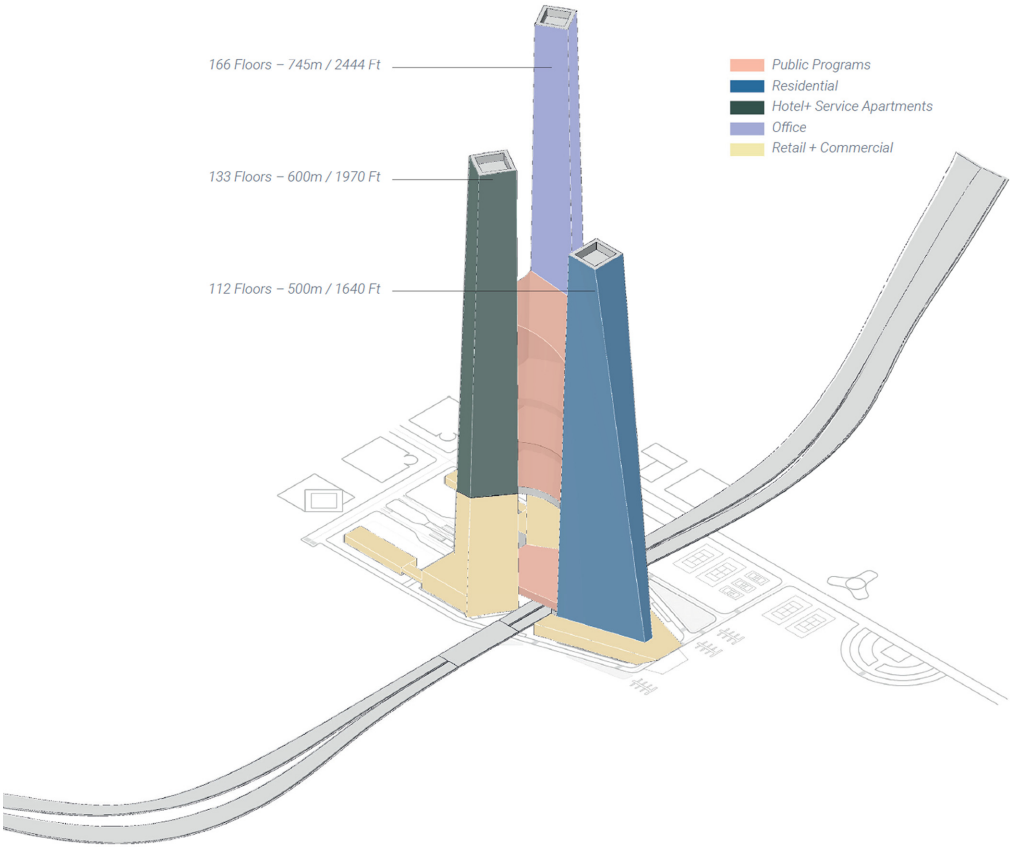


Figure 5. Program diagram.

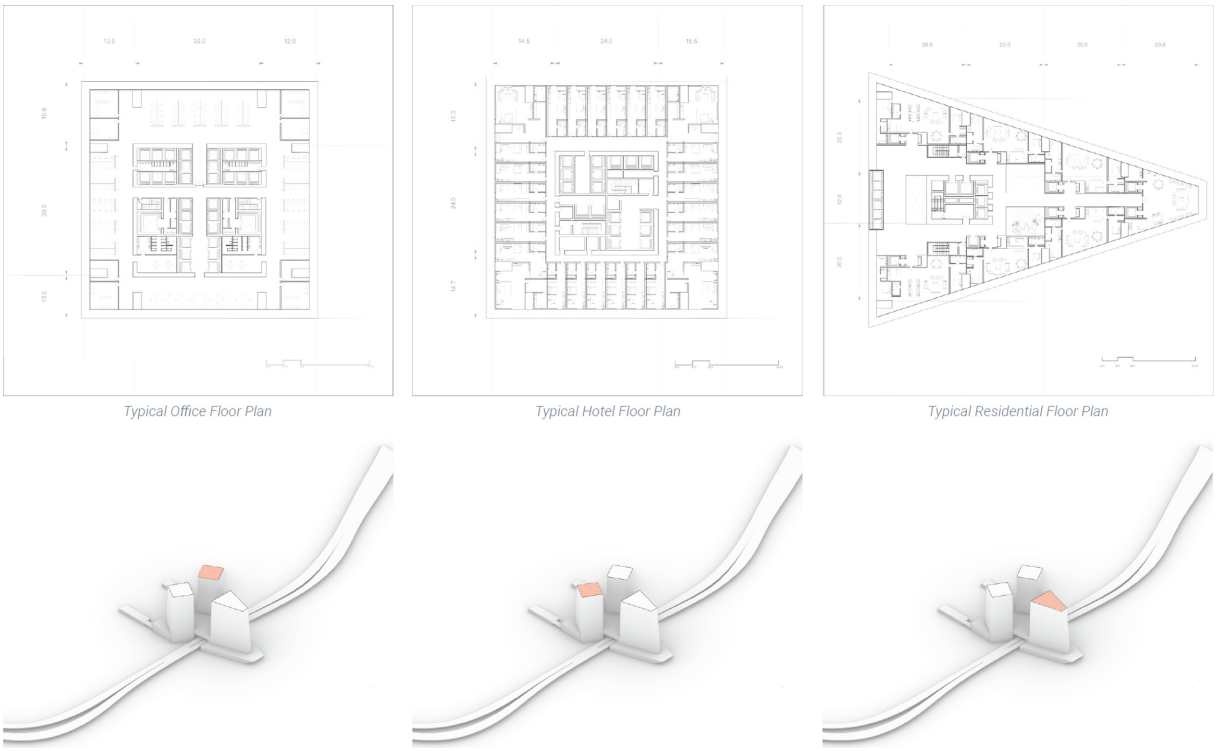


Figure 6. Typical floor plans.

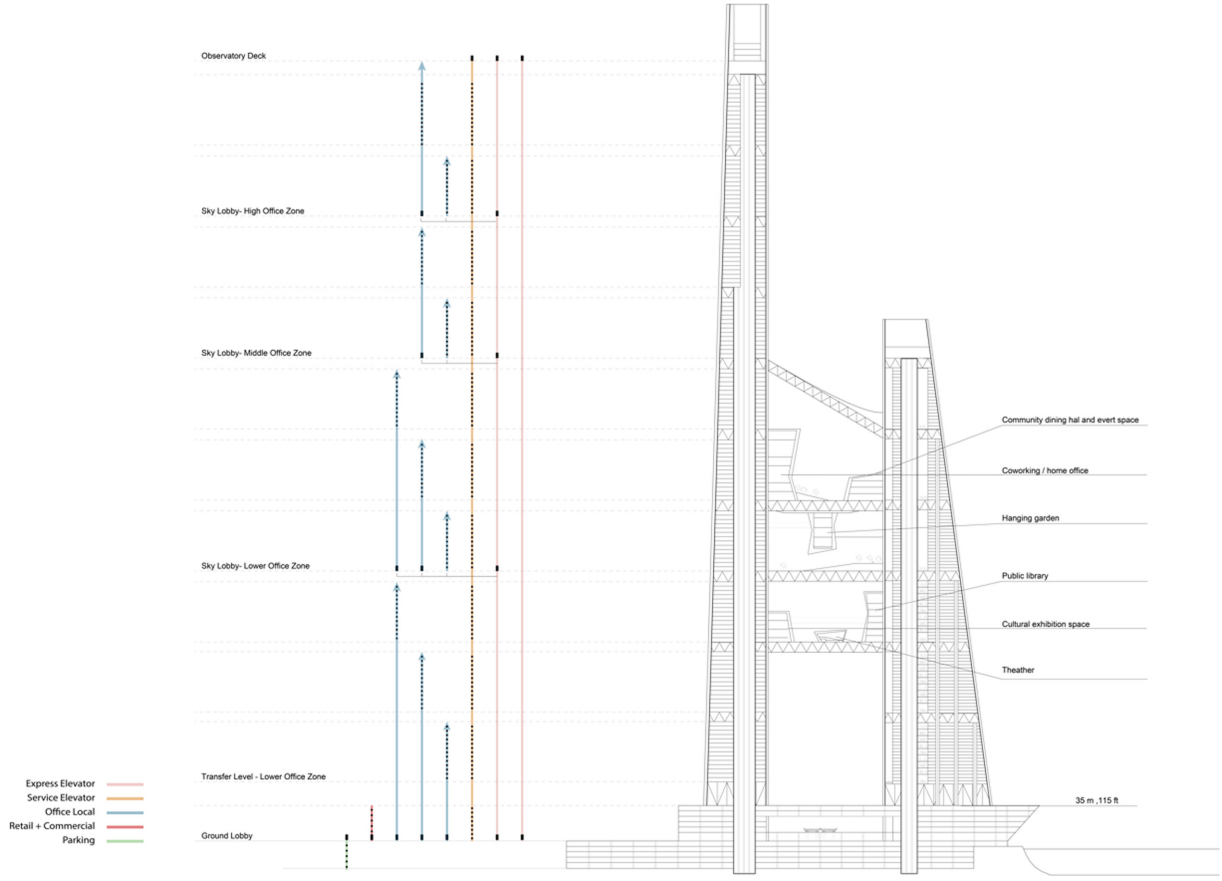


Figure 7. Section cutting through the office tower, mid-level public programs, and the residential tower with elevator zoning diagram for the office tower.

4. Independent Systems, Collective Form

The circulation strategy is structured around a dual-core system that clearly separates public and private movement within the building. Each tower contains an independent core dedicated to private circulation, serving office, hotel/service apartment, and residential programs respectively. This configuration allows vertical circulation to remain efficient, secure, and program-specific, minimizing conflicts between different user groups and reducing the spatial footprint of each core. In parallel, a dedicated system of express shuttle elevators is assigned exclusively to public circulation. These elevators within the public cores operate independently from the private cores and connect the ground floor directly to elevated public spaces. By allowing visitors to access mid-tower civic programs without passing through private lobbies or controlled zones, the system reinforces the legibility and openness of the public realm, ensuring that public space remains genuinely accessible rather than conditionally permitted.

To support this spatial openness, corresponding safety and security systems are integrated into the design. Access control is strategically located at transitions between public and private zones, maintaining openness while protecting residential and office areas. In this way, security functions as an embedded infrastructural layer rather than a spatial barrier.



Figure 9. *Umeda Sky Building*, Osaka, Japan, designed by Hiroshi Hara. Image source: https://en.osaka-info.jp/spot/umeda-sky-building/.



Figure 8. Rendering of the project.

The externalization of public circulation has been widely discussed as a strategy to enhance spatial legibility and civic openness in tall buildings. When express elevators are exposed, vertical movement becomes readable from the public realm, allowing users to immediately understand how upper-level public spaces are accessed. Built precedents such as the Centre Pompidou demonstrate how exposed circulation systems can transform elevators from concealed service infrastructure into a legible public interface, enhancing orientation and civic openness (Rogers and Piano, 1977; Frampton, 1992). In the context of tall buildings, this strategy also resonates with broader discussions on vertical circulation as an organizer of spatial and social hierarchy

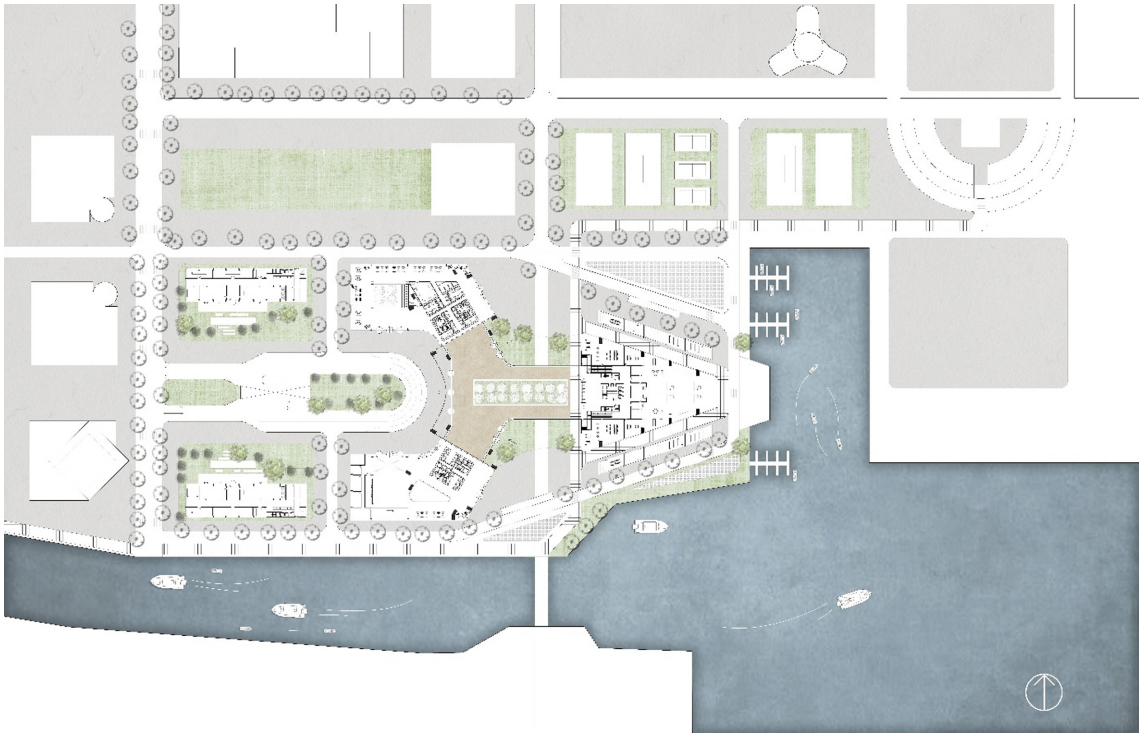


Figure 10. Ground-floor plan illustrating public ground continuity across the highway above.

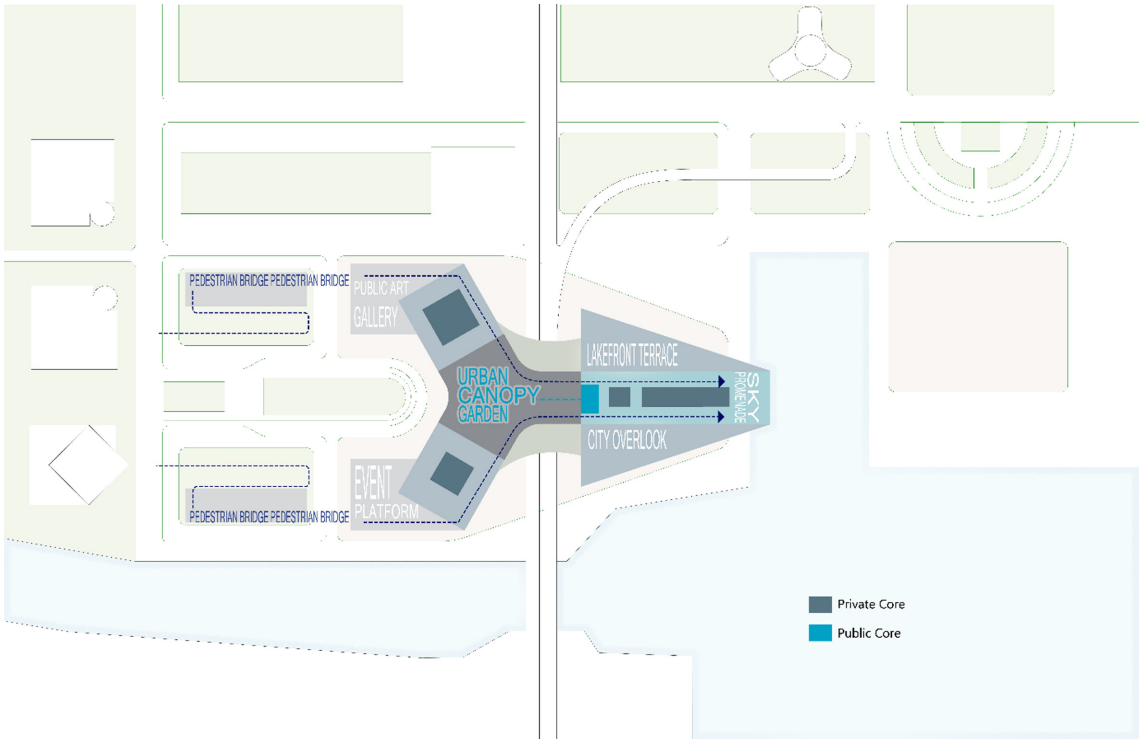


Figure 11. Upper-level diagram illustrating the vertical extension of public space across the highway below.

(Koolhaas, 1978). High-rise examples such as the Umeda Sky Building demonstrate how elevated public connections can operate as shared civic destinations within vertical frameworks. In Umeda Sky Building, visitors take an express elevator from the third floor to the 35th level, then transfer to a transparent escalator that continues upward to the 39th-floor Sky Observation Deck. This kind of sequence not only choreographs vertical movement as

a public experience, but also allows visitors to gradually encounter panoramic views during ascent, transforming circulation itself into a scenic civic event rather than merely a means of access.

At the ground level, circulation is organized to negotiate the presence of the elevated highway by establishing public space both above and below the infrastructure, reconnecting the riverfront and the lakefront through a continuous civic sequence. Beneath the highway, an underpass plaza transforms residual space into an active threshold, accommodating pedestrian movement, informal gathering, and retail spill-out while maintaining visual continuity across the site. Retail programs and park edges anchor this lower level, drawing people into the building and reinforcing the ground as a shared public surface. Above the highway, an urban canopy garden functions as a lifted public ground, allowing pedestrians to cross the infrastructural barrier through landscape rather than enclosure. Pedestrian bridges link retail roofs and podium levels, guiding visitors through the garden toward elevated terraces and lookout points with open views to the lake. Together, these layered circulation strategies establish a continuous public route in section, ensuring that movement across the site remains legible, accessible, and spatially enriched despite the presence of large-scale infrastructure.

5. Conclusion

This project reframes tall buildings as instruments engaging with civic extension rather than isolated towers of stacked private space, positioning vertical development as an opportunity to host public life instead of displacing it. By treating structure, circulation, and program as a unified framework for public space, the proposal demonstrates how high-rise buildings can actively reconstruct the continuity of the waterfront and reassert public access within dense urban conditions. Rather than limiting public ground to the horizontal surface, the project argues that civic space can be deliberately embedded within the vertical dimension, transforming height from a mechanism of privatization into a medium of collective urban experience. In doing so, it proposes a new model of vertical urbanism in which public infrastructure and architectural form operate as a single integrated civic system.

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