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Introduction

The concept of heterotopia, bridging virtual and physical spaces with human scales, plays a productive role in generating contemporary urban and architectural design strategies. Derived from Michel Foucault's inception of *heterotopia*, urban design theorist David Grahame Shane categorizes three urban elements: armature, enclave, and heterotopia (Shane, 2005). Among these elements, the emergence of heterotopia has always been favored by post-structuralists as a catalyst for creative contemporary urban design methods, from the certainty and uncertainty of Bernard Tschumi's Parc de la Villette to the nothingness of Diller Scofidio + Renfro and James Corner's High Line. This paper also presents the processes of one of our design projects involving urban scales as an exploration of these new urban design strategies.

In Charles and Ray Eames's short film "*Power of Ten*" released in 1977, through a zooming camera's lens, we experienced a sequence of visual transformations with scales from human being to planetary beings and back to atomic beings. A daily experience in a Chicago waterfront park was de-familiarized through systematic changes of scales in both space and time, from 100 million light years away of the limits of the observable universe to a proton of a carbon atom within a DNA molecule in a white blood cell (Horton, Z., 2021). The incremental increases of multiplication of 10 in the first half of the journey, and the inversion later, shifted our perceptions of visible physical phenomena, both ontologically and epistemologically. Once again, technological interventions enabled us to delight ourselves by seeing the world as a multitude of worlds.

As Friedrich Nietzsche wrote in *The Wanderer and His Shadow* in 1878, "*The press, the machine, the railway, the telegraph are premises whose thousand-year conclusion no one has yet dared to draw*", modernization and technological progress have been constantly changing our modality of experiences as well as the relationships to aesthetic. Ontological shift of physical scale of industrialization and the machine age also inspired Le Corbusier, and he looked on automobiles, airplanes, ocean liners and industrial products of civil engineering as the expressions of modernity.

In his seminal book “*Towards a New Architecture*” published in 1924, the sublime of ocean liners empowered by their transcending scales was translated into the poetics of modern architecture (Corbusier, 1924). The ramp, as an invention of his apparatus of new architecture was repeated almost in every of his projects, from Villa Savoye in France to the Carpenter Center at Harvard University. It changed the scale and speed of how we move our bodies in space, allowing us to experience a new kind spatial movement in modern architecture. Seven decades later, Rem Koolhaas’ “*Bigness or the Problem of Large*” envisioned the irreversible and radical increase of scale in buildings and cities driven by technological, economic, and political power of post-modern society at a global scale (Koolhaas, 1994). Bigness is a metaphor of architectural paradigm change in the context of the recent globalization. This theoretical stand was manifested in most OMA’s global practice, such as the Euralille in France, Seattle Central Library in the US, and the CCTV in China.

The ontological shift of virtual scale in the age of globalization has been supported by ubiquitous and ever-escalating progressions and applications of digital technologies. In the field of architecture and urban design, virtual scale has been both a heated debating concept and an evolving opportunity for ontological and epistemological movements in architecture. William Mitchell, in his “*e-topia*”, proclaimed that we were transforming from “Machine for Live in” to Computers for Live in, where radical scale set changes were emerging simultaneously: new global interdependencies; the network city extended; the end of rural isolation; displacement of place; juxtaposition between public and private spaces; decentralization and delocalization. However, without contemplating the arguments between digi-phile and digi-phobe, Mitchell advocated that the definitions of architecture and urban design must be expanded to encompass both virtual places and physical ones (Mitchell, 1999).

Heterotopia

The concept of heterotopia, bridging virtual and physical spaces with human scales, plays a productive role in generating contemporary urban and architectural design strategies.

The inception of heterotopia is coined with Michel Foucault’s *Of Other Spaces: Utopias and Heterotopias*, in which he argues that we are unfortunately still living with certain oppositional spatial practices such as private vs public, family vs social, cultural vs utilitarian, and space of leisure vs that of work. Foucault examines the set of relations that define the sites of spatial practices. He is interested in certain sites that can relate to all the other sites in such a way as to “suspect, neutralize, or invert the set of relations”. He further analyzes that the space perceived from a mirror is a utopia, a placeless place, and a site without a real space in society. However, a mirror is a real site, and it connects a specific space to other places, the virtual spaces, therefore, a mirror functions as a heterotopia (Foucault, 1984/1967).

Derived from Michel Foucault's definition of heterotopia, urban design theorist David Grahame Shane categorizes three urban elements on multiple scales: armature, enclave, and heterotopia. Among these elements, the interpretation of heterotopia has always been evolved as both a post-structuralist's debating subject and a catalyst for contemporary urban design methods (Shane, 2005).

Multiplicity of Human Scale

For urban designers and architects, if structuralists have established complex networks of sets of relationships, they have also enabled post-structuralists to “suspect, neutralize, or invert” these relationships (Foucault, 1984/1967). In Bernard Tschumi's Parc de la Villette, the experience of the *otherness* in the park was ambiguous. It reacted to, released from, and reconnected to the forces of the urban dynamics of the Paris city on different scales. Radically departed from both Frederick Law Olmsted and high modernists' approaches, the design deliberately liberated its fundamental and underlying structural elements from a prescribed set of relationship: circulations as lines with the scale of pedestrian movements, follies as anchor points of activities with the scale of a pavilion, and park as open spaces with the scale of open landscape. The relationships between each layer were intentionally suspended to allow each system to act independently and generate unexpected spatial experiences. The autonomy of each layer also enacted itself as a site. The deconstruction of predictable and controllable design principles generated new relationships for these spatial organizational elements and formal systems. Each layer was formulating as both conditions and opportunities for movements and opportunities of human interactions in public spaces. The design encouraged the formations of ever-changing relationships between temporal participators and the permanent park elements, and it unfolded unexpected chances through time for programs and events. Simultaneously, through programs and events, the spatial and temporal experiences and activities constantly constructed and reconstructed new relationships to the site and established different sets of ever-changing relationships to the city. It became a host for diverse programs and events.

A heterotopia is a place at a real site that simultaneously connects to other places. These connected places are heterogenous that can also be real or virtual or both. “The heterotopia is capable of juxtaposing in a single real place several spaces, several sites that are in themselves incompatible “(Foucault, 1984/1967). Historically, a program and an event could always connect a place to spatial practices of a site in a city and beyond, both real and virtual, like in a *theater* as Foucault indicated. However, the notion of heterotopia addresses emerging and more challenging contemporary urban issues and conditions of heterogeneity, temporality, complexity, intensity, dynamics, mobility, and unpredictability. Critical postmodern urban design theories, from Aldo Rossi's *The Architecture of the City* in 1966 to Colin Rowe's *Collage City* in 1978, argued that design organizational forms, spaces, and programs could be independent and juxtaposed to each other. In Parc de la Villette, Bernard Tschumi developed a radical concept between program and event. In an interview by *Praxis 8*, Tschumi defined program as prescriptive and that “a program relies on repetition and habit”; in contrast, an event cannot be designed, and we can only design certain conditions for potential unknown events to occur. In other words, “An event occurs unexpectedly”

(Tschumi, 2006). Therefore, an event is not necessarily to be attached to a certain program, although an event and a program can relate to each other accidentally, an event is a play of chance other than ad hoc, and it is event that evolves in time and space as part of being and becoming.

Temporal and Spatial Extensions of Human Scale

The concept of heterotopia unfolds possibilities to re-construct alternative relationships and scales between architecture as an autonomous discipline and social space as the domain of spatial practice. Undeniably, architecture needs to negotiate with social, political, and economic conditions to establish its own position. However, architecture could never be merely an outcome or direct product of the social practice determined by materialist's constraints. Striving for the freedom from socioeconomic constraints, "like conceptual art in the mid-1960s, architecture seemed to have gained autonomy by opposing the institutional framework. But in the process, it had become the institutional opposition, thus growing into the very thing it tried to oppose" (Tschumi, 1994).

Instead of imposing oppositional relationships to the socioeconomic constraints, the High Line park came into being along with unexpected events. As a heterotopic project, it was exemplified by its pluralistic scales through unprecedented processes. In 2001, when photographer Joel Steinfeld published his photograph of this decommissioned railroad, titled as *A Railroad Artifact*, the sublime of enduring forces of nature, oppressed by the city as a machine, that gradually reclaimed the site from the withdrawn infrastructure and embraced the surrendering rusted steel rails, suddenly changed how we looked at the site and its relationship to the city. The idea of the High line as an urban park was conceived through a sequence of events, and it was Friends of The High Line, a self-organized community group other than an established institution that preserved the original railroad (Davis, D.E. and Gray, S.F., 2019).

Inspired by the Promenade Plantee in Paris, this community group initiated the competition for the design of this elevated green linear park. The process of transforming it into a public park unfolded into a series of events, and in the end, the park became an event. The very idea of the design of the park was surprisingly as simple as to intensify the natural process of this rhizomic ruin and to re-connect it to everyday urbanisms of the city. As Elizabeth Diller reflected on the design process during her lecture at Harvard University Graduate School of Design invited by Scott Cohen in 2013, the sense of nothingness was really what the architects had conceived and constructed. By neutralizing the set of relationships between the High Line and the site, the programs, and the city events, it expanded its scale and evolved into a vital public domain of the city.

Scale of Collective Identity and Representation

The High Line connects its site to New York City through ever-changing linkages, both real and virtual, and at complex scales and speeds. As a passerby, you can just walk onto a section as a shortcut to your path and also a momentary escape from the busy streets; you can take a break from the daily duty by sitting at the out-ledge of tall grass grooves, imagining a distant landscape from Manhattan's cityscape; you can simply sit on a step of the elevated amphitheater and watch the flow of cars through the looking glass; you can find a peaceful mind, surfing the smartphone, taking a phone call, or reading an open page, to refresh yourself at a site that connects to both public and private spaces through different physical and virtual linkages. Families find it relaxing to bring their kids to the elevated plazas; schoolteachers take advantage of the botanical diversity to arrange outdoor learning sessions in the grooves; teenagers enjoy the openness of space along the trail for adventures. The High Line is a real place as well as a virtual site. It acts as a network for public programs both within the site and to the city. As a heterotopia, it links many other sites beyond the scales of the site and the city, both real and virtual. The High Line represents one of Michel Foucault's favorite subjects – the boat: “the boat is a floating piece of space, a place without a place, that exists by itself, that is closed in on itself and at the same time is given over to the infinity of the sea” (Foucault, 1984/1967). The boat is the metaphor of heterotopia also the manifestation of “heterotopia par excellence”, so does the High Line Park.

From Precedent to Project: The Urban Inhabitable Object

The design and realization of the Urban Inhabitable Object explored architectural scales in these three categories.

1 Multiplicity of Human Scale

In response to a call for a street prototype festival international design competition, we designed an inhabitable object involving complex and diverse dimensions on a human-centric scale. We explored multiple levels of human scales that allow different people to use or interact to it without either a specific program or any predetermined practical intent. The design form was reduced to a simple framework, however, to project a multitude of potentials, possibilities, and opportunities for public interactions on an urban scale. It is neither a shelter nor a building, therefore, as an abstract yet inhabitable object duo to its adaptable scale for people to act upon.

With this winning design proposal, we were commissioned by Downtown Denver Partnership to materialize it for a two-week prototyping festival in the summer. The current 16th Street Mall was opened in 1982 as one of American's well recognized urban design projects during the movement of *new urbanism* era. It was designed by Henri Cobb of Pei Cobb Freed and Partners in collaboration with OLIN landscape architect. The mall's public space is marked by a wide pedestrian promenade.

This central tree lined corridor with red-and-gray granite pavement also serves as an axis for stores of major businesses as well as points of tourists' attractions. The project site was at the most prominent section, but the challenge was to have minimal interference to the daily operations of the stores as well as the existing urban infrastructures. On the other hand, the installation must be able to invite the public to participate. The budget and materials were limited as a temporary structure for a two-week event only. In conclusion, a small project in the physical scale had to be magnified to be impactful on such a large urban scale site.

The bigness of a small project was celebrated through the notion of movement unfolding multiplicity of human scale in urban public space. Looking beyond conventional pragmatic constraints such as site context, form, program, materials and building tectonics, the design strategy was to search for the connections between movements on a human scale to urban mobility, of a different architectural domain inspired by Foucault's concept of *otherness*. Through exploring the notion of movement and mobility, the design developed opportunities to *suspect, neutralize, or invert* the set of relationships between human scaled body movements and urban mobilities.

There were different scales, modes, speeds, directions, and rhythms of movements and mobilities on-site. On a downtown district scale, free shuttle buses formed one continuous loop, circulating around the main streets on the fixed schedule. Bicycles were ubiquitous as a symbol of Denver's unique environment as well as healthy lifestyle. On a community scale, riding a bike was more convenient and efficient than shuttle buses and was easier parking than cars. Of course, on a neighborhood scale, strolling on foot was what the mall was designed for.

In response to different movements on site, a Cartesian coordination system was established. The overall design form was comprised of three bar-shaped linear elements that were placed along the pedestrian flow (X-axis) and divide the flow into four strands of movements: the middle two streams created congestions; the outer two streams could either slow down the speed or allow the movements to flow uninterrupted. By elevating three-linear bars at different scales and heights, as differentiated topographic planes, that allow people to interact in different positions, the design further diversified movements along both the Y and Z axes. The geometric relationships between the three bars were intentionally randomized, resulting a system of disjunction. Through *neutralizing* these sets of spatial and functional relationships, we assumed that chances could find their own chances through their interplays.

Along the Z-direction, the design provided a range of elevated surfaces at different heights for people to engage: the height of a step, the height of a ledge, the height of a chair, the height of a stool, the height of a table, the height of a countertop. In public spaces, people could choose to sit on a step, sit on a ledge, sit on a chair, sit on a stool, and lean on a counter edge; people could freely step on a step, step on a ledge, step on a seating, and rest their feet on a table edge. Along the Y-direction, the narrow gaps between the bars could only fit one person to pass to interrupt or delay the flow along the X-direction; the depth of each bar's top surface was designed to be comfortable enough for people to sit temporarily but uncomfortably for a prolonged duration, as a way to discourage and interrupt the privatization of public space. These arrange-

ments generated rhythms and patterns of diverse-scaled human activities and urban spatial movements (Fig. 1).

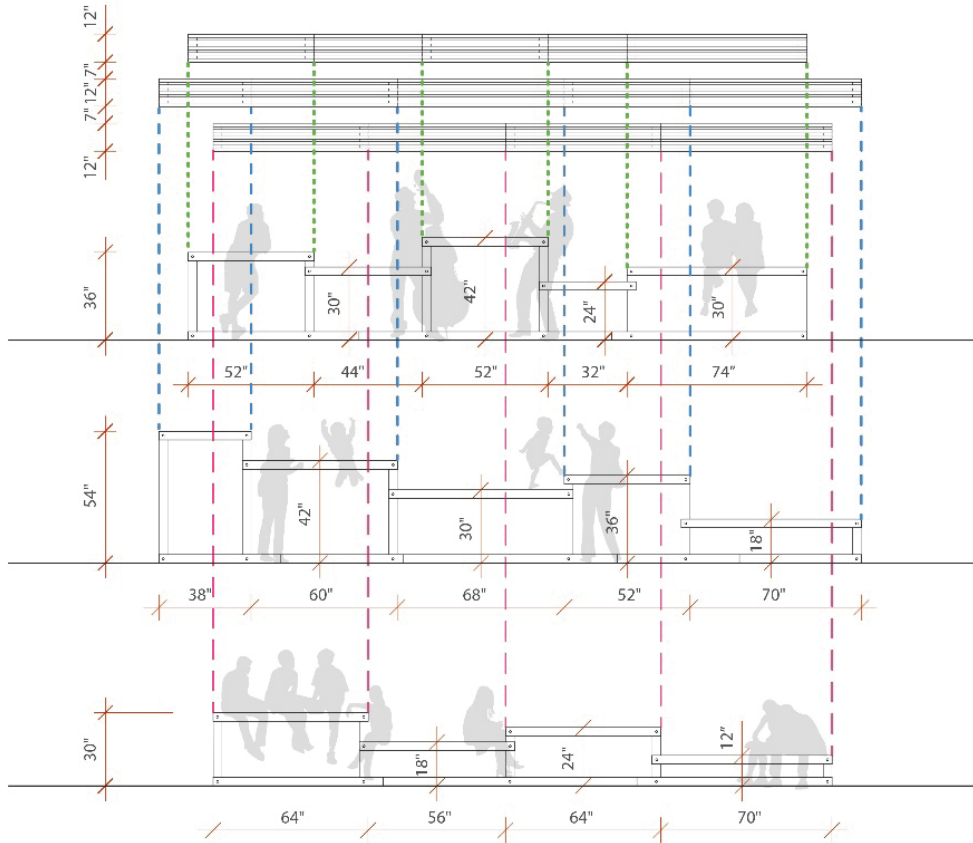


Fig. 01. Plan + Section.

Source: Tony Yue, author's design team.

As indicated in Tschumi's theory, a *program* is repetitive and somehow predictable and mostly controllable, but an *event* may never happen again and is unpredictable and uncontrollable. A predetermined set of relationship between table and bench could clearly define a specific program without being able to generate unpredictable multiplicity of events. Herman Hertzberger argues: "The secret of the habitability of the Amsterdam canal houses for example lies in the fact that one can work, live, or sleep anywhere; that spaces leave the individual quite free with regard to his interpretation of living. The greater variety of the old town is certainly not caused by more comprehensive or richer elements (those of the 20th century are more complex), but by a sequence of spaces which, although generally not much

different one from another, allow individual interpretations because of their greater polyvalency” (Hertzberger, 1963). In the same way, by *suspecting, neutralizing, or inverting* the table-bench relationship, the multiplicity of human scale allowed people to “mismatch” all design elements without any predetermined correlational orders, which made these elements more adaptable to changes as well as inhabitable, creating opportunities for unforeseeable *events* to happen.

The design form was reductive and de-materialized as a set of abstract diagrams with intricate dimensions at specific human scales, however, during this two-week-long festival, media coverage was overwhelming: two kids climbed on two different tops of the *bars* and found comfortable positions for each of them to carry on a face-to-face conversation; an athletic man lifted up his body with two hands holding on two horizontal frames that fitted his height, and swung his body like on a Pommel Horse; school kids jumped up and down on it as an extended territory to explore on the way back to home; people of different ages and physical conditions could always find different positions to rest upon comfortably. They could sit often on the lower bars with their backs leaning against the taller bars. Occasionally, someone could even be lying on it for a sun bath. For street performers, it could be an instant stage right in the center of a public space. For cyclists, both the riders and the bikes could find spots to rest upon. With the support of free-Wi-Fi infrastructure, this Inhabitable Object also became another hot-spot for passersby to make a stop and navigate in virtual places beyond physical scales. The scales of virtual and physical intersected at this location, and the acts and actions of people were momentary and ever-changing, constructing and generating movements, motions, programs, and events in both virtual and physical spaces, functions, programs, and micro-events on site were far beyond our scales of imagination (Fig. 02 & 03).



Fig. 02. On Site Photo.

Source: Nick Fish, author's design team.



Fig. 03. On Site Photo.

Source: Nick Fish, author's design team.

2 Temporal and Spatial Extensions of Human Scale

This Downtown Festival was an impactful event at both a physical place and virtual sites hosted by local social media. Surprisingly, after realizing that people had been overwhelmingly interacting with this prototype during these two weeks, the festival organization believed that it had become an inseparable feature of the 16th Street. They decided to preserve it as a permanent feature of the city, although it was built for a temporary festival. We were concerned about its durability and curious to see how well it could withstand so many daily activities in such creative ways.

Two years later, we were contacted by the director of Downtown Denver Partnership again and delighted to hear that this project had been performing well. To continue its service to the public as a permanent feature, some wood members would need to be replaced and the paint would be refurbished. Since this project was of the world of *otherness* and out of what the city had planned for, its cost of maintenance also became an exceptional item out of the city's budget. Supported by the Downtown Denver Partnership, we were asked to design images for social media and posted a call for public donations.

In order to produce an effective image for social media, multiple images at different scales from the real site and re-imagined sites were edited in digital media. The design of the poster was to project a real place and a sequence of real events related to this place into a virtual space, which could connect different temporal spaces from the past to the future. To compress spatial experiences into a 2-D image, the play of scales was an essential strategy in creating a visual narrative where different images at a variety of scales of time and space were articulated as a collage.

This fundraising process extended this project from a physical site to its presence of the future at social and virtual scales. Consequently, it enabled the project to be professionally refurbished by a local contractor, and became a permanent urban feature, continuously operating on heterogeneous scales in both physical and virtual spaces. The virtual presence of the project echoes what Foucault called the space reflected from a mirror, and it is unreal, like a utopia, but together with the mirror, they become real, as heterotopias (Foucault, 1984/1967).

3 Scales of Collective Identity and Representation

Three years after the event, the Downtown Denver Partnership informed us that our design had become an icon for the 16th street, and they were inviting us to provide additional design plans for placing more inhabitable objects in other significant areas of downtown public spaces. To continue invigorate downtown and improve quality of public spaces and public life, as a Downtown Denver Partnership's long-term objective, creating an evolving cultural identity for public space became a priority. Supported by the joint funding from local government and corporations, the new design initiative would support vibrant urban events and activities of the local community and beyond.

Although the initial design was never intended to be iconic to begin with, it went through an unexpected and unprecedented process. After three years' exposure to the public, its layered and looped lineal elements could be perceived as an abstract sign representing layered Rocky Mountains of Denver; the rainbow colors of the bands could also be interpreted not only as a connotation of social diversity but also as a supportive signification to current LGBT movement in Denver. From the complexity of human scale, through collective interactions and reflections, the design transcended its operational mechanism in a physical sense, functioning as a representation for both physical and virtual realities. As a design becomes collective reflections of heterogeneous individuals, it embodies a multitude of meanings and beliefs that influence social identities on ideological and cultural scales (Fig. 04).

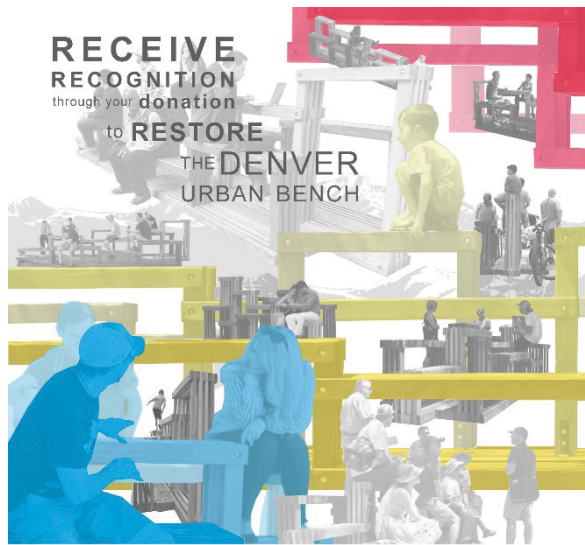


Fig. 04. Poster for Social Media.

Source: Jiawen Qiao, Huiyu Pan, Nick Fish, author's design team.

Conclusion

Evolving urban scales have been shaping contemporary heterotopic realities in both virtual and physical domains. Perceptions of physical scale changes in our built environment, contemplated by Corbusier and Eames during the early 20th century, have been constantly reframed by both digital media and ecopolitical dynamics of the cities. However, human scale-based method is critical, meaningful, and instrumental in contemporary design practice. It posits the power, latent or blatant, to generate the multitude of relationships and opportunities that allow diverse individuals with freedom to create and re-create user-defined activities and interactions. An effective architectural project, as an intervention to public space, simultaneously constructs virtual and physical places. The multiplicity of architectural scale not only informs a human-centric site but also unfolds a new kind of “other place” – a heterotopia – that both contributes to the evolving authenticity of the site and transforms the immediate presence of the site internally.

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