

MULTISCALAR SPATIAL STRATEGY: The Reconsideration of Urban Informality as Collective Form

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Many of the research agendas, publications and case studies that illustrate how informal settlement upgrading efforts attempt to meet the challenges of urban growth focus on the key political, institutional, financial, and social networks required to be cultivated, strengthened and connected; however, if the ambition is to truly reach scale the spatial must also be addressed as critical.

THE PROBLEMATIC

As cities rapidly expand to host 50 percent of the world's population, Rem Koolhaas critically identifies how "urbanism has been unable to invent and implement at the scale demanded by its apocalyptic demographics" (1995 p961). Over the course of the urban population shift many attempts have been made to address the spatial deficiencies of cities. Unfortunately the majority of these materialize the belief that the scale of ambition ought to be replicated in the scale of the plan. Instead of success, the urban condition has been scarred by the huge physical failures of modernism, preservationism and new urbanism. Creating broader problems within the field, strategies that turn away from the realm of the spatial, discredit urbanism and favor economic policy. Leaving cities to expand and develop based upon the remnants of modernism and the incessant demands of a growing population. However, the institutional reforms that were supposed to enable markets and housing finance during the 1980's and the housing sector reforms of the early 1990's, also have not been able to reach the scale of the problem. Currently over 950 million people live in squalid, unsafe and un-serviced slum and squatter settlements, and without signifi-

cant change the number of slum dwellers will reach 2 billion by 2025 (UN-Habitat 2003). To combat these demographics, strategies to reach scale must no longer make the same mistakes as modernism and attempt to invent something big enough, but instead must reconceptualise the problem. The spatial must be regained by urbanism, not in an effort to preserve the existing city or trivialize the previous efforts, but as a line of reasoning, a methodology of rethinking the existing city.

There is no denying that the major challenges facing cities are urbanization and poverty, and in combination the challenge of slums. Characterized by overcrowding; poor or informal housing; inadequate access to safe water and sanitation; and insecurity of tenure, slums have long been a target of urban strategies. The precise urban area under scrutiny in this attempt to redefine the role of the spatial, will be peripheral informal settlements, which tend to be large with relatively good quality housing, but with low levels of basic services and low access to transportation. Generally these settlements provide few civic facilities and services, but have substantial economies and viable markets. Informal settlements are usually illegal, either due to unauthorized occupation of land, or lack of planning permission (UN-Habitat 2003). Lack of secure tenure, poor access to employment and environmental hazards all contribute to deterioration, and in the past led to policies of eviction, clearing and re-housing. Recently many programs instead have focused on the benefits of in-situ upgrading, which tend to spawn individual incremental improvements and in some cases long-term neighborhood validation. If we recognize that in the near future the inhabitants of

slums will make up more than 50 percent of the urban population, then informal settlements must be interrogated with the same, and perhaps even greater, ambitions as the formal city.

Reconsideration of Methodology

If we recognize that attempts to apply a spatial response to informal settlements all seem to result in upgrading projects that fall short in one way or another of the ambition for a strategy that values the urban form, delivers the framework for a neighborhood, recognizes the material dynamism of architecture, and ultimately reaches scale; then, it seems necessary that an investigation of alternate methodological constructs must occur. This investigation proposes a reciprocal multi-scalar spatial strategy that relies upon the consideration of informal settlements as collective form, valuing the landscape and its composition. In an attempt to move beyond projective responses toward a methodology these reconsidered settlements are utilized to drive forward the theoretical understanding of a multi-scalar strategy. Providing both a critical framework for analysis and the potential for proposition, perhaps allowing an alternative understanding of productive structure and indicating a way forward for upgrading. It seems possible that a multi-scalar spatial strategy has the potential to increase ambitions, re-conceptualize problems, and perhaps ultimately suggest a methodology for reaching scale.

Critical Context

The critical context for a spatial strategy is the form-giving urban fabric; the scope, understanding and clarification of such a landscape becomes crucial to its theoretical development. It is proposed that landscape can be interpreted as urban process, materially embedded within the fabric as cultural geography, patterning and texture, where the natural topography is intrinsic to the structured patterning. This investigation suggests that landscape can be understood as the material domain of the built environment, which utilizes architecture to index the urban process. This is similar to Rossi's notion that the plan and street act as primary elements that persist through transformations, and actually allow for the dynamic process of urbanization. From his point of view, architecture is the material image of the city in transformation, a moment of modification for both the physical and

cultural structure of place (Rossi 1982). Recognizing the urban fabric, as being in a constant state of transformation and that material architecture is capable of indexing such transformations, provides a mechanism for the interpretation and valuing of the landscape. Therefore, a theoretical approach is proposed, where landscape is understood as urban process and where architecture becomes the domain of natural organization.

GENERATIVE ELEMENTS

As a means of further clarifying the potential of collective form, it seems useful to start with two theoretical perspectives on the spatial properties of the informal. Fumihiko Maki, and Alfredo Brillembourg and Hubert Klumpner of Urban Think Tank, architects working as urbanists, note that the current problems facing contemporary cities require new conceptual analyses. In their attempts to redefine the informal condition they use metaphors to describe the generation, form, growth and manipulation of settlements.

Group Form. Accretion

Fumihiko Maki acknowledges the rapid transformation of the urban condition, where hierarchy and order seem to be extinct structuring concepts. In response he describes the necessity for masterform, which unlike the traditional instruments of masterplan, building or typology, has an embedded dimension of time that allows for the dynamic manipulation of several independent systems while maintaining collective form (Maki 2008). Vernacular settlements provide Maki with the comparative urban structure to substantiate his group form theory, architecture and urbanism's response to time based spatial processes.

Group form is "form that evolves from a system of generative elements in space," and is characterized by a consistent use of materials, the manipulation of the natural landscape, a respect for human scale, and sequential development that generates patterning (Maki 2008 p51).

Maki's theory of group form supports the observation that informal settlements can be understood, not as chaotic collections of individual dwellings; but as large forms with clear relationships to natural topography, and a seemingly consistent palette of materials. Provocatively, he states that informal settlements evolve from a system of generative el-

ements that suggest a manner of growth and then demand the further development of elements. The notion of generative elements seems to allow for a potential clarification of the transformative ambition of a spatial strategy; however, it also raises questions regarding the nature of these material elements. Maki suggests they are dynamic and identifies the principles of gathering, dispersal and stop as possibilities, however, in order to push the conceptual methodology forward it seems these generative elements must be identified within informal settlements. Also, it seems critical to note that the concept of group form suggests growth occurs sequentially, and that this accretion manifests itself through the patterning of the settlement (Maki 2008).

Group Form. Sponge

Similarly, Urban Think Tank recognizes a new principle of urbanism within informal settlements, where all the traditional urban systems, including the block, the street, and the square have ceased to exist (Brillembourg 2007 p41). In response, their research attempts to understand the process and production methods of the informal city through a projective approach, identifying the rich textural continuity, cellular patterning, spatial layering, yet a seemingly morphological homogeneity of the urban condition (UTT 2005 p20). By returning to architecture and urbanism, Urban Think Tank believes they can identify an alternate, original urban strategy for approaching informal settlements.

“Petare [a large informal settlement in Caracas] is best compared to one giant adaptable mega building, a structure like a large bed sheet thrown over the mountains and valleys of Caracas. Rhizome-like, it is connected with all other cities; porous like a sponge, it is open to modifications” (Brillembourg 2007 p41).

Urban Think Tank’s description of Petare seems to be useful when considered in conjunction with their discourse regarding the necessity of considering slums as a general condition, emphasized here through the discussion of rhizomes. In this manner, their recognition of a particular informal settlement as an adaptable mega building begins to align with the general observation of the slum as a large form. Interestingly, they use the metaphor of a bed sheet thrown over the topography to highlight the significant relationship between the form of the settlement and the natural topography. It seems

that the analogy of a bed sheet also has merit in describing not only the settlement’s fluidity and continuity, but also its edge conditions; the bounded consistency of fabric. The notion of the informal settlement being porous like a sponge clarifies both the spatial quality of the settlement and suggests that unlike many beliefs of informal settlements being impenetrable in actuality they are permeable. It seems likely that considering the informal in this manner could provide alternate strategies for architectural and urban insertions, as well as for social services. Finally, Urban Think Tank clearly states that the structure of the informal is open to modifications, bringing forth a plausible ambition toward change and the potential for a new kind of design (UTT 2005). This suggests transformative ability, coupled with the recognition of the permeable bounded condition of informal settlements, could lead to the clarification of a spatial strategy’s ability to densify or renew the urban fabric.

Both Maki and Urban Think Tank set forth to redefine the informal condition; they provide provocative descriptions of the generation, form, growth and manipulation of settlements, suggesting an alternate, but legitimate, urbanism. Although, both seem to have the same overarching belief in the creativity and legitimacy of informal settlements, there seems to be a fundamental bifurcation in their understanding of the informal, specifically regarding the processes that generate form. Where Maki sees the informal as a form that accretes over time generating patterning, Urban Think Tank views the informal as a sponge that is permeable and open to perturbations. In comparison, although the accretion strategy recognizes the sequential nature of development and evolution that can and does occur, it seems the understanding of the informal settlement as a porous bounded patchwork suggests a greater number of spatial opportunities for action.

Generative Elements

The identification of the patterns of growth, accretion or patchwork, allows for a distinct shift in the conceptual understanding of informal settlements and pushes forward an alternate line of investigation. Although each theory seems to suggest rational sequential development and growth, the concepts provide little evidence of the catalyst for this growth or the capacity for mutation. Generally, growth of informal settlements appears to multiply

the material and spatial inadequacies, and worryingly seems to be plagued by an inability to self-modify. In direct contrast, both Maki and Urban Think Tank suggest that the informal fabric is open to modification and has the capacity to evolve. Maki specifically suggests that a series of generative elements are catalytic, and explores the spatial evolutionary nature of group form, noting that the physical material patterning allows for a structural change in the form of the city (Maki 2008). Potentially, this could be understood as architecture having the capacity to index the process of transformation and the material dynamism of the generative elements. For this investigation it seems prudent to accept the hypothesis that the concepts of gathering, dispersal and stop are material elements that can be identified. If the ambition is to instrumentalize the generative elements that enable the transformative ability of the collective form, then the questions of kind, attribute, and scale of such elements must be further explored.

Gathering

In response to the informal city's lack of all traditional urban systems, Urban Think Tank attempts to use design to visualize, address and solve real problems. They explicitly reject traditional social enforcement remedies and instead propose architectural and environmental solutions. Their projective approach focuses on rectifying the lack of physical and social infrastructure through "small and medium sized architectural insertions intended to resolve specific problems of circulation, sanitation, housing and recreation: a flexible, quick-fix 'acupuncture' applied to urban ills" (Beardsley 2008b p38). Interestingly, the projects appear to utilize material architecture to strategically manipulate the physical informal landscape and urban area, an approach that perhaps aligns itself with that of generative elements.

Taking the case of the Vertical Gymnasium, located in an informal settlement of Barrio La Cruz, Caracas, Venezuela, the intervention provides a much-needed civic facility and public space for the neighborhood. Deriving cues from the structural and programmatic layering of the informal surroundings the gymnasium expands by repositioning an existing football field vertically, allowing for additional recreational activities to be inserted. The architecture physically responds to the street

and entrance condition through the use transparency at ground level, allowing for the phenomenal expansion of the interior recreation space toward the neighborhood; as well as, by creating a deep overhang that protects the adjacent pedestrian area from the elements and creates a small gathering space (UTT 2005). The expansion of the interior volume through the façade to the street, and the directed lateral expansion work to draw in and bring together residents from the neighborhood, while potentially driving the spatial upgrading of the street and immediate surrounding area. Although the performative, social impact of the gymnasium is undeniable (a 30% lower crime rate (UTT 2005)), its claimed ability to manipulate the physical landscape and urban area is questionable. There are many critics who believe that the spatial impact of a single intervention, like the vertical gymnasium, on the landscape does not seem to reach the scale of the urban area, or the scale of the problem. If we consider the vertical gymnasium to be a dynamic gathering element specifically placed within the informal settlement to act as a catalyst for the evolution of the material landscape, then it looks as though this sort of project is exactly what is required. However, it seems plausible that the gymnasium could have a greater urban impact, if the building was conceived in conjunction with a methodological framework that included a neighborhood infrastructure connectivity initiative, or if it were seen as part of a larger network, or as the seed of a series of development nodes. Nevertheless, an architectural insertion that attempts to alter the landscape by becoming a hub in the urban fabric seems to instrumentalize the generative element of gathering.

Dispersal and Stop

In the early 1990's the municipal policies of Rio de Janeiro, which addressed informal settlements (favelas), critically shifted away from isolation and removal strategies to an approach of acceptance, upgrading, and physical and political incorporation within the city. Favela-Bairro developed as one of the first programs internationally to recognize the favela as a valid urban form and to address the multi-dimensionality of poverty, in this way revolutionizing previous concepts for addressing informal settlements. Favela-Bairro does not focus upon individual buildings or houses, but on the creation of a habitable productive environment suggesting

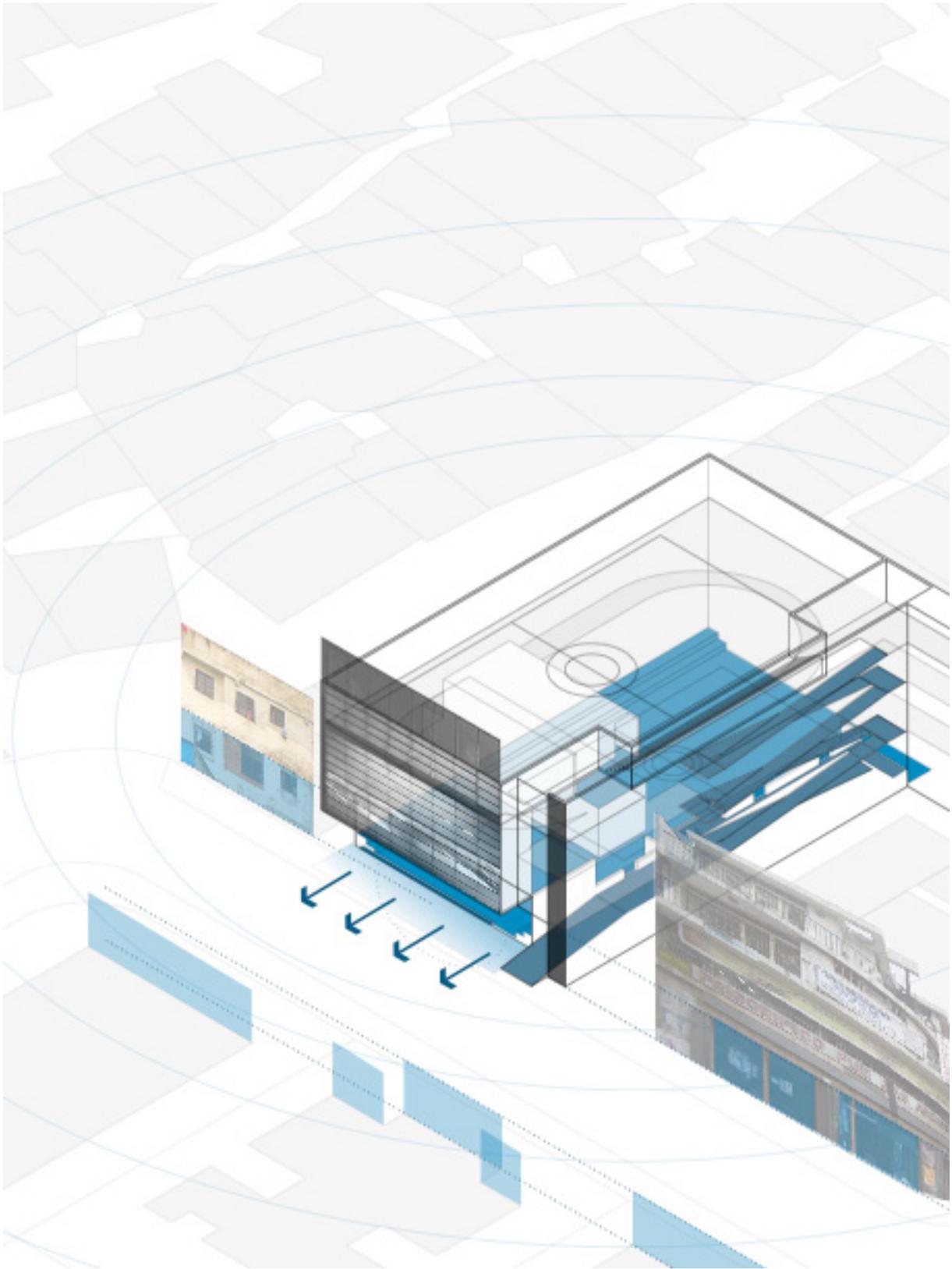


Figure 1: Vertical Gymnasium. Gathering



Figure 2: Parque Royal. Dispersal and Stop

that landscape is critical to upgrading strategies (Werthmann 2008). It seems possible that this manipulation of landscape utilizes generative elements as key drivers for networked solutions.

Parque Royal was one of the first favelas targeted by the program in 1994. The settlement primarily consisted of stilt foundation shacks that favored the density of the interior of the favela rather than the precarious, squalid waterfront. The upgrading consisted of providing basic services, lighting, road paving, recreational areas, and service and training programs in new civic facilities. The urban strategy, taken up by ARQUI5, created a ring road and canals that act both as a boundary for the favela, but also protect the property at the water's edge. Former dead end streets were integrated within a network of infrastructure, which reconnected the interior of the favela and seemingly directed movement from the dense interior toward the ocean. The combination of the directed dispersal of density toward the water and the strong boundary created by the waterfront drove a rich zone of transformation and ultimately revalued the thickened edge as a public promenade. It seems these urban elements have triggered the gradual renovation of individual properties, and "entrepreneurs have taken advantage of the scenic landscape and established small shops in the first floors of their homes overlooking the bay. Landscape in this instance was turned into a cultural and an economic asset" (Beardsley and Werthmann 2008 p42). The transformative ability of these urban tools seems clear. A directed circulation infrastructure and a strong edge can create a thickened zone of productivity that alters the urban fabric, and seems to instrumentalize the generative elements of dispersal and stop. Interestingly, there appears to be a reciprocal relationship between urban scale generative elements and architectural scale mutation. Providing the possibility that a series of generative elements could allow the informal fabric to gain and sustain self-modification. In a manner that is similar to Rossi's observation of the binary relationship between building typology and urban morphology. The clarification of generative elements suggests the kind and scale of instruments necessary for the transformative ability of a strategy.

Movement Vectors

Although not generative elements in and of themselves, movement vectors and networks are critical

components for the element of dispersal and seem to have the capacity to strategically translate and focus directed movement toward material dynamism. The ability of movement vectors to influence the urban fabric was recognized by Alison and Peter Smithson, when they suggested that the future urban form would be directed by autoroute infrastructure (Frampton 1999). Assuming this relationship is accurate and movement vectors can strategically organize and orient the fabric toward densification, extension or renewal, then it is critical to clarify how these paths, routes, and networks are generated, differentiated and support the process.

In response to the problems associated with the sprawling, disconnected, and un-serviced informal growth of Bogotá, Colombia, a series of mayors, including Jaime Castro and Enrique Peñalosa, supported an infrastructural approach to renewal and integration. The mass transit system, known as TransMilenio, connects peripheral, informal settlements to the city centre via efficient, dedicated bus lanes. Secondary smaller buses supplement the main bus routes and serve as feeders for the adjacent settlements and are complemented by a network of new sidewalks and bicycle lanes. TransMilenio stations were envisioned as the seeds of nodes that would provide much needed civic facilities, formal amenities, including: public libraries, high schools and subsidized housing projects; and public space to informal settlements (Beardsley 2008a). Despite radical improvements in quality of life, undeniable reduction in violent crime (fifty percent) and a decrease in traffic accidents, the question remains: whether the TransMilenio project as a movement vector is catalytic of an architecture that has the capacity to index the urban process and promote transformation of the urban form. At many locations the area surrounding the pedestrian bridges has been redeveloped to take advantage of and respond to the critical mass generated by the stations. However, instead of reinforcing the entire length of the infrastructure, development occurs in pockets in direct relation to the pedestrian bridges, as a series of sub-centers along the spine. Interestingly, in some locations a parallel bicycle path and pedestrian way are located a few blocks away from the highway, in these locations there appears to be potential to reinforce a differentiated fabric and a hierarchy of primary, secondary and tertiary routes. However, it seems that the TransMilenio infrastructure, although opening up many tracts of land, does

not seem capable of anticipating an urban fabric. Without a larger strategic ambition and framework, movement vectors themselves are unable to project the form of the city. They become infinitely extendable without suggesting an architecture, providing a regulation for nodality, or a logic for openings in the fabric. Yet as critical instruments, vectors are capable of strategically translating and focusing the dynamism of movement toward a material architecture that indexes the urban process, and allows for the transformative ability of a multi-scalar strategy.

Open Space

The allocation of landscape, understood as public space, can provide critical pockets within a settlement that fosters both social processes (gathering space, community building) and spatial processes (legibility, hierarchy). These urban voids provide critical open spaces within the informal fabric, unfortunately they are often utilized projectively as planometric buffers, urban solutions to social and material disjunction, and as generic tools of regeneration with little ambition toward generating a framework for neighborhood creation. However, if open space is recognized as having similar characteristics to Rossi's notion of primary elements, then it could be utilized as a critical component "capable of accelerating the process of urbanization in the city" (Rossi 1982 p87). Voids appear to materially organize an architecture that strategically orients the urban fabric toward densification, extension or renewal. The question remains, how to identify, reinforce and direct a network of voids, which move beyond delivering isolated pockets of open space.

Recognizing the potential of open space, Flavio Janches and Max Rohm along with a group of students have turned their attention to the informal settlement of Villa Tranquila, located on the periphery of Buenos Aires, Argentina. The settlement, although physically isolated from the city centre, has recently been targeted for upgrading (including improved infrastructure connections and public amenities), however the possible transformative role of landscape remained unexplored. Noticing the absence, Janches and Rohm began investigating the settlement's interstitial spaces, believing the voids could be transformed into "new forms of public space that would be the starting point for the revitalization of the villas [informal settlements] and their integration with the rest of the city" (Beardsley 2008 p36).

The ambition was to generate a set of guidelines that could be utilized for any redevelopment effort (Studio Works 2008). Unfortunately due to financing restraints, the resultant project only consists of a large recreational area, including athletic pitches, green space and the linking of three residential areas. However, the design lacks ambition to engage the material structure of the surrounding settlement and strategically channel the dynamism generated by critical mass. Although, providing an important amenity for the community it does not seem to embody the networked transformational agenda of the earlier research, nor does it seem to provide a methodology for future upgrading. In contrast, the initial analysis provides a far richer insight into the fabric of the informal settlement. The identification of differentiated open spaces and the material architecture of voids suggests the structure of informal settlements is inherently inclined toward differentiation; contradicting many views of the informal being a homogenous fabric, incapable of supporting institutions that generally require spatial distinction and hierarchy. It seems that if the open spaces are influenced by Maki's generative elements of gathering, dispersal and stop, then the elements could strategically direct the dynamism of critical mass in a manner supported by a morphology of surface and material detail of the void.

THEORETICAL MODIFICATION

If an informal settlement is interrogated in a manner, which does not dismiss the spatial, but attempts to recognize potential generative elements within the fabric; then the general concern regarding its inability to self modify could be set aside. Instead the spatial condition seems to provide a rich array of possibilities that if directed could lead to the transformation of the informal. The identification of open spaces within the fabric, if understood as a larger network of voids, confirms the inherent potential for differentiation. It seems that if these open spaces are considered topologically, then their surfaces, the facades, ground, and layered section, may be activated through the urban process and the resultant dynamism directed toward material transformation. It is proposed that if an informal settlement is considered as a large urban form, then the identification of open space becomes more than a singular entity, but the overall pattern of voids and pores can be understood strategically. The lack of differentiation within the in-

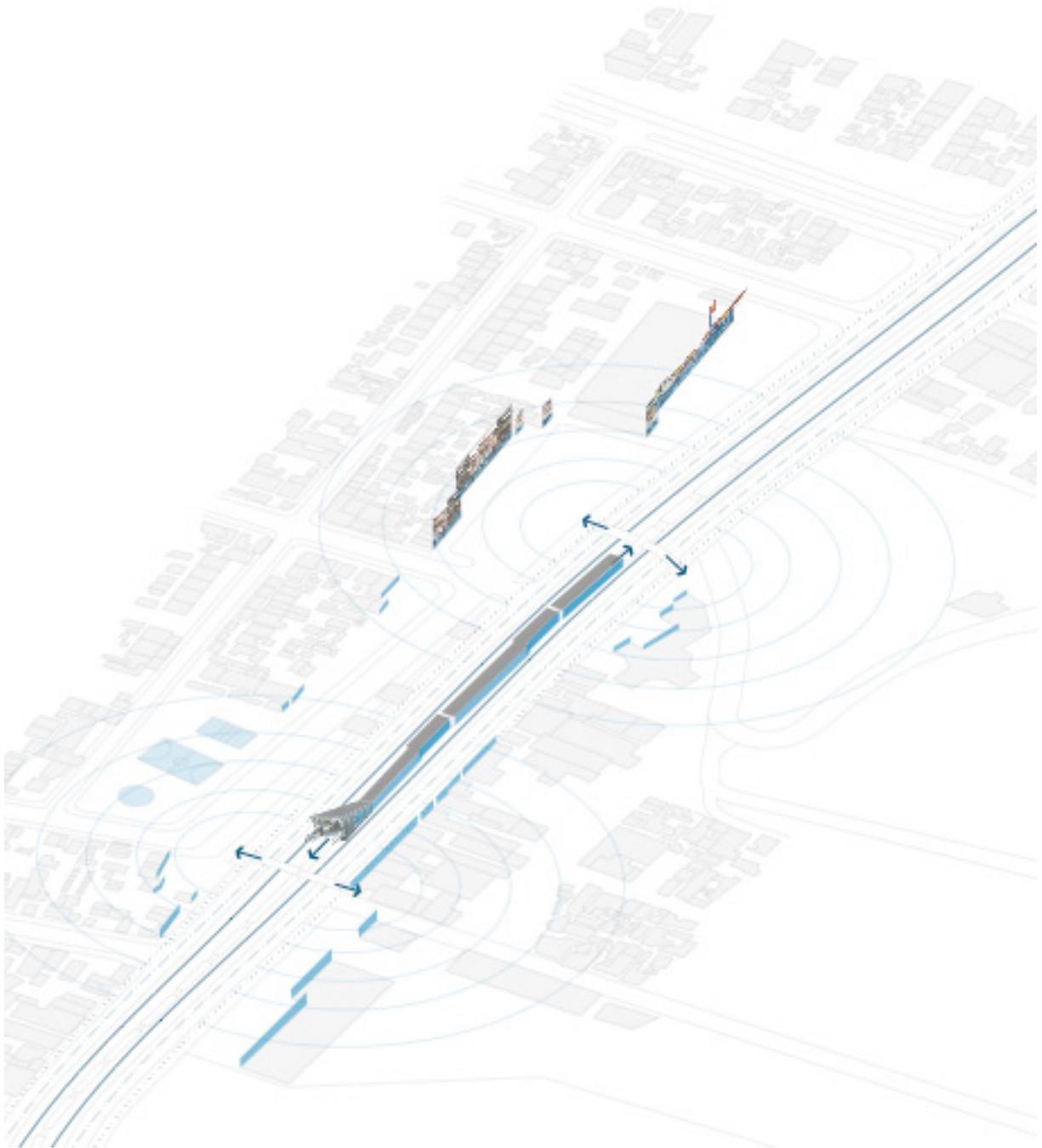


Figure 3: TransMilenio. Movement Vectors



Figure 4: Villa Tranquila. Open Space

formal fabric can generally be understood to be one of the reasons why settlements fail to support the mix of functions required and usually found within the formal city. If open space is capable of being transformed in a manner that leads to a range of urban conditions, from larger civic spaces, to privileged semi-public spaces, to private spaces, then it seems likely the resultant fabric would be capable of supporting civic amenities. However, transformation does not seem possible without the assistance of critical instruments that have the capacity to translate and focus the dynamism toward physical change. It is no coincidence then that movement vectors were investigated, their capability to strategically convert and direct the dynamism of movement toward a material architecture that indexes the urban process, and allows for transformation becomes critical. Unfortunately, the vector, especially as infrastructure, is often understood as a tool to deliver a critical mass from one point to another, rather than as an instrument that has the capacity to gather the urban fabric, orient it toward densification and suggest a manner of extension or renewal. These qualities make the inclusion of movement vectors critical to any strategy that is attempting to address the informal fabric. However, a single vector never has the ability to create a truly differentiated fabric, as it becomes infinitely extendable without providing a method of regulation or nodality. It seems likely that in combination with open space, movement vectors, as plural insertions, could accentuate the differentiation and hierarchy inherent within the fabric; as well as, strategically transforming the material structure of the informal and producing the capacity to support larger ambitions. Yet, the other catalytic elements of gathering, dispersal and stop are also critical instruments of transformation. As architectural and urban scale structures they are capable of drawing in and holding together a critical mass as a node, directing and restructuring existing patterns of movement to strategically modify the fabric, and harnessing and laterally transferring dynamism to generate productive density. Interestingly, like open space and movement vectors, these elements are most productive when utilized not individually, but as an integrated strategy that attempts to address a broader urban vision. The relationship between elements is reciprocal, urban scale elements allow for architectural scale mutation and vice versa. Perhaps, allowing for an initial strategic insertion of elements to be self-sustaining

and to provide the informal fabric with a means of long-term self-modification.

Although open spaces, movement vectors and generative elements are all necessary instruments, which provide a catalytic reaction within the urban fabric, the interpretation and definition of that fabric is critical for all upgrading attempts. The understanding of an informal settlement as collective form allows additional possibilities for any strategy. Both Maki and Urban Think Tank provide valuable interpretations of the fabric, which allow the informal to be seen both as something that evolves and develops, and as porous and open to mutation. Additionally, it seems important to recognize the fabric, as collective form, is characterized by a consistency of materials and a continuity with the natural landscape. Often the potential of these qualities is unrecognized due to the stigma associated with informal settlements. Materials are often only recognized as being of poor quality, temporal, recycled or unfinished, whereas their ingenuity, structural capacity for modification, and indexing capability are overlooked. The natural landscape is often treacherous, unsafe and plagued by natural disasters; however, the material structure of the settlement intelligently maximizes the natural resources. The conditions generate a cohesive form that not only mimics the landscape, but also indexes the natural topography within the architectural form as the material structure of the built environment. It seems that interrogating the settlement in this manner, as a whole, allows for the structure to be identified and valued, broader potential networks to be recognized and the dynamism of the urban process to be respected and pushed forward, allowing for a multi-scalar understanding of the informal. Specifically, enabling the topographic form to be understood as composed of both materially dynamic architecture and urban scale systems, supporting the processes of transformation. Upgrading attempts that are simply insertions of programmatic agendas forgo the opportunities of dynamism of place and the projective nature of architecture. Instead any attempt to transform the informal fabric must consider the whole, and a strategy for transformation must include a methodology for questioning landscape.

Projective Speculation

Returning to the previously explored investigations of informal upgrading strategies, which material-

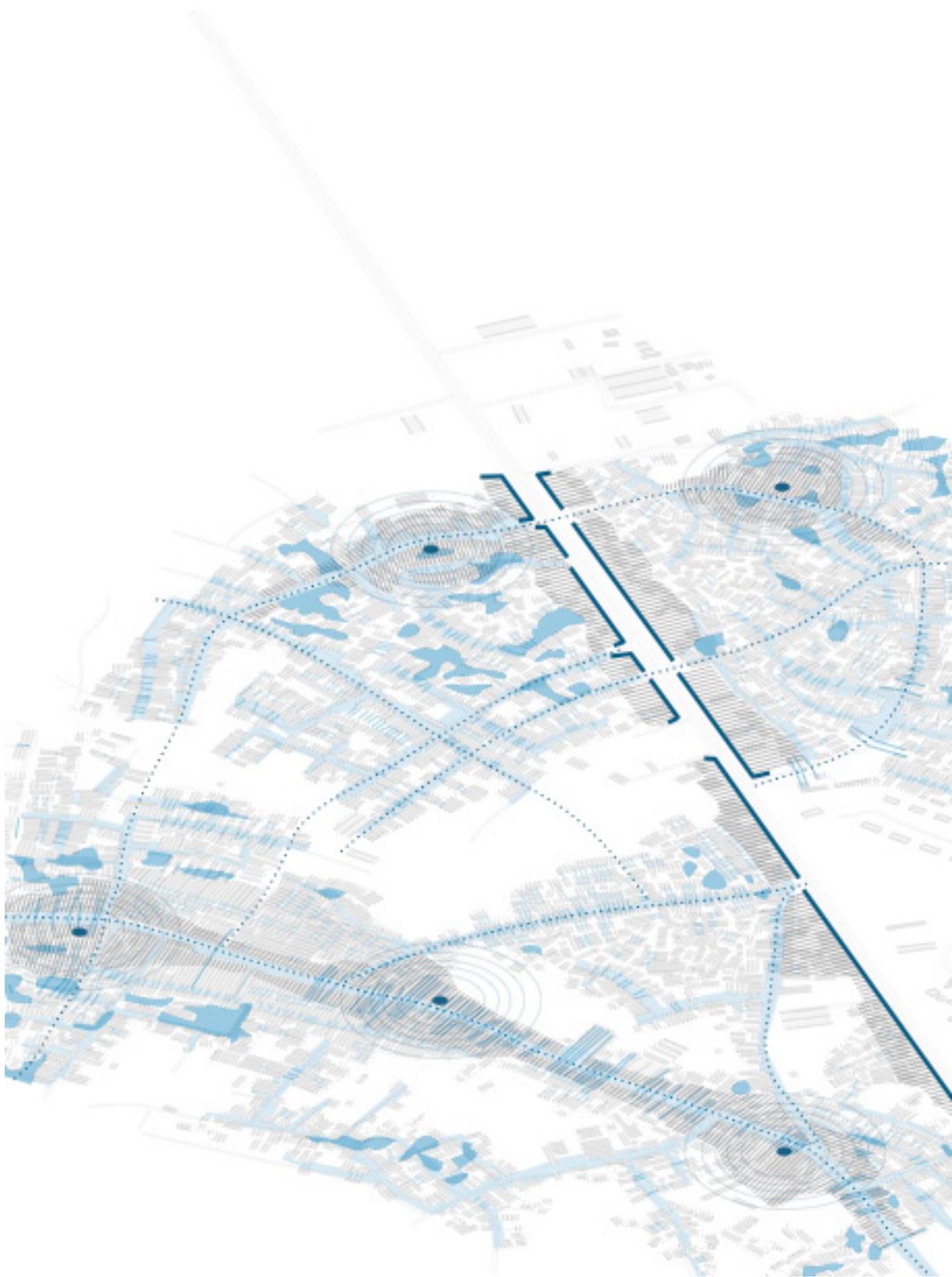


Figure 5: Alaba Market. Multi-scalar Strategy

ized generative elements, it now seems possible for a reciprocal investigation to occur. Initially these strategies were selected for their spatial ambitions; however successfully the attempts physically engaged the material architecture or the environmental potential, their shortcomings were also recognized. However, if the newly identified multi-scalar spatial strategy is taken into consideration, with its ability to identify and value the productive structure, to respond to and push forward the urban process and to productively utilize the dynamism of place; then it seems appropriate to speculate what such a methodology could provide to these previously analyzed strategies.

The first investigation identified Urban Think Tank's vertical gymnasium as a dynamic gathering element specifically placed within the informal settlement to act as a catalyst for the evolution of the material landscape. Although, the project provides a necessary civic facility to the fabric in a manner that respects and utilizes the dynamism of place, its ability to strategically manipulate the informal settlement was limited. In this case it seems that a multi-scalar methodology could provide a framework capable of generating a greater urban impact, specifically allowing the projective insertion to act a node within an integrated network. The recognition of the settlement as group form, not only allows it to be understood as inherently differentiated, porous, and structured by a complex circulation network, but also clearly identifies the physical scale of ambition. It then seems possible to envision the urban components that must be introduced to allow the projective insertion of the vertical gymnasium to reach the scale of the form. This would likely involve strengthening and directing the circulation system or introducing a series of civic facilities within the fabric to generate regulated centralities across the settlement. Potentially allowing upgrading to occur in a manner that respects the benefits delivered by multiple scales of modification and perhaps reaches the ambition for urban integration.

The generative elements of dispersal and stop were examined through the investigation of the upgrading initiative at Parque Royal. The upgrading strategy utilized landscape (understood as public space) as a key driver in the evolution of the informal settlement. In conjunction with a strong circulation network and catalytic elements, the initiative in-

telligently supported the embedded structural and environmental value of the settlement in a manner that directed the urban process forward and implicitly revalued the spatial condition of the favela. Interestingly, it seems that many of the benefits of a multi-scalar approach, including: its ability to identify and value the productive structure, to respond to and push forward the urban process and to productively utilize the dynamism of place; seem to be intuitively addressed by the Parque Royal upgrading strategy. However, this does not seem to be due to a systemized effort by the Favela-Bairro program, rather an exemplar of spatial responsibility and ambition by ARQUI5. Recognizing that the program supports multiple responses from a variety of firms, it seems possible that a multi-scalar upgrading strategy could provide an overarching structure to enable projective responses to consistently reframe the informal fabric.

The TransMilenio project, explored as a movement vector, exemplifies transportation infrastructure upgrading attempts, where dedicated bus lanes reconnect peripheral, informal settlements to the city centre and stations act as seeds of key civic nodes within the fabric. Although the notion of connectivity is crucial to the strategy, the deficiencies of a single vector to provide differentiated movement, project the form of the city or translate the dynamism of movement toward material architecture were identified and must be addressed to allow upgrading attempts to be truly seen as successful. If the TransMilenio project was considered through a multi-scalar methodology, then perhaps some of the shortcomings could be overcome. Such a strategy could allow the informal fabric, adjacent to the primary movement vector, to be investigated in a manner that identified the structure, grain and hierarchy of productive open spaces. Also it seems to suggest the secondary and tertiary movement vectors, specifically the bicycle paths and pedestrian ways, which could be utilized to direct the resultant dynamism to strategically activate productive voids and transform the adjacent fabric. Ultimately proposing an architecture that could anticipate and perhaps even suggest additional modifications that respect the material capacity of place.

Similarly, the potential of open space as an initiator of upgrading was investigated through Villa Tranquila. It was suggested that the identification of an existing network of voids, including their size, scale

and direction could be materially altered to radically reframe the informal settlement and establish clusters and nodes within the fabric. The strategy relied upon the recognition of the settlement as group form, the valuing of the structure, as well as the potential for a material morphology of place. Unfortunately, it was determined that without additional generative elements the informal fabric was worryingly incapable of self-modification, and unfortunately the strategy had no capacity to insert such elements. In contrast, a multi-scalar approach provides the capability of identifying additional elements of gathering, dispersal and stop within the fabric in conjunction with the recognition of the structuring capacity of the complex circulation network, all of which have catalytic potential. It seems that if Villa Tranquila was investigated with such a methodology, then the possibility of landscape could be more clearly recognized and the material structure of open spaces activated by the dynamism delivered by movement vectors and dispersal networks. Suggesting a manner for the voids to strategically deflect the surrounding fabric and in their morphology allow for a continued upgrading of the fabric.

REACHING SCALE

In alignment with the World Bank and UN Habitat policies toward the eradication of poverty and the Millennium Development Goals ambition to significantly improve the lives of 100 million slum dwellers by 2020, there is no doubt that the return to the realm of architecture and urbanism is vital (UN-Habitat 2003). The enormous scale of poverty and the inadequacy of current strategies necessitates massive change. It is no longer acceptable to attempt to reach scale through big projects, infrastructure provision or even land restructuring. Instead the problem must be reconceptualised. It is suggested that a multi-scalar spatial strategy allows for exactly this kind of reconceptualization, where urbanism no longer attempts to invent something big enough to confront the apocalyptic demographics, but instead raises its ambition by seeking the productive structure of landscape. Utilizing a multi-scalar methodology it seems possible to reframe the informal fabric's transformative abilities through an upgrading strategy that radically re-examines the possibilities of the spatial and ultimately may provide an urban methodology to reach the scale demanded by the apocalyptic demographics.

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