Medium Density Beyond the Missing Middle

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The question of housing in America's growing urban centers has gravitated towards extremes in recent years: efforts at densification have sparked massive developments of multi-story apartment blocks, on the other hand the free standing single family house remains to date the unchallenged ideal of many Americans. Austin, TX is no exception to this trend: Single-family homes continue to make up by far the largest share of housing while large multifamily structures have seen a steady increase by about 40% over the last decade[1]. This development has led to spatial and social disparities. While multi-unit structures have accelerated the urbanization of a few neighborhoods and corridors, and cater to a transient population of young professionals, rising property values have made the "house" an increasingly unattainable dream for many middle class families.

This lack of a middle ground has been aptly identified within the discourse of New Urbanism as the "Missing Middle,"[2] referring to the density range between the apartment block and the single family house as much as a vanishing "middle class". The Missing Middle promotes walkable neighborhoods with housing densities able to sustain local amenities and businesses without sacrificing essential comforts of the single family home. Gaining ground throughout planning departments across North America, the idea has increasingly come to be reflected in the rewriting of zoning codes.[3]. But despite the groundwork being laid, a true design discourse to give form(s) to the idea has yet to emerge. All too often, Missing Middle housing is reduced to a mere zoning problem or entangled in a retrogressive formal agenda and the desire to create a simulacrum of a pre-modern city based on pre-WWII housing types. All but absent from this discourse is the rich legacy of modernist experimental housing that explored the medium density range - often already conceived as counter model to CIAM's pre-war doctrine of the functionalist city. Regardless of successes or failures, this discourse hinged on two crucial recognitions. First: the unit always prefigures a (possible) city, and the smallest domestic space begins to suggest attitudes towards the relationship between individuals, architecture, and the city; and second: these relationships are inherently a design problem.

An ongoing series of advanced design studios taught by the author since 2018 has addressed the medium density housing range in various contemporary contexts. Looking simultaneously ahead and back, these studios encouraged design speculation into the ways we live, how our dwellings form units, clusters, and cities, while establishing discursive links to the postwar legacy so often "forgotten" by the current Missing Middle debate. Three performance criteria were established for the studios to describe "medium density" as a set of qualities rather than a number (units/acre): (1) Units had to provide ground floor access from the street, supporting a sense of ownership often positively associated with the single family house. (2) Each unit had to provide private outdoor space(s) protected from views. (3) A minimum of one off-street parking space was to be provided per unit.

Identifying shared bodies of ideas between the design work and postwar discourse, this paper will discuss trajectories that have emerged from this research and attempt to give the Missing Middle a disciplinary foundation outside the New Urbanism.

BETWEEN UNIT AND CITY

Current Missing Middle debates tend to foreground infill construction in established neighborhoods. Here, challenged by hardened NIMBY ("Not-in-my-back-yard") attitudes, density becomes a stealth operation: an increase in numbers is mitigated by the explicit desire to be *compatible in form and scale with detached, single-family houses[4]"* Accordingly, proposals show a preference to replicate the free standing "house-on-a-lot" model (in addition, free standing structures are often encouraged by local zoning), except that the "house" contains multiple units as a duplex, triplex or fourplex. As FAR's and building footprints thus increase, ever thinner perimeters of leftover spaces around buildings contribute more to a desired image of a suburban garden city than the occupants' quality of life. The lack of attention to the "space-between" becomes exacerbated when new Missing Middle developments — often conceived by a single developer and therefore not subject to traditional lot divisions — simply reproduce the pattern of streets, lots, and "houses," and perpetuate a suburban *image* rather than search for a *spatial* vocabulary to accommodate the desirable aspects of suburbia.[5] Endlessly repeated, the same fourplex that may stand inconspicuously in a historic
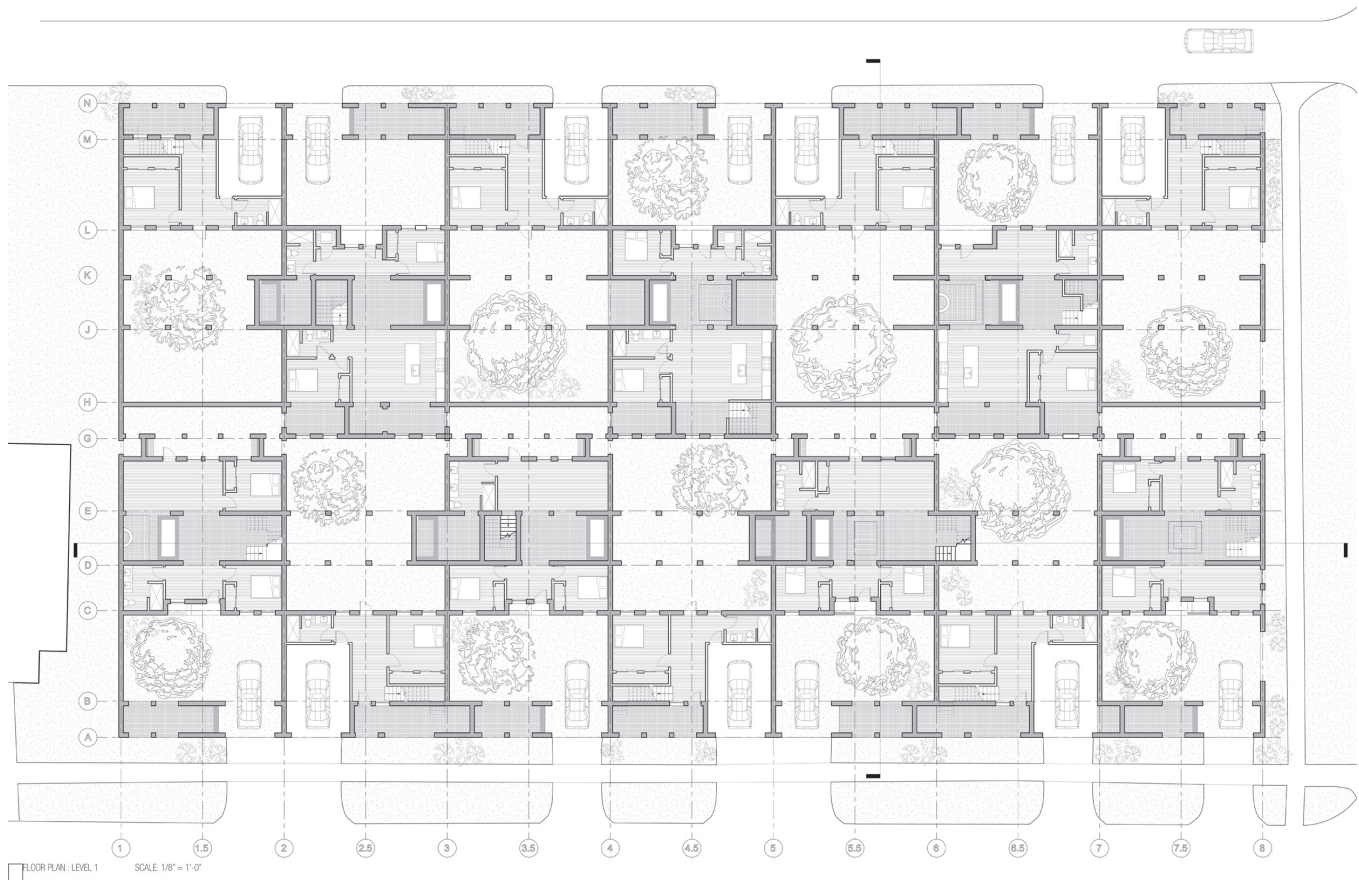
Figure 1. Between Unit and City. Drawing by Rebecca Gawron and Paul Hazelet.

neighborhood, transforms into a monstrosity: formulaic, predictable, and unable to define private or collective space. As cities continue to grow, retroactive infill strategies make up only a small part of residential construction. With vast quantities of new housing being constructed on peripheries (which certainly holds true for the Austin metro region where these studies were conducted) or as revitalization of brownfield sites, medium density models today have the chance to explore not only the unit itself, but the ways in which units form clusters, and how intermediate spaces configure scales of domestic, collective, and public life.

MAT-STRATEGIES

The idea of alternative forms of horizontal density is not new. The 1960's saw a prolific exploration of models that attempted to resolve the discrepancy between the individual mandate of the *house* and systemic nature of *housing* beyond the latter being a mere category of CIAM's functional city. Defined less by a common formal language than by a number of shared attitudes and characteristics, these experiments came to be summarized as "mat" buildings, a term coined by Alison Smithson[6] who, along with a group of younger members of CIAM, had begun to question the rigidity of the Athens Charter since the 1950's. Expansive and horizontal, the mat

was conceived as counterproposal to the functionalist city and the compositional urban space of prewar modernism. It emphasized relationships over finite form, and replaced the customary division into streets, lots, and buildings with an integrated matrix of space, structure, and movement, thus blurring divisions between building and city. While not exclusive to housing, this strategy inherently addressed the question of individual inhabitation within the systemic nature of the modern city. Its genealogy includes the attitudes pioneered in the early work of Georges Candilis and Shadrach Woods with ATBAT-Afrique[7] and their interest in the North African vernacular as much as the Dutch structuralism of Aldo van Eyck or the Smithson's focus on scales of mobility on display in their *Berlin Hauptstadt* competition of 1957. A common thread of all mat buildings was a keen awareness of the interdependence between the smallest unit of habitation and the framework of the city. As Jaime J. Ferrer *Forés* writes:

"The cell — an individual building or space that accommodates human activities — was organized through the 'from cell to cluster' principle, which separated the urban tissue into its smallest components, cells, and re-assembled them so as to establish intricate spatial variation between private and public space."[8]

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Figure 2.The Mat Typology revisited. Model by Rebecca Gawron and Paul Hazelet.
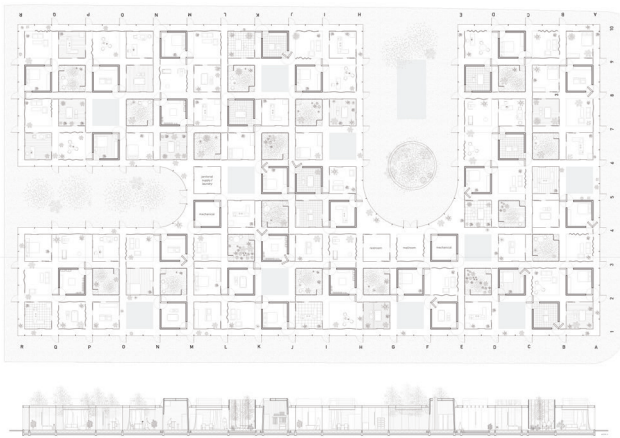

Figure 3. A City of Rooms. Drawing by Ezra Wu.

But while the cluster worked from the bottom up to give form to the intersection of the individual and the collective, it equally operated from the top down as an intermediary between the public and infrastructure networks of the city (described by Shadrach Woods as "stem") and the individual. Alison Smithson's dual demand that planning *"be reconsidered as proceeding from stem to cluster[9]"* at the same time as *"in the design of cells one proceeds from core to cluster[10]"* places the cluster at a crucial, if precarious intersection.

The absence of the cluster scale from most contemporary debates on Missing Middle housing is all the more surprising given that at this scale a number of unique contemporary challenges and changes in the way we live (together) come into view: Emerging models of cohabitation beyond the nuclear family suggest new forms of collectivity and shifting boundaries between cell and cluster. At the other end of the spectrum,

housing clusters increasingly act less as extensions of the infrastructural networks of the city, but as explicit counterpoints – urban enclaves tasked with creating collective identity in an ever expanding territory of urban networks.

FROM CELL TO CLUSTER: REPETITION AND VARIATION

The project by Rebecca Gawron and Paul Hazelet (Figure 1&2) illustrates the studios' focus to productively engage with the dialectics of individuality and collectivity, repetition and exception, unit and cluster, and part and whole. The project explores a hybrid of a horizontal structure consisting of alternating open and enclosed spaces, and a vertical functional and material organization. This basic checkerboard grid is offset to introduce series of intermediate spaces; some become transitional open or enclosed porches, others form solid masses to hold service and circulation. Characterized by the contrast between its stark materiality (load bearing brick walls) and the softness of the patio vegetation, the ground floor creates a formally strong yet functionally flexible framework for inhabitation. Each unit is crowned by a floating double height roof volume. The layering of horizontal and vertical zones produces a richness of spaces within a rational constructive framework. Subtle variations of the roof shapes create different floor plans and lighting conditions, and stress the individual character of the units, while the heavy brick base establishes a palpable collective foundation. Notably, at the cluster scale the project establishes an interdependency between units as none of the patio spaces can exist in isolation, and is always formed by several adjacent volumes. This simple relationship is exploited to create outdoors spaces that alternate between individual retreat and collective engagement. The fine line between simplicity of a repetitive system and richness of occupation achieved in the project brings to mind Alison Smithson's words describing the work of sculptor Louise Nevelson:

> *"Parallell phenomenon of evenness of attack on the ordinary, lifting the everyday to a poetic level. Apparent sameness made the carrying order"*[11]

A CITY OF ROOMS
The mat's fluidity of scales between city and unit is the starting point for Ezra Wu's radical proposal for a new communal housing type (Figure 3). Further blurring the scales between domestic and city life, the proposal's basic cell is no longer the family unit, but the individual room itself. This reduction of individual ownership in favor of shared amenities is emblematic of a renewed interest in communal and co-op housing models that have emerged in response to the current affordability crises. Where the historic mat type had begun to exchange individual expression for collective identity, Wu's proposal brings this trajectory to a logical conclusion: Individual ownership is reduced to a basic micro-unit module, each equipped with connections for essential amenities such as electricity and water, as well as air conditioning.

As users rents out one, two, or several units they begin to build their own spatial compound of rooms. The single story grid becomes the playing field for a constant process of negotiation between users; the wide hallways are always collective spaces, and a number of units are reserved for shared services and courtyards. The project reproduces the logic of the city grid on a domestic scale. If the 1960's mat building blurs the boundary between architecture and urbanism, the city - in this vision - becomes a city not of buildings but a city of rooms.

FROM CLUSTER TO ENCLAVE

Even when built, the mat of the 1960's retained an implicit ambition to act as an ideal type for a potential city to be. While acknowledging the emerging phenomenon of infrastructure-driven urbanization, the ideal city outlined by the mat (and subsequently expanding the concept from *mat building* to *mat urbanism*) maintained the dual modernist prospect of design control and universal validity. Remarkably, as a diagram, this city has today to a great extent materialized. Stan Allen offers an insightful observation in his reassessment of the mat in 2001[12] noting the emergence of a *"radically horizontal urbanism"*[13] in the late twentieth century:

> *"Cities like Los Angeles have developed as vast, mat like fields, where scattered pockets of density are knit together by high-speed, high volume roadways. Their radical scale shifts and extreme social contrast undermine the ability of architecture to mediate these transitions. Los Angeles is a polycentric web, coincident in many ways with the Smithson's diagrams of urban form."*[14]

The city, in other words, increasingly operates like a mat, except at a scale far beyond the urban imagination of the 1960's and the grasp and control at the level of architectural space-making that the Smithsons and their contemporaries had envisioned. For Allen, the solution is an expansion of the vocabulary and strategies of architecture, manifest for example in the tactics of landscape urbanism. But where Allen expands the scope of architecture to assert design agency in relation to elusive processes of urbanization, other models have all but accepted the impossibility of the contemporary city as holistic enterprise. One such attitude can be found, for example, in the work of German architect O.M. Ungers, whose *Dialectic City* acknowledges the impossibility of contemporary urban environments to be planned according to a single strategy, and instead calls for the simultaneous presence of antithetical urban enclaves and layers.

> *"The city made up of "complementary places" consists of the largest possible variety of different parts, in each of which a special urban aspect is developed with a view to the whole. In a sense it is a system of the "city within the city." Every part has its own special features, without however being complete or self-contained. [...] and therefore combines with other highly developed places to form a complex system, a kind of federation."*[15]

The shift from the city as plannable whole to multilayered system of enclaves has significant implications for the scale of the cluster. The 60's mat typically treated the transition from the infrastructural (stem) to the cluster scale as seamless. Projects such as Candilis, Josic, Woods' Berlin Free University or Frankfurt Römerberg use a consistent architectural vocabulary (grid/infill) to suggest a continuity of the urban habitat across scales, echoing Alison Smithson's assertion that *"Today space is total and society is universal."*[16] But if we accept the postmodern idea of the city as a complex and contradictory whole, each collective cluster now faces a dual task: At the level of functionality, it needs to continue to facilitate transitions from the infrastructural to the scale of (co)habitation. On the other hand, it needs to increasingly become a generator of collective identity, both organizing and giving expression to the attitudes and needs of its occupants.

FROM MAT TO FIELD

The design proposal for an "Urban Village" by Allison Walvoord and Krishnan Mistry (Figure 4) explores the housing cluster as a tense hybrid between legible urban enclave and multi-faceted collective formation. As a starting point, the project takes the idea of "house-ness" – and therefore everything that appears desirable about the free standing single family house – to an extreme. A dense agglomeration of self-similar, gabled "houses" endorses the desire for formal and symbolic legibility of the private dwelling. The dense clustering on the other hand creates a different kind of shared identity with pockets of collective space at different scales throughout. The sum ultimately supersedes its parts and transforms the typical isolation of the "house-on-the-lot" model into a collective whole. The assumed equation of "one unit = one house" holds no longer true in this vision: Units can span across several volumes, and, in reverse, a single volume can accommodate several units. The result is an urban village whose legibility oscillates between part and whole, which carries the promise of a living model that affirms both the value of individual expression and the presence of a collective in the city. Moving beyond the mat's continuous uniformity the project acts as what can be described as a "Field Condition"[17] Indebted to the mat, field conditions are agglomerations of discrete parts that go beyond both classically modernist composition and the systemic structuralism of the mat, as Stan Allen observes:

> *Field configurations are loosely bounded aggregates characterized by porosity and local interconnectivity. The internal regulations of the parts are decisive; overall shape and extent are highly fluid. Field conditions are bottom-up phenomena: defined not by overarching geometrical schemas but by intricate local connections.*[18]
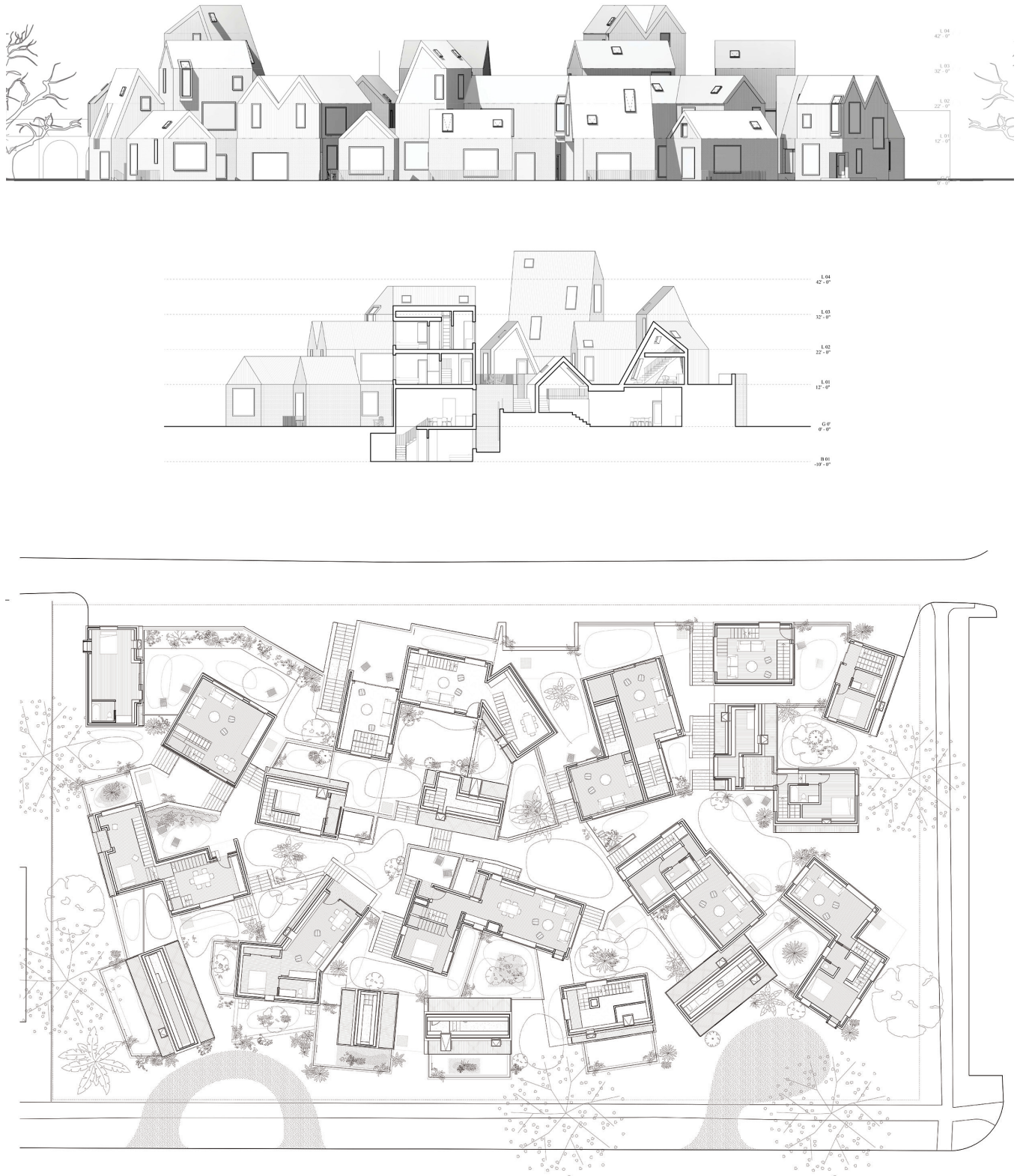
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Figure 4. Field as Urban Enclave - Urban Village. Drawings by Allison Walvoord and Krishnan Mistry.

Figure 5. The potential of the row. The project by [student names] explores variations of the row house. Image by Guopeng Chen and Ian Beals.

Unlike in the mat, meant to "epitomize the anonymous collective,"[19] the individual object is not dissolved as a cell in an overall system (spatial, structural, or geometrical...) but retains its autonomy as a discernible part of the whole. Each housing unit in a dense field, therefore, does not automatically cede its individuality to the whole, but rather contributes through its individual layout, shape, or disposition. Where the mat concept assumes totalizing organizational control and often results in spatial homogeneity, the field amplifies relationships between parts, allows for moments of greater or lesser density, and suggests different uses of space. At the same time, the project achieves an outside legibility, discernible itself as an object in the larger field of the contemporary city.

TYPOLOGY AS FRAMEWORK FOR INNOVATION

Mat strategies are not readily associated with questions of typology. Yet there is a delicate balance between the ways in which the cluster scale continuously reinvents itself in response to climatic, social, topographical, and other contextual factors, and the typological nature of the unit itself.

Currently, a majority of Missing Middle advocates look back to housing types commonly found in many North American cities before WWII, and before single family zoning was codified.

Often, a return to traditional types and, more general, the idea of "typology," is summoned as countermeasure to the "compulsive originality[20]" of the avant-garde to reinvent the city. Yet, the capacity of an eclectic mix of California Bungalow Courts, Philadelphia Row Houses, and Boston triple-decker, uniformly constructed in 2x4 framing, to provide any meaningful link to the past of a city like Austin - today ten times larger than in 1945 – seems questionable and readily reduces historic continuity to visual cues.

Design studios sought to investigate housing types not as fixed entities, but as what Rafael Moneo calls *"frame within which change operates, a necessary term to the dialectic required by history."[21]* To Moneo, writing "On Typology," change and permanence are not mutually exclusive, and typology is the very mechanism to facilitate this coexistence:

> *From this point of view, the type, rather than being a "frozen mechanism" to produce architecture, becomes a way of denying the past, as well as a way of looking at the future. In this continuous process of transformation, the architect can extrapolate from the type, changing its use; he can distort the type by means of transformation of scale; he can overlap different types to produce new ones."[22]*

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VARIATION WITHIN UNITY: THE POTENTIAL OF THE ROW

A number of unit types have over time emerged as particularly suitable for dense recombination, among them the courtyard type and the row house, offering two and three (respectively) "blank" sides as connection points with adjacent units. While the courtyard type has been a consistent presence in mat developments for decades, it may be instructive to consider the evolution of the row house in the context of typological evolution. Originating in 16th century Europe, the principle of the row house is simple: A superstructure of parallel load bearing walls – sometimes shared, sometimes doubled up, often equidistant – defines repetitive compartments containing a unit. The spatial principle is identical with the structural principle, light can only enter from two sides, and plans are flexible exclusively in one direction. Endlessly reproducible, the row house was embraced by modern architects from Le Corbusier to Ernst May in search of solutions for the crises brought about by mass urbanization. No other type more explicitly embodies the emergence of "housing" within the logic of capitalism's separation of live and work – including its negative connotations. While cost- and energy efficient and able to generate high densities, there are less desirable characteristics to this type: the continuous façade makes privacy for outdoors spaces difficult to achieve, access to daylight is limited and decreases with unit depth, and unit variations can be challenging.

Atelier 5's Siedlung Halen (1957 – 1961) is a milestone in the evolution of this type away from the modernist "Zeilenbau" (linear bar) that dominated early modernist developments towards a collective mat formation integrating a variety of private and public outdoor spaces within repetitive framework. Helped by a stepping topography, the project evolves the type of the row house in two significant ways. First, the framework of the dividing shear walls is not limited to the unit itself but extends to organize exterior spaces, thereby transforming the "backyard" into a walled patio that is an integral part of the fabric. Between these elongated walls a series of *brise soleils* begins to modulate the façade into protruding and recessed areas, providing a highly layered threshold between exterior and interior to add a layer of visual and spatial privacy previously unknown in row houses.

The studio project by Guopeng Chen and Ian Beals (Figure 5) explores a further evolution of the row house type. The design proposal embraces the repetitive system of shear walls as organizational backbone. These walls, however, extend across the entire depth of the site, and, instead of the customary one, now accommodate a total of three units per structural bay. In this configuration, the typical front/back condition – and its lack of private outdoor space – is replaced by a multiplicity of intimate courtyard spaces. The constraint of the elongated bay is embraced in the interlocking arrangement of units in plan and section: Each unit has an individual entrance from the street, from where the occupant is pulled deep into the

hidden word of the block. Compared to a typical row house, the project achieves a threefold increase in density, and different size unit types invite economic diversity. The resulting sculpted block ascends from the residential street towards the commercial thoroughfare at the back of the site, modeling a possible transition between existing low-rise neighborhoods and density corridors.

CONCLUSION

The Missing Middle has given a name to a set of issues relating to an underrepresented and much needed housing segment. It has helped create awareness and advocacy, slowly beginning to shift attitudes and generate potential for substantial change. But as much as we should be cautious of narratives singling out culprits ("modernism"), we should be wary of promises of universal fixes ("The Missing Middle Housing Neighborhood Kit™"[23]) as we begin to search for architectural solutions. The studio series introduced here makes an attempt to link the Missing Middle debate to the disciplinary discourse of postwar modernist practice, drawing upon both its precedents and attitudes towards the agency of housing to inform relationships at, and between, the domestic and urban scales. The examples discussed in this article are neither meant to be comprehensive nor guidelines for action. They share, however, the attitude that neither housing types, nor the city itself are fixed or immutable entities, but exist in a continuous dialectic relationship of permanence and reinvention.

ENDNOTES

1. Within the Austin census, detached single unit structures made up 45.6% of total structures in 2018, largely unchanged from 2010 (46.1%). Structures containing more than 50 units have increased by 40% over the same time period. Source: https://censusreporter.org/data/table/?table=B25024&primary_geo_id=16000US4805000&geo_ids=16000US4805000,05000US48453,31000US12420,04000US48,01000US

2. The term has been used since about 2010 and was coined – by his own admission - by CNU member Dan Parolek, principal of "Opticos Design".

3. Austin's most recent proposal for a new land development code, for example, would allow duplex construction on almost every single family lot and includes a zoning category (R3) to allow for up to three units on previously single family zoned lots.

4. Karen Parolek Dan Parolek, "Missing Middle: Why Form and Scale Matter," CNU, April 11, 2018 https://www.cnu.org/publicsquare/2018/04/10/missing-middle-why-form-and-scale-matter

5. Take a look, for example at the utterly uninspiring and thoroughly suburban Prairie Queen in Papillion, Nebraska designed by Dan Parolek's own firm Opticos Design

6. Alison Smithson, "How to Recognize and Read Mat-Building; Mainstream Architecture as It Has Developed Towards the Mat-Building," *Architectural Design*, no. 9 (September 1974): 573-590.

7. ATBAT-Afrique: African branch of the Atelier des bâtisseurs (ATBAT), founded by Le Corbusier in 1947. For reference, see in particular the *Carrières Centrales* Housing Project, 1951 - 1952

8. Jaime J. Ferrer Forés, "Mat urbanism: growth and change," *Projections: MIT student journal of planning*, no. 10 (2011): 75.

9. Smithson, "How to Recognize and Read Mat-Building," 581.

10. Ibid.

11. Smithson, 584.

12. Stan Allen, "Mat Urbanism: The Thick 2-D," in *Case: Le Corbusier's Venice Hospital and the mat building revival,* ed. Hashim Sarkis, Pablo Allard and Timothy Hyde (Munich, Prestel, 2002), 104-117.

13. Allen, "Mat Urbanism," 124.

14. Ibid.

15.   Oswald M. Ungers and S. Viehts: *The Dialectic City* (Milan: Skira, 1997), 20.

16.   Smithson, 580.

17.   Stan Allen, "Field Conditions," in *The Digital Turn in Architecture 1992–2012,* ed. Mario Carpo, (John Wiley & Sons, 2012) 62-79**.**

18.   Allen, "Field Conditions," 63.

19.   Smithson, 573.

20.   Doug Kelbaugh, *Repairing the American Metropolis: Common Place Revisited* (Seattle & London: University of Washington Press, 2002), 99.

21.   Rafael Moneo, "On Typology," *Oppositions* 13, (Summer 1978): 27*.*

22.   Moneo, "On Typology," 27.

23.   As advertised on https://opticosdesign.com/the-missing-middle-housing-collection/