

# Control of Form and Space

## A Basis for Comparison of Multifamily Housing in Japan and the United States

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### Introduction

This paper offers notes toward a method of comparison of multi-unit housing in Japan and the United States. It suggests comparison by examining the control of form and space. Examining signs of control is fruitful because, more than inert physical form, housing concerns first of all the action of people in making lifeless materials and un-decorated spaces into living environments. Control in the sense used here is the actual manipulation of physical form - arranging furniture, adding walls and other physical elements, and making them alive with decoration and care.

This perspective requires comparison by observing how the physical environment is transformed, and under what patterns of control. It looks beyond language mediated comparisons familiar to the social sciences, and goes directly to the built form of the dwelling environment and the control of that form by various parties. It sees housing as fundamentally a living, changing artifact.

With the focus of these notes on multi-unit housing, a working definition is needed. In these notes, multi-unit (or multi-family) housing is the kind of housing in which the front doors of dwelling units open onto a three-dimensional network of spaces common to some or all building inhabitants. This network itself connects to the wider public sphere shared by other buildings. The existence of such a network means that some part of the building in question is common or shared.

This distribution of shared and individual space is a relevant characteristic of multi-unit buildings, aside from whether they are rental, cooperative or condominium occupancies. It includes housing of any story-height, including low-rise buildings and high-rise elevator buildings, in which individual doors open into shared territory in this particular way. This description distinguishes multi-unit housing from "row-houses" or "detached" houses, in which individual dwelling territory connects directly to the wider public sphere.

In multi-unit housing, several territorial boundaries can be found, as diagrammed below. This concept of "territorial depth"<sup>1</sup> is another way to distinguish between single family and multi-family housing.

## **Prevalence of Multi-Unit Housing**

Multi-unit housing is important in both countries. Depending on exactly how data is collected (and no uniform method exists internationally), multi-unit housing represents a higher percentage (35% and growing) of the total housing stock in Japan since its introduction more than 70 years ago than the United States.<sup>2</sup> This is understandable because of intense population pressures on limited land areas. In the United States, where multi-unit buildings account for less than 22% of the housing units (defined as more than two units per building), multi-unit buildings have nevertheless been built from the last half of the 19th century.<sup>3</sup> Even with this currently small percentage of the total stock in the United States, the subject bears consideration, because of increased recognition of the benefits of more compact residential land development patterns.<sup>4</sup>

In the United States and Japan, as life style, demographic, economic, land use, infrastructure and sustainability issues exert pressure to build in more dense patterns, the question of a next generation of multi-unit housing is critical, if for different reasons and out of different experience. It is also the case that in both countries - with important differences - the continuing use-value of the existing multi-unit housing stock is a looming priority. The importance of this housing type - especially in the revitalization of urban and peri-urban centers - means that both public policy and private investment, architectural and urban planning, construction and manufacturing activity must collaborate in finding a better and more sustainable way of building multi-unit housing.

How different are the experiences, and how really different are the multifamily buildings found in each country? What are the common characteristics of this kind of housing in both countries? Finally, what lessons can be learned from these comparisons for future planning, despite the differences among regions, climate, living styles and customs, industry and economy, and history and culture, within and between these two countries? At the conclusion of these notes, suggestions are made of a general nature - at the risk of oversimplification - in answer to these questions.

## **A View of Housing Based on Control**

The basic viewpoint taken in these notes is that a healthy dwelling environment is not possible in the long term, unless individual inhabitants can control or shape the dwelling environment. Without this, we do not have dwellings, but only glorified prisons.

The idea of taking control has implications beyond a better physical environment or happier households, as important as both are. It has important economic consequences, for dwellings both rented and owned. This is the case because inhabitants who take control of their dwellings make purchasing decisions for products and labor. Residents typically spend more for their own dwellings if they decide for themselves, than they would spend if the decisions are made by someone else. In a healthy economy of residential neighborhoods, therefore, a very large market exists for safe and well designed consumer products for houses and dwellings.

Unlike the consumer products industry, however, the building products industry has not yet fully recognized this latent economic potential - particularly in multi-unit housing, and particularly in the United States as compared to Japan. Building industry trade shows in both countries exhibit thousands of consumer - oriented products from toilets to kitchen cabinets to lighting fixtures to finish materials. Yet the overwhelming reality is that the structure of the residential building process is confusing, complex and not ready to fully engage the consumer market in a coherent way. In contrast to the single family house market, which in both countries fully grasps the power of household purchasing decisions, the multi-unit housing industry is not yet fully consumer - oriented. This is both a problem and a lost opportunity for everyone.

Another reason that the idea of responsibility is important is that the well-being of a residential environment depends on both collective and individual assumption of responsibility if it is to sustain itself socially and physically. It is clear that across the spectrum of income, neighborhoods in which inhabitants take control - and invest in and care for - their dwellings are healthier over the long run than those in which inhabitants passively occupy buildings. Tied closely to this fact is that these same neighborhoods are healthy to the extent that the shared physical environment is just as deeply cared for and subject to investment as individual dwellings.

The answer to healthy neighborhoods thus lies in a careful balance of control between the individual household and the larger community at several levels - the building, the block, and the district.

### **Distribution of Collective and Individual Responsibility**

In both countries, housing is perhaps the most important mediator of the distribution of control between the individual on the one hand and the group on the other. With this as a certain fact, it is also the case that distribution and assumption of responsibility is more direct and understandable in some kinds of residential buildings than other kinds. The single family house and the row-house are two kinds of housing forms in which the separation of responsibility - between individual household and the community - is well understood in both Japan and the United States, and in which little confusion exists, especially with the detached house type. There is a legal (fee simple) and a technical (separated structures) basis for these types which lives in a very direct way in the social bodies involved.

The physical separation of detached houses - while they are still connected to public infrastructure and share public space - reduces negotiation and conflict among the many players. Negotiation is limited to fences, landscape elements, building setbacks from property lines, building mass, and utility connections in the street. These are certainly much less complex than walls, facades and roofs of attached houses, and certainly less complicated than the entangled systems of multi-unit housing.

Among the attached forms of housing, row housing - more common in the United States than in Japan - has found a way of organizing the distinction of control in both countries. In the United States, the European tradition of single family attached houses - in groupings of two (duplex) or more units - is common and attractive in the market and among urban designers.

This kind of house form remains a familiar and preferred type in part because we understand how to personalize each unit in the context of a common fabric of territorial levels and form. While here the forms subject to conflict and negotiation are more complex than the fence in the detached house, over many centuries, understandings have developed which have led to the present acceptance of this form of housing.



*Duplex houses in an historic preservation area in Nagoya (photo by author)*



*typical row houses in Washington, DC (photo by author)*

These row or attached single family houses show evidence of control by the "powers" occupying the units. Starting as uniform houses, windows have been changed, roofing altered, trim and details painted different colors, and landscaping cultivated differently in each territory. Similar if not more dramatic changes have occurred inside.

## **Technical Facts of Multi-unit Housing**

The identification of and separation of responsibilities is much less clear and not so easily accomplished in multi-unit buildings, however. This is the case in both countries, and is the case in any of the tenancy types associated with multi-unit housing: cooperative, condominium or apartment.

In great measure, this difficulty - and the resulting loss of individual freedom to control the direct dwelling environment - has to do with technical realities of multi-unit housing. The central fact in most conventional multi-unit housing is that the technical systems for the building are organized in one complex "bundle of decisions". This "single level of control" corresponds to a centralized process of designing and construction: one party controls the design process for the entire complex of individual units in aggregate, and one party controls the construction. No matter how skillfully organized, the result is a unified and intricately entwined assembly of products meeting the requirements for optimization of the design team or the construction team.

In both Japan and the United States, the process of designing and constructing conventionally starts with unit floor plans. These plans - one or more types and sizes in a building - are arranged to make a building design. When the arrangement is complete, engineers make drawings showing the layout of columns, piping and other mechanical systems. The combined drawings of unit plans and technical systems are integrated into a single complex design. Especially under the constraints of seismic design, information about the structure informs the building and unit arrangements. Once completed, the design documents constitute the instructions for the construction process. The result is an integrated, unified building understood as a single, complex system, with many technical subsystems. From the viewpoint of the designer, engineer, or the contractor, this unification is efficient and reduces confusion, but only if the program is fixed and unchanging. The dwelling unit thus becomes the single most important decision for marketing as well as for technical reasons.

There is good reason to believe that this process has been normal since the time when multi-unit residential buildings first appeared (as early as the Roman apartment building). Those in power found efficiency in unifying all decisions in rendering their responsibility. Even when buildings were relatively simple in technical terms, the social reality of "territorial depth" presented its own challenges in reducing conflict and maintaining some measure of individual autonomy.

But organizing unified responsibility became increasingly difficult by the introduction of many new mechanical systems supporting modern life over the past decades of the late 19th and early 20th century. This gradual "invasion" of so-called resource systems in large buildings in both countries is a reality too often overlooked. Many new specialists joined the design teams' negotiations, making coordination more difficult. Changes to one subsystem often sent perturbations through the entire composition, a result made the more difficult because no one person controlled the entire process any longer.

A chart showing this historical evolution for the United States (delayed in Japan for perhaps three decades, but now well advanced) indicates three eras:

This gradual accumulation of these "invisible systems" in buildings has resulted in a state of severe technical entanglement. Because "technology" is not autonomous, but lives in a social body, this entanglement of parts means entanglement of those controlling the parts. This state of affairs no longer respects the changing needs of the society. Further, the previously simple territorial boundaries between the common and individual territories - and between individual territories - have been radically disrupted by these systems. Now, territories are no longer autonomous, but are entwined by the many resource lines crossing boundaries in often confusing pathways. For example, the piping for one unit may enter several other units before reaching the public infrastructure.<sup>5</sup> The confusion this presents is the reason that in single family detached developments, the underground cables and pipes for one house always go directly from the public easement (the street or alley) to the house, never passing through another territory on the way.

It can be argued that the almost universal impulse (with some notable exceptions) to live in detached houses - even in dense urban areas - is in part the result of a desire for individual autonomy and reduction in conflict. There is no question that many households in both Japan and the United States would like to - and somehow manage to, even if in modest and cramped houses - live in detached housing, or dwellings which have control patterns like detached houses.

Entering a dwelling unit in any multi-unit building, we also must recognize another reality of multi-unit housing. At a certain point - around the time that mechanical equipment entered the stage - a watershed change occurred in the ordering of interior space. In both countries, early vernacular houses - even early apartment buildings - were built without much in the way of functional differentiation of spaces. This was before kitchens and bathrooms brought with them their associated mechanical systems.<sup>6</sup>

Activities could occur in many possible places. People brought in for each activity the personal possessions needed - furniture, storage units, decorative elements and so on. Sometimes because the same activity took place in the same space over a long period, some of the forms of habitation became fastened in place: furniture came to be built-in, or moveable storage units came to be built-in.

This idea of space as offering capacity was normal in prefunctionalist times. Possibilities were given, rather than specific uses. Now, however, the functionalist practice known in both countries dominates. Form - "following (one) function" - rigidly locks activities in place. Acts of habitation are inhibited from fully expressing themselves. Both on the interior and exterior of dwellings, the act of habitation is largely frozen in multi-unit buildings. Interior design, for its part, is subject to severe limits, making decoration the largest possible move.

In keeping with the rigid and complex entanglement of technical systems, administrative rules have come to match the rigid and unified buildings. Complex legal documents now accompany the dwellings in multi-unit buildings, designed to avoid disputes which might end in a law court. A substantial part of such rules for condominium buildings concern the "resource distribution systems" occupying the ambiguous "inbetween" sphere of control between the specifically "individual unit" and clearly "common" elements. In United States condominiums, such "inbetween elements" are called "limited common elements", and include balconies. It is interesting to note that the question of "which party controls the windows" has been the subject of dispute between unit owners and the association of owners.

In both countries, it is sometimes said that households choosing to live in multi-unit buildings do so to avoid the responsibility for so many physical elements as in detached houses.

People are said to live for shorter periods in multi-unit buildings. This may be true in part. But it is also the case that investments in remodeling and upgrading multi-unit buildings in the United States approaches a level beyond that invested in new multi-unit construction in any given year.

It may also be the case that we see in this view - and the real estate marketing industry associated with it - a self-fulfilling situation. Because multi-unit buildings are technically and administratively entangled, households are constrained from exercising the control - and experiencing the freedom and autonomy - that many might like to have.

### **Control as the Basis for Comparison**

Comparative studies of the sort proposed in this essay would try to understand the conventions and rules concerning what actually happens inside a given dwelling territory - that is, the question of control and form. What physical elements (walls, doors, electrical connections, valves on pipes, and so on) mark the boundaries between spheres of control (territories)? What elements are permitted inside? Can the territorial boundary be changed, and if so, by whom? How are boundaries between dwellings made differently from boundaries between dwellings and the common elements and spaces?

In addition to the physical elements, a comparative study would also take account of social and economic conditions. There appears to be less inhibition in regard to the outward demonstration of individual control in some situations than in others. How do these differences and similarities relate - if they do - to particular kinds of residential architecture or building types and regional styles? Why in one place does a particular building type give rise to more individualization and not in another place? How is control related to economic class, to climate, to sophistication of technical means, if at all?

For example, it appears that in both Japan and the United States, individuals of higher income and "class status" are often willing to give up individual autonomy in multi-unit buildings.<sup>7</sup> An informal stroll through any area of any city in Japan or the United States gives evidence of this tendency, as the scenes below show. Large and architecturally imposing multi-unit buildings - apartment and condominium buildings alike - stand along the street with no visible sign of individual control showing on the public face. Individual households are willing - and in fact wish - to follow strict rules limiting individual control, indicating that in these cases, the instinct for individuality is assuredly suppressed in favor of conformity and reduced conflict. We will never know if it is otherwise unless the possibility exists practically in both a technical and administrative sense.

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*typical apartment building anywhere in Japan (photo by author)*



*typical apartment building in the United States (photo by author)*



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But in a rare multi-unit building in Japan, households are ready to exercise control of their individual territory even on the building facade, perhaps only because central control is absent.



*rare example in Japan of household control of unit facades (photo by author)*



*an experiment in intentional control of the facade per dwelling unit: NEXT 21 (photo by the author)*

## Open Building: Toward a New Residential Architecture

One of the principle reasons to propose comparative studies between the United States and Japan based on control is the growing awareness of the importance of this viewpoint in the housing field. Under the broad term of reference "open building", the image of housing as a changing socio-technical artifact under the control of various parties including the household is finding acceptance, and practical technical answers demonstrated.

In Japan, Europe and North America<sup>8</sup> - but with most vigor in Japan<sup>9</sup> - the exploration of "open building" is reaching serious levels of commitment. But despite the construction of dozens of projects, the work deserves to be reinforced by careful comparative study of the behavior of buildings from the perspective outlined in these notes. The results should teach useful lessons for researchers in architecture and in the social sciences, and reinforce emerging trends in policy making and housing finance.

But the results of such comparative studies could also have an impact on international cooperation in new technology development. Presently, there is strong pressure to simplify and clarify the pathways and boundaries of supply lines in multi-unit housing. The most interesting developments in freeing individual territory from the rigid rules of supply lines and resource distribution systems will be in making power, gas and water / drainage systems which allow planning and installation freedom at the level of the individual dwelling. This is happening in both countries, but is noticeably leading in Japan where the history of multi-unit housing is shortest and perhaps less entrenched than in the United States. Product information and performance specifications for building products will become standardized internationally, (witness the discussions between the US and Japan on performance standards at the government level), supporting the development of products with higher potential for international trade.

*In light of these developments, the importance of comparative studies of buildings under the control of households on the one hand and the collective or group on the other will add an important dimension to international understanding. Improved technical measures and housing policy will result from good research based on the concept of control. At stake is the freedom for the individual household to control, care for, decorate and improve the territory they occupy in respect to their particular circumstances. The traditions and desire for this freedom are strong in both countries, aside from their unique and quite different histories, cultural roots, climate and social rules. The rebirth of this freedom, even in complex and dense multi-unit housing environments, is of the highest importance in both countries, for the health of the built field and its occupants.*

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