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Heritage, History and Design Between East and West

A Close-Up on Kyoto's Urban Fabric

Marie-Thérèse van Thoor & Sara Stroux [eds]

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Adapting Traditional Machiya to a Contemporary Lifestyle

Lidwine Spoormans

When the German architect Bruno Taut visited Japan, he expressed his appreciation of the traditional house in his book *Houses and People of Japan*.

‘The most interesting feature of the house is not its material appearance but its life. The Japanese house ... is like a stage in an open-air theatre, the background of which, visible through the open wall, is nature.’ (Taut 1958)

But the vitality of traditional Japanese houses was already at stake in Taut's time. At the end of the book, he described the disappearance of traditional wooden architecture and the rise of new structures constructed of tin plate, which Taut characterized as ‘trash’ (Taut, 1958). He could not understand why Japanese people preferred modern houses.

This text focuses on the machiya, a traditional wooden townhouse. Its origins date back to the 12th century, when merchants all over Japan started to build temporary structures in town centres from which to sell their goods. Over the course of 800 years it evolved into a traditional vernacular house combining workplace and dwelling. Machiya in Kyoto (kyomachiya) came to typify the historical capital of Japan and, since Kyoto was spared earthquakes and Second World War bombing, they continue to play an important role in the cityscape. However, most of the machiya that still exist in Kyoto today were built in the 19th and 20th centuries, owing to a devastating fire that swept Kyoto in 1864, destroying many of

its machiya (Löfgren 2003). The most important features that distinguish machiya from other traditional Japanese houses are the combination of business and residential space, deep and narrow parcelling with a closed street front, internal gardens (patios) and a long internal corridor connecting front and back. Unlike in Western domestic culture, rooms in a Japanese house do not have a single function, such as bedroom or dining room. The use of a traditional Japanese space plan works differently. Firstly, rooms can be separated from, or joined to adjacent rooms by way of sliding partitions, thereby creating small, secluded or large, continuous spaces. Furthermore, the use of a space changes depending on the time of day, the season or the occasion. Furniture ‘on legs’, like tables, chairs and dressers are not used in traditional Japanese homes. Instead of fixed pieces of furniture, the Japanese use moveable pieces that are used and then stored in built-in closets. The spatial layout of the Japanese traditional house is, as Bruno Taut described it, an open-air theatre in which different scenes alternate.

Although machiya are considered cultural heritage, their number is decreasing year by year. A survey of machiya by the Kyoto Centre for Community Collaboration (KCCC) in 2003 showed that 13% of machiya in Kyoto were demolished between 1996 and 2003 and replaced by modern, in many cases high-rise, housing estates. In the same period, 80% of the traditional houses were modernized, with the loss of various features of the traditional structure (KCCC, 2009). And this trend continues. The owner's decision to preserve or replace a machiya depends on

many factors: earthquake resistance, fire prevention, the cost of maintenance and renovation, high-rise surroundings, and inheritance tax are some of the drawbacks of living in a machiya (KCCC 2009).

The history of machiya has been extensively studied. Important literature for this study is Löfgren's wide-ranging research into the machiya and its development (Löfgren 2003) and Ueda's *The Inner Harmony of the Japanese House* (Ueda 1998), describing the development and qualities of the traditional Japanese house, including machiya. Despite the literature on the history of machiya, there is little Western research on its contemporary use. A 2007 research project by Atelier Bow-Wow documented all the machiya in the city of Kanazawa. By measuring the extent of their differences to the archetypal Edo machiya, the present machiya stock was categorized and represented by names like 'glass machiya', 'false-mustache machiya' or 'retired machiya'. Their method of analysis—reduction to a principle, categorizing and naming the alterations to machiya—has been an inspirational example for this study.

Although in recent years many machiya have been renovated and adapted to different uses, there has been no architectural evaluation of the spatial layout of these examples found so far. To what extent have machiya characteristics been preserved in these examples? Which machiya elements have been removed, transformed or adapted and what is their new purpose? Do current renovation projects contain new interpretations of machiya elements that might prove inspirational for the reuse of other machiya? The spatial layout and the possibilities for adapting it to new demands is crucial for the reuse of all types of buildings. For houses like machiya, which are still numerous and play an important role in the townscape, finding new uses and users is crucial to keeping the houses and the neighbourhoods 'alive'. Most attention, heritage regulations and design codes relate to the facade, its materials and details (Van Thoor pp. 33-37). Even Atelier Bow-Wow's research focuses on the presentation of the street facade and disregards the interior use of the house.

This study attempts to fill this knowledge gap by developing models for future reuse of machiya that combine contemporary lifestyles and traditional characteristics, in order to present possibilities for the preservation of machiya. The models for reuse are based on an evaluation of the spatial layout of renovated machiya in general and an analysis of the modifications of typical machiya elements in particular. This text documents ten case studies, based on location visits, photographs, drawings, interviews and literature study (for drawings of the floor plans of all case study buildings see pp. 96-99). Since there are 48,000 machiya in Kyoto, this study is illustrative rather than representative.

An important selection criterion for the case studies was the ability to visit the building. Since it is uncommon in Japanese culture to welcome strangers into your private domain, visiting a house entails building a network. Architects turned out to be the best contact for arranging a visit, and that influenced the selection. As to the approach taken in renovating a machiya, three main categories can be distinguished. The first is the restorative approach, which aims to reveal and preserve authentic qualities. The owners in these cases are machiya 'believers' and their mission is to promote machiya. A second category is a transformation designed by an architect, who deliberately combines old characteristics and new additions to make machiya fit for contemporary use. But the majority of machiya fall into the third category and are maintained and adapted without any guiding vision or architectural design and specific machiya qualities are not taken into account. Although all categories are represented in the documented case studies, the last category is under-represented in comparison with the machiya stock in Kyoto.

	MACHIYA	Width x length (m)	Current program	User
1	Mumeisha	10,0 x 33,0	Model-machiya Dwelling	Family
2	Kamanza Cho-ie	4,6 x 18,6	Model-machiya Office	Kyomachiya association
3	Anewal	6,0 x 19,2	Gallery Office Guesthouse	Architect-entrepreneur
4	Mugen	9,6 x 20,6	Hotel Apartment	Tourists/ entrepreneurs
5	Gae	4,3 x 14,6	Single-family house	Family
6	Noda	4,1 x 19,3	Single-family house	Family
7	Senryogatsuji	5,7 x 36,0	Shared housing	Young professionals
8	Iremoya	5,3 x 15,2	Shop	Box sellers
9	Higashiyama	4,6 x 10,5	Guesthouse Shop Coffee bar	Artist-entrepreneur
10	Inokuma	4,6 x 10,5	Office Garage	Architect

TABLE 1 Basic data of the ten documented case study machiya

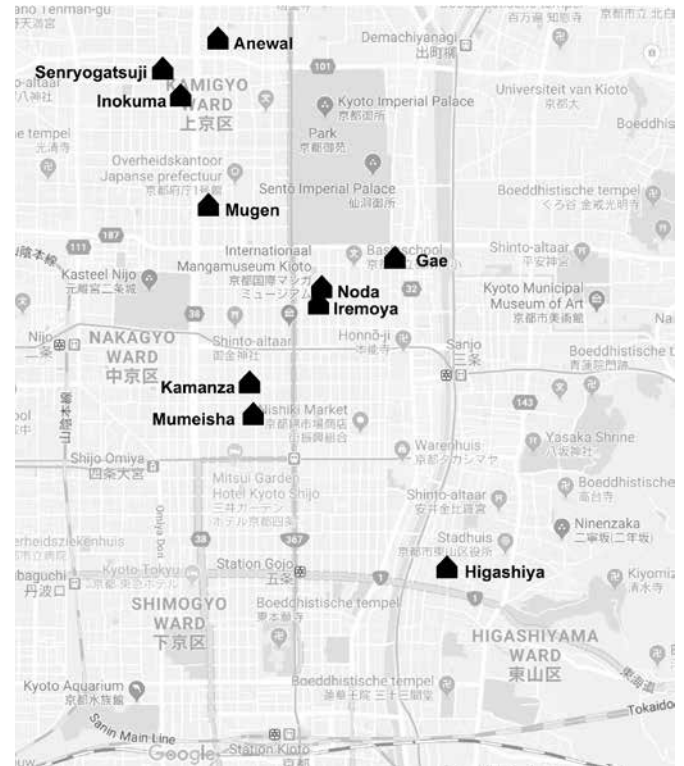


FIG. 1 Map of Kyoto, with the ten case study machiya marked

Comparison of ten cases

Size

The size of the ten machiya buildings varies greatly, as can be seen in Table 1. Kyoto districts are associated with a particular industry or business, so the district in which a machiya is located is a good indicator of the family's wealth and their machiya's size. Many machiya in Kyoto have their origins in the textile business, for example, the trade in kimonos, silk or thread in the Nishijin area [FIG. 1], but other businesses and crafts are also to be found.

In some cases, location, business and the family history explain a machiya's size, layout, luxury, et cetera. For example, the Yoshida family living in the very large and luxurious Mumeisha machiya ran a successful kimono business for generations. In other cases, however, like Higashiyama machiya, the exact age, function and history are unknown. Sometimes, machiya that are situated very close to one other have very different characteristics, like the small Inokuma and very large Senryogatsui.

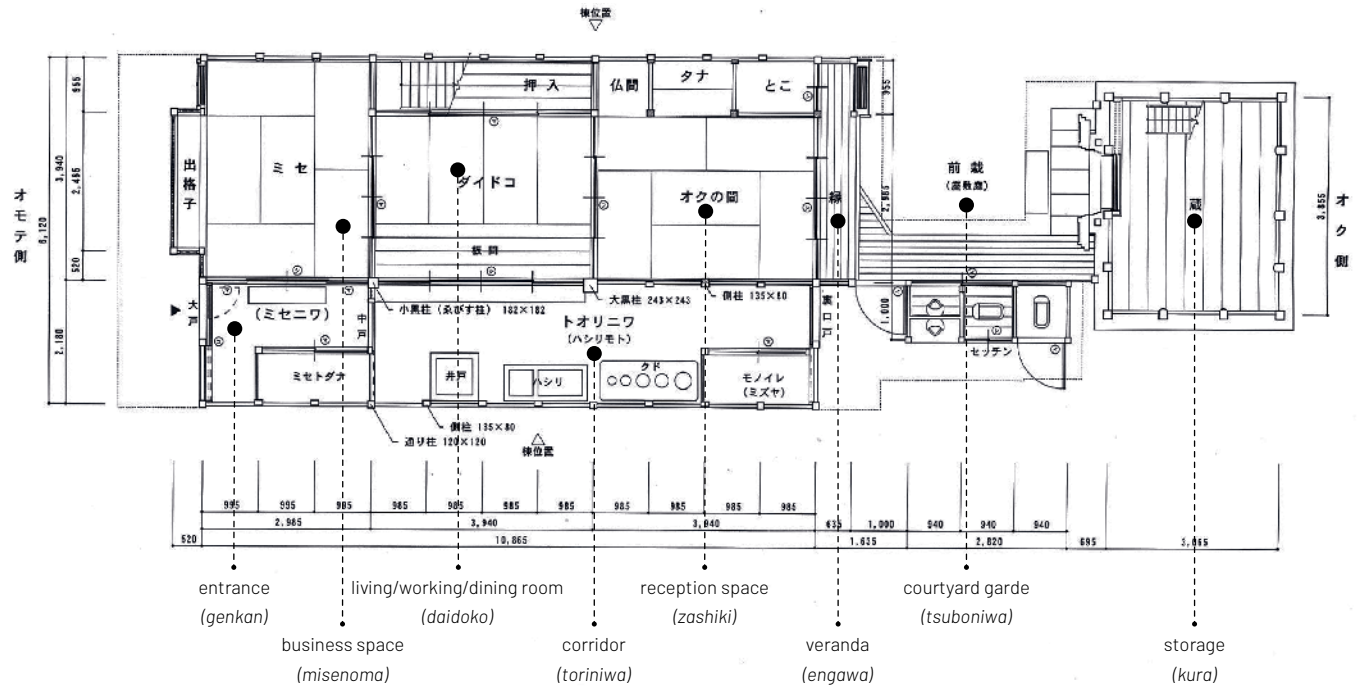


FIG. 2 Typical machiya layout

Although the precise dimensions may differ, machiya plots are always narrow and deep. A longer plot normally means more patios, as in the very deep Senryogatsuji and Mumeisha plots which have two patios and a backyard. The layout of different parts divided by patios, provides daylight and beautiful views. Many machiya have one patio, either surrounded by rooms (Anewal, Kamanza, Mugen) or at the back of the plot (Noda, Gae, Higashiyama, Iremoya); some have no patio at all (Inokuma). Some wider than normal machiya, like Mugen and Mumeisha, have a double row of rooms, whereas the others have one row of rooms lining the corridor. In the case of a double row, the middle rooms are narrower, do not receive daylight, and in most cases fulfil a transition function to an adjacent main room.

Programme, users and owners

Historically, machiya combine business spaces at the front of the house with residential spaces at the back. As Löfgren has pointed out, the house needs to be lived in to save some of the historical character of the machiya and its community life. However, the once inseparable working and living function is often lost, as in several of the machiya in this study. Mumeisha and Mugen combine dwelling and working, albeit in a non-traditional way, with the house occupying the former storehouse (*kura*). Only the smaller machiya, like Noda and Gae, have been transformed to single-family houses. Although once inhabited by one family and their servants, the larger machiya—if still residential—now contain collective housing (shared house or hotel). Mixed programmes occur in all sizes thanks to the

corridor (*toriniwa*), which makes all rooms directly accessible. Only one of my cases was a shop (Iremoya), but in Kyoto many machiya house small restaurants or cafés, as well as shops specializing in traditional crafts (Clancy 2012).

Six out of ten of my machiya have tourism-related programmes. Three of these offer accommodation, and two are Model Machiya that can be visited. According to a project manager from Hachise, a real estate company that buys, renovates and sells machiya, most of the people who sell machiya inherited it. Typical buyers are foreigners (30%) or Japanese people from Tokyo or other cities. It would appear that Kyotoites do not appreciate their own heritage as much as outsiders do. For many Japanese, the image of the machiya is of something impoverished, out-of-date and uncomfortable (Brown 2009). Architects and designers seem to make up another group of machiya fans, as they are the users in three of my cases. As mentioned before, however, my network determined the selection of cases, which may mean that architects are over-represented.

Renovation approach

Most architects I interviewed stated that it is important to preserve machiya. However, they think that designers need to be flexible and not overly orthodox in order to develop viable renovations. In my interviews, I asked them to define the 'essence of the machiya'. Their answers were very diverse. 'The relation to the public space is the essence. Every machiya renovation starts with the question of how to give the *misenoma* (business space) a good new use.' '*Toriniwa* (corridor) is the backbone of a machiya, since it connects exterior and interior and gives access to every part of the house. We reused *toriniwa* in all three machiya renovations we did.' 'The fact that the dweller is able to maintain and restore the house himself because of the materials and techniques used, is essential. Machiya is DIY.' Studying the designs, it becomes clear that in their approach to renovation architects prioritize different machiya elements, depending on how they interpret the essence of machiya.

Elements of the spatial layout

Although flexibility is a key characteristic of machiya, some aspects of the spatial design are strict. For example, dimensions are based on the size of a tatami mat, approximately 180 x 90 cm (Hein 2016), and consequently the dimensions of all spaces and building elements are multiples of 90 centimetres. Another dominant principle is the distinction between a low earthen floor (*doma*) and the raised tatami-covered floors (*yuka*). The machiya layout is characterized by a clear division between served spaces (raised floor) and servant spaces (low floor). All original machiya have an open entrance (*genkan*), a wide corridor (*toriniwa*), a business space (*misenoma*), a main residential and reception space (*zashiki*), a courtyard garden (*tsuboniwa*) and, in many cases, a fire-proof storehouse (*kura*) [FIG. 2]. Although the use of most served spaces is flexible, servant spaces, like the kitchen in the corridor, have fixed functions.

Some fixed machiya elements are a constraint on contemporary use. Two spaces with a fixed function that is no longer relevant (the *kura* and *misenoma*), provide an opportunity for a new use more in line with contemporary life. The *kura* walls are made of thick layers of clay to protect family valuables like kimonos from the climate and from fire, which was very important in a city where wooden buildings predominate (Brown 2012). This well-insulated, freestanding structure now provides an ideal location for a living space (Mugen, Mumeisha), a public function like a gallery (Kamanza Cho-ie), or a music and film room (Senryogatsuji). The *misenoma* at the front of the house was traditionally a merchant's shop. In former days, the front of the *misenoma* was open, as can be seen in picture scrolls depicting scenes from the Edo period. Later on, latticework decorated the facade and provided privacy, which is convenient for the many machiya that have lost their commercial function. Adaptive reuse provides an opportunity to restore the open relation between the house and public space, which some of the users and architects interviewed nominated as the essence of the machiya.



FIG. 3 Traditional toriniwa in Anewal (view from the entrance)



FIG. 4 A second toriniwa in Senryogatsuji shared housing (view towards the entrance)

Contemporary architects like Atelier Bow-Wow, try to resist the tendency towards enclosed, introverted spaces and argue for more communication, the introduction of public functions, and openness to the neighbours, including for new houses (Nuijsink 2012). This is achieved by the transparent front of the coffee bar in Higashiyama and by the public function and lowered level of the *misenoma* in Kamanza Cho-ie.

Two spatial elements appear to have a big influence on the spatial possibilities of the new machiya layout. These are the *toriniwa* and the stairs, which organize the horizontal and vertical logistics of the house. The renovation cases studied reveal different design solutions to the task of adapting these elements to contemporary lifestyles.

Toriniwa

The *toriniwa* is a corridor on one side of the house. It runs from front to rear of the plot and allows access to a succession of rooms. It is a zone of practical purpose and contains the entrance, kitchen, cupboards, toilet and bath cell, and ends in a backyard. The key characteristic is the low earthen or concrete floor, in contrast to the raised tatami-covered floors of the rooms. The difference in floor level has a functional, a spatial, and a social basis. According to Ueda (Ueda 1998), servants and employees were restricted to the domain of the earthen floor and in ancient Japanese society, with its rigid social class system, they were not permitted to rise above it. How does that relate to the society of today? One of the architects stated: 'The outside is folded into the house and that is a true quality.' But a machiya resident said: 'The *toriniwa* doesn't fit a modern lifestyle because it requires an organizational effort.'



FIG. 5 Vanished toriniwa in Inokuma, now a garage (view from the entrance)

Bringing the food from the kitchen to the reception room, removing shoes and putting them on again after dinner. People prefer the dining room and kitchen to be easy to use and not separated from one another.' The main advantages of the corridor are the accessibility of all the rooms, from front to back of the plot and consequently the opportunity to compartmentalize. The main disadvantages are the strict separation from other rooms by floor level and the low level of comfort of this hybrid outside-inside space. The case study houses demonstrate new interpretations of the spatial, functional and social qualities of the corridor.

Traditional toriniwa

The Anewal machiya in the former textile area of Nishijin is 130 years old and originally housed a business trading in thread. The current occupant has lived there for some time, but a few years ago he introduced a new use. The ground floor now provides gallery space, used for exhibitions, meetings and projects; the

front room on the upper floor is a shared office space; the back part of the upper floor is a guest room for rent. The *toriniwa* is traditional in its form and uses [FIG. 3]. It contains old stoves and big wooden cupboards, a dividing *noren* (curtain) and a citrus tree. It is used as entrance, kitchen, place to meet, bike storage, laundry space and other storage. The value of this space in the current programme is that it unites the different functions and users of the machiya.

A second toriniwa

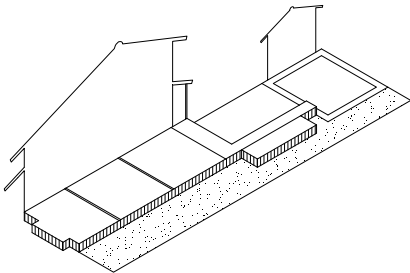
The Senryogatsuji machiya, which is very large, was built in the Ninshijin textile district during the Meiji period. Three years ago, a real estate company transformed the machiya into a shared housing complex and now they rent out rooms to young professionals. The building contains eight individual rooms, a dining-kitchen, several toilets and bathrooms, a patio garden, a tatami room, a terrace, a music and film room and a vegetable garden. The *toriniwa* is now a paved corridor that ends in the backyard. It is partly overbuilt by the hall on the first floor, which provides a good view into the *toriniwa*. The smart solution in this design is the duplication of the *toriniwa* [FIG. 4]. Alongside the original corridor, a new corridor was introduced that links all the rooms and functions of the house. Unlike the traditional corridor, the new one is on the higher 'tatami level', so there is no need to remove shoes before entering the rooms, and the corridor becomes a convenient connecting element and an integral part of the house.

Vanished toriniwa

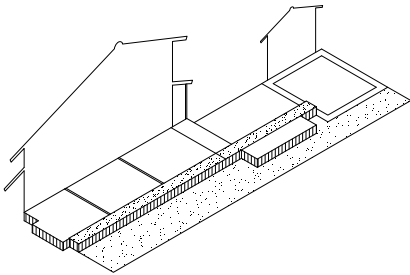
The machiya in Inokuma dori is one of a row of five. Nothing is known about the machiya's origins, but its former function was as a factory making paper boxes. Since 1999, it has housed a garage and storage space on the ground floor and office space on the upper floor. The most important reason for renting this property is the fact that it is cheap. There is no *toriniwa* but a study of the roof construction indicates where it must have been. Today the entire ground floor is at the lower *toriniwa* level and paved in concrete [FIG. 5].



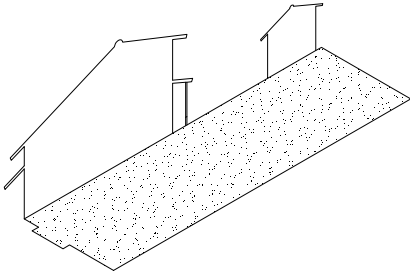
FIG. 6 Extended toriniwa opens up to a patio in Kamanza Cho-ie (view from the entrance)



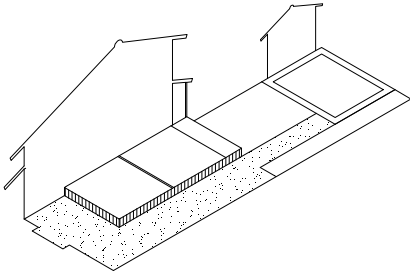
Traditional toriniwa



Second toriniwa



Vanished toriniwa



Extended Toriniwa

FIG. 7 Model of four design strategies for adapting the toriniwa (corridor) to a new use

One small raised section serves as a stair landing and the place to remove shoes. This transformation was not designed by an architect and the sacrifice of the *toriniwa* was not a part of any design vision. It is just the practical adaptation of a structure by people running a business.

Extended toriniwa

Kamanza Cho-ie has a special history. It was built by the family Onoya, who operated a blacksmith's workshop turning out kitchenware. In 1887 the childless Onoyas donated the house to the neighbourhood association and Kamanza Cho-ie became a neighbourhood house. In 2010 Kamanza Cho-ie was renovated and today it is the office of the Kyomachiya association. An important aim in the renovation was to preserve the public function and improve the gradual transition from the street to the interior of the machiya. To create a welcoming entrance for visitors, the low floor level of *toriniwa* was extended by the front room (*misenoma*) that was lowered and thus became more public [FIG. 6]. Another clever 'extension' was the relocation of the toilets in the patio from the garden to the side wall, opening up a clear view and direct access from the *toriniwa* to the patio garden.

To summarize, abandoning the strict zoning of the traditional machiya, and adapting the floor level of the *toriniwa* is a useful strategy for accommodating new programmes [FIG. 7]. In the case of public functions, the low earthen floor (*doma*) can be extended, and in private programmes with one user, more raised tatami-covered floors (*yuka*) can be created. Shops and restaurants benefit from the first strategy; single-family houses choose the latter. Collective or mixed programmes adopt hybrid solutions and, in some instances, the traditional *toriniwa* layout acquires a new social function of bringing users together.

Stairs

Stairs in a machiya are hidden. In the typical layout, the position of the stairs is in a 'closet' located on the wall opposite the *toriniwa*, accessible from the *misenoma* or *zashiki* room.

However, stairs can sometimes be found in unexpected positions, either original or added later, and a fixed placement does not seem to exist. Bigger machiya can have more stairs, accessible from different rooms, always in an enclosed alcove. Stairs are normally steep, have small landings, are made of wood and closed off by doors both downstairs and upstairs. Compared with Western staircases, they are less spacious. Historically, upstairs rooms in a machiya were not used for normal everyday living, but for storage and as a sleeping area for servants (Ueda 1998), which might explain the disregard for the amenity and the position of stairs. In adaptive reuse, the eccentric placement of the stair is problematic, because it forces people to pass through one room to get to the next. This limits privacy and the possibility of creating and accessing smaller rooms. According to one of the architects, privacy, including among family members, has become more important in recent decades. For collective housing or mixed programmes, direct accessibility of spaces is even more important. In these cases, stairs are introduced in different positions to improve the usability of the first floor.

Multiple hidden stairs

The Mumeisha machiya was built in 1909 by the family of Mr Yoshida, the present occupant, who were silk traders. During its lifetime, alterations have been made to the house, such as raising the room height of the upper storey. In the 1960s, Mumeisha was adapted according to the trends of that time: air conditioning, glass roofs covering the *niwa*, a concrete parapet and two parking places in the *genkan*. According to Mr Yoshida, people lost the sense of the machiya and got caught up by capitalism. Returning to Kyoto in the 1970s, he restored the house to its original state. This large and luxurious machiya has three 'closet-stairs' (plus two in the *kura*). The stair in the *genkan* is in an exceptional position and seems to have been added later. Although not every room is directly accessible, the availability of several ways to access the first floor offers more possibilities for reuse. The introduction of multiple (hidden) stairs, is a potential model for machiya renovations [FIG. 8].



FIG. 8 Hidden stair in Mumeisha

Dutch model

The machiya in Higashiyama is owned by HAPS, an organization that provides accommodation for artists. The artist renting the house renovated this machiya himself to create a guest rooms on first floor and a shop and coffee bar on ground floor. The coffee bar, visible through a new open window frame, is a reinterpretation of the traditional function of the *misenoma*, that of displaying and selling goods. The facilities in the corridor

and the reopened patio are collectively used. The history of the machiya is unknown, but the previous 'modernization' with veneer panelling and toilets with plastic roofs in the patio has been reversed. Now there is a wide and comfortable stair in the middle of *toriniwa*. The central position of this stair and the first-floor landing, reminiscent of a typical Dutch house, provides direct access twitho the guest rooms upstairs [FIG. 9].



FIG. 9 Dutch model in corridor of Higashiyama

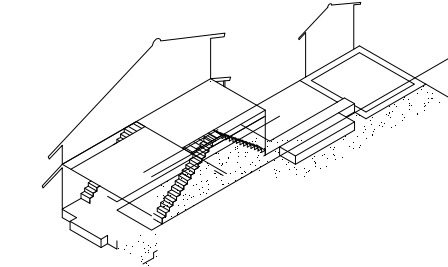
Central staircase

A similar strategy has been used in the Mugen machiya. Like Mumeisha, this is a large machiya with a relatively wide front and a double row of rooms. Originally it was a showroom for kimonos and textiles, but in later years it housed a medical practice. An entrepreneurial couple bought the Mugen machiya with the aim of turning it into a *ryokan* (traditional Japanese hotel) with five guest rooms. The *kura* at the back was transformed into

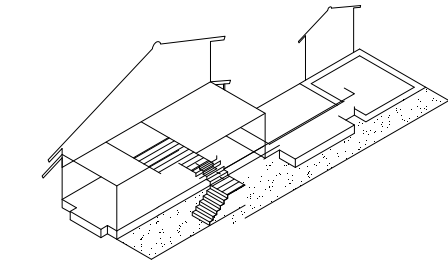
the hotel bar and the owners' private apartment. The *toriniwa* has retained its traditional function as corridor and kitchen and gives access to a platform with a wooden floor in the middle row of rooms. Adjacent to that platform, is a new, open staircase leading to the landing on the first floor, which is surrounded by the guest rooms [FIG. 10]. The central position of the stair is an efficient way of providing access to the smaller private units. The spacious sizes and open access to the common spaces and stairs results in a clear and generous routing.

Loop

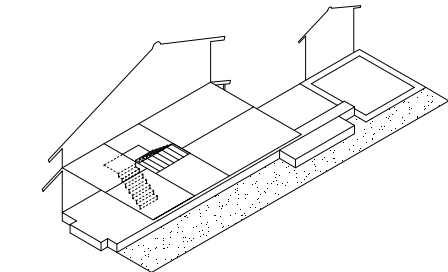
The Gae machiya is located in a neighbourhood south of the Imperial Palace and close to the court. According to the renovation architect, its first inhabitants may have been palace bureaucrats. After finding this plot for sale, the present owners encountered a building almost unrecognizable as a machiya. The *toriniwa* had been moved to the other side, a garage inserted and the roof altered. The intention of the new owners, who wanted to make a single-family home, was therefore not to restore, but to create a new design showing the historical layers of traditional elements, alterations, new interpretations of tradition and totally new elements. The layout is atypical for a machiya: the kitchen and tea ceremony room are on the first floor and the ground floor is open-space, with a bathroom, toilet and kitchenette as a central core. The *doma* (low floor) is minimized towards the entrance and the rest of the ground floor has a raised floor. The stair is in same zone as the entrance door but rises in the opposite direction. This creates a looping route from the entrance, around the core to the narrow stair, through the kitchen and so to the other rooms on the first floor [FIG. 11]. A similar routing is used in the Noda machiya, although there the entire ground floor is paved and at *doma* level. The box shop in Iremoya machiya is another example of a loop, but for a public function. This loop routing negates the typical machiya layout, but is a good way of creating a continuous space for a single-family house or some other single-function use.



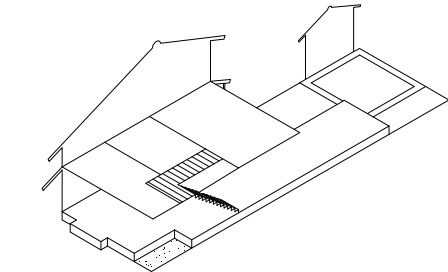
Multiple hidden stairs



Dutch model



Central stairs



Loop



FIG. 10 Central staircase in Mugen (top)

FIG. 11 Loop routing in Gae (bottom)

FIG. 12 Model of four design strategies for improved stair access

To summarize [FIG. 12]: although a single hidden stair in its traditional position can be sufficient for certain public or single uses, most new programmes require some modification of the vertical circulation. A loop route stringing the rooms together may be suitable for single functions in small machiya, such as private houses or shops. In the case of collective or mixed programmes, a new stair in a central position and open to the *toriniwa* is crucial for independent access to the various parts.

Something original

Drawing on ten renovation cases, this study has presented examples of the reuse of machiya through the modification of spatially characteristic, but (in terms of current demands) limiting machiya elements. New interpretations of these elements have been translated into models. Although the number of examples was limited, and the case study buildings differed in size, programmes, users and designs, some general conclusions can be drawn. The functional requirements of new programmes appear to be an important factor for design choices. In particular, the distinction between a single function with one user, and a mixed programme with multiple users, appears to be decisive for the reuse design, and especially for the circulation system. Strategies for adapting floor levels (see *toriniwa*) and connections to the first floor (see stairs), are completely different for mono-functional programmes and mixed programmes. In mono-functional programmes, open plans and passing through other rooms are possible, whereas in mixed programmes compartmentalization is crucial.

Not every programme is suitable for every machiya. The machiya determines the feasibility of a new programme. Small machiya are normally appropriate for mono-functional programmes, such as a single-family house, shop or restaurant, etc. Large machiya tend to be used for mixed programmes. Financial reasons and risks may play a role, but the arrangement of rooms, size and spatial organization of large machiya also make them very suitable for subdivision. Many renovated machiya,

small and large, house functions related to tourism. Preferring a machiya—its location, its programme, its appearance—to other building types and design choices are influenced by commercial motives and by a desire to promote Kyoto's cultural history. Furthermore, architects exert their personal preferences, by prioritizing different machiya elements in their approach to renovation. In every adapted machiya, some elements are lost, some are modified and some are retained. Although many renovation projects do not preserve the complete authentic construction, Kyoto's machiya stock as a whole represents all the key characteristic elements.

Only when the spatial layout can be adapted to modern lifestyles and feasible functional programmes, do machiya have a future. As Brumann stated: 'For the vast majority of the houses, "freezing" will not do. Instead, something original has to be done with them to make their continued existence viable and meaningful, and this may involve their physical structure, uses, or both.' (2009). The examples presented here demonstrate ways of combining traditional characteristics and contemporary requirements; they do something 'original'. Inhabitants, users and architects developed solutions, based on their own wishes and preferences. The contribution of this study is the analysis and categorization of these proven solutions. By presenting them as spatial models, this study aims to provide current and future machiya owners with insight and inspirational but practicable models and thereby contribute to the preservation and enjoyment of machiya.

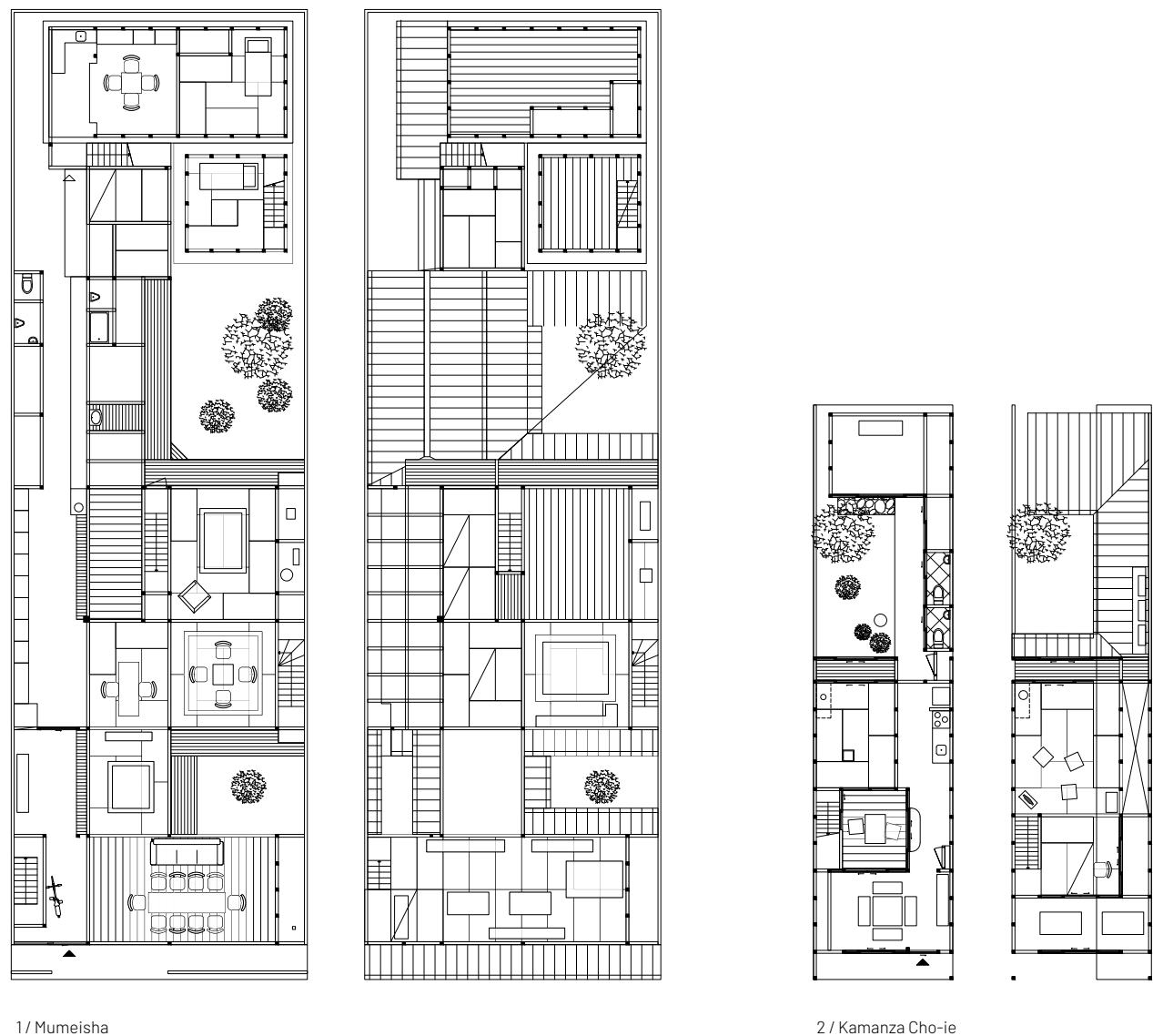
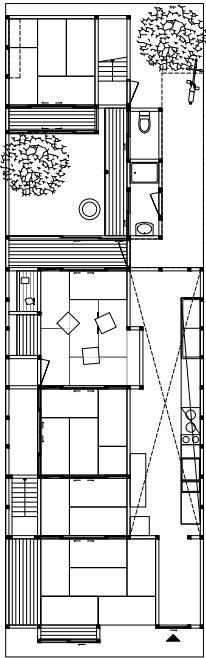
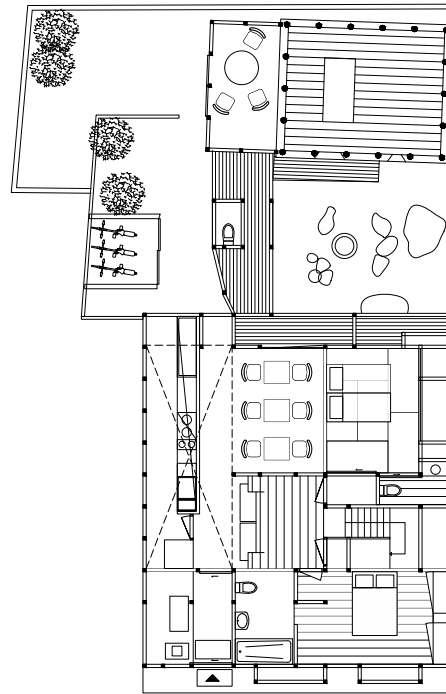
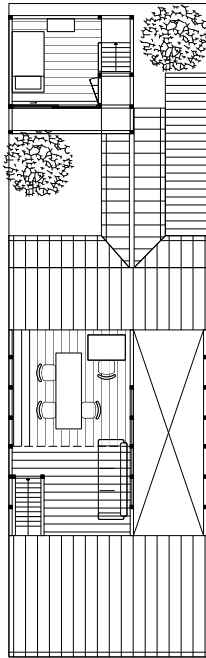


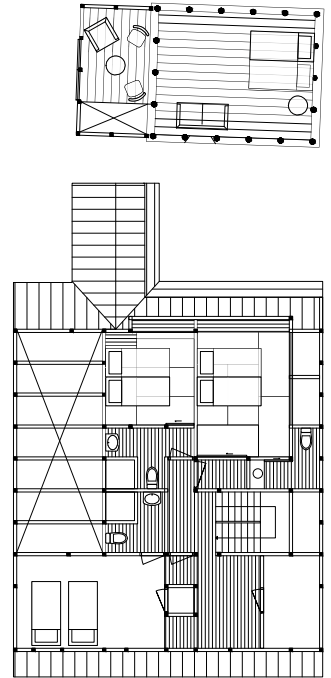
FIG. 13 Floor plans of the ten documented case study machiya



3 / Anewal



4 / Mugen



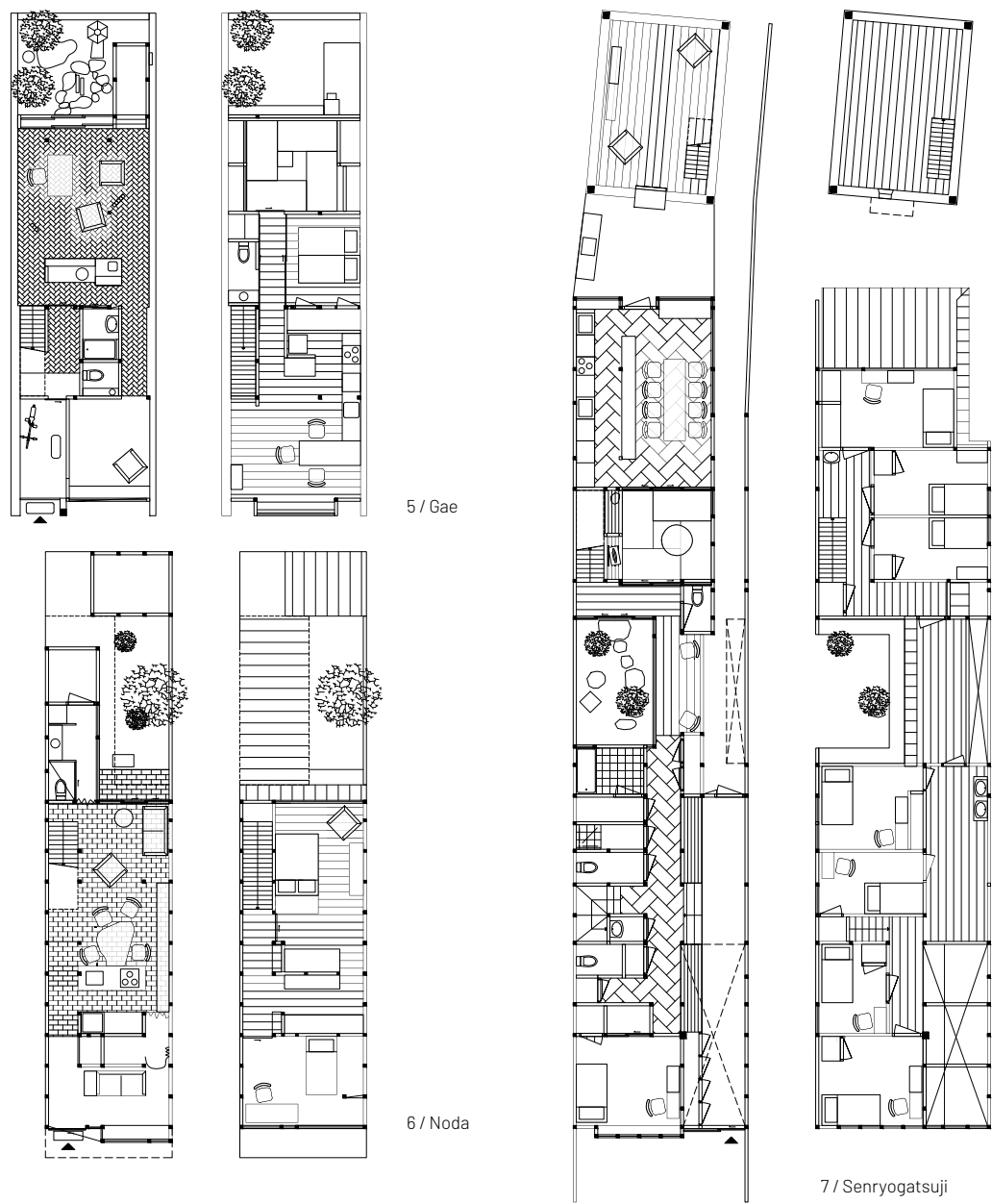
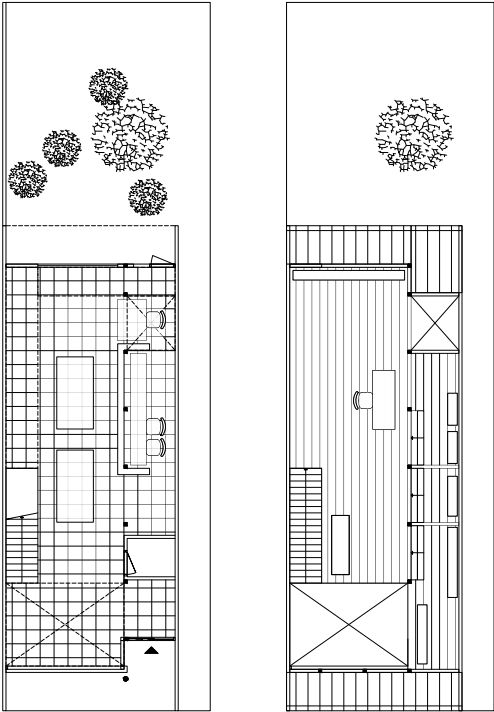
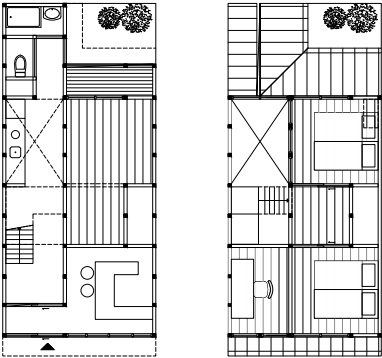


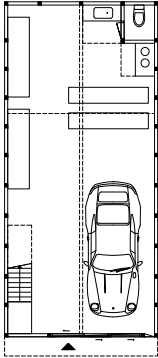
FIG. 14 Floor plans of the ten documented case study machiya



8 / Iremoya



9 / Higashiyama



10 / Inokuma

