Journal of World Architecture, 2026, Volume 10, Issue 5
https://bbwpublisher.com/journal/JWA
Online ISSN: 2208-3499
Print ISSN 2208-3480

A Study on the Relationship Between Residential Patterns and Housing Unit Development from Lilong Housing in the British Concession of Modern-Era Tianjin

Huiyu Deng, Bolong Yao

Tianjin University Research Institute of Architectural Design and Urban Planning Co., Ltd., Tianjin 300073, China

Copyright: © 2026 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: Lilong housing is a type of townhouse that originated in China's modern concession era. It subverted traditional residential patterns and adapted to new residential modes brought by land scarcity, large-scale urbanization, and the westernization of people's lifestyles, showing a transitional state toward modern residential patterns. Taking the development of Lilong housing in the British Concession of modern-era Tianjin as an example, this paper classifies residents in the concession area according to their economic status, occupational conditions, and lifestyles, and correspondingly divides housing into three categories: middle-class housing, high-end housing, and apartment-style Lilong housing. It analyzes the correlation between residential patterns and housing unit development from the perspectives of architectural elements, floor-plan layout, and spatial organization. The conclusion is drawn that residential patterns influence housing unit design, including floor-plan scale and shape, circulation-organization modes, and room layout, which further provides references for modern housing unit design.

Keywords: Lilong housing; British Concession of Tianjin; Residential pattern; Housing unit; Garden

Online publication: November 17, 2026

1. Introduction

Originating in the late 19th century, Lilong housing refers to new-style residences introduced to China by Western powers. Designed with reference to the layout of European townhouses, it connects residential building clusters via Lilong alley spaces, marking a new phase in the development of modern-era residences (**Figure 1**). Based on floor-plan layouts, Lilong housing falls into four types: old-style Lilong housing, new-style Lilong housing, garden-style Lilong housing and apartment-style Lilong housing. Few old-style Lilong houses were built in the British Concession, so this paper will not discuss them.

Previous studies mostly focused on the hybrid Chinese-western appearances and unique Lilong alley

spaces of Lilong housing, while its internal residential spaces received insufficient attention. Nevertheless, the invasion of capitalism and the emergence of commercialized housing broke traditional residential patterns. Lilong housing became a transitional product from traditional residences to modern dwellings. Over the 85-year history of the concession, changes in the internal spaces of Lilong housing recorded how local dwellings gradually evolved toward modern residential patterns, and truly reflected residents' understanding of and responses to modern-era lifestyles.



Figure 1. Yuwenfang (left) and Minyuan Xili (right)

2. Background for the development of Lilong housing in the British Concession of Tianjin

After Tianjin was forced to open its port in 1861, various countries established concessions along the Haihe River and introduced western-style buildings by virtue of their privileges in housing construction and management. Concession-zone construction triggered a sharp population surge. Chinese and foreign real-estate developers built a large number of Lilong houses for rent and sale. By 1949, Lilong housing had become the most numerous and widely-distributed housing type in Tianjin [1].

The British Concession featured the earliest development and the longest duration and thus was highly representative. It developed centered on Zizhulin, and expanded southward due to excessive population density [2]. The Five-Great-Avenues area was its high-end residential quarter. After multiple expansions, the British Concession possessed a complete Lilong-housing system that fully presented the evolution trajectory of Tianjin's Lilong housing, hence carrying outstanding research value [3].

3. Concept of residential pattern

The residential pattern of dwellings refers to a spatial system adapted for human habitation and daily life, covering layout, space, and usage modes. Research shall follow the logic from "people's daily life" to "architectural space" [4]. Era, population groups, and lifestyles determine residential patterns; residential patterns in turn shape architectural forms and reflect development trends of dwellings.

Lilong housing in the British Concession of Tianjin belonged to commercialized housing and showed polarization. Residences for grassroots residents featured high density and poor conditions, while high-end dwellings for privileged classes were independent courtyard houses with superior environments [5]. Diverse

residential patterns gave rise to rich architectural styles. This paper categorizes residential patterns by population groups, analyzes corresponding Lilong spatial forms, sorts out their evolution rules, explores the essence of architectural evolution, and provides references for housing research [6].

4. Analysis of three development modes of housing units

Planned under the Garden-City theory, the British Concession of Tianjin boasted regular road networks and complete supporting facilities, making it highly livable and attracting a large number of residents [7]. Residents mainly fell into three groups: the middle class mostly lived in compact small-unit new-style Lilong houses; upper-class groups resided in high-quality new-style Lilong houses or garden-style Lilong houses with spacious courtyards [8]. In the later period, responding to population explosion, real estate developers constructed multi-story apartment-style Lilong housing with self-contained independent units, which were close to modern dwellings. The three groups coexisted, and various housing unit types developed simultaneously [9]. Through classified comparison, this paper explores the internal correlation between residential patterns and housing unit evolution.

4.1. Development mode of housing units for the middle-class

Traditional Tianjin dwellings were northern courtyard-style bungalows centered on courtyards, emphasizing axial hierarchy that embodied feudal social ranks, while secondary spaces suffered poor daylighting. In the early construction phase of the British Concession, Chinese and Western residential patterns collided. Moved-in clerks and intellectuals shifted from extended family households to nuclear families and attached greater importance to residential comfort. Coupled with land scarcity, traditional courtyard houses could hardly be constructed in large quantities in a short time; hence, new-style Lilong housing emerged [10].

New-style Lilong housing for the middle-class featured compact layouts and pursued high floor area ratios [11]. It prioritized daylighting and ventilation for each unit to adapt to nuclear family life. Abandoning traditional symmetrical axes, most buildings had two to three stories with a plane coefficient exceeding 60 %, and were equipped with complete functions including living rooms, kitchens, and bathrooms. Adopting the form of small bay-width and large depth, the buildings improved daylighting through mass subtraction. Meanwhile, inheriting the notion of harmony with nature, front and rear gardens were set to balance ventilation and residential atmosphere. Selecting typical middle-class Lilong cases, this paper analyzes housing unit evolution from architectural elements and spatial organization, and explores correlations between housing unit changes and residential patterns [12].

The depth-to-bay-width ratio serves as a key indicator for evaluating housing unit livability; the optimal value ranges from 1 to 1.5. A ratio below 1 goes against thermal insulation, while a ratio above 1.5 leads to poor daylighting and ventilation. The overall depth-to-bay-width ratio of middle-class new-style Lilong houses in Tianjin far exceeded 1.5, bringing inherent defects [13]. In design, mass subtraction and small additional courtyards were adopted. Main rooms such as bedrooms were kept within a proper ratio and opened directly to the outdoors. Auxiliary spaces including staircases, kitchens and bathrooms were arranged on the deep-depth side to strike a balance between high density and residential comfort. Majia Villa tried to adopt an inner patio to improve daylighting, yet it was unfavorable for thermal insulation in northern China and thus was not widely popularized [14].

Next, architectural elements connecting indoor and outdoor spaces such as gardens and terraces are discussed. Different from central courtyards in traditional courtyard houses, gardens in Lilong housing were mostly small-scaled and embedded at building corners as components of spatial sequences. Cases such as Shengshenli and Yongdingli set small front and rear gardens enclosed or semi-enclosed by boundary walls to strengthen the spatial sense of territory. Although Xiannong Courtyard had no independent enclosed gardens, building mass voids created semi-enclosed garden spaces. Front and rear gardens had differentiated functions. Front gardens connected entrances, provided daylighting for main rooms, and featured regular low-lying forms to create a warm architectural atmosphere. Rear gardens adjoined kitchens and bathrooms, served household chores, and had irregular outlines following building contours to introduce natural surroundings for auxiliary spaces. Differentiated designs for front and rear gardens based on diverse lifestyles coordinated the relationship between architecture and nature and brought permeability to compact residential units [15].

As distinctive features of Lilong housing, terraces were mostly formed via mass subtraction and often combined with attic rooms. They could be used for drying laundry and admitting natural light. Lilong houses on Chongqing-Dao Road and Shengshenli set large front terraces adjacent to bedrooms for leisure use, weakening the oppressive feeling of buildings toward front gardens. Restricted by site conditions, Majia Villa adopted overhanging balconies instead. As transitional spaces between indoors and outdoors, gardens and terraces flexibly changed with functions and lifestyles, and exerted influences on the internal layout and exterior appearance of Lilong housing.

Finally, room organization and building circulation are explored. Traditional dwellings had very limited circulation spaces with rooms connected end-to-end, resulting in poor privacy. Though compact in floor-plans, new-style Lilong houses organized circulation relying on staircases. Each main room opened directly toward staircases to avoid end-to-end connections of rooms. Stairwells were placed between primary and secondary spaces to realize functional zoning. In some cases, spaces under staircases were used to arrange kitchens, bathrooms, and storage rooms for maximum land use efficiency. Narrow vertical circulation sequentially connected rooms and terraces and achieved efficient organization of housing unit spaces.

4.2. Development mode of high-end housing units

Safe and comfortable environments in the concession attracted nobles, warlords, wealthy merchants and other upper-class residents. They had high requirements for residential space and daylighting, and required separated circulation for masters and servants. Compact middle-class Lilong housing could not satisfy such demands, so real estate developers constructed large-scale new-style Lilong houses and garden-style Lilong houses. Evolved from new-style Lilong housing, garden-style Lilong housing featured low building density and spacious gardens. Most were two-to-three-story semi-detached buildings with three sides exposed to the open air. Multiple entrances could be set to realize separated circulation for masters and servants. This paper selects Fukangli, Anlecun, and Guilinli as cases. The first two are garden-style Lilong houses, while Anlecun belongs to new-style Lilong housing. Though of different types, they reflect lifestyles and spatial characteristics of the same social stratum.

4.3. Development mode of rental apartment-style housing units

New-style Lilong housing and garden-style Lilong housing consumed considerable land and construction costs. In the later concession period, real-estate developers developed apartment-style Lilong housing to

accommodate more households (**Figure 2**). These dwellings were no longer independent single-family houses. Shared staircases connected self-contained residential units on each floor. Compact and economical in space, they were also equipped with independent service staircases that did not interfere with main pedestrian flows.

Units of apartment-style Lilong housing mostly adopted inner-corridor-based spatial organization, divided into short inner-corridor type and patio inner-corridor type. Shunheli adopted the short inner-corridor layout with two households per staircase, close to modern dwellings. Baoshanli adopted the patio inner-corridor layout. Enclosed units formed an inner patio, so kitchens and bathrooms could open toward the patio to improve living conditions.

Apartment-style Lilong housing units had relatively small floor areas and inherited the characteristics of large depth and small bay width. Gardens and terraces shrank, and centralized green spaces were adopted. Shunheli relied on rear terraces to improve daylighting and ventilation. Most residents were short-stay clerks and merchants in the concession. Featuring standardized housing units and low costs and adapting to nuclear family needs, apartment-style Lilong housing constituted an important transitional form from traditional to modern residential patterns.

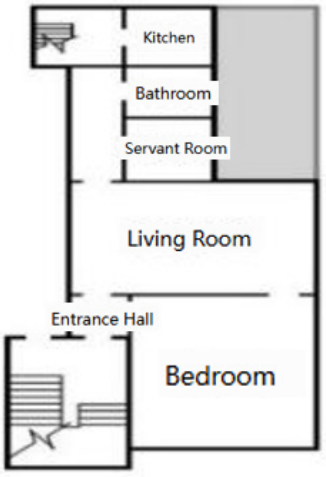


Figure 2. Apartment-style Lilong housing units

5. Conclusions and enlightenments

To sum up, the evolution of Tianjin Lilong housing alongside eras and lifestyles essentially represented the transition from traditional to modern residential patterns. Oriented toward diverse population groups, it generated various housing unit types as a product of housing commercialization. Housing unit design always adhered to refined functions and separated circulation, attached importance to gardens and terraces, and adopted the combination of solid and void forms to improve indoor environments and enhance residential quality. Housing units adapted to different users by adjusting floor-plan dimensions, circulation systems, and room layouts. Even for the same population group, designs kept experimenting with combinations of architectural elements and formed stable housing unit types after weighing pros and cons, offering references for subsequent design practice.

It can be seen that residential patterns constitute an extremely important factor influencing housing design. Although Lilong housing has become part of history, many of its design concepts can still serve modern housing design. When studying modern residential patterns and housing units, people must holistically consider the correlations between economic indicators, residential standards, residents' living habits, and spatial organization. People should take a developmental perspective to foresee potential future upgrading and reconstruction, and create people-oriented and healthy dwellings.

Disclosure statement

The authors declare no conflict of interest.

References

[1] Wang SZ, Chen ZM, 1986, Lilong Architecture. Tianjin University Press, Tianjin.

[2] Jing QM, 2011, Architectural Culture of Tianjin. Tianjin University Press, Tianjin.

[3] Lu H, 2013, Atlas of Tianjin Historical-Feature Buildings. Tianjin University Press, Tianjin.

[4] Yang BD, 1993, Modern-Era Chinese Cities and Architecture. China Architecture & Building Press, Beijing.

[5] Liu TF, Tian H, 2015, Gardens of Western-Style Houses on Tianjin Five-Great-Avenues. Tianjin University Press, Tianjin.

[6] Yang ZY, Cheng WJ, 2016, Research on Housing Unit Evolution and Lifestyle Transition from the Perspective of Lilong Architecture (Part I). Residence, 2016(3): 24–31.

[7] Yang ZY, Cheng WJ, 2016, Research on Housing Unit Evolution and Lifestyle Transition From the Perspective of Lilong Architecture (Part II). Residence, 2016(3): 32–38.

[8] Liu M, 2017, Research on the Evolution of Modern-Era Lilong Housing in Tianjin, thesis, Tianjin University, Tianjin.

[9] Lu H, Zhao JB, 2010, Overview of Residential Buildings Among Tianjin Historical-Feature Buildings. China Real Estate, 2010(12): 70–75.

[10] Yang BD, 1983, Discussion on Design Techniques for Lilong Housing. Architectural Journal, 1983(2): 20–23.

[11] Wang SZ, 1982, Several Treatment Techniques in the Planning and Design of Tianjin Lilong-Style Housing. Journal of Tongji University, 1982(3):104–111.

[12] Sun Z, 2007, A Comparative Study of Modern-Era Chinese Lilong-Style Housing, thesis, Wuhan University of Technology.

[13] Feng Q, 2015, A Regional Comparative Study of Modern-Era Lilong Housing in Tianjin and Shanghai, thesis, Tianjin University, Tianjin.

[14] Chen GD, Xu SB, Aoki NB, 2018, Planning Thoughts of Tianjin Five-Great-Avenues — Translation and Review of Anderson's 1918 Plan for the British Concession of Tianjin. New Architecture, 2018(6): 108–114.

[15] Lü JH, Rowe PG, Zhang J, 2003, Modern Chinese Urban Housing 1840–2000. Tsinghua University Press, Beijing.

Publisher's note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.