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Historic towns and traditional houses are an important part of architectural heritage. Heritage has a dual dimension of time and space, the time dimension reflects "historic", the space dimension expresses "regional", is the core value of urban cultural inheritance and sustainable development. At present, most studies on the preservation and renewal of ancient cities are mainly evaluated from the material space or historical dimension, weakening the value analysis from the full cycle time dimension, while the value evaluation system is mainly divided from the material
space and weakens the time dimension. At the same time, most of the research focuses on the historical dimension of time, but the present use and future development are often ignored. Therefore, this paper analyzes the value dimension of the whole cycle, uses the literature analysis method to obtain the evaluation content and indicators, adopts the survey questionnaire and surveying and mapping method to evaluate the quantitative value, establishes the historical value evaluation system, and puts forward the classification principle of the historical value of traditional houses and the corresponding protection strategy. In addition, the paper analyzes the use status and space requirements of traditional courtyards, and summarizes the transformation strategies of use value and sustainable value. Finally, a whole-cycle value assessment framework of the ancient city and residential courtyards was formed, protection and renewal strategies were proposed, and case transformation was carried out to provide reference for historical and regional protection in the development of ancient city heritage.

Key words: Historical value evaluation, Traditional courtyard, Heritage protection, Historic city

1. Introduction

Yulin ancient city, located in the north of Shaanxi Province, has been a historic military and transportation fortress for hundreds of years, writing a magnificent history on the Loess Plateau and adding to China's profound architectural heritage\(^{(1)}\). Since modern times, the pattern of the ancient city has been affected by the political, economic and cultural development, and the overall style and traditional courtyard of the ancient city are undergoing constant changes\(^{(2)}\). The city outline, functional layout, spatial pattern, road system and many other aspects are very different from the typical Chinese traditional city form, and have unique characteristics, which is of great

Historical value assessment is very important for the preservation and renewal of architecture heritage. The modern view of heritage protection believes that the focus of heritage protection is to protect its value, which is based on the value of the heritage itself. Regarding the value of heritage, the Venetian Charter states that the value of heritage includes historical, artistic, and scientific values. The Burra Charter complements social and cultural values, which are influenced by education, politics, ethnicity, etc.

From the time dimension of value, heritage value can be divided into historical value, use value and sustainable value from the perspective of the whole cycle. Historical value includes spatial texture and architectural style, use value includes social functions such as residence, production and life, and sustainable value includes vitality and creativity of environmental development. Therefore, to realize the revitalization of the ancient city, historical value evaluation is the key to the protection of the heritage, which not only affects the current use and vitality, but also affects the future development potential.

The new contributions of this study are as follows: (1) Put forward the evaluation system of historical value dimension, classify the courtyards and historical价值 of buildings in ancient city, such as cultural relic courtyards, historic courtyards, and ordinary residential courtyards. (2) From the perspective of use value, including living environment, public service facilities, public communication space, etc., the satisfaction and demand of living in ancient courtyards are comprehensively analyzed. (3) Provide different types of preservation and renewal schemes for the historical value of the courtyard. (4) From the perspective of sustainable value, the protection
and renewal strategies for ancient residential courtyards are proposed. This study will provide a
valuable perspective for the conservation practice of historical ancient cities. It also provides a
value evaluation method from the time dimension of the whole cycle. In the practice of renewal
and development of ancient cities, we can also provide conservation and renewal solutions with
sustainable value.

1.1 Historical evolution of the ancient city

The historical evolution of Yulin ancient city mainly experienced three periods\cite{12}: (1) Ming and Qing Dynasties. According to *The Records of Yansui Town*, the urban pattern development of Yulin began in the early years of the Ming Dynasty (1368-1644), during which the castle was built to form the city scale. After three expansions (known as ‘Three Expensions of Yuyang’), the current urban pattern of ‘Six towers line the street’ was formed\cite{14} (as shown in Figure 1, 2). After several renovations in Qing Dynasty (1636-1912), Yulin finally formed an "ancient coin"-shaped outline and remained to this day\cite{14} (as shown in Fig. 1, 2). (2) During the period of the Republic of China (1912-1949), it was repaired and rebuilt mainly in combination with military defense, and some modern public buildings were added while the overall pattern changed little\cite{15}. (3) After the founding of the People's Republic of China in 1949, civil air defense military structures were mainly built in part of the city wall and its underground, while some modern public buildings and residential buildings were built\cite{16-17}. 
Fig. 1 Map of six towers line the street

Fig. 2 Evolution of ancient pattern ("Three Expansions of Yuyang")

There are two main roads running through the north and south in the ancient city. The road pattern in the central and western regions is relatively regular and has a chessboard layout. Block roads connect the main road in an east-west direction, cutting the plot into rectangular clusters. The area near the northeast corner of the city wall is located in a mountainous area, the road layout is flexible and free which forms a rich urban space (as shown in Fig. 3).
1.2 General situation of residential courtyards

With the development of cities and streets, residential buildings have also developed vigorously. The soldiers who came to the border from all over the country brought the architectural technologies and culture of their hometown, which were constantly exchanged and integrated in Yulin ancient city, and constantly adapted to the local climate to form local architectural features.

In terms of courtyards, there are many types of courtyard house, which are mainly divided into three categories (as shown in Table 1): (1) Regular courtyard house. Folk houses of Yulin ancient city belong to Chinese traditional northern courtyard system, many regular courtyard houses have been preserved which are mainly composed of one or two courtyards. Regular courtyard house is generally arranged on a north-south axis, with the main building located in the north and the courtyard located in the south. The buildings are connected with each other by courtyards, which can provide sufficient lighting and outdoor courtyard space for the interior of the building. The topography of the city is quite different and high in the northeast and low in the...
southwest. Affected by this, there are many east-west axis courtyard houses besides the most common north-south axis courtyard houses. When the multi-courtyards are organized together, it can be a common front-back combination or left-right juxtaposition, in left-right juxtaposition case, the east courtyard is mostly used as the inner courtyard [18-19]; (2) ‘Guyao’ courtyard house. Since the period of the Republic of China (1912-1949), some ‘Guyao’ courtyard houses appeared, which were mostly used as wing rooms on both sides or opposite houses of main houses. There were few ‘Guyao’ structures used as the main house; (3) ‘Kaoshanyao’ courtyard house. ‘Kaoshanyao’ courtyard house are mainly distributed in the northern part of Yulin ancient city with complex terrain, which is a form appeared in the context of the city development during the late period of the Republic of China. The history of the formation and development of this type of courtyard house is not long, and its main form has been adapted to local conditions by following the traditional cave dwelling architectural style. For example, the orientation and layout of cave dwelling courtyards are influenced by the mountainous terrain in the north, most of them present irregular flat forms.

Table 1. Yulin traditional compound type

<table>
<thead>
<tr>
<th></th>
<th>(1) Regular courtyard house</th>
<th>(2) ‘Guyao’ courtyard house</th>
<th>(3) ‘Kaoshanyao’ courtyard house</th>
</tr>
</thead>
<tbody>
<tr>
<td>The characteristics of single buildings are as follows:</td>
<td>(1) Most of the building structures are mainly wooden structures, and the plane shape adopts the form of ‘Chuanlang Hubao’, that is,</td>
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</tbody>
</table>
adding the front colonnade with a depth of a horizontal spacing between purlins in front of the main room of the principal house, and then push the exterior eaves decoration between the two ends to the front colonnade eaves columns, forming a flat layout with three concave spaces in the middle (as shown in Fig.4)\(^{[20]}\); (2) The building wall material adopts blue brick, which is beautiful, material-saving, firm and durable; (3) The architectural details have rich cultural and artistic features, such as brick carving art on a screen wall facing the gate of a house, wood carving art on dougong and sparrow brace, ceramic art on animal head sculpture and roof ridge, calligraphy art on architrave(used with dougong), etc., which are treasures of Yulin folk art with high historical value\(^{[21]}\) (as shown in Table 2).

![Figure 4: The form of ‘Chuanlang Hubao’\(^{[20]}\)](image)

<table>
<thead>
<tr>
<th>Brick Carving Art</th>
<th>Ceramic Art</th>
<th>Calligraphy Art</th>
</tr>
</thead>
<tbody>
<tr>
<td>‘Zhaobi’-Screen wall facing the gate of a house</td>
<td>Animal head sculpture and roof ridge</td>
<td>Architrave</td>
</tr>
</tbody>
</table>

Table 2. Cultural and artistic features in architectural details
According to the investigation and statistics, there are about 1600 courtyards in Yulin ancient City, among which 97 courtyards are listed as national architectural heritage protection units, but most of them are buildings before Qing Dynasty, which are seriously damaged due to long history. However, there is a lack of scientific standards for the protection and repair of historical traditional features in architectural theoretical research, and local residents lack awareness of historical heritage and cultural protection in the process of reconstruction. The courtyard is arbitrarily rebuilt or newly built by blind use of new materials that are not consistent with the traditional style, resulting in the destruction of original architectural style and historical traces. Therefore, the article constructs the courtyard value evaluation system to analyze the current situation of various courtyards, and puts forward the protection and renewal strategy to adapt to the residents' living mode and continue the regional characteristics of Yulin Ancient city.

2 literature review

In recent years, heritage protection has received much attention, so there are a lot of studies on ancient city heritage protection, including the dynamic mechanism of historic city renewal and development[22], spatial form evolution and structural characteristics[23], traditional residential courtyard[24], architectural culture and art[25], tourism value and development[26], etc., which together constitute the material and intangible basis of heritage value.
Wenyan Yu established the value evaluation system of the four dimensions of the historical role of the ancient city, regional environment, traditional style, art and science, and proposed the development strategy of the ancient city in terms of ecology, industry, function and so on[27].

Fankai Gao studied the spatial vitality enhancement strategies based on the catalyst theory of function, culture and landscape[28]. Izadi et al. use analytic hierarchy process to analyze the problems of historical urban development[29]. Shemirani et al. take the historical and cultural city of Hamadan in western Iran as his research object, and uses the method of urban catalyst to find the vitality of urban renewal[30]. Tian, Zhao et al. summarized the morphological characteristics of Yulin city and its surrounding areas under the impetus of culture, and proposed the spatial protection mechanism of morphological and cultural representations[31-32]. Jingjing Wu introduced the change of human settlement environment and protection strategy of military castle in Yulin area from the aspects of natural environment and social environment[33]. Dahai Li investigated ancient city records and other documents to sort out the evolution process of urban form from the perspective of archaeology[34]. Qidi Zheng analyzed the urban internal transportation system in different periods to study the characteristics of urban spatial structure through the use of space syntax[35]. Yu Pei et al. examined the historical stratification process of Yulin Ancient city based on the method of urban historical landscape, interpreted its morphological evolution process and conducted value assessment[36]. Jiaying Huang et al. analyzed the spatial pattern of cultural landscape in Yulin and studied the characteristics of fragmentation, spread and connectivity of the ancient city landscape based on GIS[37]. Yunshu Mu studied the protection strategy of the quadrangle and emphasized its protection significance from a macro perspective[38]. Weixiao Han
discussed the regionalism of the spatial form of Yulin courtyard. Zhaoxu Lai analyzed the historical and cultural value of the residential building types, the spatial organization of courtyards and the spatial pattern of streets in Yulin. Xiaoli Wang et al. studied the historical cause and evolution of courtyard houses in Yulin. Yaxin Wang proposed the social sustainable development strategy of embedding the function of retirement station in Yulin courtyard. Dan Yin et al. studied the conservation of ancient towns from the perspective of cultural ecology. Yanjun Li summarized the construction and decorative art of cave dwelling in Yulin from the perspective of traditional ritual culture. Siting Li studied the cultural genes in the landscape of Yulin district. Juejun Li believes that Yulin ancient city cultural memory site to be protected. Xi Chen studied the path of cultural heritage protection in tourism development.

At present, the study of Yulin Ancient City mainly focuses on the evolution, characteristics and development power of urban spatial form. Through archaeology, multi-dimensional value evaluation system, catalyst theory, historical stratification, cultural landscape and other methods, this paper studies the protection and development strategy of ancient city value from a macro perspective. Studies on residential courtyards mainly discuss their historical causes and characteristics, and lack the perspectives of use value and sustainable value from the time dimension of value. Although some scholars have proposed protection strategies, they have not provided specific practices and case studies. Therefore, we discuss the preservation and renewal strategy of the ancient city space and residential courtyards from three dimensions of history, use and sustainability.

3 methods
Status investigation and value assessment of the courtyard. Through the investigation of various buildings and courtyards in the ancient city, the whole cycle value evaluation system is constructed to evaluate and grade the historical value\cite{48-49}.

3.1 Composition and distribution of historical remains in ancient cities

The heritage of Yulin Acropolis is composed of one acropolis wall and 110 ancient buildings. The city wall consists of two parts: the current city wall heritage and the historical city wall heritage\cite{50-52}. The current city wall heritage includes 15 sections of continuous city wall relics and 15 sections of ruins, among which 3 city gates, 2 city gate ruins (West Gate 2), 2 Wengcheng, 2 city towers, 15 Mamian, and 6 structures with protective value of modern times (including 5 military structures and 1 civilian structure, such as the military site of General Deng Baoshan Headquarters, which was built in 1939, consists of three-hole cave dwellings and wing rooms.) are preserved in the city wall relics section (as shown in Table 2). The historical city wall heritage includes 1 historical city wall relic and 2 historical city wall ruins. The ancient buildings consist of 13 public buildings and 97 courtyard houses.

<table>
<thead>
<tr>
<th>City gates</th>
<th>City gate ruins - Zhényuán Gate</th>
<th>Wēngcheng of South Gate</th>
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<tbody>
<tr>
<td><img src="image1" alt="City gates" /></td>
<td><img src="image2" alt="City gate ruins - Zhényuán Gate" /></td>
<td><img src="image3" alt="Wēngcheng of South Gate" /></td>
</tr>
<tr>
<td>City towers - South Gate</td>
<td>Mamian</td>
<td>Modern Structures Preservation - General Deng Baoshan Headquarters</td>
</tr>
<tr>
<td><img src="image4" alt="City towers - South Gate" /></td>
<td><img src="image5" alt="Mamian" /></td>
<td><img src="image6" alt="Modern Structures Preservation - General Deng Baoshan Headquarters" /></td>
</tr>
</tbody>
</table>
3.2 Courtyard grade and historical value evaluation

The protection of historical ancient cities should follow the principle of limitation, that is, determining the protection objectives, scope, and different levels of protection in different areas [53-55]. Residential courtyard houses in Yulin can be divided into three categories based on their historical significance and protection value level: cultural relic courtyards, historic courtyards, and ordinary residential courtyards [56-57]. Their distribution and historical value evaluation are shown in Fig.6. Among them, 97 cultural relics are scattered, accounting for only 7.69% of the total. Historical courtyard refers to the courtyard with traces of historical traditional architecture [58]. This kind of courtyard has not been completely updated into modern courtyard, still has a certain historical value and should be protected. About 60% of ordinary residential courtyards have been updated to modern buildings without conservation value.

Figure 5 Current distribution and historical value evaluation of courtyards
The preservation of courtyards with historical protection value is complicated and diverse, which can be sorted into the following four categories: (1) Class I, the overall pattern of the courtyard is relatively complete, and only partial restoration is needed\(^{[59]}\). For example, No. 4 Courtyard of Dayoudang Lane maintains its original appearance from the main building to the surrounding structure, with some parts damaged and requiring local repairs such as roof maintenance, doors and windows repairs etc\(^{[60]}\); (2) Class II, the courtyard layout has been largely preserved, although parts of the buildings have been demolished or renovated. For example, No. 8 Courtyard of Wanfo Tower Lane, the original layout of the courtyard still exists, and some buildings have been constructed and renovated. However, the buildings still have different degrees of damage, such as serious roof leakage, wall alkalization, need to be completely restored to the rebuilt part\(^{[61]}\); (3) Class III, the layout of the courtyard was badly damaged and poorly preserved, with only individual or partial buildings remaining (such as the original three Guyao, now only two are left); (4) Class IV, the structure of the courtyard is poorly preserved without any trace of the existence of traditional residential forms, and the qualification of the document protection unit should be cancelled.

Among them, the second type of courtyard accounts for 63% of the cultural heritage units and is a key target for the protection and repair of ancient residential buildings in Yulin Acropolis.

For the third and fourth types of courtyards, appropriate restoration work can be carried out based on early images, surveying data, or literature\(^{[62]}\). In terms of courtyards layouts, only a very small number of courtyards retain their original forms, while the vast majority of courtyards have lost their original forms and need to be rectified on the overall layout. From the perspective of
architecture, the main structures or maintenance structures of most single buildings are damaged, and there are also alterations that are not consistent with the original appearance, and even dangerous houses exist\[63-64\]. The protection and renovation of historical buildings should focus on maintaining their authenticity, coordinating urban development, and protecting their uniqueness\[65-66\]. Therefore, it is recommended to carry out the maintenance and repair work of ancient buildings immediately, appropriately protect and repair them, and prevent them from being demolished, newly built or destructively renovated by users\[67\].

3.3 Current use situation and sustainable demand of courtyards value

The value evaluation of courtyards is divided into two aspects: use value and sustainable value. The use value will affect the future residential sustainability, and the sustainable value will also reflect the space use demand, thus providing the direction for the renewal and transformation of the use value. Therefore, we evaluated the use value by analyzing the current use status of the courtyard, investigated the residents’ space use needs, and proposed protection and renewal strategies with sustainable development value. Through the investigation and interview of the residents of various courtyards in the ancient city, a total of 300 questionnaires were issued and 276 valid questionnaires were received. Score the degree of living satisfaction and living demand with a full score of 5, and get the average score of various living indicators, as shown in Fig.6.
The survey found that the most residents in the ancient city are mixed tenants and homeowners with tenants accounting for the majority. The owner mainly lives in the main room, and the tenant mainly lives in the wing room. Most of the original residents have been moved, and the tenants are migrant workers. Different residents have different activities and lifestyles (see Fig. 7a). At present, there are two main problems in buildings of courtyards houses: (1) After the addition and reconstruction of the courtyards, the spatial patterns have changed, the lack of daily maintenance and repair, and the problems of building structures and decorations are serious; (2) Backward living conditions in the courtyards lead to poor quality of life for residents. Large number of users, backward infrastructure, lack of heating facilities, poor kitchen and bathroom environment, impeded drainage, even the whole yard shares a dry toilet (see Fig. 6b).
According to research, residents’ demands for living space is mainly divided into the following aspects: (1) For high-quality living space, modern building equipment and design are used to improve living quality\cite{68}; (2) For the demand of public transportation, increase the area of roads at all levels of the ancient city, and improve the transportation facilities; (3) For all kinds of life service facilities, increase the number and quality of facilities, including restaurants, commercial, cultural and entertainment places, garbage stations, public toilets, fire stations, etc.; (4) For the demand for activity space and green land, ecological landscape space is created by reducing building density and increasing the green area of courtyards and urban squares\cite{69}. Based on the assessment of use value and sustainable value, we summarized the protection and renewal strategies of courtyard value. The interaction of use value and sustainable value is mutually reinforcing, which is the key to the protection of traditional residential courtyard value.

4 case study

4.1 Strategy of courtyard space reconstruction and renewal
Based on the research of courtyard classification based on historical value evaluation, the typical courtyard cases are renovated by using the strategy of use value and sustainable value. The density of courtyard buildings in the ancient city is high, and most of them are privately built by residents without complying with laws and relevant regulations. The age, form, and height of these buildings are different, inconsistent with the historical style of the ancient city, and in violation of the standards of the Ministry of Housing and Urban Development and the urban planning scheme. However, the area is located in the old urban area of Yulin City, with a complex composition of residents, high demolition costs and difficulty. The project disturbs the people to a certain extent and should not be carried out on a large scale.

The renovation can be carried out according to the classification of courtyards as follows: (1) Restore cultural relics protection courtyards to preserve their forms and correct the disharmonious elements of style and features to preserve the authenticity of historical heritage\(^{(70)}\); (2) The existing buildings with historical protection value should be rectified or repaired to restore the original style; (3) Rectify the existing ordinary residential courtyards, and rebuild or dismantle the buildings that affect the style of the ancient city to make them harmonious with the style.

### 4.2 Reconstruction case

Based on the three levels of the historical value evaluation of the courtyards, the value assessment of the buildings in the cultural relic courtyards in the ancient city is carried out, and it is classified according to the existing quality and style, which is mainly divided into four levels(as shown in Fig.7). (a) The building is well preserved and only needs routine maintenance. Some are inhabited by residents for daily life, while others are preserved as museums for exhibition only. (b)
Generally preserved, and both the traditional style and the quality of the building have been damaged, requiring large-scale restoration and maintenance. (c) The building is dilapidated or seriously rebuilt, and the main structure and maintenance are in a bad condition, requiring comprehensive restoration. (d) The building has no historical traces, no conservation value but is of good quality and requires restoration of the architectural features.

Taking the courtyard No.11 Courtyard of Dinghuisi Lane as an example, this paper puts forward the renovation strategy and scheme design for the courtyard of cultural relics protection unit. The courtyard is located in the southeastern part of the ancient city (as shown in Fig.8).

**Fig. 7 Distribution of Cultural Relics Courtyard and Location Map of No. 11 Dinghuisi Courtyard**

The courtyard has good conditions of overall preservation with two courtyards, especially the main structure, wooden structure, roof and envelope of principal house. In the lobby of the main entrance, there is a well-preserved brick carving "Geese return" pattern on the ‘Zhaobi’. The additional buildings in the middle of the courtyard and the general buildings on the east and west
sides have destroyed the style of the courtyard. It belongs to the first type, cultural relic courtyard, and the original historical pattern is relatively perfect, which needs partial repair or maintenance (see Fig.8). The walls of the principal house, wing house, opposite house are well preserved, and the roof is relatively intact with well-preserved tiles, and the enclosure structure is also intact, retaining most of the wooden components and of high quality.

However, some historical buildings have been seriously damaged, and the roof of the side house has been damaged. The appearance of some wing rooms is severely damaged, the roof is damaged and added blue colored steel plates for protection, the wooden windows are maintained with metal railings, and the exterior walls are plastered with cement. The general buildings that have a significant impact on the appearance are those added to the southwest and southeast corners of the courtyard, which adopt a flat roof form, cement plaster, metal railings, and anti-theft doors, which have a certain impact on the style and features (as shown in Fig.8).

Reconstruction intention: It is necessary to rectify or dismantle the additional buildings in the courtyard and the buildings in the east and west corners to restore the original pattern. Carry out daily maintenance on the roofs of the principal house, wing house and opposite house, and restore
the original roof of the wing house with blue color steel plate. On the restoration of envelope
structures, daily maintenance shall be carried out on the roofs of the principal house, wing house,
opposite house and rear house. Restore the cement plastered walls of eastern wing house and the
traditional style. And repair the foundation and walls at the entrance. Compare the layout of the
courtyard before and after the reconstruction (as shown in Figure 9).
Fig. 9 Analysis of courtyard situation before and after reconstruction

The reconstruction methods of building facade are as follows: (1) The protection of roof is mainly to restore the original sloping tile roof. For cases where the ridge of the roof still exists and the texture is damaged, protection and maintenance are the main measures. The added blue color steel plate should be removed and the original mechanical tile or slate roof below should be repaired mainly by dismantling and repairing; (2) The protection of enclosure structures such as walls is mainly to restore blue brick walls. For some cement plastered walls, use blue bricks for tiling. For ceramic tile walls, ceramic tiles need to be removed and restored to original blue bricks; (3) For doors, windows, and detailed decorations, well preserved mahogany doors and windows are mainly maintained and repaired. Restore the traditional forms of damaged wood carvings, carved angle brace and other detailed structures. For aluminum alloy doors and windows with severe style damage, they need to be dismantled and transformed into wooden materials that
match the original style and color. The specific operation plans are compared as follows (see Fig. 10).

(a) Elevation of the original courtyard

(b) Elevation of the renovated courtyard

Figure. 10 Elevation mapping of courtyard buildings before and after reconstruction

5 Conclusion

The protection and renewal of historical ancient cities need to be comprehensively considered from different levels such as urban planning, courtyards and single buildings. From the
perspective of time dimension of heritage protection, it can be divided into historical protection level (historical value), community livable level (use value) and urban development level (sustainable value). The renewal of community livable level also includes sustainable value, and the three values are not independent but interact with each other. The specific contents are as follows:

(1) Historical protection level. Historical buildings should focus on restoration, restoring the old parts to their original appearance, demolishing the newly built parts, following the traditional pattern, preserving the traditional style, and reigniting the memory of the ancient city.

(2) City level. As a part of the city, the protection of historical blocks must be coordinated with the city development, and finally according to the topography make the different parts of the city form different spaces which are different from each other and closely related to each other, and form a rich and unified urban space.

(3) Community livable level. Preserve the original characteristics of residential areas and their community characteristics, meet modern residential needs and lifestyles, transition from material protection to spiritual protection.

Therefore, this paper mainly investigates and evaluates the preservation of historical features of Yulin Ancient City, including the macro pattern of the ancient city, the middle courtyard and the micro architecture. At the city level, the historical value assessment of the ancient city's residential buildings is divided into three categories: cultural relic courtyards, historical courtyards and ordinary residential courtyards. According to each kind of traditional residential courtyard, the
method of historical protection is put forward, and the renewal strategy of sustainable value is analyzed. Finally, it provides the reference of the ancient city protection practice, and carries on the renovation design of the traditional residential courtyard. The research perspective and method of this paper can provide new ideas for the protection and sustainable development of historical ancient cities.

Declarations

Ethical Approval

Not applicable

Competing interests

The authors declare they have no competing interests

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Availability of data and materials

All the data generated or analyzed during this study are included in this published paper.

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