Cultural Heritage Conservation and the Sustainability of City's Orderly Development: identification, conservation and construction of historic space

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Abstract

Chinese Eastern Railway is the well-conserved linear cultural heritage in China in the 20th century. Despite that the conservation career of cultural heritage along Chinese Eastern Railway flourishes, the contradicted benefit demands between the conservation of historic buildings and the orderly development of the city is increasingly obvious. In this paper, Hengdaohezi Town, a station-located town along Chinese Eastern Railway, is taken as an example to explore its conservation of cultural heritage and sustainable ways for city's orderly development from the view of historical space. It's indicated from the results that mutually contradicted benefit demands could be balanced through the identification, conservation and construction of historic space. Then the requirements of historic heritage conservation are satisfied through the combination of conservation zoning delineation, limitation of building height, integration of spatial morphology, etc. Additionally, city development and construction and living environments could be improved through the adjustment of land use, alleviation of road traffic, upgrade of greening system, remediation of ecological environment, etc. Moreover, it's shown from the realization ways that identification, conservation and construction of historic space is one of the ways to achieve the sustainable development of historic towns.

Keywords

*Sustainability, heritage
ways, Hengdaohezi*

conservation, town

construction, realization

1. Introduction

The Siberian Railway is an important regional traffic corridor, built by Russia in the late 19th and early 20th centuries. And Chinese Eastern Railway in China is actually its eastern branch. Almost twenty-five years of construction activities along the lines have led to large-scale and a considerable amount of buildings group, which drove the rise and prosperity of many cities

as the prototype of spatial development of station-located areas. The core cities of regional development and characteristic resource towns are both involved. The former includes Russia's Vladivostok, Khabarovsk, and China's Harbin. The latter includes Russia's Krasnoyarsk, Taiga, Novosibirsk, Omsk, Yimianpo and Hengdaohezi in China. The architectural heritage along Siberian Railway and Chinese Eastern Railway profoundly impact city pattern evolution and even the social integration, cultural exchange and economic circulation in Sino-Russian bilateral area, until now.

As urbanization process and market economy effectively speeds up, the station-located cities and historic buildings are faced with a series of problems to be solved. Firstly, historic buildings lacks of necessary repair with constant damage. A large number of historic buildings are damaged. Random construction and renovation of historic buildings inside and outside have caused excessive density, broking the garden-style layout, one house and one courtyard, of historic buildings and giving huge potential fire problems. Secondly, development and construction activities threaten the conservation of historic environment. The rapid and disorderly development of city construction and renovation of old cities for the purpose of real estate development lead to a large number of residential communities and modern buildings, which hardly consider the relationship of street space scale and coordinate with historic buildings. The improper layout of building scale and body seriously damage the original historic characteristics. Thirdly, the lagging municipal construction affects the life quality of residents. Most of the historic buildings are located in the old cities, where the municipal facility conditions are poor, life garbage is dumped randomly and sewage is usually discharged to the streets directly. Additionally, the green land and public activity space are absent in old cities.

In this research, based on the existing achievements, Hengdaohezi Town is taken as an example to analyze the actual problems for city development, cultural heritage conservation and resident life , such as demolition of old historic building and construction of modern buildings¹, original appearance repair of historic buildings and conservation of historic authenticity². It aims to balance the interesting conflict of mutual contradictories among historic building conservation, city oderly construction and life improvement.

2. Literature Review

Along nearly 2,500 kilometers Chinese Eastern Railway, the buildings and structures are large and diversified in number and types. It has become the unique cultural phenomenon in northeast China with its far-reaching influence on city characteristics, social structure and life pattern. Since the beginning of road and affiliated area construction, the agencies and scholars from China, Russia , Japan and other countries upheld strong academic interest and research enthusiasm for the experience and conservation of engineering construction and architectural skills, social and cultural and economic activities; especially during the past twenty years, when city heritage conservation, rapid acceleration of urbanization and railway traffic almost simultaneously develops, the attention, discussion and research for the city development and heritage along Chinese Eastern Railway has been ushered into a peak

¹ remove old historic buildings and build modern building facilities

² restore historic building appearance and conserve its historic authenticity

period with rich research achievements, displaying multidisciplinary perspective, multi-special categories, and multiple time and space dimensions.

2.1. Cultural heritage prototype interpretation

Based on the prototype and morphology, the diversified classification standards include architectural function (original function, such as station building, engine house, water towers, residential houses, churches, etc.)(Zhuo N.2016), architectural style(traditional Russian-style buildings, Art Nouveau buildings, eclectic buildings, etc.) and façade decoration(roof molding/dome, entrance, column, doors, windows and balcony). Supplemented by the necessary graphic language and literature, the expression and artistic characteristics of each types and categories are systematically analyzed to further explore out more abstract and broad cultural meaning at the level of aesthetics and semiotics(Li, G.Y 2014). Moreover, the spatial morphology and mechanism (architectural spatial morphology, spatial morphology) and more macroscopic natural landscape types, along the lines are summarized in their characteristics to further apprehend the system and structure, spatial distribution and natural environment characteristics of the earlier Chinese Eastern Railway, which is greatly significant to guide the city conservation and urbanization development along Chinese Eastern Railway(Zhao Z.Q.2016).

2.2. Renovation of historic buildings and Renewal of historic blocks

This research mainly consists of two types: design practice and strategies formulation. The former focuses on the specific material space renovation and functional positioning. The digital technology ways are applied to provide design guidance for the renovation of historic buildings; the new blue print of historic blocks and sections are set up through the restoration of systematic characteristics, repair of historic buildings, conservation of ancient trees and the introduction of modern city function space (Zhao, T.Y.2006) In sight of the conservation and reutilization of the former stations and other historic buildings, the implementation strategies are put forward in building appearance, internal structure, utilization function, surrounding environment and public facilities; based on the integration, permanence and systematicness of historic block renewal, the affecting factors of renewal pattern is summarized to further put forward the corresponding working programs as well as the evaluation and feedback mechanism, which is usually accompanied by quantitative evaluation of various indicators; moreover, considering the urban planning as the management ways of city construction, the conservation strategies are put forward for rules and regulations, policy implementation and operation and management (Zhao Z.Q.2012) .

2.3. Regional integration and tourism development

In addition, the conservation of Chinese Eastern Railway is combined with modern economic and social life to therefore fully play the advantages of tourism resources and improve its actual position in city economic society, which is also an important topic of heritage research. The network of tourism space focuses on the selection and theme classification of tourism resources at municipal level connects the resource of theme nodes in series to form theme ways and therefore construct spatial network (Tang, Y.X.2016) ; tourism space structure across the administrative regions constructs industrial heritage tourism space structure of Chinese Eastern Railway from three aspects: hierarchy nodes of tourism cities, division of tourism circle and planning of tourism lines (Tang, Y.X.2017) ; The tourism development of

the whole lines suggests integrating the representative heritages along Chinese Eastern Railway within four northeast provinces, jointly develop natural landscape within the region, establish the cooperated mechanism and construct the integration of Chinese Eastern Railway lines.

3. Materials and Methods

3.1. Case Study

Hengdaohezi Town, N44°48' and E129°04', is located in the west of Hailin City. Hengdaohezi Town occupies the important geographical position for the three eastern provinces in China. It's 300 km away from Vladivostok, Russia. As the main thoroughfare of northeast Asia, it's in the core of Northeast Asia Free Trade Zone; meanwhile, Hengdaohezi Town is located at the Russian economic belt of Harbin, Mudanjiang, Suifenhe and Dongning, the only place for exchanges of western region in Heilongjiang Province. On the other side, Hengdaohezi Town is an important node for coal, wood and water before climbing the mountains and loading trailers (auxiliary engines). Meanwhile, there is a large amount of railway departments, buildings and ancillary facilities in Hengdaohezi Town, having great influence to the operation and management of Chinese Eastern Railway.

Figure 1 Location and historic and cultural environment analysis

3.1.1 Interpretation of city characteristics

The town is entirely surrounded by mountains and a river goes through inside. The terrain is higher in the north with the slope below 25%. And the partial is between 25%-50%. Depending on the railway and river growth and development, the morphology is belt. The city is divided into four parts by railway, rivers and mountains. The historic buildings are more to the north of the railway, the space is narrow between railway and river, scattering some earlier Russian-style houses. The buildings are mainly built after the founding of PRC to

the south of the river and to the east of the mountains. The spatial layout of city street is evenly distribution and radial. The streets and lanes remains the earlier evenly distribution to the north of railway. To the south of railway, the streets and lanes space is mixed by evenly distribution and radial type, naturally formed.

Historic streets and lanes is pleasant to the north of railway and the width (D) varies between 2m-5m and it's usually 3m-4m away from the eaves height of buildings on both sides, D/H is smaller than , making the street more intimate. The types of historic buildings are dominated by small residential houses and public buildings. The decoration of historic buildings shows strong exotic cultural characteristics, reflecting in flat shape, wood material, wall color, window and door decoration and lien contour, etc. The use of these detailed components and decoration reflects multiple characteristics of Russian-style buildings.

Table 1 city characteristic analysis

Characteristic type	description
Settlement morpholgoy	Strip city morphology, evenly distribution residential morphology and surrounded by mountains with river going through
Street space	Spatial layout of evenly distribution and radial type, pleasant street scale
Building characteristics	Regular appearance (regular geometry), stone and wood structure
Decoration art	Onion dome, tetrahedral tower drum, flat Mukeleng-style houses and engraving patterns

3.1.2 Analysis of cultural heritage

Hengdaohezi Town has a large number of historic buildings with large scale and concentrated distribution. These historic buildings could better reflect the historic characteristics, exotic culture and folk customs during Tsarist Russia and the Japanese-Puppet period. At the same time, they also witness the history of Chinese Eastern Railway with higher historic value. Secondly, the architectural details with beautiful appearance and unique style are well reserved to reflect the historic development background and provide materials for architectural culture and art of historical process with profound academic value.

Thirdly, many photographers, film and television producers, and sketching enthusiasts perform photography, filming, and sketching in towns. A large number of historic buildings have left the most authentic side of the town with higher artistic appreciation. Ultimately, industry-dominated Hengdaohezi Town is changing. And these rare historic resources strengthen the connotation of the town, which is a solid backing for other industries with higher utilization value.

Table 2 typical historic buildings

historic buildings	Representativeness	Value characteristics
Engine House	Modern industrial architecture civilization	Historic value

	point	academic value artistic value utilization value
Railway white building	Former residential houses and official buildings for Chinese Eastern Railway experts	
Log yard	Photos of the earliest log yard in China (in the Museum of Chinese History)	
Orthodox Notre Dame Church	The only remaining wooden church in the three eastern provinces	
Ancient Russian stree	The best preserved Russian style historic district	

3.1.3 Historic space identification

The planning drawings of earlier cities are interpreted to explore their historic space constitution, boundary and characteristics. The layout of earlier Hengdaohezi Town considers railway station as the center and rectangle squares and a large amount of greening are set up surrounding the center. On the other hand, taking railway station as the base point, the town develops along the railway lines. The administrative region is set up in the north (inside there are religious land use, education land use and medical land use); secondly, in the east and west set up are the boundary region (military land use inside) and village region (mainly residential land use). The road network of the town is typically rigid. Street design is wide, straight and flat. The land is divided in standard grid. The buildings inside the street profile are arranged in double rows with ending buildings close to the four corners.

Figure 2 Historic planning drawings

After hundreds of years of city development and construction, city historic space has been submerged in the continuous expansion and transformation of city map. Through the

comparison between original and existing planning drawings, the historic space boundary of Hengdaohezi is determined (see Figure 3). Within historic boundary, it's still clearly to get the characteristics of earlier city planning: grid road network, wide, straight and flat street, neat land division and line architectural texture. However, the typical road greening and that in front of the station are hardly preserved. Overall, the historic space of Hengdaohezi retains the framework of earlier planning.

Figure 3 comparison between historic planning and the existing space

3.2. Research Methodology

Combining with the city development problems and relevant analysis, the principles of jointly development are put forward between heritage conservation and regular construction. The first principle is to coordinate conservation and construction. The city not only conserves and continues historic culture, but also needs to promote economic development and social progress and fully combines conservation with construction. City conservation and construction rules are respect to highlight conservation keys. The construction of new districts should be coordinated with old district conservation. Meanwhile, the requirements should be satisfied among city economy, social development and improve citizen's life and working environment. The second principle is sustainable development. City development couldn't quick and simply pursues economic interests. The current utilization methods should ensure the future sustainable development. The relationship among historic heritage conservation, residential environment improvement and industrial development should be comprehensively coordinated. The conservation and utilization are combined with the conservation prioritizing to formulate city construction content with sustainable development significance. The last principle is historic environment conservation. The conservation of historic space not only aims single cultural relic, but also involves relics, historic space, historic buildings and traditional characteristic buildings, facilities and structures and ancient trees, etc. with overall conservation measures. Based on the above three principles, the realization ways, historic conservation and construction are formulated to anticipate achieving the sustainability of heritage conservation and orderly construction.

4. Results and Discussion

4.1. Conceptions of realization ways

The sustainable ways of both are explored through the formation of implementation strategies, planning framework, conservation zoning and key construction (see Table3). The development strategies consider conservation of historic environment, exploration of cultural potential and improvement of life environment; the planning framework further explores cultural connotation based on the analysis of city traditional characteristics. The structural planning is constructed for the overall conservation of material morphology and cultural connotation of Hengdaohezi Town. In material space morphology, the historic elements of the cities are divided into three levels: nodes, axis and regions. These three levels of space are mutually connected to jointly constitute the historic spatial layout of Hengdaohezi Town.

In the first level of conservation zoning, the historic section, where the traditional layout and historic characteristics are completely conserved and historic buildings are concentrated, are determined as core conservation boundary. And outside the core conservation scope, the construction and controlled section are determined. In the second level, the scattered various level of cultural relics conservation unit, historic buildings and traditional characteristic building are determined in their conservation scope and construction and controlled scope. The environmental coordinated area is determined if necessary. The third level mainly aims at ancient trees, mountains and rivers. The key conservation content includes various historic buildings within the cities and their surrounding environment; in addition, the original natural environmental elements area considered as the key component of city historic space, being protected properly.

Table 3 heritage conservation and city construction development ways

Ways	Content	Description
Implementation strategies	conservation	Conservation historic environment and focus on the overall appearance. Improve the conservation recognition and visual perception of historic characteristics from user and experiencers
	governance	Comb historic context, reproduce historic atmosphere. Maximize the conservation of historic trace, promote coordination and unification of history and modern
	renovation	Improve citizen's life, perfect facilities. Consolidate house structures, perfect infrastructures, improve sanitary

		and beautiful environment
Planning framework	single core	core of city center landscape
	Two belts	Hengdao River and its branch going through Hengdaohezi Town
	Four districts	Concentration area of cultural relic conservation buildings and industrial heritage area
	Five scenic points	Orthodox Notre Dame Church, Hengdaohezi Engine House, No.7 Russian-style Wooden Houses, White Railway Building, Railway security station
Conservation zoning	The 1st level	Conservation scope determination of historic buildings concentration area
	The 2nd level	Conservation scope determination of single historic buildings
	The 3rd level	Conservation scope determination of ancient trees and rivers
Key conservation	Artificial environment	Various levels of cultural relics conservation units of key conservation towns and their surrounding environment
	Natural environment	Deserve appropriate conservation as the component of city historic space

Figure 4 conservation framework of historic space

4.2. Conservation of historic space

4.2.1 Determination of conservation zoning

The determination of core conservation scope should comprehensively consider topography, road traffic, courtyard ownership and other conditions to conserve and maintain street space and cultural heritage within the core areas. It's not free to build or demolish. The new built or demolishing buildings must adhere to the conservation principles³, meanwhile, and ensure the consistency with the overall style of the buildings. The first level includes four core conservation areas, in which the sections with abundant historic buildings and well-preserved sections are improved as historic blocks.

Table 4 historic block conservation information

District	Are of core conservation scope	Area of historic building base	Conservation content
Historic block of ancient street	61 hm2	18933 m2	Conserved buildings Historic buildings without being leveled
Shunqiao historic district	6.4 hm2	4003 m2	
Foshou historic district	6.4 hm2	3613 m2	
Industrial heritage district	13.1 hm2	-	

Then, the construction controlled area is determined, 209.7 hm2, according to the integrity of historic environment, coordination of environmental characteristics and the safety of heritage distribution area. The height, scale and color should be coordinated with traditional

³ In core conservation scope, spatial layout of the historic village and the façade, materials and color of buildings along the street should be changed without authorization; the renovation of the existing buildings should keep or restore their historic and cultural characteristics; new construction and expansion of the road shall not be allowed without authorization. The renovation of the existing roads should keep or restore their original road layout and landscape characteristics.

characteristics when the new construction, renovation and expansion are approved within the construction controlled scope; new construction, renovation and expansion should not destroy the traditional characteristics of the historic village. Moreover, according to the overall harmony of village environmental characteristics, the environmental coordinated scope is determined, 774.5 hm². The construction projects should not be freely constructed within environmental coordination scope to further maintain the historic section relationship with surrounding environment as well as the water, soil and natural environmental landscape to the greatest extent.

Figure 5 City conservation zoning scope

For single memorial buildings and ancient buildings and its surroundings, the conservation scope is 2-5 times of the height of the main buildings and the construction control scope is 4-8 times of the height of the main buildings within the second level. In addition, zoning also needs to collectively consider the construction status quo and development trend of local cultural heritage and ownership of the building land. Construction control scope is mainly based on the integrity of historic environment and harmony of environmental characteristics. Within the third level, the scope is conserved within a radius of 5 meters from ancient trees. The mountains and rivers consider its natural layout and pattern as conservation scope while taking into account the greening environment on both sides.

4.2.2 Limitation of building's height

In view of the requirements of cultural relic conservation, the echo and reunification of scenic spot, the outline of urban space and conservation of characteristic landscape, the existing condition and land use planning are combined, based on the above single height control, to overlap the above single planning results to ultimately determine the building height of each land plot (see Table 5). The original building height of cultural relic conservation unit is maintained, not allowing the height of common buildings or structures exceeding that of cultural relic conservation buildings within the conservation and construction control scope. The existing buildings like this should be removed. The original height of conservation buildings and historic buildings, not being listed in cultural relic conservation unit, are maintained. The common buildings and structures, whose height exceeds that of conservation buildings and historical buildings within the surrounding area of 10 m, shall be lowered or removed.

Table 5 Height control (unit:m)

Controlled area	Building style	eaves height	total height of ridge	total height of buildings	remarks
The 1st level	One-story sloping roof	< 4	< 6	-	the construction buildings, historic buildings and the reconstructed buildings to the original appearance are not subject to this limitation.
The 2nd and 3rd level	Two and three-story sloping roof	< 4	< 4	< 12	Within city construction and control scope, the height limitation is 10m for key areas and 13 m for non key areas.
The 4th level	Four-story sloping roof	< 13	< 15	< 17	Within environmental coordination scope, the height limitation is 13m for all areas.

Figure 6 city buildings height control

The control of view corridor for city landscape is the key of building height control. The buildings within landscape corridor shall base on analysis of view field of scenic spots within visible range to further determine height control requirements. View corridor includes the viewing space between scenic spot and landscape objects as well as its surrounding environment. The general view corridor are crucially constructed and conserved for important landscape including round house, No.7 wooden house, white building, Hengdaohezi Town police station, former Hengdao maintenance site, Hengdaohezi railway station and Hengdao maintenance apartment.

4.2.3 Integration of spatial morphology

The historic space morphology is unified through develop conservation and construction requirements of building appearance, color and style, building layout, internal function and building scale. In general, within core conservation areas and characteristic coordination

areas, the morphology and color of newly-built buildings are restricted to keep harmony with traditional characteristics. For newly-built low-rise residential buildings within the cities, the slope roof must be applied. The built residential houses with flat-roof must be gradually changed into slope roof; for the existing buildings with slope-roof buildings, the roof color is cyan. In sight of building color, the newly-built buildings should conform to the color and style of old buildings with red-titled slope roof and red-titled materials.

Respecting the original architectural style, the township and newly-built buildings should keep harmony with historic conservation blocks and un-reconstructed buildings. The slope roof is red titled. The façade is dominated by red brick and yellow. The material is mainly paint and supplemented by red brick. The line is white. Then, according to the different functions of the buildings, the commercial and office buildings apply red titled or red slope roof, yellow materials or ceramic title. The storage and factories and other public buildings use flat roof with grey, blue or iron color. The façade is dominated by cement, stone and paint. In addition, the construction principles of public buildings and commercial buildings focus to create different spatial atmosphere according to different functions to further increase the recognizability of the buildings.

Table 6 Integration of spatial morphology

content	Conservation requirements	Construction requirements	remarks
Building appearance	Maintain and restore the original characteristics of the buildings	The appearance of newly-built buildings should conform to that of historic buildings	To apply building symbols and language with city characteristics; the appearance of buildings on both sides of the river display traditional characteristics of residential houses.
Color and style		Encourage warm color construction(including buildings, pavement and environment, etc)	Avoid monotony, use warm color to give people a warm and lively visual care
Construction layout		Construct historic building layout and water, lanes and alleys and other traditional features	—
Internal function		The newly-built buildings are constructed according to internal functional organization and characteristics of historic buildings	—
Building scale		Control newly-built buildings scale to in	Newly-built buildings should apply courtyard-style (groups

		accordance with historic environment of conservation area	of single buildings) and to give a balanced visual experience
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4.3. Spatial construction of township

4.3.1 Adjustment of land use

Township land use is complicated with confusing layout. The historic and surrounding areas are mixed with industrial land use, not conducive cultural heritage conservation. Then the commercial land and entertainment land is less, the parking lot is obviously insufficient for industrial transformation and development. The existing land use is adjusted as follows. The land use converted for land on both sides of Hengdao River and inside historic block, including industrial land, land with low economic benefit and long-abandoned land use. The original land structure is improved to achieve consideration in conservation, development and efficiency.

Table 7 land use adjustment

Existing problems	Type before adjustment	Type after adjustment	Adjustment purpose
Destroy historic space characteristics	Industrial land	Commercial service Cultural entertainment	Coordinate general characteristics Conserves spatial morphology
Low economic efficiency	—	catering service museum exhibition	Develop tourism industry Improve per capita income
Long-abandoned without utilization	Abandoned land	Green land, squares	Efficient use of land Improve space quality
Less municipal infrastructures	—	Municipal public facilities	Increase public facilities, Enhance living environment

The expansion process of construction land is greatly limited by topography. Land expansion therefore is restrained by spatial growth boundary to some extent. The spatial growth boundaries are determined by combining with population development scale, city construction land requirement and ecological space integrity. The northern part could be controlled in a suitable construction area with a slope of less than 25%; the southern part could be controlled to the G301 national road and partial still takes mountain as the boundary with less than 25%; the eastern part boundary takes the eco-sensitive northeast tiger park as the boundary.

4.3.2 Improve road traffic

The scale, portion and layout of the original road should be kept within scope of historic space. Non-historic roads should be broadened without affecting the historic spatial characteristics of the block. The traffic road network selects and determines lines on the original road network and is parallel to the central streets. According to the texture and terrain of old and new cities, the mixed road network structure and three-leveled road classification are constructed (see Table 8) in combination with courtyard division and land saving. Among them, parking is not allowed for trunk roads and the branch roads advocate bus first.

Table 8 structure of road network

Road network structure	Road classification	Road width	Road function
mixture	Trunk roads	16m	Connects external traffic
	Branch roads	12m	Organize public traffic
	Allies	6m	Construct pedestrian system
		4m	

Parking lot and squares. The requirement for parking within township is considered while taking account into the demand for public space from citizens. At the area with large pedestrian flow, 7 parking lots are set up with 9 recreation and squares. Public traffic. The relationship between internal bus lines and external long-distance bus lines are dealt with. The selection of bus stops should fully consider the surrounding land use layout and public service facilities to ensure bus accessibility with the service radius less than 300m. Pedestrian traffic. The effective width, continuity and flatness of the pedestrian roads on both trunk and branch roads are ensured. The accessibility of pedestrian roads and crossing facilities are required to strengthen the maintenance, management and supervision of pedestrian system. Additionally, the pedestrian space is added specifically to cover the space of entire old streets. Waterfront space and central greenland park.

4.3.3 Upgrading of greening system

Within historic space, the cultivation of trees and shrubs should be terminated as appropriate. Other measures include beautify environment, control land use construction and protect cultural relics from destroying. The set-up of various facilities within historic blocks should fully reflect the principle of sustainable development and focus on greening space organization to strive to minimize the pollution on air, water and soil and restore good ecological environment. Within river channels on sides of Hengdao River⁴, the flood-tolerant trees and grasses should be selected without affecting flooding. The greening should be strengthened with the attention to vegetation combination and landscape composition, making it an original ecological waterfront park for citizen and tourists.

The following measures are applied to improve the greening quality and ecological quality of the cities: firstly, with the street-facing buildings position, several small open spaces are

⁴ Hengdao River is an important geographical element for city construction, as well as an crucial part for greenign and ecological environment. And its water quality can reach to the 1st level, which is precious ecological landscape resource. The essential ecological environment should be conserved for Hengdao River.

formed with appropriate trees planting to enhance the vitality of the city. Secondly, the courtyard greening of residential houses on both sides of street is enhanced. The single ornamental plants are planted to form sight attraction to further improve residences' landscape aesthetics with rational arrangement of the courtyard greening. The third point is to conserve historic trees. The historic trees are the important natural landscape resources to reflect regional environment and history. Satisfying the conservation, the subsequent supervision, management and maintenance work are well done.

4.3.4 Ecological environment remediation

Air environment remediation measures. the unified heating intensity of the city are enhanced to encourage the application of clean energy. The city reconstruction and greening are also strengthened with the improvement of road hardening rate and greening coverage. As the existing industrial structure is transformed, the greening conservation and low-polluted industries are vigorously developed. In addition, the city dust pollution is controlled with technological or administrative ways to improve city greening. The trees species with strong anti-pollution performance are selected to develop plant purification, combined with urban greening planning.

Water environment remediation measure. The construction of sewage treatment plants are accelerated with improving sewage treatment rate. The underground water is protected from the pollution of sewage source. Open channels are governed and restricted from discharging sewage. The sewage pipes are prevented from rupturing, polluting underground accidents. The sewage discharge pipe network is strengthened in its design, implementation and management to ensure the normal operation, reduce pipe rupture and pipe leakage and other accidents. The underground water resource is effectively developed and used.

Sound environment remediation measures. The supervision and management of sound environment remediation measures are strengthened to establish public participation system. Around sound-sensitive areas, the speed limit zone and horn limit zone are set up. The tonnage of the passing vehicles is limited to improve the surrounding sound environment. For the area near sound-sensitive area, the noise radiation direction is properly arranged with reasonable building structure. The three-dimensional greening of the factory-dominated areas is strengthened and if necessary, the sound insulation walls are built to minimize noise.

5. Conclusions

Through a series of practical exploration including the identification, conservation and construction of historic space, the author preliminarily puts forward the ways to realize the sustainable cultural heritage conservation and regular city development during the urbanization process. In general, it's indicated from the research results that the contradictories and interest claims are finally satisfied among historic building conservation, regular city construction and citizens' life. The positive development strategies are preferable to the future development of the city.

In conclusion, this research is both theoretically and practically meaningful.

In practice, to realize the sustainable cultural heritage conservation and regular city development, several suggestions are put forward for historic space identification, conservation and construction. Firstly, sustainable conservation. Cultural heritage conservation calls for continuous attention. The long-term and effective conservation mechanism is formulated to avoid the protection of dead sheep; secondly, sustainable utilization. Cultural heritage utilization is the most directly reflection of its various values. Without affecting its conservation, the value of cultural heritage should be maximized and reflected. The third point is sustainable development. Cultural heritage conservation and utilization should also be considered with city development to realize coordinated development of cultural heritage and city construction. The fourth point is sustainable policy. The policy for cultural heritage conservation and utilization needs to be formulated with other relevant policies, such as heritage conservation management, utilization, paid policy for repair, to guide citizen's positive attitude toward the conservation.

On November 9, 2018, UNESCO announced the results of this year's asia-pacific cultural heritage protection award in Bangkok, Thailand, and hengdaohezi town was awarded the honorary award of 2018 cultural heritage protection.

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