Evaluation of railway stations as cultural heritage objects

L Lisienkova and T Lisienkova

1 Moscow State University of Civil Engineering, Yaroslavskoe shosse, 26, Moscow, 129337, Russia
2 Higher School of Economics (National Research University), Moscow, Russia

E-mail: lisienkovats@mail.ru

Abstract. This article touches upon different characteristics of evaluation of cultural heritage estate sites. The classification features of buildings that can be described as railway stations and terminals have been specified. A functional analysis of objects like railway stations and other kinds of road junction construction sites and buildings for purposes of transportation system has showed that it is possible to identify and evaluate the consumer properties and usefulness of buildings based on its technical characteristics. The study of planning systems in terms of consumer preferences has allowed to identify their advantages and disadvantages. As a result several principles of complex assessment of cultural heritage estate objects for transportation system have been developed. Prospective studies can be related to the modernization of classical approaches to evaluation of real estate of transportation infrastructure with consideration of intangible value of cultural heritage objects.

1. Introduction

Railway station is an important transport hub with rich infrastructure of road and rail public transport. In order to preserve the cultural heritage object of transportation system in its authentic historical environment, it is necessary to design a regulation base for development and economic activity on such objects.

Historically, the development of transport infrastructure primarily included the construction of station buildings. As technical and artistic requirements to station buildings were quite high, they were designed by leading architects of their time. The railway was designed to be a developed system of rails and supporting buildings along its entire way

Unique station buildings of 19th century present an ensemble of constructions and transportation structures that are protected nowadays as monuments of history and architecture. Therefore, the preservation of such of cultural heritage is extremely important for future generations, historical identification of the city and further development of its urban space.

Currently, there is a negative tendency to tear down such buildings or distort their appearance during repair or reconstruction.

Mostly objects of cultural heritage are historically associated with territories where they are located, paintings, sculptures, arts and crafts, objects of science and technology and other objects of material culture [1]. According to federal law “On objects of cultural heritage (monuments of history and architecture) of the peoples of the Russian Federation” №73-FZ as well as some other works ([2], [3], [4]) these types of estate objects usually arise as a result of historical events and are valuable in terms of history, archaeology, architecture, urban planning, art, science and technology, aesthetics, ethnology or anthropology, social culture, and are considered as evidence of historical eras and civilizations, genuine sources of information about the origin and development of culture.
Despite the fact that cultural heritage objects are of special value due to its historical and cultural importance, the problem is that most of such objects (“monument buildings”) is in poor condition and needs restoration.

The reason for this problem is the lack of funds for restoration works in the state budget. Therefore, a following tendency has arisen: state authorities strive to transfer ownership of cultural heritage objects to investors (other words – to sell) in the shortest period of time, or transfer them to long-term leases (usually for 49 years) at a reduced rate [5]. This practice of transferring cultural heritage objects to investors or for rent is considered almost the only way to restore these capital construction objects and preserve their intangible value.

As a result, cultural heritage objects are involved in the market turnover in the real estate market. Therefore, the development of an objective methodology for evaluation of real estate objects which are identified as objects of cultural heritage is relevant and has scientific and practical significance in the processes of sale, insurance, privatization and other real estate transactions.

The purpose of the work is to develop methodological approaches to the evaluation of cultural heritage on the real estate market.

The subject of the study is the evaluation of real estate objects related to cultural heritage sites.

2. Material and methods

2.1. The definition of cultural heritage objects
Cultural heritage objects can be defined as immovable cultural values created by a person in the past, which are included in the Unified state register of cultural heritage objects (historical and cultural monuments) on the basis of a regulatory legal act of an authorized public authority [6] – for example, in Russia it would be the procedure for determining the subject of protection of cultural heritage object of an Article № 64 of the Federal Law №73-FZ “On Cultural Heritage Objects (historical monuments) and culture) of the peoples of the Russian Federation”.

Currently, the role of cultural heritage objects is growing as one of the directions in municipal, state and international cultural policy [7, 8]. The commonly used interpretation of “cultural heritage objects was given during the creation of the UNESCO Convention for the Protection of the World 12 Cultural Heritage in 1972, which define cultural heritage with three categories [8]:
- monuments: architectural structures, works of monumental sculpture or painting, elements or structures of archaeological origin, cave paintings, cave habitations, etc. that have universal value in terms of history, art or science;
- groups of buildings and constructions: separately standing or interconnected buildings that, due to their unique architecture or place in the landscape, have universal value in terms of history, art or science;
- objects: creations of nature/territory and mankind, including archaeological objects that are of exceptional value from a historical, architectural, ethnological or anthropological point of view.

From a legal point of view, the term “object of cultural heritage” has been included in legal vocabulary relatively recently. The Law of the Russian Federation of October 9, 1992 №3612-I "Fundamentals of the legislation of the Russian Federation on culture” (Article №41) was the first document to include this term. Currently, in the legislation of the Russian Federation the concepts of “objects of cultural heritage” and “historical and cultural monuments” are used on an equal footing to define real estate objects with historical and cultural value. In addition, Russian legislation also uses terms that are close in meaning: “cultural values”, “cultural heritage”, “identified objects of cultural heritage”, “objects with features of cultural heritage values”, “objects of historical and cultural value”, “objects of archaeological heritage.”

Adequate economic evaluation of buildings and monuments on the real estate market depends on the justified classification to what type of estate objects it belongs to [9, 10, 11]. As it is shown in “Comprehensive assessment of historical and cultural buildings on the real estate market” by A.
Lukov t
the use of classification is the crutial initial stage of the evlauation process, and, as a consequence, can lead to effective investments.

2.2. General classification of cultural heritage objects
The typology of architectural objects of cultural heritage were developed during various historical periods under the influence of the social system and the development level of the productive forces of society. Therefore, each era is characterized by its own idea of the functional and spatial organization of buildings and constructions [12].

In his work “Comprehensive assessment of historical and cultural buildings on the real estate market” A. Lukov presents a functional analysis of many types of objects, which later became the basis for systematization and classification of architectural systems of cultural heritage objects.

The analysis of architectural systems, the identification of the morphological types of “building monuments” as well as the analysis of their forms and structures have been presented in the works of many researchers [13-16]. Basically, the proposed typologies of cultural heritage objects are based on the historical development of architecture. However, the practice of determining the architectural systems of different complexity levels is carried out without taking into account their functional integrity, which combines various household processes, recreation, production and communications. For example, it is difficult to draw conclusions about the organization and cost-effectiveness of a mid-18th century apartment building or an apartment building of early 20th century withou data on demographics, wealth of households, level of comfort, provided services, etc. It is difficult to evaluate the optimality of architectural systems (house, ensemble, historical quarter) without knowing whether they were integral from a functional point of view.

The multilevel classification of architectural systems of “buildings monuments”, built with multilevel grouping method (“feature tree”), is presented in Table 1.

The first level in table 1 represents only the general restrictions lied on of cultural heritage objects (only immovable historical and cultural monuments). Each level has its own name and a set of values of the corresponding classification attribute.

| Table 1. Classification of cultural heritage objects. |
|-----------------------------------------------------|
| Level 1                                             |
| 1. Immovable monuments - historical and cultural buildings |
| 1.1. Territory of immovable monuments               |
| 1.2. Ensemble of immovable monuments                |
| 1.3. Complex of immovable monuments                 |
| 1.4. City planning institutions                     |
| 1.5. Memorable sites and places                     |
| Level 2                                             |
| 2. Objects of immovable monument buildings          |
| 2.1. Historical monuments                           |
| 2.2. Archeological monuments                        |
| 2.3. Architectural monuments                        |
| 2.4. Objects of monumental srt                      |
| 2.5. Complex monuments                              |
| Level 3                                             |
| 3. Functional (spatiality) hierarchy                |
| 3.1. Complex of constructions                       |
| 3.2. Complex of buildings                           |
| 3.3. Homesteads                                     |
| 3.4. Separate buildings                             |
| Level 4                                             |
| 4. Typology of buildings                            |
| 4.1. Religious buildings of the XI - XX centuries    |
| 4.2. Civil buildings and structures of the XV - XX centuries |
| 4.3. Fortification buildings of the XV - XVII centuries |
3. Results

3.1. Functional analysis of the typology of cultural heritage objects

In his work «Comprehensive assessment of historical and cultural buildings on the real estate market» A. Lukov has noted that in previous studies mainly industrial buildings of the 19th century, adapted for new non-production purposes, as well as civil buildings of the late XVII - early XX centuries were studied: palaces; city and noble mansions; residential (commercial) houses; state-public buildings (courtyards, hotels, shops, galleries, etc.).

Obviously general classifications cannot include all kinds of buildings and objects and consist of enlarged groups. Displaying the individual technical characteristics of the object in the classification allows specifying their consumer properties and use [17].

The construction system is the interconnection of the supporting structures of the building monument, ensuring its strength, rigidity, stability. There are two major types of building systems: wooden and stone architecture.

Russian wooden architecture is characterized by wooden buildings; traditional wall construction (frame, lattice or combined).

Russian stone architecture is characterized by systems of arch-vaulted structures, frameless, frame or combined construction of the bearing wall.

Structural schemes of buildings monuments are not very diverse and depend on the time of construction.

Buildings of 18th - beginning of 19th centuries are a combination of rooms enclosed by capital walls. This pattern is typical for buildings enfilade layout.

Until the middle of the 19th century, monument buildings did not differ in the variety of structural. In the second half of the 19th century various designs and architectural forms appeared as well as the combined systems acquired independent significance: such as brick-vaulted, brick-reinforced concrete, metal-brick.

Monument buildings of the early 20th century have a clearer and more perfect structural design. The exception was mansions with a complex layout with a combination of several structural systems. At the end of the 19th – 20th centuries three flexible and independent structures appeared: supporting structures, external enclosing structures and the structure of spaces. These structures vary depending on the internal constraints of the building.

3.2. Study of quality indicators of planning systems for cultural heritage objects

Monument buildings are specialized real estate adapted for the implementation of certain functional processes [16]. Therefore, to develop a methodological approach to evaluation of this objects, it is necessary to take into account significant consumer characteristics, features and the structure of planning systems.

The shape, composition and aesthetic content of the building monuments are displayed through historical types. Historical types are complexes that represent the structural and architectural differences of different periods in the evolution of buildings. An example of historical types of cultural heritage objects of the late 17th - early 20th centuries presented in table 2.

The study of planning systems from consumer point of view allowed to summarize their advantages and disadvantages (table 2).
Table 2. Consumer properties of planning systems for cultural heritage objects.

| Planning Systems          | Advantages                                                                 | Disadvantages                                                                 |
|---------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------|
| Enfilade                  | - large excess bearing capacity;                                           | - a large number of passage rooms (front and residential ones)               |
|                           | - the possibility of layout change;                                         |                                                                              |
|                           | - various reconstruction options.                                          |                                                                              |
| Corridor                  | - a big number of layout variations without destroying the supporting structure of the building | - long floor corridors;                                                      |
|                           |                                                                              | - placement of apartments or premises along the corridor                      |
| Corridor-enfilade         | - the possibility of layout changes without changing the supporting structures; | - a long corridor along the wall or in the middle                             |
|                           | - implementation of various layout options                                  |                                                                              |
| Compact, mixed            | - the rooms are grouped around the staircase;                                | - linear layout with one-sided or two-sided lighting;                        |
|                           | - combinations of compact and corridor systems                              | - the arrangement of rooms in the depths of the black staircase               |

4. Discussion

4.1. Methodological approaches to evaluation of cultural heritage objects
Based on the analysis of the consumer characteristics of monument buildings, the stages of a complex economical evaluation of monument buildings on the real estate market have been developed and outlined below:
1. Analysis of buildings of any complexity and function as architectural systems.
2. Classification of building systems, structural solutions and building techniques with consideration of the history of their development.
3. Comprehensive assessment of building monuments:
4. Systematization of the types of architectural and spatial organization of objects.
5. Identification of structural and typological characteristics of objects with consideration of functional, historical and aesthetic factors.
6. Classification of the building according to the initial layout.
7. Prediction of the model of the building monument in the new function.
8. Optimization of the building monument model with minimization of new rebuildings for adaptation of the object to a new functional purpose.

4.2. Factors affecting the value of cultural heritage objects
The market value of cultural heritage objects is affected by several factors:
- the cost of the land where the object is located;
- the cost of the building itself, taking into account the engineering and technical wear;
- intangible pricing factors: prestige, historical, cultural and architectural significance.

Application of standard approaches to the evaluation of cultural heritage objects is impossible, since these approaches do not take into account the intangible value of these objects [18-20].

4.3. Cost-based pricing approach for evaluation of real estate object
Cost-based pricing approach is one of the methods of determining the selling price of an object based on the costs of creating a similar new object, taking into account the actual physical, external and functional wear of the building [21, 22].

The cost approach is not applicable for objects of cultural heritage, since it takes into account only the physical, material characteristics of the building, ignoring intangible factors. The physical wearout of a building is determined by the method of standard product life, what means the older the building – the cheaper it will be. But the cultural heritage objects have historical value, thereby, the cost-based price will be lower than the real one.

Another disadvantage of this approach is the difficulty of costs estimation for building of similar facility as there are no directories or documents with construction indicators of such unique facilities. The construction technologies used during the building of the facility which could happen several centuries ago are not typical to the ones used in the modern world [23].

4.4. Analogue-based pricing approach for evaluation of real estate object

Analogue-based approach deals with determining the selling price of an object based on price of similar objects. The main problem of this approach is the absence of a culture heritage objects market, which in most cases forces the appraiser to abandon this approach [1, 22].

The application of analogue-based pricing approach could be possible with the development of relative adjustment coefficients that would take into account non-material pricing factors (prestige, cultural and architectural significance, restrictions on changing the layout and appearance, etc.). Unfortunately there are no wide spread methodological sources with such coefficients.

4.5. Income-based pricing method for evaluation of real estate object

Income-based pricing method is applicable only to income-generating real estate objects. The main difficulty in using this approach arises:
- while calculation restoration costs;
- while determining the potential income that this object will be able to bring after restoration;
- while determining rental rates.

Studies have shown that intangible factors of objects of cultural heritage can change the value by 40 - 250% [23].

5. Conclusion

As a result of the analysis held in this study, the following problems have been identified:
- the impossibility of using classical approaches to cultural heritage objects evaluation;
- the lack of a unified methodology for evaluation of such objects;
- the lack of adjustment coefficients that will take into account intangible factors of cultural heritage objects;
- limited market offers for the selling of monument buildings;
- lack of a reference regulatory documents with specific indicator of value with the classification of cultural heritage objects;
- the difficulty of determining the cost of restoration work.

Based on the above conclusions, the research prospects can be connected with the development of a methodology for the complex evaluation of objects with the modernization of classical approaches for real estate object pricing and taking into account the intangible value of cultural heritage objects.

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