

Information models of planning strategies for reconstruction and modernization of RSC in the historic city

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Abstract – The aim of the work was the development of information models planning strategies for reconstruction and modernization of RSC (railway station complex) historical cities. As a result it was formed a system of the planning model for the strategy of reconstruction and modernization of the RSC, which is the theoretical basis for the selection and design of the strategies for reconstruction and modernization of RSC in the historic city.

Key words – Railway station complex, information model, strategy, reconstruction, modernization, historic city.

I. Original principles of forming strategies for reconstruction and modernization of RSC historic cities

Considering the reconstruction of stations, we face a number of problems associated with the production of the correct approach in dealing with architectural monuments. During the reconstruction and modernization of RSC there are several limitations associated with the historic value of the station building and the environment in which it is located. There is a problem with providing all necessary functions in a limited space and the preservation of historic proportions.

The initial principles that should be the basis for developing strategies for reconstruction and modernization RSC historical cities are: theoretical foundations RSC reconstruction and modernization of historic cities (typology and characteristics of functional spaces RSC; factors, affecting the formation and development of RSC; techniques of reconstruction and modernization RSC historical cities), theoretical concepts of strategic planning (problem oriented, theoretical validity, systematic presentation, considering the complexity of tools and mechanisms for problem solving and the development of RSC) information model (Fig.1).

Creating theoretical principles of strategic planning and the theoretical foundations of reconstruction and modernization RSC historic towns of information models allows creating a theoretical principles of strategic planning and the theoretical foundations of reconstruction and modernization RSC historic towns of information models enables further by feeding the model input variables to model best practices for reconstruction and modernization of RSC in the historic city

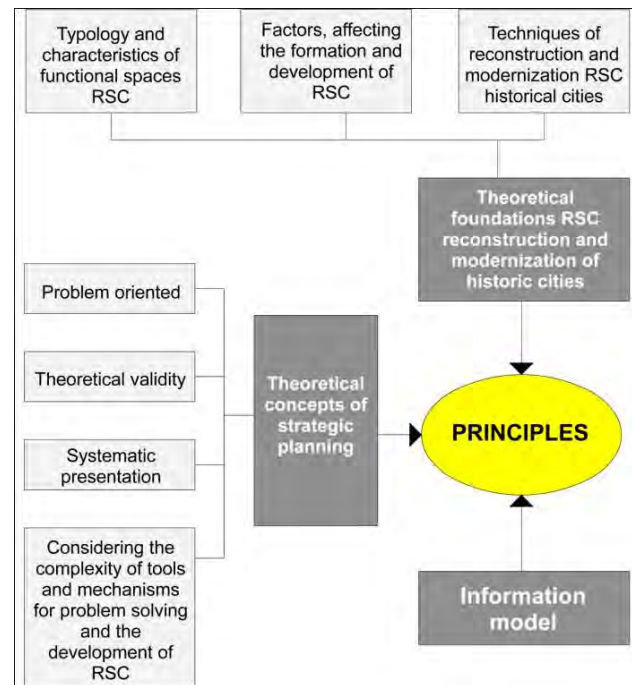


Fig. 1. Original principles of forming strategies for reconstruction and modernization of RSC historic cities

II. Models of planning strategies for reconstruction and modernization of RSC in the historic city

Information model of planning strategies for reconstruction and modernization of RSC in the historic city (Fig.2) is a collection of information that describes the essential properties and condition of objects RSC, its resources, processes, structure and relationship to the historic city:

$$IMP = U[IM, OM, MSP, C_{SS}] \quad (1)$$

IMP - information model planning strategy for reconstruction and modernization of the RSC in the historic city, *IM* - input model reconstruction and modernization of the RSC in the historic town, *OM* - object model, *MSP* - a model of strategic planning for reconstruction and modernization of the RSC in the historic city, *C_{SS}* - criteria for selecting strategies for reconstruction and modernization RSC historical cities.

Input model of reconstruction and modernization of the RSC in the historic city considers RSC on the meta-level and determines the status of the object, defining its place in the historical city, the relationship venous sampling programs (international, national, regional, local), infrastructure, environmental, kinds of track links, status and level of reconstruction and modernization of RSC:

$$IM=U[S, LR, L, I, E, T, MC, LRM] \quad (2)$$

S - model of status RSC, *LR* - model of relations RSC from programs, *L* – model of location of the RSC in the historic city, *I* – model of infrastructure, *E* - environmental model, *T* - model of the type of track combinations, *MC* - model of condition of RSC, *LRM* - model of the level of reconstruction and modernization.

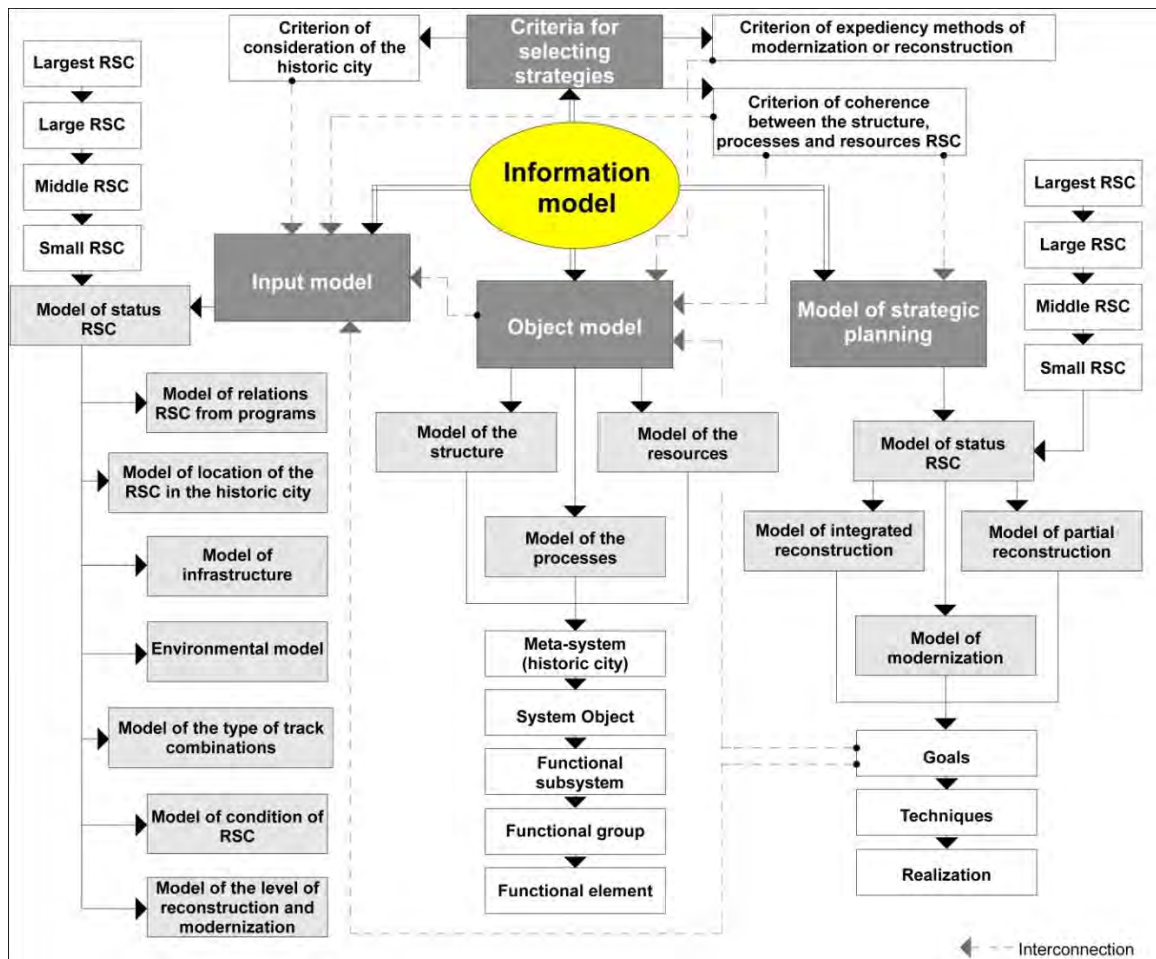


Fig. 2. The information model of planning the strategy for reconstruction and modernization of the RSC in the historic city

Object model (OM) includes a model of the structure (M_{OS}), resources (M_{OR}) and processes (M_{OP}) at different levels of organization of RSC:

$$OM = U[M_{OS}, M_{OR}, M_{OP}], \quad (3)$$

The analysis of the processes that occur in modern RSC allows to predict and create strategies for reconstruction and modernization.

With constant increased number of processes it is necessary an expansion of the resource base RSC.

Analyzing the structure of the railway station, you can see that there are different processes in its different elements. For example, take the Lviv Main Train Station (Fig.3).

There are processes in the forecourt: traffic, masses of people, trade and service.

A resource base can provide all the necessary processes fully, but there are some problems with its organization.

The city has a great tourism potential, so it is useful to take the zone for tours. Also it is important to ensure the information for tourists.

Items retailers are quite chaotic. The solution to this would be to create an organized shopping complex, which is required for all travellers.

Also, the area is used partly. It can be organized a recreation, hotel and museum area and organized canteens on these areas.

There are several types of movement of people: passengers arriving, passengers serving, welcoming, accompanying, RSC workers.

A construction of the station is in constant interaction with these different types of human visits. Therefore, it appears the processes of a trade, service, information and advertising.

When upgrading it is necessary to ensure the separation of human masses, equipping the station for people with luggage and people with disabilities (disabled, elderly and children): escalators, elevators, moving belts and so on.

It can be installed vending machines for tickets and information links to ensure wider processes associated with the service.

Another important element of the structure RSC is the tracks area with a platform, designed for embarking and disembarking passengers. This is the main process of the area.

Therefore, as in other functional subsystems RSC, it is an important differentiation of human masses. Following the experience of the movement of large station complexes in Europe, you can define a clear stopping wagons place of various classes of facilities and install panels with information on stopping wagons place of various classes and rooms.

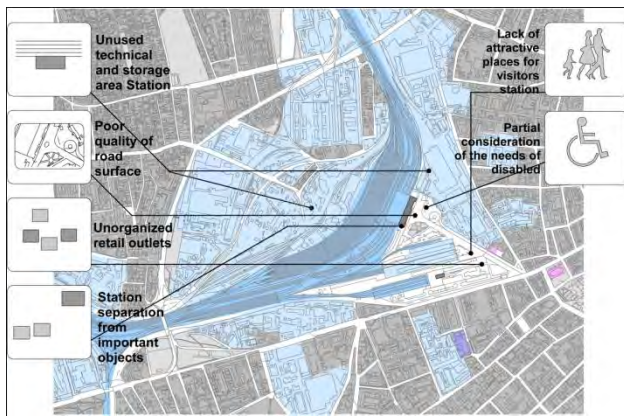


Fig. 3. Main Railway Station Square of the City. Conflicts and Problems

Model of strategic planning for reconstruction and modernization of the RSC in the historic city related with approaches: modernization (*MOD*), partial reconstruction (*PR*), an integrated reconstruction (*CR*). It defines: objectives, methods and implementation of strategies.

$CR, PR, MOD \rightarrow goals \rightarrow techniques \rightarrow realization$, (4)

Aims of strategies are formed from the original principles of analysis and input object model reconstruction and modernization of the RSC in the historic city. Techniques are methods of achievement goals.

During the research it was found that large stations because of their importance for the city and region need more resources to ensure that all possible processes. Therefore, they may need upgrading but also reconstruction.

However, in small stations, most studies of objects in Ukraine, you just upgrade.

The Strategic Plan has a complex internal structure that reflects the multi-system nature of the RSC and necessitates the formation of plans, projects and programs. For small and medium RSC it can be developed the plan only with the relevant sections of the plan, and for large and complex RSC as part of the historic city - each section can have the open form in the plan or program [1].

The programs, plans and projects are the result of the strategic planning model reconstruction and modernization of the RSC in the historic city.

The models system makes it possible to predict and identify a strategy for reconstruction and modernization of RSC in the historic city according to the following criteria: effectiveness, history matching and expediency.

III. Criteria for selecting strategies for reconstruction and modernization of historic cities RSC

As a tool of choice strategies for reconstruction and modernization RSC historic cities it should use a criterion of consideration of the historic city, a criterion of expediency methods of modernization or reconstruction, a criterion of coherence between the structure, processes and resources RSC (Fig.4):

$$C_{SS} = U[C_{CHC}, C_{EX}, C_C], \quad (5)$$

C_{SS} – criteria for selecting strategies for reconstruction and modernization of historic cities RSC, C_{CHC} – criterion of consideration of the historic city, C_{EX} – criteria of expediency methods of modernization or reconstruction, C_C – criterion of coherence between the structure, processes and resources RSC.

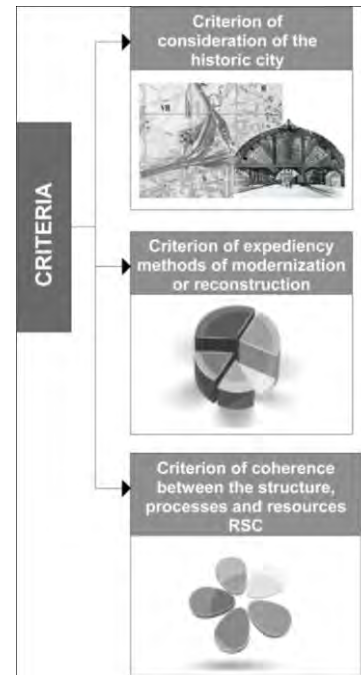


Fig. 4. Criteria for selecting strategies for reconstruction and modernization of historic cities RSC

Criterion of consideration of the historic city (C_{CHC}) follows from the analysis of input reconstruction model and modernization of the RSC in the historical city (*IM*), which determines the state level for reconstruction and location in the historical city:

$$C_{CHC} \rightarrow IM, \quad (6)$$

The expediency of the strategy is the appropriate relationship between the objectives and possible methods of reconstruction and modernization RSC of historic towns which provide the efficiency system. The **criterion of expediency methods of modernization or reconstruction** follows from the analysis of the input model of reconstruction and modernization of the RSC in the historical city (*IM*), the object model (*OM*), models of strategic planning for reconstruction and modernization of the RSC in the historic city (*MSP*), possible risks (*R*):

$$C_{EX} \rightarrow U[IM, OM, MSP, R], \quad (7)$$

Due to the fact that the current RSC is an object of a great complexity, designers have to solve the difficult problem of combining architectural layout of existing and projected volume of RSC in the historical city [2].

Therefore, it becomes important to output criterion of consistency between the structure, processes and resources of RSC (C_C). It follows from the analysis of object model (*OM*) which shows the organization structure, processes and resources RSC:

$$C_C \rightarrow OM, \quad (8)$$

In general, the criteria for selecting strategies for reconstruction and modernization of historic cities RSC must meet at least two methodological requirements: to reflect objectively the value of the real effect from the techniques of reconstruction and modernization of the RSC and the available resources, to have quality uniformity and comparability of quantitative [3].

Conclusion

Information model consists from a system of models: input models, object models, strategic planning for reconstruction and modernization of the RSC in the historical city.

By creating models of planning strategy for reconstruction and modernization of the RSC in the historic city, the main characteristics of RSC detected. This allows you to predict the future direction of RSC and gives an analytical representation for shaping strategy for reconstruction and modernization of the RSC in the historical environment.

Information model can deduce basic criteria for selecting strategies for reconstruction and modernization RSC of historical cities such as the criterion of consideration of the historic city, the criterion of expediency methods of modernization or reconstruction, the criterion of coherence between the structure, processes and resources RSC.

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