Available online at www.sciencedirect.com

ScienceDirect

Procedia Engineering 165 (2016) 627 – 632

Procedia Engineering

www.elsevier.com/locate/procedia

15th International scientific conference "Underground Urbanisation as a Prerequisite for Sustainable Development"

Development of underground space as part of efforts to improve the spatial structure of Moscow

Vladimir Korotaev [a,]*

[a]*Deputy Head of the Federally funded national research establishment 'The Council for the Study of Production Forces', Russia*

Abstract

Conducting spatial development of any large city, and especially in case with Moscow - one of the world's largest agglomerations - requires adopting a development strategy for 30-50 years and determining key principles of its spatial arrangement.

Peer-review under responsibility of the scientific committee of the 15th International scientific conference "Underground Urbanisation as a Prerequisite for Sustainable Development

Keywords: Spatial development, Underground vector of development, Underground urbanization, Underground cities, Public multifunction underground spaces, Comprehensive development of underground spaces in metropolis.

1. A transition of the city from the state of territorial expansion, to the structural, functional and environmental reorganization and infrastructural development of the city territory within its existing limits

The concept of a "compact city" is obviously essential for Moscow. Moreover, reorganization of different areas of the city requires taking different implementing approaches. The city's areas, especially its historical center, are its most valuable assets. Implementation of this concept can be only possible by adopting the spatial principle of urban environment arrangement, and, in the first place, by utilizing its underground resources. The examples of Montreal,

* Corresponding author. Tel.: +903-969-33-42.
E-mail address: vlkorotaev@mail.ru

Peer-review under responsibility of the scientific committee of the 15th International scientific conference "Underground Urbanisation as a Prerequisite for Sustainable Development
doi:10.1016/j.proeng.2016.11.759

Toronto, Amsterdam, and Boston display an efficient use of underground resources in reorganizing these cities' territories, primarily aimed at creating a convenient urban environment.

Moscow has significant potential for reorganization, including inefficiently used industrial areas, and underdeveloped transport infrastructure facilities such as railway rights-of-ways, technical areas of various utility networks that require rearrangement, thousands of hectares of valuable urban areas occupied by one-story garages. Communications relocation, construction of the underground transport systems will require considerable material expenditure but will also help release the city's most valuable asset – the land. For these activities to be carried out there is need for a substantial review of their implementation methods. There are cases where a seemingly cost-effective construction solution turns out to be loss-making or inefficient in the course of future exploitation. Given the importance of the whole life cycle of facilities, underground construction is highly efficient.

2. Development and upgrade of the radial-circle structure of the urbanized framework formed by the historical area core and territories located close to motorways and public transport hubs, that creates the basis for the social and business functional subsystem of the city and also houses most of the city activities and most important forms of urban development

Envisages the following stages of planning documentation development–development plan on the city center, or development plans of separate areas of the city.

At this stage, the Master Plan no longer offers a consistent detailed consideration of its principal areas, especially in terms of spatial arrangement, and splits into separate sectoral projects. There is a need for comprehensive projects, especially in the city's central part, taking into account the underground space development. This includes, first and foremost, a program for constructing tunnels along the Garden Ring with surrounding areas, development of transport interchange hubs on the existing underground metro and railway stations, such as Kievsky, Savyolovsky, Belorussky, Paveletsky, Kursky, Leningradsky, Yaroslavsky, Rizhsky and the adjoining territories. This is a complex problem that can be resolved only by reorganization of these facilities together with the adjoining areas.

A striking example of such developments are reorganization programs undertaken in the majority of European railway stations, including those in Paris, Vienna, Antwerp, Stuttgart. Some of these stations have created unique and convenient interchange platforms, some of which are located on several levels, and all of which have multifunction public underground areas linked with urban territories, having acquired new functional capacity owing to the reconstruction of these railway stations.

3. Consistent transformation of the monocentric structure of the city's urbanized framework that is based on the dominant role of the historical center core, into a polycentric one, whose implementation requires priority development of the urbanized framework of Moscow's midline belt, including territories located close to the Third and the southern part of the Forth Ring Roads"

Envisages shifting the development focus to the peripheral parts of the city so as to unload the center and create new sites of labor application. Moscow's emerging growth points will be the newly created multi-functional regional centers in the midline and peripheral parts of the city, many of which will coincide with the transport interchange hubs located in those areas and will require a comprehensive reorganization of the adjoining territories.

Activities to establish these major transport interchange hubs can be only possible through the use the spatial approach to their implementation, and, in the first place, by using the underground space resources. Programs for constructing transport interchange hubs in many cities of the world have served as growth points for implementation, renovation and rehabilitation of these cities' territories, thus helping to create new public centers and areas, enhancing the status of these areas and enabling to set up unique convenient urban facilities. These include the famous transport interchange hubs in Tokyo, Seoul, Singapore, Beijing, Munich.