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Perspektywy budowy ośrodków transportu i komunikacji na terenie Ukrainy

Prospects of the construction of transport and communication centres in the territory of Ukraine

Streszczenie

Artykuł dotyczy doświadczenia w projektowaniu centrów transportowych i komunikacyjnych w ramach międzynarodowego systemu transportowego. Określa specyfikę funkcjonalną węzłów komunikacyjnych i ich skuteczność w rozwiązywaniu problemów transportowych na Ukrainie.

Słowa kluczowe: centra transportowe i komunikacyjne, stacja, węzeł komunikacyjny, terminal

Abstract

This article deals with the experience of designing transport and communication centres as part of the international transport system. It defines the functional specifics of transport hubs and their efficacy in addressing transport issues in Ukraine.

Keywords: transport and communication centres, station, transport hub, terminal

The transport and communication centre is a relatively new type of construction emanating from the combination of buildings with different functional purposes and the transport and pedestrian communication links between them. Transport hubs in the cities arose from the new needs of people using the city, accelerated rate of life, technological progress, transport development and attempts to rationally use space in the city with the help of vertical and multi-level designs.

The complex and branched transport networks of cities caused the need for transfers between different modes of transport. We see pedestrian tunnels constructed at railway stations, bus stations and in airports as well as single- and multi-level methods of linking pedestrians with transport. Single-level types of connection includes overground stops and underground passages where transport networks cross on one level. Multi-level connection is done with the help of both overground and underground passages, tunnels, bridges and overpasses.

Transport communication centres enable transport system efficiency at different levels ranging from district to international connections. International multipurpose centres become the entry points into the cities and become their architectural symbols. Analysis of the international experience of the design and functions of these objects contributes to a better understanding of the role and significance of the international transport and communication centre in the life of the modern metropolis.

Let us examine major transport systems with large capacity transport modes, specifically, air, rail and sea. Rail transport is used for transportation within the territory of the continent, aviation – for intercontinental communication and sea – between the ports connected by maritime routes. We might see new modes of transport appearing in the future.

Berlin Central Station (Berlin Hauptbahnhof), the largest not only in Germany but also in Europe, came into operation in May 2006. It is located on the site of Lehrter Bahnhof destroyed during WWII. Berlin Central Station construction commenced on October 13, 1995 following the decision made in 1992.

Architect Meinhard von Gerkan designed the multi-level station building with fourteen tracks of different functionality converging and intersecting. The capacity of the station is 164 rapid intercity trains, 314 regional trains and more than 600 local suburban trains and trams on a daily basis.

The three-level station building of 15,000 sq m, houses dozens of shops and food halls.

Until 2006, Berlin had several railway stations and each of them was intended for a specific purpose; this is no longer the case. Central Railway Station in Berlin is the hub connecting the cities and regions of Germany and the entirety of Europe (Ill. 1).

New San Francisco Transbay Terminal construction was launched in 2013. Occupying 1,500,000 sq. ft., it serves as a transport hub, a public park and an urban space as well as an office centre and retail complex. Monumental Terminal, designed by the reputable firm Pelli Clarke Pelli Architects, is a hub for 11 systems of local and regional transport

serving 45,000,000 people annually. In addition to being a hub for the most popular transit destinations, the project will include a rooftop park of 5.4 acres designed by PWP Landscape Architecture.

Transbay Transit Center will cover an area of five blocks and will have housing to meet various tastes and attract more people to live in this area. Transbay Transit Center is not only a transportation hub but also a leisure facility with a top roof park of 5.4 acres full of plants native to the area, an amphitheatre for 1,000 persons, a café, a children playground, a cultural and education centre as well as bicycle paths and footpaths.

The underground terminal halls will have natural light coming through the sky windows (atrium) in the park. The retail space and food court offer comfortable facilities for travellers and tourists using the transit centre as well as for local residents. The new hub addresses the issue of CO₂ emissions since, in addition to the green area offered downtown the metropolis, it serves as an 'eco filter' absorbing exhaust gas from busses, processing rain water and grey water, thus preventing the building overheating (Ill. 2).

The Ephemeral Roof Exchange in Hong Kong, a transport hub project, includes three renewable energy generating systems. Designed by Steven Ma Tze Chung, Wendy Fok Wei Yue and Dominik Strzelec, the structure welcomes travellers from three points of entry – by air, by sea and by road.

The Ephemeral Roof has three separate renewable energy systems: its south facade is covered in photovoltaic louvers to generate power; a hydro collective system that collects humidity and rainwater hydro-energy to provide a cooling system for the waiting guests; an embedded piezo-electrical system collects sound and vibrational energy from the numerous passing vehicles of the border crossing to generate renewable energy. The boundary crossing facility will be a transportation hub to process travellers and cargo arriving and departing from the nearby international airport, the connecting road network and the thriving waterway network (Ill. 3).

Functional and technological processes are the realization of the building's main function in terms of time and space when it is divided into the main and supporting functions on all spatial levels of the building. Functional and technological processes can be general and specific.

Three recent trends can be distinguished here:

- in urban development: close link of trade and public centres with transport streets, highways and parking lots that are often used in building architecture (access ramp, flying passages, underground parking, top roof car parks, etc.);
- in building structure: trade facilities integration into other public services, thus creating major multipurpose public centres;
- in internal space: arranging for multipurpose communication space (shopping street, square, passage, forum) uniting various facilities and businesses into one integral structural entity.

- Nowadays, functional zoning is characterised by two opposing principles:
- creating (strict): limited in terms of space zones meant for specific activity located in the most convenient places in terms of proximity and the use of other zones, taking into account the number of clients, visitors, staff, etc.;
- free type of zoning: arranging universal space that can be transformed at different times for different types of activity depending on needs. All zones are subject to free planning and, depending upon necessity, can be located in different places; zones can also overlap.

The main approach in functional spatial arrangement is to provide for minimum transport and pedestrian connection with regard to comfort, reliability and the logical localisation of multiple functions.

The main indicators of functional quality of designing transport and communication centres are rational positioning, compactness, multi-level structure, intensity of transport and pedestrian movement.

As a result of its geographic location, over the course of a century, Ukraine has served as a bridge between Europe and Asia, and between north and south. It also has an extensive transport network and has developed all modes of modern transport.

The developed transport network unites the time and space that divide manufacturers, buyers and sellers, employers and employees. In economic terms, it bridges time and spatial gaps between production and consumption. The transportation factor is of crucial importance in regional and international economics and foreign trade.

For the transport system to remain competitive and efficient as part of an international transport network, it is necessary that the government efficiently regulates and governs the activities of transport companies with regard to the creation of the transport services market, technological and environmental safety and security of transport, and the international activity transport companies. The reform process of the Ukraine transport system provides strengthening of public oversight with respect to the use of the cargo component of the national marine fleet as a transport system branch with some foreign currency resources.

Foreign experience of design and engineering proves that it is necessary and possible to successfully design transport centres under different development/building conditions with any traffic flow and passenger load. The terminal will then not become another overburdened gravitation centre for private vehicles and buses but will instead deal with the issues of the comfortable movement of passengers, quick transfer switching between different modes of transport and developed transport infrastructure.

The construction of international transport and communication centres in Ukraine will contribute to its integration into the global transport system; it will resolve a number of pending transport issues and will prevent new issues caused by the fast modernisation of transport and new modes that appear.

New transport technologies influence transport and communication centres network expansion and sophisticated planning and building. Identifying the main stages of transport and communication hub development and the analysis of architectural and urban development characteristics of building shows a gradual transition from simplified one-level facilities to sophisticated, multi-level facilities that can be easily transformed. Transport and communication system development trends are shaped by the design of shopping centres, express service facilities, information centres, municipal and regional administrative and business centres focused on proximity in terms of connectivity, flexibility with regard to both time and space, and providing services to transit passengers.

Translated by Natalia Moroz



III. 1. Central Railway Station in Berlin (Source: <https://ru.wikipedia.org/wiki/Берлин-Центральный>)



III. 2. 'Eco filter' (Source: <https://sf.funcheap.com/city-guide/rooftop-park/>)



III. 3. Boundary crossing facility (Source: <https://inhabitat.com/ephemeral-roof-exchange-is-a-space-age-transport-hub-for-hong-kong/ephemeral-roof-exchange-1>)

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