CONVENIENCE AND SAFETY OF MOVEMENT OF BLIND PEOPLE ACROSS THE INDUSTRIAL CITY TERRITORY: ERGONOMIC AND ARCHITECTURAL PLANNING ASPECTS (ON THE EXAMPLE OF THE CENTRAL DISTRICT OF MAKEYEVKA)

N. Sholukh, Doctor of Architecture, Full Professor
N. Yupatkinska, Master of Architecture
Donbas National Academy of Civil Engineering and Architecture, Ukraine

The article is devoted to improving the spatial orientation and movement of blind people in the territory of the industrial city. On the example of compact settlement of the blind in the territory of the Central district of Makeyevka authors analyze the degree of comfort and safety of established routes of movement of these categories of people from their places of residence to the main objects of social services, enterprise UASB, as well as to the religious building and the city park. The attention is paid to the most difficult and dangerous sections of the road due to the spontaneity of the new sites development, increasing traffic, high degree of gas and dust on the streets, as well as other adverse urban ecological factors natural for the industrial city. On the basis of the analysis authors conclude the need for special architectural planning and technical activities aimed at increasing the convenience and safety of movement of the blind in the city.

Keywords: blind and visually impaired, specific needs, convenience and security of movement, industrial city, transport and pedestrian communications, special architectural and planning techniques and means, spatial reference.

Conference participants

S tatement of the problem, its connection with important social and scientific problems. Creating a comfortable and safe routes for blind and visually impaired people in the city is one of the most important practical conditions for successful social integration of these people into mainstream of the society. Recently, this problem becomes critically socially significant in the large industrial cities, usually distinguished by complicated planning structure, significant congestion of the traffic, a high degree of environmental pollution, as well as many other adverse factors that are not typical for the cities of other types. In such circumstances, the movement of the blind man obliged to rely only on hearing, smell and tactile sensations is extremely difficult and unsafe.

Examples of simultaneous combination of many unfavorable factors, significantly complicating the movement of the blind, can serve the conditions in the territory of the Central district of Makeyevka – one of the largest industrial cities in Donbas. The choice of this area as an example also specified the fact that there is a compact settlement of blind at this territory. The main impulse for the creation of this “unusual settlement” in this part of town was the discovery of the Branch of Donetsk (Stalin) Artel of the blind in 1936, which in 1954 was renamed the TPE UASB (Training and Production Enterprise of the Ukrainian Society of the Blind). The formation of the company was the main place of employment of visually impaired people in Makeyevka. At first the blind lived in small single rooms allocated in the nearest residential buildings. At a later date, these people were granted residence, and in 1961 and 1967 in the Central district of the city on the Donetsk Str. were built and brought into service two specialized houses for the blind and their families, one of which has 16 apartments and the other 40. In 1973 in the same area near the blind housing was constructed and put into operation a new production unit of TPE UASB. The main routes of movement of the blind developed in such conditions, had a relatively short duration and remained quite comfortable and safe for these people for a long time.

Recently, with the increasing number of unfavorable urban ecological factors mentioned earlier, many long-established routes of movement of the blind in the city in certain areas appear extremely difficult and dangerous. That is why, the identification of such areas and their deep study from ergonomic, architectural planning and other essential points of view should be considered as extremely important social and scientific issues required immediate solution.

Analysis of the latest developments and publications on the topic of the research suggests that the concerned problem not received adequate attention from the experts and designers until now. Most of the studies devoted to design for the needs of visually impaired people, mainly deals with the adaptation of certain types of residential and public buildings, more rarely covers issues related to the arrangement of the object-spatial environment of these people. As for the problem of creating comfortable and safe routes to the blind in the industrial city, it does not practically studied and covered in the scientific literature (except for very rare occasional mention of its relevance) [3, etc.].

Nevertheless, it should be mentioned works of Stepanov V.K., Sharapenka V.G., Sigaeva A.V., Kutievich V.V., Sholukh N.V., Tore Lange, Barmashinoy L.N., Danchakov I.O., and some others scientists of our country and foreign scientists [1, 2, 4, 5, 7, 8, etc.]. Well-grounded works of these and other scientists not named here can serve as a basis for general strategic approach to solution of this very complex and multifaceted problem. A considerable part of the issues deeply analyzed in studies of Sholukh N.V. and Gavrikov V.S. “About adaptation of the road-street areas of the town to the specific needs of little mobile groups of people” [8] and “Analysis of road and street network of Donetsk from the requirement of convenience and safety of handicapped subpopulation movement” [7]. Some of the recommendations and suggestions stated in these studies can be used to improve the conditions of spatial orientation and movement of...
the blind in the territory of the Central district of Makeyevka. At the same time, there is a need in additional deep studies, which would allow to take into account features of the present routes of the blind in this area. There is also a need in research, which would allow to take into account the negative impact on the adaptive capacity of these people some urban ecological factors caused by industrial features of the industrial city and its development at the present stage. In these important studies there is part of an unsolved problem, which is this article dedicated to.

Analysis of the modern state of the main routes for the blind in the territory of the Central district of Makeyevka. As a result of deep sociological and architectural researches conducted by the authors on the territory of compact settlement of the blind in this area of the city, found that the increase of the degree of difficulty and danger of the main routes of movement of these people due to the effect of negative conditions and the following factors (list them in order of importance):

– first, a significant material deterioration of the previous system of specific spatial references, as well as all kinds of warning and protecting elements arranged along the traffic and pedestrian paths (meaning the relevant traffic signs, sound and controlled traffic lights, fencing turnstiles and inflated kerb, signal warning coloration and other elements by which could orient blind and could see the drivers), many of these elements, laid in 60-70 years of the last century, to the present time have come into complete disrepair or are in poor condition;

– secondly, the grass roots formation of new building of the city, which leads to a significant change or almost complete block of established routes of the blind (it is primarily a question of trade pavilions and various annexes of such purpose, which are at the level of the first floor of residential and public buildings and lead a significant reduction in the pedestrian zone of the street, modification and complication of pedestrian path);

– thirdly, the congestion of traffic of the city and a further increase of the number of necessary personal vehicles that ultimately leads to the unauthorized parking along the streets and alleys, as well as in the territories of interyard spaces in residential areas, one of the dangerous consequences of such transport expansion is a significant reduction in the transit area of sidewalks and walkways, which in turn, significantly increases the risk of running-down accidents; in the area of compact settlement of the blind, this risk increases of many times and almost borders with the reality (!);

– fourth, the influence of adverse urban ecological factors caused by industrial features of the industrial city and its development in the current very difficult social and economic conditions; the growth of anthropogenic pollution of the environment (which is manifested in a high degree of gas and noise pollution, reduction of green areas, etc. [6]) has a negative impact on the work of saved sensory analyzers of the blind man, prevent him from recognition of useful sound, aromatic and other signals, on which he can rely in the city.

The result of deep sociological and architectural researches conducted on the territory of compact settlement of the blind is to identify the most difficult and dangerous areas on specific routes of these people from their residence to the enterprise UASB as well as to nearby objects of social and living services, city square and cathedral. Among such areas, primarily should be mentioned crossroads formed by the intersection of Engels Str., Donetsk Str.and Lenina Av., as well as crossroad formed by the intersection of Teatralnaya Str., Deputatskaya Str., Donetskaya Str., Lenina Av., and Ostrovskogo Str. Especially difficult and dangerous areas of the blind path in this area should be considered the intersection of Shevchenko Str., Donetskaya Str. and Lenina Av. Some of the analyzed areas are shown on the scheme, which is shown in the article (Pic. 1).

Some scientific and practical recommendations and proposals for providing the comfort and safety of movement of the blind in the territory of the Central district Makeyevka.

Based on the results of the research the authors propose a specific set of special architectural planning and engineering techniques and tools, realization of which will make the movement of the blind in the territory of the industrial city more comfortable and safe.

Proposed methods and means can be represented by the following main groups, depending on what sensory analyzers of the blind directed their action:

– Tactile and motor analyzers: protecting and guiding turnstiles device and excessive kerbs; approach to the dangerous and complicated areas of the change of the slope of the road or usage of the road surface with a relief texture; elimination of the height differences, etc.;

– On the hearing instrument and residual vision (some categories of the blind): installation of sound and controlled traffic lights at crossroads; application of a bright warning coloration on areas of walking paths near the border with the roadway or where height differences; the use of the road pavement of hollow paving slabs at difficult areas, reinforcing the sound of human steps; arrangement of fountains with intensified noise of falling water in the respective areas of the city, as well as other various audio landmarks that can be recognized by a blind person in the general background noise of the urban environment;

– On the olfactory system: planting flowers with intensified smell and some trees along the difficult and dangerous areas of the way (in the conditions of gas pollution of the industrial city recommended plants having strong smell of flowers or foliage, which the blind can feel at the distance).

Important architectural-planning and, at the same time, urban development activities aimed at ensuring the safety and convenience of movement of the blind should be regarded the maximum distance from their residence objects that may be areas of concentration of a large number of vehicles (parking lots, car service centers, gas stations, etc.). Depending on the nature and complexity of the route section provides certain sequence of events and their implementation (Pic. 2).

Conclusions. We examined some important ergonomic and architectural planning aspects the problem of improving the spatial orientation and movement of visually impaired people.
Pic. 1. Scheme of specific routes of the blind in the territory of the Central district of Makeyevka with identifying the most difficult and dangerous sections of the way.

Pic. 2. Scheme of the fragment of the Central district of Makeyevka specifying measures to ensure the comfort and safety of movement of the blind.
in the territory of the industrial city. By analyzing a specific urban situation has been shown that the convenience and safety of movement of the blind in the city is largely dependent on the peculiarities of its planning structure, material and technical conditions of traffic and pedestrian communications, the extent of their adaptation to the specific needs of these people, as well as general ecological state of the urban environment. It was also shown that under the conditions of the industrial city the problem of forming comfortable and safe routes for the blind cannot be solved without taking into account the negative impact of some urban ecological factors caused by industrial features of the city and its development.

At the end of this article, the authors express the hope that proposed approach to the examination of this problem, as well as some recommendations and suggestions for its solution will be taken into account by specialists, designers and other stakeholders that are not indifferent to the fate of the blind.

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Information about authors:

1. Nikolay Sholukh - Doctor of Architecture, Full Professor, Donbas National Academy of Civil Engineering and Architecture; address: Ukraine, Makiivka city; e-mail: ar-proekt@mail.ru

2. Nadia Yupatkina - Master of Architecture, Donbas National Academy of Civil Engineering and Architecture; address: Ukraine, Makiivka city; e-mail: nadia-arx@rambler.ru