Perception of Space and Mental Maps: The Case Study of City Chotebor (Czechia)

Ales Kankovsky, Michal Kraus

Department of Civil Engineering, Institute of Technology and Business in České Budějovice, Okružní 517/10, 370 01 České Budějovice, Czech Republic

kankovsky@mail.vstecb.cz

Abstract. The issue of public space in cities has recently become an increasingly discussed motive not only among architects, but also politicians and ordinary citizens. This is a topic that reflects the satisfaction and quality of life of all residents. Public space can be characterized as a space accessible to people at any time of day, designed for a wide range of different age groups, social classes, genders, and races. The perception of urban space by its inhabitants is an important part of research into urban structure and spatial planning. The process of mental mapping makes it possible to define potentially dangerous or otherwise critical areas of cities. Mental maps could reveal the specifics of fear of a defined group of people, including their reasons. Addressed identification of stressors is a key basis for increasing urban satisfaction and security. The paper presents a case study of positive and negative localities based on mental mapping in a typically medium-sized city in the Czech Republic, in Chotěboř.

1. Introduction

All urbanized public spaces in developed countries are evidence of the development of human civilization, which testifies to the skill of the creators and the intellectual level of society, expressed mainly by urban design, architectural expression, and functionality of cities. Most public urban spaces have been and are designed for the needs of more than one generation. Their well-thought-out design respects the current requirements for public space in the given period, currently in accordance with the principles of sustainable development. Currently, more than 55% of the world's population is located in heavily urbanized areas. The growing trend of the urbanization process will continue [1-3]. For sustainable development of the city in accordance with the principles of sustainable development, it is necessary to design conditions for the development of individual functional components so as to ensure consistency of all-natural, civilizational and cultural values in the territory, with regard to sustainable development and especially maintaining environmental quality [4-6].

2. Mental map and perception of public space

A mental map can be defined as an image of the environment as perceived by its users. The mental map is used by Kevin Lynch in the research that was presented in the book The Image of the City [7]. According to his approach to mental mapping, specific sketches of spaces perceived by individuals are projected into maps, along with the perception of individual elements in space [8]. Kevin Lynch suggests that mental maps consist of 5 basic elements - paths, edges, areas, nodes, and landmarks.

A vibrant and sustainable city needs a combination of a good and attractive urban space and a decisive number of people who want to use it. Public spaces, places accessible to all, serve 24 hours a day and they are an interactive and lively environment of the whole city. They are often a natural act of everyday life, but few realize how they affect our natural attitudes, behavior, movement, or even inspire and promote social cohesion [9].

3. Case study

The subject of the case study presented in this contribution is the possibility of using emotional maps for the urban-social analysis of the town of Chotěboř (Czech Republic). The town of Chotěboř lies in the area south of the Iron Mountains belonging to the western part of the Bohemian-Moravian Highlands. Chotěboř can be characterized as a typical Czech town of smaller size, equipped with basic offices and institutions, modern, living a rich cultural and social life, sports and is also a city of greenery. The engineering and woodworking industry is characteristic of this locality. The character of agriculture and forestry is typical for the Bohemian-Moravian Highlands and the altitude of 500 m above sea level. Chotěboř is part of the Havlíčkův Brod district, since 2003 part of the Vysočina region and municipalities with extended powers of state administration III. degrees. The administrative district has 22,000 inhabitants in 31 municipalities. Chotěboř, including local parts, is spread over 5,405 hectares at an altitude of 515 m above sea level. Approximately 9,200 inhabitants live here. The average age of the population as of 1 January 2017 was 43.1 in Chotěboř. The city is struggling with the outflow of population, especially young people, and thus the population is slowly aging.

The urban plan of the city is almost circular in shape. In the northern part of the city, we find the monument zone of the old town, including a castle with a park, agricultural production, and small industry. In the east, there are sports grounds, which are gradually moving into the wild in the Železná hora Protected Landscape Area with a nearby nature reserve in the valley of the Doubrava River with an educational trail. Industrial areas are concentrated in the southern part, in the western part, there are neighbourhoods of family houses with gardens and greenery. Figure 1 shows an aerial image of the city of Chotěboř extracted from the Google Maps portal [10].
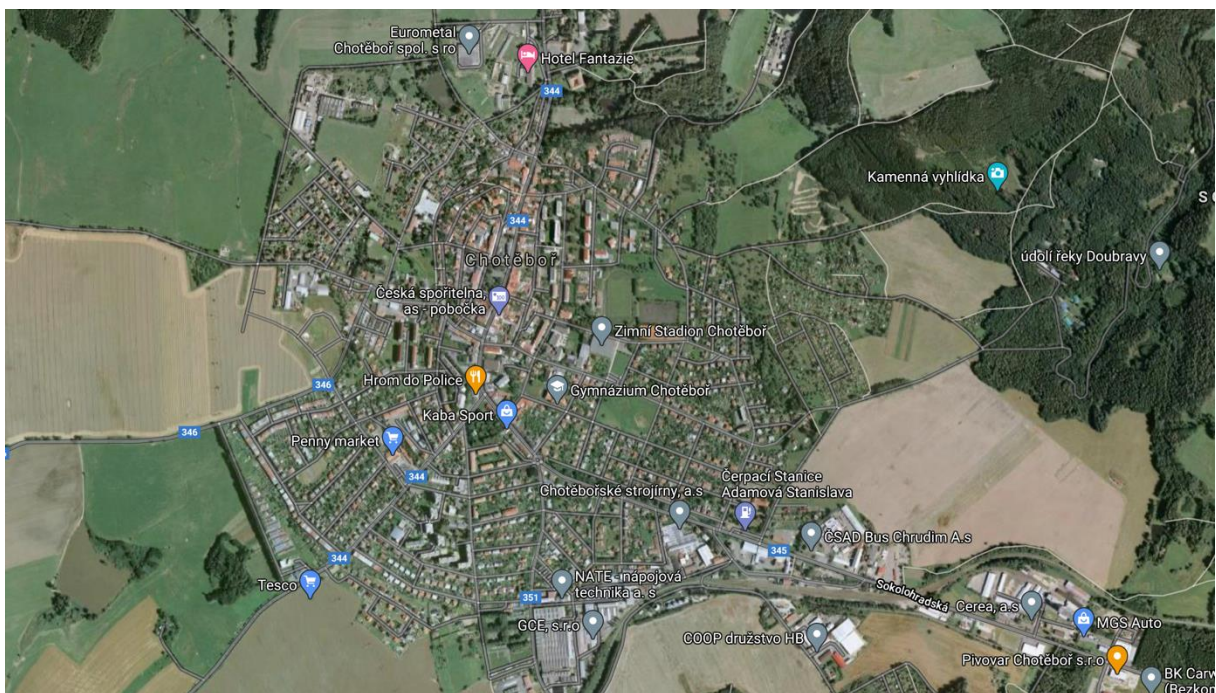

Figure 1. Aerial view of the town of Chotěboř [10]

As part of the survey, mental maps were filled in with predetermined research questions. Marked routes and places were entered on the map. These maps were then layered so that it was possible to track the places that most often match. For each map, the two most intensive areas were selected. These areas were statistically described in terms of residence, age, and gender (These data will be subject to further statistical testing in subsequent phases of the research).

Figure 2 shows the mental map where residents do not feel comfortable, or they even feel threatened. These places can be marked as maps of fear. Marked localities, polygons 1 and 2, are typical of old houses with neglected maintenance and narrow streets. These localities can be characterized as excluded with an increased frequency of Roma citizens and other problem groups. Rarely, prostitution, usury and petty theft occur in the locality. Gambling is strongly represented in the locality, occasionally drug addiction (toluene, marijuana) and alcoholism.
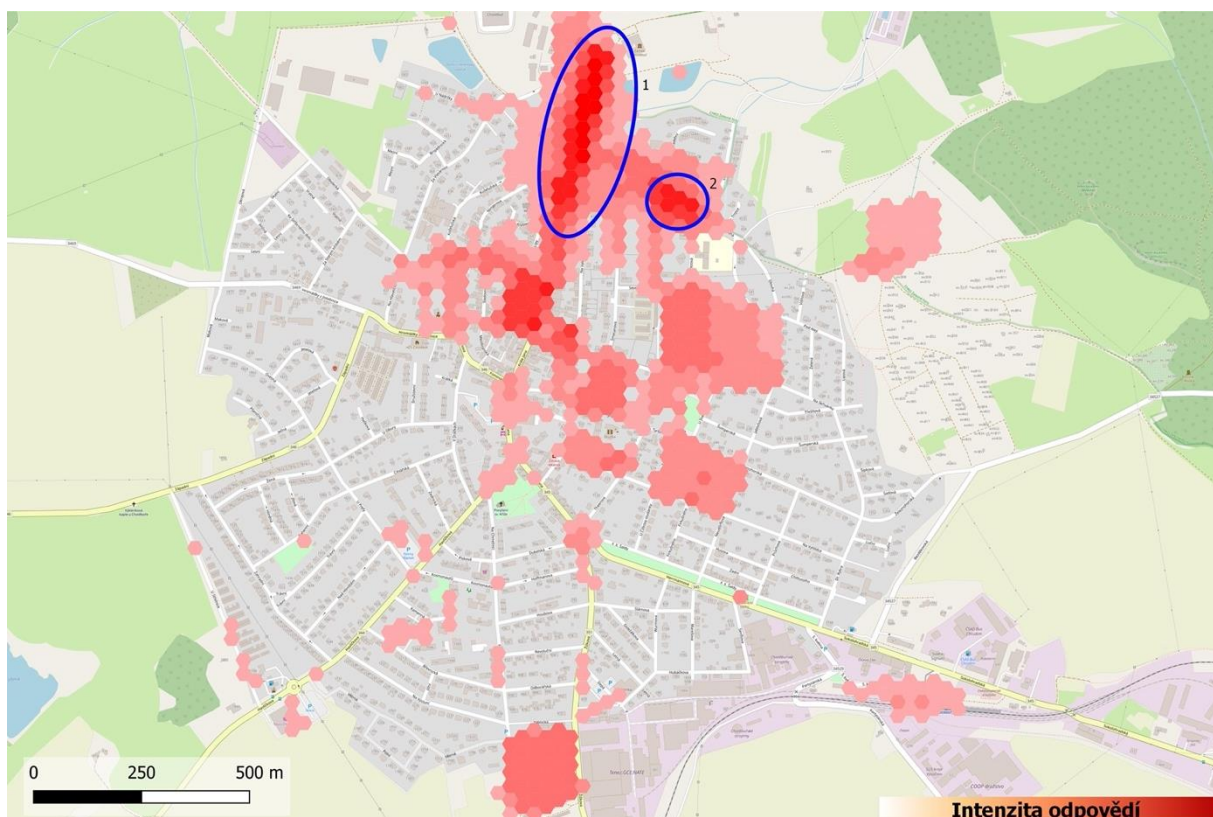

Figure 2. Mental map of Chotěboř with marking of public places that do not like (places of fear), based on [11]

The number of Roma inhabitants in a given locality culminates in the range of 101 - 150. The locality was created by the gradual relocation of Roma families as part of the provision of alternative housing. In 1997, a number of families lived in city flats, which began to be returned to the original owners in restitution. Most locals are dependent on social benefits. Several people own trade licenses (especially for excavation and minor construction work). Some work occasionally "illegally". The collection of scrap iron and the dismantling of wrecks for spare parts is also widespread.

For a long time, members of the Roma ethnic group have been one of the most endangered social groups in the Czech Republic in terms of the emergence of residential segregation. The concentrated housing of Roma in some parts of cities and municipalities is the result of the interaction of a number

of mechanisms and actors. The main causes of Roma segregation can be found primarily in general economic and social conditions. The Roma citizens were raised with the stigma of inferiority, denied equal access to education and employment, and prevented from enjoying the benefits of education and living in a multicultural society. The main causes of the segregation of the Roma include not only the influence of the family and lifestyle, financial literacy - i.e., segregation from the Roma themselves, but also prejudices of society, ignorance and misunderstanding of ethnicity, failure to learn the Czech language. Within the framework of employment, there is often racial segregation, which makes it impossible for this target group to fully enter the labor market [12-17].

Figure 3 shows the emotional map of places where citizens feel safe, comfortable and do not want to change them. Polygon 1 is a location for sports and leisure. Many panellists go for a run or otherwise spend their free time here. Here the area is considered by panellists as the only locality with vegetation in the city centre. In the locality, there is a winter stadium, modernized athletic complex with a football field, and tennis courts. These localities are generally positively perceived and widely used by citizens. Polygon 2 shows the location of the town square in Chotěboř. Panellists evaluate this locality positively, mainly due to the occurrence of mature greenery, which, among other things, provides protection from the sun in summer. The dominant feature of the inner square is the fountain and the Plague Column. The square is located approximately in the centre of Chotěboř. It houses important civic amenities (town hall, post office, shops, restaurants, etc.) and also functions as a bus stop. Overall, the square is frequented by residents. Service roads are logically located around the perimeter of the square. Currently, motor traffic predominates over pedestrian use of the square. A completely straight section of road does not prevent excessive speeds of passing vehicles. To revitalize the square to ensure maximum functionality, a Territorial Study of Selected Public Places in Chotěboř was prepared in 2018. It counts on the reduction of greenery and the installation of urban furniture in the form of benches, waste bins. bicycle stands, etc.
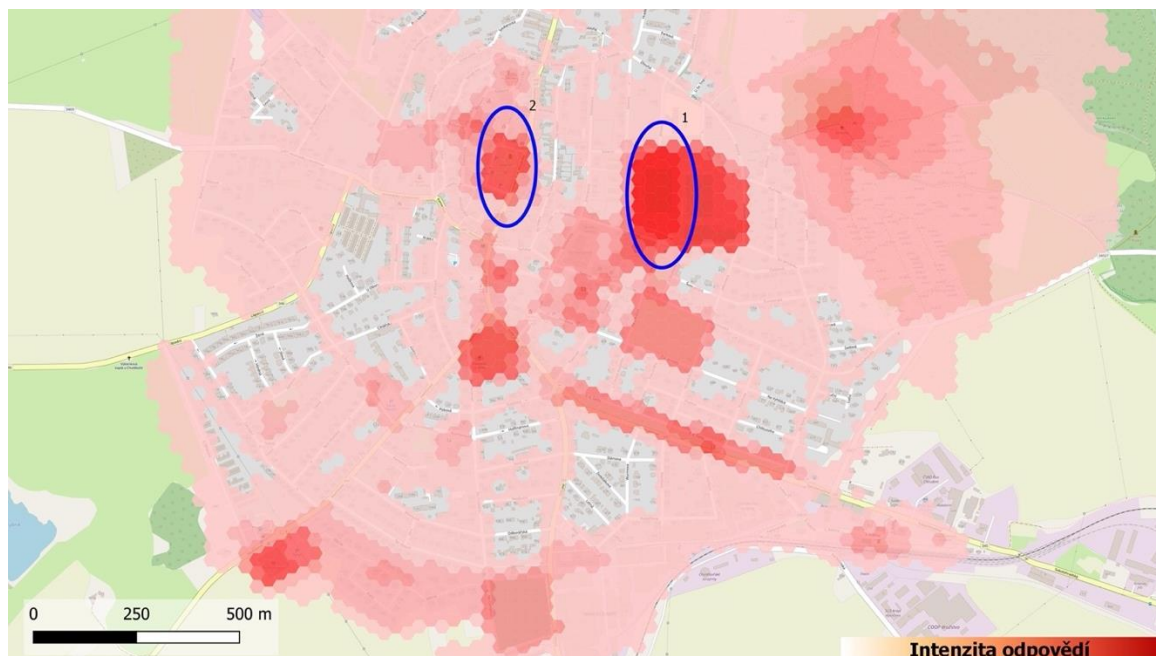

Figure 3. Mental map of Chotěboř with marking of public places, where residents feel satisfied, based on [11]

4. Conclusions

Today, cities cover only 2% of the earth's surface, but they are home to most of the world's population, which, among other things, consumes 60% of energy production and is also the source of 70% of CO_2 emissions. At the same time, especially in the 20th century, cities - concentrates of economic, political and cultural life - grew to such proportions that their development had to be managed and planned. The process of involving the public (citizens) in the creation and planning of a public urban space is necessary to ensure the connection and comfort of the city's inhabitants. The successful interaction of the public and the city is based on mutual communication that will be understandable and accessible to both parties. Mental maps are one of the ideal solutions for mutual communication.

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