

The third and perhaps the less felicitous identity is represented by the main square, the so-called »Tobačni trg« (Tobacco square) alongside »Kvadrat« (Square). Because of the undefined surrounding built environment and the high wall of »Kvadrat« at one of its edges it might make an unpleasant impression upon users. Even though this place is described as representative due to the importance of the building, its use will probably remain limited to passing through and will not make people stay.

The winning solution thus offers a wide variety of environments. It is based on existing elements but goes beyond. In a balanced manner it adds new ones that build a fresh and contemporary image of the Nova Tobačna. It will also help build the identity of the broader space of Vič which has no clearly defined centre of activities and now is devoid of characteristics its inhabitants could identify with.

The arrangement of the northern edge of the location bordering on the railway line will require further discussion before implementation. Owing to the activities related to the section of the railway running underground through the town which started only after the conclusion of the competition, it is likely that some changes will occur in the following years impacting essentially on the space in its immediate vicinity. Across Tobačna, over the railway line, there are namely the villas of Rožna dolina. In the competition proposal the transition from twelve-floor towers to the small scale of three-floor villas is abrupt. In the case the railway goes underground and the space at ground level becomes passable, this contrast will be particularly visible and may influence negatively on the characteristic of space at Rožna dolina.

## 5. Conclusion

For the time being it seems that among all Ljubljana's abandoned complexes Tobačna and its surrounding will be the most fortunate. The investor proved by the competition that he might be considerate towards the heritage preserved at the location. An appropriate treatment may enhance its value and also contribute to the identity and character of new buildings in the immediate vicinity. We can be very satisfied for the time being with the steps made so far towards the location's revival. We can only hope the future ones will match them. With the successful activation of the Nova Tobačna Ljubljana will finally get an exemplar case of how the procedure of revival of an abandoned area can be implemented in our conditions. Now, other locations may follow.

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# The dimensions of urban public space in the user's mental image

## 1. Definition of the research problem

One of the definitions defines the open public urban space as a space amidst built structures which is accessible to all without limitations regardless of their conviction and social or economic status. Space so defined is continuous in the physical sense and flows uninterruptedly amidst the built structures. Physical continuity is clearly shown in the presentations of the morphological structure according to the Gestalt principle, in which the open public space is an unbroken form (a positive) spreading without interruption amidst individual objects (negatives). The Figure below shows an example of urban environment built on octogonal grid with a full parameter blocks (7x7) in which theoretically 16 buildings appear with a single open space. The same holds true for other morphological patterns of compactly settled urban areas.

Our experience with open public spaces tells us that despite their physical continuity they do not appear as uninterrupted spaces in our mental images. Some parts have a stronger presence in our mental image than others, some are not present at all. Users' value judgments about individual parts of a space may diverge, too.

In order for urban design to establish a citywide transparent and clearly structured public space network it is important to know how and according to what principles this space is structured in a user's mental image.

## 2. Theoretical Foundations

Let us first shed light on the relation between a mental image which is an immaterial category, and space intended here as a material (physical) category enabling the establishment of the former in a variety of ways.

According to Bell et alii (2001) an image about space forms in two ways: through one's own direct experience about a space or indirectly through information acquired from other people. In either case a complex process of acquisition, processing and interpretation of information is involved and there are no clear dividing lines between individual phases. Information acquisition usually occurs through direct sensory experience (sight, hearing, smell, touch) which provides information on the surrounding environment. Another way of information acquisition is through various mediations that are more or less objective. Recordings of space (plans, photographs, audio and video recordings and similar) count among more objective sources of information, while sources reflecting the author's subjective interpretation like narration, paintings, literary depictions and similar are regarded as less objective. (Hudson-Smith, web source).

Perception of space is also strongly culturally conditioned. In some cultural environments where the primordial way of life has been preserved, the experience of space is still linked to meanings and symbols. Thus the Aboriginal perception derives from mythology and conviction respectively that we do not possess the land but are possessed by it being a part of it (Aboriginal Environments research Centre, web source). A comparison with the western attitude towards space in which space is (still) regarded first of all as a property (Tuan, 2002) which we have freely at our disposal, shows that spatial perception is to a great extent imparted to us by education and based upon experience within the cultural environment we grow and live in.

### 3. Research Approaches

Researches into urban environment perception have been in full swing since the second half of the past century. Many have been concerned with the mental image of space as a result of a visual and kinesthetic experience of space. Lynch (1972, 1981) has identified the principles we apply to structure the environment we live in into a controllable and transparent whole by means of five basic components: areas, boundaries, paths, nodes and space markers. Cullen (1961) highlighted the meaning of sequences alongside the paths along which the user is moving for his experience of town. He drew attention to the importance of the user's actual position within the continuum of the open space for experiencing »here-there« and orientation in town respectively. He also called attention to the importance of changes in experience along the path which can be ensured in various ways (for example by changing the morphology or use of space etc.). One of the established indirect ways of researching the perception of urban open spaces is based on behavioural studies. Their underlying premise is that users' decision on how to use spaces is based on their mental images of these spaces (Hershenson, 1998). Ever more attention is also paid to the research of the immediate impact of senses on experiencing space, especially to the roles of sight, hearing, smell and touch (Porteous, 1996). Due to the fast development of new forms of communication ever more researches focus on the impact of mobile information media on environmental perception (YouTube, web source).

### 4. Research Questions and Conception of the Method

In order to understand the structuring of an open public urban space in the users' mental images we need to know:

1. which and what open public spaces are present in the users' mental images of a particular urban entity (quarter, estate, town),
2. what are the quantitative and qualitative dimensions of these spaces (in the users' mental images),
3. which spaces the users experience as adjacent to these spaces and what connects and/or delimits them,
4. what influences on the hierarchy of these spaces in the users' conceptions.

Let us first define the fundamental notions. Let *microenvironment* be the smallest individual unit of the urban open space which together with the others in the user's mental

image (that is at the level of idea) constitutes the fundamental element of the open public space network. *Starting microenvironment* is the microenvironment where the user is located, and represents his starting-point at the moment of mentally structuring the open public space network. *Adjacent microenvironment* is every microenvironment perceived by the user as in whatever way connected with the starting microenvironment. Any starting microenvironment can be linked to various numbers of adjacent microenvironments. Linking elements are those material or immaterial characteristics of two adjoining microenvironments which in the user's mental image link the two of them. And delimiting elements are those material or immaterial characteristics of two adjacent microenvironments which in the user's mental image divide them into two separate microenvironments (otherwise experienced as mutually connected, but due to the recognised delimiting elements not perceived as one unit). *Seeming adjacent microenvironment* is every open urban space physically adjoined to the starting microenvironment or linked to it in any other way, nevertheless not perceived by the user in his mental image as an adjacent space. As it is not present in the user's mental image, it cannot be object of this kind of examination.

As the study is related to immaterial (mental) image of material (physical) space it is also important to define:

1. whose mental images are worthy of study,
2. which spaces contained in mental images are to be studied,
3. which data are important (and need to be collected),
4. how to collect the data.

As the conception of space is markedly subjective, conceptions of all those who use the space and are thus familiar with it are important for the planning of open urban public spaces. Sampling should be made with respect to the following aspects and user groups respectively:

- frequency of presence in the space (we may assume that conceptions of users who daily interact with the studied spaces differ from those of users who use the spaces less frequently),
- favourite leisure activities (we may assume that conceptions of the people who are close to the urban way of life are different from conceptions of the people who prefer to spend their leisure time in a natural environment),
- cultural milieu of the user (as perception is culturally conditioned we may assume that conceptions of the users belonging to autochthonous cultural milieu differ from those of the users belonging to other cultural milieus),
- fundamental statistical categories of users – gender, age and education.

The choice of a concrete space of research arises directly from the question which are the principal characteristics of those open urban public spaces that are present in the user's mental image of the town. Although we are interested in the studied phenomenon at the micro level of concrete spaces, we need to consider a wider spatial context – a quarter, a neighbourhood or even a town. According to Lynch (1972) people form mental images of towns, which reflect the content and plan of town with regard to personal experience, and mental maps are their graphical reflections. Individual open urban public spaces which show in these maps are thus appropriate study cases. For a final choice in theoretical researches it is important to know the frequency of recall (how often they turned up) and the varieties in morphological typology of spaces (linear<>plane, paved<>made green, etc). According

to some researches (Hershenson, 1998) the limitations of human memory bring up 7 as the number we are still able to master in our working memory, and this is why it makes sense to study no more than seven units at one time.

Markedly subjective condition of the researched phenomenon and the qualitative orientation of the research dictate the choice of the research technique that can offer an insight into an individual's spatial experience and at the same time enable general conclusions. According to Kvale (1996) interview is the most appropriate tool for understanding an individual's experience of life and world. Researcher can, through interview, listen to what people themselves say about the world they live in, he can hear their views and opinions expressed in their own words and learn about their work and life situations, plans and hopes. According to Kvale a qualitative interview is an inter-view. The scope of an interview is to »acquire descriptions of the living world of the interviewee with attention to the interpretation of meaning of the described phenomenon« (p. 5). This is another reason why interview is a particularly appropriate technique for studying mental images (Yin, 2003).

Case studies selected, the interviewees have to be mentally located into the spaces under study i.e. they have to be informed where exactly they should mentally locate themselves during the interview. We may assume that a specific position within the space (at the centre/edge of a square, park, street etc.) considerably impacts on the perception due to the micro scale of the phenomenon under study, which is why it has to be clearly defined (e.g. using an X mark on the map). Mental introduction into the studied space can be made in various ways – for example with town plans, panoramic or aerial shots, photographs and similar. They have to be sufficiently general so as not to suggest any value judgements.

In order to make the interviewees' answers finally comparable it is necessary to structure the interview. The questions can be divided into five groups with regard to their role in the research process:

- introductory questions – their intention is to mentally locate the interviewee into the studied space;
- quantitative questions – they examine (measurable) physical dimensions of the studied space;
- qualitative questions – they examine (unmeasurable) value judgments about the space under study;
- questions intended to recognise mutual linkages – they find out which aspects play a key role in the mental structuring of the open urban public space into individual units;
- control questions – they check whether it is a momentary or steady image of the space.

The spreadsheet below presents a few examples of these questions.

- Imagine that you stand at the spot marked by X on the map. Indicate where in your view run the boundary lines of the space you are situated in.
- In your opinion which are the main characteristics of this space. Enumerate an arbitrary number of characteristics.
- Among the stated characteristics name those which in your view are positive and those which are negative. If new characteristics come to your mind, bring them up and take your position towards them in the same manner.
- Mark on the map the boundaries of all adjacent spaces which in your opinion are linked to the space you had al-

ready marked. Number these spaces with successive numbers so that you give n° 1 to the one which in your view is most closely linked to the space X, and n° 2 to the one which is next most closely linked to, etc.

- State for every one of the numbered spaces its principle characteristics. Enumerate an arbitrary number of characteristics for each space.
- Give the reason why the space marked by n° 1 is of all marked spaces the most closely linked to the space X.
- Give the reason why the space marked by the highest number is the least linked to the space X.
- Draw the path on the map along which you most often move through the spaces you marked on the map.
- For what reason and in what way (on foot, on bike, by car etc.) you most frequently employ this path? Is this the shortest path (if not – what is the very reason you do it)?
- Draw on the map the paths along which you would take a tourist not familiar with the space through the marked spaces. Comment on why you would employ that very path.
- If you stood at the spot marked by X and would have a possibility to take but one photograph, where would you point your camera?
- Draw up this view. Name every thing you find essential in this view.
- Imagine you stand at the point X with closed eyes. What sounds do you hear? If you enumerated more than one sound, name the one you find the prevailing and most characteristic respectively for this space.
- Does this sound (prevailing and most characteristic respectively) also appear in any of the adjacent spaces your numbered on the map (if so, in which ones)?
- Imagine you stand at the point X with closed eyes. What smells do you perceive? If you enumerated more than one smell, name the one you find the prevailing and most characteristic respectively for this space.
- Do these smells appear also in any of the adjacent spaces you marked on the map (if so, in which ones)?
- Imagine you have to touch with your fingers any one of the things in the spaces you marked on the map – what would you most like to touch? Why would you most like to touch that very thing?
- Imagine you have to walk barefoot on any one surface in the spaces you marked on the map. Where would you most like to walk? Why would you most like to walk on that very surface?

### Processing and presentation of data

Data acquired through interview have to be transformed into a transparent form which assists the planner in making decisions about concrete interventions into space. For the sake of transparency and data crossing it is sensible to display the data collected through interviews in a GIS environment as they can thus be simply analysed and compared to other spatial databases.

In the following section are presented some displays associating qualitative and quantitative data like:

1. physical dimensions of the starting microenvironment itself (where it reaches to in the user's mental image),
2. physical dimensions of the starting microenvironment including the adjacent microenvironments (which linkages are pursued in the user's mental image),
3. characteristics of individual microenvironments (the starting one and the adjacent ones) as well as value judgments concerning these characteristics,
4. value judgments on these characteristics,

5. elements linking and delimiting microenvironments (definitions of terms are to be found in Chapter 4).

*Experienced boundary map* (briefly *boundary map*) is a map in which the lines denote the boundary of space as experienced by the user at the standpoint X (in the Figure below e.g. 1). The most relevant map from the planning point of view is *the common map of experienced boundaries of the microenvironment* (in the Figure below 123...n), which represents the sum total of individual ones. It displays jointly the space boundaries as experienced by a large number of users. Where the lines thicken or even overlap we speak of the so called *commonly experienced microenvironment boundary*. The outer circumference of the entire map (in the Figure below marked by a thick line) represents *the maximally experienced microenvironment boundary*.

*Map of intensity of loyalty to microenvironment* (briefly *intensity map*) is a map showing how strongly individual parts inside the maximal boundary of microenvironment are experienced as its component parts. In the case of an individual's experience (in the Figure below e.g.1) this intensity is equal for the entire microenvironment. The relevance lies in the *common map of intensity of loyalty to microenvironment* which shows simultaneous experiences of several users. The graphical display is generated by simply adding the hues of grey from individual maps – the darker the area in the common map, more users experience it as a part of the microenvironment dealt with.

*Map of linkage to the microenvironment surroundings* (briefly *linkage map*) shows how a user experiences linkage of the starting microenvironment to adjacent microenvironments. It's the most complex among the maps as it also displays – besides the contents of the maps described earlier – the same contents of all neighbouring microenvironments. Since individuals experience different numbers of adjacent microenvironments, data processing requires categorical uniformity as displayed in Table below. Thanks to the GIS environment we can directly verify, for example, linking and delimiting elements by clicking on individual boundaries. In combination with the morphology map it is equally possible to identify the seeming adjacent spaces (they show with no grey hues on the map).

Interviews also provide data on qualitative characteristics of microenvironments. It is sensible to unite them with regard to the three basic categories that previous researches have defined as essential to establishing identity of a space (Punter, 1991, Montgomery, 1998):

- physical characteristics (e.g. street furniture, built structure, rhythm, proportions, materials, etc.),
- programmatic characteristics (e.g. street life, events, activities, services in the open space and in the establishments at the edge, etc.),
- symbolic and semantic characteristics (symbolism, memories, associations, legibility, etc.)

In the GIS environment these data may be displayed in two ways:

- as tables attached to individual polygons marking the experienced microenvironments boundaries. They are simply accessible by a click.
- graphically, by taking into account the principles of mixing three primary colours and the colour circle respectively. A calculation is made for every microenvironment of their physical, programmatic, symbolic and semantic characteristics. Then colours are generated depending on their mutual proportions (as shown in the Figure below) – the

number of physical characteristics signifies the number of units of blue, the number of functional characteristics signifies the number of units of red and the number of symbolic characteristics the number of units of yellow. In this way *the map of experienced microenvironment identity* (briefly *identity map*) is created.

### Anticipated results and utility for urban planning needs

The anticipated contribution of the presented method to urban planning is twofold:

1. On the theoretical level it complements the knowledge of what impacts on the structuring of open urban public space in users' mental images, and proves that an open urban space in the mental image of its users is structured – in contrast to its physical appearance – into individual, relatively small, more or less clearly delimited units i.e. microenvironments.
2. Practically speaking, it is a tool providing insight into concrete user experience. It enables to recognise the needed physical and programmatic interventions into space in order to make it attractive. It also provides concrete answers to questions on how to physically and programmatically design and manage an open urban space so as to integrate it with other spaces and make it, in the mental image, a component part of an open public space network at the urban level. Public spaces which are clearly recognised as an integral part of a wider system have a better chance to be used – and presence of people in the public places in the town is one of the fundamental indicators of urban environment quality.

In the future it will be necessary to look into additional possibilities for (faster) collection and processing of data, enabling to build up a database grounded in experiences of a class of users as wide as possible.

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### List of Figures

**Figure 1:** From the viewpoint of physical space the proportion between built structures and open public spaces in the theoretical model of a compact town on the grid 7x7 1:16

**Figure 2:** Formation scheme for the mental image of space

**Figure 3:** The common boundary map is the sum total of individual maps.

**Figure 4:** Intensity map is the sum total of individual maps.

**Figure 5:** The final linkage map of an environment is the sum total of individual linkage maps. A darker hue means a stronger linkage to the starting microenvironment.

**Figure 6:** Every one of the microenvironments in the user's mental image is denoted by characteristics that can be classified into one of the three fundamental categories. If we assign a colour to each of the fundamental categories (physical characteristics = blue, programmatic characteristics = red, symbolic characteristics = yellow) and then mix a corresponding number of units of colour with regard to the number of characteristics within individual categories, the resulting colour tells us

which are the prevailing characteristics of a microenvironment. Thus, for example, the space predominantly denoted by functional and symbolic characteristics in the user's mental image, gets coloured with the hues of orange. According to the Montgomery's theory successful spaces are characterised by a combination of all the three fundamental categories which in terms of the colour wheel means that successful places are close to black (equal representation of all three primary colours and physical, programmatic and symbolic characteristics respectively).

**Spreadsheet 1:** Sampling parameters for controlling the user's experience image of the open urban public space, including reasons given.

**Spreadsheet 2:** Examples of questions for controlling the dimensions of individual open public spaces in the user's mental image and for checking hierarchical relations between them.

**Spreadsheet 3:** Examples of questions for controlling the impact of the way of use and direct environmental perceptions on the experience of hierarchical relations between individual open public spaces in the user's mental image.

**Spreadsheet 4 with the legend:** Individuals experience different numbers of adjacent microenvironments depending on the starting microenvironment. The table displays cases in which user perceives 3, 4, 5, ....., or 10 adjacent microenvironments (Arabic numerals). In order to be able to make comparisons a conversion in comparable categories must be made (Roman numerals I-VII) depending on how strongly the user experiences his attachment to the starting microenvironment (during the interview he expresses this by numbering the adjacent microenvironment from 1 onwards – see also spreadsheet 2). Adjacent microenvironments which are experienced as the most linked to the starting microenvironment (statistically 100%) appertain to the category I, and those which are experienced as the least linked to the starting environment (statistically 0%) appertain to the category VII. In graphic displays each category is associated with the determined grey colour according to the principle that microenvironments experienced as more closely linked to the starting microenvironment have a darker hue of grey.

For sources and literature turn to page 62.

Translated by Studio Phi.

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## Scenarios: from knowledge to devising policies

### 1. Knowledge as basis for policy making and assessment

Our expectations about future are reflected in today's activities and assigning measures. However our knowledge about future can only be uncertain. Our predictions can only be based on assumptions instead on facts. One can only assume how the different factors will interact and manifest their consequences in the space in the future.

Landscape is being changed by natural processes as well as by public policy measures. These measures are either intended to change the landscape or have primarily other purposes, but have also side effects on the landscape. Even with the landscape-objective oriented measures we cannot exactly predict the effects of an individual measure in the real environment, either in synergy with or in contradiction to other factors. Even less controllable are the effects of non- landscape-objective oriented measures and natural processes. All these activities can have also unexpected or undesired effects on the landscape.

Knowledge about impacts and the assessment of their acceptability is a key base for devising and confirming policies and their measures. Slovenian and European legislation distinguish two types of assessments that are also obligatory and legally defined. Environmental impact assessments (EIA) are used for appraisal on a project level as a part of administrative procedure of issuing building permit, while strategic environmental assessments (SEIA) assess the hierarchically higher documents (plans, programmes and policies) and are a part of procedure of devising and passing these documents. The role of SEIA is mainly optimization of policy making and should therefore be performed parallel to the document preparation. It should also be ensured that the findings of SEIA are adequately considered in the document contents. This type of assessment is called integrated SEIA. EU has recently recognized the need to assess public action on highest levels – level of policies. Strategy of sustainable development of the EU (the Gothenburg strategy) assumes the impact assessment for all policy proposals and their measures, to ensure adequate evaluation of their economic, social and environmental effects. Different needs and varied professional practice in EU countries have resulted in different forms of policy assessment, which differ regarding their aims and focus. Besides environmental impact assessments are these mainly Impact assessment, Territorial impact assessment, Regulatory assessment, Sustainability assessments. The assessments, which concern actions more general than project, necessarily require consideration of all three aspects of sustainable development (economic, social and environmental), larger geographic areas and longer time horizons. Consequently these assessments become complex, loaded with uncertainties and full of conflicting interests. To cope with these issues, the SEIA toolbox is becoming more diverse, involving other techniques besides traditionally used impact