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SCIENCE FOR A SUSTAINABLE DEVELOPMENT

Design and Renovation of Urban Public Spaces for Sustainable Cities

DRUPSSuC

SD/TA/05A

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FINAL REPORT PHASE 1 - Summary

Design and Renovation of Urban Public Spaces for Sustainable Cities

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Design and Renovation of Urban Public Spaces for Sustainable Cities

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In this time of post-Kyoto negotiations and award of the Nobel Prize to the Intergovernmental Panel on Climate Change (IPCC), at a time when private space get the upper hand over public space but also at a time when social contacts are gradually shifting to the virtual sphere, it seems crucial to reconsider the development of cities and their public space. This space has played an important role in the design of European towns and their social, cultural, political and economic structures. This public space is increasingly privatized and invaded by automobiles, and it is now becoming more synonym of problems than welfare. With today's urban sprawl and the considerable daily consumption of space and energy, the loss of urban landscapes quality and the fraying social fibre that go with it, improving urban public space is essential.

Public space also appears to be a crucial issue in the social, environmental and economic balance of European towns. In coherence with the sustainable development pillars as defined in the Brundtland report, this balance and its implementation in the design of high quality urban public areas is one of the bases of the creation of sustainable urban planning.

The research project "Design and renovation of urban public spaces for sustainable cities – DRUPSSuc" financed by the Belgian Science Policy as part of its programme "Science for sustainable development - SSD", concerns the development of decision-taking tools for the design and management of urban public spaces in order to maximize their user-friendliness, comfort and attractiveness, all from a sustainable standpoint, both as concerns local public space and the global

1. Introduction

Most studies that have been done about the question of urban public space deal with specific themes that do not include confrontation of all aspects that enter into account in the life cycle of public areas.

Nonetheless, a study dealing with complex problem, such as the question of sustainable public space, cannot consist of distinct sectors that can be managed separately to get an optimal response. A transversal approach seems to be the key for successfully envisaging the subject at hand. This approach breaks down barriers between disciplines by connecting them to each other for their mutual enrichment. The aim is to pass from simple maxima to a composite optimum.

The transversal approach for urban public areas is achieved in this study by using eight non-exhaustive and non-exclusive themes of research: users (perception, utilization, ownership, participation), urban density, mobility, microclimate and pollution, vegetation and biodiversity, water, artificial lighting and acoustics.

The concept of sustainable development and its three pillars – social, environmental and economic – are used as the main references in this study. In this sense, public urban space can be considered lasting if it constitutes a user-friendly place for potential meetings, if its design corresponds to certain environmental objectives in terms of protection of nature, air pollution, accessibility, etc., if it integrates the built-up area as a structural element while safeguarding natural cycles, and if it is economically viable.

The DRUPSSuC study was done in two phases. The first phase, in 2007-2008 is a phase for research and global theoretical proposals envisaged via the eight themes specified, considered from a transversal perspective. This phase is summarized by this document and developed in greater detail in the full report on

the study. A second phase in 2009-2010 will be devoted to validating the theoretical approach by case studies in order to produce validated, utilizable tools to aid decision taking and design.

First, this document describes the objectives of this research project; the definition of a common typology used for the public areas retained, and the methodology applied at both transversal and specific levels. The second phase presents the transversal approach and the table of evaluation criteria to be taken into account in the design/renewal process of an urban public area. The details of these criteria and recommendations are developed in the full report. Before concluding, the perspectives of the second phase of the research product and its case studies will be mentioned.

2. Objectives

The main objective of this study is to promote sustainable development of urban areas thanks to the development of methodological tools and transversal techniques for the design and renewal of public spaces. On the basis of this objective and the analysis of concrete objectives associated with public space in the eight themes of specific research retained, a common grid of objectives is proposed in figure 1. The fundamental objective of our research project is the improvement of the quality of living in an urban environment.

3. Typology

In order to allow a dialogue between the various publics concerned (researchers, designers, decision takers, users,...), a common vocabulary must be established for the typology of urban public spaces. Moreover, this typology targets ensuring transversal coherence and feasibility of the research project by defining a certain number of types of public spaces to be envisaged.

To define our common typological denominators, we have chosen to establish a two-dimensional typology.

The first dimension taken into consideration refers to types of public spaces defined by their morphological structure, their limits, consisting of buildings or others, and the nature of those limits. Three types of morphological spaces have been highlighted: the street, squares, and green areas. The street is a "linear" space connecting other public areas. The square covers all “plane” public areas. Finally the particularity of a green space is the predominance of plants.

The second dimension of typology highlights the different natures of urban zones. These zones are based on the historic construction of the town, from the centre to the outskirts, and on criteria of density and mixed usage. Three types of zones have been defined: the town centre, the urban zone and the suburban zone.

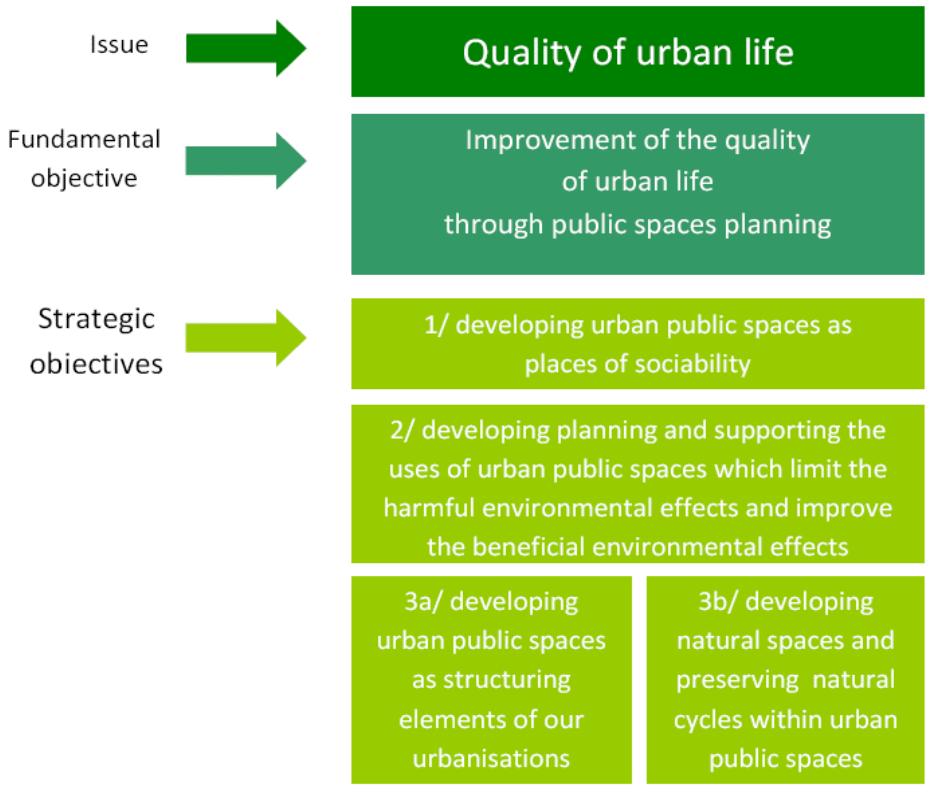

Figure 1 : Objectives of the design/renovation of urban public spaces

Nine categories of urban public spaces are defined using the common typology of urban public spaces in the two dimensions retained – each of the three morphological types in each of the three urban zones.

4. Methodology

After setting up a solid transversal framework by defining common objectives for the eight research themes in the typological classification of urban public spaces, each theme developed a specific methodology for further study of the question from a transversal standpoint. These different approaches, which are detailed in the full research report, give overall results and define a series of recommendations and criteria corresponding to achievement of the common objectives.

5. Transversal approach

In terms of the analytical methodology, the DRUPSSuC research project takes consideration of public space and the surrounding context. Two scales of analysis are thus defined: on one hand, the perimeter of the overall context including the public areas under study and on the other hand, a "zone of influence" including the local perimeter, that being the public space itself, extended to its immediate limits.

In the first phase, the main social-economic characteristics of the overall context are identified, using concepts pertaining to density, mixed usage and mixed populations. The presence and dispersion of natural elements complete this study of the context. After that, notions pertaining to accessibility and mobility to and inside the area are developed.

After this analysis of the context, the "local" space, its morphological characteristics and its usages are scrutinized. An analysis of physiological comfort is done with an approach of the visual and acoustic microclimate, completed by an analysis of psycho-sociological factors. The elements corresponding to the need for security (objective and subjective) or promoting physical and social activities are discussed in the second phase. The participative aspect and its influence on the feeling of ownership of a place complete this overview.

Analytical criteria and recommendations are defined for the design/renewal process for lasting/sustainable urban public areas under the model retained for analysing public space and in relation to each of the eight research themes. Table 1 at the end of this text shows a list of the criteria defined and developed in the complete report on the first phase of the DRUPSSuC study.

Two methodological comments are needed with regard to these criteria.

First, these criteria were developed by research that is essentially theoretical, and they must still be adapted by case studies scheduled for the second phase of the research project.

Secondly, it must be noted that the type of data to be collected varies considerably with the theme studied, requiring very different types of measurements when dealing with quantitative factors versus qualitative factors. The amount of lighting or the width of the street, for example, are not measured in the same way as user satisfaction or the feeling of security.

6. Second phase

The second phase of the DRUPSSuC study, the results of which will be distributed in the first quarter of 2011, consists mainly of validation, or possibly reformulation of the theoretical phase using real case studies, and of the development of concrete tools and recommendations to promote design and renewal of urban public spaces, to improve urbanization policies and to draft guidelines for their standardization.

The case studies will be done in Brussels, Leuven and Namur – one in each of the three Belgian regions. The medium-sized towns of Leuven and Namur are undeniable interest, because their size is comparable to that of many other Belgian towns. Brussels is interesting because of its status as the Belgian and European capital, its economic role, its social mosaic, its size and the presence of the three urban zones defined in our typology.

7. Case studies

For a coherent transversal theoretical approach, the analytical methodology in the field is done considering two parameters. The first one, called the overall perimeter, is generated by isochrone curves (5 minutes – 300 metres around the public areas via an urban itinerary) and the statistical sectors they intercept. This takes into consideration the public space and its context of influence.

The second parameter is defined by the built-up and other limits of the public space, in other words the public space extended to the façades of constructions and other boundaries that define its outline.

Prior to every analysis in the field, a descriptive data sheet is done including the limits of the parameters in consideration. An example of this datasheet for a case study in Ixelles is given at the end of these pages (Figure 2).

The case studies done will collect objective and subjective data according to the criteria grid retained. These data will then be submitted to an analysis using statistical tools. This test of concrete cases, with their specific scales and links, will validate the criteria for future applications. The applications will take the form of concrete solutions, particularly via recommendations, tools for regular use, good management rules and models for reaching optimal situations.

8. Conclusion

The key to responses to current problematics associated with urban public spaces is a transversal approach to these areas. In this study, the transversal approach is envisaged from a sustainable standpoint. This has been done using eight non-exhaustive and non-exclusive research themes.

This approach has given a matrix for analyzing public spaces using evaluation criteria. The final objective of this criteria and all this research is to promote sustainable development of urban zones by means of the creation of methodological tools and transversal techniques for the design and renovation of urban public spaces.

Context	Built-up and social-economic context
	C1 : Density of human activity
	C2 : Mixed usage employment-housing
	C3 : Number of housing units per hectare
	C4 : Age structure of the population and social classes
	C5 : Architectural context
	Natural context
	C6 : *Measurement of quantity of accessible green spaces per inhabitant*
	C7 : *Accessibility of green areas and playgrounds*
	C8 : *Large lines of trees on avenues and boulevards*
	C9 : *Rivers and streams with planted banks*
Physical accessib-ility	C10 : Proximity of facilities and services complementary to housing
	C11 : Proximity of schools and jobs/ public transport stops
	C12 : Accessibility for cycling
	C13 : Accessibility for public transport
Local morphology	Materials and dimensions
	C14 : Adaptation of areas for pedestrians
	C15 : Adaptation of types of trees planted along the streets
	C16 : Respect of distances for planting trees
	C17 : Permeability of the earth
	C18 : Control of luminous flux
	Physiological comfort
	C19 : Physiological comfort of pedestrians
	C20 : Variability of the height of buildings influencing air flows
	C21 : Visual comfort at night
Uses and psychological comfort	Security
	C22 : Objective and subjective security
	C23 : Surveillance of the area
	C24 : Control of access
	Nature and discovery
	C25 : Diversification of planted structures in green areas
	C26 : *Ecological management (mowing) in green areas*
	C27 : *Accessibility of zones developing biodiversity*
	C28 : *User satisfaction with regard to the presence of green areas*
	Sociability, stimulation, identity
	C29 : *Organized or non-organized local activities*
	C30 : *Utilization of the space*
	C31 : *Identification of the users' feeling of belonging*
	C32 : *Night time lay-out and urban structure*
Participation	C10 : *Integration of the project in a participative system*

Table 1: Criteria for the analysis of urban public spaces

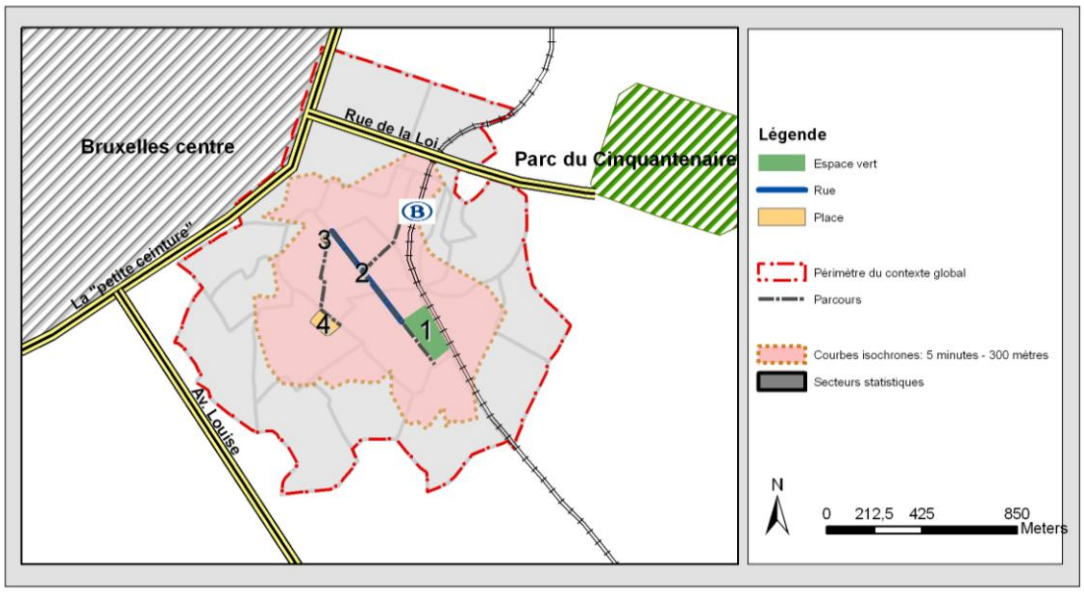

Figure 2 : Example of urban course, Blyckaerts district in Ixelles

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Design and Renovation *of* Urban Public Spaces *for* Sustainable Cities

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