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OPPORTUNITIES OF LOCAL PLANNING OF STREET GREENERY IN ECOPHYSIOGRAPHIC STUDIES AND STUDIES OF CONDITIONS AND DIRECTIONS OF SPATIAL MANAGEMENT

Keywords: street greenery, spatial planning, ecophysiographic study, study of conditions and directions of spatial management.

Introduction

Street greenery is an inseparable and particularly important element of municipal greenery. It takes a significant area of each town, creates an advantageous layout of greenery lines throughout this town. These greenery lines interpenetrate and join other greenery areas that accompany areas of various purpose, greenery areas, semi-natural areas, town forests as well as areas that surround towns. This greenery fulfils numerous important functions. It has an aesthetic role, recreational role, isolating role, it forms the climate and enlarges the system of municipal greenery.

Street greenery is often marginalised, its condition happens to be unsatisfactory if it is created in a limited way that does not fully use the opportunities of planning and applying new technical solutions. On the other hand, there is a growing interest in this type of greenery and the approach to it and its formation is becoming better.

1 In the article an ecophysiographic study is called an ecophysiography and a study of conditions and directions of spatial development - a study.
The situation of street greenery in Warsaw is a good example. On the one hand the City maintains its street greenery in a standard way but also notices its more and more significant value, potential and position in the city greenery system, which results in finding better solutions. Recently the city prepared a series of fundamental studies of street greenery: a comprehensive inventory of street greenery and development strategy for street greenery.

According to Gehl J. (2013), one of the most famous researchers and renovators of public areas in the countries of northern Europe trees and plants are appreciated and attached to. If trees are leafless for half a year, the pleasure of their presence is much bigger when they have leaves and the people particularly appreciate season changes of flowers, shrubs and trees. For example, in north Europe countries most of the so called English squares have trees, shrubs, lawns and flowers as opposed to the south Europe countries where they are usually deprived of plants’.

Street greenery should be appropriately taken into account in spatial planning on the local level in harmony with street spatial management and other municipal greenery.

Unfortunately, changes in the Polish legislation are still insufficient from the point of view of greenery areas. There are no regulations that would stipulate the substantial scope of planning studies concerning greenery areas neither in the form of a separate law or in the form of an amendment to the existing legal acts such as the law on spatial planning and management of 27 March 2003, R. Ropela and others (2009). The issues of deficiencies of

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Drawing 1. Reference drawing 2 presenting street greenery as an element of anthroposphere, an element of municipal greenery system that fulfils important functions and develops in difficult conditions of municipal environment.

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2 Drawings by Joanna Borzęcka
legal regulations were discussed by Szczepanowska H.B. (2008), Szczepanowska H.B. and others (2012), Sitarski M. and others (2013), Suchocka M. (2013), Sobczyński L. (2014). They talked about marginalisation and inappropriate account given to street greenery, including local spatial planning. The recommendations concerning the solutions to the problem may be formulated on the basis of the research task carried out in the Institute of Spatial Management and Housing called ‘Guidelines for street greenery planning in cities on the example of Praga Północ in Warsaw’ (Szczepanowska H.B. and others 2014).

The purpose of this article is to describe the opportunities of street greenery planning starting from analysing the conditions stipulated in ecophysiographic studies prepared for the needs of the study and ending on the scope of conclusions written down in the study of conditions and directions of spatial management.

**Methodology**

In order to describe the opportunities of street greenery planning the conclusions formulated during the research task ‘Guidelines for street greenery planning in cities on the example of Praga Północ in Warsaw’. Literature, proper legal regulations and example planning studies such as the ecophysiographic study and the study of conditions and directions of spatial management of the capital city of Warsaw were studied in a directional way.

Regulations and provisions related to street greenery were looked for in order to be used for greenery planning. Obstacles and opportunities for street greenery were looked for.

Provisions that were directly or indirectly related to street greenery were identified also in the context of the elements of spatial management that co-exist with street greenery or constitute a condition to the existing of street greenery, in particular: streets, areas directly adjoining streets, public/representative areas, historical streets and areas located next to streets.

It was listed and studied how legal regulations correspond to their practical application.

Suggestions of new provisions concerning street greenery were prepared and presented with the use of the provisions found in the example planning documents.
Critical analysis of planning documents

Street greenery in the ecophysiographic studies

According to article 72.5. of the law on protection of environment of 27 April 2001 (as amended) an ecophysiographic study prepared for the needs of the study of conditions and directions covers the whole natural environment and its individual elements (including plants/greenery) and their connection with the whole area of a given town. The regulation concerning ecophysiographic studies of 9 September 2002 covers natural environment, its individual elements in a way that is appropriate to the above mentioned regulation.

However the issues of street greenery are not directly formulated in the above-mentioned legal acts, there are no terms like: vegetation, greenery, greenery area, street greenery.

The only regulations that directly regulate the presence of street greenery in ecophysiographic studies are articles 72.1.3) and 72.4. of the law on protection of environment of 27 April 2001 (as amended) which say that ecophysiographic studies ensure, inter alia, a comprehensive solution of the problems of arranging and designing greenery areas (street greenery included)\(^3\).

For example, the ecophysiographic study prepared for the needs of the Study of the capital city of Warsaw contains all the issues and elements of natural environment, basic concise information is given for all kinds of greenery areas. However, street greenery is treated in a marginal, imprecise and incomplete way and was not presented in the drawing. This approach is not an exception.

This ecophysiographic study contains information concerning greener and its environment including information about soil, earth, water, groundwater, climate, etc. The ecophysiographic drawings to the Study of the capital city of Warsaw were scaled 1:35 000 (a special scale adopted for the

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\(^3\) The definition of greenery areas in the law of protection of nature of 16 April 2004 (as amended) - areas with the technical infrastructure and buildings functionally bound to these areas, covered with vegetation, located within the borders of compact development of a village or town, having an aesthetic, recreational, health or protecting functions, in particular parks, lawns, promenades, boulevards, botanical gardens, zoological gardens, playgrounds, historical gardens and cemeteries and greenery accompanying streets, squares, historical fortifications, buildings, landfills, airports, railway and industrial facilities.
needs of this document) and based on materials containing information about the basic elements of the environment covering the whole city at a scale of 1:10 000. However, usually ecophysiographic studies are made in the same scale that is used in the Study of conditions and directions, particularly the main map with conditions and usefulness of areas for particular purposes. Thematic maps are usually scaled differently. The various scales adopted for ecophysiographic studies are also conditioned by the opportunities and ways of treating street greenery.

It has to be added there are no legal regulations that directly state that an ecophysiographic study has to be made before or during the works on the study of conditions and directions, e.g. the ecophysiographic study prepared for the needs of the Study of the capital city of Warsaw was made during the works of the Study (www.architektura.um.warszawa.pl/ekofizjografia). This makes it possible to use the materials prepared during the works on the study of conditions and directions in the works on the ecophysiography, which has a significance also for the account given to street greenery.

As there are no precise regulations concerning the level of detail and the scope of ecophysiographic studies they may have very varied forms from limited, generic, schematic ones to extended, multidimensional and accurate documents. However, there is a tendency for limiting information. This also refers to street greenery issues. The law defines the general framework of this documentation but does not require any direct reference to street greenery, it does not say how and to what extent this issue has to be covered.

*Street greenery in the study of conditions and directions of spatial management*

The regulations that describe the required scope of the study (articles 9 and 10 of the law of spatial planning and management of 27 April 2001, the regulation concerning the scope of the draft of the study of conditions and direction of spatial management of a commune of 28 April 2004) talk directly about street greenery only in article 72.1 of the law on protection of the environment which says that the study of conditions and directions of spatial management of a commune describes the conditions of preserving nature balance and rational management of environmental resources in particular by ensuring comprehensive solutions to the problems of development of towns and villages with
special account to the arrangement and design of greenery areas (including street greenery, etc.).

According to the above, a study is a planning document that describes the conditions and directions of spatial management of the whole area of a town, including issues concerned with street greenery.

In connection with the above, street greenery should be taken into account in planning at the level of the study of conditions and directions, however it is not stipulated how and to what extent.

The provisions of the Study of the capital city of Warsaw in the fragments concerning street greenery are very imprecise and incomplete but they emphasise a large multidimensional significance of greenery, including street greenery. A general direction of street greenery planning is drawn which basically covers the protection of the existing and introduction of new street greenery areas. The issues concerned with other elements of spatial management such as streets, street adjoining areas of a particular purpose that create the conditions and directions for street greenery development in an indirect way are presented in a much wider and precise way and are present in the drawing of the study. The Study of the capital city of Warsaw also gives an account of the public areas and their connectors (mainly streets and street adjoining areas) that are significant for the formation of street greenery.

According to § 5.1. of the regulation on the scope of the study of conditions and directions of spatial management of a commune of 28 April 2004 the draft of the study drawing has to be prepared on a copy of a topographic map scaled from 1:5 000 to 1:25 000. As an example, the main drawing of the Study of the capital city of Warsaw - Functional and spatial structure - directions of spatial management - was made at a scale of 1:20 000. Various scales of study drawings, adopted as needed, also condition the possibilities and ways of covering street greenery.

The drawings of the Study of the capital city of Warsaw do not present any street greenery although all the more important streets are drawn precisely enough.

It has to be emphasised that topographic maps do not show all the actual dimensions of the elements they cover, e.g. the width of roads is marked in a symbolic way (to make roads well visible on the map), and not in their actual dimensions.

But M. Hruba (2008) writes that drawings attached to studies of conditions and directions are made on topographic maps in a defined scale with maximum possible
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It should be added that the provisions of the Study of the capital city of Warsaw concerning street greenery were formulated when street greenery was not so exposed as it is now and there were no extended and detailed studies and data concerning street greenery that are available nowadays when the street greenery of Warsaw is catalogued in a detailed way.

Right now, it is possible to present street greenery in the study in a fairly arbitrary way covering a wider or narrower scope of the topic, giving it an appropriate significance or not. The opportunities of a more precise coverage of street greenery issues are not fully exploited. The law imposes a general framework of covering this problem, it does not require direct reference to street greenery in studies of conditions and directions, it does not say how and to what extent this issue should be covered.

Suggestions concerning coverage of street greenery in ecophysiographic studies prepared for the needs of studies of conditions and directions

At the stage of working on the ecophysiographic study it is possible to cover the issues of street greenery and environment and then use the results in the study of conditions and directions.

An ecophysiographic study enables to present all of the street greenery in the whole town.

The study should describe, diagnose and assess street greenery and formulate conditions for street greenery in reference to all the streets of the analysed town, in their full length including the directly adjoining areas. However, in big cities with a lot of long streets it is possible to cover street greenery in detail in the more significant streets: higher class roads, streets that constitute important public areas, e.g. greenery areas next to the important streets may be presented in a drawing and in the text, and the remaining street greenery only in the text.

The discussed ecophysiographic study is a planning document that may refer to the connections of street greenery areas with other street greenery areas and greenery areas of other kinds, generally with the nature system of the town.

detail, including maximum preciseness of such elements of spatial development as roads, buildings, greenery areas, etc. This makes the recipients of the maps treat them in a too precise and literal way.
Because of a general nature of the ecophysiographic study prepared for the needs of the study of conditions and directions and because of the fact it covers the whole town area, it should talk about street greenery in an adequately general and simplified way but at the same time detailed and accurate for the given town, the information about greenery should be generic but bound to particular situations, particular streets.

The maps should present street greenery using appropriate graphic symbols adjusted to the general graphic appearance of the ecophysiographic study and to the map scale.

In order to ensure appropriate coverage of street greenery in ecophysiographic studies at a scale of a town, I suggest a set of catalogues, analyses, assessment (the first two ones being basic and essential) that conform to the above prompts on the approach to street greenery:

- catalogues / assessments of existing street greenery,
- assessment of the value of streets from the point of view of street greenery development with account to public areas and greenery connections,
- calculation of the number of trees per one kilometre of a street.

**Catalogues / Assessments of existing street greenery**

The first stage is to prepare catalogues / updated catalogues of existing street greenery. It is suggested these examinations were carried out with reference to three categories of street sections with greenery: sections with large greenery areas/the most valuable; street sections with lawns/less valuable and street sections without greenery/the least valuable.

This way of cataloguing/assessment is simplified and contains generalised information adequate to the general nature of the ecophysiographic study for the needs of the study of conditions and directions.

It has to be pointed out that the analysed cataloguing/assessment is concerned only with the existing greenery and existing streets and their sections.

It is assumed that the catalogued street greenery is the greenery within the borders of the street areas drawn in the ecophysiographic study as well as the greenery that adjoins streets, particularly in public areas.

It has to be added that the basic street sections for which the catalogued greenery is analysed are sections located between the more important crossroads. This kind of covering street sections has a number of advantages:
the sections are precisely bordered and easy to identify, they are actually separate street sections in the real space of the street and they enable using the analyses of this stage in the analyses of the stage of working on the study of conditions and directions because the same street sections between crossroads may be discriminated in the drawings of the study of conditions and directions and of the local plan.

This kind of catalogue/assessment may be carried out on the basis of available satellite photos, ortho-photos (use of such Internet portals as Geoportal that contains ortho-photos of the whole country). This catalogue/assessment was based on such materials.

Drawing 2a. Catalogue/assessment of existing street greenery on the background of an ortho-photo - illustration of the streets of Warsaw at a scale
In exceptional situations detailed catalogues of street greenery are prepared for towns. They may be used too and there was one made recently in Warsaw - (Street greenery catalogue in Warsaw, 2013).

The analysed catalogue/assessment should be then taken into account in the study, particularly at the stage of working on the conditions of spatial management.

**The assessment of the value of the streets in terms of their importance for street greenery development with account to public areas and greenery connections**

In order to plan street greenery inscribed in the town area and its greenery and nature systems in an adequate way it is suggested to prepare a street greenery network based on the elements presented below and their value assessment.
The elements of analysis are particularly sections of the streets that are important public areas and/or connectors, and of the streets that connect large greenery areas, forests and other seminatural areas of the city. These sections were given appropriate weight depending on the kind of elements that are bound to them. Consequently, six categories were created.

It has to be added that at the stage of ecophysiography (before or during the works on the study of conditions and directions) basically only existing street sections may be analysed.

Drawing 3a. Assessment of streets in terms of their importance for street greenery development with account to public areas and greenery connections on the background of the drawing attached to the Ecophysiographic study for the needs of the Study of the capital city of Warsaw/Development of nature system of Warsaw - illustration of the street network at a scale of the city (source of the ecophysiographic study map: http://www.architektura.um.warszawa.pl/ekofizjografia)
Drawing 3b. Assessment of streets in terms of their importance for street greenery development with account to public areas and greenery connections on the background of the drawing attached to the Ecophysiographic study for the needs of the Study of the capital city of Warsaw/Development of nature system of Warsaw - zoomed street fragments with highlighted street sections between more important crossroads in Praga Północ district in Warsaw:

1. sections of streets that constitute important public areas and are, therefore particularly important to the development of street greenery, weight factor +4
2. sections of streets that constitute important connectors of the enumerated public areas and are therefore important to the development of street greenery, weight factor +2
3. sections of streets that connect larger greenery areas, forests and other seminatural areas of the city and are therefore important to the development of street greenery, weight factor +2;
4. remaining streets or their sections as important elements of development of street greenery, weight factor +1;
5. sections of streets that constitute important public areas and simultaneously connect larger greenery areas, forests and other seminatural areas of the city and are therefore particularly important to the development of street greenery, weight factor +6
6. sections of streets that constitute important connectors of the enumerated public areas and simultaneously connect larger greenery areas, forests and other seminatural areas of the city and are therefore important to the development of street greenery, weight factor +4

(source of the ecophysiographic study map: http://www.architektura.um.warszawa.pl/ekofizjografia)
It is also necessary to emphasise that the discussed value assessment is concerned with potential opportunities for greenery (the existing greenery is analysed in the catalogue/assessment described above).

This assessment should be carried out as a component of an adequate drawing attached to the ecophysiographic study, e.g. a drawing called - Creation of the nature system of Warsaw.

The presented assessment should be then referred to in the study of conditions and direction, particularly at the stage of working on the directions of spatial management.

**Calculation of the number of trees per one kilometre of a street**

Apart from the above, it is suggested to analyse the number of trees per one kilometre of a street as part of the works on the ecophysiography of the study of conditions and directions (in order to decide if there are enough trees as compared to the recommended tree number index per one kilometre of a street).

The calculations of the number of trees per one kilometre of a street should be carried out in accordance with the following guidelines:

Use the standard of 100 trees per one kilometre of a street as the index of ‘biological life’ as suggested by Balder (1997). Using it is simple to find out tree deficiencies in particular streets. Balder and others (1997) prepared the standard of average 100 trees per one kilometre of a street in Berlin. This optimum number of 100 trees per one kilometre of a street refers to a one-carriageway street or two-carriageway street with a central reservation without trees. Simultaneously the optimum number of 100 trees per one kilometre of a street refers to the trees growing in the right-of-way (trees growing in areas the directly adjoin the carriageway).

If the analysed street has two carriageways and has a central reservation with trees or possibility of planting trees it is recommended to use this section as two parallel streets with adjoining lanes of trees. In such street section the number of trees that factually grow there will be the number of trees growing next to one of the carriageways averaged for the whole street section.

Obviously, during planning works the standard is verified in individual streets because of the encountered limitations that usually result from technical factors on the surface and below the surface of the ground, presence of buildings, underground development and other appliances as well as from the need of having more trees like in sections of streets that
constitute important public areas and/or street greenery network connectors to the system of city greenery.

The analysis has to be carried out by calculating the existing street trees and referring them to the recommended index of 100 trees/km of a street.

This needs to be displayed in the street sections between the crossroads allocating the number of existing trees and the number of recommended trees and highlight the sections with sufficient number of trees and those which have too few or too many of them. Carry out the analysis on the basis of ortho-photos.

The following additional recommendations need to be remembered in reference to this analysis.

Drawing 4. Calculation of the number of trees per one kilometre of a street on the background of an ortho-photo - zoomed example street fragments with highlighted sections between more important crossroads in Praga Północ district in Warsaw.

Number of trees per one kilometre of a street:
- no trees (grey)
- much below the index, 1-39 trees/km (red)
- moderately below the index, 40-94 trees/km (light yellowish green)
- close to the index 95-105 trees/km (green colour in the drawing)
- moderately above the index, 106-139 trees/km (olive-coloured)
- much above the index, 140 and more trees/km (blue)
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- Because different street classes are covered in various ecophysiographic studies and studies of conditions and directions (e.g. in Warsaw collective streets and higher classes are taken into account with local street class excluded), the analysis may only cover the streets that are included in the planning document;

- Ecophysiographic studies and studies of conditions and directions streets are sometimes presented in drawings with various level of detail: they may be quite precise as polygons with factual dimensions (as in the ecophysiographic study and the study of the capital city of Warsaw) but may also be drawn with lines of varied thickness. In this situation the number of trees per kilometre of a street will only be precise in the first case - as it is known what the factual range/shape/area of the streets is and how many trees grow in this area; in the latter case the number of trees will be approximated;

- Because the analysis is made only on the basis of ortho-photos the number of trees for identification will be adequate to the technical possibility of identifying trees and to the fact if the available ortho-photos are updated.

The presented analysis has to be then taken into account in the study of conditions and directions of spatial management.

To sum up, the presented catalogues, assessments, street greenery analyses as well as other information of significance to street greenery and works carried out on ecophysioographies and studies of conditions and directions constitute a good, detailed material for diagnosing, assessing and formulating conclusions related to the conditions concerned with street greenery for the needs of the study of conditions and directions. The other mentioned information of importance to street greenery that may be used include information about other greenery areas, nature system of the city, streets, spatial management of areas that adjoin streets, types of vegetation landscapes or noise hazards.

The information/materials presented above make it possible to plan street greenery on the basis of the current situation and existing greenery.

**Recommendations for coverage of street greenery in the study of conditions and direction of spatial development**

In the study (of conditions and directions of spatial management) it is possible to give adequate account to street greenery and its environment in reference to the whole of the analysed town.
The texts and drawings concerning street greenery should be prepared on the basis of available and previous studies, particularly with the use of the recommended catalogues, assessments and analyses of street greenery in the ecophysiographic study.

The study of conditions and directions should formulate conditions and directions related to all existing and planned streets in the town on their whole length and to street adjoining areas. However, in big cities that have a lot of long streets it is possible to cover street greenery in detail only in reference to the more important streets.

The study is a planning document which may cover the connection of street greenery areas with other street greenery areas and with other kinds of greenery areas, with the nature system of a town and with the whole planned spatial development.

Since a study of conditions and directions is a generic document with generic provisions, scales and maps used, street greenery should be covered in a generic and simplified way but also with a certain level of detail and adequacy to the given town, the information about greenery should be generalised but correspond to particular situations and streets.

The maps should present street greenery using appropriate graphic symbols adjusted to the general graphic appearance of the ecophysiographic study and to the map scale.

It is to be emphasised that the provisions concerning street greenery constitute a fragment of wider provisions concerning greenery in the study and this is the context in which they should be interpreted.

Moreover, the provisions concerning street greenery should be formulated in connection with the elements of spatial management that coexist with it and that condition its existence in the study, in particular with streets, areas that directly adjoin streets, public/representative areas, historical streets and street adjoining areas.

At the stage of the study, particularly during the works on the directions of spatial management, provisions and drawings related to newly planned streets are added including the street greenery attached to it.

The catalogues and assessments presented below should be made as components of the appropriate drawings attached to the studies, e.g. drawings called Conditions of spatial management / Natural Environment, Directions of spatial management/Nature system of Warsaw.

Thus, the following provisions and drawings are recommended (the following modification and addition to the present provisions and drawings) for street greenery in the study on the example of the study
of conditions and directions of spatial management of the capital city of Warsaw.

The following provisions concerning street greenery are recommended in the part called Conditions of spatial management of the capital city of Warsaw in division V Condition and functioning of the environment, in chapter I Structure of nature in subchapter Structure of greenery areas in item Street greenery:

Street greenery accompanies most of the streets of the city as detailed in the catalogue of street greenery (see drawings 5a and 5b)

As shown in the catalogue there are … kilometres of streets in the city and: … km of street sections with a large share of high greenery, … km of streets with lawns/a small share of high greenery, … km of street sections without greenery.

The most common greenery forms are (e.g. tree lanes, planted vegetation in the form of greenery groups of various height arranged into compositions along streets, scarps and embankments; some streets have trees that make them look like lanes.)

Because of the unique value and age the following trees have been named natural monuments: ....

Street greenery is an element that enhances the quality of the street areas and their appearance. The role of the greenery that accompanies streets is to separate vehicle traffic from other passages that run along streets (footpaths, bicycle paths), to provide acoustic insulation, to limit the spreading of pollutions generated by transport, prevention of dazzle, protection of slopes of embankments and excavations against slides and soil erosion.

Apart from this, street greenery network is important for connecting the city greenery and nature system.

In Warsaw streets there are: … trees, … shrubs, … creepers, … as well as … flower pots with the area of …, … lawns with the area of ....

In division into districts the above data present as follows: …

There are ...species of trees, ...species of shrubs, … species of creepers.

In division into districts the above data present as follows: …

Including the following species of trees: …, of shrubs: …, of creepers: …

The age of the trees is the following: there are … trees aged …, …

In division into districts the above data present as follows: …

Varied, but generally difficult street conditions result in significant variety of the health condition of the trees.
There are … trees in good condition, … trees in fairly good condition, … trees in bad condition.

In division into districts the above data present as follows: …

The following provisions concerning street greenery are recommended in the part called Directions of spatial management of the capital city of Warsaw, in division XII Directions of changes in the spatial structure and the purpose of the areas in chapter I Spatial structure - directions of changes, in subchapter 1.1. Elements forming spatial structure and city landscape, in item (6) Greenery areas, including forest greenery areas.

Drawing 5a. Catalogue/assessment of street greenery (see the description in the text) on the background of the drawing of the Study of the capital city of Warsaw/Conditions of spatial management / Natural Environment - illustration of the street network at a scale of the city
(source of the study map: http://www.architektura.um.warszawa.pl/studium)
The following general assumptions and main directions of changes are assumed. Greenery areas constitute a significant component of the city structure. They will have a variety of functions (biological, climatic and hydrological functions) co-creating the Nature System of Warsaw as accompanied by the Vistula and the river bank greenery and hydrographical system and areas of other purposes. Apart from natural functions the greenery areas will play important social, cultural and aesthetic roles.

In the structure of greenery areas in Warsaw, the areas of arranged greenery, including street greenery, are discriminated.

For the formation of the spatial structure of greenery areas it is important to:
- preserve and create the spatial continuity of the natural structure of Warsaw in relation with the interregional and regional systems of natural connections;
- expose the areas of high natural and landscape values in the city structure and stop the degradation of greenery;

(source of the study map: http://www.architektura.um.warszawa.pl/studium)
subject the forms of management to natural functions and create optimum conditions for residence, work and relaxation.

The main directions of changes and transformations of greenery areas require protection of natural environment and its resources, appropriate directions of changes and transformations concerned with the functions of areas in spatial management, including protection of the existing and creation of new greenery accompanying buildings and housing estate greenery including greenery in streets and squares.

Drawing 6a. The directions concerned with planning street greenery in streets classified from the point of view of significance to street greenery on the background of the drawing of the Study of the capital city of Warsaw/Directions of spatial management/Nature system of Warsaw - illustration of the street network at a scale of the city

(source of the study map: http://www.architektura.um.warszawa.pl/studium)
Protection of the existing and introduction of new street greenery in the Study covers adaptation of the existing street greenery, building the network of street greenery to make it inscribe in the city in an appropriate way, in the system of city greenery, in the city nature system, in the street interiors, public areas and representative areas based on the elements presented above and their value (see drawings 6a and 6b).

In order to do this kinds of streets were discriminated and their significance to street greenery was weighted. As a result, directions of street greenery network have been set out in individual street sections that have a varied significance for greenery.

To sum up, the presented catalogues and assessments of street greenery accompanied by other information of significance to street greenery and the analyses carried out during the works on the study of conditions and directions constitute a good, particular material for formulating conditions and directions concerned with street greenery. The above-mentioned other
information of significance to street greenery that may be used include 
information about existing and planned greenery areas of a different type, 
about the nature system of the city, about streets, spatial development of 
the street adjoining areas (e.g. connecting the street greenery network 
with the road classification map prepared during the works on the study of 
conditions and directions we obtain information concerning conditions for 
street greenery created by the technical parameters of roads and the nature 
of traffic in various streets).

Summary

Street greenery as a particularly important element of city greenery, 
faced with the identified problems of marginalisation and inappropriate 
planning on the local level, requires an enhancement.

This article presents conclusions of studies and the worked out solu-
tions saying how street greenery is covered in the ecophysiographic study 
and the study of conditions and directions of spatial management.

This suggestion of coverage of street greenery in the ecophysiographic 
study or the study of conditions and directions is inscribed in the scope of 
currently prepared studies in a harmonious way, extends them and fills in 
the gaps in this respect.

Opportunities of appropriate, relevant, precise and realistic street 
greenery planning are discussed concerning the subsequent stages of works: 
starting from inventory works, analyses, guidelines for ecophysiography, 
through conditions through directions of spatial management covered by 
the study.

Simultaneously, the issues connected with greenery/street greenery 
in spatial planning on the local level require comprehensive works and 
solutions, particularly within the scope of methodology, standards and 
legal regulations.

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