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Зеленая инфраструктура: от глобального к локальному
Сборник материалов международной конференции
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Сборник трудов конференции «Зеленая инфраструктура: от глобального к локальному» содержит тезисы докладов, прошедших процесс двойного реферирования, осуществленного научным комитетом. Конференция проводилась во Мраморном Дворце Санкт-Петербурга и в Ултуне, Уппсале, Швеция с 11 по 15 июня 2012 года. Эта конференция была изначально задумана и поддержана Шведским университетом сельскохозяйственных наук в Уппсале, администрацией города Санкт-Петербург, Санкт-Петербургским государственным лесотехническим университетом, Шведским Институтом (Швеция), FORMAS (Швеция) и Европейской Федерацией Ландшафтных Архитекторов.

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Introduction and Welcome

Welcome, and Добро Пожаловать! to the conference "Green Infrastructure: from global to local", held at Marble Palace, St Petersburg, Russia, and in SLU, Ultuna, Uppsala, Sweden from 11 to 15 June, 2012.

The Conference

The idea to host a conference in Russia and in Sweden in 2012 stems from 5 previous conferences which took place in St. Petersburg. The first international conference in 2007 entitled "Globalisation and Landscape Architecture (GaLA): issues for education and practice" was an immense success. The 2008 conference addressed different international aspects of urban design and ecology and was dedicated to the 75th anniversary of the first Russian landscape architecture program, which was introduced at the Saint-Petersburg Forest Technical Academy in 1933. The 2009 conference was addressed historical landscapes in the modern era. 2010 Conference was dedicated to contemporary landscape design and 2011 to the Landscape architecture projects: from theory to implementation. The success of these five conferences inspired EFLA to offer St. Petersburg and Uppsala as places for the EFLA Regional Congress.

The main objective of this conference was to raise the attention and awareness among scientists, urban planners, landscape architects, city's administrations and the other stakeholders on importance of creating sustainable green infrastructure in the cities and using the full potentials of green infrastructure for primary production, biodiversity development, ecosystems services, recreation and mitigation of consequences of globalisation and climate change. The conference focus is reinforced by the widely international conference participants, who come from Russia, Sweden, Italy, New Zealand, USA, Malaysia, France, Canada, Turkey, Estonia, Iran, Slovakia, Japan, Latvia, Austria, The Netherlands, Germany, Serbia, Poland, Lithuania, Portugal, China, South Korea, Ukraine, Belgium, UK, Australia, Romania, Singapore, Nigeria, Egypt, Kazakhstan, Slovak Republic, Spain, Hungary and Bulgaria.

Content:

Welcome note

This is the second year in a row that I have had the privilege of attending the ICON-LA event here in St. Petersburg, Russia. Last year's event was a resounding success and just a quick glance at this year's programme suggests that everyone who has been wise enough to book their place at the conference is in for an exceptionally informative and professionally challenging series of educationally and intellectually challenging debates. It is comforting to know that the topic of green infrastructure is so high on the political agendas of many governments around the world.

The programme indicates the widest range of speakers and presenters from our profession across the globe. It is wonderful to see so many new faces, the future of our profession, alongside many of those more familiar, well-established professionals - all of whom will offer opportunities for in-depth engagement and further (polite!) interrogation.

Hopefully, many of you will have taken the opportunity to get a closer look at this wonderfully 'green' city full of public parks and vibrant amenity open spaces. The pre- and post-conference tours I attended last year gave me my very first opportunity to better understand the wonderful work that has been taking place with remarkable effect. This year's conference has, of course, the added bonus of taking us on a trip across the Russian countryside by train to Helsinki and then on to Sweden by boat for the second stage of presentations. I commend all of those involved with the organisation of this conference for the inspirational approach taken to provide us with what must be one of the most exciting conference events we could hope for.

Prior to the ICON-LA event I had the privilege of chairing the annual general assembly (GA) of the European Federation for Landscape Architecture (IFLA Europe) also here in St. Petersburg. As president of the Federation, I wish to thank Larissa Kanunnikova (on both a professional and personal level) for providing us with a venue for our meeting at such relatively short notice and without a second thought as to the added pressures this may place upon her and her team of dedicated professionals. Without such help our aim of promoting the profession via the presentation of the GA in as many member countries as we can within the Council of Europe and the European Union would have fallen from the rails at only our second attempt.

Thus, it is that I wish everyone here a very enjoyable (and educational) event and hope that you will all depart the conference after four or five exceptionally rewarding days and spread the word to your professional colleagues and friends to let them know just how much they have missed and where they need to be around this time next year!

With very best wishes and very many thanks,

Nigel Thorne MSc FRSA MIHort Intl.ASLA FLI PPLI
President, the European Federation for Landscape Architecture
Vice-president, the International Federation of Landscape Architects

Welcome note

Dear participants of the conference!

It is for the sixth time that the best world professionals come to Saint Petersburg to participate in the annual conference and discuss the problems which are topical for all regions, countries and cities.

The theme of the conference "Green infrastructure: from global to local" is a great ground for sharing and combining our unique experience, strategies, creative achievements to elaborate new trends in the creation of city landscape as integral, diverse and harmonically developing environment.

Saint Petersburg is the best place for the meeting of specialists in the sphere of landscape architecture and design. In the city space the glorious traditions of landscape art are united with the modern ideas and solutions. The traditions embedded in historical ensembles of gardens and parks, water panoramas and embankments are carried on and provide the basis for new green infrastructures.

Participants from 41 countries of the world have got together at the conference in order to unite their efforts in finding the ways of achievements integration for the creation of sustainable city landscape systems. Wide range of questions to be discussed at the conference:urbanization and ecology, globalization processes interaction, preservation of historical and natural diversity and unique features, social development and culture. Each participant will be able to obtain valuable information and contribute into joint experience.

Saint Petersburg is very glad to welcome the conference participants and wish them fruitful cooperation and creative atmosphere.

Уважаемые участники конференции! Дорогие друзья!

Вот уже шестой год Санкт-Петербург собирает лучших профессионалов мира для обсуждения проблем, актуальных для всех регионов, стран и городов.

Тема нынешней конференции «Зелёная инфраструктура: от глобального к локальному» — прекрасный повод объединить наш уникальный опыт, стратегии, творческие достижения в поиске новых направлений создания городского ландшафта как целостной, многообразной, гармонично развивающейся среды.

Санкт-Петербург — лучшее место для встреч специалистов в области ландшафтной архитектуры и дизайна. В пространстве города соединяются великие традиции садово-паркового искусства, современные идеи и решения. Исторические ансамбли садов и парков, водных панорам и набережных находят продолжение в новых зелёных структурах, создаваемых в контексте развития городских территорий.

Сегодня на конференции собрались участники из 41 страны мира, чтобы вместе найти пути интеграции достижений в создании устойчивых систем городского ландшафта. Широкий круг вопросов урбанизации и экологии, взаимодействия процессов глобализации, сохранения исторического и природного своеобразия, социального развития и культуры позволит каждому из участников внести свой вклад в совместный опыт и получить ценную информацию.

Санкт-Петербург рад приветствовать участников конференции с пожеланием плодотворного сотрудничества и творческой атмосферы.

Larisa Kanunnikova
Chief landscape architect
Administration of St. Petersburg

Лариса Викторовна Канунникова
Начальник управления ландшафтной архитектуры
Комитета по градостроительству и архитектуре Санкт-Петербурга

Keynotes

speeches

abstracts

Resilient Citylands — Launching a New Research program for Sustainable Human Habitats in the Baltic Sea Region

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Resilient Citylands is presented during the sixth ICON-LA conference as a new cutting-edge concept describing carbon-neutral, transport- and resources efficient urban-rural integrated human settlements, suggested to be realized in Baltic Sea Region cities within the next four decades. Resilient Citylands feature an appropriate fractal integration of built and green/blue structures at a range of scales from the largest macro-and micro-regional to the intermediary city- to the small local community and fine scale details. Future urban Cityland structures are expected to combine urban form and function with rural properties. Future rural Cityland structures are also expected to integrate urban functions. Shared features for more urban parts and more rural parts comprise primary production, recreation, and ecosystem services for green/blue structures of different scales. But they also contain urban-rural interactions of transportation, modern communication, settlement morphology, supplementing cultural landscapes and assets. The co-evolution of future urban and rural areas particularly highlights the boundary zones between the built and green/blue structures as strategic areas for providing the industrial and process combinations for exchange and refinement of Cityland physical and non-physical resources. Good practices of emerging Citylands will be shown from Sweden, Denmark, Germany, Holland and China. A practical road map for the development of the Baltic Sea Region Cityland project will also be displayed

Perspectives of urban blue-green infrastructure

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Urban blue-green infrastructure holds many advantages and possibilities: it provides amenity, structure to the city mesh, recreation areas, biological-technical functions such as cleaning city air and improving city climate and hydrology. It also makes available areas for schools' outdoor education, and improvement of public health leading to reduced social costs (McDonnell et al. 2009). On the other hand, if poorly planned, designed and managed, the urban blue-green infrastructure can hold many disadvantages and problems: Spaces Left Over in Planning (SLOP), ugliness if unmanaged, areas used as nothing but shelter areas to roads and industries, wear-and-tear, conformity, and costly planning problems. The city of Stockholm can be taken as an example (Florgård, 2007). The nowadays blue-green infrastructure is from many points-of-view a model for a well-developed structure. Blue-green "fingers" connect the surrounding countryside as wedges into the very city centre, providing possibilities for clean air to enter the city, as well as ecological corridors. The structure makes the city

conceivable, and there is never far to go for any citizen from home to a green area. Is Stockholm a unique example? Yes, and no. It is unique in the way that the natural conditions are favourable. But no, it is not unique in the way that many cities have the chance to make changes at some stage in their development. The blue-green structure of Stockholm did from the beginning emerge by chance. Intentional development has only happened during the last century. Many cities, nonetheless, may hold that opportunity. Due to industrial crises, economic crises, changes in land-use and so on, often opportunities emerge to change the city structure and develop a blue-green structure. The key factors are three: first, to capitalise on an opportunity when it occurs. For that to happen, some sort of preparedness is necessary, at least at the idea level. To be prepared can mean that the idea of a structure is present. Second, the occurrence of committed people in the city administration is vital. A committed person, or better a group of politicians, planners and experts, can do much if they get the chance. Third, the support of the public is crucial. Members of the public are on many occasions very interested in their environment. These factors were at hand when the Stockholm blue-green infrastructure was established. But these factors are international. In many cases such planning strategies can be developed. There are, however, some threats even to an established structure. A significant threat is a combination of irreversible changes and the so-called tyranny of small steps (Florgård 2010). If a part of the blue-green infrastructure is built on, even for deserving purposes such as schools and day nurseries, this area will not usually turn back to a green area; the change is irreversible. One small change might not have much negative impact; so another development for another deserving purpose might be carried out. The cumulative effect of such uncoordinated small steps threatens the value of the whole area.

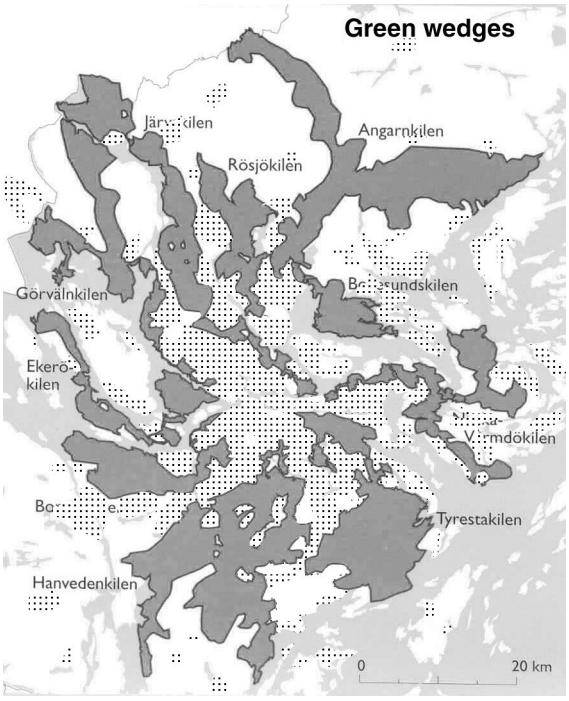

Fig. 1. Stockholm's green wedges ("…kilen" = wedge). Grey = developed areas (including parks and small natural areas)

Historic green infrastructure of St. Petersburg: present and future

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Saint Petersburg or "Venice of the North" is a unique city from the historical, cultural and natural viewpoints. The city was built in the complicated climatic conditions (complicated hydrological conditions, issues of annual floods, northern location (latitude 60 North). Its historical center and architectural complexeswere included in the UNESCO World Heritage List in 1991. There are 700 architectural monuments of

18th–19th centuries and historical parks under the State protection in the central part of Saint Petersburg. A great number of historical monuments makes the strategy of their protection in market economies especially complicated.

Nowadays the architectural and design regulations, rules and other standard documentation are being developed in order to improve normative and legal mechanisms of State regulations in the sphere of landscape organization, urban environmental improvement and control of the activities on preserving the city's architectural and historical appearance and coordination of public authorities.

Comprehensive approach to the problems of preserving the architectural city's integrity, modern organization and urban territorial improvements is accepted as a basis of the standard and legal documents.

The Regulations of Nevsky Prospect were developed in 2010. These Regulations are aimed to regulating the problems of complex architectural and landscape environmental organization including the colors of facades, external improvement, flower decoration, small architectural forms taking into consideration the urban design of Nevsky Prospect as the main axis of Saint Petersburg, as well as one of the main elements of City's green infrastructure and landscape scenario.

Main goals of the regulations are:

- to preserve its historic and cultural heritage;
- to improve the urban environmental quality;
- sustainable development;
- to preserve and develop green system;
- to form an integral system of the historical center's urban landscape.

The Regulations were approved by the decree of the Committee on Urban Development and Architecture on May 28, 2010 No.: 1759 "About approving the arcitectural and decorative Regulations of Nevsky Prospect and adjoined areas".

One of the most important problems for modern Russia is to explore the experience of European countries and to develop efectively the green infrastructure including the historical center of Saint Petersburg.

Main strategic aspects of the architectural and landscape scenario using the examples of City's various historical districts are shown in this presentation.

Urban hinterland as bio-cultural heritage: Application of an ecological landscape framework to greening Middle Eastern cities

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The problematics of unregulated urban growth in Middle Eastern cities is often framed with disregard to the rural hinterland. As a result, rural peripheries and the semi-natural landscapes they incorporate are reduced to 'available' land that can accommodate the expanding urban footprint. The loss of open/green landscapes deprives the urban inhabitants from encounters with nature, erodes the sense of place and region and adversely impacts the urban environment. Growing demand for housing and infrastructural services, perhaps understandably, takes priority. In this presenta-

tion I will argue that the self-centered, exclusive outlook is not only counterproductive but is in fact detrimental to the city and its inhabitants. Instead, I propose a shift in urban greening towards an inclusive, holistic framework that prioritizes the synergy between city and its natural and rural peripheries. Rural peripheries, villages and agricultural fields, mountain and desert, embody the co-evolution of culture and nature in the Middle East, a landscape heritage and repository of the 'natural' and 'cultural' wealth that predates the city. The hinterland thus has the potential to inspire urban greening strategies and counterbalance prevailing neoliberal planning of cities in the region. To demonstrate my argument I shall draw on a large-scale urban greening project in the city of Erbil, Iraq. The landscape of greater Erbil straddles the Kurdish foothills and the western desert plateau. The hinterland landscape of Erbil includes 23 villages, rainfed agriculture and pastoral lands and seasonal watercourses. Applying the holistic framework of ecological landscape design, the project vision is broadened beyond the current focus on the city towards protecting the natural environment, agricultural livelihoods and rural heritage while providing an alternative conception of amenity and recreation.

Green infrastructure for Europe's growing and shrinking city regions

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Europe is a highly urbanized continent where 70% of the human population is already living in urban areas. This figure is expected to increase to 84% by 2050 (Kabisch and Haase, 2011), leading to the further expansion of urban areas. Interpretation of CORINE land cover data shows, that more than 8000 km² were converted from farmland and natural areas to artificial surfaces between 1990 and 2000 alone, approximately corresponding to the size of Luxembourg (EEA, 2006). It is a one-way process as almost no land was converted back in the same period. Moreover, the density of urban development has dramatically decreased. Between 1950 and 1990, urban areas expanded by 78% while the population grew only by 33% in the same period (EEA, 2006). This low density, and often leap frogging development has been termed urban sprawl.

However, very different trends can be observed. While economically thriving city regions continue to attract people, other cities are losing population, and are thus shrinking. In growing city regions, pressure on open spaces is high both within and outside built areas. Shrinkage, on the other hand, leads to decline and abandonment of unattractive inner city neighbourhoods but still low-density developments can occur at the urban fringe. At the same time, wastelands in shrinking cities can have a level of high biodiversity; they may offer the potential to reduce green space deficits in densely built areas as well as moderating the urban climate. These potentials, nonetheless, are rarely realized in declining cities due to economic constraints.

Green infrastructure is suggested in this presentation as an important approach to promote environmental quality and to face the challenges of climate change in urban areas. We define green infrastructure as an integrated and strategic approach to the development of a coherent green space system providing multiple ecosystem

services in urban areas. Green infrastructure can include all green areas in a city, from public green spaces such as parks, woodlands and other natural areas, farmland as well designed green spaces on private grounds such as residential gardens and roof greening. Wastelands can be an important component of the green infrastructure as well.

The presentation will draw on results from the research project PLUREL – Peri-urban land use relationships – Strategies and Sustainability Assessment Tools for Urban-Rural Linkages, funded by EU from 2007–2011:

To explore the drivers and processes of landscape change in Europe's rural-urban regions.

To identify formal and informal approaches to the planning for multifunctional green infrastructure in rural-urban regions which are adapted to the specific conditions and respond to the particular challenges of Europe's diverse rural-urban regions.

Urban Green Infrastructure for Climate Benefit: Global to Local

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Climate change has been called the defining issue of the twenty-first century, with cities seen as both solutions for reducing overall greenhouse gas emissions as well as the places most dramatically and tragically impacted and therefore most critically requiring adaptive practices. Plagued by uncertainty and the diverse expected global and localized impacts of climate change, planners and designers are challenged to find solutions to help prepare for the inevitable impacts that existing atmospheric carbon levels are predicted to cause, while also promoting practices that will minimize those levels and therefore potentially reduce the severity of effects. Taking an ecological approach, how can we negotiate uncertainty, complexity, and the need for flexibility with the goal of achieving resilient, humane, biodiverse regions and metropolises? Urban green infrastructure offers a perspective and a suite of methods that encompass multiple urban systems, with the capacity to simultaneously address climate change issues while also providing multiple benefits related to urban environments, health and quality of life. The presentation will offer a comprehensive definition of green infrastructure and examine the multiple advantages of implementing urban green infrastructure practices, especially related to climate benefit. Highlighting the dual mitigation and adaptation capacities of urban green infrastructure systems, the presentation will illustrate planning and design practices and principles through both imagined futures and existing enacted examples from the US, Asia, New Zealand and Europe.

Abstracts

In English

The search for the relational complex system: A theoretical framework for interconnections between a landscape and contemporary art

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Landscape is a changing entity. A cultural landscape, in mutual connection with contemporary art processes, is like a living organism, which is always subjected to changes in time. To a great extent, it is related to globalization and urbanization processes, introducing new forms as well as understanding and perception determined by time and space. Connections and disruptions among various spaces, density of artworks in space and a connection with a landscape is part of the processes mentioned above and they are subject to change upon modifying different settings of the planning. Hence the focus moves from individual artwork conception vis a vis the system of artworks.

Therefore, in this research interconnections between different perspectives are explored looking for the answers to the following questions: How are new relationships between the cultural landscape and contemporary art established? What is the perspective in a global and local space interpretation? What are the potential global and site-specific planning tools and opportunities? To find the answers, case studies in three different levels are analyzed including the Latvian and international contemporary art projects. Respectively, these perceptive levels represent:

• a single artwork as an element – represented by cybernetic sculpture "Red Queen's Race" at the Jelgava Palace courtyard by artist Krists Pudzens, Latvia (Fig. 1);

Fig. 1. Cybernetic sculpture "Red Queen's Race" at the Jelgava Palace courtyard by artist Krists Pudzens, Latvia
a – designed place at the Jelgava Palace garden (visualization),
b – implemented at the Jelgava Palace courtyard.

• as a group of artworks, complex entity – represented by the Open-Air Art Museum at Pedvāle (Fig. 2); and

• a totality of groups in the landscape, a type of system to function internationally, including parks of manor houses or new parks dedicated for modern and contemporary art – represented by the Yorkshire Sculpture Park, the United Kingdom (Fig. 3).

For a more valuable analysis, interviews with the authors of the projects, curators and representatives of local governments have been provided.

Through the case studies provided, the paper closely examines connections to the landscape through analysis of materials and narratives used, as well as via contribution to place making. The aim of this investigation is to study, analyze and develop those interconnections between the landscape and contemporary art, which determine the contrapositions of the global and local in the landscape, applying the approach of production of space as suggested by Henri Lefebvre. He formulates space as a complicated network of relationships that is constantly being elaborated and re-elaborated.

According to the conceptual summary on the production of space provided by Lefebvre, contemporary artworks have been explored as a totality of groups that forms a certain system. Thus, this research offers an approach of a complex system, which defines the connection of the global and the local focus with the potential of the landscape and the landscape determined by the work of art. This connection characterizes the different approaches in planning, namely, the vertical and horizontal. The research is concluded by drawing attention to the tension which occurs and results from the representative set-up of the artwork, and questions what impact is left on a spectator by the artworks.

Fig. 2. The Open-Air Art Museum at Pedvāle, Latvia

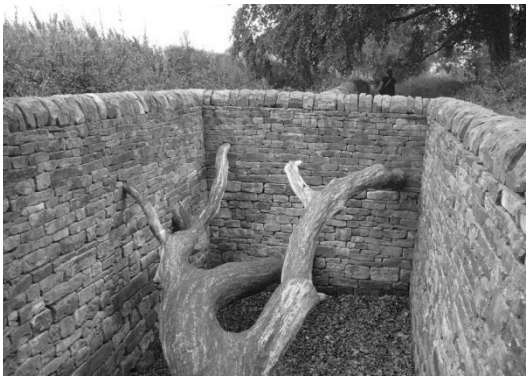

Fig. 3. The Yorkshire Sculpture Park, United Kingdom

Condition estimation and prospects of planting trees and shrubs in large cities of Povolzhye

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Green plantings are obligatory and a significant component (element) of the urban landscape, providing comfort and quality for people and astabilizer of ecological equilibrium.

A condition analysis of planted trees and shrubs in large cities of Povolzhye (Samara, Toliatti, Volgograd, Saratov) showed that areas of green plantings in most cases do not correspond with normative requirements, when in urban agglomerations the area of planted trees and shrubs should occupy not less than 50% of the territory (including country woods), but in residential areas – is not less than 25%.

Only 10% of Samara's population live in the territories which have sufficient planting of trees and shrubs, 84,5% – with provision of 45% and less norm of planting trees and shrubs (table 1). From 2006 to 2010 years 73,2 hectares of green plantings were destroyed at transfer of city lands to other categories.

Table 1.

Normative and real provision of green plantings in administrative districts of Samara

Regions	Existing planted trees and shrubs		Necessary area (according to the standard 10 m^2/p)	Deficiency of planted trees and shrubs		Population thousands of people
	hectare	m^2/p	hectare	hectare	m^2/p	
Kuibyshevsky	20.1	2.5	80.4	60.3	7.5	80.4
Samarsky	7.9	2.5	30.5	22.6	7.5	30.5
Leninsky	48.0	7.5	63.8	15.8	2.5	63.8
Oktyabrsky	114.9	10.4	110.1	0	-	110.1
Zheleznodorozhny	15.0	1.5	103.6	88.6	8.5	103.6
Sovetsky	35.1	2	178.4	143.3	8	178.4
Promyshleny	124.4	4.5	268.7	144.3	5.5	268.7
Kirovsky	65.1	3	231.1	166	7	231.1
Krasnoglinsky	37.5	4	84.3	46.8	6	84.3
Only around the city:	468.0	4	1150.0	682.9	6	1150.9

*Reference: general plan of Samara's development

The green planting area of general use in Toliatti within the inhabited territory is 755 hectares that makes only 42% from the standard.

It is necessary to recognize that the current state of green territories in Volgograd is also adverse. In the administrative districts of the city the unevenness of green tracts distribution is observed (table 2).

Table 2.

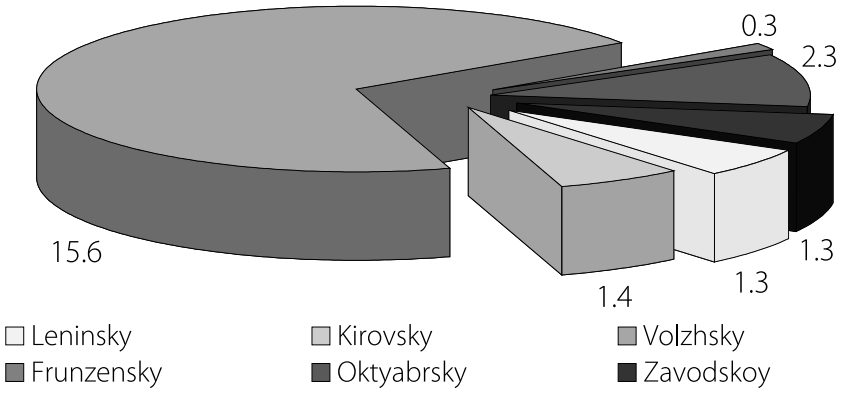
Green plantings provision of the general using on administrative districts in Volgograd

№	District name	Actual provision, m^2/per	Area of planted trees and shrubs of general useper hectare
1.	Tsentralny	27.9	370.0
2.	Voroshilovsky	4.9	54.4
3.	Sovetsky	4.0	76.0
4.	Dzerzhinsky	6.0	200.1
5.	Tractorozavodskoj	7.8	110.42
6.	Krasnooktyabrsky	11.4	172.5
7.	Kirovsky	12.2	113.5
8.	Krasnoarmeisky	12.2	195.9
	Only around the city:	10.8	1292.82

At present there are 12389 hectares of green plantings in the city. The area of green plantings at one resident is less than 10,0 m^2. There is a systematic destruction of green plantings too in dense building zones.

The special feature for Sartov is very dense building, especially in the city center. In 2009 there were only 3,5 m^2 green plantings for each inhabitant of Saratov.

Fig. 1. Green planting provision for the general use in administrative districts in Saratov (m^2)



Thus, for all cities of Povolzhye the tendency is to area reduction of t planted trees and shrubs as a result of dense building.. One of the means of increasing areas of green planting is active development of territories with divided forms of a relief which are not suitable for building. According to the official "Russian Earth Fund" ravines cover 1,1 up to thousand hectares in the cities of the Saratov region ; in Volgograd region – 1,7 thousand hectares; in Samara region – 0,2 thousand hectares.

Created plantings should possess simultaneously high sanitary – protective and aesthetic properties that is impossible without expansion of the range of uses of trees and shrubs.

Ecosystem services in urban planning – mapping and visions

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The concept of ecosystem services is still new and unfamiliar to many actors in urban land-use planning in Finland, and has been mostly used for research purposes only. In my research I am studying the possibilities of utilizing ecosystem services in urban planning. Firstly, I present what kind of ecosystem services are provided by urban areas. Secondly, I research tools in the field of urban land-use planning for preserving and enhancing the functions of natural processes. Here, the participation of citizens is included as a potential resource. And finally, I show my visions of what the future of "ecosystem service cities" could look like.

In contemporary urban planning cities should be understood as a complex systems formed by the interaction between nature and culture. In addition to different administrative structures, cities can be seen as dynamic organisms formed by their inhabitants. Therefore, for creating sustainable cities, we should look at the whole picture, not being restricted by artificial borders or the existing policies of planning and management. The ecosystem functions are not only present in the green areas shown in master plans. Actually a large part of the green space in cities is located elsewhere, including streets, private gardens, wastelands etc. The capacity of public green areas is not capable of filling all the demands related to, for example, storm water management or recreational use, as the cities keep growing and the land use is intensified. For resolving the existing pressures on public green areas we need to bring new concepts like green infrastructure. However, I find that the planning of green infrastructure is still needed in more holistic and multi-disciplinary approach. Ecosystem services could be a useful concept on the way towards ecological urbanism.

This research present the results of the mapping of the most important ecosystem services found in urban areas, including water purification, health benefits, pollination i.e. The city of Lahti, Finland is used as a case study, however it can be applicable for any urban area. The aim of the mapping process is, first of all, to clarify what is meant with ecosystem services in an urban context, and secondly, to illustrate what kind of ecosystem services are provided by different urban neighborhoods. For this purposes the city was divided into different functional areas, including gardens and courtyards, public green areas, commercial areas, infrastructural areas, urban forests, water edges, other natural areas and wastelands. The mapping will be concluded in May 2012.

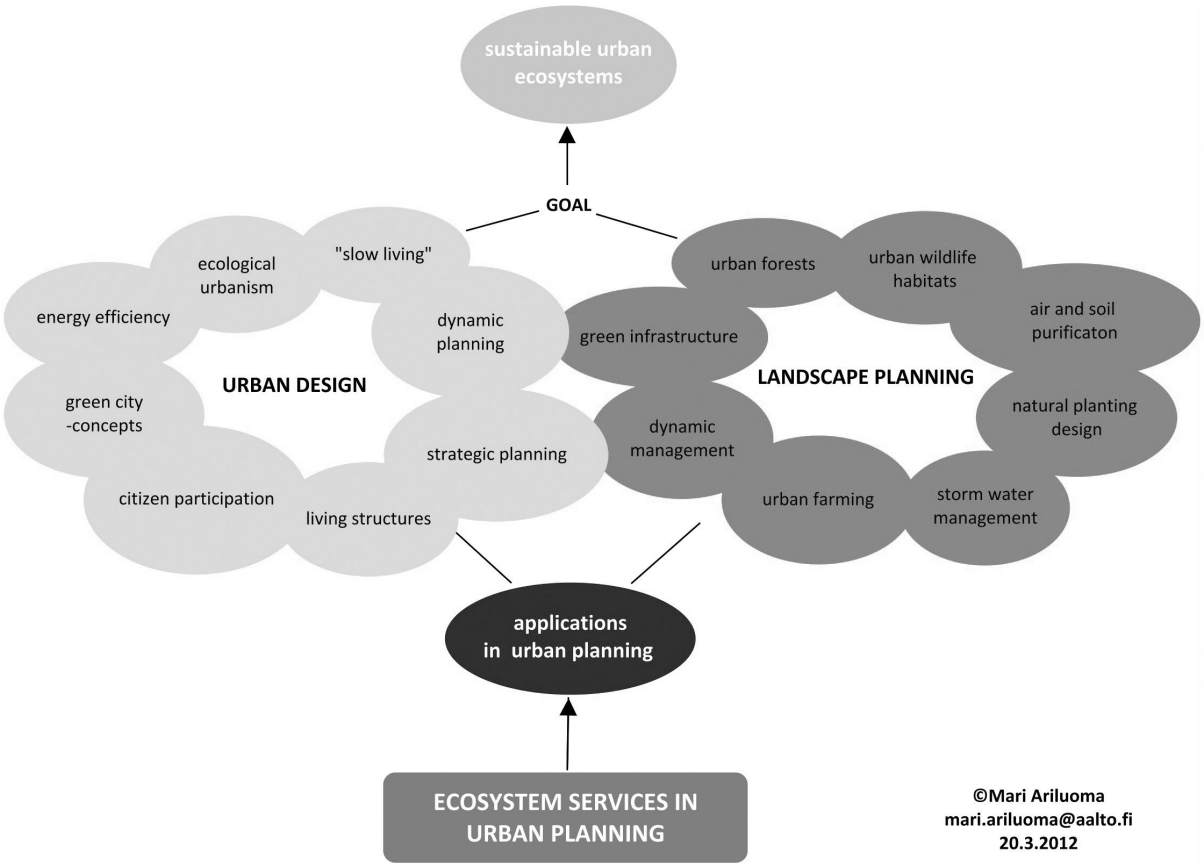

Fig. 1. Possible and existing application of ecosystem services in urban planning.

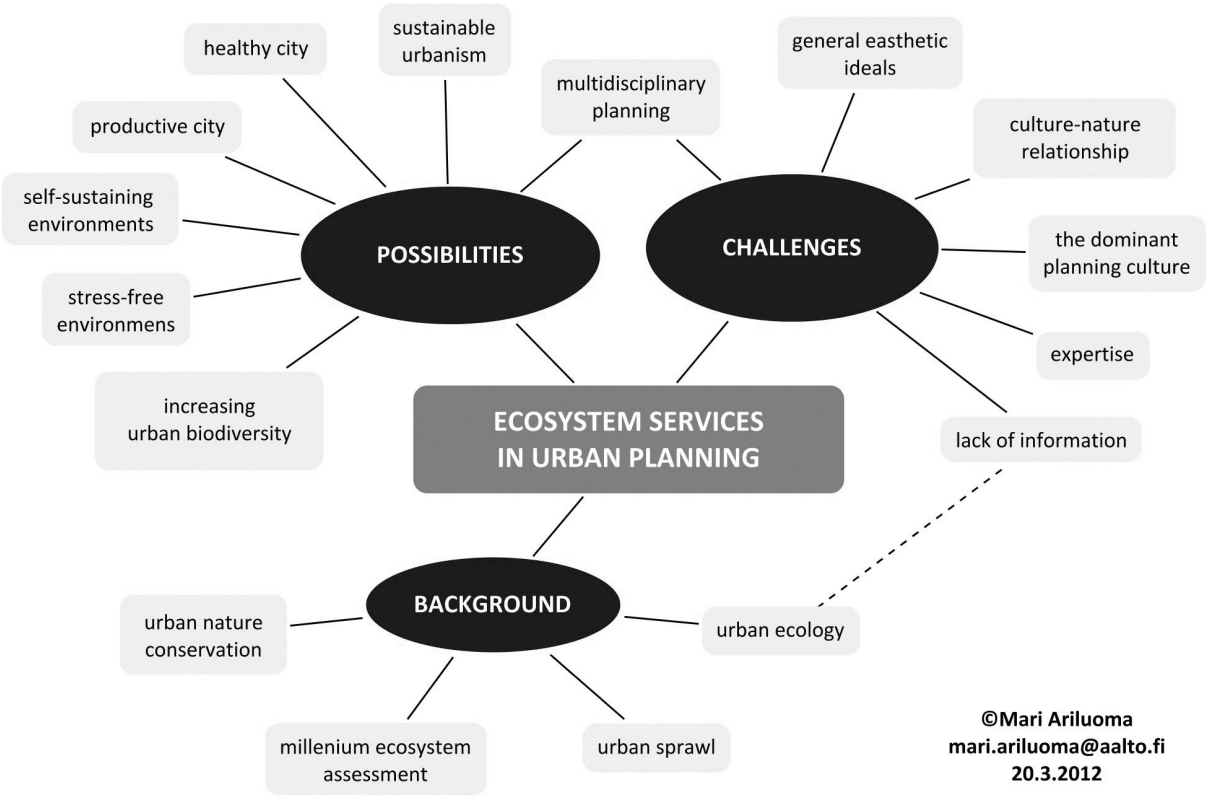

Fig. 2. Possibilities and challenges of an ecosystem services approach for urban planning.

Exploring the Roles of Ecological Networks and Ecosystem Service Assessments in Socio-Ecological Systems

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Spatial heterogeneity in urban ecosystems results in increasingly isolated remnant patches unable to support ecological processes. The ecological network concept, as a sub-system of green infrastructure, has emerged in the past three decades in response to expectations for a balance between conservation and development in human-altered environments. It is a spatial concept developed to facilitate the connection of critical ecosystems for protection and restoration of biodiversity. The notion of a sustainable landscape not only emphasizes ecological integrity and the provision of ecological services, but also a social dimension that is not externalized in dynamic and complex ecosystems. As the ecological network concept is a societal construct, this dimension is focused on the impacts of landscape fragmentation on human interaction and contact with nature. This paper reviews and critiques literature on ecological networks published between 1995 and 2011, emphasizing the viability of multiple services provided in the planning and implementation process. Included is a commentary on whether ecological services, as an indicator of value, sufficiently capture the social dimension. An extensive literature search was carried out from primary and secondary sources using keywords of ecological network, biodiversity conservation and ecosystem services. The paper explores whether the primary ecological role of the connectivity embedded in an ecological network relates to social dimension. It is contended that these dimensions remain uncaptured in the decision-making process. A range of challenges and issues remain, however, for integrating biodiversity conservation with other sustainable uses of landscape. This paper suggests potential research directions that could help address these challenges.

Low Impact Design as a tool to create sustainable and interactive environment in the town of Novoe Devyatkino

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Novoe Devyatkino is a typical St. Petersburg suburb with active residential construction and as a consequences increasing pressure on very limited green areas. The traditional approach to the design of the urban environment, promoted in Russia for the last 15 years, follows globalization trends and dramatically changing the face of the territory towards placeless landscapes. This approach usually does not take into account the character of the local plant communities and contributes to the creation of biologically unstable ecosystems. This practice has resulted in the introduction of

aggressive introduced plants and the threat to natural biodiversity. It has resulted in soil and groundwater degradation and disruption of the already fragile ecological balance of urban and natural landscapes.

This project is based on a new concept for Russian urban landscape design, the principle of Low Impact Design. This approach has been used in many European, USA, Australia and New Zealand cities. The key task of this design is to create a sustainable environment by using typical local plant communities. We also take into consideration the dynamic character of vegetation as well as respect the natural flow of water and its infiltration into the soil. The project has to deal with stormwater runoff without creating a network of traditional drainage systems, which in our case, is replaced by a chain of "rain gardens". One of the main challenges of our conceptual approach is abolishing the idea of a traditional lawn, which requires intensive management and maintenance (weekly mowing, very often herbiciding and pesticiding). Instead, the design proposes creating meadows, requiring a minimum of care and calling for the preservation of biodiversity. The project provides for the use of decorative groups of shrubs and trees, based on a mix of species from natural biomes, which will allow the creation of the "spirit" of the Karelian Isthmus.

The project also proposes a "public garden" where residents of neighboring houses could grow common garden plants and vegetables without using pesticides and fertilizers. We also introduce interactive gardens such as a "Garden of bugs," "Garden of touch" and "Garden of Sounds." Traditionally, the maintenance and construction of urban green areas in Russian cities is a task of specialized landscape companies (private or municipal). However the experience of European cities, for several years using the concept of ecological design, proves the success of direct involvement of local residents into the design, construction and maintenance process. By introducing a similar approach we hope to reduce vandalism and increase social interest in maintaining and improving the status of residential areas.

Another positive aspect of this project is its cost effectiveness compared to traditional methods of improvement, as well as the possibility of preserving and increasing the biodiversity of the urban environment.

Greenery as symbolism of cultural heritage

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Cultural heritage is a unique and irreplaceable cultural value of a nation. Created over time, it directly indicates the level of social and cultural development.

Green corridors are linearopen area forms, which, depending on structure, could have ecological, sanitary, hygienic and social functions. Their primary role at the level of landscape is connection between fragmented landscape elements and their transformation into one unique system. The basic element of this structure is vegetation.

The "Iron Curtain" divided Eastern and Western Europe for almost 40 years cutting off contacts between people on both sides. Nature seized the deserted border areas. Today, known as the European Green Belt, a string of beautiful habitats with rare plants and animals, connects European landscapes and forms a living monument of European history.

The European Green Belt is a good example of a connection between green corridors and heritage of the past. Led by this idea, this work seeks to create a bridge between these two elements; to connect the historical sites, to raise the level of communication between local, regional and international level, to encourage socio-economical development and to develop biodiversity and environment as well.

The Roman Empire was one of the greatest forces in the world's history. Many traces all around the world testify to this statement. Unfortunately many of them are covered with sites of other historicepochs, but also some are waiting to be revealed.

The significance of the vegetation is greater because it allows the possibility that it be used as symbolism in the space. The use of vegetation aims to convey a life in the legionary camps and castles. By designing the archaeological park with elements of Roman life, based on historical facts and maps, the story of the Roman era would not be forgotten. Some forms of trees could replace towers, some installations could replace watchtowers, but some of them could be reconstructed in total.

Vegetation could represent the ideal of the Roman Empire existence in order to provide the opportunity to experience smells, to taste the fruits and through landscape design to connect with a long gone Roman Empire.

This paper aims to present the possibility of cultural heritage visualization with the vegetation of the Roman Empire period, in the form of green corridors as a modern element of improving the environment. The research area is a territory of a province Upper Moesia with its Roman sites: Singidunum Tricornium, Aureus Mons, Vinceia, Margum, Viminacium.

The survey itself included an analysis of the space, through field-work and a process of interviewing the space users and eminent experts. With systematization of established data and comparative analysis (of studies similar to the researched issues), conclusions have been made and the results were given throughout the proposal for further revitalization of the Roman heritage in the researched area.

Droogdokkenpark: a tidal park at Antwerp

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A Masterplan for the Antwerp Scheldt Quays

The Antwerp Scheldt Quays are a strip of nearly 7km long and on average 100m wide. Recently, port activities expanded towards the north of the city. The quays were abandoned and became prey to neglect – estranged from city and port. In addition, in 1978 a concrete 1.35m flood defense wall was constructed along the quays. Except for some minor interventions in the central part of the quays, public space remained untouched for years. Meanwhile the quays were spontaneously claimed for walking, picknicks, jogging, cycling and even for mass events.

In 2007, the city and the Flemish government decided to join forces in a Masterplan for the Scheldt Quays, tackling three challenges: the adjustment of the flood defense, the stabilization of the old quay wall and the renewal of public space. Due to climate change, the flood defense level in Antwerp has to be raised to 2.25m. Merely raising the existing 1.35m flood defense wall with another 90cm is not an option. The landscape architects PROAP and WIT were selected to design a masterplan. The flood defense will provide a structuring element for public space. The masterplan provides essential guidelines for long-term spatial development and will serve as a frame of reference for the different execution projects, such as the Droogdokkenpark.

Droogdokkenpark

Droogdokkenpark articulates the northern transition from hard-surfaced quay to the natural river bank. The flood defense acts as a natural dike, turning the public space into a tidal urban river park. Apart from the spectacular view, three exceptional atmospheres combine in a unique location right on the curve of the river: the tidal experience of the Scheldt river, a new urban park and the cultural discovery of the old harbour history.

After a design competition, Vogt and Van Belle & Medina were elected to design the Droogdokkenpark. A gentle sloping topography spans the different levels of the water barrier and the existing ground level, creating a landscape park with open and enclosed spaces in the park defining the views over the Scheldt, the Royerssluis and the drydocks.

The area of mud flats and tidal marsh is protected by the European Habitat Directive for nature conservation and is kept as much as possible in its original state, raising the existing dike and broadening the dike inland at some places. A renewed pier gives access to the mudflats and tidal marsh enabling close contact to the tidal shore, being a perfect place for nature education.

The Belvedere is an elevated platform as a viewpoint on the city and harbor. The hexagonal shape refers to the historic bastions along the river and creates with its soft core of grass and trees, a pleasant space to meet.

The 1,5 meter level difference between the park and the site of the drydocks is used to create views on the protected boat repair docks. The preservation of this maritime heritage and its specific character are very important to maintain the unique atmosphere and identity of this place.

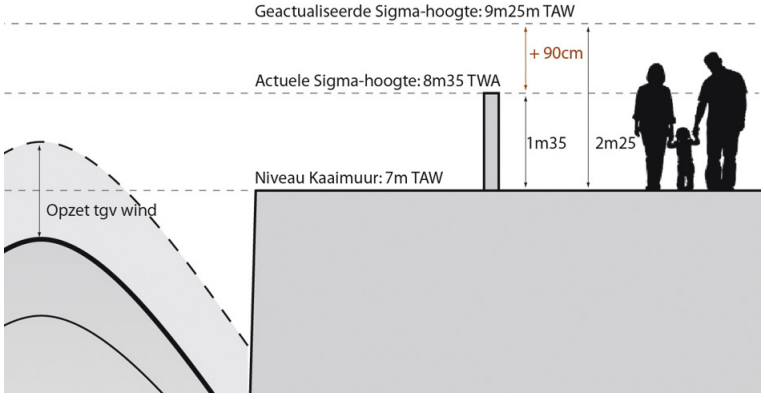

Fig. 1. Scheme of raised level of water barrier

Fig. 2 Plan with people

Fig. 3 Perspective:Relation between park and drydock site

From road obsolescence to contemporary European low ecological cost network.

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The paper sustains a methodology to alleviate road redundancy by reconverting roads into a greener infrastructure system. The aim would be to reconfigure historical access and circulation flows, which in turn might emphasize a more appropriate ecological approach to intended ecosystem services.

When confronting the road system redundancy as a case study, we will also consider out-of-useareas. Only those specifically closed to traffic by fences will be called "obsolete roads" as meant to be a waste engulfed by the landscape and nature. Conversely, if the road is open for use, we will consider it as "obsolescent", whether it is kept as an abandoned redundant road, or it is included within a management or conservation program. We are interested in redundant roads as phenomena of disuse, neglect, fand change of use. We believe it is precisely these changes in flow behavior that present the opportunity for landscape regeneration.

All these phenomena are especially visible in the obsolescent European cross-border areas where a non-motorway conventional road system redundancy overlaps with obsolescence processes in boundaries. Those hotspots concentrate road redundancy (disappearance of physical borders through major infrastructural innovations

such as tunnels, viaducts or variants) with their own obsolescence as State borders within the European Union Area (historic state borders often coincide with landforms, mostly protected as natural parks, natural reserves or ecological corridors).

We have detected two main variants in the recycling strategy. The first one would be based on ecological restoration through – total or partial removal and organic absorption of these pathways. The other would consider formulating the use of infrastructural redundant roads we would consider to be maintained.

We should then proceed to analyze road fragments through different geographical sites in relevant European study cases in order to constitute a catalogue of recommended interventions, promoting eco-environmental recovery and stimulating activity by increasing social benefit.

After mapping the overlap of road-network redundancy, the ecological corridors and accessible activity nodes, strategic planning will be undertaken. The methodology consists in promoting a strategic process of road network deconstruction from the redundant mature meshed grid, to an arborescent structure. The intentional pruning maintains accessibility to productive units by reinforcing the minimal ecological cost branches (paths) and removing the high-cost redundant ones. This time-lapse process culminates with a road density decrease and their subsequent eco-environmental improvements.

Methodological implementation on the simplest part of an obsolescent road is the conversion of a redundant loop road into a (or various) spur road. Those planning decisions would immediately transfer to reality by low traffic volumes, expanding land mosaic patches and low impact on watershed resources and water bodies. Associated improvements effects would be visible on riparian and stream ecosystems, while decreasing habitat fragmentation by establishing larger road-less areas.

Our goals are to promote an alternative, eco-environmental recovery, focused upon reducing road impact on terrestrial and aquatic ecosystems; recycling the redundant roads under consideration towards a low ecological cost network.

The revival of the Summer Garden – a green "heart" of St. Petersburg

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There are many gardens and parks in St. Petersburg but the most famous and oldest of them, without a doubt, is the Summer Garden. It was established in 1704 and become a favorite summer residence of the tsar Peter the Great. The history of this garden is full of interesting as well as dramatic events. Numerous well-known foreign and Russian architects and gardeners worked forthe development of garden composition. The Garden has experienced natural and social disasters such as floods of 1777 (when the fountain system was destroyed) and 1824, as well as the blockade of Leningrad. From the19th-century this garden has been the favorite public garden of the city.

In the 20th century, the Summer Garden is the main part of the historic green "heart" of St. Petersburg, and is included in the UNESCO World Heritage List. Given the historical, cultural, ecological and recreational value of the Summer Garden, the question of itsrestoration has been raised since the 1940s, when the first scientifically sound restoration work in the Summer Garden (led by Professor TB Dubyago) was carried out. This work was interrupted by the Second World War. During the blockade on the territory a few bombs were dropped on the garden, but the trees were generally not affected. In 1940 and 1970 two restoration projects for the garden were suggested. But both projects never were fully implemented.

In 2004, the Summer Palace and Summer Garden moved under the jurisdiction of the State Russian Museum, and for the first time the conceptual design of the garden restoration has been displayed for public consideration. The project, designed by architects of Lenproektrestavratsiya Institute, initiated a serious discussion. Not all of the ideas suggested have been recognized and and accepted for implementation.

During the archaeological escavations 10 fountains from the beginning of the XVIII century and a small harbour foundation were discovered in the southern facade of the Summer Palace. In year 2012, visitors will be able to see the harbour of Peter I, but without water.

Most of all professionals were concerned about the state of trees in the garden, many of which are at least 300 years old. The trees have grown, and the garden started to be very shady. This has created favorable conditions for fungial disease development. In total, 24 species were recorded. The most dangerous among them is wood fungi, because they spread rapidly and are able to destroy not only the old or young trees, but damage the marble sculpture as well. Some damaged trees were removed and replaced with new plantings of appropriate tree species, suitable to our climate.

Some of the fountains were recreated according to historic documents and archeological studies (fig. 1 and 2).

According to the restoration project the number of bosquets were reconstructed according to historical data. For example, the bosquet "Menazheriyny Pond" is an artificial reservoir, the bosquet "Cross promenade" has to crossed berso with the central fountain. The third bosquets is titled "The Bird Yard" where visitors will see the specially made houses for the birds.

During the restoration works there was a special attitude towards preserving the garden's character. For example the spatial composition of this garden – a big volume of trees which plays a significant role in the densly built historic centre – was preserved. There were many other reconstructed elements which were typical for formal gardens of Peter the Great's time for example trimmed hedges along the alleys, and the embrodery parterre along the Swan canal. The "jewel" of the Summer Garden, the unique marble sculpture was restored as well. Due to severe damage by time and air pollution it was decided to keep the original sculpture inside the museum and replace it with copies.

Restorers and employees of the Russian Museum tried to keep its historical meaning and identity during the reconstruction of the Garden. It was also a very important task to maintain and improve its ecological condition. The image of the Summer Garden is inseparable from the image of St. Petersburg and it is a cultural heritage not only of Russia, but also a monument of the world's garden art.

Fig. 1. One of the reconstructed fountains.

Fig. 2. The reconstructed character of the formal XVIII century Summer Garden

Moscow's natural heritage

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In the territory of modern Moscow back in the nineteenth century there were woodlands, meadows, and marshes. Currently, the city has more than 10 hectares of these original forests. The largest of them are “Moose Island” (Losiny Ostrov) and Izmailovsky Bitsevsky Forest.

Moscow is situated in the heart of Russia, and Moscow's forests have an exceptional biodiversity. The unique natural landscapes such as taiga forest, riparian and upland meadows, swamps, lakes and forested valleys, cut by deep ravines, always attract residents. Here plant communities and rare plant species are saved and restored. Moscow has also 51 “monuments of nature”. These recreational areas contribute significantly to the Russian capital’s green infrastructure.

Urban forests are not only "hot spots" of clean air enriched with oxygen, but they also improve air quality in areas adjacent to rsidentional areas to a distance of 2–4 km. The concentration of pollutants is reduced by 2–3 times. Large green spaces also improve the urban atmospheric radiation regime and provide a thermostatic effect on the microclimate of the city. They regulate the wind regime, creating a local flow of air at a speed of 2–3 m/s. Forests are the most comfortable places for public entertainment and recreation, physical and psychological comfort, they have a positive effect on human emotions.

Since 2005, the Faculty of Landscape Architecture has a special research component during the summer field practice in botany and plant physiology. Ground vegetation is studied in the forest parks of Moscow. The detailed surveys has been done in Khlebnikov's Forest Park on the planned areas of integrated reserve "Altufievsky, in nature reserve "Medvedkovo", parks "Izmailovo forest", Kuskovo and Pokrovskoe-Streshnovo. Here we study the species composition and abundance of ground cover, rare and endangered species, populations which have reached a critical level within Moscow. The main goal of such research is to create a new ecological worldview for students and to develop research projects on urban forests in Moscow.

Roads belong in the urban landscape

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In spite of being an essential part of the system of automobility and as such playing an important role in the development of urban landscapes, road networks seldom attract much attention among architects involved in the planning and design of urban landscapes. One reason is probably found in the dominance of the zoning approach to planning, where road planning easily becomes isolated and reduced to a matter of traffic regulation and transport economy. Another possible reason could be, as suggested by the Australian landscape architect Christopher Sawyer, that road networks like other infrastructures are conceived ‘outside’ the more visually oriented domain of landscape

architecture at a much larger and more abstract territorial scale. This is not to say that infrastructure does not operate within the landscape, it obviously does, but rather that it does not originate there. According to Sawyer, infrastructure is conceptually located elsewhere and thus is not strategically accessible to landscape architects working only in the realm of landscape. As a consequence infrastructure often becomes something landscape architects work around rather than engage with and alter.

If Sawyer is right, how can we as landscape architects engage with road networks in profound ways, which move beyond the purely visual and pictorial? Is it possible to conceptually (re)locate road networks in the landscape? The paper will address these questions by discussing different understandings of landscape and its relation to infrastructure and claim that 'roads belong in the urban landscape', a claim that echoes John Brinkerhoff Jacksons essay Roads Belong in The Landscape (1994). Furthermore, it will be argued that road networks can be considered an important framework for creating new 'green infrastructures' that can qualify urban landscapes in terms of improving their overall porosity and connectivity.

In order to strengthen this argument, the paper will (re)visit three different 'sites' in relation to modern road networks, which hold a potential in relation to the development of green infrastructures in fragmented urban landscapes: The roadside will be described as a parallel network with a capacity to connect otherwise isolated fragments – an idea with references to the concept of parkways. The super grid will be presented as a pertinent way to organise the interface between 'urban' and 'rural'. Last but not least, the fine network of minor roads – the sponge will be described as a platform for site-specific development without 'fracture'. The potential of each of these sites will be exemplified by particular reference projects working in a cross-disciplinary field between landscape architecture and urban planning.

Thinking wastelands as a valuable asset for green urban infrastructure

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Deserted urban space, originating usually from land previously used for different activities, is nowadays one of the main subjects for research studies and projects. Such spaces generated in time, due to the lack interest and maintenance activities, special ecosystems often bearing a great environmental value.

In Romania, one of the most well-known cases – related to this topic – is Bucharest's Lake Vacarest[1] – a main attraction in South-East Europe for environmentalist and bird-watching enthusiasts, but this area is far from being an isolated example. The present study revolves around another less known case FALEZA NORD CONSTANTA area – the site between Constanta[2] and the Black Sea. Although used in the '60s and '70s as a dumping site for the soil extracted from the foundation of the future blocks of flats built inside the city during that period, this space developed a specific ecosystem that accommodates today species of great value (species presented on Romania's Red List for rare or endangered plants; endemic species).

This paper aims to present the research regarding the possibility to implement a future assessment methodology for urban green spaces that will take into consideration also the issue of environmental quality and value of this type of space. Establishing the natural matrix of the area (local phytocenosis stage of relative stability and structure), determining the present stage of development for it and identifying the factors that govern the changes driven over the herbal complex are some of the main issues tackled here.

For the Romanian landscape professional environment, offering true recognition of the value of such spaces within a green network is still a new quest. Already part of our urban environment, these spaces should also be awarded with the right place within the green infrastructure of the city. This goal can be accomplished by defining the factors that compose and govern them and this study attempts to set a path in this direction.

Primary assembly
- broad specific diversity
- stable species / slow dynamics
- strong endemism

Vacant plot (wasteland)
- heterogeneous specific diversity (indigenous and exogenous)
- unstable species
- weak endemism

Landscaped space
- reduced or no specific diversity
- species artificially maintained trough contrary energy
- minimal or no endemism

Fig. 1 The representative vegetation according to the occupied type of space[3]

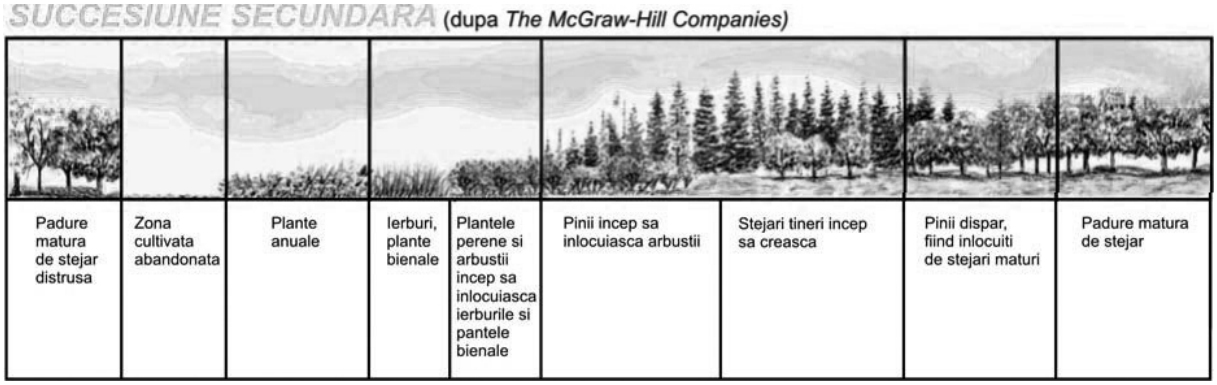

Fig. 2. Secondary succession stages (after The McGraw-Hill Companies)

* notes

1 Lake Vacaresti is an artificial construction built in the community period (before the Romanian Revolution – December 1989) as a direct result of the Nicolae Ceausescu's ambition to transform Bucharest into a harbor for the Black Sea; although finished during Ceausescu's life time, the lake was never filled with water (the natural resources of Bucharest and surrounding area are far from providing the required quantity of water) and meanwhile, due to the protection offered by its build shores, nature reinforced her rights and transformed the lake into a well weld ecosystem.

2 Constanta is the main Romanian harbor-city to the Black Sea.

3 According to Gilles Clement - Manifeste du Tiers paysage, Edition Sujet/Objet, Paris, 2004, p. 15, p. 25.

Scales of landscape, scales of design

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We cannot speak about a true green network in Bucharest. There is no global vision concerning public green spaces, just some old parks scattered across the city, some boulevards with dying trees, small squares and some modernist neighbourhoods with blocs of flats floating in amorphous "green spaces". In fact any green square meter in the city belongs to one of the past urban projects. After 1990 a lack of interest concerning the urban landscape is to be noticed, besides some "embellishing" gestures made during election campaigns.

The article will present the results of a research project concerning the (re)creation of a true green network for the city that could fulfill Bucharest's ecological social and cultural needs. By mapping the spatial resources that can be used in order to design a coherent green network we faced a complex tissue that cannot be approached in a unitary manner. A coherent strategy should take into account the different dynamics the city is undergoing and the site-specificity of any area that might be integrated into the green system.

Based on the field research, three different categories of further green network elements are to be defined, each one of these relating to a different scale of design:

The local scale includes two different kinds of urban tissues: the private/community gardens of the old neighborhoods covering the most important part of the central area and, paradoxically, the interstitial spaces of the modernists/communist collective housing assemblies forming a residential belt around the traditional core. These local scale dynamics are based mostly on vernacular gestures or small individual projects, a specific "small" design recalling Giovannoni's edilizia minore (Giovannoni, 1913) (Fig. 1).

The urban scale is formed by the main squares, parks and boulevards that should form the main framework of the green infrastructure. It represents the modern project of the 19th and 20th centuries based on technical projects but still keeping a human scale of the design. An important spatial resource, marked by the same urban logic, is represented by the industrial wastelands, forming an entire crown around the 19th century city and connecting the center with the outskirts of the city by the 20th century industrial axis. (Fig. 2)

The territorial scale concerns the new urban sprawl engulfing the rivers, lakes and forests around the city. This territorial scale behaves as an anti-urban organism Giovanonni's anti-urbanizzazione (Giovannoni, 1913). These new amorphous areas are facing a loss of human scale but also the loss of a coherent, technical vision. The existing natural areas are accessed by the new development but there is no real connection between the surrounding waterfronts and forests and the city or its new sprawling areas. (Fig. 3)

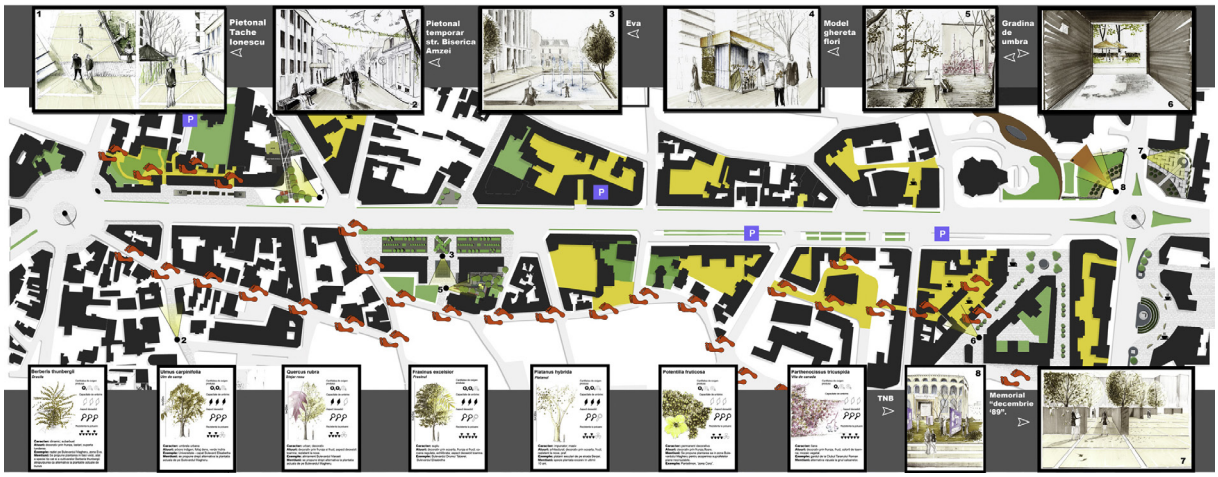
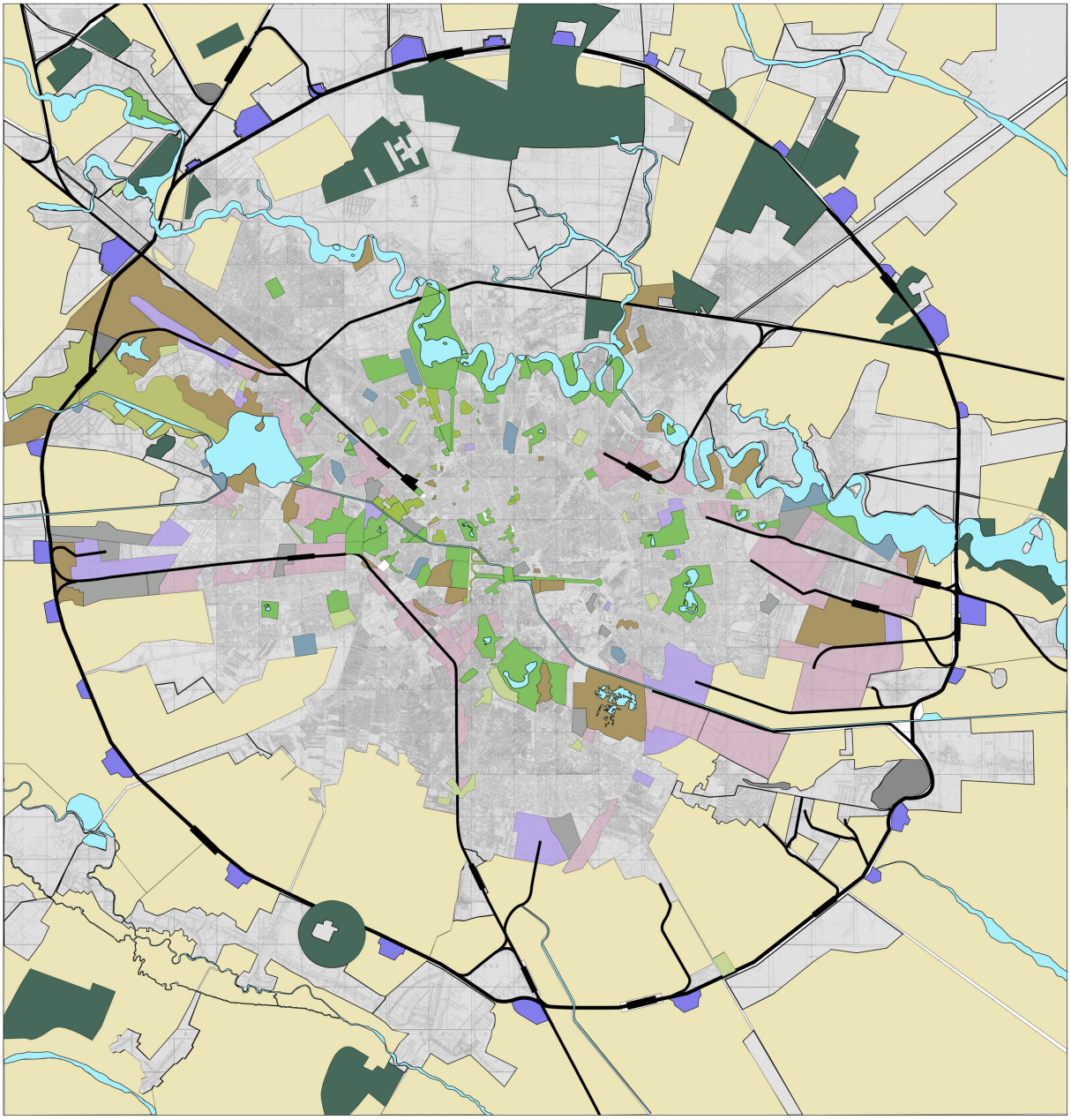


Figure 1.



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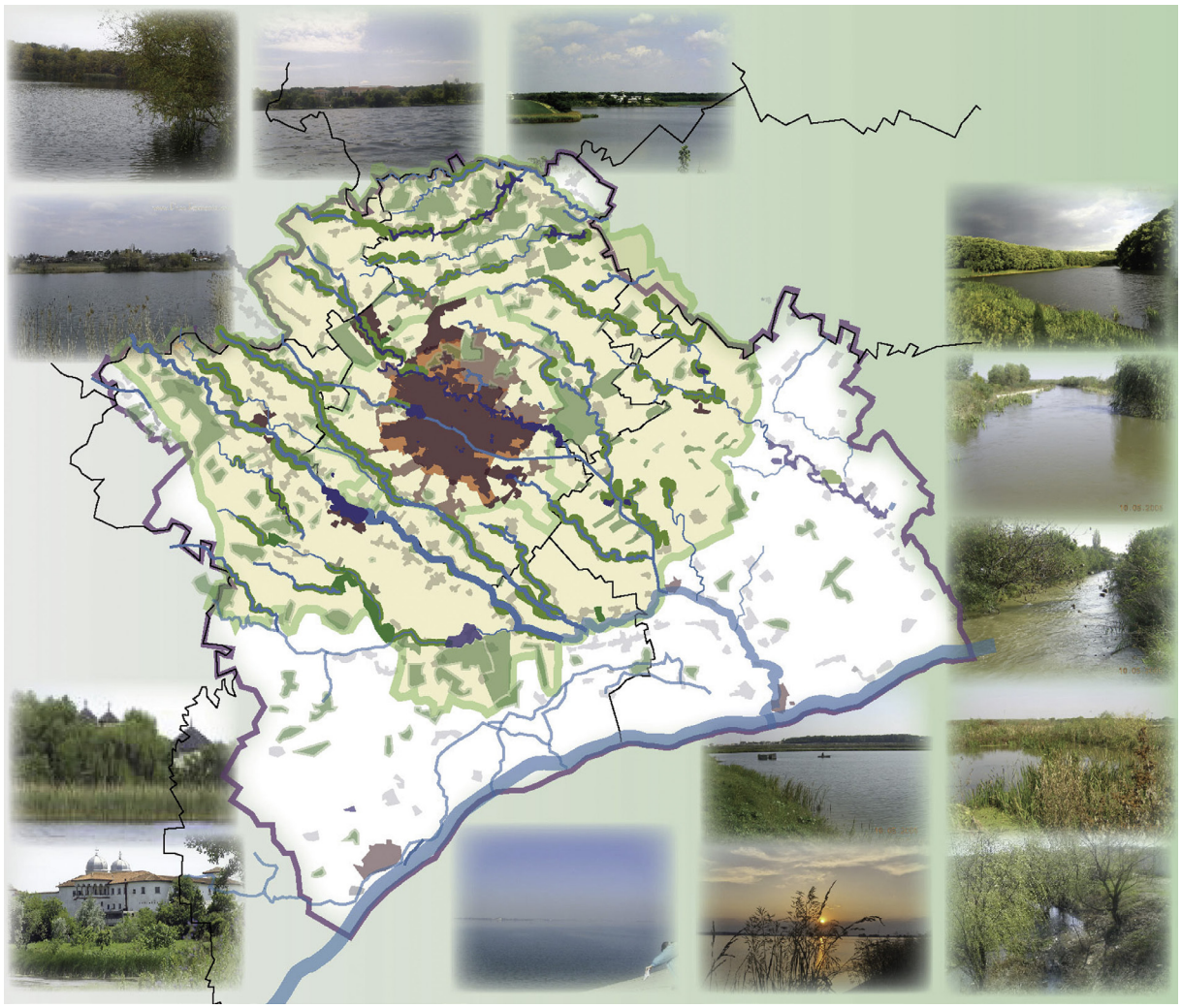

Figure. 3.

Our strategy for a Bucharest green network combines these three kind of elements but also their specific practices, strategies and dynamics combining them in order to bring general coherence at the local level and human scale and space articulation at the territorial scale. The general approach supposes a dual bottom-up and top-down perspective.

Public Transportation and green infrastructure: A new city for its inhabitants: the case of the tramways in France

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The increasing concern for nature in the city and a better quality of urban landscapes is followed by the desire to see the quality of individual and collective lives improve. It is in this context that a new couple "the city and its public transport infrastructure" made its debut about ten years ago in European and French planning programs.

Seen from an historical perspective, car flow management has taken precedence over space management for a long time. In the past fifty years the city has confiscated the streetscape: the main arteries of the city and the new infrastructure are still reserved for cars, as it is the case in many French and European cities. The urban landscape is not really visible. It is subject to the simple function of flow management related only to the economy of the city and its territory. The new aspirations for the landscape and the new lifestyle of urban dwellers make it possible for municipalities to formulate projects that regain new spaces, to imagine new means of transportation and to evolve their own perception on their territory. These efforts have largely been initiated by the work entrusted to multidisciplinary teams in which landscape architects, promoters of this new vision, play a fundamental role.

Thus landscape architects are likely to formulate new visions for the landscape, based on a more natural urban landscape in relation to economic activities and the living environment of the inhabitants. The emergence of these projects often means regaining the quest for a new urban identity, based on better service in the city centers and various public facilities in the practical and enjoyable city, thanks to a soft, non-polluting and silent mode of transportation.

To illustrate this, I will share with you the operating results, conducted by l'Agence "DVA Paysagistes", whose main themes are articulated around public transport infrastructure and green infrastructure: the proposal for the tramway in the city of Douai, France and a transportation hub at La place des Quinconces in Bordeaux, France.

Green infrastructure and stormwater management in a city center.

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E-mail: Stormwater management isn't only a question of engineering or security for our public spaces; it opens new possibilities to improve the quality of our living space and to develop new design. It isn't only a question of quantity, but also of quality. Every week, we (re)discover the capability of some plants and associated microorganism to clean our gray water. There are already many successful realizations, in Germany, Holland, as well in the USA or Australia, but we propose to illustrate this question with a project developed by our office in Lyon – France.

Lyon is the second biggest city in France. The project takes place in the sleeping suburb of Vaulx-en-Velin. The old farming village exploded in the 60s with the construction of much social housing. It was a typical "plateform" urbanism with big empty open spaces. Cars on the ground flour, shops and offices at the first level, flats from the second level upwards. In 2000, the council began the destruction of the big central shopping center and started moving back to more traditional and dense urban planning. Our team, including architects and civil engineers, are developing the second and last step. More than 10 million Euros are being provided for the creation and renovation of streets, parking places, squares and other small public spaces. Our proposition is to develop a concept of green infrastructure which can also manage the "public"

stormwater with hardly any drains. We are working on three types of solutions: raingardens, underground water treatment passing through tree substrate and "evergreen" reinforced grass pavements.

The raingardens vary in size. Some are very small, and some are public gardens easily flooded. Others are too large to build within street space, so we propose to clean the grey water off the road directly to the tree substrate, before it infiltrates into the ground. "Evergreen" surfaces are used only in the parking areas, complementing some other raingardens. All these propositions are being developed in partnership with the engineers from the city, plant nurseries, and also possibly with the university (in discussion). We are testing the substrate of the plantation, as well of the plants (seven species of trees, five bamboos and a range of shrubs).

This project is also a social success. It's the first time that our office has succeeded in convincing our local politicians to accept such a trial, with the inherent possibility of failure, and the local service managers responsible for maintaining drainage, streets, trees and cleaning services of public spaces have through this project been able to work "transversally" together rather than separately in a vertical style.

Fig. 1. Vaulx en Velin project
• parking with raingarden

Fig. 2. Vaulx en Velin project
• public square

Fig. 3. Vaulx en Velin project
• street with raingarden

Roads are damaging Turkey's protected areas

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Transportation infrastructure extendsalong thousands of kilometers and causes landscape fragmentation in a broader extent. The movement of animals is impeded and mortality of animals by vehicles occures frequently. Landscape fragmentation also causes the decrease of habitat size especially in the core area of the patches. Thus the vitality of the core species is put at risk. Roads introduce chemical contaminants and exotic species to natural areas and interrupt the ecological processes. Divided populations, isolated habitats and the reduced sizes of these small habitat remnants threaten the persistence of wildlife populations.

Turkey is placed at a unique location between Europe and Asia and at the junction of 3 global biodiversity hotspots: Mediterranean, Caucasus and Irano-Anatolian. Only 4.64 % of Turkey is protected. In addition, there are 305 Key Biodiversity Areas (KBAs) (these comprise 26 % Turkey land area), which are not yet protected. KBAs are selected by using standard, globally applicable criteria considering the distribution and population of certain species groups: Mammals, amphibians, reptiles, birds, freshwater fish, butterflies, dragonflies and plants.

Turkey has almost 65000 km length of roads, 60% of this road network was constructed in the last decade. However these roads were constructed regardless of ecological interest. In this broad network only one fauna passage was located to prevent landscape fragmentation. Therefore landscape fragmentation is a significant problem for Turkey.

In this study landscape fragmentation is examined within the context of protected areas and key biodiveristy areas of Turkey. Effective mesh size (meff) metric is used in this analysis. The current situation of landscape fragmentation is indentified for each area. Priority areas for mitigation measures are determined. Landscape bridges, habitat passages and other mitigation measures are proposed to support green infrastructure and the contuniuty of these valuable areas.

Latvian Cultural and Natural Heritage – Historic Gardens and Parks: Vision of state and Community

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Gardens and parks are the result of the interaction between a man and nature, which is reflected through the artistic and architectonic dimensional elements and structure synthesis. The art of gardens is the result of a continuous exchange of ideas, inventions, scientific discoveries, and cultures in the whole world. The heritage that is a result of this synergy should be protected and used in a sustainable way, which would serve as the bridge to our common past, present, and future. Popularization of UNESCO and ICOMOS charters, conventions and recommendations and popularization of the

scientific and practical literature and articles on historic gardens and parks over the last decades have also facilitated awareness and acknowledgement of the values and importance of the Latvian historic parks and gardens in the context of common living-space quality. Society, as the consumer and manager, is the main architect of environment quality through the conception, evaluation, care, and use of heritage, while the state, as the regulator, is the contributor of all the mentioned environment quality criteria. But is this actually true? Are these interrelations (state-owner / manager-consumer) clearly defined in detail and are they systematically improved? The aim of this article is to clarify society's awareness, understanding, and attitude towards historic gardens and parks, and towards the park as cultural and natural heritage, and the necessity of its preservation in the context of state regulation and the activities linked to it. To achieve the aim the following tasks were set:

1. To collect and perform a conscious critical evaluation of documented material of the laws and regulations approved by the state, which concern the issues of protection, preservation, and development of historic gardens and parks as cultural and natural heritage;
2. To explore state activities in regard to the popularization of the issues of historic parks and gardens in society.
3. To analyze a comparative study describing the attitude of society as the consumer and the manager, towards the issues of protection, preservation, and development of historic gardens and parks, based on the resources of the sociological research surveys ordered by the Latvian Ministry of Culture in 2002, and the sociological surveys carried out by the author of the article in the doctorate thesis from 2009–2011.

The political power of the state is to promote national wealth and identity through culture and natural heritage protection, preservation, and integration in society processes. Some fundamental inconsistencies have been found in the collected and analyzed Latvian laws and regulations, in regard to historic gardens and parks. The existing thirty-year-old legislation is very weak – non-systemized, generalized, and even contradictory. Partially, it is explained by the multidisciplinary nature of historic gardens and parks, and the lack of specialists in this industry. The state activities in resolving the problematic issues are consistently wide-ranging, however, it must be noted that the reflection of problems and the search for solutions through organizing discussions, have not given any positive results. However society's comprehension, both as the consumer and the manager, of the cultural and natural heritage values and significance, reflects the quality of the historic landscape. Thisunfortunately has a negative tendency to decrease.

In order to resolve the problem, all state laws and regulations relevant to historic gardens and parks are required to be reviewed, considering the regulations issued by UNESCO and ICOMOS and the neighbouring countries, for example, the experience of Estonia in these issues.

Landscape as Infrastructure: Asserting the Right to Landscape

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Infrastructure is defined as "the basic structure of an organization, system" or in other words: the underlying framework of a system. Infrastructure therefore is the essential and vital condition for existence of any system. Landscape as a concept is the spatial infrastructure of our world, an integrated system of our physical and social environments that we depend on for our survival and wellbeing. Landscape is spatial by definition but is at once temporal, physical and intangible, artefact and idea, a framework that ought to support human wellbeing whether it is green, blue, urban, suburban or rural infrastructure. Such a definition of landscape as an "umbrella concept of an integrated entity of physical environments [that] is imbued with meaning and comprises an underpinning component for ensuring well-being and dignity of communities" is the rational for asserting the Right to Landscape.

The scholar Yi-Fu Tuan whose seminal work on landscape in the last four is among the pillars of theoretical development of landscape and the humanities comments that the Right to Landscape: 'promises to transform landscape from a concept in cultural geography and landscape architecture to a concept indispensable to the probing on human nature hand human well being' Landscape as Infrastructure corroborates the imperative that landscape is a universal realm inline with the universal nature of human rights. The articles in the Universal Declaration of Human Rights (UDHR) represent a moral standard that transcends any local or national law. These are rights to material basic needs for survival (food, shelter, healthcare) as well as the emotional, cultural and social rights that support human dignity.

Aligning landscape infrastructure with universal human rights highlights two main issues that are interrelated: human ethics and the notion of landscape as common good. These issues also reverberate the spirit that initiated the European Landscape Convention (ELC), a 21st century formative document that has positioned landscape at the forefront of European environment and planning discourse.

This conference paper will first address the conceptual framework of the right to landscape; it will then illustrate how abstract concepts of ethics, social justice and common good embodied in landscape as infrastructure can capitalize on the analysis skills and the visionary thinking of scholars and professionals in landscape planning and design.

Planning and design with trees and shrubs in open public places: The Case study of Uppsala (1800–2010)

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Parks, avenues, single trees and other green architectural structures are a living cultural heritage of the cities. Previous research in Sweden (within the field of urban landscape history) has mainly focused on general planning. Plant composition and the management of vegetation in public places in Sweden have never been discussed in detail. The aim of this research is to describe how city planners, park directors, landscape architects and other collaborators within the profession have planned, designed and managed the green areas (green architectural structure) in Uppsala. One of the goals is also to analyse a particular arboreal composition of green infrastructure. The main research question is related to various processes of vegetation planning and management. Other study questions are linked to the specific type of vegetation (species) and its role in design. According to R.G. Collingwood (1994) "the historian's business is to know the past, not the future". At the same time, the knowledge of urban history creates a platform for making decisions in the planning process in the future.

What makes then the city of Uppsala a good case study? Uppsala is the fourth largest city in Sweden (app. 195 000 inhabitants in 2010) and has a big variation of green areas (vegetation structures). There are still a lot of old and new vegetation elements in parks, avenues and public squares that can be seen as living historical evidence. Uppsala is also a city well known for its park directors. Several of them were famous and respected in the whole country. This fact is described in the book "Det gröna Uppsala" (The Green Uppsala) by one of the former park directors Eric Laufors (1987). Uppsala is also an academic city with long traditions and good research resources. The personal preference and experience (I live and know this city quite well) also played an important role in a case study choice.

The research within the project is to a large extent based on historical data. Traces of activities in the planning process are likely to be found in archival records, documents and in the remaining living vegetation in different sites. Thus, existing trees and shrubs will constitute the living historical objects in this case study. Inventory and analysis of existing vegetation has initially been an important research assignment. Besides historical sources (maps, drawings, photos, texts etc.) and field-work, interviews will be a complementary source of information. All together, this "evidence" will enable me to perform a triangulation.

From Historic Landscape to Urban Ecological Network: Themes & Context

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Landscapes around the world have been changed dramatically during the last 5 decades. While new functions, related land uses and infrastructures dominate and trigger this change, places with an historic past have become more fragile than ever before as a backdrop for contemporary urban life. Within this mechanized world, search for historical roots has turned to searchingfor a new way of understanding ecological order by looking at past land uses and anticipating future projections to propose landscape generated ideas for sustainable development.

Istanbul has a unique landscape that developed over a long period of time. From the Byzantine period to the contemporary metropolis, the historical development period of the city left behind a landscape that can be considered as multilayered strata. This unique landscape can be read through multiple ways. The historic background and ecology appears to be the best ways to understand landscape's diverse and dynamic structure. From anecological perspective, historic landscapes and their components contribute considerably to the ecological structure of Istanbul. Especially as a metropolitan area, Istanbul has been facing the problem of urban spread toward green areas at the periphery and urban intensification at the center, that lead to loss of a considerable amount of green areas thus loss of ecological sustainability. As a result green areas at the center have become small patches in the form of urban parks. Within this dense built environment large green areas as major component of the green networks are represented in the form of parks, groves and large gardens that have an historic background dated back to 19th century. As a part of historicheritage, today much more attention needs to paid to these green heritage areas for their potential for the ecological sustainability of Istanbul.

This paper aims to analyze the green heritage of Istanbul as important infrastructure by looking at three important typologies; historic gardens, groves and parks. Physical structure, design approach, and design components are going to be analyzed to introduce themes and context generated by those historic landscapes. According to spatial analyzes these historic typologies are going to be mapped and potentials are going to be discussed to propose a green network for the European side of Istanbul. A literature review, data collection from site visits and maps prepared with GIS are going to be utilized to frame the method of the research.

Urban Green space biodiversity in the city of Porto, Portugal

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Urban areas are traditionally considered as fully anthropogenic environments, concrete jungles without natural green. Several plant and animal species thrive, however, even in the busy city centers not to mention parks, courtyards or urban forests. These areas support species specialized both in open and closed environments. All those involved in either design or maintenance of urban green structure should consider the questions of urban biodiversity and its protection. Research is needed to better understand: What kind of habitats can be found from the urban green areas? What is the relationship between the spatial character of urban green structure and its biodiversity? How does organization and design of urban green structure influence the diversity of flora and fauna? Which spatial strategies and tools can be used by planners, designers and managers of urban green structure to address the question of biodiversity within the city environment?

This research is focused on the city of Porto, the heart of a metropolitan area of nearly two million inhabitants. It is the second largest Portuguese city with a mild Atlantic climate, with several important and diverse natural habitats close to each other (River Douro and its mouth, seafront, several streams with few stretches still running in the open, and rocky escarpments) and a variety man made habitats with different design character, sizes, locations, and connectivity (parks and gardens, relic woodlands and farmlands, historic gardens, derelict lands, brownfields and rural sites). Its geographic, social and environmental context together with high diversity of situations in a relatively dense urban fabric makes Porto an ideal place for detailed green structure research in a southern European scenario.

Focusing primarily on public parks, gardens and plazas, a sample group was chosen and each site assessed according to spatial character, design composition, human use, habitat diversity and species occurrence. A specific methodology for habitat and species survey in the urban context was developed by adapting the survey methods suggested by the European Biodiversity Observation Network (EBONE). Three thematic research groups from different scientific backgrounds conducted the survey in the study areas: landscape architects, botanists and vegetation ecologists and zoologists.

Relationships between biodiversity indicators, ecological factors, and spatial design are to be examined using correlation techniques, multivariate analysis, geographic information systems, landscape analysis and interpretation, landscape critique and aesthetics assessment. Based on data interpretation, spatial patterns that create opportunities or problems for urban biodiversity are identified, in order to conclude which design/ planning strategies have an impact on biodiversity levels.

As the environmental, economic and social dimensions meet strongly in urban areas, research on urban biodiversity should be interdisciplinary and oriented towards policy and management. This calls for an integrated approach to environmental management in urban environments. This should foster sustainable land-use policies

which avoid urban sprawl and reduce soil-sealing, include promotion of urban biodiversity and raise awareness for urban citizens. The research aims to contribute to a better understanding and promotion of the relationship between biodiversity, spatial form and management within the urban environment, particularly for the disciplines involved in planning, design, management and decision-making on the urban landscape.

Green Infrastructure and its Importance for Village Restoration and Rural Development in Central Europe

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Green infrastructure has a significant potential for the restoration of rural villages and supports sustainable development of rural areas in Central Europe. This paper focuses on the importance of creation of comprehensive green infrastructure systems on different levels and scales to promote the development of rural areas in Slovakia and other countries of Central Europe. Infrastructures systems on different levels create together a complex green network with not only ecological but also urban, landscape architectural, social and economic dimensions. This complex network mostly does not arise on a global level. It grows up from local to global.

To achieve a sustainable development of a specific rural area we have to focus at first on strengthening the green network on a regional level. Every rural region has a special identity, landscape structures and landmarks with historical importance. The visual expression of diverse landscape structures is called landscape image or countryside character. The historic landscape structures represent a very important part of the landscape infrastructure. They have a significant cultural and historical value and represent thereby an important part of the green heritage of the countryside, which has to be protected.

The strategy for development of rural municipalities should not be processed on a local level for a specific village. It should be elaborated at first on a micro-regional level. By planning and creating new greenways or by strengthening existing greenways connecting certain municipalities, a complex micro-regional green network can arise. These greenways not only enhance biodiversity and ecological stability of the landscape, they also represent a significant instrument of landscape architecture to increase the visual and perceptional value of the rural countryside. One of the most important dimensions of greenways is their social infrastructure represented by recreational, educational, cultural and perceptional functions and values. Greenways on micro-regional level have a wide range of principles and functions which we summarized in Table 1.

At the local level green infrastructure represents an urban, landscape architectural and social linkage between urban space and the surrounding landscape of the municipality (Fig. 1). The visual dimension of this linkage is represented mainly by

higher woody vegetation in the form of entrance alleys to the village, accompanying woody vegetation of streets and watercourses, greenery at the village square or other forms of vegetation. The green infrastructure at the local level is an important tool for landscape architects to help create a coherent and harmonious visual whole from the built-up area and the surrounding landscape of the cadastral area. The urban core and the most important social node of the green infrastructure of villages is the village square, which therefore has the greatest potential to become an attractive contemporary public open space (Fig. 2).

Table 1.

Overview of principles and functions of greenways, green networks and green infrastructures

Ecological Dimension	Urban and Spatial Dimension	Social Dimension	Economic Dimension
bio-corridors, bio-centres, interactive elements and natural systems;			
importance for nature conservation, environmental and landscape protection	aesthetic, design and cognitive function; visual-landscape-forming, compositional and spatial significance; urban-space-forming element	recreational function	agriculture and forestry function
promotion of sustainable land use, development and way of life; linking of greater natural areas, existing and planned green spaces	connection and transport function	educational function	positive impact on local economy
	linking inner-urban areas, connecting the urban area with the surrounding landscape	cultural function	positive impact on sustainable tourism
strengthening of ecological stability of the area	inclusion of major source and destination points and public facilities	participation in design and maintenance of the green network	positive impact on mobility
urban ecology and urban climate function	multifunctional ways for non-motorized users	safe and attractive routes to school	

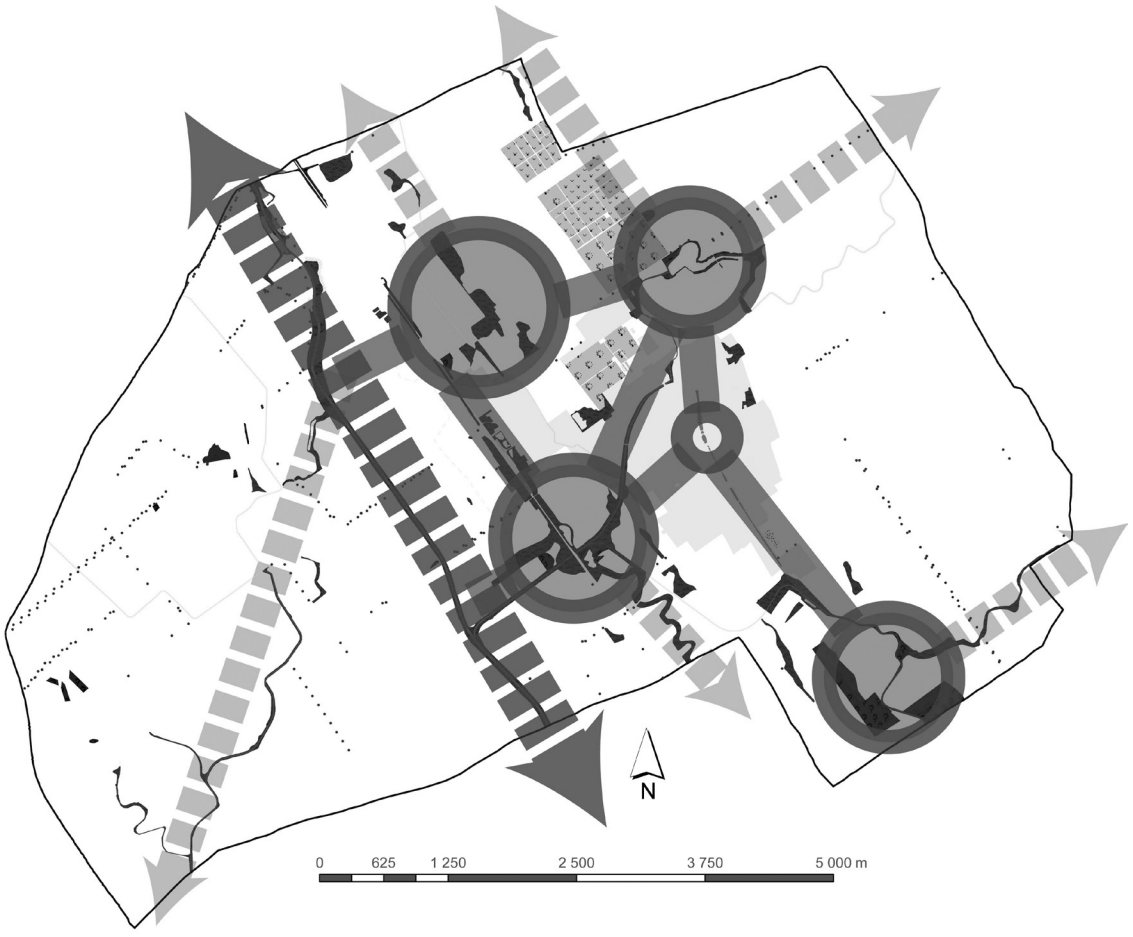

Fig. 1. Scheme of the green infrastructure at local level for the whole cadastral area of rural municipality Tvrdošovce situated in the southwestern region of Slovakia (drawn by Attila Tóth)

Fig. 2. The village square represents the urban and social core of the green infrastructure of rural municipality Tvrdošovce (drawn by Attila Tóth)

Open urban area quality and perception

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Open areas in which a significant part of citizen's life passes make up an important component of town/district image. Criteria of their assessment, functionality, purpose, historical values can be different. But as a rule they do not characterize the quality of urban habitat on the whole. Although this problem is obviously vital for our country, the criteria of urban environmental quality have not been investigated yet from the sociological positions and there are no well-defined terms and definitions.

The best results of person's positive appreciation of an area are his/her joy and happiness based on object/feeling comparison with positive experiences and reminiscences. The main task of open urban areas is to stimulate this perceptible process.

Many developed and open urban areas remain empty. The areas' attraction is determined by combination of interests of city economy, business and, of course, of the citizens themselves. The European countries use enlarged territorial development plans (strategic spatial planning) aimed at environmental quality improvement.

Nowadays, the Moscow megapolis suffers a lot of problems including those connected with open area attraction. There are many directions to solve the problem. They are to provide the green territory cleanliness, security, qualitative rest availability in his/her district; to create emotional, cultural and historical areas, to inspire people modeling and using open areas in accordance with their own wishes; area mobility taking into consideration seasonal and weather peculiarities; enlargement of projects on a city scale, architectural solutions symbolic constructions based on natural advantages of a territory and its historical heritage, development of fashionable recreational places, to provide self-descriptiveness of the territory in order to reconstruct its connection with the nature.

In the process of designing and improving undeveloped territories, fractional planning of various sectors on the same territory, as well as execution of performance requirements actually excludes a qualitative and emotional attitude based on their perception by real visitors. Such an approach separates a customer, an executor and a user. There must be unified environmental quality conceptions, which can become a basis uniting all the enumerated aspects.

Stress and fear in people are caused by the aggressive and stressful character of life in a big city. A person can get a feeling of security and comfort only in an open area. Loneliness in a crowd is compensated by virtual communication methods; open public areas compensate a lack of social intercourse among children and adults. The deficit of positive emotions is compensated by people's contacts with a landscape providing the effect of returning to the Nature. Citizens' mass escape from a city at the week-end proves a deficit of qualitative recreational areas within the city boundaries.

Natural landscape perception is often reduced to its esthetic value, and the recreational use – to its functionality.

The term "an environmental quality" is widely used in the lexicon of politicians and public men. Development of system analyses and designing methods based on the open area perception as an environmental part of the person possessing definite qualitative properties will support forming harmonic environment taking into consideration conditions, complexity and tempos of the contemporary life. These methods can be based on a system of weighted test estimations, for example, impressions, feelings, conditions, memories associated with some definite open areas. The methods can be realized for various groups of consumers.

Effects of design and location of sacred places for urban green infrastructure

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The characteristics of forests and green spaces in an urban or a suburban area depend on the area's historical diversity. It is important to understand the process of historical transition of the culture of such areas. For urbanization, these spaces are fragmented and reduced by land-use management. It is necessary to not only preserve the uniqueness of an area that has been shaped by its history and culture but also consider the long-term use of an urban space from the perspective of developing a wide landscape.

In this study, the effects of location and design of sacred places such as shrines in urban or suburban areas of forests and green spaces in these areas were examined by two approaches.

In the first approach, the distribution morphology of small open/green spaces in an urban area was examined. In the second approach, the locations of shrines, temples, parks, and satoyama were analyzed by GIS. It was found that shrines and parks tend to be dispersed and temples tend to be concentrated in certain areas. 68% of shrines have been built on slopes. To investigate the geographical features and their relationship with ecological resources, a continuous green space was generated by forming a buffer between the spaces of forests that include shrines and the surrounding green space. This analysis showed that the main building located on the downward slope shows either a high green preservation function (19.4% of cases) or a low one (38.9% of cases). It was conjectured that this difference derives from the relationship between the entrance path and the steep inclination. On the other hand, the main building of a Shinto shrine shows an excellent green preservation function when located on a steep upward or downward slope (11.8% of cases).

Most forests and green spaces are fragmented and reduced by uniform spatial development. As a result, natural spaces that serve as a breeding ground for diverse wildlife are greatly reduced in urban areas. Moreover, the decline of green spaces in cities results in environmental deterioration such as the impoverishment of flora and fauna, heat island effect, heavy rains, and, most importantly, loss of culture and history, based on which the cities are developed.

The green spaces of shrines contribute largely to burden sharing as they are located on transformed steep land or transformed open land, which are otherwise difficult to inhabit. Although the relationship between green spaces and geography investigated using continuous green spaces with shrines and forests as reference points may not always be consistent with that observed for geographically varying slopes, it was found that the former can be used as a standard evaluation method for any region.

How far are we from the idea of green infrastructure implementation? – Green measures applied in Poland

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The concept of green infrastructure is now considered as one of the key ideas of sustainable development at regional and local scale. The way the term and the idea are understood by urban planners, local authorities, local people and other stakeholders is still not unequivocal and differs from country to country. Nevertheless, because of its potential, importance and crucial role in shaping of the urban environment by providing various ecological services it is worthwhile transforming the concept into a broadly used instrument, which combines land conservation and land use planning.

In Poland the concept of green infrastructure has not been enshrined formally yet, as the term is not explained in any act of law. Of course, it doesn't mean that the green issues are not visible. The fundamental ecological concepts that underpin a green infrastructure approach, such as multi-functionality and connectivity, have been in use in Polish planning and nature conservation practice since the early 1980s.

The aim of presented research is to assess the opportunities and obstacles for implementation of the green infrastructure concept in Poland at the national, regional and local level. We analyzed various instruments and measures relevant to green infrastructure, such as legislation, sector policies, and management schemes. In our investigation we focused on the main functions provided by green infrastructure: enrichment of habitat and biodiversity, maintenance of environmental processes and providing recreational opportunities.

We found out that the measures differ significantly depending on the level of implementation, e.g. at local scale the most important seems to be spatial planning while at national level – nature conservation.

Provisions of the local level planning documents specify the minimum quantity of biologically vital areas for each plot of land. This measure called Ratio of Biologically Vital Area (RBVA) was introduced in the planning practices during the mid 1990s, to enhance the environmental performance of the existing or planned areas, and as result to improve the living conditions for the inhabitants.

At the national and regional level green infrastructure is implemented as an ecological network that comprises a system of protected areas. Since 2004 one of the elements of protected areas systems (Protected Landscape Areas) was given the role of ecological corridors in order to assure connectivity of the network.

Our analyses led us to point out that some of the surveyed measures could be recognized as quite effective and create an opportunity to develop the idea of green infrastructure. Furthermore, the lack of co-ordination between different measures' implementation is regarded as the biggest obstacle.

180 years of urban evolution in four European cities – Built Area, Open Space and Green Infrastructure

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The 19th century marked the beginning of a period of profound renovation in urbanism. New concerns about living conditions met new design and planning approaches that fulfilled them. Since then, significant new transformations in the mind-set of decision makers, politicians, designers, planners and scholars occurred. Concepts like ecology, recreation, social fairness, heritage protection and sustainability were gradually introduced in the urban planning vocabulary and contributed to a drastic transformation of the framework and priorities of those responsible for managing and promoting change in the urban fabric. All these transformations had a deep impact on the balance between built areas and open spaces and, therefore, on green infrastructure, either directly or indirectly.

The aim of this study is to determine the collective outcome that all these transformations had in the urban fabric, particularly in the relationship between built areas and the ecological structure in some of the most important European cities.

To achieve this goal, it was necessary to use a source of reliable data regarding the first half of the 19th century that featured the same information about a large group of cities at the same time. The ensemble of city maps produced between 1830–1842 and published by "England's Society for the Diffusion of Useful Knowledge" is a remarkable instrument for comparative analyses between cities of this period, since it presents a sample of 40 cities in 19 different countries. All cities are roughly represented at the same time and, most importantly, with the same graphic language and the same level of detail. These maps were the object of Melville C. Branch's "Atlas of Rare City Maps: Comparative Urban Design, 1830–1842" that provides a set of statistical data and context of each of the different cities at the time that these maps were developed. By making a comparative analysis between the characteristics of each city in 1830–1842 and their current state, it is possible to achieve a distanced perspective of the real outcome of the change in urban status quo, a view not bound by regional specificities or a planning intervention at a particular time.

This paper reports a pilot study that was developed as the first step of this research project. At this stage, four European cities were selected. The criteria for their selec-

tion were their relative similar dimension and population during the 19th century, and their geographic representativeness, namely, cities from the more diverse geographic regions within the European continent. Therefore, the cities of Marseille, Stockholm, Geneva and Porto were selected, all being middle-small size urban fabrics in 1830–1842.

Each of the four cities was analyzed by a set of four parameters: 1) percentage of built area in the urban perimeter; 2) percentage of open spaces in the urban perimeter; 3) total area of green spaces; 4) total dimension of streets with trees. These set of parameters were assessed both in the city of the 19th century and in 2010, allowing determination of the variation of each one of them, over a period of more than 180 years.

Problems of Protection of Arranged Green Spaces in Conditions of New Architectural Policy

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Conservation and development of towns' green areas in the conditions of economic reorganization of society and further urbanization processes has become one of the main problems for their stable ecological and architectural development in the future. It helps to form a supporting ecological frame of arranged green spaces and expanses of water connected with large-scale green areas of suburban areas.

Rational and full value utilization of the natural landscape of Bryansk and its suburban area is a complicated, labour-intensive and long endeavour that started in 1960. The basis of the town green belt consists of large forest tracts of coniferous and broad leaved forests. The left bank part of the Desna flood-lands is considered as the main recreational area, including the system of forest-parks. This unified and integrated system of recreational areas, which defines the spatial composition of the town, includes large-scale gorges and ravines crossing the hill-side part of the right bank with their picturesque relief which can and must be considered a powerful reserve in the system of arranging green spaces in the central part of the town and as the most important link of interconnection and continuity of arranged green spaces of the suburban and town area of Bryansk.

Unfortunately, to date green areas of Bryansk are separated, not connected plots, demanding considerable work on their landscape transformation. During the last forty years no large green tracts were created and because of the increase in individual residential investment the area of green spaces for general use will decrease up to 5–8 m^2 / person.

As a whole this unsatisfactory situation is aggravated by ecologically incorrect town-planning changes and as a result areas with green plantations decrease. As an example we can take the so called "reconstructions" of areas of the historic centre of the town – Gagarin boulevard; the "round" public garden, and the squares of Military Glory and Revolution. Projects for improving these areas didn't envisage the preservation of an old green resource. So in the realized project of boulevard Gagarin reconstruction many trees were completely destroyed: 54 horse-chestnuts, 10 silver birches and 200 metres of line grass-plots. More than 50 trees, coniferous species among them,

were destroyed while changing the appearance of the square of Military Glory. Widening of highways of the central part of the town was the reason for destroying grassplots and about 50 trees of basswood. But neither architects, nor nature protection services of the town tried to protect green plantations. Moreover, the necessary, in this case, democratic procedures of a public opinion study were not conducted.

Due to the negative facts in the architectural policy of Bryansk, the problem of immediate improvement and changing ravine areas into accessible recreation areas is still an urgent matter for the town. In all master plans of the Soviet period, ravines were considered as an obvious asset value for the town. Gradual exclusion of individual development from their territory, arranging green spaces and their improvement, changing them into recreational areas for town people were planned. But unfortunately implementation of project decisions hadn't begun under the Soviet regime. The new town-planning approaches to those areas have resulted in reducing the boundaries of ravines' protective areas, assignment of slope lands for development and cases of construction without permission.

The concern of the community about the ecological situation in the town has resulted in organization of initiative groups which, with the assistance of judicial bodies, managed to organize public hearings concerning green spaces in the course of which civil society unanimously expressed their opposition to such reconstructions.

Lost green spaces in the central part of the town are difficult to restore. To some extent they may be restored by making additional efforts. For example compensatory green spaces in the centre of the town where town people can take an active part may be of great importance.

The architectural department of the town has been given the task to develop architectural planning and dendrological solutions for organizing parks and other recreational facilities on the complicated relief of ravines and gorges. Efficient work on Bryansk ravines' relief could increase their natural qualities. The town would get perfect landscape parks, wonderful islands of nature. It's important to bear in mind that ravines are wedges coming from green flood-lands of the Desna through large residential areas of Bryansk central district. They serve as an entrance into the forest and park zones of the town. Valuable natural tracts of recreational forests together with ravines must be included in the system of arranging green spaces with their following reorganization into forest and park recreational zones.

Further inventory work on revealing, preserving and observing different categories of arranging green spaces is necessary. Town people who protect plots with green plantations, which are ruthlessly and with impunity destroyed may be of great help for specialists. The town greatly needs realization of large-scale arrangement of green spaces. It's also necessary to arrange green spaces on smaller territories and plots, even a "one tree public garden" on unoccupied or in abeyance areas paved with concrete tiles can make a difference.

The regional scale of green structure – the approach to agricultural land in municipal comprehensive planning.

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Studies on sustainability mainly focus on an urban point of view that is often addressed separately from research on rural areas, agricultural lands and forests. Cities are supported with food, material and energy from further places than their immediate surroundings. So far in a short time perspective it has been beneficial to geographically separate production from consumption. The environmental crisis – global change (IGBP, 2004) and resource crisis e.g. peak oil (Aleklett, 2008) claim a new paradigm on how to organise and plan urban and rural areas. Urban-rural interactions are of current interest in spatial planning. A localization of a larger share than that that exists today of primary production of food and bio fuel is a probable effect of an increased price of oil. In addition, a growing population means growing demands for food and energy. This development will increase the pressure on productive land areas globally including landuse changes. It is vital to increase the understanding of, and planning for these transformations even if the full picture is difficult to obtain. Key issues, such as how spatial planning works in practice and how natural resources and landscapes are used, need to be taken into consideration. This paper discusses the regional scale of green structure from a spatial planning and production perspective. A national study was conducted to investigate the approach to agricultural land and local flows in municipal comprehensive planning. The study was followed up by conducting a text analytical study of comprehensive plans with a focus on agricultural land.

Understanding the Atlanta BeltLine as a Working Landscape

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The concept of working landscapes is based on the relationship between infrastructure and public open space. It has the potential to make a substantial contribution to enhance the quality of life in the city. We investigate the potentials of this concept along the case of the Atlanta BeltLine. Since the origins of Atlanta, Georgia, USA, development was mainly driven by infrastructure. Atlanta is a rapidly growing metropolitan area. At the same time large areas along a historic 22-mile railroad corridor are abandoned. The long term development of the BeltLine Project aims at reusing this land to improve the quality of life by providing a network of parks, multi-use trails, various real estate projects and a new transit ring.

The paper examines the development of the existing belt line corridors from a monofunctional transportation infrastructure (see fig. 1 and fig. 2) into a complex hybrid

working landscape. The investigation is based on a basic discussion of the concept of working landscapes by analyzing scholarly literature. The BeltLine serves as a case study. It is examined by analyzing scholarly literature, project related publications and the official website of the project. Site visits and photo documentation provide insight into the construction of Old Fourth Ward Park, one of the first realized projects, opened in 2011.

Over decades the belt lines were understood as monofunctional transportation lines and had a dominant influence on the determination of spatial relationships in the city. This will continue with the BeltLine project – but in a more complex way, by intermingling social, economic and ecological spheres. The reconfiguration of this space opens up many opportunities. The interconnectedness of infrastructure and public space in the BeltLine Project creates a strong foundation to create a hybrid working landscape on various scales. On a city scale is has the potential to shape a new public realm and have an important impact on the quality of life of the inhabitants. On the scale of designing sites or neighborhoods, the combination of stormwater detention and public space is particularly compelling and open for new design solutions. Old Fourth Ward Park is a hybrid place. It provides open space for a neighborhood which was underserved with public open spaces. At the same time it contributes to citywide needs by retaining stormwater. This project's combined goals of water detention for a neighborhood and traditional park functions raise important programmatic and aesthetic questions.

Thinking of and working with hybrid working landscapes asks for a redefinition and extension of traditional open space typology. Discussing process orientation, hybridity or change must ultimately influence design processes and design language. It is concluded that finding synergies between design and engineering provide a rich source of innovation for new urban landscapes.

Fig. 1. Abandoned rail corridor

Fig. 2. Abandoned railroad bridge

Rainwater Management in Open Spaces as a Challenge for Landscape Architecture exemplified by a Case Study in Vienna, Austria

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Storm water systems in European cities are mostly based on the 19th century concept of underground sewers. Sustainable urban development induced on-site management and open drainage of storm water are considered best available technology. After a boost in the 1990s implementation and further development seem to have slowed down.

This paper looks into the development of rainwater management in open spaces as an assignment for landscape architecture. It focuses on the scope and the barriers in everyday practice. Goals and methods of these systems are outlined in a review of technical and scholarly literature. The progress and limitations of on-site storm water management are analysed using statistical data and a descriptive case study of built structures in Vienna. A compilation of projects in different European countries illustrates the scope of incorporating functions into designs.

Approaches are classified as concealment (keeping rain water out of sight), inconspicuousness (incorporation in design and everyday day use) and artful rainwater design (highlighting rainwater as a site commodity). Storm water systems in Vienna vary in accordance with zoning and sewer regulations. In some areas a ban on rainwater discharge into public sewers led to on-site systems. However soakaway pits prevail which are not consistent with ground water protection and multifunctionality. Open storm water drainage and swales are not common and rainwater management is not well integrated in open space design. This may be due to storm water management being traditionally assigned to building services and not to landscaping.

Environmentally responsible storm water management as part of the overall open space design may be impeded by lack of information among decision makers and planners and by planning processes adapted to conventional drainage. Implementation could be stimulated by adapting building codes and regulations, discounting storm water fees and providing competent information.

Fig. 1 Artful rainwater design – Kueppersbusch estate in Gelsenkirchen, Germany, by Szyszkowitz Kowalski Architects

Fig. 2 Inconspicuous open storm water drainage – Bombadier estate in Vienna, Austria, by Rajek Barosch Landscape Architects

Green space branding: are Danish cities capitalizing on their green space assets?

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An increasingly global economy has led to a fierce competition between cities at a national and international level. In order to attract creative investors, citizens, and tourists, cities have embarked on marketing campaigns, differentiating themselves based on strengths and competitive advantage. One such strength is quality urban green space. Amongst other benefits, parks and other urban green spaces make cities more attractive and liveable places, attracting people and investments to urban centers.

Applying a place branding approach, this paper presents the results of a countrywide survey of Danish municipalities and their participation in urban green space branding schemes. To compete both nationally and globally, Danish cities are crafting green city, or environmentally sustainable, profiles. However, it is unclear what the roles of urban green spaces, such as parks, are in these marketing schemes. Based on survey responses from both green space and communication staff, an overview is presented of the status of city and place branding through green spaces. The findings show that this type of branding exists, but often lacks a strategic approach with the majority of Danish municipalities branding their green spaces independently of their municipal brand. Moreover, survey results demonstrate that local and potential citizens are the main focus of those municipalities that are integrating green spaces into their city brands. The results call attention to the role of green spaces in successful place branding, offering important links to local citizens and point to the potential for involving new voices in city visioning processes by better integrating urban green spaces into city branding campaigns.

Macro Scale Plans in Turkey and a Green Infrastructure Road Map; Istanbul and Bursa Cases

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In the last ten years, macro scale plans have been prepared in order to guide the socio-economic development and urbanization system in accordance with the environmental priorities. In this 1/100.000 scaled environmental plan, evaluations are performed on a regional or provincial basis and sub-scale applications have attempted to adhere tothe holistic view. However, it is seen that ecological integration and the issue of green infrastructure networks are not sufficiently involved. Addressing macro

scaled plans with the approach of ecological networks and green infrastructure is important for the contributions to offer in terms of the settlements or the government, and also for the natural-based solutions. Such an approach is highly important in the settlements where the rate of urbanization is highly above the national average. These settlements have turned into places where air pollution, heat islands, flooding due to rainfall, waste-water, living detached from nature is prevalent. These mentioned problems occur in Istanbul, the first metropolitan area, and in Bursa the fourth metropolitan area in Turkey. Therefore, integration of ecological networks and green infrastructure issues are stated as issues in macro scaled studies prepared in the years 2005–2006 in Istanbul and 2011–2012 in Bursa. These plans define the content and direction of urban rehabilitation and development. The studies were based on analyses of data from the natural structure on the basis of GIS. In both cities, green corridors are defined in order to base planning on an integrated system of urban green and green infrastructure. These assessments, made on the basis of natural structure, are defined in order to develop a scheme of healthy city macroform and a guide-map for meso and micro level spatial planning and urban design studies to spread green infrastructure.

Urban parks as green-blue infrastructure:the Ankara Mogan park case

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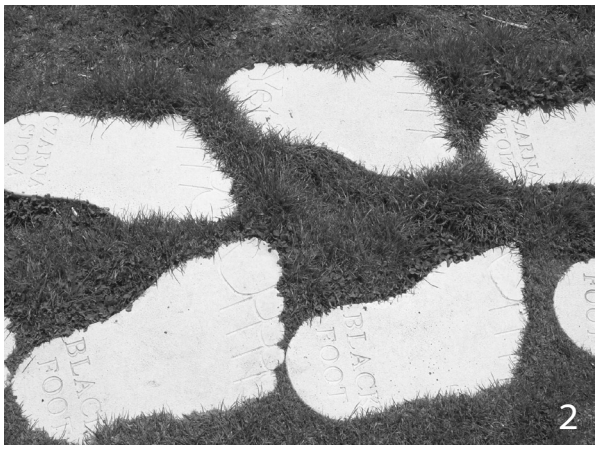
The busy lives of metropolitan people are rendered even harder by the necessities and imperatives of urban living. Paired with the low quality of life in urban settlements, this way of living further challenges the mental and physical health of people. In such an environment, a healthy and happy life for urban people is dependent on a strong socio-economic structure and well-established green areas. Green areas have a critical role in balancing the degraded relationship between humanity and nature and enhancing urban living conditions.

Ankara is the second biggest city in Turkey after Istanbul. Being the capital city, it used to be known for its culture, arts, sports and political activities. Today, however, it is known for its big shopping malls. Due to faulty urban transformation policies, the valleys that help the city to breathe are populated with high-rise apartment blocks, and the parks have been converted into housing or shopping areas. Hence, preferences have also tended towards consumption-oriented passive indoor recreational activities. Today, while the people of Ankara spend their free time in shopping malls during weekdays, they generally prefer to go to city parks and other green areas at the weekends.

Mogan Park, which is 25 km from the city center, is one of the favourite destinations especially at weekends for people in Ankara thanks to its green-blue infrastructure (Fig. 1). This is a large-scale park established around Lake Mogan with a total area of 60 hectares. In addition to its green areas, the Park extends recreation services such as water activities, walking paths (Fig. 2) and sports facilities to its visitors (Fig. 3). Lake Mogan is one of the 184 Important Bird Areas (IBA) in Turkey as recognized by Birdlife International. A 274 km^2 area of the lake lies within the boundaries of the Golbasi Specially Protected Area (SPA), which is one of the 14 SPAs in Turkey. The lake is an important roosting and breeding site for raptors and waterfowl. It is also among the

candidate nature conservation sites of the EU nature conservation legislation. An endemic wildflower species, Centaurea tchihatcheffii, also inhabits the lake perimeter.

This paper will introduce the green-blue infrastructure values of Mogan Park and its importance for the people of Ankara, emphasize the link between the green and social infrastructure, and provide suggestions for its sustainable use.



Cemetery as park: The heterotopian nature of the Great Cemetery in Riga

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Physical space shapes itself following the selective logic of human mental action. Some human made artefacts are preserved through time and nature's cataclysms, war and human inflicted disasters. Historical memory passes by the insignificant facts, holding on only to those that are fraught with meaning (Veselovskij, 1989). Poulnabrone dolmen, the Pyramid of Djoser, the human beauty of the Parthenon and the spirituality of Chartres' cathedral – these artefacts are silent witnesses of incarnated human identity. Information significant to human identity is preserved, being transferred by metaphor. The transitive nature of metaphor creates meanings, harmonized with the new chronological environment. Being in a process of metaphorical transition, many of contemporary public spaces can be described as heterotopias. Many heterotopias were translated from event into building, from time to space, from a transient moment to the permanence of a place, and these processes occurred in some cases as a structural reaction to a crisis (Dehaene, De Cauter, 2008).

Every culture creates "heterotopias" in urban environments today. Any one of us can observe the process of metaphorical transformation and actively participate in the live mystery of Metaphorical Transition, experiencing the power of eternal Metaphor in the shaping of space.

A territory with a very unique character, the Great Cemetery of Riga, is a former complex of cemeteries, founded in the 18 century. Today no burials take place there anymore and it is actively used as a park. The Great Cemetery as "interspace" has impacted people's mind and emotions through time, being a "sacral" apparition in the fabric of the city of Riga both spatially and mentally.

Situated close to the border of the historical centre of Riga1, the complex of cemeteries is one of the biggest (more than 35 ha) green areas in the 19th century part of the city. Located in the northern part of Riga, the Great Cemetery is historically connected with one of the oldest trade routes, the "Via Magna" (Lielais ceļš lat.), leading through Middle Land (settled with Baltic tribes) to the area settled by the East Slavic tribes, where in the 15th Century the Kingdom of Russia appeared. Hidden behind the facades of the buildings of busy Freedom Street2, the Cemetery maintains the reminiscence of the "golden age" of the site. This place is nowadays visible and a touchable essence of Riga's and Latvia's history and culture. Some of the most well known personalities, who had shaped the spiritual, cultural and built environment of the country during the last 200 years, are buried there.

Multicultural, historically and socially diverse, it is unique not only as green public space in Riga, but also as a cultural and spiritual phenomenon of world heritage. Cemetery – park is an example of the interspaces with their heterotopian nature and ability to accumulate and to "slow down" the race of history.

Nowadays, left by the authorities and professionals to organize itself, it is emanating a quiet and light harmony and tells the dream about future celebration of Friendship and Tolerance, storing in its "body" the power of a metaphor.

1 Riga's historical centre since 1997 is classified as world heritage UNESCO whc.unesco.org/en/list/852

2 Main street of Riga, former Alexandrovskaja

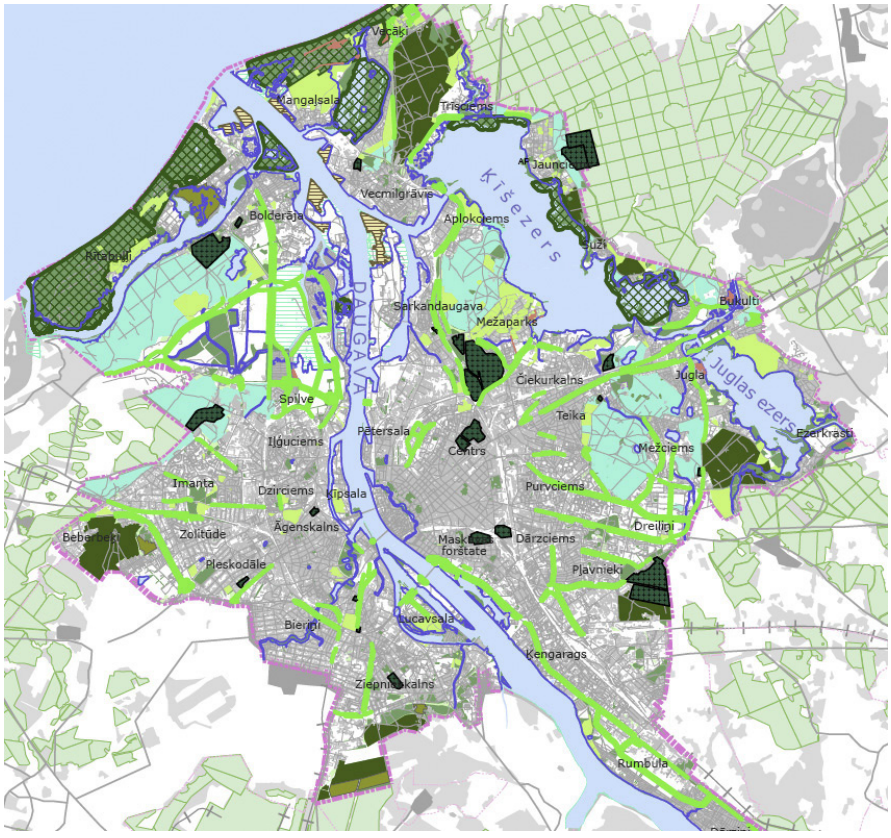

Fig. 1. Greenery and nature areas. Riga development Plan 2006–2018, map.6.1.

Fig. 2. The Greate Cemetery, Riga, Chappel, beginning of 19th century, 2010, photo H. Gutmane

Fig. 3. The Greate Cemetery, Riga, Chappels, 18–19th century, 2011, photo H. Gutmane

The Preservation of Isfahan Persian Gardens as Green Heritage

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The ancient Iranians had much respect and admiration for natural waters and trees, alone or together, as one of their greatest cultural values in pre or post Islamic periods. The oldest Persian garden so far found dates back to the Achaemenid Empire (550-300 B.C.) and the Pasargadae quadrants, both indicating the antiquity of garden designing in Iran.

This paper aims to explore the Iranian old gardens and the tradition of garden designing in history with a special focus on Isfahan's green spaces at the era of Safavid (1500–1700A.C.). During the Safavid dynasty, Isfahan, as the largest Persian garden city, was supported by a green major axis called Chahrbagh that has remained as green heritage. Gardens and trees were the most important natural and architectural elements in Isfahan's cityscape at that period. These elements usually have been considered as a traditional identity of the garden city; their sustainability hence had a key role in preserving the structure. Designers therefore produced particular urban infrastructure systems of in-ground irrigation systems. They had to construct the channels that branched off from the central river of Isfahan (Zayandehrood) and delivered the water to all parts of the city. Safavid tree-lined straight streets, gardens as well as water supply systems have been recorded in European travelers' reports. One of the main purposes of this study is re-exploring the historical innovations of Iranian garden designers as well as the main reason, and the specifications of Chahrbagh origins. The final results will help the readers to revitalize some of the structural plans and methods of constructing an Iranian garden city at the era of Safavid. The research applies an analytical-descriptive method with a specific example through a case study.

Relationship between Community and Nature in the Egyptian villages

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The relationship between man and nature since the dawn of history is embodied in the first agricultural community in the valley of the Nile. Egypt was one of the early societies that were connected to nature and have been affected and influenced by nature, forming one of the great civilizations of history. This relationship has continued in this valley as towns, villages, countries and different communities evolve, and the key factors of these communities were water and greenery.

In recent times as a result of social, cultural and urban changes, this distinctive relationship faces a set of challenges and problems that may affect the natural environment. It began with migration from rural to urban areas and the collapse of the traditional concept of farming. The urban population in Egypt could reach from 40% in

2010 to 60% in 2030, threatening the agricultural environment. Lacking the cultures of social change in rural communities in Egypt,the lack of scientific development of the environment may help these communities to survive and extend.

Egyptian lakes have social and environmental aspects including interaction between farmers, fishers and Bedouins. These various societies and different cultures live together surrounding Egyptian lakes,giving these sites very special character. Villages surrounding lakes are impacted by a number of problems such as accommodation, rapidly growing populations, unemployment, lack of education and lack of environmental awareness.

The research presents the problem of these communities surrounding Egyptian lakes and the development of methods and environmental performance of these urban communities in line with the challenges of recent time.

The aim of this paper is to formulate a conceptual framework to achieve harmony between urban, community and surrounding nature in Egyptian villages, through an interdisciplinary literature review of the concepts of green and social infrastructure. Finally, based on a synthesis of the literature a conceptual framework is presented.

Vegetative outdoor advertising as a green infrastructure

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Advertising is always looking for new means of expression. It is trying to gain new spaces and media. The industry has always valued the element of innovation, which is extremely important to every company's image.

Greenery – the garden and the park, evoke very positive associations (such as: ecology, health, naturalness, freshness), therefore, advertisers are increasingly turning to the means of expression associated with living plants (as opposed to ones captured on video or photos).

The use of living greenery, particularly flowers, in outdoor advertising is not an entirely new phenomenon. Along the highway in the U.S. and Canada one can observe "vegetative advertising" – texts, or images created along the road with the use of plants. These are plants with colourful leaves, flowers, combined with artificial elements, composed as a sign or a logo. This form of advertising, despite its apparent attractiveness, has been criticized as a syndrome of appropriation of the landscape by private companies (usually large corporations). "Dressing up" ads in positively associated greenery and apparent re-naturalisation of the space along highways leads to a progressive spreading of the corporate landscape.

Some forms of "green advertisement" have much in common with "traditional" forms of flowerbeds and flower carpets. Other, newer, less standard ideas for using greenery in advertising could be considered in the category of temporary gardens.

Patrick Blanc, a world famous botanist creating picturesque plant compositions on vertical walls, calls his projects "vertical gardens". Installations similar in character appear as elements of the outdoor advertisement – in the form of billboards or free-

boards. "Green" outdoor advertising can use already known advertising space and techniques, though adding a novelty of connecting a poster with a living, growing, difficult to maintain and more demanding, vegetation.

In the paper, the author looks at various forms of "green" advertisement from around the world, comparing methods and techniques. Little known and rarely studied "vegetative advertising" could become an important part of urban infrastructure green in the next decades.

Fig. 1. "Non-smoking area" social advertising in Warsaw, Poland
(source: authors archive)

Fig. 2. McDonalds "Fresh Salads" Ad.
(source: www.aces.uiuc.edu/news/News_Photos/billboard/images/SaladBillboard.jpg)

20th century multi-storey residential areas

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The concept of neighborhoods, at the heart of which lies the idea of large-scale residential areas, was first promulgated in 1929 by a sociologist and planner Clarence Perry. The research reveals that the architecture, the design and the common space of the neighborhood and their functionality may facilitate or, on the contrary, slow down the development of social relationships. For example, there have been several studies conducted revealing that for a certain group of individuals a common space (for one group of neighbors it is a courtyard) is the most important everyday meeting and communication place. Even the quality of this common area affects the mutual social connection – for example, in areas with more vegetation and trees, the social activities of residents can be observed more often than in those with less vegetation. Consequently, the research comprises publically available scientific information on the ecological aspects in the urban environment and the use of vegetation in multi-storey residential areas in Latvia. A relatively large amount of publications concern urban landscapes from the ecological perspective. The emphasis in these publications are mainly put on the natural areas, parks and other vegetation enriched areas, including family gardens, and the importance of biological diversity and fragmentation of nature is also emphasized. The scientific publications emphasize that the public parks and private gardens in the city are of great importance in providing and maintaining biological diversity, and they provide significant ecosystem services.

This means that alongside maintaining the biological diversity of the landscape, it is also essential to consider the ecological evaluation of the landscape in order to improve the microclimate, and to diminish noise and chemical pollution, and provide recreation possibilities for the residents. Consequently, based on the obtained information, the emphasis of this research is placed on the residential areas built in the second half of the 20th century, because these territories in Latvia have not been previously thoroughly studied and ecologically evaluated. The research process resulted in obtaining information regarding the experience of foreign countries in improving and facilitating ecological aspects and processes in the multi-storey residential areas..

The research presents the analysis of the residential areas of the cities in Latvia built in the second half of the 20th century, as well as the condition of their vegetation systems from the ecological perspective. The research established that the major part of these residential outdoor areas are composed of green lawns and asphalted areas that lack qualitative vegetation systems (Fig. 1, 2). In the research process, the vegetation systems and green zones of the multi-storey residential areas are evaluated according to their accessibility and exploitation possibilities for the area's residents, as well as the importance of the vegetation systems for the well-being of the residents and the present condition of vegetation elements. The research established that these elements are mainly used for short-period relaxation after a business day. As this type of open area is located near residential housing, it is of great importance for the less mobile groups of residents (children, elderly people, and physically challenged residents), as well as for working people who have little spare time to spend outside. The

comparative analysis was applied in the research to study the residential areas of Latvia built in the second half of the 20th century, where the author's previously performed studies on the landscape quality of the residential area courtyards in the cities of Latvia were taken as a base. From the ecological perspective, the aim of the research was to determine the actions necessary to be taken to improve the maintenance of the vegetation in the 20th century multi-storey residential areas, which would provide recreation possibilities for the area's residents.

Fig. 1. A negative example of a residential area in Latvia, Jelgava city, Satiksmes Street. (Photo by author, 2012)

Fig. 2. Another example of a residential area in Latvia with no vegetation, Jelgava city, Satiksmes Street. (Photo by author, 2012)

Riversides' management for "green and blue" recreation in cities – a case study of Poland

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Location and development of European cities have always been strongly connected to rivers. In the Middle-Ages, most cities were seated on riversides and with time they changed their settlement structures depending on strategic importance, improvement and the introduction of new functions such as defense, commerce, communications and power engineering development through utilization of cultural and natural resources for the creation of hydro-technical systems. At the end of 19th and the beginning of 20th century, relatively recently, attractive river-banks have gained new significance as sites for tourism and recreation activities. New river routes were created and they also included landscape aspects. Currently, since many of the original functions of human settlement have disappeared or been modified there is a need for active and passive recreation sites for inhabitants. Riversides and rivers themselves are exploited and utilized again as important recreational spots.

Riversides are also very important and sometimes crucial elements of the urban landscape, and they have a direct impact on its character, aesthetic and quality. River and riversides' structures promote sustainable tourism development, which includes specific forms of recreation based on natural values and cultural heritage protection. The relationship between water and green areas in urban zones might be a basis for "green and blue recreation". In this study many forms and directions in development of riversides in Poland were analyzed. Agglomerations, big and small cities as well as small settlements were compared. Actual projects and realizations in historical contexts and resources were analyzed. In the presented examples the role of the river might be observed at two spatial scales: the mesospatial urban scale – where the river crosses the city or where it is tangential to the city and becomes part of the urban structure; and the microspatial site scale, where the river interacts with architectural features and objects in urban space (Kosiński 2001).

The projects analyzed in the study are already realized or they are in the realization process. The choice of projects is not accidental. In all projects the main emphasis was made on returning inhabitants to the river and the recreational usage of the river itself and its banks. Additionally, in the analyzed projects we can observe an extremely diversified character of a river or rivers in the same city, sometimes even in very short distances. An analysis of forms of river banks' development and programs of usage as well as interviews with inhabitants and users, demonstrate the special role of river valleys as a part of green urban infrastructure and areas with important recreational functions and potential. The way of human interaction with natural features, especially in spaces connected to water and green areas, expresses their need to reclaim a standard of life, good health and physical conditions. In this case, nature is not only a source of aesthetic experiences but through sustainable development can satisfy a need for human recreation, rest and physical activities.

The Baroque Garden in the Tessin House in Stockholm

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The royal architect, Nicodemus Tessin the Younger, built his own residence opposite the Royal Palace in Stockholm between 1695 and 1701. The façade is strongly influenced by contemporary Roman architecture, but the garden is typically French. Tessin visited and studied the works of André Le Notre during his educational Grand Tour in Europe. Tessin's baroque residence, including the garden, is one of the best preserved in Europe.

There are similarities in the sequence of spaces, as well as in the facades, between the Royal Palace and Tessin's own house. A likeness that expresses Tessin's own view of a high social position and at the same time, considering the huge difference in scale between the buildings, exposes the social distance between the King and his architect.

Two drawings by Tessin of the ground floor including the garden, are preserved in the National Museum of Fine Arts in Stockholm. One of the ground floor plans, signed August 8 1696, has a text describing both the rooms in the house and the garden. (Fig 1.) The full paper will have a translation into English of Tessin's description of the garden and an analysis of its composition.

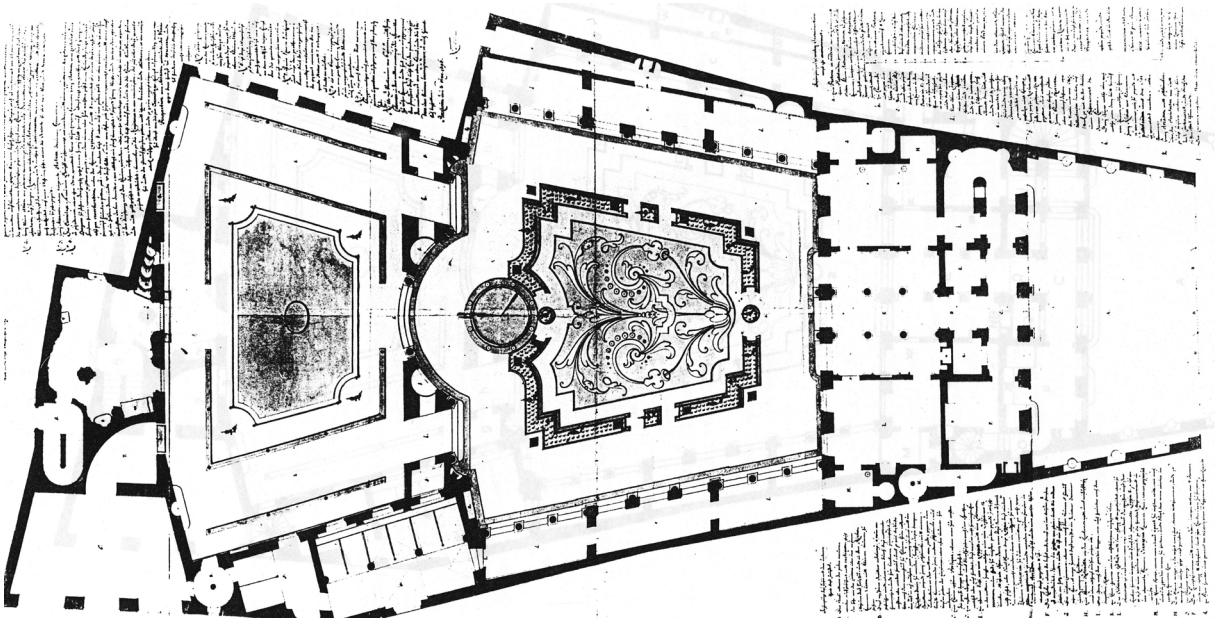

Fig. 1. Tessin's plan of the ground floor of his residence, signed August 8, 1696. Original in the National Museum of Fine Arts in Stockholm.

The garden has gone through many different periods of decay and renewal. In the beginning of the 20th century the garden was overgrown with big trees. In the mid 20th century it was restored with Tessin's plan as a model, but in a very simplified way. When the buildings were restored in the mid 1960s, the garden was also restored again. This time the restoration recreated the original garden as accurately as possible. Landscape architect Walter Bauer was responsible for the garden restoration. (Fig 2 and 3).

Fig. 2. The garden from the main building. Photo: Rolf Johansson.

Fig. 3. The garden and the background building with a false perspective. Photo Rolf Johansson.

Corridor management plan and scenic byway proposal for northeastern Anatolia, Turkey

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The Scenic Byway is a road recognized by the United States Department of Transportation for its archeological, cultural, historic, natural, recreational, and/or scenic qualities. The program was established in 1991 to preserve and protect the nation's scenic but often less-travelled roads and promote tourism and economic development.

This study was carried out in Erzurum–Rize (D925) highway and its surroundings in Northeast Anatolia Region where the west part the of Caucasian Ecological Region is located, identifiedas one of the most ecological sensitive areas by Conservation International (CI), during April 2001–September 2003.. The aim of the study is to determine use potential as a scenic byway in respect of landscape planning principles for the Erzurum–Rize highway corridor. With this aim, a Corridor Management Plan (CMP) is suggested. Items such as visual quality analysis, tourism potential (TP), participation of society in scenic byway planning progress and natural and cultural aspects in environmental analysis, including necessary landscape reclamation, have been evaluated in the CMP. In this study, Visual Quality Analysis was carried out in nine sections by using United States Federal Highway Administration's "Visual Quality Analysis Method".

The evaluation of visual quality is by the identification of vividness, intactness and unity present in the view shed. This approach is particularly useful in highway planning because it does not presume that a highway project is necessarily an eyesore. This approach to the evaluation of visual quality can also help identify specific methods for the minimization of each adverse impact that may occur from the project. The definition of the three criteria for the evaluation of visual quality is:

Vividness is the visual power or how memorable the landscape components are as they combine in distinctive visual patterns.

Intactness is the visual integrity of the natural and man-built landscape and the visual freedom from encroaching elements. This may be present in urban and rural landscapes or in natural settings.

Unity is the visual coherence and compositional harmony of the landscape as a whole. Unity frequently attests to careful design of individual manmade components in the landscape. These factors are the three criteria of the objective rating system and have equal influence on the visual quality assessment of the landscape. The assessment is the result of the calculation of the following equation:

Visual Quality = (Vividness + Intactness + Unity)/3

According to visual evaluation results of the research, average visual quality, unity, intactness and vividness were 4.21, 4.69, 4.00, and 5.34 respectively. The highest values were determined as K6 (Ovit mountain pass) with 5.47 and 5.34 for visual quality and vividness, K7 (Sivrikaya village–Ikizdere county) with 5.44 for unity, K9 (Ikizdere–Anzer plateau) with 6.13 for intactness. The lowest values were calculated as K2 (Kuzgun damp–Golyurt pass) with 3.39 for visual quality, K4 (Pazaryolu–Ispir) with 3.75 for unity,

K3 (Golyurt pass–Pazaryolu district) with 2.20 and 2.95 for intactness and vividness. According to all evaluations, it was concluded that Erzurum–Rize (D925) is suitable for designating as a scenic byway and some suggestions were given.

If the Turkish General Directorate of Highways makes use of this research, some roadway corridors can maintain not only transportation utilities but also link to nature conservation and promote rural tourism in sensitive ecological regions.

Fig. 1. C1 Corridor (Serçeme valley–Kuzgun damp)

Fig. 2. C6 Corridor (Ispir District –Ovit Mountain Pass)

Fig. 3. C7 Corridor (Sivrikaya Village –Ikizdere Valley)

Commercial zones as a resource for urban green infrastructure

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Saint Petersburg is now going through significant urban planning changes. Recent market analyses showed that the development of commercial zones is one of the largest and most active sectors in the building industry. Furthermore, modern large-scale multifunctional (mixed-use) office buildings are significant elements of urban structure and centres of attraction for people; they form new open public spaces.

Our study of office buildings in Saint Petersburg, conducted from 2009–2012, led to the conclusion that surrounding areas almost always lack green spaces, protected and defined zones for recreation and social interaction. Our study showed that currently, buildings' footprint covers the major part of the plot of land (action area). Office buildings tend to occupy surrounding open public spaces for parking purposes. Overall, our results indicated the need for systemic and normative approaches for the landscape organization of office buildings' territory in order to improve green infrastructure.

We suggested that office buildings and surrounding spaces could be an important resource for green infrastructure. Therefore, we recommended different ways to define pedestrian, parking and recreational zones using trees, hedges, storm water swales and retaining walls. We also suggested the creation of green roofs, green terraces, green facades and green courtyards for office buildings to improve the environments' quality and to save resources.

Next, we developed a theoretical spatial model for optimal methods of greenery introduction into particular functional zones of office buildings (see Fig. 1). In the current model we used a holistic approach to effectively integrate plants, landscapes and buildings. It implies an intensive cooperation of landscape engineers, architects, developers and administrators right from the beginning of a new project. Since the layout of buildings and facilities heavily influences plants' well being, architects have

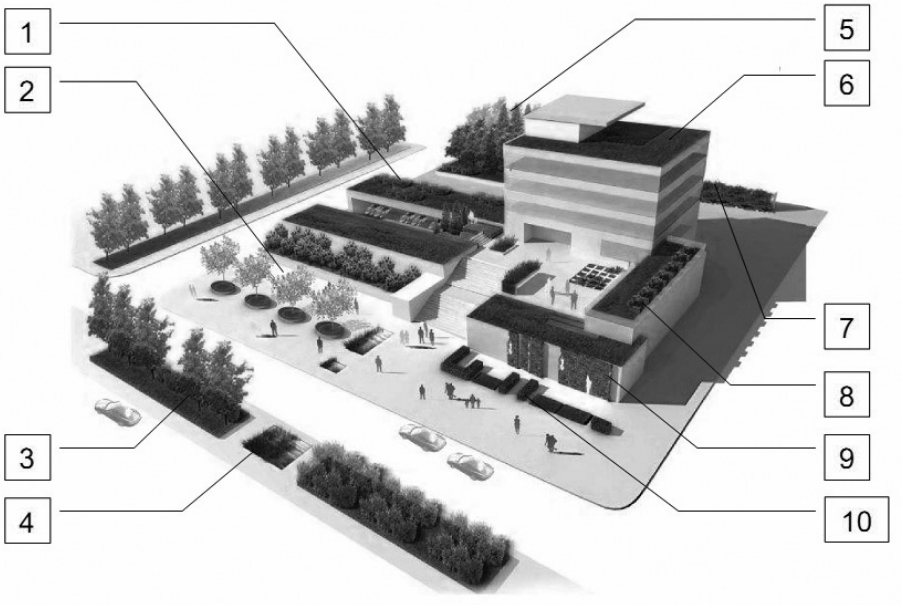

Fig. 1. Theoretical spatial model of green buffer space of mixed-use office buildings.

to adapt buildings' form, facilities and configurations for sustainable planting and for ecosystem services. It is possible nowadays to extend green areas with the help of innovative technologies, i.e. greenery could be integrated with architectural objects and could be included in the inner and outer spaces of buildings. Furthermore, the model enables the integration of local native plant communities with mixed-use office buildings to improve biodiversity and natural identity.

Based on our results, we suggest new legislation limiting the development of office building plots that will introduce norms of building footprint and green areas, including vegetation for the promotion of environmental quality. We suggest stimulating the demand for green buildings and green roofs by creating policies and incentives targeted at developers, building owners and managers, insurance providers and the financial community.

Our approach enables effective integration of greenery with mixed-use office buildings, improves the quality of urban environments and develops green infrastructure in Saint Petersburg. Overall, our approach demonstrates that new commercial zones are important resources for Saint Petersburg's green infrastructure.

Korean Traditional Pungsu System as Green-Blue Infrastructure

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According to recent definition of green infrastructure, pungsu (fengshui in Chinese), the traditional land use theory of Korea, is close to its concepts. In pungsu certain places in the landscape have "ki (the breath of life)" and such places are more favorable than others for a building or a landuse. In pungsu – literally pung means "wind " and su "water " – the ki is dispersed by wind and blocked by a watercourse. An auspicious place is determined by the location of surrounding mountains which affect its exposure to wind and by the orientation to watercourses. Pungsu principles can be applied to the examination of the local landscape. One sites a building or a landuse in relation to the forces of nature in the physical world in order to obtain maximum benefits. Pungsu's concept can be seen as the symbolic result of modern ecosystem theory.

In this paper I discuss pungsu from the perspective of green-blue infrastructure – within the scope of "green network", "blue network" and "white network (micro-climate system)", which are mentioned as parts of ecological planning.

1. Green Network

In the theory of pungsu the terrain around a site should have the formation of an armchair; the hills in the rear should fence off the cold bitter northerly wind; those on the left and right should flank it, and the front should be opened or unobstructed such that view, airiness and sunlight can be brought in (Fig. 1). It is important that the building and site always be enclosed and surrounded by continual mountains. These continual mountains for each house become green infrastructure in a village or city (Fig. 2, Fig. 3).

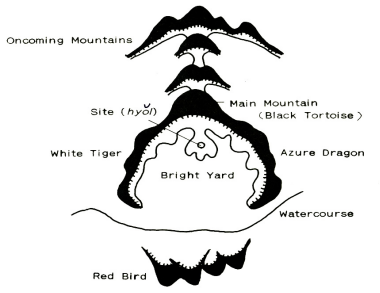

Fig. 1. Concept of Pungsu

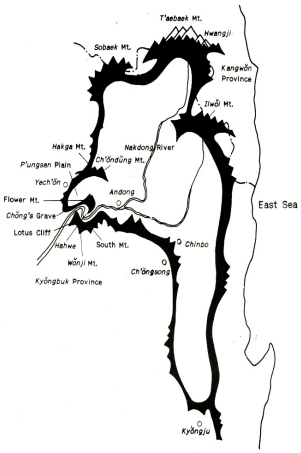

Fig. 2. Mountains in Pungsu

Fig. 3. Green Network following Pungsu Theory

2. Blue Network

Pungsu also emphasizes the blue network (water system) that is closely linked with a green network. The ideal water-flow should always surround the site based on the topography; meanwhile the inflow path should be visible whereas the outflow path should be hidden. In ancient times, rivers were quite important for irrigation for farming and fertile alluvial soil is always available along a river (Fig. 4). This showed an ideal relationship between humans and nature, which is mentioned symbolically in pungsu.

Fig. 4. Blue Network in Pungsu

In a modern perspective when water flows in a curve, and surrounds a site, it lengthens the period that rainwater remains on the ground. This enables more infiltration of rainwater into the ground and thus moisturizes the surrounding soil and maintains the humidity of the air. This is a common technique used in current environmentally friendly landscape planning for rainwater management.

The pungsu concept of a blue network is conducive to sustainable farming and a comfortable environment for people who live in areas of East Asia who face the impacts of monsoons during wet and dry seasons, to live in more comfort.

3. White Network (Micro-climate System)

The ideal site layout mentioned in pungsu is not in a fully surrounded state. It is a state where mountains surround the front and back parts but there are some gaps

arising between the mountains at both sides because of the interval of flowing water (Fig. 1). Such geomorphology provides a comfortable microclimate protecting the site from the cold wind from the north during winter but conducting the pleasantly cool wind from the southeast during the summer. It ensures that the wind always creates an appropriate state on site (Fig. 5).

Fig. 5. White Network in Pungsu

The land use pattern of Korea has been significantly influenced by the nature-oriented pungsu theory. A city was developed following mountain and water networks and this green-blue infrastructure became a basic structure of a city (Fig. 6).

Recently, however, westernization and urbanization have been rapidly altering the old traditions of the holistic landscape systems (Fig. 7). We lost most of the traditional green-blue infrastructure systems following western urban planning concepts and ironically we are reconsidering new green-blue infrastructure systems following western concepts.

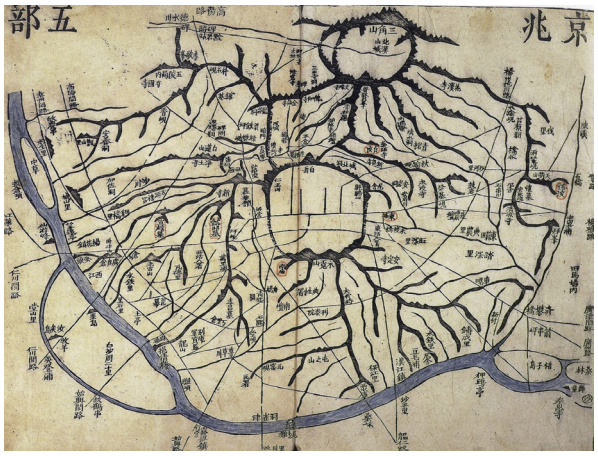

Fig. 6. Green-Blue Infrastructure of Central Area of Seoul City with Pungsu Theory (19C)

Fig. 7. Modern Development of Central Seoul without considering Green-Blue Network (20C)

Recent sustainable landscape planning and design proposals are still not yet fully verified. However, the pungsu has held in harmony with nature and community for over 2,000 years. It shows in itself a proof of sustainable environmental planning. Pungsu theory can be therefore an alternative tool for sustainable environmental planning and is emerging as a new paradigm for achieving harmony between humans and nature.

Heritage contributing to sustainability: Topkapi Palace – then and now

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Urban green infrastructure encompasses a variety of green spaces; such as parks, urban forests, roof gardens, private gardens, and green corridors. Another type of green space is historicgardens (i.e. palace gardens), which are also deemed as natural and cultural assets.

Palaces and their gardens, which were built many years, even centuries ago, have both environmental and cultural importance for today's cities and societies. Today, some cities are identified with their famous palaces, which they inherited from the past. Istanbul is one of those cities possessing a number of palaces – namely Topkapi, Dolmabahce, Ciragan, Yildiz, Beylerbeyi- inherited from the Ottomans. Among them, Topkapi Palace (fig. 1) is the oldest one where the sultans during the Ottoman Period have lived in for centuries.

Fig. 1. View of Topkapi Palace

Being surrounded by high walls, Topkapi Palace consisted of the inner and outer parts. The inner part of the palace – again enclosed by walls – had sequentially located courtyards. The outer gardens were laid beyond this inner part between the outer and inner walls. The outer gardens covered the greatest amount of green spaces such as cultivated lands, vineyards, pastures, meadows, prairies, the sultan's private gardens (hasbahce), as well as stables and play areas. Facilities of the outer gardens supported the sustainability of the facilities of the inner palace. A fish market, boat houses, storerooms, windmills, a bakery, kitchens, hospitals, baths, small mosques, tailors' and tent-

makers' sawing rooms, and gardeners', millers' and oarsmen's dormitories were located in the outer gardens. Moreover, various crops were grown, and both wild and domestic animals were raised in this vast area. Thus, the palace could sustain itself for days.

With the rise of urbanization, however, the outer gardens of the palace began to deteriorate (fig. 2). Trees in the outer gardens were cut down, and roads and buildings replaced the vast green spaces. While the gardens of Topkapi Palace had the potential to support biodiversity of a developing city, deterioration of the outer gardens resulted in the loss of plant and animal species. Yet, the remaining gardens and courtyards with existing monumental trees and plant species can support formation of a structured network of urban green spaces.

Fig. 2. Outer gardens of Topkapi Palace

This paper, through the demonstration of Topkapi Palace, focuses mainly on how palace gardens can contribute to urban green infrastructure. By preserving palace gardens, both sustainability of cultural green heritage and promotion of urban green infrastructure could be provided. Thus, historical gardens should be thought as part of a wider natural and/or built system that surrounds them.

Alexandrova dacha as a green heritage of PavlovskIn the second half of XVIIIth century

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The unique complex «Aleksandrova dacha» was uniformly built in the system of tsar's parks of Pavlovsk. The concept was based on the "The fairytale of Tsarevitch Chlor", written by Catherine the II in 1781–1782 for her grandson, the future Emperor Alexander I. The fairy tale narrates the adventures of a Tsarevitch Chlor in search of virtue. The storyline was the composite basis for the organization of the park and construction of a walking route literally taking the visitor through the fairytale happenings. The ensemble should be perceived as fantastic scenery (decoration) with pavilions and small architectural structures where visitors arrived at the landscape architectural environment built to follow the fable's storyline.

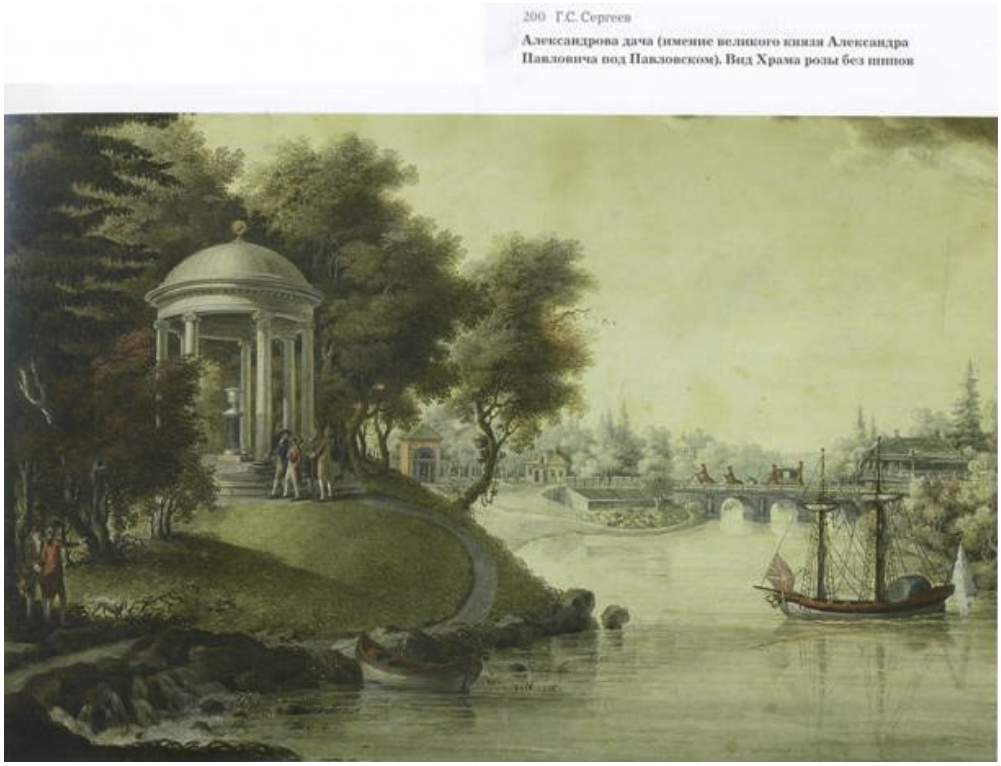

Fig. 1. The view of the Pavilion "Roses without spines"

Fig. 2. Paviolion "Echo" (Flora and Pomona) in 2010

Fig. 3. View of the Cerera Pavilion

The ravine formed in the tideway of the river Tyzva became a composite basis of park Aleksandrova Dacha. Its natural form partially enhanced, determined the location of composite knot of gardens. The high water table has allowed texpansion of visual space and to arrange visual links.

The Temple of Flora and Pomona is just one preserved from the architectural scenery of park Aleksandrova Dacha, and it is now in an unsatisfactory condition.

The Temple base"Roses without thorns"which precisely defines a site of a structure (pavilion) and its composite role has remained at the top of one of the ravine slopes. The pavilion rotunda, the focal element for the basic visual shaftsand park prospects (perspectives) is a culmination point of the storyline and a walking route of Aleksandrova Dacha.

The plan of the organization of green plantings was defined by the conditions of the topography and the form of a water mirror. Rows of trees underlined a line of coastal slopes of a ravine and formed a background for architectural constructions and

fan-like prospects (perspectives). Species compositions of the plantings were probably similar to the Pavlovsky Park because they had been formed in almost identical forest growth conditions during a short time period.

At present spontaneous plantings predominate of the territory of Aleksandrova Dacha. The Major species are: Alnus incana; Populus tremula; and Padus avium.

The restoration of this unique historic complex is possible on the basis of the remaining literary scene and expressive landscape development due to the modern level of the initial concept of an "educational garden". Aleksandrova Dacha is a very important part of green historic heritage of the town of Pavlovsk.

Green Continuity: contribution of greenways to city and urban life

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Recent urban migration and population increase in big cities give rise to damage in urban areas regarding visual characteristics and identity. Some cities have difficulty in protecting their cultural and historic values and making them remarkable, which means degradation in green structures that have great potential for landscapelegibility. As a part of green infrastructure, the greenway is an approach to making connections, acting like a key solution, which has become very popular recently. Under its “green” strategy, it creates legible and well-defined cities by connecting streets, urban parks, historic and cultural areas, and schools.Greenways are networks of land containing linear elements that are planned, designed and managed for multiple purposes including ecological, recreational, cultural, aesthetic, or other purposes compatible with the concept of sustainable land use. Greenways can balance climate and the ecosystems of cities, and hence benefit urban people. As a result of careful design of green areas in the urban ecosystem, climate can be moderated, and residents can be closer to green areas and gain social, psychological and recreational benefits. With this linking function, including historic and cultural characteristics, rural areas become accessible, and an increased quality of life, education and a healthy environment can be provided. Trabzon province was selected as the site of our study. Trabzon lies in the northeast of East Anatolia, on the coast of a natural harbor of the Black Sea built at the side of the Asia – Middle East transit road. Respectively, these steps are followed:

1) Gathering Inventory: The literature was reviewed. Trabzon city center was divided into 5 parts. An implementation study was done by using the “Likert behavior scale”.

2) Analysis Studies: The data gathered from the survey study were analyzed. Frequencies were found. The relations between the contribution of the green areas in different parts to the city and the contribution groups were identified.

3) Recommendation: At this step, all the findings from steps 1 and 2 were evaluated. Green continuity strategy and the possible contribution of greenways were defined on the photographs and satellite images. The functions were evaluated for different parts of the city.

The survey tool conducted within the borders of Trabzon city center in accordance with the purposes of the study is important material. To be able to create more appropriate and suitable images for the study, satellite images were used. Moreover, thirty working groups were created for five parts of Trabzon and each of them included at least three master or PhD candidates. The group members evaluated every characteristic regarding their fields. The contribution of green areas to the city was evaluated according to: legibility, accessibility, alternative transportation, touristic, recreational, protection, identity, socialization, quality life, economic, aesthetic, habitat, climate control, pollution control, relationship between urban- rural-nature area, awareness, and education criteria. The main purpose of the study is to identify a sustainability strategy for the greenways and their contribution to creating a high quality open green area, which is useful for a city and its residents.

Indicators in Understanding of Human Sensory Perception Factors in Watermill Landscapes: A Case Study Undertaken in Latgale Upland Area of Latvia.

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For the next steps of the planning process in development of landscape politics, it is necessary to identify the existing situation. Indicators are qualitative descriptors and quantitative measures that report key information to assess several factors of landscape as a system. Territories in former watermill surroundings include watershed landscapes, cultural heritage landscapes, industrial landscapes, and interaction of cognitive values in one spatial system of a landscape. Information regarding the local level of landscape planning in these territories of Latvia has not been researched enough to date. There are however several studies that have been undertaken in architecture, construction, ecology, and history sciences about this subject. The global processes regarding watermill territories development have been developed in several steps up to now. Some territories of watermills have disappeared; some of them have new functions – small-scale hydroelectric power plant station functions, hotel functions, dwelling house functions, and others. The aim of the research was to define the indicators of watermill landscapes while understanding sensory perception factors.

The various tasks of the research were defined. First, to look at data from different studies according to collected data of sensory perception and landscape indicator definitions, then collect suitable criteria for definition of landscape perception, and finally perform a case study. Based on existing research methods, the method of identification of landscape elements and determination of landscape indicators were synthesized. The determinants of landscape indicators were separated in four landscape perception aspects – visual, audible, kinaesthetic and cognitive perceptions. Each of the perception aspects was assessed in one of four-factor groups of landscape struc-

ture – Sensory factors, Sociability factors, Technological factors, and Ecological factors (Fig. 1). Each perceptual aspect of landscape structural factors characterises the landscape elements, which are defined as landscape indicators. Each landscape indicator was assessed in one of three categories, with a closer description of the condition of each landscape indicator. In the research part of the case study, out of the three areas in Latvia, the Latgale upland area was chosen as the territory of research. There were 75 established places of watermills in the researched territory (according to a map of the situation in 1920). The assessment of landscape indicators was conducted into 24 watermill territories. The territory of the study was found to be an important resource for development and an opportunity to be restored, scientifically, culturally, historically, and by educational functions. In such a territory it is necessary to develop the values of landscape, to include new architectural elements in the historic landscape, to develop design of small architectural forms and design the surrounding environment, to add several new and attractive functions to these watermill territories and buildings, to noticeably increase the amount of cognitive perceptive information and to develop the territories in relation to the surrounding landscape territories. The method of developed landscape indicator assessment and the results achieved from it could be used in future possible studies.

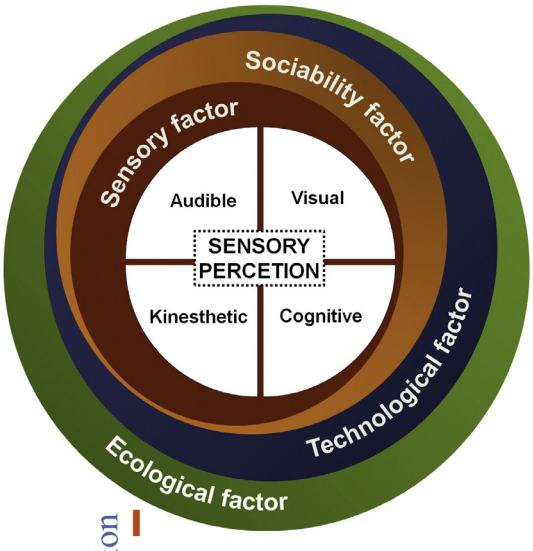
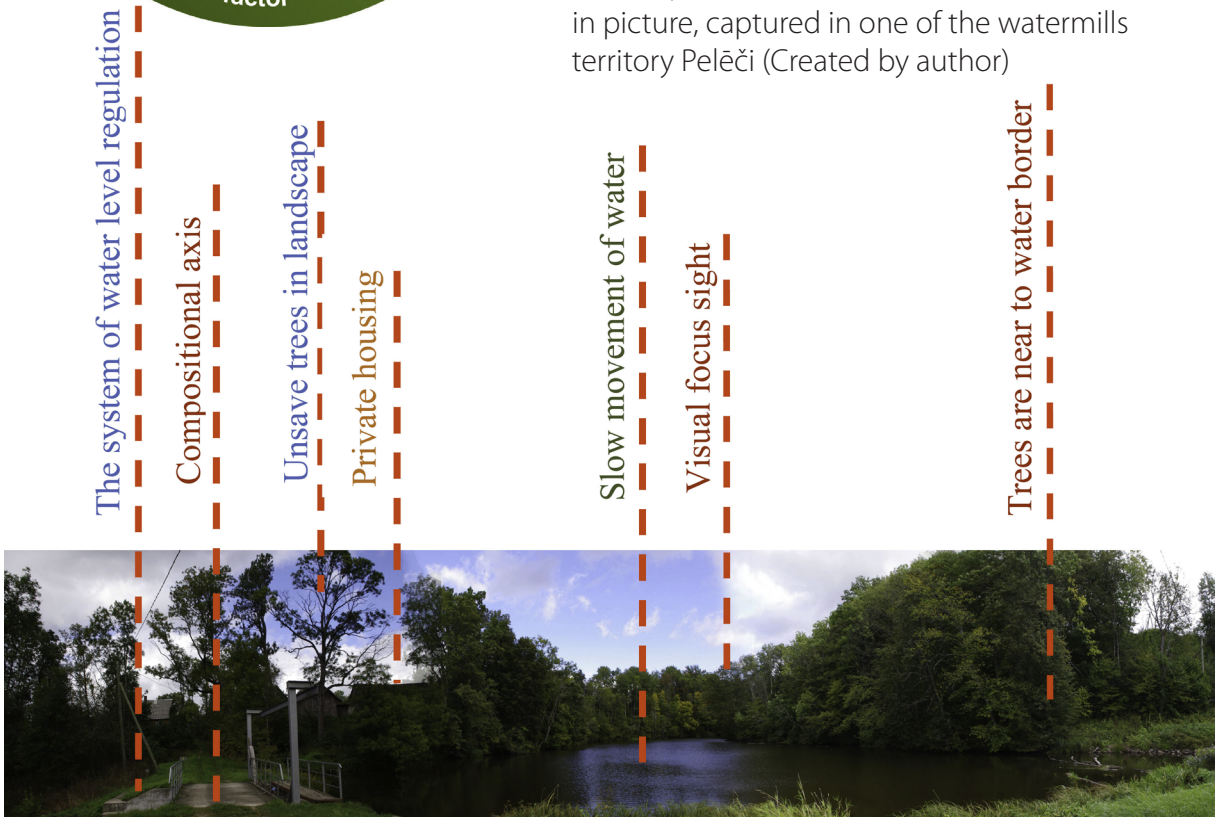


Fig. 1. Landscape sensory perception indicators model (Created by author)

Fig. 2 Example of several indicators in the landscape of the watermill, which can be shown in picture, captured in one of the watermills territory Pelēči (Created by author)



Perspectives of laying out and reconstructing the parks in the City of Voronezh

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City ecological carcass fulfills environmentally-forming, nature-conservative, recreational and sanitary functions, thus providing favorable conditions for citizens' life. Being able to level a high anthropogenic burden, the natural communities (due to their biological diversity) allow the urban landscapes to support the environment comfortable for people.

Reconstruction of the ecological carcass besides reorganizing already existing general use green zones includes development of the new functional parks' zone. This complicated task is connected not only with some financial and economic difficulties, but also with a competent functional-territorial zoning of urban environment and its separate fragments. One should pay special attention to landscape and ecological improvement of city's residential territories by means of green plantations reconstruction and development of new recreational places within the administrative districts for all categories of citizens in the formed city structure, where all the territory can be divided into several zones.

In this connection we put by 2 tasks in 2011:

1) To develop a Reconstruction Project of the Municipal Enterprise "The Central Culture and Recreation Park" (which is widely known among citizens as the Dynamo Park) located in the historical center of the City, namely the Central Administrative District; 2) to develop the Green City Project in the ecologically unfavorable Zheleznodorozhny District in Voronezh, which is located on the "wasteland" territories. In the first case, a small part of the specially-guarded territory is to be reconstructed. Its relief is hilly and it corresponds to a greater extent to the concept of developing the first City mountain skiing center "Canyon". (Figs. 1, 2).

A number of challenges had to be met in connection with the set goal: to carry out landscape – ecological description of the territory for allocating the parks; to give social-economic justification of organizing the parks; to develop a business plan of constructing the parks; to determine investment attractiveness of the planned objects; to find out long term period and profitability of the projects; to prepare the construction design estimates and commissioning the objects; to carry out landscape-functional zoning of the design parks; to prepare a database of the recommended tree and bush species assortment for the park zones.

A full set of the necessary documents was prepared as a result of the carried out work. The documents allowed establishing and justifying the advisability and advanced development of two parks on the right and left banks of the Voronezh reservoir. These data are presented in Table 1.

The proposed projects of multifunctional landscape-recreational parks allow solving a number of ecological, economic, cultural, sports components of the social sphere in Voronezh and the Central Black Earth areas on the whole. Parks are the objects of social-economic significance with aggregated investments of 540 Billion rubles and the pay-back period of 7.3 years. Their fulfillment will be a practical contribution to solving the urban area problems.

Table 1.

Concepts and aspects of developing projects of parks on the territory of the City of Voronezh

The Project territory is 54.85 hectares. According to landscape-ecological conditions, it is referred to the Central hilly landscape – functional area in Voronezh. The surface makes up a gully and hilly type of the area with western air stream. Flora is a set of forest (upland oak-forest remains), meadow-steppe, meadow and riverside-water vegetation. Many species are herbal or decorative plants. Landscape structure, microclimate, soil-vegetable covering determine ecological conditions of projecting a landscape-recreational park.	The Project's Territory is 24,28 hectares. The landscape-ecological conditions are determined by its placing at the left riverbank of valley-terraced landscape-functional area in Voronezh. All territory is composed of deposited and inwashed beaches formed as a result of natural and technogenic relief formation processes. The relief is flat. The closeness of a large water body – a reservoir – favors to form steady and gusty winds in north-western direction. Nowadays the territory is covered with dirt-ruderal vegetation and it is slowly becoming turf-covered. Territorial-functional structure, peculiarities of geomorphology, microclimate, soil, and vegetation determine the landscape – ecological conditions of the projected landscape-recreational park.
The Canyon Park is located in the historical and cultural center of the city with high carrying capacity of population, existing stable biocenosis and high reproduction degree. Landscape of the area allows placing mountain-skiing and snowboard routes on its territory, as well as tubing and rollerbahn routes.	This ground area belongs to reserved territories. It is located 10-min. walking distance from settlements. This is the first specialized landscape-recreational object for citizens' complex recreation in the Zheleznodorozhny District.
This territory is included into the reserved lands, thus requiring a special control of its functional, ecological and cultural conditions. In this case, it is necessary to reconstruct the park with the least damage to its natural components applying at the same time all the needs of modern society in developing culture and sports.	Close neighbourhood with the defined area of water with the children's sports school training boat and canoe oarsmen is successfully matched with the sports zone of the projected park. A stretch of the sand riverside territory is a picturesque right-bank view place in Voronezh.
The park actually does not require any financial investments connected with scale planting of greenery on its territory, tracking driveways and parking lots.	"Running" sands of anthropogenic origin prevent from quick and qualitative housing construction. This territory can be used for constructing a landscape park with some elements of social and cultural and recreational structures.
Maximal capacity of the projected park will be 800 persons per hour. Necessary investment sum – up to 200 Million rubles. The recoupment of capital investments will make up 4,7 years.	Maximal capacity of the projected park will be 700 persons per hour. Necessary investment sum – up to 340 Million rubles. The recoupment of capital investments will make up 7.3 years.
Social-economic effect of the projects: accrued taxes into the budget, some 160 new working places will be created as a result of fulfilling the projects, the population requirements in qualitative and healthy recreation, as well as sports exercises will be met; children's sport will be developed and construction of the complexes will attract additional labour and investment resources and it will help enhance the prestige of Voronezh; modern technical and organizational solutions providing preservation of park zone ecological condition at constructing and further operation of the park will be used in the process of realizing the project.	

The contribution of green roofs to green infrastructure: two case studies in Washington DC, USA

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The United States Environmental Protection Agency (EPA) recently issued National Pollutant Discharge Elimination System (NPDES) and Municipal Separate Storm Sewer Systems (MS4) permits. Communities like Washington D.C. USA have modified their development guidelines to meet the requirements of these new permits with the goal of improving water quality. The new regulations promote green infrastructure practices that can infiltrate, retain, and evapotranspirate rainwater on or within the site. The EPA has defined green infrastructure at the site scale as "stormwater management systems that mimic nature by soaking up and storing water." In Washington D.C., green roofs have become a prevalent green infrastructure tool to retain water and to reduce stormwater runoff pollution caused by urbanization without occupying scarce and expensive ground surface. This presentation is organized into four sections. First, in order to frame an understanding of the research, we provide an overview of current relevant stormwater policies of the EPA, the District Department of Environment (DDOE), and the District of Columbia Water and Sewer Authority. The DDOE oversees stormwater activity in the District of Columbia and Washington D.C. The second section of the presentation is a review the literature. The literature review focuses on the demonstrated green roofs successes and benefits of green roofs in reducing runoff and improving water quality. Third, we present two case studies located within Washington D.C, selected characteristics, and their stormwater benefits. The first case study project is a 68,000 square feet (6,317 square meters) green roof on the U.S. Department of Transportation (Fig. 1). The second case study project is a 27,750 square feet (2,578 square meters) green roof on the World Wildlife Fund Headquarters. The results of these two case studies document and explore the water retention and stormwater pollution benefits as the result of green roof vegetation and substrate properties. Select-

Fig. 1 Greenroof on Department of Transportation, Washington DC, USA (photo by www.greenroofs.com/projects/pview.php?id=280)

ed design elements are documented and analyzed using available GIS information, photography, and on-site investigation. Results will also include interviews with selected stakeholders. Stakeholders could include stormwater regulators, roof system manufacturers, vegetation nursery suppliers, maintenance companies, engineers, and landscape architects. In the fourth and last section, we will present the new rebate/credit policies of the agencies including the stormwater fee and impervious area charge fees. We further summarize the successes and direction of green roofs as a contribution to green infrastructure in Washington D.C.

"Marginal" Urban Vegetation

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Urban development continues to reduce the amount of vegetation in the city, resulting in most cities being perceived as lacking green areas and presenting levels of pollution and bio climatic discomfort that are causing the quality of life to deteriorate. Green structures have been recognized as an important contribution to improve these urban conditions, affecting surface temperature, hydrology, carbon storage and sequestration, and biodiversity. Despite the efforts of local governments to implement green structures in the cities, these conditions are mostly still inadequate.

In the city, parks and gardens are green areas of the city that – due to their identity – are part of the every day life of the inhabitants. These spaces are classified and protected from urbanization by the City, as well as, and mainly, by the inhabitants. But the ecological matrix of the city is not limited to these spaces. On the other extreme of the scale of landscape values in the city, are the spontaneous areas of vegetation covering slopes, vegetable gardens in empty plots or the vegetation in the inner-courtyards, which often have a negative image. These marginal spaces have their own dynamics, diversity, and often they survive outside the municipal initiative.

Questioning the potential of the existing resources of the city as a structure capable to generate better environmental conditions, requires new dynamic tools to understand existing processes and relations at different scales. High resolution satellite imaging can provide an accurate, economical and straightforward information to map, analyze and monitor urban vegetation, since it offers a large and frequent temporal cover. The spatial dimension of urban ecology can be a useful planning tool, facilitating the comparison of existing urban areas and helping to predict the ecological impact of new urban developments.

Through concepts such as structure, function, context,connectivity,dynamic, heterogeneity and hierarchy it's questioned what factors influence the marginal vegetation on the urban landscape at the different scales.

The "Marginal Urban Vegetation" of the city of Lisbon, as a case-study, is identified, investigated and evaluated by means of satellite images (Fig. 1). The evolution of this vegetation is monitored with images of the past ten years, contextualized in the new urban plans for the city. Using landscape metric indexes, the structure of the vegeta-

tion is characterized, and its spatial patterning quantified (Table 1). Through the analysis of data retrieved from Vegetation Indexes (such as the Normalized Differentiated Vegetation Index), information is gathered about how this vegetation works, in terms of productivity and water, in order to understand what can its contribution be to the ecological structure and its relation to the formal Urban Ecological Structure of the city.

The urban vegetation induces several environmental, social and aesthetic benefits to the city, and incorrect urban planning, as well as insufficient ecological structure can raise environmental costs. It is fundamental to have the availability and knowledge of the environmental parameters of the existing vegetation, including that vegetation that is beyond the planning instruments, but nevertheless affecting the ecological quality of the city.

Fig. 1. Marginal Vegetation of Lisbon – NDVI Quickbird, May 2005.
a) Total Vegetation
b) Vegetation integrated in the Municipal Ecological Structure
c) Marginal Vegetation – remaining vegetation.

Table 1.

Landscape Metrics of the most significant typologies

Patch	Inner-courtyards	Empty plots	Infrastructure	Vegetable Gardens
Total Area (m^2)	1 582 191.00	2 276 762.00	925.20	285 854.00
Patch Number	14 910.00	11 602.00	100.00	1 406.00
Mean Patch Size	160.1	196.20	9.30	203.3
Perimeter Density	3 319.90	2 080.50	13 268 8	2 080.50

The Ecological Network in Portugal

Magalhães, Manuela R.[1]; Cunha, Natália[2]; Pena, Selma B.[3]; Müller, Ana[4]

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The Ecological Network was included in the Portuguese legal system in 1999. However, prior to this, there were other planning norms intended to ensure water, soil and natural vegetation protection, including ecological reserves and classified areas. Recently, Natura 2000 Network and other protected areas, defined by European and Worldwide Directives, were added to this classification.

The aim of this project is to unify the several components in the Ecological Network, a single continual network, which, besides protecting areas with biological interest, is based on the spatial components of the physical systems that support the ecosystems and, consequently, the habitats. Therefore, the several landscape elements, intended to be protected, are included in the Ecological Network in order to contribute to their ecological sustainability. Furthermore, this Network should be at the basis of Landscape/Land-Use Planning, in which the aim is to combine both the ecological and cultural sustainability through the integration of soft mobility networks, of natural and cultural nationality, and through a suitable location, in ecological terms, of human settlements and rural land uses. The concept of Ecological Network is related to the concept that has been developed all over the world,designated as Green Infrastructure.

Since the beginning of the 90s, the Research Centre for Landscape Architecture "Prof. Caldeira Cabral" of the Technical University of Lisbon has been proposing ecological networks at a municipal level in Municipal Green Plans, which have been expanding Ecological Network's utility to environmental land-use planning in urban and rural spaces and, in the latter, in peri-urban situations as well as predominantly rural situations in the Lisbon Metropolitan Area. The methodology that has been developed during this experience was also applied to the regional level in the Lisbon Metropolitan Area and, at this stage, an application at a national level is being developed in a three-year research project funded by the Fundação para a Ciência e Tecnologia (FCT).

Therefore, it can be shown that the application of the developed methodology at a municipal scale in different contexts generates different situations; it also shows the Ecological Network components at the regional and national scales.

As an example, some case studies of Ecological Networks were presented and delimited at a municipal scale: Lisbon (Fig. 1), Almada Municipality, Baião Municipality; and at a regional scale: Lisbon Metropolitan Area (Fig. 2). At a national scale, the components that will be included in the delimitation of the Ecological Network (Fig. 3) were defined and a first sketch of a National Ecological Network will be presented.

At this stage, it is important to compare the methodology and the outcomes achieved by other countries, as well as to collect information on the regulation pertaining to the use of each component of the Ecological Network

Figure 1

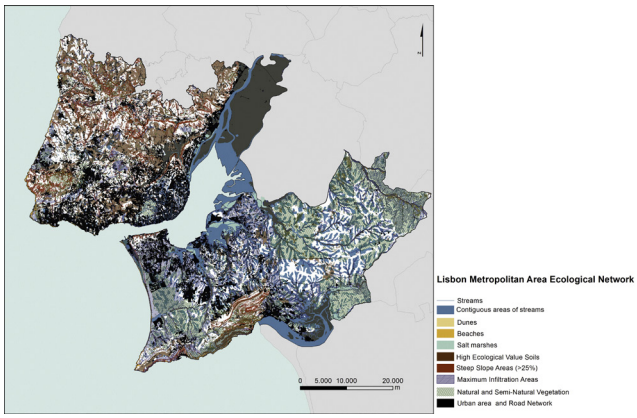

Figure 2

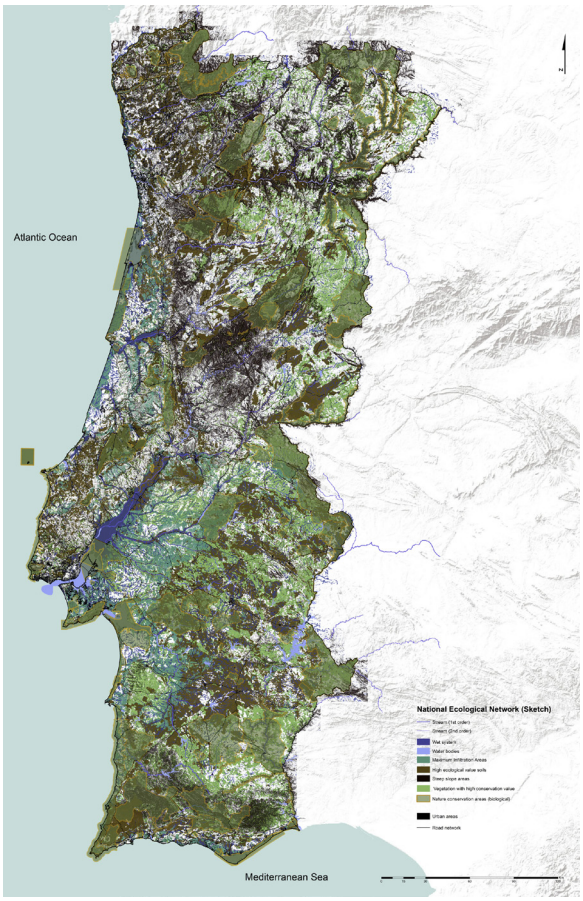

Figure 3

The Coastal Area in the Ecological Network

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The aim of this poster presentation is to promote the application of criteria (i, ii, and iv described below) and their application. The criteria were developed in case studies focusing on Arrábida and Eastern Algarve ("Algarve Sotavento" – Fig. 1).

Coastal area mapping at several planning scales is central in the composition of the Ecological Network or, in other words, Green Infrastructure.

In Portugal, the coastal area is characterized by a variety of situations: low coastal areas presenting sandy beaches, dunes, estuaries and drowned valleys ("rias"); and

high coastal areas presenting hard or friable rocky cliffs, such as sandstone, fossils, and fossil dunes.

Due to this variety, the coastal area has been for a long time of great interest in the development of main cities, economic activities and in several places embodying religious or epic symbolic characteristics..

Recently, the institutionalization of the concept of leisure led to considerable pressure on the coastal system, especially since the 60s, due to tourism activities and second housing, which in many cases have been destroying the conditions that sustain the interest of the coastal area.

Since the end of the XIX century (1884), the establishment of the Maritime Public Domain determined the need to define a public land strip for coastal protection. Since 1983, Portugal has been trying to preserve specific sensitive coastal zones through the creation of National Ecological Reserves, based on criteria defining the establishment of protective land strips in different ecological situations presenting major or minor concerns.

Figure 1

It's the aim of this study is to establish scientific criteria on which coastal areas' mapping could be based, as well as be integrated in land-use planning, contributing to the definition of land use norms less arbitrary and more sustainable and eventually more easily acceptable to the public.

The first criterion (i) concerns the morphological aspect; it maps the areas based on their form, slope and geomorphological composition, defining the interface land-sea that is more sensitive to risk. This first step allows mapping specific primary coastal zones.

However, another level of the land-sea interface can be designated, which presents a great interest for land-use planning. It can be named as the Pre-coastal area and its mapping is based on its (ii) vegetation; (iii) direct exposure to sea winds; (iv) thermoregulation resulting from the proximity to the sea; and (v) the influence of the sea on buildings' architecture and, ultimately, on the development of activities related to it.

The Research Centre for Landscape Architecture "Prof. Caldeira Cabral" (CEAP) has been participating in a research project, funded by the Fundação para a Ciência e Tecnologia and coordinated by the Faculty of Architecture of the Technical University of Lisbon. In this project – "Sea Architectures" (PTDC/AUR-AQI/113587/2009), relating to criteria i, ii, iii, and v were applied to two different case studies; the criterion iv is

being developed by a larger team in the frame of another project – "National Ecological Network – a proposal of mapping and policies" (PTDC/AUR-URB/102578/2008), lead by CEAP.

Green Infrastructure x Infrastructure for the Dead

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Infrastructure for the dead, usually refers to the traditional burial grounds and their associated funeral homes. However, in the case of contemporary Hong Kong, a dense city in the Asian region, infrastructure for the dead refers to a whole different set of urban, non landscape-based, and even cross-border burial systems, that are operating well but also creating multiple issues that demanda more intricate network of both green and social infrastructure to accommodate this unique "burial urban-scape".

Therefore, this paper, "Green Infrastructure x Infrastructure for the Dead", aims to explore if a comprehensive green+social infrastructure system could alleviate some of the issues created by the infrastructure for the dead in Hong Kong and its extended Pearl River Delta (PRD) region.

This paper will first explore a common typology of an urban burial option, the columbarium, to examine how, on the one hand, it is able to resolve Hong Kong's land shortage for burial due to an increasing death rate, but on the other hand, fails to consider the Chinese cultural belief of death's strong attachment to ground. Hence, this paper will examine if a network of green infrastrcuture could be compatible with these columbaria, not only as a physical and environmental integration of the columarium facilities, but also act as a social and cultural response to the social association between death and the return to nature.

Burial in Hong Kong is also made complicated due to a continous shortage of ash-niches available in the public columbaria. Hence, a network of "black market" columbaria emerged in recent years. However, their illegal uses of land/building for burial facilities not only create sanitary problems, but also social conflicts with the existing residents in the neighourhood. While a comprehensive green+social infrastructure may help ease the issues raised by these illegal columbaria practices, implementing them via a top-down governmental strategy may not work with the private and sometimes illegal nature of existing columbaria practices. Therefore, the second part of this paper will explore the more grass-roots and small-scale application strategy of these green+social infrastructures, so that they are more apt for these private practices of columbarium to implement, and hence to improve the "burial urban-scape" from a bottom-up approach.

To conclude, this paper aims to investigate if green infrastructure can be integrated with the contemporary burial facilities of Hong Kong, not directly to seek a solution for the problem of burial ground shortage, but to enhance the quality of urban bruial and its integration with urban social networks, and last but not least, to offer alternative insights of how urban burial factilities could integrate with green network and "re-connect" the whole subject of "urban burial" with nature through a comtemporary interpretation.

Guidelines for the design of sustainable green infrastructure

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This paper addresses the design of sustainable green infrastructure. A sustainable green infrastructure should make wise use of the site's natural resources and hard landscape materials used in its construction. Among others, it should protect natural resources, local ecosystems, habitats, and species; use local resources; reduce, reuse, and recycle resources; reduce waste and emissions; increase carbon sequestration; make wise use of energy; and reduce ecological loss.

Based on an extensive literature review, this paper presents several guidelines for the design of sustainable green infrastructure. These guidelines are grouped according to the elements found more important for achieving sustainability in green infrastructure: soil, water, vegetation, biodiversity and hard landscape materials.

Soil management guidelines address three main topics: soil carrying capacity and fertility, soil permeability, and soil restoration. Soil carrying capacity and soil fertility should be respected with land-uses being defined according to these two parameters. Soil permeability must be preserved through the minimization and concentration of impermeable areas. Damaged or contaminated soils should be restored.

Water management guidelines promote the protection and restoration of local natural water systems and wetlands, the preservation of the natural drainage system, and the use of local water resources for irrigation and supply of water features.

Vegetation management guidelines prescribe the maximum protection of non-invasive existing vegetation, the elimination of invasive vegetation, the preferential use of native vegetation, and the adoption of efficient and non-pollutant maintenance practices.

Biodiversity management guidelines promote the protection and restoration of local ecosystems, habitats and species; the rehabilitation and restoration of degraded and/or threatened ecosystems, habitats and species; and biodiversity increase.

Hard landscape materials management guidelines address the origin and destiny of materials, and the construction process. To use less material, reuse materials, and use recycled materials is the sustainable path in what concerns the origins of materials. The use of reusable and recyclable materials is the main guideline in what concerns the destiny of materials. The construction process should minimize the impact on the local and global ecosystem.

The incorporation of global sustainability principles in the elaboration of these guidelines makes them potentially applicable to a wide range of situations, contributing to the sustainable design, construction and management/maintenance of green infrastructure in a diversity of ecological and geographic situations.

Ecological engineering to enrich the future

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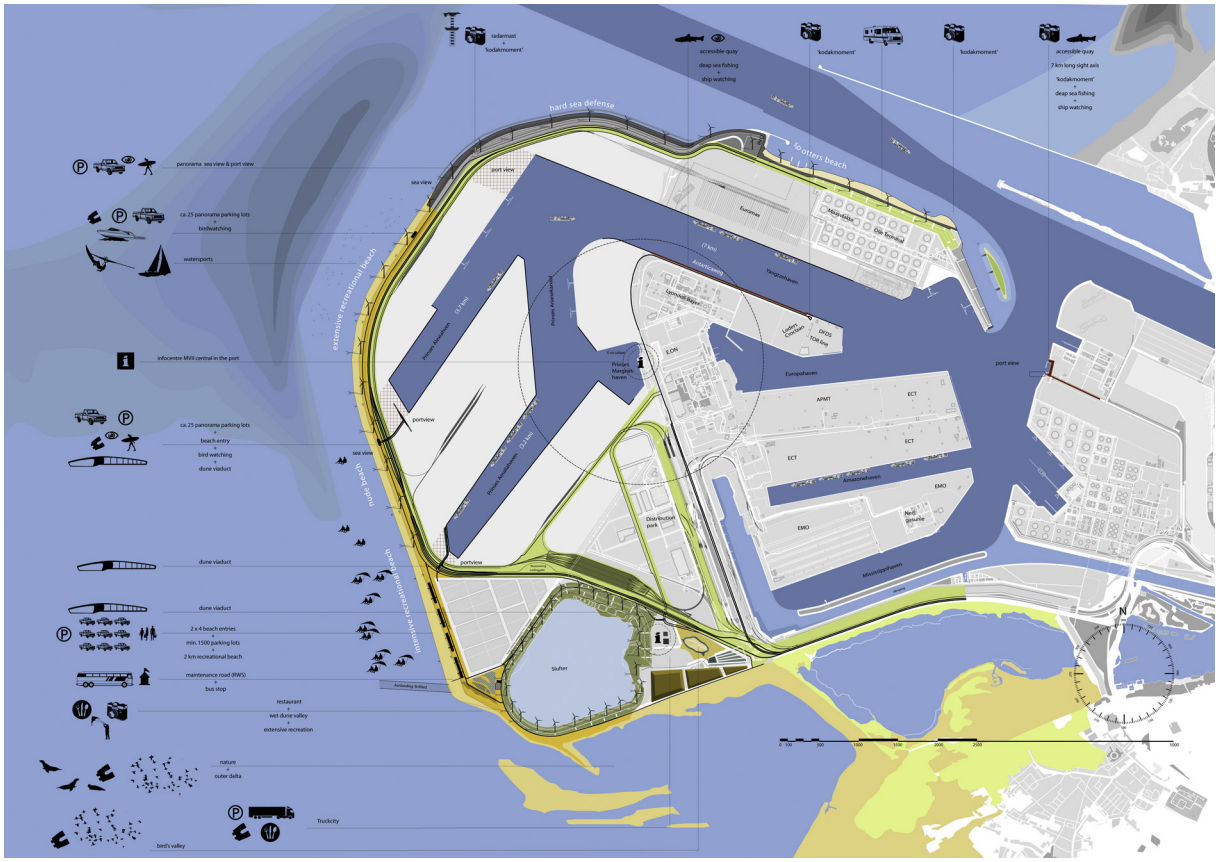
Since the 1970's birth of environmentalism, ecological policy has developed to be a hindrance for development in the Netherlands. The goals are noble, but when fallow land is covered with plastic foil to prevent habitation by endangered species, something is wrong. In the last decade, several solutions have been developed: one to lawfully allow for temporary nature, another to acknowledge nature as a dynamic entity that can be changed and even be given more space.

In the presentation, we will show how H+N+S was able to enrich civil engineering with ecological engineering, using the plans for the port extension Maasvlakte 2 as examples. We will show that this integrated approach not only benefits nature, but also the experience of spatial quality.

In a recent evaluation study of the 'Room for Rivers' project, initiated by the practice H+N+S, the supervision with an eye for spatial and ecological quality was appreciated and was said to have led to cheaper and more effective plans. We will describe this process of supervision and of nature development along the rivers, adding quality while addressing safety issues. The planological solutions and river design process in which our office has been involved, create the structure at a higher scale level. It gives us room to create quality in the precise design, as we will show in the presentation.

The Port of Rotterdam has planned a westward extension of its harbor area to provide for future growth. The 2000 ha. land reclamation project Maasvlakte 2 is meant



to provide space for industrial activities, along with new dunes and dikes to assure safety. Our practice was invited to prepare a plan for the whole new landscape which gives space for recreation and nature areas as well. Detailed landscape designs are being worked out by H+N+S at present for the nature areas as well as the industrial and recreational areas.

The Dutch river area is always changing. The canalized rivers create levees by sedimentation. The increased rainfall due to climate change creates the need to make 'Room for the River' and strengthen the dikes. H+N+S was one of the first to address this issue with the plan Ooievaar (stork) and has worked on realization ever since. Recently, we drew a private sector initiative that developed an integral strategy to win sand and clay, and simultaneously create room for the river and for nature. This is an example of how planning can (relevant in times of receding governments and financial crises) build on private initiatives.

In times of economical headwind and impending climate and energy crises, designs for our future ought to be integral and assertive. We want to illustrate in the presentation how landscape architects can play this role: exploring possibilities to address the issues at hand, bringing disciplines together via visual language, informing the public via participation, exhibits and books, and making a common future.

St. Petersburg Green Infrastructure as a factor for sustainable development

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The Agenda for Sustainable Development «sustainable development» («Agenda XXI»), was adopted at the UN conference in Rio de Janeiro in 1992. Sustainable development is a self-sustaining development which improves the quality of human life and at the same time takes into consideration the real possibilities of ecosystems. Formation of a stable green infrastructure of the city is seen today as a crucial part of the concept of sustainable urban development.

In many cities of Russia the system of green space is a random combination of gardens and parks, parkways and street trees and it does not focus on the formation of favorable urban environmental conditions. The most significant disadvantages of this system are its large undeveloped areas in the central part and autonomy and isolation from suburban landscapes.

We believe that the following principles should be considered for green infrastructure of the city:

• continuity: the principal axes of the green infrastructure of the city should be a logical extension of some elements of green infrastructure of a larger urban planning unit – the district;

• the interdependence of the elements of green infrastructure: infrastructure should not be a random mosaic of different urban green spaces, but an environmental system of axes. On the intersection of such ecological lines it is logical to locate relatively large green areas – centers of ecological and recreational activities;

• the relative autonomy of the individual parts of the green infrastructure elements: they should penetrate into most important structural urban planning units

of all sizes – residential and industrial areas, microdistricts, etc.;

• functional coordination of green infrastructure to specific natural and economic conditions of the city, which should be reflected in planning and design principles;

• the simultaneous planning of green infrastructure and urban development as part of the integrated architectural and planning structure of the city.

Organisation of the green infrastructure of St. Petersburg should include the following directions:

• Organisation of larger units of green infrastructure through the creation of new park areas, including existing residential areas of St. Petersburg and the newly built-up areas;

• Strengthening the links within the green infrastructure through the development of linear green areas along the main city roads and embankments;

• Rational organization of inter-housing estates green areas (small scale areas in residential areas) as the primary units of green infrastructure of St. Petersburg;

• Reorganisation of the historic center and increasing the green areas by the introduction of new technologies (vertical and container gardening, "green roofs" and "green walls");

• Increasing the level of green areas of St. Petersburg by1.5 times (compare to the present status) by moving some companies and businesses from the historic center to suburbs and using these vacant lands;

• Development of the coastal areas of the Neva River and the Gulf of Finland by the creation of new parks and gardens on the reclaimed lands, taking into consideration the specifics of the development of such areas;

• Re-use of transport areas (green corridors along all kinds of public railroads spaces, as well as extensive spaces of railway stations and parking facilities);

• Development of the landscape areas adjacent to the Ring Road (bypass) and use of the motorways and railways slopes;

• Develop a program of recreational use of urban forests as an important component of green infrastructure of St. Petersburg;

• Include water protection zones, sanitary protection zones of enterprises and protected natural areas into the green infrastructure of St. Petersburg;

• Reclamation of areas of former industrial sites and landfills of municipal and industrial waste and their landscape development in the green infrastructure of St. Petersburg.

The development of green infrastructure of St. Petersburg by reducing its discretion and increasing its connectivity will enhance the stability and ensure the sustainable development of St. Petersburg as a whole.

And now for something completely different: Green infrastructure in a very wet region of the world compared with historic wetland cities

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The West Coast region of New Zealand has an annual rainfall which reaches 10,000mm in the mountains declining to 2000mm at the coast. The region is bounded by a mountain chain to the east and the Tasman Sea to the west, extending 600 kms. It is a region of mountains, rainfall and rivers, with a unique landscape character. The West Coast Regional Policy Statement, prepared under New Zealand's Resource Management Act, identifies a main issue as conflicts in land use: conservation of wetlands, lakes and rivers are not compatible with agriculture, forestry and mining. The New Zealand legislation provides for the safeguarding of the life-supporting capacity of water, soil and ecosystems and the preservation of the natural character of wetlands, lakes and rivers from inappropriate subdivision, use and development as a matter of national importance.

Seeking to address and resolve conflicts the Regional Council prepared a variation to their Land and Water Plan to provide objectives, policies and methods to manage wetlands and ensure their ecological sustainability. The Plan set out to identify what is a significant wetland, and how wetlands might be developed or protected. This plan document resulted in appeals to the NZ Environment Court by a range of conflicting groups which have lasted for over two years. Evidence from many experts on ecology and ecosystems has been presented. The Court and those involved have now agreed on definitions and maps of significant wetlands and the Court has decided how wetlands should be assessed if development is intended.

Even in this wettest of regions ecosystem services was considered important, even vital, to decision making. Conservation arguments highlighted the importance of a coherent and integrated approach to natural resource management. By comparison, the creation and enhancement of networks of open space and natural areas in cities, termed green and blue infrastructure, is often given less attention in environmental decision-making. However the long and expensive dispute over management of ecology and green and blue infrastructure, in an area which claimed a surfeit of these resources, indicates the importance of ecosystem services, particularly for cities where water management issues are significant.

How can blue and green infrastructure be retrofitted into historic cities where infrastructures have long been in place, such as St Petersburg and Stockholm? The recently adopted UNESCO Historic Urban Landscape approach, taking a landscape urbanism philosophy to heritage management, provides tools and actions which could usefully be debated by the communities of both cities. The Historic Urban Landscape approach refers to the context of cities including its infrastructure above and below ground, as well as open spaces and gardens, together with the intangible dimensions of heritage. It urges consideration of the inter-relationships of physical forms and natural features and settings, in order to better integrate urban heritage conservation strategies with sustainable development. The paper concludes with a discussion on wetland rehabilitation as a means to address the need for green infrastructure in cities.

Taming the road: Methodology for strategic recycling of existing road network to green infrastructures.

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The twentieth century has paradoxically witnessed the past tendency of cities to increase in population and size worldwide, as well as their general fragmentation in many cases. Communication network development has altered space-time conception leading to activity dispersion, territory specialization, and polycentric use of the city artifact.

High levels of auto-contention (trips done starting and ending in the same sector) are more than ever registered for wider areas. Our daily mobility habits have become a complex sequence of multiple trips, which are not easy to accommodate in massive transport systems. The intermediate road network becomes the multifunctional place and space where many mobility logics coexist. Within this context, it may seem reasonable to assert that roads have also become "the dwelling place of the collective" as streets in the words of Walter Benjamin.

Our sense of identity has switched from the concept of place to our mobility habits experience, and consequently, our landscape perception has been skewed. While all efforts are concentrated on improving urban landscape and environmental quality in city representative spaces, our daily landscapes and public road spaces are left wild under car domination. The reality, however, is that the road system supports the coexistence of many other mistreated transport modalities. A smart-active redesign could dignify pedestrian and cycle oriented spaces bringing road landscapes closer to be evocative of aesthetic, cultural, and environmental values.

Some punctual interventions have already tackled the question. A wide range of examples is found around from more pedestrian-friendly junctions in a peri-urban context to the location of viewpoints and cycle lanes on panoramic routes. However, there is a lack of an analysis methodology enabling the legibility of such phenomena and performing further strategic planning.

This paper sustains the preliminary results of a GIS-based methodology that evaluates graphically and numerically the potential of the road network as a multifunctional space. The method aims to dissect the apparently chaotic multipurpose use of the road network. Moreover, the obtained outputs assess the degree of environmental and landscape pressure on the infrastructure's area of influence. The Valles Oriental region in Catalonia (Spain) illustrates some of the outputs and potentialities of this approach throughout the paper. The results offer criteria as a starting point for a taming process of the road network. The aim is not so much its integration with green infrastructures, but rather its transformation into one of them.

A scale approach to green infrastructure: principles, policies, and practices in the State of Maryland, USA

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This presentation explores the impact of green infrastructure (GI) policies and practices in contributing to ecosystems services and the sustainability of the built environment. GI is an approach in planning, design, and management that is increasingly being promoted to provide multiple benefits to address goals of landscape sustainability. However, there are significant differences between the perspectives that various stakeholders have both in the definition of GI and how those perspectives influence how they see GI in providing different solutions to different problems. The author uses a scale approach to convey how GI is interpreted and implemented at different scales by different stakeholders. The author further contrasts and compares selected innovative GI policies and practices that are being used in the State of Maryland. Multiple scales and the degree of integration between the GI approaches in Maryland are explored. Maryland is considered a leader in the nation in GI tools for land preservation, forest retention and conservation, and stormwater management – all actions that are being labeled by various stakeholders as GI. The increasingly important role of GI as a solution to non-point re-development pollution loading in the Chesapeake Bay, the largest estuary of its kind in the world, is emphasized. This presentation is organized into four sections. First, I will present State of Maryland policies that incorporate GI. In terms of water quality benefits, the relationship between new state watershed planning activities and the regulatory policies of the United States Environmental Protection Agency (EPA) will be highlighted. In terms of land preservation, the GreenPrint program, administered at the state level in collaboration with smaller governmental county units, will be presented along with underlying GI principles. In the second section, I will present how GI principles are incorporated in the county planning review process in implementing multiple environmental objectives, including forest retention. At the property scale, I will focus on the implementation of the Forest Conservation Act which is primarily administered by the county governmental unit. I further present the results of forest retention and creation in the development process and tree canopy goals that have recently been adopted by many counties. The third section will focus on the implementation of the new Environmental Site Design (ESD) regulations at the site scale. ESD incorporates low impact development (LID) principles to provide for distributed hydrology and attempts to mimic nature by infiltrating and retaining water. Lastly, I will compare and contrast across scales the successes and limitations of different GI approaches. I further critic the use of GI as a framework for guiding future policy and practice to achieve landscape sustainability goals.

Development of green infrastructure in Tehran: Organizing the Ecological structures along the major axis of the city

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Fragmentation and failure in performance of urban green spaces is one of the main issues affecting today's cities. Although this is due to growing construction as well as demolition and fragmentation of gardens and parks, the roots of the problem is in unsustainable development in large cities. This type of development in large cities including Tehran, leads to traffic problems and an inefficient urban environment and spaces that eventually affect daily life of citizens.

Due to the impact on the urban environment, transport corridors are one of the most important elements in separation and subsequent destruction of habitats. The importance of this issue in Tehran metropolis results from the very fact that the checkered network of roads and streets, has led to fragmentation of gardens and old green patches, functioning as the lungs of the city. For decades, urban streets as a part of the body of the city have been mainly at the service of transportation, whereas their roles and functions as lively urban space have been neglected. This is in contradiction to the fact that, the importance of green and ecological infrastructures has led today's attempts, in large cities, to employ the road network to create green corridors having multiple functions within cities as a way to link parks and natural reserves. In parallel to this the appropriate environment will be created for citizens.

Fig. 1. Urban development and landscape evolution in the streets of Tehran 1941

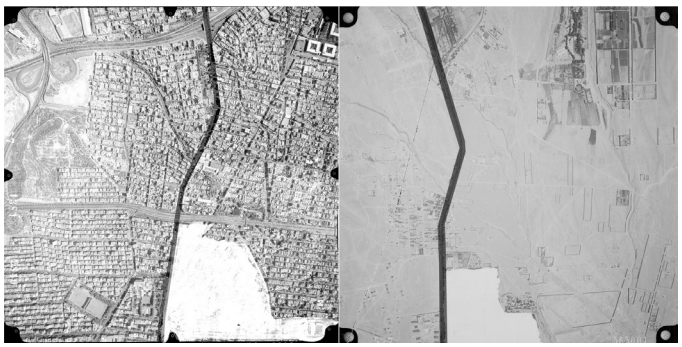

Fig. 2. The aerial photographs of studying area in 1956 and 2002

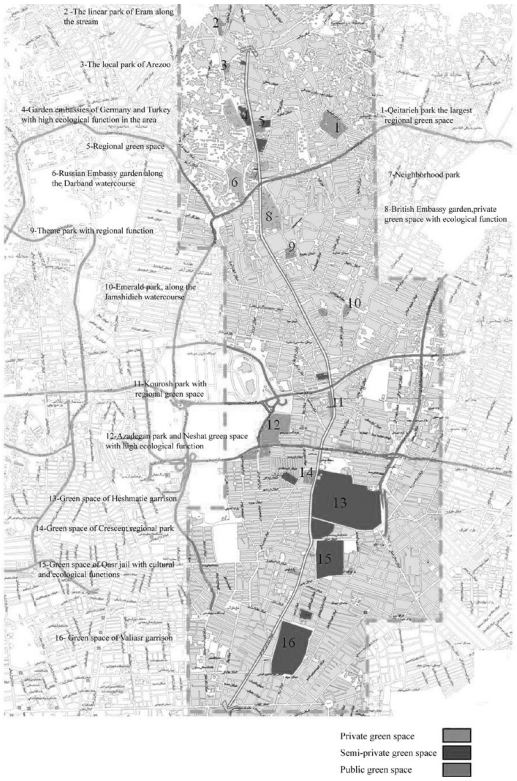

Fig. 3. Type and size of green spaces along studying area

This paper attempts to apply the concepts and definitions of green corridors, such as continuity of urban green patches and aesthetic aspects in design of city streets to enable them to act as green corridors that could be included in the green network of Tehran in future. This would establish the link between the remained urban green spots which would strengthen the ecological aspects relatedto urban street spaces for social participation of people.

According to completed studies, the history of gardens, in particular, those remained from the Qajar period, demonstrate a high capacity in the selected area for linking these green patches. So, evidence and related documents of scattered green spots and their location within the study zone was collected, and historical records of development changes along the axis in the aerial photographs, taken in different years, was explored and compared. The study area was then divided into two zones and two main strategic plans were defined to pursue the plan goals. Eventually design approaches and solutions based on the results of site analysis, utilization of existing facilities such as subway lines, expansion and integration of pedestrian paths, renovation of street furniture, creation of bicycle routes as well as increasing the quality of tree protection was adopted.

According to the scheduled detailed plans, many gardens now allocated to other usages, will be converted into public green space in future. This is a positive actionbut this process has been very slow so far.

If the organism is the enemy, then what?

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Following from Antonin Artaud, Gilles Deleuze and Félixe Guattari would declare the organism to be the enemy of the body and of life. More precisely, according to Brett Buchannan, it is about going beyond the organism, "of penetrating past the phenomenological interest in the lived body and being in the world, in order to discover the ontological processes that create what we are accustomed to calling the organism. "The organism is the enemy" in the same way one might argue that ecological infrastructure "is the enemy". That is to say that when we begin to see ecological infrastructure as a solution, we begin to limit its potential. When we begin to think in terms of solutions we begin to fix in place and reify the immanent. In effect the idea of infrastructure (or providing a framework supporting structure) may be taken to imply ecological solutions, but can we, and should we, be speaking about ecology in such terms?

The idea that the organism is the enemy is not to presuppose that the organism is working against us or even that the organism doesn't exist. Rather, we must begin to realize that the idea of any organism, human or "other", presupposes an infinite multiplicity of factors that go into the actualization of any being. Instead of being complacent about ecological infrastructure, i.e., as something that that can be described of consisting of a set or sets of qualities in space and time. We must be concerned with the genesis of ecological processes, what do ecologies do, and how do they articulate themselves. It is simply that infrastructure, as a metaphor, does not go far enough. How do we go about expanding upon this metaphor?

Ecological infrastructure: an examination of three Canadian Cities.

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This paper examines the idea of ecological infrastructure within the context of three Canadian cities located in three distinct ecological regions i.e., the boreal forest (in the Precambrian Shield), the tallgrass prairie and the shortgrass prairie. Each city was examined through the design studio process using a combination of GIS investigations and CAD based design iterations. Investigations begin with macro scale considerations of ecological functioning within the urban settings and micro scale designs are developed to illustrate how strategic actions could help build or reinforce an urban ecological infrastructure.

In the studio we begin by asking what is an urban ecological infrastructure, and, what are reasonable goals and objectives in designing and developing such an infrastructure? Rather than working from a singular definition, we are seeking the definition as part of the design thinking. So for example "ecological Infrastructure" may be defined as the organizational framework that meshes ecological processes and ecosystem services into the urban fabric. Goals that may emerge from such a definition include:

Designing ecological infrastructure systems to frame growth around regional mixed-use centres

Re-constructing anthropocentric infrastructure systems to incorporate natural processes in the city

Identifying vital ecosystem services and incorporating their functions and processes into an ecological infrastructure

Indicating areas of opportunity, where human and natural processes intersect, to allow for hybrid processes to emerge

The paper illustrates how design context, understood as the convergence of natural and urban systems, provides the basis for modeling urban ecological infrastructure, beginning with a macro scale long term ecological plan of the city and resolved through a series of site specific design investigations

Legacies of green infrastructure in Sarajevo – a historic garden city without a green future?

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In an urban era where cities produce 80% of greenhouse gasses, consume 75% energy but only take 5% of the planet's surface, it is no surprise that most voices tend to propose urban sustainability and resilience as the logical solution to this hazardous problem. Therefore,, the discourse is oriented towards inventing new methodologies and proposing sophisticated technological solutions as the cure to address mistakes

of the Fordist city. The positive historical examples often remain largely neglected and forgotten, even though Lewis Mumford and many other authors often praised the pre-industrial city as a great example of efficiency, dense urban form, walkable communities and exemplatory use of local resources. The question arises what is really applicabe today and what inspirations can be derived from historical examples? Which past success stories could have contemporary correlations and how can they be used to propose a sustainable urban transormation?

This work will therefore focus on the case study of a city of Sarajevo, looking at its vernacular architecture, organic urban "melting with surrounding mountain nature" as well as its garden tradition – the reasons why Sarajevo has been compared many times to other "garden cities" of medieval times such as Damascus and Padova. All the aspects including specific sustainable water infrastructure as well as the urban agriculture tradition were kept until the end of World War II, when a late wave of industrialisation and urbanisation hit Yugoslavia – almost completely erasing the legacy of the historic green city. Additionally, before this paradigm shift, Sarajevo's planning philosophy was based on unwritten green postulates of a guaranteed unblocked view from each house and metaphors ensuring the preservation of urban nature by comparing rivers to spines and surrounding mountains to lungs - a long time before theories of "city as organism" or "green infastructure" were prevalent. As the tragic urbicide ended the socialist and industrialisation period at the end of the 20th century, Sarajevo's modernist urban fabric was dissolved and "ruralized", which opened the space for traditional strategies to return.

This paper identifies the problematics of sustainability issues Sarajevo is facing today, pointing out that eco-urbanism principles have been the basic ingredient of Sarajevo's vernacular urban design for centuries. In combination with most recent theories of sustainable cities, this work promotes the named historical success stories as a key factor in creating a new, stimulative, urban development strategy.

Active trails as a new element of green infrastructure in the city's agglomerations of the Baikal region.

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Organization of green infrastructure is a necessary condition for sustainable and successful development of contemporary cities. Generally, cities and city's agglomerations of the Baikal region is situated in the mountain taiga landscape zone. Due to the existence of rich and accessible natural forests there were no requirements to create anyspecial green recreational infrastructure within the city.

The official system of protected areas was formed by the end of 20th century in Russia, in order to maintain natural resources,. At the present time, there are 7 categories of protected areas according to the special features of each particular territory and the status of environmental agencies within it: state natural refuges, including biosphere reserves; National Parks; Natural Parks; state natural reserves; monuments of nature; dendrological parks and botanical gardens; and finally resorts.

Currently, there are four State natural refuges and three National Parks on the water shed area of Lake Baikal. Natural Park is the only category which is not represented in this territory. Over the past century on the shores of Lake Baikal three urban agglomerations were formed: Irkutsk–Angarsk–Shelekhov; Baikalsk–Slyudyanka–Kultuk and Severobaikalsk–Nizhneangarsk.

In 2003, aiming to connect cities, natural surroundings and protected areas a non-profit environmental organization "The Great Baikal Trail" was created,operating on the different parts of Baikal Region. Based on a study of international experience on active trails, young ecologists and volunteers are seeking to create the first environmental trail system in Russia.

Even the practice of ecological trails is rare but it has a great future for all regions of Russia. The major aims of this project are development of eco-tourism in the Baikal region; building safe trails for travelers of all ages, nationalities and levels of training; safety and environmental protection; international cooperation; raising environmental and cultural identity. For that matter, different international education programs are conducted within the frame of "The Great Baikal Trail". This work is guided by experienced leaders who have close cooperation with public organizations, government agencies, businesses and local communities.

By this moment more than 650 km of the Great Baikal Trail was cleared and renovated. New pieces were constructed as well. The volunteers made plenty of bridges, steps, barriers, camping areas, retaining walls and other elements which are required for comfortable tourist activities and environmental protection. Nevertheless, the total length of the Great Baikal Trail is planned to be more than 2000 km.

Overall, it can be seen that preservation and sustainable development of the unique green infrastructure linking together natural and man-made landscapes is one of requirements of the urban process that is happening now in the Baikal region. Meanwhile, the experience of active trails establishment can be used as an example of the formation of unified green recreational infrastructure around the metropolitan areas.

Scenarios for the Recognition of Seasons in Cities

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Seasons vary in number and proportion of the year depending on the landscape's geographic location. The changing seasons affect expressions of landscape by abiotic and biotic factors and human activities, perception and experience. How are we to deal with the phenomenon of seasons' succession in landscape and urban planning and design? This theme's significance increases within areas with large variations among seasons and a diversity of seasonal expressions in the landscape. Before exploring and developing strategies and approaches toseasonal changes in cities, scenarios for planning and design of aspects related to seasonal development in landscapes in current theory and practice were reviewed. The data were aggregated by a combination of bibliographic review and autoethnographic inquiry.

The result is an elaboration of both contrary and complementary scenarios recognised in current practice and theory in different scales, methods and landscape materials, including an investigation beyond the field of landscape architecture.

In the context of values driven by existential aesthetics and concepts of authenticity and diversity of landscapes the paper highlights the importance of recognition of seasonscape and its incorporation in landscape and urban planning and design. The research proposes to raise questions with planners, developers and designers for alternatives – either production of prototypic landscapes or creation of regional specific seasonscapes. The weakness of a proactive approach to recognition and acceptance of the expression and character of a seasonscape and its interplay with urbanism and further inclusion within landscape and urban design and planning; is that it is creatively capacious. Is this an opportunity or constraint?

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Idealism and practice of public participation in the context of the rising pressure of economic success. The Coastal Strip in Gdansk as case study

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Loss of fully-developed urban culture and lack of thinking about public interest can be observed in every place where the true polis has become only "an urbanised area". Lack of understanding of public interest generally hinders solutions to urban problems and furthermore causes serious consequences, which are being expressed in the general trend towards private appropriation of that which has been the essence of the city for centuries – public space.

Currently, Polish legal and institutional conditions are not conducive towards establishment of spatial order and maintaining common areas as spaces that deserve special attention. Deregulation of the planning system carried out in recent years, have relegated land to use based on purely economic determinants – maximum profit from investment at minimal cost for development of the plan.

A low level of awareness and civic culture in the understanding of public good also brings many threats to green spaces in the city and hinders the process of proper maintenance of these spaces. Local authorities are not steadfast in their management due to strong investor pressure. A bad situation is worsening by the growing expectation for economic growth and the temptation to simply multiply the profits that can be generated through sales and investment in attractive urban areas.

This paper presents the main assumptions of the project of Coastal Strip[1] development in Gdansk. According to the authors best knowledge this is the first pro publico bono project in Poland in a large area of the city formed by the initiative of, and elaborated by the city's inhabitants supported by two NGOs. Another issue discussed in this paper is an innovative method introduced in university education, expressed in the

1 Coastal Strip (Pas Nadmorski) is a common name of the area extending to a length of about 5 km at the interface of built-up areas in Gdansk and the Baltic Sea. The mostly unbuilt terrain is covered by coastal forest and meadows.

involvement of students in the on-going process of forging a new strategy for urban green spaces. Integrating a practical approach with rather idealistic visions proposed by students resulted in an interesting extension of public debate. Successive stages of the civil project preparation and students' activity are discussed with the background of the shortcomings of Polish planning legislation and the challenges faced by the public participation process in terms of building a civil society.

Fig. 1. Aerial photo of the Coastal Strip in Gdansk. View towards the southeast showing the potential of the green landscape in the urban environment (photo K. Gierszewski).

Fig. 2. One of the two housing settlements realised in the Coastal Strip as a "gated community" and the visualisation of high-rise buildings proposed by developers in the eastern part of the area (photo: K. Gierszewski / developer's website promotion materials).

A number of walking and cycling paths and the beaches extending the entire length of the coast, make this area a natural recreation site for the whole agglomeration of Gdansk, in particular, for nearly one hundred thousand inhabitants of the three nearby districts. The Coastal Strip because of its natural potential is also the refuge of many species of fauna and rare species of plants and an important part of the biologically active areas of Gdansk. Currently, the undeniable value of the Coastal Strip and its attractive location within the city has caused increasingly stronger investment tension in this area.

The Climate-Species Matrix – a new approach for the selection of tree species for urban habitats with regard to climate change

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Green infrastructure and especially urban trees have great benefits for human's living quality in cities. With the climate changes that are already under way, it seems uncertain how the trees in cities, which have to cope with extreme conditions as it is, will fare if the conditions in their habitat become even more difficult.

The climate in cities and that in natural habitats differ in several ways. During periods of heat, city centres grow hotter than the countryside and do not cool down as much as the countryside during the night. This can have a negative impact on plants as well as on humans. The distribution of precipitation is also disadvantageous: Many heavy rains during the summer months mean that most of the water flows off the surface and only a little is absorbed into the ground. This has the consequence that while trees in urban areas are becoming ever more important, they also have to cope with increasingly extreme climate conditions, especially periods of heat and drought in summer. The current prognosis for the coming decades suggests that future urban woody species should be selected mainly on the basis of their suitability for dry habitats.

On the one hand this investigation focuses on species which are commonly used in urban planning. On the other hand it also includes species which are rarely used but which occur naturally in areas with more severe droughts in summer.

Based on reliable publications and practical experience an extensive attempt is presented to classify and assess more than 230 woody species that are used as roadside trees or for parks and gardens in Central and Nothern European cities with regard to their usability according to expected climate change. A new climate-species matrix was developed for this purpose (fig. 1): 4 degrees of drought resistance and 4 degrees of winter hardiness are the decisive criteria in a two-dimensional assessment. The woody species were placed in 16 categories of decreasing tolerance, ranging from 1-1 (very suitable) to 4-4 (very limited usability).

This categorisation on the basis of drought resistance and winter hardiness provides a sound basis for decisions in planning the use of tree species in cities for the future. This planning process must of course also include additional criteria like soil

	-1	-2	-3	-4
1-	1-1	1-2	1-3	1-4
2-	2-1	2-2	2-3	2-4
3-	3-1	3-2	3-3	3-4
4-	4-1	4-2	4-3	4-4

Fig. 1. Categories in the climate-species matrix with 16 subcategories („grade pairs") based on drought tolerance and frost hardiness
green – "very suitable": 1-1, 1-2
green-yellow – "suitable": 1-3, 2-1, 2-2
yellow – "suitable but occasionally problematic": 2-3, 3-1, 3-2, 3-3
red – "not very suitable": 1-4, 2-4, 3-4, 4-1, 4-2, 4-3
purple – "unsuitable": 4-4

parameters, shade resistance, aesthetics, etc, depending on individual requirements. This paper is therefore meant to be a basis for discussion and must be supplemented by further research as well as by experience of practicians and dendrologists.

Green River Brateevo

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Both in Moscow, a densely built megopolis, and in the Netherlands, a densely populated urbanized country, there are big challenges in the development and maintenance of a healthy green urban and peri-urban environment. Improving the quality of existing public space and cityscape and sustainable development of new areas will improve the quality of life and create new economic, social and environmental value. Green can do so much more!

In 2010, Dutch government agencies, Moscow City Government and consultancy agencies on landscape architecture cooperated closely in setting up a bilateral project to develop a toolkit for sustainable green development as an integral part of urban (re) development.

Brateevo is a typical Moscow neighbourhood with high-rise buildings and large green areas. It was chosen as a pilot area for its good location between the Gorodnya and Moscow rivers and the new developments in the area. The project team and relevant stakeholders exchanged ideas and experiences on new meanings of green. In a thorough and interactive process, these were then evaluated and translated into a general vision for Brateevo, and realistic and well-designed projects. The results will provide inputs for a general toolkit.

For example, different experiments have been carried out in the Netherlands on a new meaning of green. Urban challenges like heat stress, air pollution, flooding or

water quality, can be solved through a smart design of the green space by creating physical connections between the public space and the urban fabric. This solves problems in a durable and sustainable way, creates quality and creates value!

A bright and sustainable future for Brateevo

Though the total area of green space in Brateevo is substantial, it misses a clear identity, seems to be underused and is not well connected to the green areas within the built environment. Brateevo has a lot of potential for vibrant and well-used areas with extra value, through linking green areas and water, linking the green-blue network with urban fabric and linking the local and city scales. The master plan includes three key projects, each carefully upgrading the existing green areas towards multifunctional urban spaces and filling the missing links with smart new developments. The master plan shows that the spatial quality and function of the public space can quite easily be substantially enlarged, resulting in challenging, innovative, practical and realistic green designs. Ready for a bright and sustainable future.

Under construction

The Russian-Dutch team of designers and policy makers will further elaborate the plans towards their realisation. Local knowledge, local energy, but also scientific and practical knowledge will be fully involved. The project has won the Russian National Award on Landscape Architecture 2011, in the category of Best Conceptual Public Plan. This was an additional impulse for the project.

The master plan and design illustrate that Brateevo in particular and Moscow in general, have great potential for a green, bright and sustainable future. Building smart connections on every scale, making big plans and small plans, crossing borders, but most of all by working together.

Green Infrastructure: the composition and sustainability of peri-urban planted tree communities in stream gullies in New Zealand

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In New Zealand the peri-urban land use transition from pasture to urban provides an opportunity to improve biodiversity through the rehabilitation of forests and wetlands within a matrix (Meurk and Swaffield, 2000; Meurk and Hall, 2006) of connected ecosystem patches and corridors of variable sizes. Some such patches and corridors will be riparian ecosystems within Low Impact Urban Design and Development (LIUDD; van Roon and van Roon, 2009) style developments. The objective in forest rehabilitation sites is to provide the conditions and seed stock that will enable permanent forest cover. Only by this means can the objectives of the New Zealand Biodiversity Strategy, LIUDD, and the urban forest matrix (Meurk and Swaffield, 2000) be achieved.

This research investigated planted tree communities within gullies in Manukau, New Zealand. The changes in the composition and structure were examined in relation

to planting age, site and landowner maintenance. The composition elements examined included planted trees, weed and grass species, and secondary tree species. The aim was to determine the likelihood under the current conditions of these plantings developing into secondary forest and what actions if any need to be taken to improve these chances.

Adequate and steady tree growth is occurring, pasture grasses take up to 17 years to be displaced, weed and pest management is very variable across landowners, and natural recruitment of future canopy native species is very low. The scarcity of secondary native species settlement brings into question the species balance of the initial plantings and whether or not there were sufficient canopy tree seedlings. Further supplementary planting of secondary species, and weed eradication on most sites, needs to be carried out to ensure that these plant communities mature into permanent native forest stands that will provide both terrestrial and instream biodiversity returns. The conclusions reached will assist future decision-making in the creation and maintenance of other re-vegetation sites in terms of initial planting composition, supplementary planting and maintenance.

Characterization of non-urbanized areas for land-use planning of agricultural and green infrastructure in urban contexts

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Non-urbanized areas (NUAs) are outdoor places with significant amounts of vegetation. They are mainly semi-natural patches that represent the last remnants of nature in metropolitan areas, characterized by a high degreee of fragmentation. As part of the agricultural and green infrastructure they provide ecosystem services, such as purification of air and water, mitigation of floods and droughts, regeneration of soil fertility, moderation of temperature extremes and enhancing of landscape quality. Like all natural ecosystems, NUAs today are endangered by urban sprawl, which is the main cause of their fragmentation and loss of evapotranspiration features. For these reasons, the protection of these areas is a fundamental issue for land use planning, and it requires appropriate strategies for their management.

We propose a land-use suitability strategy, based on five different analytical phases, to address the land-use of NUAs of urban green infrastructure: 1) land use and land cover analysis quantifies the percentage of evapotranspiring surface for each land use; 2) fragmentation analysis assesses the size and density of NUAs; 3) proximity analysis takes into account the degree to which NUAs are close to residential areas; 4) the results from these analyses are integrated in a land use suitability matrix, which produces as output a new scenario of prospective land uses for NUAs; 5) a compatibility matrix verifies the correspondence of these new land uses with the current ones to confirm or modify the proposed land uses. The resulting scenario (figure 1 and table 1) allows enhancement of the production of ecosystem services and defines new appropriate land uses for NUAs within the agricultural and green infrastructure. The model has been developed with GIS, using a set of data which includes high-resolution orthophotos,

vectorial cartographies and field surveys. The method is tested on three municipalities within the Catania metropolitan area (Italy), characterized by a considerable urban sprawl.

Table 1.

Prospective land uses of non-urbanised areas

Prospected Land Uses (PLUs)	Number of patches	% num of patches	Total Area (ha)	% area	Average Patch Area (ha)	ET	FR	PD
Agricultural Park	88	0.07	263.6	0.21	29957.4	80.3	1.1611	34.0
FRICHE	16	0.01	3.7	0.00	2333.3	83.8	1.3077	39.6
LUP	217	0.17	211.0	0.17	9722.1	70.9	1.1731	33.3
Natural Park	190	0.15	184.8	0.15	9727.4	85.4	1.1781	37.3
Playgrounds	27	0.02	11.5	0.01	4261.1	70.9	1.4244	41.9
Allotment Gardens	15	0.01	18.9	0.02	12664.1	80.3	1.4313	43.7
Informal Recreational Areas	378	0.30	246.0	0.20	5732.2	70.9	1.4058	29.2
CSA	331	0.26	307.2	0.25	4736.4	83.5	1.4278	31.8

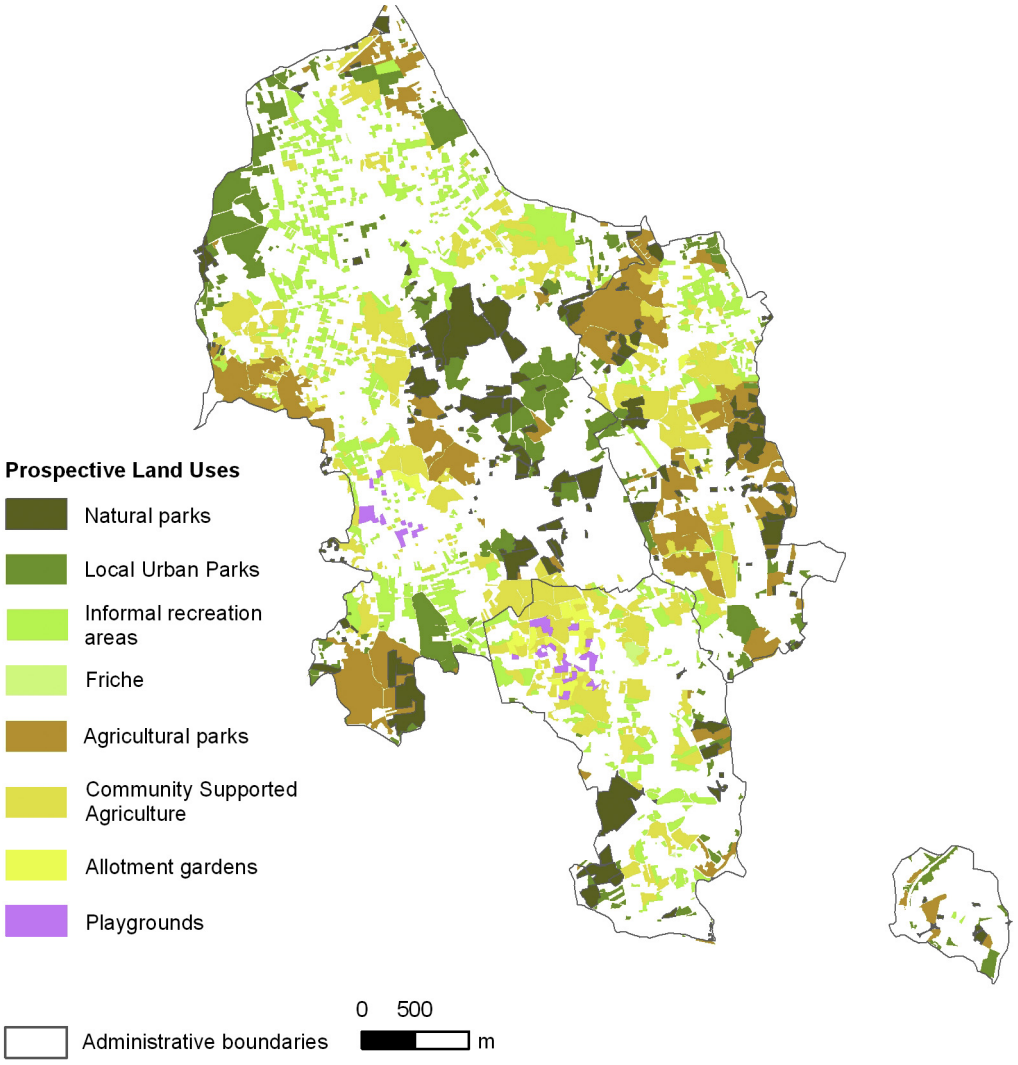

Fig. 1. Prospective land uses of non-urbanised areas

From Green Structure to Blue-Green Infrastructure.Revitalizing urban streams to cope with climate change and social demand – Laje stream, Oeiras, Lisbon Metropolitan Area

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The concept of Green Infrastructures is currently leading adaptive and multifunctional planning, requiring a landscape scale approach where ecological connectivity is one of the major challenges. Water bodies, rivers and streams are key features in structuring landscape processes and functions, acting as a network of 'blue' corridors requiring the preservation of good ecological status or potential. The Green-blue infrastructure concept shows an evolution from a traditional conservation-planning tool, such as the green structure, or green-belt approach, to cope with climate change and involve societal needs and public participation.

In the Lisbon Metropolitan Area (Fig. 1) the concept of green structure has been developed since the last decades of the twentieth century. It has been included in territorial planning at municipal level, showing concerns for improving the quality of life of urban communities and the protection of environmental values. Green Structure plans are important tools for municipal land use planning strategies, addressing recreation, conservation and biodiversity.

Although the urban streams flowing in this region show considerable mismanagement (e.g., poor ecological water quality, flood risks, urban encroachment and bad state of riverine habitats) they are classified as green corridors within the municipal green structure. Urban development pressures impacts the ecologic and social value of environmental features. Climate change scenarios for this Mediterranean climate region point towards increased high peak flood risks, as well as low flows and dryer periods. So the planning for stream restoration and management will need to cope with more frequent extreme events, as well as the need for restoring water quality, following Water Framework Directive (WFD) requirements.

The municipality of Oeiras, close to the city of Lisbon, intends to face this challenge with the revitalization of the urban streams in its territory, looking for a planning process able to deal with these issues. These streams connect dense housing devel-

opments with open spaces and heritage sites, creating interesting opportunities to link nature and culture, vernacular artifacts and traditions with renovated engineering approaches (Fig. 2).

Flood control, recreation, environmental education and water quality improvement are goals needed to be addressed in a multi-functional process, adapted to a Mediterranean context. Following an international workshop that assessed opportunities and constraints for revitalizing these urban streams (Anderson et al., 2005) a master plan for the Laje stream corridor in the Oeiras municipality is in progress. A large historical 'Quinta' (farm estate) that in the past was dedicated to agriculture is now planned to become a Thematic Park, where Laje stream and water traditional devices are structuring key elements. Flood control and detention basins, stormwater management, habitat restoration and heritage conservation are challenges to be implemented in an innovative and integrated system, compatible with human uses and enjoyment.

It is the opportunity to shift from a more 'spatial planning' approach of green structure to a more complex and multifunctional concept of blue-green infrastructure, aiming to focus on the urban streams as key elements to attempt to address the challenges of coping with climate change and with other environmental pressures, as well as social demands.

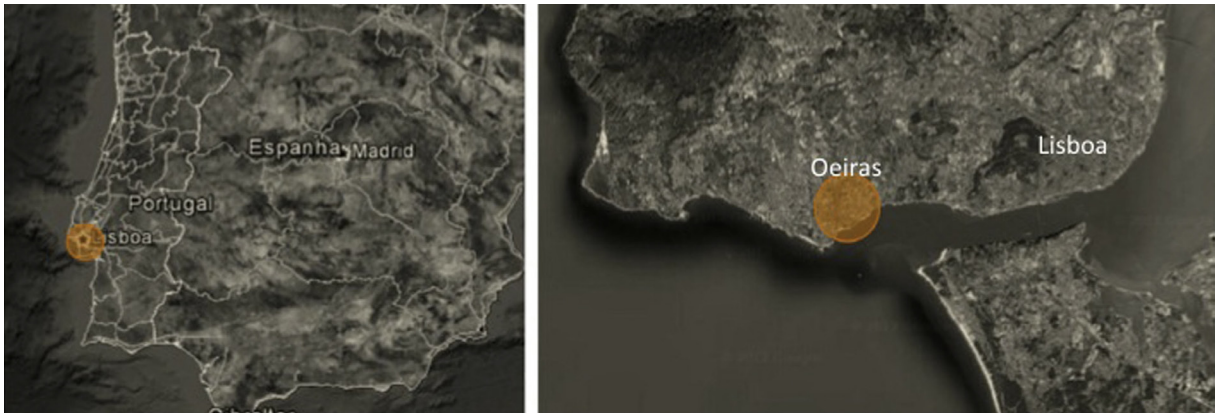

Fig. 1. Location of Oeiras in Lisbon Metropolitan Area

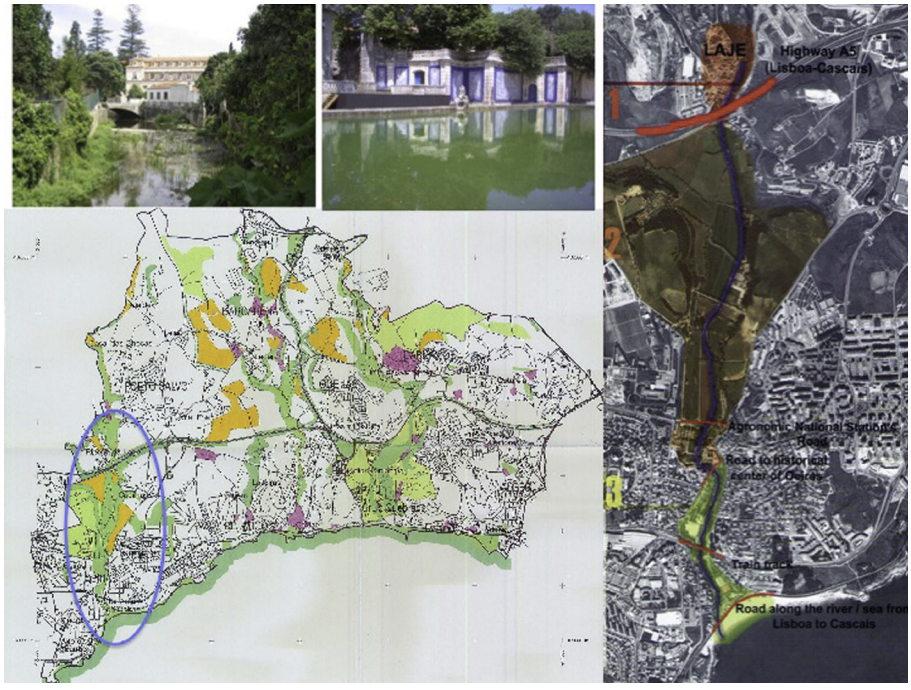

Fig. 2. Green structure of Oeiras municipality and case study area of Laje stream corridor

Features of a green infrastructure of cottage settlements

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New cottage settlements after construction face problems of rain and snow runoff. The causes of these difficulties are related either to the shortcomings of a project and its implementation, or the inability for water to disperse into nearby hydrological elements.

Drawing on international experience in the field of civil engineering infrastructure, we have developed a storm sewer project involving elements of sustainable design for the cottages to the west of Moscow. The water disposal system is designed along the road and consists of two parts. Waste water flows into the underground collector system through sewer pipes from pavements and roofs, passing primary treatment in grit gulley and inspection manholes. The rest of the surface water infiltrates into the upper layers of the soil and the surplus falls into the open part of the water disposal system which is put in relief depressions – so called "swales". On the surface they are decorated like a "dry stream" with deposits of gravel and boulders that serve as the top layer of drainage under which a layer of sand-and-drum with a drain pipe lies. When the snow melts, or when it rains, the water flows through drain pipes into the underground collector system.

We have implemented well-known European trend "Back to nature" aesthetics in the decorative landscaping of the "dry stream". The plants were selected according to requirements of local biodiversity supporting lists. In this regard various types of local hygrophilous plants like sedges (*Carex*), ferns (*Pteropsida*), meadowsweet (*Filipendula*), hazels (*Corylus*), spindle tree (*Euonymus*) and willows (*Salix*) have been widely used in decorative compositions. Thus, has been planned an ecosystem with the principles of sustainable design..

Green heritage and historic landscape architecture.

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Among the sites of landscape architecture, historic park complexes occupy a special place. The uniqueness of the historic park areas is primarily determined by the dualistic nature of these entities: they include both historical and architectural monuments and their surrounding landscapes.

In the modern urban world the function of historical parks has changed, and the spatial organization of park areas reflects this contradiction between their current functional content and those of ancient times.

As part of historical development of park areas the functions of individual components, primarily vegetation, change. With the accelerating process of urbanization and a rapid deterioration of the ecological state of the environment, the significance of

the function of green components of historic parks is increasing. Vegetation in historic parks played a leading role not only in creating their aesthetic appearance, but also in performing important ecological functions.

Park vegetation is the basis of historic recreation in urban areas. Vegetation creates the green spaces that accommodate comfortable environmental conditions, saturate the atmosphere with oxygen and protect it from noise, dust, gas content, etc.

Within the area of the historical park green, the park complex component has another important function – the environmental one. Due to the peculiarities of formation, conditions and history of historic parks they are very diverse in terms of vegetation cover. Special ecological and environmental importance is attached to those parts of the parks, which formed the landscape.

It has been established that the park areas where modes of care and the hard-regulatory structure of plant communities had been removed, park vegetation developed under the general laws of natural systems' evolution and their properties gradually approached their natural counterparts. Within the park area there are historic plant communities, in which species' composition and structure is fully consistent with the natural systems that can be considered as the local environmental standards. The age of the stand, constituting the skeleton of these plant communities, is in some cases comparable to the age of the garden. There is a need to preserve not only each of the mature trees, but the phytocenosis as a whole, as a natural system, including all tiers of trees, underbrush, undergrowth and ground cover. These mature stands, together with other components of the phytocenosis as a green legacy of the park, of course, are especially valuable elements, and require extra attention, care and protection.

The urban areas of park landscapes of the old manor complex are practically the only possible location of poorly retainedplant communities. Thisis especially important for the conservation of natural biodiversity in the big cities. This determines the need for a comprehensive survey of historic parks and areas of vegetation inventory to identify not only the location of zones of plants listed in the Red Book, as well as some valuable trees, but also a small selection of retained plant communities that reflect the natural biodiversity.

In solving problems on the zonal-functional organization of historic park areas, green heritage historic landscape architecture must be identified as protected ecological objects.

Miss!ssippi

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The paper discusses the relationship of transport infrastructure and green infrastructure on a national scale and at the same time on the scale of the human body.

For the past 60 years the Mississippi river has been forecasted to make the next periodic geomorphologic shift within the delta-fan that resembles the Mississippi Delta. All land of Southern Louisiana has been recently deposited by an episodic and frequent shift of the course of the River; within the past 5000 years this has been not the exception, but the implicit rule. The next inevitable shift is only held back by the

"Old River Control Structure". Without this set of concrete weirs maintaining a 30/70 flow ratio, the larger portion of the stream would have already diverted along the shorter path through the Atchafalaya and would have eventually abandoned the Port of Louisiana and New Orleans. In a case of a sudden loss of control, the river switching path would be rapid and not reversible. Within days the largest chemical industry and the "Big Easy" would be left as a salty tidal creek without a source of fresh water. Consequently the Port of Louisiana with its petrochemical industry would be without navigation and without process water – it would be shut down within days. The city of New Orleans would be left in the intruding saltwater of the gulf without a source of freshwater supply.

In the spring of 2011 a historic record of river flow was funneled through the "plumbing system" as the ACOE refers to the lower Mississippi. In their minds – they won the "flood-fight 2011". While fixing the damages caused to the flood protection system, it seems questionable how much longer this system may be maintained at all costs of maintaining the mechanical control-systems against natural dynamics. In favor of navigation the "levees only policy" was cut of all diversions over the past 100 years. The resulting channelization is directly linked to delta starvation and causes the massive land loss of Louisiana. The excess sediment carried by the Mississippi is intentionally washed off the continental shelf and its nutrient discharge causes a growing area of hypoxia along the gulf coast: An extended coastal dead zone depleted from oxygen.

The research indicates a correlation between the vulnerability of the city of New Orleans and the scale order and control imposed on the landscape dynamics of Southern Louisiana. Green infrastructure in this context needs to be understood on a regional scale.

ParadoXcity

A series of speculative design research proposals explore the implications of the worst-case scenario as well as pro-active strategies for alternative futures.

How can we sustain stability without stagnation?

If landscapes are constructed or deconstructed at a regional scale what is the role and the scope of landscape architecture in this system?

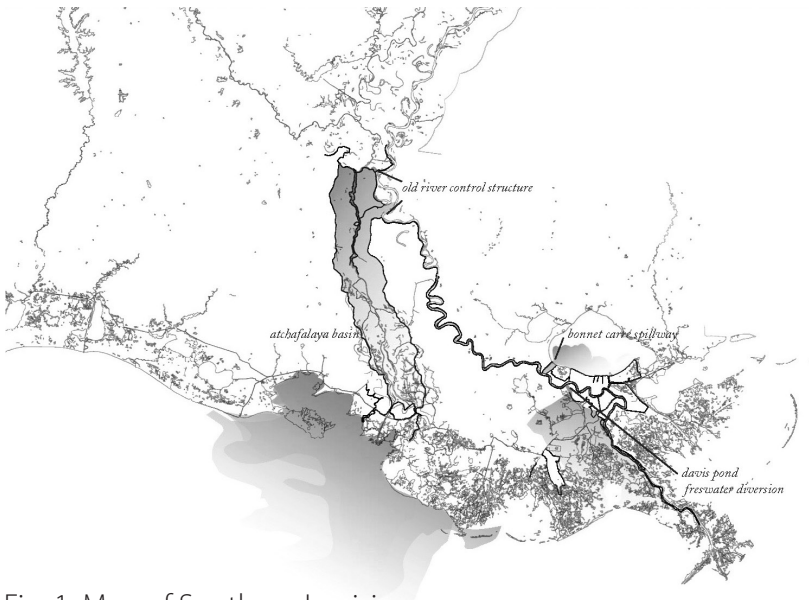

Fig. 1. Map of Southern Louisiana

How does this perspective suggest thinking differently about New Orleans and its natural disasters of Katrina.

Landscape processes have been marginalized at a regional scale; they are now coming back unexpectedly at the same scale.

Can we out-engineer the delta?

Green infrastructure against flooding as a new challenge of the town of Pula, Croatia

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In urban areas the impact of flooding in recent years has increased, due to climate change and inappropriate sectoral storm water management and urban planning, often characterized by scant consideration of the natural watershed, its natural water cycle, and the ecological, social and aesthetic issues.

The intention of this paper is to show how a coherent and integrated storm water management approach can aim to mimic a natural water cycle and improve the efficiency of the urban drainage system and the quality of public space, in terms of ecological, aesthetic, and social parameters, integrating urban green spaces into storm water infrastructure.

The City of Pula (Croatia) storm water management plan is the result of the collaboration of an interdisciplinary team: landscape architects, physical, urban and environmental planners, civil engineers and GIS experts. In this plan the team has tried to apply Watershed-Scale Water Sensitive Urban Design principles, which implies the integration of landscape and urban planning with urban storm water management, with the basic principle that small scale decentralized site-specific landscaped storm water-solutions can become part of the city's green infrastructure and improve its sustainability.

The planning process adopted for this plan was based on four steps:

Watershed and sub-watershed historical evolution and current site analysis, for the identification of present conflicts at the sub-watershed level which lead to flooding.

Fig. 1 Site opportunities for the implementation of the WSUD principles (from dark grey – high potential to light grey – low potential)

Impact assessment of the future development plans and the identification of "problem areas" and locations of special concern. The technique used was a GIS simulation of existing superficial runoff rate and future runoff rate based on the planned city growth. The result was the identification of the sub-watershed with its major impacts.

Identification of the site's opportunities with the definition of suitable areas for the implementation of the Water Sensitive Urban Design principles, and the degree of their potential.

Storm water management plan proposal with the definition of planning and site design guidelines for sustainable land management that supports the plan objectives.

The benefits of this approach are multiple: reduction of storm water runoff, storm water treatment, mitigation of flood risk, recharge of groundwater, lower capital costs compared to conventional storm water infrastructure, positive impacts on urban micro-climate conditions, benefits on air quality, habitat improvement, habitat connection, health benefits, new recreation spaces, improvement of the visual aesthetics of urban space.

A Sustainable Development Approach within the Transportation-Energy linkages (Patterns), Istanbul Metrobus Case.

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Humankind is trying to develop solutions intended to enhance the quality of urban life, to ensure ecological sustainability.

Sustainability requires organization and planning without overloading the main resources of the ecosystem.

Sustainability, which can undergo changes due to political decisions, strives for harmonizing human systems with nature.

Humankind increased its pressure on nature to supply the energy needed for human activities and has substantially harmed the life chains of the ecological cycle.

Together with increasing energy consumption induced by the industrial revolution, the energy demand has begun to be mainly satisfied by fossil fuels. However, as a result of the petroleum crisis and of the intensified environmental problems, countries have been in search of alternative energy resources since the second half of the 20th century.

For example, in Brazil, the government in 1970s initiated the National Bioethanol Program (ProAlcool). The biofuel market that has been promoted by this program has rapidly grown thanks to the governmental support and substantial increases in petrol prices.

In this conservationist project, a system minimizing the consumption of nonrenewable energy resources and restricting emissions and wastes taking by into account the carrying capacity of earth has been considered.

The purpose of this study conducted based on the forestated facts is to reveal how a green infrastructure system of Turkey may satisfactorily benefit from the biofuel resources. The green infrastructure system has primary effects on socio-economic life at the national level and urban/rural planning at the local level.

In addition, the suggestions of this study aim to contribute to building the joint effort required to design a currently nonexistent comprehensive national biofuel policy.

In the sample study about this subject, metrobus lines in Istanbul will be used as a transportation investment that has been highly discussed recently.

Metrobus use is looked upon as a new means of mass transportation due to low pollution emissions and alternative fuels used, not only with respect to the energy sector, but also according to the researchers studying environmental issues.

Due to the vehicles that will be withdrawn from traffic thanks to the İstanbul metrobus system addressed in this study, time and distance savings of 1/3 will be achieved. However, the Metrobus system seems inadequate in terms of the fuel type used. Although diesel, petrol, LNG and electric engine vehicles can be utilized in the metrobus system, petrol derivative diesel engine vehicles are predominantly used.

Between 1990–2004, Turkey was the country where carbon dioxide emissions increased most rapidly by 72.6%. By proposing a new biofuel policy towards reducing the carbon emission, a new proposal of "energy agriculture" and "energy forest" for nature-friendly renewable biofuel that can be used for the metrobus system will be developed. A proposal for realizing energy agriculture and energy forest in the areas known as ETA (ecological agriculture area) around Kurfallı and Akören village sites of Silivri district of İstanbul, presupposing public/private sectors' and local residents' cooperation, will be presented.

Identification of blue infrastructure in Warsaw, Poland

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"Blue infrastructure" is a new term not yet clearly defined and therefore sparsely used in Polish vernacular. The constant development of cities in Poland, however, increases the awareness of the necessity for well-functioning urban hydrological systems – evident especially in big cities, such as Warsaw (the largest city in Poland with over 2 million inhabitants) where problems are beginning to emerge. In our study we attempt to define and assess the elements that can be regarded as the components of Warsaw's blue infrastructure (Fig. 1).

The core of Warsaw's blue infrastructure is the Vistula River. It flows through the city center and has urbanized boulevards along the left bank, while the right bank consists of a temporarily flooded, natural poplar-willow riparian strip. The river is the most important source of drinking water for city dwellers, as well as the receiver for both storm and wastewater.

The Vistula's tributaries, open drainage channels and small water reservoirs play a significant role in the whole urban hydrological system. Over 500 of them are scattered within Warsaw's area, with sizes varying from 50 to 200,000 square meters. In many places they are main receivers of storm waters, although unfortunately in most cases these are not adapted for such functions (especially for changing water levels). Some districts (mainly those experiencing frequent urban flooding) are implementing new programs for the restoration of such areas. A positive example is the Ursynów district, where 90 water reservoirs are located and gradually being restored as part of the district's sustainable strategy. These initiatives are leading to the enlargement of retention in the catchment area of urban streams (for example The Służewiecki Creek and The Jeziorki Canal) and can also offload the overloaded open channels, decrease the flood risk and form habitats for flora and fauna as well as serve as recreational spaces for people.

Other positive aspects observed in Warsaw are occasional attempts to create Sustainable Urban Drainage Systems in newly developed areas. Such initiatives however are still not sufficient either in size or in the response to needs.

Despite the fact that the overall area covered by waters is quite high in Warsaw, it still does not form a defined harmonious network or system. The elements that should be a part of a blue infrastructure are still chaotic and lack proper maintenance. Proper identification of the components, however, will help in defining the guidelines for forming and connecting sustainable blue infrastructure in the future. A process is necessary to protect and restore terrestrial hydrological connections as well as naturalize channels in order to create functioning and sustainable blue systems in Warsaw.

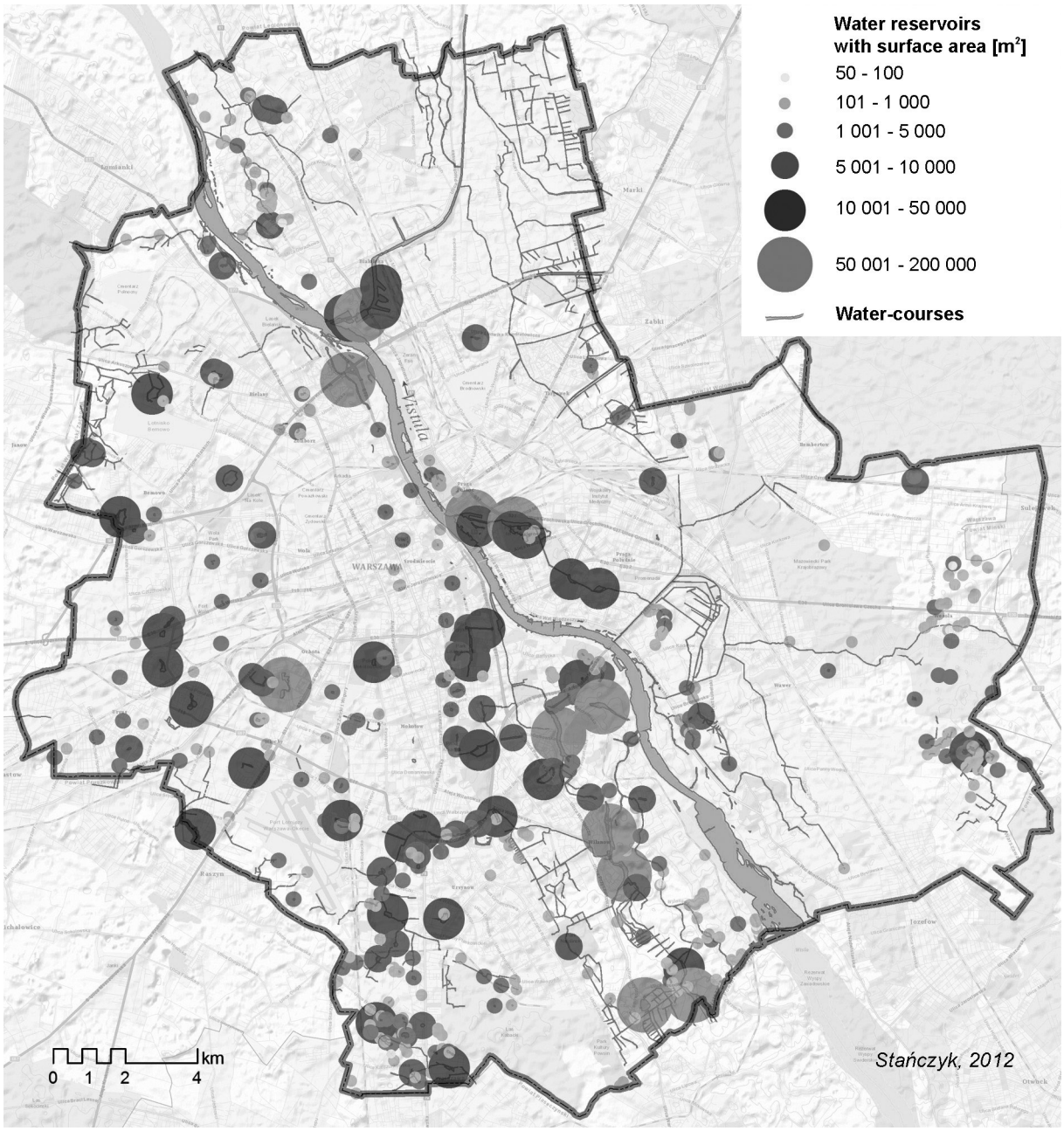

Fig. 1. Blue infrastructure in Warsaw

Landscapes of identity value as a part of Estonian green infrastructure

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Thematic plans for "Environmental conditions directing settlement and land use" for ensuring the functioning and development of green infrastructure, for all counties of Estonia were prepared during the years 2001–2006. The plans are to be used in general county and other levels of planning, where the layout of green infrastructure is required.. Thematic plans contain two sub-themes – ecological network and valuable landscapes. The ecological network was assembled from existing and potential green spaces and greenways. Valuable landscapes were chosen by assessment of five different value types: aesthetic, recreational, natural, cultural-historical, and identity value. Identity value was evaluated through public involvement (questionnaires and interviews), as four other values were identified by experts (map analyses, site visits). Landscapes containing identity value were defined, as landscapes carrying value and importance for local people or landscapes known widely.

The importance of the landscapes with high identity value for green infrastructure development cannot be underestimated as these landscapes are recognized by the local community as highly important. The aim of the current paper is to analyse how landscapes of high identity value are positioned within and can influence the development of green infrastructure. The paper focuses on two research questions: 1) Which types of landscape were considered as carrying the highest identity value? 2) To what extent high identity value correlated with experts assessed values?

In order to research the issue thematic planning documents analyses were conducted; 9 out of 15 county thematic plans included evaluation of the landscapes´ identity value. Landscapes with the highest identity value (n=116) were chosen for further analysis of landscape types and correlations between values. Landscapes were classified into types according to the range of human influence; landscapes with material heritage (buildings and settlement structure) were divided into types according to representativeness of the historic period (ancient landscapes, manor landscapes, farm landscapes, soviet heritage landscapes or historic concentrates).

22% of the analysed landscapes of high identity value were similarly highly rated in all other value assessments. The majority of the landscapes with high identity value scored higher for aesthetic and cultural-historic values. Accordingly, less of the landscapes that contained high identity value were also highly valued for natural or recreational value parameters. Tempesta (2010:271) found that in some cases historic value does not make landscape more aesthetic. This study shows that being highly appreciated for aesthetic and cultural-historic values landscape is more likely to contribute to local identity.

To sum up, landscapes that were most valuable to local people are typically: landscapes with character clearly different from the surroundings; landscapes of high concentration of different values (or valuable objects); large areas with equal distribution of high quality in one or more value types or/and settled landscapes.

The analysis of Urban Open Space System – Providing the 'flow' for Living Systems

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The number of green system strategies and plans of cities and regions is continuously increasing. Today's urban areas crucially need them in order to support a more liveable environment. The aims of these strategies are to create a network of green that provides biodiversity for fauna, flora and to provide free, easy access for human society.

In several cases the connectivity of green spaces is a difficult issue. In dense urban areas, like downtowns, where green elements can be rarely found, it is hard to make any connections. Applying only green in open spaces, as a key element of creating a system, is sometimes not possible or not enough. There is a need to use other open spaces that are not necessarily covered with green.

The aim of this presentation is to find solutions to create a continuous network with real linkages of open spaces. It will seek an answer to the question, 'What kind of open spaces can fit into a system?' It cannot be said, that every open space is appropriate. What are those attributes that can evaluate an open space to become a proper part of a well-functioning system? First we need to know, what does a well-functioning system require, and then we have to find those open spaces, which have enough potential to satisfy these requirements.

The sample area where detailed analysis was made is the downtown of Budapest. Most European cities' downtowns are quite similar. They lack green spaces, while their open spaces have other qualities. The basis of the methodology for surveying the open spaces comes from New Urbanism, a school of thought from the 1980's, when the increasing number of cars blocked the pedestrian movement and decreased the amount of pedestrian areas. This situation drove a need to analyse how could open spaces be linked together and what ecological, economic, structural, aesthetic and social values should they have in order to improve people's well-being in a dense city. The more values an open space has, the more multifunctional it is and the more useable it could be for a system.

In the case of Budapest, the ecological, structural, aesthetic and social functions of an open space were analysed. Through the analysis a categorization of the open spaces can be made and it is possible to sort out spaces that have enough value and potential to become a coherent part of the system. Thereafter we can define, what attributes can make an open space appropriate for being a part of a system. With this, a complete infrastructure can be created, where the real flow of living system appears. This would link together green spaces with other open spaces, to become a multimodel network, a so-called Urban Open Space System. With the use of several kinds of open spaces there would be a better chance to satisfy the expectations of modern urban life.

Urban Rivers and Riparian Cities: the Built-Blue Interface in Russian and U.S. Urban Design

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Rivers and riverbanks have long acted as a "contact zone" between nature and society, a liminal space in which the mutual construction of built and natural environments can be clearly observed. The characteristics and behavior of rivers have often structured human actions at multiple scales, determining the course of empires and the development of cities, inspiring regional environmentalism, contributing to a locale's sense of place. Rivers are 'natural,' yet intimately connected to urban infrastructure and industrial production. From Peter I's 1703 establishment of Sankt Piterburgh in the swampy delta of the Neva and Moika Rivers, to Frederick Law Olmsted's reconstruction of the Boston Fens into an 'Emerald Necklace' of green spaces, the river-city interface has been a significant, and challenging, site of activity for landscape architects, urban designers, and city planners. In this paper, I compare the historically diverse design treatment of rivers and river embankments from the early 20th century to the present day. Using historical case studies from both relatively well-known and lesser-studied Russian and U.S. cities, I examine how changing understandings of hydrological systems, public space, and urban and environmental health manifest in plans and practice with vivid spatial, ecological, and experiential results. Specific examples discussed include the cities of Moscow, Krasnoyarsk, Denver, Portland and New York, and the Volga and Columbia Rivers. Soviet plans of the 1930s for the reconstruction of Moscow and the Volga River are compared to coeval plans for the Columbia River, as well as to more recent developments in both countries, in order to demonstrate the broad range of techniques and priorities which have shaped 20th-century city-river interactions. Given the urgency of present-day concerns over water quality, access to drinking water and sanitation, storm-water management and potential sea-level rise, how best to integrate hydrological and urban systems at the city scale is a question of both global and local interest. Through better historical understanding of the priorities and motivating concepts of past attempts (successful and otherwise) to design for cities on rivers and rivers in cities, today's designers and scholars will be better equipped to understand and respond to present concerns.

Green Infrastructure as a Basis for Social Cohesion: A Case Study from Iran

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An important issue emphasized in green infrastructure initiatives is creating an ecological whole. Many present-day cities, in their development, are turned into fragmented parts not only ecologically, but also socially; a fact which draws attention to

the importance of considering social cohesion. This paper investigates the green infrastructure in Semnan, Iran, that has formed the urban landscape through time and studies the attached traditional social infrastructure. Inspired by this legacy, a proposal is presented to integrate green and social infrastructure systems in the modern urban context.

Semnan, located on the northern fringe of the great Kavir desert, benefits from two characteristics: the traditional water division system and the urban farms and gardens around the old context. The water division system includes a river divided into six streams in Pārā that conduct water to six pools of the six old neighborhoods and thereafter further divided into smaller branches to reach farms, gardens and also houses. This system had an associated social system that managed it in different scales and thus formed the green infrastructure of the pre-modern city. The social infrastructure included roles and relationships, each attached to a special place in the water division network. The system further engaged all citizens through rituals and events and also the role of the pools as a characteristic identifying public open space in each neighborhood.

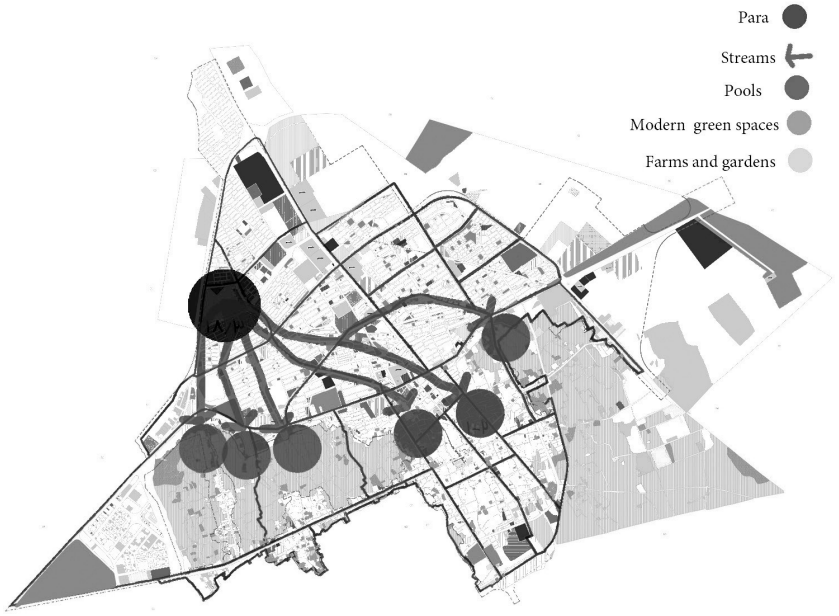

Fig. 1. Green infrastructure in current context of city

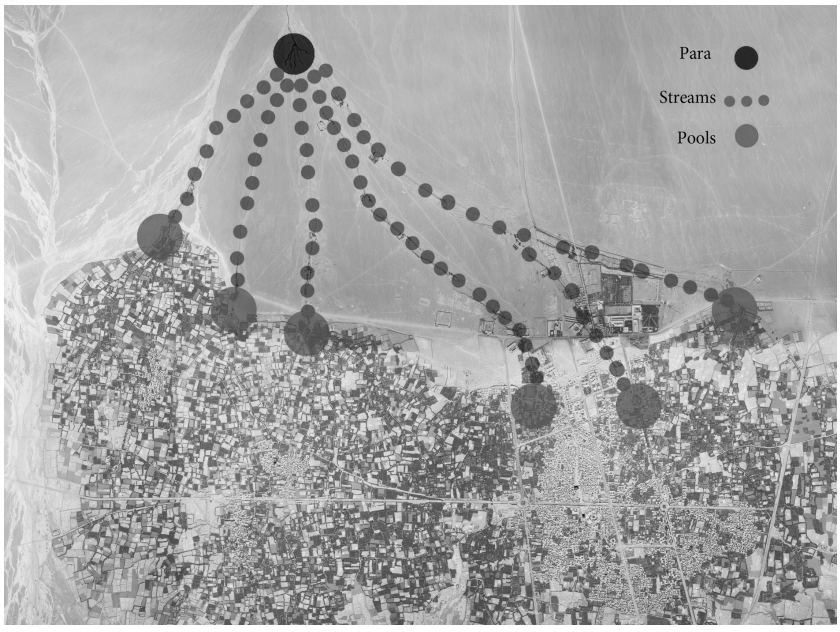

Fig. 2. Aerial photo 1956. Water division system

Although the traditional social system has faded away during the modern transitions, both the physical elements of the green infrastructure and the demands for it are still extant. On the other hand, the modern districts in their northward development are detached from the southern old context and have mostly covered the streams beneath the blocks and passages, neglecting the old system. That is while they particularly lack green spaces.

This paper, first, reevaluates the physical and social aspects of the traditional water division system, studies the mechanisms it defined and adapts them to suit the contemporary community conditions in different urban scales. Secondly, it analyzes the modern district and presents a strategic plan that redefines the existing green spaces in the modern context as community gardens and utilizes the water division network or its footprint as connecting corridors to link patches of planned community gardens with farms and gardens of the old context. This plan provides an opportunity to join the detached modern context with the historical one that benefits both and the city as a whole, and enhances social cohesion through a continuous landscape.

Inspired by the social and cultural aspects of the traditional water division system, modern roles and relationships, events and participatory mechanisms are provided to apply the plan and connect the people to the green infrastructure. As a result the modern context is provided with the much-needed green spaces and the old context with the fading life and vigor and above all, the city with a green infrastructure, uniting the two parts and forming not only an ecological whole but also a social one.

Urban agriculture, marginalised societies and green infrastructure – is there a possible link?

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The aim of this paper is the analysis of the possibilities of integration of marginalized societies into the urban green infrastructure of Belgrade.

Unfortunately the majority of society holds prejudices and marginalizes some populations, turning the whole situation, sometimes, into very unpleasant life scenarios. Improving quality of life and understanding the culture, psychology and needs of those marginalized social groups was, and still is, one of the challenges that have poor or questionable achievement results. In this paper we will briefly describe the steps of our cross-cultural investigation, with complete analyses of their living areas, concentrating first on environmental characteristics; our proposed idea is to involve the marginalized groups with urban farming practices in Belgrade, with a focus on educational pre requirements (which could include Steiner's biodynamic system).

According to many authors, urban agriculture could provide significant economic and ecological benefits to the urban population. Among those specific marginalized societies, we can find ethnic groups, like the Romany community, who might show low aspirations, but quite rapid adaptation capabilities, with a hidden potential to be economically independent and equal citizens.

Combining contemporary needs with the characteristics of all observed social groups, we suggested that their involvement in urban agriculture could improve living conditions, through creating more functional, healthier and aesthetically pleasing environments. Those assumptions are verified through several questionnaires that showed these groups' willingness to participate in further development of green infrastructure.

In that way, parts of the green infrastructure of Belgrade could gain another functional role, involving promotion of economic activity, but more importantly, for the marginalized group it could provide a sense of belonging to society, motivating representatives to become more active and willing to participate. Of special importance is, of course, the process of education, as one of the vital prerequisites for successful involvement. Similarly important is the careful selection of the areas which are in accordance to the planned green infrastructure network, but also those where the environment is appropriate for urban farming, avoiding all the areas where existing conditions are too contaminated and could represent a health hazard for the consumers.

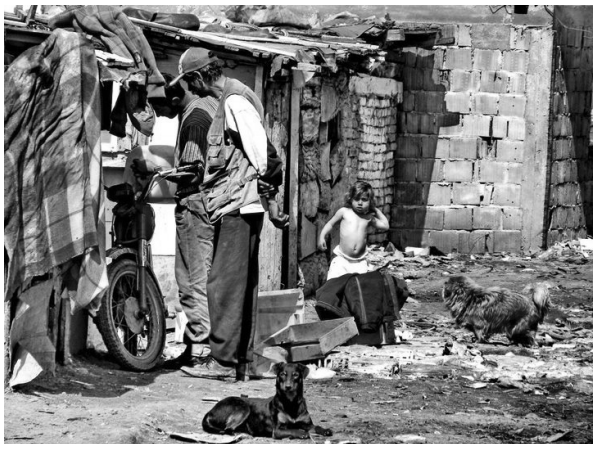

Fig. 1. Marginalised Society of Belgrade – Mali Leskovac

Fig. 2. Example of urban agriculture in Havana, Cuba

Assessing the Green Infrastructure Potential in Sariyer, Istanbul

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Sustainable cities are only possible with integrated green system planning and design. The green infrastructure approach can play an important role in this endeavor. As a network of multifunctional green patches and corridors, a green infrastructure can deliver a variety of ecosystem services and quality of life benefits in a rapidly changing urban matrix. Consequently, the evaluation of green network opportunities is essential

for green infrastructure planning and management. The aim of this study is to assess urban green infrastructure potential and its characteristic components in Sariyer, Istanbul, Turkey.

Sariyer comprises most of the unfragmented forests of Istanbul and ecologically, economically and socially significant coastal line (Fig. 1). On the other hand, Sariyer struggles with the challenges of urbanization: increasing population and squatter settlements, urban expansion on natural areas, spatially and structurally changing coastal zone, and pollution are just a fewof the challenges.. Sustainable urban green infrastructure development and management are essential for the future of Sariyer, hence contributing to the livability of Istanbul at larger scale.

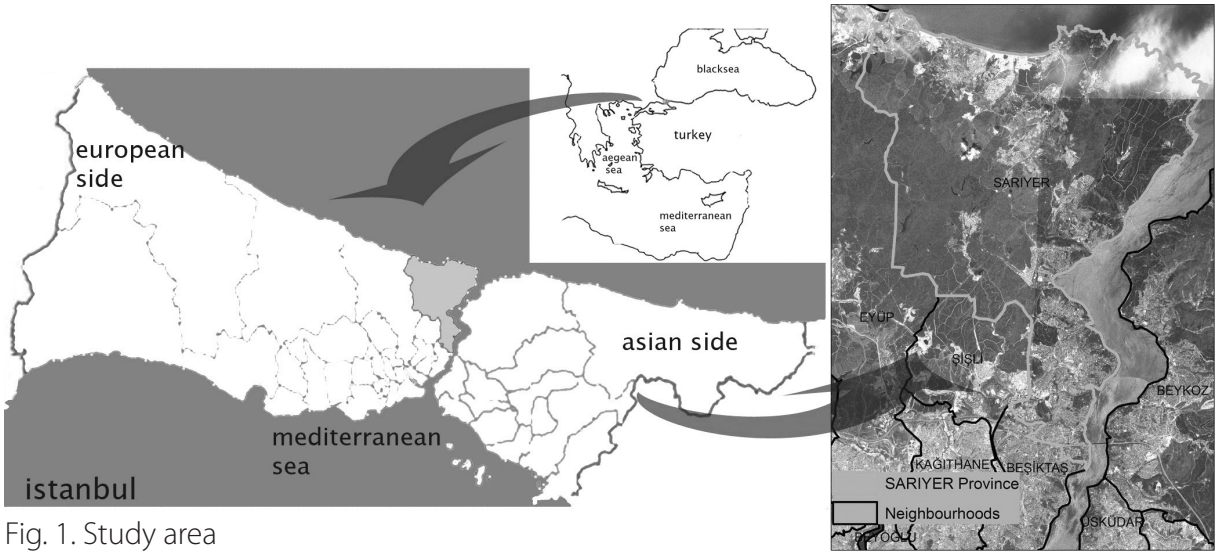

Fig. 1. Study area

Already rectified, pan sharpened and mosaiced Ikonos images (dated 2005) are used as primary research materials in the study. The boundary of the case study is adapted from the Istanbul Municipality District map. A 1/100000 scale Environmental Plan of Istanbul and its plan notes are obtained from the Istanbul Greater Municipality. Also, a 1/5000 scale master plan of Sariyer is used as ancillary data. A supervised classification method has been employed to acquire landuse maps. Information related to the roads and the coastal line is manually digitized from the satellite images. Major patch and corridor types are acquired by using landuse maps and the master plan. This step is supported by site surveys, and a final map of network elements is obtained (Fig. 2).

Primary patch categories include environmental patches, disturbance areas, introduced patches, agricultural lands and water surfaces. The corridors are categorized as major road corridors, forest road corridors, river corridors and environmental corridors. Characteristics of these potential elements are further illustrated through site scale analyses. The outcomes are presented in the form of micro scale sections and drawings (e.g. Fig. 3).

Results show that 82% of Sarıyer has the potential for establishing green infrastructure. Environmental patches (e.g. forests) cover the largest area in the study area followed by introduced patches, disturbance patches, agricultural lands and water surfaces. The most abundant corridor type is introduced road corridors followed by forest road corridors and environmental corridors. River corridors are very rare in the landscape mostly due to urban development on them. The findings also show that

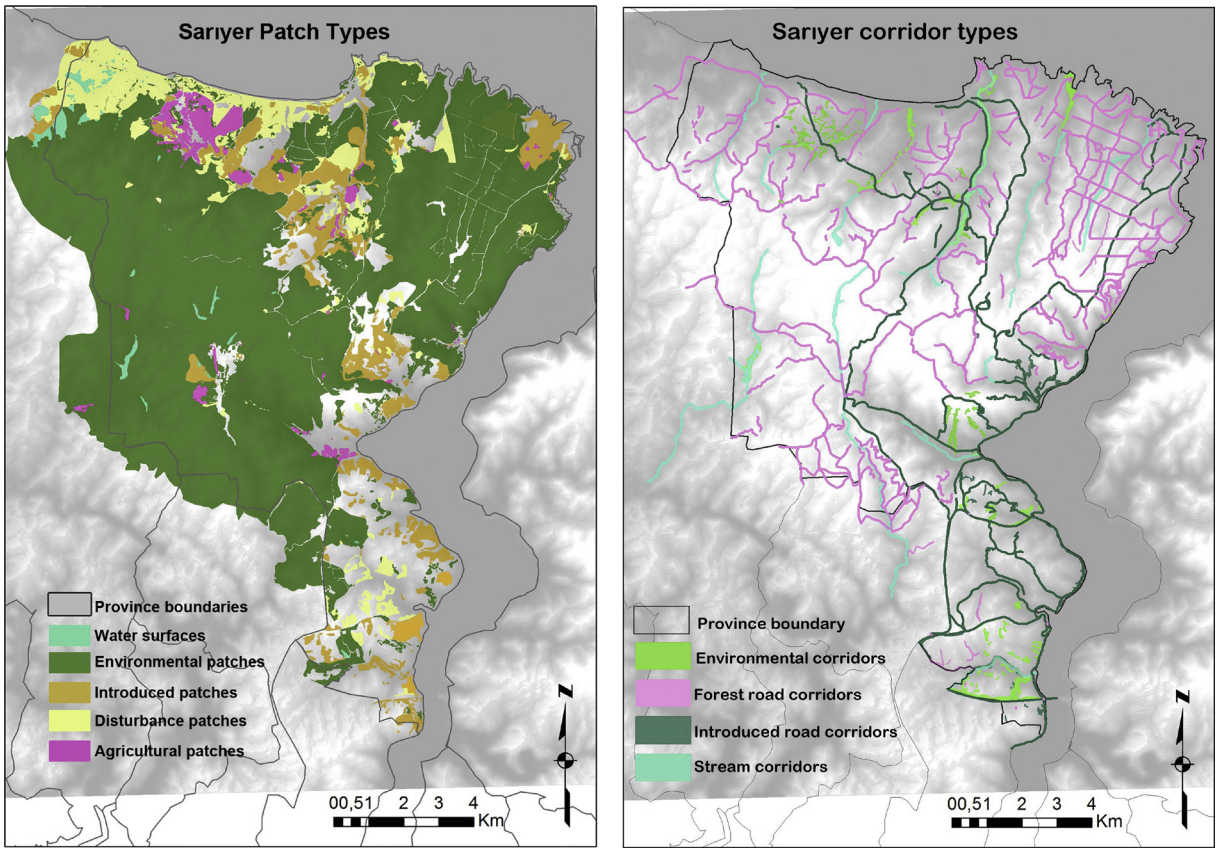

Fig. 2. Potential patches and corridors in Sariyer

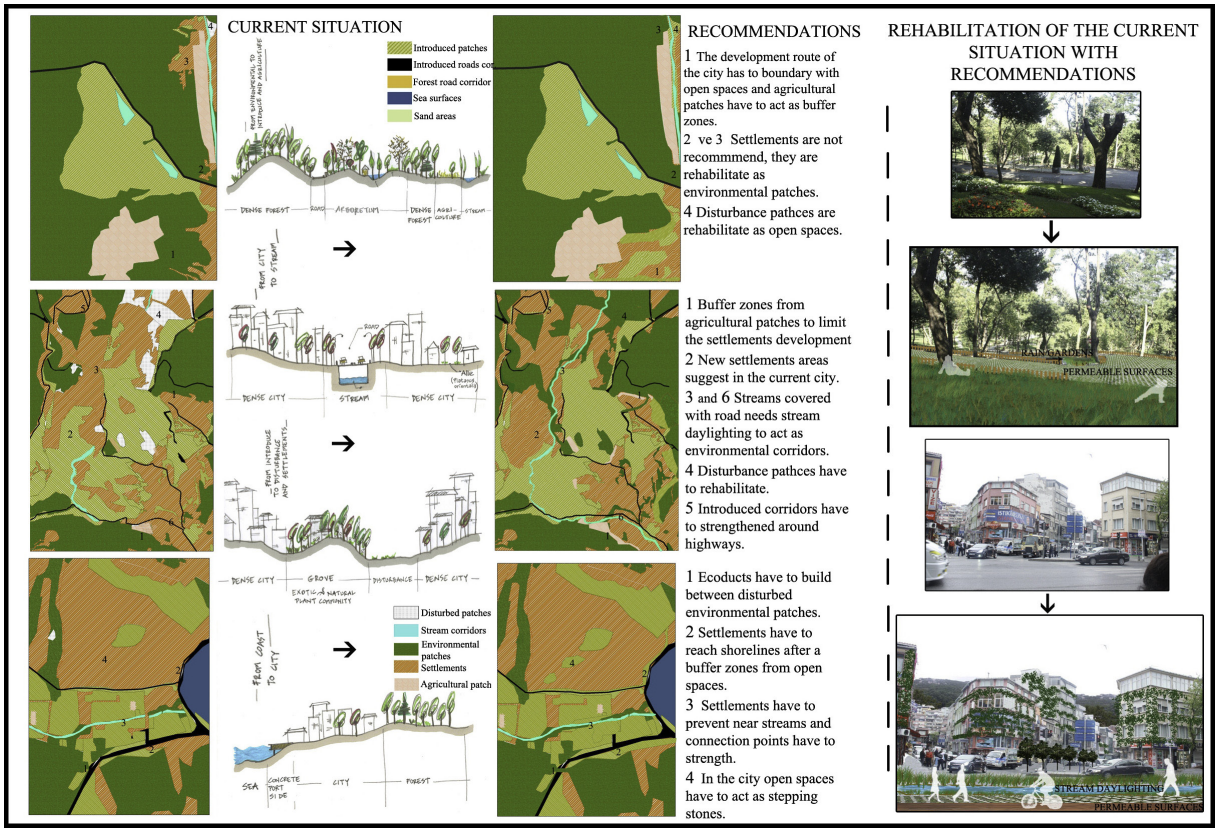

Fig. 3. Micro scale illustration of green infrastructure elements

forest patches, the most important elements of green infrastructure in Sariyer, are fragmented by suburban developments in which a considerable amount of introduced patches such as neighborhood parks are embedded. Social and economic aspects are as important as the physical dimensions, and hence recommendations are delivered to handle all aspects of green infrastructure development in Sariyer. The outcomes of the presented work can be beneficial to promote sustainable urbanism in Turkey and the other developing countries.

Revealing the Potential of Historical Groves in Istanbul

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With a history dating back to 660BC, Istanbul has always been a significant city, knitting together the cultures of East and West. This cultural synthesis has brought about landscape concepts driving an emergence of particular urban open spaces as in the case of historical groves of Istanbul. Originating in Byzantium times, groves have been the symbol for the"power of man capable of altering nature". Besides their evident historic and socio-cultural values, these urban green areas also have an ecological value. Hence, this study is focusing on their potentials to promote green infrastructure. However, Istanbul has experienced drastic spatial alterations within the last fifty years, including suppression of these green heritage sites. Besides the rapid urbanization, there are also some legal and administrative issues causing landscape fragmentation in the megacity.

The questions that guide this study are:

What does "grove" mean for Istanbul? What are the characteristics of historic groves and how can we classify them?

What are the factors and who are the actors affecting the management of these landscape features?

Considering the concept of green infrastructure, what is the potential of historic-groves in Istanbul?

What factors can contribute to the patterns of sustainable green infrastructure generation?

Seeking answers to these questions, this study utilizes GIS technology to analyze both the spatiotemporal changes in the region and the potentials of historic groves. Benefiting from the historicmaps and photographs, scholarly and government literature, this study attempts to gain a multilayered understanding of the pattern of historic groves. Regarding the importance of legal and administrative issues, this study reveals sustainable ways to benefit from the historic groves in Istanbul for the promotion of green infrastructure.

Today cities need to improve themselves to become sustainable in order to cope with the challenges of 21st century. With an emphasis on historic groves, this study is an attempt to highlight the importance of a green infrastructure concept for Istanbul megacity.

Planning the Green Infrastructure of Urban Sprawl – A Case Study of the Kumodraž Stream Watershed in Belgrade

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Urban sprawl is a global phenomenon that is gaining significance due to the impacts of urbanization. Although it is evident that the uncontrolled spreading of the cities carries many negative consequences, it is also obvious that this can be mitigated through directed development and a careful planning process. However, we are witnessing numerous cases that show that this process is followed by negative environmental changes, changes that may at first look insignificant, but could generate many negative consequences in the near future.

Available knowledge in the 21st century indicates that learning from the past is very important and that new urban development should be based on well-known principles, which include measures for climate change mitigation, protection of habitats and species, forming of ecological networks, just to name a few. However, in everyday practices of developing countries, theoretical knowledge and examples of good practices are often only declarative, with no manifested efforts towards their accomplishment during the development process, when the costs are lower and the chances for implementation are greater.

Examples can be found in urban fringes of many big Central and Eastern European cities, where the problem of urban sprawl is still not under control. In those cities, many of the areas that could become part of a necessary green infrastructure system, even if only through provisional exclusion from development, are irreversibly lost while a deeper analysis of their value and potential for green infrastructure has not been undertaken.. An example of taking advantage of such potential can be found at the Kumodraž stream watershed in Belgrade, which is one of few partially preserved small urban streams in the city. Different land uses, preservation of relatively large areas of undeveloped land between two types of built structures, and part of a free course of the Kumodraž stream, were the base for the assumption that habitats worth preservating can be expected to be found there. The information base was obtained through seasonal investigations, providing the possibility for mapping and assessment of urban biotopes. According to the results, it was concluded that in this area, although heavily degraded as a consequence of anthropogenic activities, valuable and even close to natural habitats still exist.

The aim of this paper is to present the results obtained through the mapping and assessment of small urban streams watershed biotopes. Those results provide argumentation for a different approach to urbanization. Special attention is given to the attempt to integrate those relatively preserved areas, in the urban fringes with the question of how they could be preserved and incorporated into the green infrastructure system in the future. In that way the focus on those areas could shift to their potential and value rather than regarding them as problems or obstacles for development.

New uses for old industrial places
(Three initiatives to implement critical restoration)

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Industrial colonies that developed along the Catalan rivers during the twentieth century embodied a particular way of life.

They were closed and self-sufficient societies and the people who lived and worked in them aspired to fulfil the dreams and dispositions of what we used to call in the Catalan language "l'amo", the master or the owner of the colony.

Over the years these communities opened to their surroundings and nearby settlements. However, with the oil crisis of the 70's many of these colonies lost their viability and the inhabitants looked for new opportunities in the nearest village or city, and consequently these industrial sites were abandoned. The state of the magnificent gardens that had displayed their owners' image and status declined, and the gardens were neglected and lost. With them a part of our history was fading into the past. What could we do to keep this legacy, what could we do to preserve and transmit this landscape heritage to future generations?

The philosophy of intervention is always the same in the various solutions proposed, but they are expressed in different ways. The search for the essence, which characterizes each garden and remains in the collective memory, should not be lost, yet it should be supported by new proposals for alternative uses in accordance with present times. For this reason, we have encompassed these interventions to preserve this unique heritage under the title: 'New uses for old industrial areas'.

We present restoration solutions for the gardens and architectural environment of the colonies: 'Rusiñol', 'Vilaseca' and 'El Pelut'. In each of the three cases we have projected the updating of these sites and their beautiful and vulnerable gardens in the twenty first century under the guidelines of 'critical restoration'. The success of this philosophy lies in the fact that it resolves the dilemmas of preserving or restoring and giving priority to the aesthetics or to historic values in times of economic and cultural crisis. Times in which we are obliged to seek synergies between all the people involved in the restoration: technicians and artists, current users and visitors, witnesses of their past and the new generations, the administration and private associations and more.

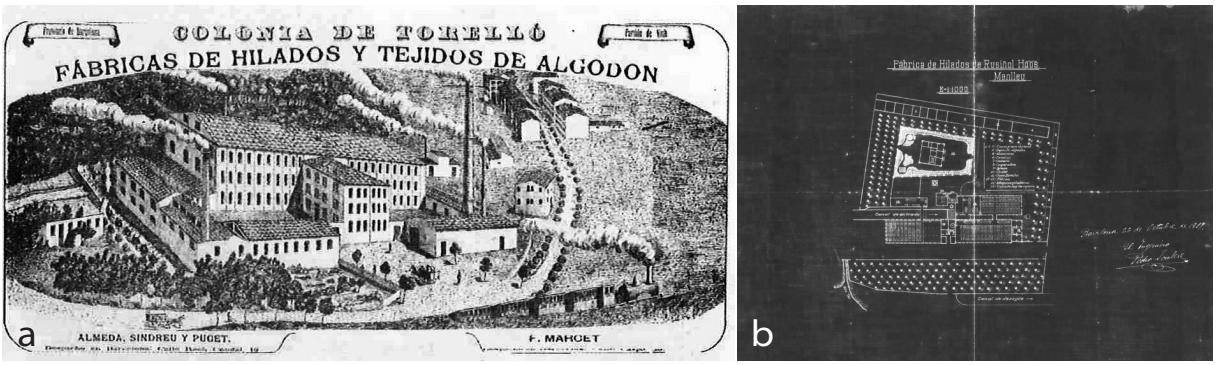

Fig. 1. a – 'Vilaseca' colony. 1883; b – 'Rusiñol' Colony. 1917.

The three gardens presented as examples of restoration maintain their genuine essence, which is the key in the process and therefore they not only maintain their historical value, but also gain in beauty and quality. The 'Rusiñol' colony, a property of the impressionist and landscape painter, has been transformed into a restaurant imitating scenes found in several paintings by this artist. 'Vilaseca' has been transformed into a residential area with its own cultural and social life in which the garden of the 'amos', the masters, the 'Almeda' family is linked to its building and it will remain as a particular space that can be visited. The colony 'El Pelut' maintains its industrial activity and its gardens, which have always been shared by managers and workers, at the will of its promoter, the industrialist Eduard Calvet and from now on it will maintain its collective features as a public garden.

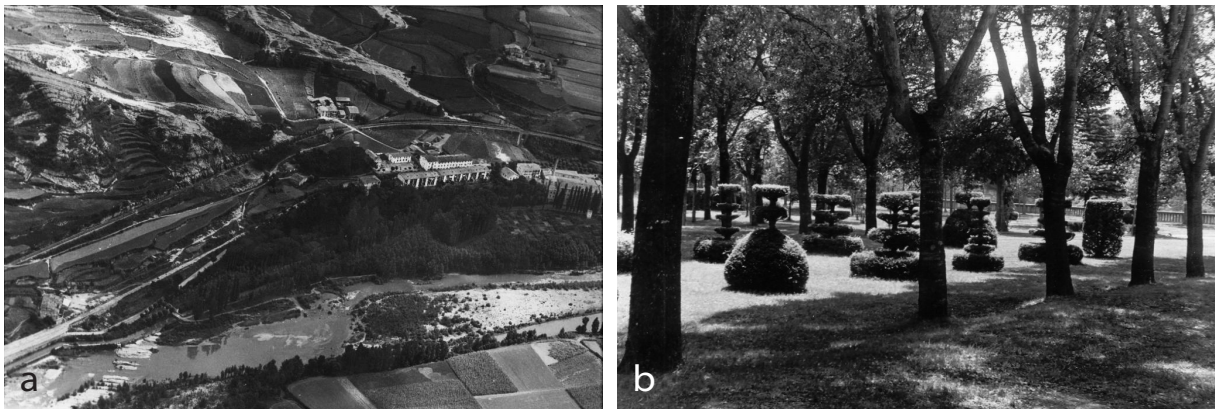

Fig. 2. a – 'Vilaseca' colony.1948; b – 'El Pelut' colony. 1980.

Fig. 3. a – proposed restoration, the house of the "l'amo". 'Rusiñol'
b – proposed restoration, garden of 'Vilaseca' colony.Proposed

Fig. 4. intervention "El Pelut"colony.

These interventions, still in progress, are possible with the help of a gardening school in the area dedicated to the training of new gardeners and landscapers, as well as local government entities such as municipalities and regional bodies and the initiative of individual people and the current owners. The proposals for action reflect the work of the landscape architects, historians, garden technicians, botanists and philosophers following in-depth historical investigation and research and applying Brandini's restoration ideas used in works of art that portrayed this green heritage of the late nineteenth and early twentieth centuries.

Grassland areas in Park Alexandria: Problems of regeneration.

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Park Alexandria is located in the northwest of the East-European (Russian) plain, within the area of the Baltic lowland. The park is located 35 km from St. Petersburg, on the southern coast of the Gulf of Finland. The relief of the territory represents a seaside-terraced plain. A bench of Litorinova terrace is below the area of the park; and at the foot of it, on the seasideland, there is a lower-terrace grassland section of the park. The observation ground for this area is near the palace "Cottage" – a monument of architecture forming a part of the State Museum – Culture Preserve "Peterhof".

At the time of commencement of construction of Park Alexandria in the 1820s, the seaside area represented woodland covering the whole of the lower terrace. It was a wetland to the east of the Lower Peterhof park, with features characteristic of similar territories of the North-West: grey alder forests and willow beds interleaved by spruce (*Picea abies*), birch (*Betula pendula*) and pine (*Pinus sylvestris*). To add broadleaf species in the area, the terrace was dried using a network of land reclamation trenches. After partial deforestation and planting trees along the routes from the upper terrace to the lower, beautiful views of the park that included the seascape were opened. The open meadow space of the area, picturesque groups of ornamental bushes and deciduous solitaires, formed the main spatial composition of the lower terrace.

The water area of the Gulf of Finland, having a meadow on the coast of 12.5 hectares, forms a part of the basin of the Baltic Sea. The territory of the meadow is overwetin some places, though in the 1980s a network of drainage channels was laid. The presence of expressed gley bed at the depth 15–20 cm and a great number of various Carex species indicates to some extent the first attributes of the swamping process. In connection with this, the grassland area will become an object of restoration work in the near future, undertaken in the territory of Park Alexandria from 2008.

Results of a soil study show that the soil on the land is grey humus-gley or sod-gley. In it the sod- and grey-humus bed is well developed, with further gleying process more at greater depth.. Originally the territory of the meadow was mixed forest, but in the last 200 years this place has been anthropogenically changed (deforestation, laying drainage channels, adding soil, sowing cereals and perennial herbs, etc.), therefore no traces of podzolization are in fact found in the soil; instead, the processes of gleying and turfing are expressed more at the present time.

Park Alexandria is located in the zone of taiga (boreal coniferous forest – southern sub-zone). This territory is typical of the low-lying south-taiga lakustrine-glacial landscape type with predominance of light sediments. In 2009 a 4th year student at the Faculty of Geography and Geoecology of St. Petersburg State University, Popova Ya.O. (scientific advisor: PhD in Geology, Assistant Professor Nekhuzhenko N.A.) conducted a geobotanic survey of the lower terrace of Park Alexandria, in which it was found that 89 trees and their undergrowth grow on the grassland area. Mostly these are oak (*Quercus robur*) and birch (*Betula alba*), the other species are represented by separate specimens: willow (*Salix acutifolia*), maple (*Acer platanoides*), lime tree (*Tilia cordata*), alder (*Alnus incana* and *Alnus glutinosa*), pine (*Pinus sylvestris*), bird-cherry tree (*Padus avium*), ash (*Fraxinus excelsior*). The core of the vegetation communities are permanent grasses and miscellaneous herbs. The most attractive plants having aesthetic qualities include, among others, *Dactylorhiza fuchsii* that belongs to the *Orchid* family. Widespread are such species as *Geum rivale, Scrophularia nodosa, Heracleum sibiricum.*

When conducting the restoration work, it is necessary to preserve the formed natural communities, emphasizing the beauty of meadow landscapes in the park's landscape.

Rijnenburg, an ecological framework for urban development

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In 2009 the Masterplan of Rijnenburg, a residential area for 7000 houses on 1000 hectares near the city of Utrecht in the Netherlands was developed. A design team of urban planners, landscape architects, building architects and traffic consultants drew up the plan in an interactive process with consultation of representatives of the residents and local authorities.

This plan is an example of a sustainable development that is based on key values of the surrounding and existing landscape. Landscape values form a basis for the structure of the urban planning.

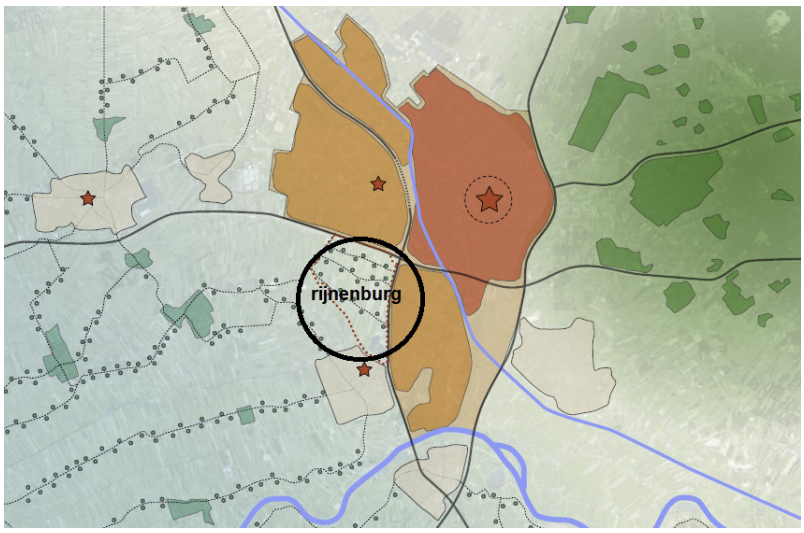

Fig. 1. Rijnenburg in the Utrecht region in the Netherlands

In a parallel planning process the starting points for climate adaptation were defined. In this process the ambition and goals for biodiversity, flood-prevention, water-retention, soil-conservation and development of cultural/historic values were decided.. This ambition was integrated in the plan.

After assessing the existing and potential ecological qualities a landscape framework was designed that functions as sustainable structure for key-stone habitats, recreation and experience of nature and landscape.

Making use of the results of several workshops in which stakeholders defined the qualities and the problems of the area, the design team drew up three scenarios based on various aspects of the landscape. The first related to the existing landscape parcelling of the peat polder landscape, the second followed the structure of the historical river bed and the third made a stronger connection to the public space and landscape of the city of Utrecht.

Fig. 2. Three scenarios for modelling the structure

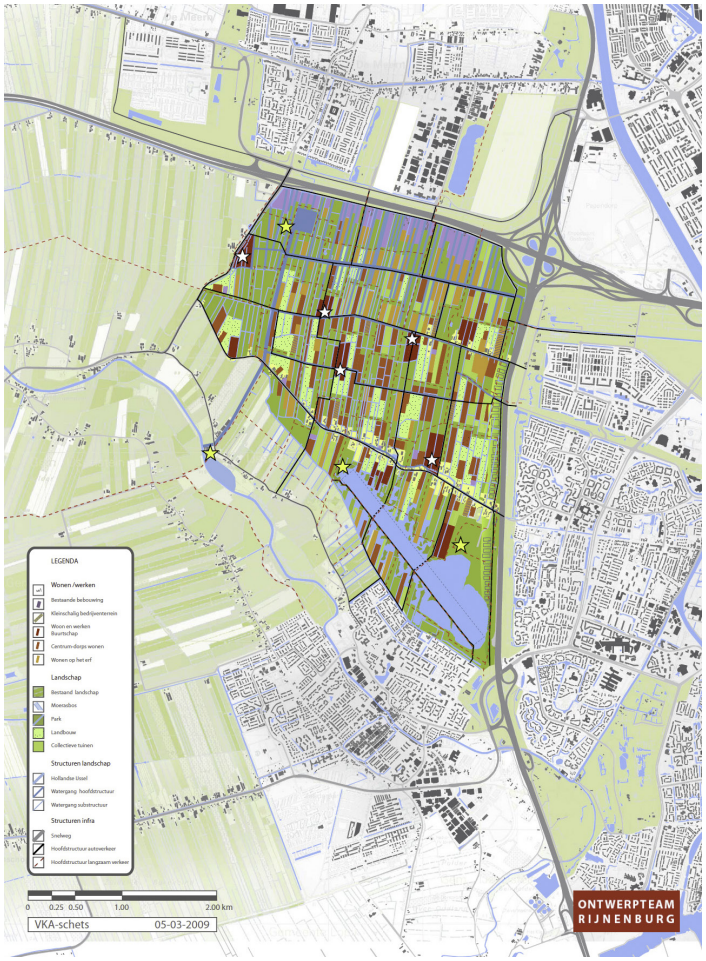

Fig. 3 Integrated model for Rijnenburg

The three scenarios were evaluated by stake holders, local authories and the design team. Criteria for assement were ecological quality, economic feasibility, sustainability, climate adaption, architectural quality of the residential areas and opportunities for slow development and cheap maintenance of outdoor spaces. By combining the strong points of each scenario an integralted-landscape and urban plan was drawn up.

The planning process, the qualities of the masterplan and the impact of decisions on landscape factors in relation to economic factors and land-ownership were evaluated.

Strong points of the project are:

• Involvement of stakeholders and local authorities in a structured process of contestation.

• Ensuring architectural quality by designing an ecological landscape framework;

• Including extensive management and maintenance of green areas by introducing urban agriculture.

• Combining recreational routes (waterways, foot- and cycling paths) with the landscape framework.

• Creating conditions for a strong social structure by the grouping of houses in different scales.

Comparing the landscape approach with more architectural or programmatic approaches for urban development, one can draw the following conclusions. The identity of the place is stengthened because it builds upon the existing qualities in the area. There are stronger and better functioning connections with the regional ecological and landscape infrastructure. Even if the development of housing takes place over a longer period of time, the spatial quality is already provided by the landscape framework. This framework adapts itself easily to changes of land use in the future.

Urban Forests and the Needs of Visitors. Case Study of the Park-Forest Košutnjak

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The park-forest Košutnjak covers an area of 330 hectares at an altitude of 250 m. Kosutnjak is a beautiful lookout point towards the center of Belgrade and a pleasant place to spend a day in a natural environment. This area has a special importance from the viewpoint of the improvement and protection of the environment because it is located in the urban core of the city. This paper deals with the study of urban forest, with a special emphasis on the importance of its use and the needs of its visitors.

For the purpose of this research, 100 visitors of park-forest Kosutnjak were approached during May and June 2010 using a questionnaire consisting of a combination of closed and open-ended survey questions.

The summary of the results shows that this area is used more by males than females. Most of them use this area for active recreation. Most of the male population use the area daily or several times a week, while the female population comes several times a month. The majority of the female population use this area for walking. The most common uses are for sport, walking and relaxing. Most respondents who use this area, come from the neighborhood, which indicates the need for a large number of such forests in the city. In terms of satisfaction with the management of this area most of them said that they are satisfied with the average score of the entire survey of 3.07.

This study represents a pilot study and contributes to better understanding of the relationship between visitors of the forest and the forest as a resource, the recreational value of forests, their protection and preservation. Results indicate that the knowledge about the behaviour, habits and the needs of visitors, is very valuable in the process of planning for management of the area.. In order to preserve these areas and to manage them properly, visitors and users must be actively involved, and their needs and benefits must be incorporated in planning, development and management. Most respondents expressed positive attitudes towards participation in management and furthermore in improvement of the existing state of the park-forest Košutnjak.

Changes in Green Infrastructure with Emphasis on the Size and Condition of Urban Trees in Six Cities in the Midwestern Region of the United States of America

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This study is one of the first to consider both public and private trees in an urban forest in the United States of America. The size and health conditions of urban forest trees are determined by many factors ranging from the genetics of the individual trees to environmental factors and anthropogenic issues. Tree size was measured by dbh (diameter at breast height, which is measured at a height of 1.4 meters in the United States) and tree health conditions were calculated by a point system. As time goes on, the trees size distribution in a 50-year-old urban forest begins to resemble the size distribution found in a natural forest. Tree health was assessed by identifying signs of decline or hazards on the crown, trunk, branches, base and roots. Then, the decline signs were counted and a value was assigned based on that number of decline signs. Our data indicates that there is a general tendency for the smallest trees to have the best health condition. This was evident in all six Midwest, USA cities in this study (Bowling Green, Bucyrus, Delaware, and Wooster, OH; Lincoln, NE and Hutchinson, MN) in 1980 and 2003/2005. This was also true for trees on both public and private land. The general health condition of the urban trees is generally better than trees found in natural forest. This is because of periodic maintenance and removal of hazardous or dead trees. When considering the relationship between the size of the trees and overall tree health conditions, there are perceptions that, as trees get larger, they become hazards because their health conditions worsen. Therefore, with our research, we can state with certainty, that there is a strong negative correlation between the size of urban trees and the health condition of urban trees, conditions decrease or worsen as size increases. This may simply be, not surprising, that as the trees age there are more chances of damage or pests, or it may be something more enigmatic.

Bademlidere; a story from a capital

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Bademlidere is a natural area and its surface is about 80 hectares. It is located on the southwest of Ankara and surrounded by urban areas between Mamak and Çankaya counties that are among the most crowded counties of the capital. Bademlidere is the extension of Imrahor Valley. Imrahor Valley is part of an important valley system of Central Anatolia that starts from Salt Lake and continues up to Mogan and Eymir Lakes. The valley system that is comprised of large forest areas, steps, brushwood, reed beds, agricultural areas, riparian areas, rocky areas, lakes and settlement areas, holds very rich flora and fauna. Waterfowls and migratory birds especially use this area. Some parts are under protection with the legal status of "Natural Protected Area" and "Specially Protected Area". Imrahor valley provides fresh air and drinking water to Ankara. Additionally the Valley serves as the flood control mechanism, maintains city health and provides recreation areas to Ankara city.

Ankara was first planned for 400.000 habitants in the 1920s, but today the population has increased up to 4.7 million. Therefore the natural areas that are placed at the boundary of this metropolis are under the pressure and threat of urbanism.

Bademlidere is an example of this situation. It is located where the city and Imrahor Valley meet. Dense housing structure compresses Bademlidere and this haphazard structure results in shack houses in Boztepe quarter and Mamak region. The projected construction plan for this region where most of the habitants are children and young people is socially weak. The foreseen plans can neither solve the housing pressure nor can enable social benefits.

We try to answer the following questions within the coverage of Bademlidere region that is the last valley of Ankara city where native flora was gradually protected and landscape fragmentation did not occur:

- What is the relation between Imrahor valley and the other important valleys of Ankara?
- What is the potential of Bademlidere region within the green infrastructure of Ankara?
- Where are the required linkages and hubs that would enable Bademlidere to provide green infrastructure services?
- Which services does Bademlidere provide to the inhabitants?
- How would Bademlidere contribute to the social structure of the city if it were to be transformed into an urban park?

Bademlidere is located in an ecological and social crisis area. It will transform uncontrollably and lose its unique values unless it is linked to the other natural areas.

Socially and ecologically Bademlidere has a critical role. In order to perform its role it requires situating the area within a holistically designed ecological network. In this regard, the study aims to constitute a public perspective basis for the area.

Green infrastructure: a park-house as a part of the architectural environment

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The rapid degradation of city territories recently occurring in the largest Russian cities with a total disappearance of open spaces has inevitably led to pressure on city ecology since priorities have been set on transportation systems, and industrial and engineering projects. There is, however, a need for new ecological-friendly design parameters for both natural and functional city environments.

The search for such moves is impossible without the analysis of existing problems in the field of the interaction of architectural projects with their natural environment and their level of inclusion of nature as components of new constructions that would promote realization of the concept of the cost-effective use of resources and ecodevelopment.

New green technologies:

1. Joint consideration of a city engineering project and its nearest landscape environment in terms of the cost-effective use of resources (detention and gathering of rain water, creation of favorable conditions for the development of flora and fauna, economy of heat, waterproofing preservation, reduction of the cost of electric power, social advantages with a view of a recreation etc.)

2. Mutual integration of the environment with industrial sites where there are positive ecological resources (aimed at selection of an assortment of green plantings giving priority to the local flora).

3. Uses of components of nature as horizontal and vertical elements of city engineering projects. The former approach to the organization of architectural spaces in the majority of domestic cities has not always been focused on inclusion of nature as a component of new constructions and did not promote realization of the concept of the cost-effective use of resources. In this respect, use of new "green" technologies should promote reduced pressure on the ecology.

On these sites “nature”, instead of "inert" materials, works to construct a united natural-architectural space by altering traditional, "lifeless" to "live" components and becomes an additional resource in improving ecological qualities of new structures that can be categorized under three types:

1. Green architectural space on a roof of transportation elements
2. Green architectural space on a roof of a former viaduct and
3. Green architectural space: building a park instead of an industrial development.

Poster

abstracts

In English

Ecological Corridors: Sustainability and Interaction of Human-River Ecosystems, Bartin River Case in Turkey

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Defined as natural watercourses, rivers and river networks are important natural corridors in the landscape with a greater role in the hydraulic cycle, surface run of and groundwater recharge. They provide connectivity for species across different ecosystems.

Bartin River Basin is one of 25 river basins in Turkey with an area of 2059.35 km^2 including Bartin, Kanlirmak and Gokirmak Rivers. The main problems in the basin are discharge of urban solid and liquid waste to the river, seasonal floods and erosion, which often become disturbing for the settlements along Bartin River. On the other hand extension of Bartin city towards the edge of the river, construction of a highway, building industrial sites next to the river are unfortunate developments that would degrade the ecological structure of the Bartin River. There are factories, agricultural fields and different plants that affect the connectivity of river corridor.

In this paper the fragmentation of river ecosystems and possible solutions to re-establish and strengthen connectivity of the ecological corridor will be analyzed in the case of Bartin River in Turkey. Satellite images, actual land use plans will be used and further fieldwork will be carried out. Strategies for sustainability and restoration of Bartin River will be developed. Study outcomes will support protection and sustainable use of the Bartin River corridor providing ecological connectivity along different parts and can be a useful guide for the establishment of macroform in the urban development of Bartin city.

Establishing regulations for urban forest areas within a city's administrative limits

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The natural elements that a city has inherited from its original location are limited resources that contribute to the specificity of both the image and the activities that influence its economic profile.

Urban forests are areas that were once outside the city and that due to urban expansion typical of the nineteenth century have been invaded by built development.

Due to the low price of land in these areas outside the city or in those included in the urban periphery, they became an easy target for real estate-investors who could buy them without financial effort, usually promoting big areas of residential developments.

Under the slogan of a healthy way of life, near the forest and with easy access to urban services, using these excuses related to the high quality of life in a natural green area, many residential neighborhoods in Romanian cities were built.

This is not an isolated case that can be linked to a specific culture concerning the usage of a space by a community.

There are frequent cases of cities that are included in urban natural areas of forest, hills, mountains, forested river banks, which require special rules for intervention concerning conservation and evolution in order to enrich the potential of the place by making use of everyday urban activities.

An urban forest-city relationship requires good accessibility, establishing areas of impact between the two distinct types of existence, crossovers, use and conservation of natural environment, also achieving a user-friendly environment by meeting safety and ecological rules.

Awareness of the necessity to respect nature conservation while integrating these areas in activities related to urban life of a city, induces increased awareness of the rigor with which the limits and scale of interventions are set.

Cities like Nara, Japan; Innsbruc, Austria (Alpenzoo area); Bucharest, Romania (Baneasa forest); Calarasi town with meadow and forestry banks on the Borcea arm of the Danube River; the situation of a mountain town as Piatra-Neamt, Romania, are some cases that may reveal types of organization of urban spaces with opportunities and potential risks in the relationship of city – urban forest.

The article aims to highlight the potential for development and use of urban forests as a key requirement in the efficient and ecological development of the cities that benefit from these natural resources.

The Mobile Landscape through a Cultural Paradigm

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Modern world desire for mobility constitutes a departure from the traditional perspective, the traditional way of seeing and experiencing the world and shifting to a focus on an abstract world of motion (Jackson, 1957). The road which supports mobility is the first vector for discovering territory and landscape in-depth since the aesthetic of a road consists of its surroundings, ditches, trees, buildings and open and closed areas. This paper tries to explore the road landscape as a cultural landscape using the development of research on visual perception directed at the road landscape view as the criteria for the evaluation of the landscape: rarity, diversity, integrity, stability, visual quality. Adapting a series of concepts and ideas from the preamble and objectives of the European Landscape Convention (Florence, 2000), synthesizing the new perspective, the roads landscape (roadscape) is a shared space, the result of the historical interaction between the initial physical environment, biological exploitation and human intervention. Hence, as a cultural landscape, the landscape of the roads expresses the interaction between natural and anthropic.

In the study carried out, the question of the meanings emerging from reading the landscape were the outcome of an investigation of the processes that give origin to form, structure and use. Roads, for example, are testimony to the main periods of cultural uses, illustrating reclamation work, agricultural and structural development, and the emergence of architecture. All these represent other useful signs to indicate human activities in the landscape based on the physical condition of the visuals, the occupation and the concentration of the activities and how the spaces are used by humans. Reading the roads' landscape is performed through visual elements of the roads. These include panoramic points of the singular elements, views of landscape disturbance and irregularity, the components of natural and anthropic systems and the reciprocal interrelation between all these, which is the processes in action.

In the Romanian landscape of towns, villages and productive land, the road landscape aesthetic complexity is sometimes compromised.

Thus the scope of this paper includes suggestions for improving the road surroundings and the scenic value of the overall territory. The following criteria to determin compatible uses/activities are highlighted: suitability, compatibility, sustainability and last but not least, vulnerability.

Landscape research with application to land-use planning of building zones: A case study for Skolkovo, Moscow region

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With the expansion of rural and urban settlements, planning development and aesthetics become priority goals of landscape planning. Sustainable planning of development depends on urban management. Comprehensive landscape and socio-economic research will prove practicality and feasibility of a project. We regard The Skolkovo innovation center as an example of appropriate landscape research application.

The Skolkovo innovation center is to be built at Skolkovo in Odintsovo district. The researched area is a Moscow suburb, 1.4 km to the west of MKAD. The area is a main source of atmospheric and noise pollution and suffers natural landscape degradation.

As the site is intended to be a highly modern complex created to encourage scientifically-technological based companies, new "residents" need a more sophisticated environment that is based on principles of environmental friendliness, energy efficiency, ergonomics and economy.

As a result of ecological survey and mapping, a set of thematic maps was compiled: a map of nature conservation, a 3D model of the relief, a map of surface slope and surface runoff, a vegetation map, tree-planting scheme and landscape map of the area. The last also shows landscape reclamation.

At the same time we carried out laboratory and field surveys of water and soil samples to detect pollutants, find out the general sanitary condition, the bacteriological and parasitological state, as well as a radiological evaluation.

Thus, we reason that: 1. high density of trees and low disturbance of soil cover provide high landscape self-cleaning potential and protect the area from degradation impact. In general, the environmental condition of the researched area should be considered as good. However, there are local natural and anthropogenic factors undermining the prospects of land use;

2. significant surface slope (from 2–3 up to 15–20º) facilitates the erosion processes. In such cases we recommend planting shrub and tree species, strengthening the slopes, as well as constructing a drainage system;

3. the drainage system should include a channel gathering land runoff from a vast area, surface water sewers in the ravine and gully, drain wells in the bottom of the ravine, talus fan and gully with water discharge into the river system and storm sewers;

4. high threshold pollution of the upper soil layer with pathogens involves removing and replacing the soil layer (30–50 cm). Withdrawn soil should be moved off-site;

5. planting of greenery involves:

• conservation of native vegetation in the coastal zone and water-conservation forest;

• cutting, treatment, sanitation pruning of plants;

• planting trees and shrubs in the areas of slopes, place of active erosion processes and decorative species according to the concept of landscape improvement.

Ecological corridor from forest to Bosphorus; sustaining the gokturk forest nursery in Istanbul

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Istanbul, a multi-cultural metropolis, still exists as the witness of four crucial empires. With its geopolitical position, the city connects Europe to Asia both physically and ecologically. Since cities are not static objects, they grow fast; pressing the rural, pushing the borders day by day and eliminating the green structure of the city. As Istanbul has been going through rapid change and development for the past decades, it is important to re-use the reserve areas that are a part of green infrastructure. Due to the increased population growth and the spread of settlements into the interior of forests in the north of Istanbul, the border lands become an important opportunity to establish the relationship between rural/urban and to meet the needs of people in terms of recreational requirements. However nowadays, districts are suffering from unhealthy construction caused by concrete urbanization and non-ecological situations.

The city has five ecological corridors that extend in the north-south direction. To maintain the quality of life in Istanbul, these ecological corridors should be taken seri-

ously in order to sustain green infrastructure. One of the main ecological corridors of Istanbul is in the direction of Gokturk which connects the Northern Forest to Golden Horn by Alibeykoy Dam. The area is located between the forests and Bosphorus, which makes the area an important middle point to link these green and blue natural environments. Gokturk Forest Nursery is a post nursery area absorbed by new urbanization form due to the expansion of the settlement to the Northern Forest of Istanbul. In 1969, it was founded to meet the needs of forest trees and ornamental plants; nevertheless it has been in a transformation phase recently. Sustaining its green function will contribute to Istanbul's green infrastructure and also create recreational opportunities for the residents.

In this respect, Gokturk Forest Nursery should be approached in a sustainable landscape planning / design process by considering its physical, ecological, social and economic potentials, and the relations with the urban /green structure must be recontextualized. Therefore, this natural landscape will define the future form of green infrastructure in the city. This study discusses the potential of Gokturk Forest Nursery and nearby, in the context of sustaining the ecological corridor between the north and the south of Istanbul. In this context, the chronological transitions of Gokturk, and the present challenge of revitalization are evaluated with the legal and political processes. New design approaches that will initiate the sustainability of green areas and preserve the ecological structure are considered by observing the analysis of hydrology, flora, environmental problems and land degradation. In addition, the current situation and likely developments will be identified using the SWOT analysis and the necessary studies in order to form healthy city continuity will be identified.

Counterpart Cities: "Symphony of Blades" A Story of the Sedimentation in Deep Bay between Hong Kong and Shenzhen

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The process of sedimentation is a unique force that singularly shapes the delicate balance of ecologies in the Deep Bay. Although sedimentation occurs naturally, the process has accelerated in recent years due to activities such as rapid urbanization, land reclamation, and other infrastructural projects such as the straightening of the Shenzhen River. Increase in sediment in the Deep Bay reduces its capacity to mediate storm water and increases the risk of flooding in adjacent areas. It also nurtures excessive growth of mangroves around the fringes of the coastline and blocks flood runoff to the sea. If the sedimentation process continues without mitigation, the productive economies and critical urban areas in Hong Kong and Shenzhen would be threatened by increased flooding.

As part of the initiatives with the Counterpart Cities Exhibition hosted at the Hong Kong \ Shenzhen Bi-city Biennale 2011–2012, "Symphony of Blades" is a visionary project that aims to stir insights of what designers could do to ease the issue.

In this project, we propose to redirect sedimentation in the bay, by influencing the direction of water current as well as sedimentation patterns. Using principles of hydrodynamics, the project simultaneously limits excessive sediment accumulation

in the Bay, while harvesting sediment to create a new local lifestyle economy. It also aims to induce mangrove growth at strategic locations to protect against future storm surges.

Symphony of Blades brings life to infrastructure; proposing industry, education and lifestyle programming amidst a sequence of sediment-manipulating blades at the mouth of the Deep Bay. The coupling of infrastructure and other urban functions fosters a greater awareness about environmental processes. While the blades harvest excess sediment in the Deep Bay, programs such as a sediment-brick factory, energy plant, a fertilizer plant and a facial mud mask factory, make use of the extra resource of sediment in the Deep Bay to serve various industrial activities which benefit the local community and economy, complimenting the vision of a "sediment-relevant" infrastructural experience.

This project was led by Wingsze Vincci Mak (abstract author for this submission) as the Design Team Leader. Two other designers in the team are Casey Wang and Manfred Yuen. This project was also assisted by the design assistants: Violette Yi-Ping Chen, Dennis Kam-Fung Lui, Kevin Chun-Kit So, Tracy Xiao-Qian Yang, and Chris Qian Zhang, at the University of Hong Kong.

For more information on this project as well as the overall Counterpart Cities initiative, please see link at: www.counterpartcities.org

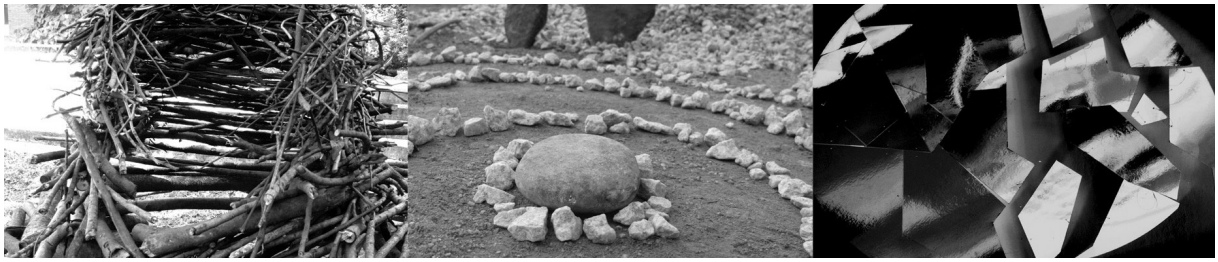

Fig. 1. Selected Project Image

Sports park "Varyag" – a combination of sports objects and a botanical garden

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Sports park "Varyag" is located in the center of Bryansk, in a ravine. The total area of the park is 20 hectares, of which 8 hectares are dedicated to sports development , and 12 hectares are part of a botanical garden. The main purpose of the park is its function all-the-year-round. The Park can be seen as a complex of open and covered sport facilities. There are also green areas and special zones of passive rest. This part plays a very important place in city life since many visitors can enjoy nature next to their home. This also reduces pressure on suburban forests.

At the moment "Varyag" is able to provide the following kinds of winter sport activities:

- the skating rink with artificial ice (for ice hockey, figure skating and skating);
- 4 educational mountain-skiing slopes with bow lifts, snowpark and a skiing lodge – sports section for mountain skiing and snowboarding;
- 5 km of a ski line and ski racing base – sports section for skiing. In the summer

this part is used for pedestrian walks and cycling. In this area it is planned to organise educational ecological tracks for pedestrian walks-excursions. The goal of this green corridor is to keep a green zone in the center of Bryansk, and to offer a unique vacation spot for citizens and visitors of Bryansk.

The specified sports buildings have a capacity for five hundred people.

There are also facilities under construction for example:

1) the house of sports (8 halls), 2) climbing gym, 3) rope small town.

The presence of two artificial reservoirs in the park give an opportunity for organising a sun deck and a beach.

The main design principle of the whole park is the preservation of the unique natural ravine and its reinfocment of special decorative elements.

The botanical garden will become a special place for the preservation of biodiversity and enrichment of urban flora. It will be an important educational and scientific centre as well. Thus, creation of the unique park combining functions of a sports park and a botanical garden, would significantly reinforce the green infrastructure of Brynsk.

The concept of recreational green spaces in the context of the Plan for Urban Densification of the Brussels-Capital Region

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In 2011, on request of the Brussels-Capital Region's Government, Town Planning Department of COOPARCH-RU, a Brussels based multidisciplinary consulting firm, developed a "Plan for Urban Densification". This Plan is one of the core elements of the new Sustainable Regional Development Plan (PRDD) that defines a territorial vision for the next 30 years.

The need to implement the "Plan for Urban Densification" arose in a context of strong annual population growth. This 10% growth rate and the desire to deal with this new challenge at a regional scale led the public administration to think about specific planning strategies.

A fundamental aim in developing the plan was to preserve a comfortable, high-quality urban environment. Green urban spaces play a fundamental role in shaping this environment.

How to combine high built density and quality urban environment?

With an urban population of about 1 million, Brussels is one of the greenest cities in Europe, each inhabitant having an average of 30m^2 of green area. These green areas occupy a total of 4000 hectares, a quarter of the region's surface, most of which are 19–20th century landscape parks such as Woluwe and Bois de la Cambre.

As seen in the pedestrian accessibility plan, green recreational areas (plan is attached) are not even in size and are not all equally well connected to the urban fabric. Often parks or green spaces are defined as strategic clusters for buildings located in areas with poor accessibility, or that lack green recreational areas. In these areas,

a mandatory element in the concept of the project is the implementation of green, open to the public urban spaces. An example is the design of the Tours and Taxi multifunctional complex which includes a park by landscape architect Michel Desvignes.

In some cases, when new parks are not possible, it is proposed to create landscaped "linear connections" from the central areas of the city to the parks on the periphery or outside the Region. For example, in the Anderlecht District Development Plan (designed by COOPARCH-RU), these linear connections link the central areas with Neerpede a park of regional significance through a patchwork of smaller green elements.

In some cases, the Plan for Urban Densification recommends a compact construction type: multi-storey buildings in a small area (a "spot" development), and implementation of an adjacent city park.

The importance of this approach emphasizes the figures: the average built density in the Region of 1,7 (the ratio between the total number of built square meters and the total area of the Region, with the exception of public space). In the Plan for Urban Densification, this factor becomes the minimum ratio new constructions must follow, or under some conditions it is increased to 2,1. In this case, it is especially important to accompany the "spot" developments.

With the rapid urban and population growth, public green spaces play an important role in the Region to maintain a comfortable urban environment at a very local level (see the attached plan). The plan shows that these spaces are distributed very unevenly.

With a high density of 2,0, "green" residential neighborhoods, with a characteristic of individual buildings and generous private gardens, have little or no public "green" zones.

In these neighborhoods, specific programs are much recommended, allowing the mobilisation existing resources and efficient use.

For example, Brussels-Mobility is developing a program that aims to create open-air parking lots, with 220 hectares on the territory of the Region, suggesting a revision of the number of parking spaces and the rational use of the available space.

Decayed production facilities and badly dimensioned economic activity buildings are also part of the reflection brought up by the Plan, and also a resource for the integration of urban green spaces in existing dense urban fabric, as for example, a park in the Schaerbeek district.

In the context of urban densification of the Region, the frame proposed by the Plan has contributed not only to preserve and maintain, but also to improve comfort and quality of the urban environment of the Brussels –Capital Region.

Green infrastructure potential in the spatial structure of the cities of Warsaw, Hamburg and Madrid: A comparison

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The role of ther green infrastructure concept in urban management has increased, but the potential to implement the idea in different cities vary.

The aim of the research is to find out how three surveyed cities differ in terms of their potential for green infrastructure development.

Three cities similar in area and population, but located in different climate regions in Europe where chosen to be analyzed: Warsaw, located in a moderate-continental climate; Hamburg, located in a moderate-maritime climate and Madrid, located in a Mediterranean climate.

The cities were analyzed from the following points of view:

Total area covered by vegetation, as a potential green infrastructure;

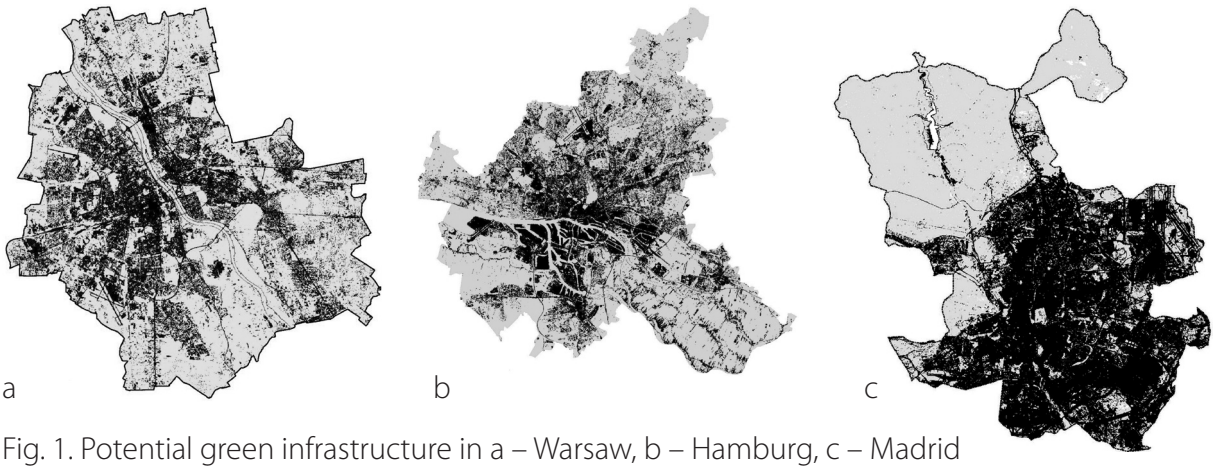
The structure of areas covered by vegetation in order to identify main elements of which green infrastructure is built;

Spatial distribution of main green infrastructure elements;

Location of main green infrastructure elements in relation to natural conditions.

To perform analysis at a city scale Landsat imagery was used. To reach the goal supervised classification and GIS tools were chosen.

The research shows what the green infrastructure elements are built of, what are the main functions of green infrastructure elements and what are the conditions that influence green infrastructure the most.



a b c

Fig. 1. Potential green infrastructure in a – Warsaw, b – Hamburg, c – Madrid

Globalization trends in green areas of Romanian cities

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This paper aims to present a comprehensive overview of the globalization trends in the Romanian cityscapes and to propose a series of guidelines for sustainable future management processes and plans. In order to provide a relevant perspective of the Romanian urban landscapes, a three-scale approach will be undertaken. The study sites are represented by: a large scale city – Bucharest, which is the capital city and the largest financial, cultural and industrial centre of Romania, a middle-sized city – Sibiu, which was appointed European Capital of Culture in 2007, and a small town – Ramnicu-Valcea, located in a highly touristic mountain area.

As culture has become increasingly placeless, more scholars advocate for the careful management of distinctiveness and diversity in the urban arena, instead of the replication of similarity or uniformity of global domination. Capability Brown, Picturesque, Victorian Gardenesque and 'Wild gardens' are landscape architecture styles that have acknowledged large-scale replication in New Zealand, Australia, North Western USA, Argentina and in the European continent. Devoid of their original significance and complexity in expression and usage, these design styles have been similarly assimilated in the Romanian cityscapes, engendering the creation of homogeneous landscapes.

The regeneration of downtowns with the appearance of high-rise office buildings and giant advertisement billboards, the increase in urban sprawl and infrastructure that supports car dependency, the rapid development of large shopping centers, all these elements valued in a consumer society are mirrored in the Romanian cities' fabric. The usage of plant material in urban public and private green areas (parks, gardens, flower beds, street plantings) and the high popularity of kitsch elements (such as gnomes, topiary art) are analyzed in how they fit into determining Romanian cultural identity. As cultural tourism seeks to highlight the differences between regions and countries, and not the homogeneity in landscapes, there is an increased need for enhancing the identity of these places.

The overarching aim of this study is to produce comprehensive research material for academia, the local administration, decision makers, developers, practitioners and citizens. The study generates a conclusion that the benefits of creating diverse resilient cityscapes significantly outweigh those of replicating similar global practices. Hence, it is anticipated that this paper will provide several persuasive factors for the development of sustainable urban landscapes that could possibly serve the Romanian national and local authorities.

Brief Analysis of the Research on Chinese Traditional Green Gardening Methods

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The Chinese traditional garden is one of the features of Chinese architectural art. At present, China has gradually converted the word "garden" to one that describes

Chinese traditional gardening, and most Chinese modern scenery gardens will be described as "landscape". "Garden" refers to simulation of natural scenery in an environment constructed by humans and it has a wide application in China, from the planting of potted plants to the setting of pool water and rockery. The focus of the Chinese traditional garden lies in the craftiness of landscaping, simulation of green landscape in nature and a perfect match of artistic elements, in order to achieve the ideal condition and humanistic spirit with harmony between humanity and nature.

The Chinese traditional gardens are mainly divided into the royal gardens, private gardens, temple gardens, mausoleum gardens, public gardens, and these traditional gardening methods are unique.

This paper is focused on the green gardening methods of the Chinese traditional gardens: 1. group landscape gardening 2. suiting measures to local conditions 3. gardening in line with specific conditions 4. making the finishing point 5. Makeup Feng and cultivate Mai (geomancy). Chinese traditional gardening art is the integrity of architecture, calligraphy, Chinese traditional painting, sculpture, gardening, philosophy, religion, mythology, astrology and other arts, and it is a model of Chinese aesthetics. The gardening reflects the Chinese people's deep philosophical speculation and the pursuit of a natural life. The paper presents research on and summarizes the type and style of the Chinese traditional gardens and green gardening methods. The study of these issues has important reference value for the world's modern landscape design.

Lednice – Valtice cultural landscape: UNESCO heritage site management by local lenses

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The Lednice – Valtice historic cultural landscape is a unique representation of a designed landscape type. The area is situated within a territory defined by the Czech-Austrian state boundary in the south – eastern corner of the Czech Republic. This unique territory was listed as a UNESCO World Cultural Heritage in 1996 as a ferme ornée type of landscape. A substantial factor in forming the face of the designed landscape was the almost 700 year-long influence of the major owner of the land – the princely family of the Liechtensteins. The Lednice-Valtice area is valued especially for its unique artistic interpretation of the landscape. The influence of fine arts, architecture, and landscape design was at its best during those periods.

The preserved remains of the designed landscape spaces currently represent the significant cultural heritage of the country and form a part of the nation's cultural identity. The value of such landscapes does not lie only in the relatively high concentration of structural and landscape architectural features as it is often misinterpreted. Extremely valuable are also the preserved spatial connections of the compositional features as well as all the subsidiary characteristics of the original spatial compositions (such as avenues, visual links, follies, park-like areas). Landscapes, unlike structures or gardens, tend to change their character according to the ever-changing social and economical situation, which is a fact that complicates the protection and restoration

of the mentioned spatial connections. The use of traditional "conservation" methods, as applied by heritage protection bodies, poses many problems for the future development of the relatively large areas in question.

Despite the effort to preserve the typical features of the landscape, it was not possible to prevent certain changes in the character of the landscape, which are related to the common socio-economic changes of the current time. The bodies of the state heritage conservation and environment protection must therefore make a strategic decision: what shall be protected and how should it be done? While the protection of architectural heritage is provided at a high level within the traditional and conservative heritage protection agenda, the conservation of designed landscapes and compositions is still in the process of development. Common conflicts of interest between the heritage care and nature protection administration bodies, their inability to cross-communicate and inferential dissension in the decision-making process are relatively new, and are a daily problem in heritage area management.

The author draws the conclusions contained in the article from her practical experience with planning and assessment of new developments intended in various designed landscapes in the Bohemia and Moravia regions of the Czech Republic.

Continuity of a landscape gardening heritage at the turn of the XIX–XX centuries in modern conditions of the Volga region

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In the central area on the right bank of the Volga economic region there was a stable time in a landscape gardening heritage during the turn of the XIX–XX-th centuries – the period of the modernist style period in Russia.

We have conducted research on the continuity of technologies and elements of landscape architecture of the period of the "Silver age" for modern green building. Results of the study are shown in table 1.

Table 1.

Continuity of technologies and elements of a landscape gardening heritage of Russia and the Volga region at the turn of the XIX–XXth centuries for modern green buildings

№	The name of basic elements, technologies, structures etc., applied in Russia in «Silver age»	Use of elements, technologies, etc. in the period. Boundary XIX–XX. In the Volga region	Presence of successive communications now in Volga region economic region
1.	Rolled lawns	no	>
2.	Green hedges from:	yes	yes
	Cotoneaster lucidos	yes	^
	Caragana arborescens	yes	It is not enough
3.	The Alpine hills and stone gardens	yes	^
4.	Cultivation of bulbous plants	few	>

5.	Wood and shrubby plantings in containers	yes	<
6.	Carpet and figured flower beds	yes	no
7.	Vertical gardening:	yes	yes
	Terraces and inputs	yes	^
	Arbours	yes	^
	Benches	yes	<
8.	"Flower" garden	yes	no
9.	Kochia scoparia in flower beds	yes	^
10.	Round beds with a fountain	yes	no
11.	Fragrant beds and border bed	yes	few
12.	Flower curtains	yes	^
13.	Cannes as dominant in figured flower beds	yes	<
14.	"Vertical" volume flower beds	yes	no
15.	One-pedigree curtains of bushes	yes	few
16.	"Colour" avenues	yes	no
17.	"Economic" gardens	yes	<
18.	"Romantic" places	yes	^
19.	"Soft" contrasts	yes	<
20.	Emblems in a lay-out	yes	no
21.	Personal symbols (the trees planted by the owner and in honour of it, beds, ponds, etc.)	yes	<
22.	Athletic fields in a lay-out	no	>
23.	Winter garden	few	>
24.	Arboretum	yes	^
25.	Topiary forms from bushes	few	>
26.	Rejuvenescence and inoculation of trees	yes	^
	> – continuity of the Russian technologies now		
	< – partial continuity of Russian technologies of the period of the end XIX–the beginnings of the XXth centuries and technologies and elements of the Volga region		
	^ – full of continuity as Russian technologies of the period of the end XIX–the beginnings of the XXth centuries, and technologies and elements of the Volga region		

Hence, it is established that a number of technologies and elements are successfully applied now in the investigated region. However a part that is lost, is an art-romantic link relating to public green spaces of the recreational environment.

Features of a cultural landscape of Tatishchevsky area (Saratov region, Russia)

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Cultural landscape is a historical equilibrium where natural and cultural components create a unified whole. The special landscape cultural phenomena of the Tatishchevsky area remaining are the manors of noble families, cult places, archaeological complexes and preserved historic rural landscapes. The cores in this area are garden-architectural complexes in Polchaninovka village (the former owner was A.N.Minh – famous figure in the tsar's court) with an area of 8,2 hectares, in Gubarevka village (the owner – nobleman A.A.Shahmatov, the area of 19,7 hectares) and in Bolshaya Ivanovka village (the owner – S.P.Korbutovsky, the area a complex of 5,6 hectares). Each of these manors had certain German roots, because either its owner or the gardener was of German origin. During 18th and 19th centuries all these estates had quite close economic and cultural connections. Preservation of such landscape heritage is important as a part of keeping the identity of this particular region of Russia.

The main point of our scientific concept is to create a natural-historic park, which includes all nearby historic sites (the mansions' park and park complexes), as part of a compact approach. The organization of such parks will allow saving the most valuable historical and cultural heritage of this region. In these natural-historic parks the protection and restoration of all historic and cultural monuments as well as natural or traditional rural landscape, would be carried out. As in the case of small settlements reconstruction, in the revival process of the historic manors, the garden and park complex approach and individual design of each facility infrastructure should be applied.

In one of the important steps of natural-historic park reconstruction, we studied and analyzed the arboreal park's composition (Fig. 1) for old trees (century trees).

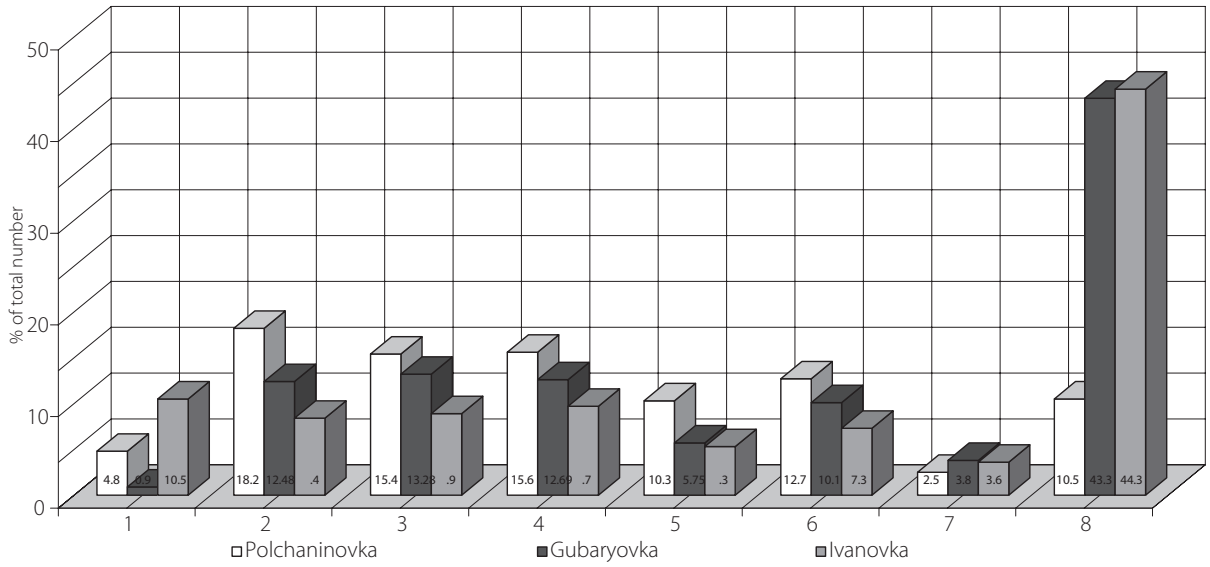

Fig. 1. 1 – *Pinus sylvestris*; 2 – *Quercus robur* L.; 3 – *Tilia cordata*; 4 – *Acer platanoides*; 5 – *Betula verrucosa*; 6 – *Malus domestica*; 7 – *Syringa vulgaris* L; 8 – Other trees and shrubs

We concluded that typical broadleaved trees such as *Quercus robur* L. and *Tilia cordata*, were dominant with an accent of coniferous native evergreen *Pínus sylvestris* (table 1)

Table 1.

№ п/п	The name of the basic, historic species of trees	Historic park and garden complexes														
		Village Polchaninovka park and garden complexes of Minh					Village Gubaryovka. Shakhmatov's park and garden complexes					B.Ivanovka's village park and garden complexes Korbutovsky				
		Tree height, m	Diameter of a tree trunk, cm	Age, year	Bjonitet	Quantity, pieces	Tree height, m	Diameter of a tree trunk, cm	Age, year	Bjonitet	Quantity, pieces	Tree height, m	Diameter of a tree trunk, cm	Age, year	Bjonitet	Quantity, pieces
	Pínus sylvéstris	20,9+23	60+100	150+250	III	10	20,9+23	31,7+50,2	150+220	III – IV	4	20,9+25	31,7+50,2	130+220	III – IV	40
	Tília cordáta	16+21,7	52+60	130+220	IV	43	18,2+20,1	52+60	130+220	IV	22	16+18	55+65	130+220	IV	38
	Quercus robur L.	23,0+26,8	30+85	120+220	III	56	18,0+22,4	30+80	130+220	IV	40	16+20,8	32,8+80	130+200	III – IV	60

"Green Infrastructure in Mind" New roles for Design Education in Landscape Architecture

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Infrastructure systems and their basic elements have occupied vast parts of our urban environments and regional landscapes. These ubiquitous structures have been considered merely on technical measures and mostly exclude social, aesthetical, ecological functions and the way which embraced "environmental tacit knowledge" as silent cultural heritage. Rethinking of such mono-functional realm of infrastructure towards a friendlier public environment is a prominent trend to recognize infrastructure's new roles as a part of the inhabited settlement.

In the landscape architectural approach to green infrastructure, we need a comprehensive and basic framework for development of academic and practical activities. Employing landscape ecology, landscape urbanism and green infrastructure thinking has been a positive response to the current need of human beings for sustainable development.

This paper, firstly addresses the potential contribution of environmental tacit knowledge and landscape analysis in Iranian cultural landscape, to help alleviate part

of those issues. The second item draws from the first and is, the role of "Green Infrastructure in Mind" in the education and practice of landscape architecture. The key questions are:

What is the setting of green infrastructures in the cultural landscape in Iran?

How "Environmental tacit knowledge" and "Green Infrastructures in Mind" can influence the way we educate, for design and the processes of green infrastructure through new case studies?

Accordingly, the paper focuses on the concept of "environmental tacit knowledge" and introduces case studies that are exemplars of the "green infrastructure" in mind through field studies in arid climates, in general, and landscape design course works at the Department of Landscape Architecture in Shahid Beheshti University (SBU), in particular. The recommendations are based on teaching/workshop/curriculum experience and an approach to education of ecological landscape architecture in SBU as the first MLA program in Iran.

Challenges of cultural heritage conservation: case study for estates' parks in European Russia

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It was not until the destruction of country estates that society began to pay attention to parks and heritage. According to the regional lists of heritage and protected areas, about 3,000 of former manor parks are registered. But more have been forgotten, those located away from the tourist routes.

This paper is the result of field surveys and data given by regional authorities. The research enables us to speak about different degrees of parks preservation (Fig. 1): 1) intact – a country estate, including rural settlement, agricultural land, adjacent areas that have undergone almost no destruction; 2) satisfactory degree – a) park and buildings are pretty much unchanged, and b) partly preserved manor, park and adjacent areas; 3) low degree – traces of planning layout or rare trees species evident, surrounding rural area is considerably transformed; 4) lost manor park – no material evidences, only historical data is available.

The majority of the parks are preserved in a satisfactory state (49%) – Torbeevo (Smolensk region), Omoforovo (Vladimir region), Nickolo-Zhupan, Dvoryaninovo (Tula region) etc. (Fig. 1). Authentic parks are 25,5% (Alexandrovskoye, Velichevo (Smolensk region), Alekseevskoe (Ivanovo region) etc.

A park is one of the most complicated objects of heritage conservation. First of all, old parks have accumulated considerable cognitive, cultural and historical knowledge, and so they improve our understanding of nature, culture of

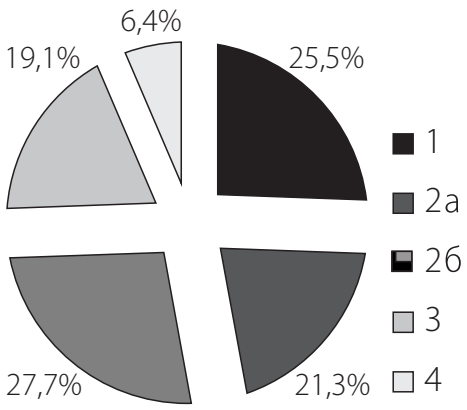

Fig. 1. Degrees of state of preservation of parks (for European Russia)

native land and express aesthetic and moral values. A number of manor parks are associated with the names of people who played a prominent role in history and culture: Yasnaya Polyana, Kobylinka (Tula region), Spasskoye-Lutovinovo (Orel region), Krasny Rog and Ovstug (Bryansk region), Karabikha (Yaroslav region), Maryino (Kursk region), etc.

Secondly, vegetation and water bodies begin to recover naturally in the absence of green management. This leads to cultural landscape degradation and the loss of its paysage, which has been developed under the architect's idea (Fig. 2–5).

Lastly, the unsteady legal status and financing problems give no possibility to develop conservation policy, protection measures and land use, and that positions heritage management on a low level.

Due to the unique vegetation communities and plant species many old parks are recognized as botanical monuments of nature, and thus, are protected areas – Aleksino, Vonlyarovo, Vysokoye, Herchikee, Lipetsy, Ray, Prechistoye, Priyutino and others (all in the Smolensk region). However, most parks are monuments of landscape architecture, and the buildings are protected as historical monuments. Evidently, components of the estate are managed by different ministries.

Fig. 2. The estate of Bezobrazovs'. View from the church on the Klyazma (Patakino, Kameshkov district, Vladimir region)

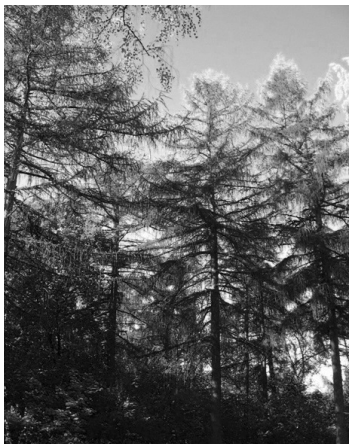

Fig. 3. Larches in park. Iskra, Korocha district, Belgorod region

Fig. 4. In the park. Alekseykovo, Lesnoy district, Tver region

Fig. 5. In the immediate neighbourhood of Trekhbratskoye, Dubrovka district, Bryansk region

According to federal authorities, the absolutely necessary investment in estate restoration (including parks) is 85 billion dollars. In the governmental program "Culture of Russia" (from 2006 to 2011), the federal budget provided insufficient funding. Thus, the restoration of Nechaevo-Maltsevo estate (Polibino, Lipetsk region) requires 25 million rubles, but the federal budget allocated only 4 million and 890 thousand rubles. Meanwhile a favourable solution to the problem is attraction of business in heritage management. Thus, the NP "Russian estate" is working on reconstruction of Znamenskoye-Rayek in conjunction with the new owner (Tver region, group of companies "KONKOR"), Akhlebinino (Kaluga region), Bogdanovo-Vitovo (Kostroma region, the insurance company "MAX"), Batyevo (Ivanovo region, business owner A. Smirnov), Varvarino (Vladimir region); and estate Steblevo (Moscow Region) is reconstructed for a private residence by lineal descendants of latest owners (Egorov's).

The study has shown several tendencies that are in favour of park management: 1) work on the inventory of parks; 2) more active involvement of business and individuals in the protection of park heritage, and 3) clear definition of legal status.

Boulevards as binding structural component of urban green framework

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Modern economic, ecological and social conditions determined new conceptual attitudes towards development of urban green plantations system.

Summarizing and analyzing theoretical materials and the experience connected with projecting urban green plantation system allows determining their structure in the form of stretched housing estates combined by green linear spaces in a unified system. The boulevards designed in accordance with the requirements to modern landscape objects can become their considerable part.

Boulevards were the earliest traditional urban green space areas. Artificial landscape elements could exert influence upon their arrangement system.

Thus, the boulevards were planned along the fortress wall ring in the process of reconstructing old towns and demolishing fortifications. That is why modern boulevards are of radial structure. In cases, when the boulevards were conjugated with "lineal" urban spaces, they accompanied the city's central axis. As a rule, they crossed its historical part and were constructed in the places of canals, rivers, gullies, ditches, etc. Also, they were arranged on the embankments or led to the embankments.

In the course of time a peculiar planning type of boulevards has been formed. It consisted of two parts: transit (as a rule, it was the main alley designed for moving quickly around) and a walking part (a system of attended alleys and areas providing a possibility of quiet rest). Large width of boulevards enabled to isolate the recreational areas from transit pedestrian traffic).

The plantings presented by tree rows and decorative beds of bushes prevailed at ancient boulevards.

Modern role of boulevards is not unequivocal. Partially preserved boulevards, especially those located along the street axes do not protect pavements and buildings

from dust, motor vehicle exhaust and noise. Besides, the boulevard plantings are deteriorated in the changed conditions and it is not possible to state the fact that they fulfill their necessary functions.

Modern boulevards have lost their historical proportions. They represent rather narrow and often fragmentary linear structures with one axis in the form of an alley, sometimes divided into two or three pedestrian traffic lanes or without any rectilinear axes at all. Such a structure does not meet the pedestrian safety requirements at existing intensive vehicle traffic as the passage from pavements to a boulevard is inconvenient, thus making the vehicle traffic complicated itself.

Complicated problems of modern cities, namely growing traffic intensity, high construction tempos, compacted site development are solved at the expense of green areas resulted in loosing the existing boulevard system.

The modern city development concept foresees a necessity of forming a unified green system, the so-called urban "green framework". Lineal basis of such a framework can be the boulevards arranged along the embankments of rivers, canals and ponds, thoroughfare plantations, streets and pedestrian zones connected in the common network.

Similar developed network of green pedestrian and transport connections penetrating inside urban territories will allow unifying urban landscape objects into an acting system, as well as providing its connections with a suburban forest park zone.

It is utterly actual to revive the role of boulevards as active pedestrian zones in the system of urban landscape objects in order to create increased comfort conditions at key transit districts. Development of multi-leveled boulevard system isolated from traffic streams will provide a possibility to arrange pedestrian communications of various types — walking, business, traveling, etc. It will also create the necessary prerequisites for forming boulevard structures of more complicated order including centers and objects of various purposes parallel with plantations.

A morphological environment for modeling ecological parameters of town infrastructure

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The conception of steady development of towns has a great influence on the town planning process. The town as the natural product of civilization can be considered and analyzed aiming at determining a further way for development of relationships that exist between society and nature. The elements of the town are divided according to the characteristic "natural environment-artificial environment" in modern models of town systems. They are presented in the form of: natural, caused by technological activity of people framework (skeleton structure) of the town, and town material.

Nowadays engineering and transport town infrastructures are actively developed. These artificial systems have a great influence on the formation of continuous ecological infrastructure. The greatest problem to the town is transport infrastructure, as it dismembers ecological infrastructure on the fragmented– "islands of nature" in the town. The challenges and opportunities, for the ecologization (ecological process) of

the town, depend to a great extent on the town planners. Their task is to separate natural frameworks of the town and human technological activity frameworks in such a way, so they will not conflict at the same level. Formation of a continuous natural framework for the whole town will only be possible by the resolving the given task.

At the same time it is necessary to know and have the possibility to predict not only technical characteristics of transport infrastructure, but also its ecological parameters. The morphological environment that forms the main approaches to the creation of the research algorithm of the ecological situation on street crossing, and forms a mathematical model, is used to resolve of this issue. Together with this, a new class of models of traffic flows is used. It is based on the microscope approach – cellular automatic devices. The program, that is recorded in the software MATLAB, makes it possible to present the interaction of the automobiles in town traffic flow. The use of a random number generator for the appearance of a new automatic device is the main peculiarity of the program's functioning. That is why, after multiple modeling of traffic on the chosen area of road, it is possible, to determine a statistic picture of the loading of its particular areas. An ecological scheme can be formed knowing the peculiarities of these influences on the environment, that is, an equivalent level of heat generation and an equivalent level of gas pollution (fig. 1–3) for the specific crossing.

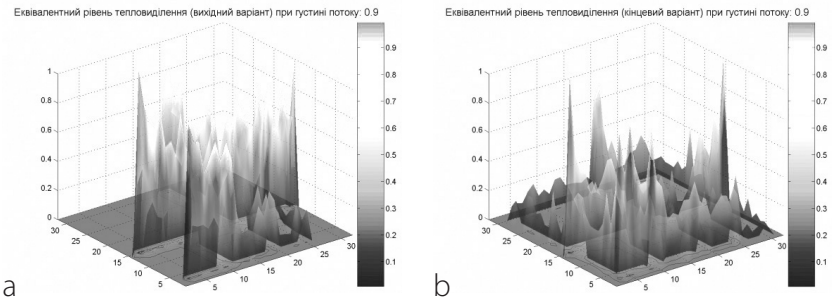

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Fig. 1. Equivalent level of the heat generation of automobile engines on crossings:
a) before the improvement of the traffic scheme;
b) after introduction of the change.

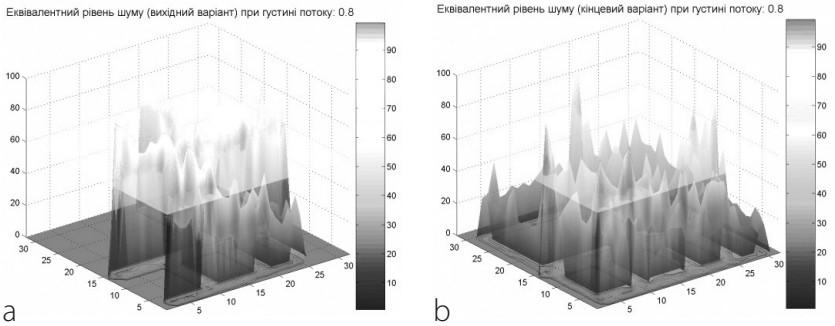

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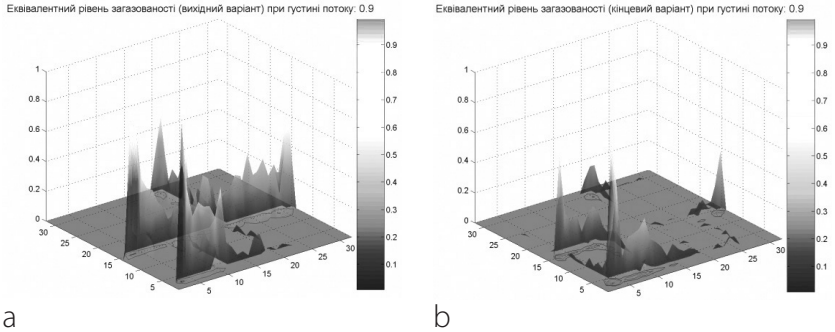
Fig. 2. Equivalent level of noise on the crossings:
a) before the improvement of the traffic scheme;
b) after the introduction of the change.



a b

Fig. 3. Equivalent level of the gas pollution on the crossings:
a) before the improvement of the traffic scheme;
b) after the introduction of the change.

It is possible to gain a satisfactory level of the ecological state in the particular areas of town by changing the character of transport infrastructure (traffic intensity, additional circuits, characteristics of transport vehicles).

The use of the morphological environment for the modeling of ecological parameters of the transport infrastructure of the town, allows a quick and efficient way of resolvingtown-planning problems at the stage of projection.

Тезисы

на русском

Зеленая инфраструктура исторического центра Санкт-Петербурга: настоящее и будущее

Лариса Канунникова

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Санкт-Петербург, «Северная Венеция», — это уникальный город с исторической, культурной и природной точек зрения. Город был построен в сложных климатических условиях (заболоченные земли, ежегодные наводнения, и северное расположение — 60 параллель северной широты)… Исторический центр и архитектурные ансамбли включены в список Всемирного наследия ЮНЕСКО в 1991 году. В центральной части Санкт-Петербурга расположены 700 архитектурных памятников 18 и 19 столетия и исторических парков, находящихся под охраной государства. Большое количество исторических памятников делает стратегию их охраны в условиях рыночной экономики особенно сложной.

В целях совершенствования нормативных и правовых механизмов государственного регулирования сфере ландшафтной организации, благоустройства городской среды и контроля деятельности по сохранению архитектурно-исторического облика города, взаимодействия органов государственной власти в Санкт-Петербурге ведется работа по разработке архитектурно-художественных регламентов, правил и иной нормативной документации.

В основу нормативно-правовых документов такого рода положен комплексный подход к регулированию вопросов сохранения архитектурно-художественного облика, современной организации и благоустройства городских территорий.

В 2010 году разработан регламент Невского проспекта. Данный регламент направлен на регулирование вопросов комплексной архитектурно-ландшафтной организации среды, включая колористику фасадов, внешнее благоустройство, цветочное оформление, малые архитектурные формы, с учетом градостроительного значения Невского проспекта как основной магистрали Санкт-Петербурга, а также одного из основных элементов системы зеленых насаждений и ландшафтного сценария города.

Основными целями регламента являются:

- сохранение историко-культурного наследия;
- совершенствование качества городской среды;
- экологическое оздоровление среды, устойчивое развитие территории;
- сохранение и развитие системы зеленых насаждений;
- формирование целостной системы городского ландшафта исторического центра.

Регламент утвержден распоряжением Комитета по градостроительству и архитектуре от 28.05.2010 №1759 «Об утверждении Архитектурно-художественного регламента Невского проспекта и прилегающих территорий».

Для современной России одной из самых актуальных проблем является распространение опыта европейских стран и эффективное развитие ландшафтного дизайна, в том числе в историческом центре Санкт-Петербурга.

В докладе обсуждаются главные стратегические моменты архитектурно-ландшафтного сценария, используя примеры из различных исторических районов города.

Оценка состояния и перспективы озеленения крупных городов Поволжья

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Зеленые насаждения — обязательный и значимый элемент городского ландшафта, обеспечивающий комфортность и качество среды обитания человека, а также стабилизатор экологического равновесия.

Проведенный анализ состояния озеленения крупных городов Поволжья (Самара, Тольятти, Волгоград, Саратов) показал, что площади зеленых насаждений в большинстве случаев не соответствуют нормативным требованиям: в мегаполисах озелененные пространства должны занимать не менее 50% территории (включая загородные леса), а в жилых районах – не менее 25%.

В Самаре только 10% населения проживают на территориях, имеющих достаточное озеленение, 84,5% — с обеспеченностью 45% и менее нормы озеленения (табл. 1). С 2006 по 2010 гг. уничтожено 73,2 га зеленых насаждений при переводе городских земель в другие категории.

Таблица 1.

Нормативная и реальная обеспеченность зелеными насаждениями по административным районам г. Самары

Районы	Существующее озеленение		Необходимая площадь (по нормативу 10 м^2/чел)	Дефицит озеленения		Население, тыс. чел
	га	м^2/чел	га	га	м^2/чел	
Куйбышевский	20.1	2.5	80.4	60.3	7.5	80.4
Самарский	7.9	2.5	30.5	22.6	7.5	30.5
Ленинский	48.0	7.5	63.8	15.8	2.5	63.8
Октябрьский	114.9	10.4	110.1	0	-	110.1
Железнодорожный	15.0	1.5	103.6	88.6	8.5	103.6
Советский	35.1	2	178.4	143.3	8	178.4
Промышленный	124.4	4.5	268.7	144.3	5.5	268.7
Кировский	65.1	3	231.1	166	7	231.1
Красноглинский	37.5	4	84.3	46.8	6	84.3
Всего по городу	468.0	4	1150.0	682.9	6	1150.9

*Источник: генплан развития Самары

Площадь зелёных насаждений общего пользования в Тольятти в пределах жилой территории — 755 га, что составляет всего 42 % от норматива.

Современное состояние зеленых территорий г. Волгоград следует также признать неблагоприятным. По административным районам города наблюдается неравномерность распределения зеленых массивов (табл. 2).

Таблица 2.

Обеспеченность зелеными насаждениями общего пользования по административным районам города Волгограда

№ п/п	Наименование района	Фактическая обеспеченность, м²/чел	Площадь озелененных территорий общего пользования, га
1.	Центральный	27.9	370.0
2.	Ворошиловский	4.9	54.4
3.	Советский	4.0	76.0
4.	Дзержинский	6.0	200.1
5.	Тракторозаводской	7.8	110.42
6.	Краноктябрьский	11.4	172.5
7.	Кировский	12.2	113.5
8.	Красноармейский	12.2	195.9
	Всего по городу:	10.8	1292.82

В настоящее время в городе насчитывается 12389 га зеленых насаждений. Площадь зеленых насаждений на одного жителя города — менее 10,0 м². Здесь также идет планомерное уничтожение зеленых насаждений в зонах уплотненной застройки.

Для г. Саратов характерна очень плотная застройка, особенно в центре города. По данным 2009 г. на каждого жителя Саратова приходится всего 3,5 м² зеленых насаждений.

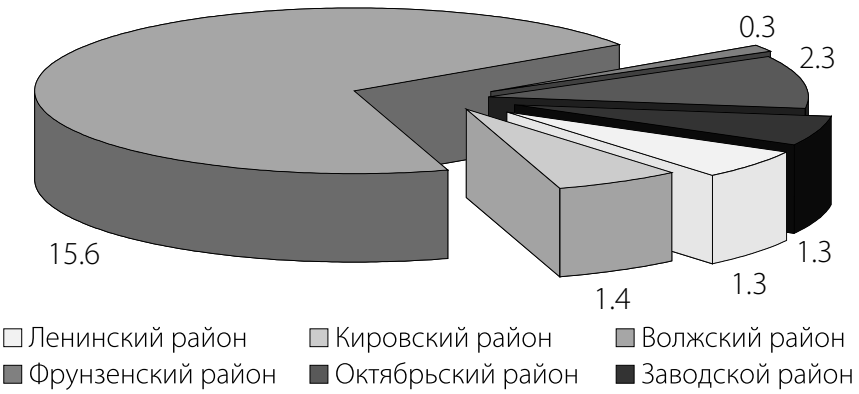

Рис. 1. Обеспеченность зелеными насаждениями общего пользования по административным районам города Саратова (м²)

Таким образом, для всех городов Поволжья прослеживается тенденция к сокращению площади озелененных территорий в результате уплотнения застройки. Одним из направлений увеличения площадей зеленых насаждений является активное освоение территорий с расчлененными формами рельефа, не пригодными под застройку. По данным Земельного фонда РФ площадь оврагов в городах Саратовской области составляет 1,1 тыс. га; Волгоградской области — 1,7 тыс. га; Самарской области — 0,2 тыс. га.

Создаваемые насаждения должны одновременно обладать высокими санитарно-защитными и эстетическими свойствами, что невозможно без расширения ассортимента используемых деревьев и кустарников.

Использование принципов экодизайна (Low Impact Design) для создания устойчивой и интерактивной среды в черте города (Новое Девяткино)

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Территория Нового Девяткино, расположенного в пригороде Санкт-Петербурга, активно застраивается: нагрузка на малочисленные зеленые зоны с каждым годом возрастает. Традиционный подход к дизайну городской среды, пропагандируемый в России последние 15 лет, соответствует идеям глобализации и кардинально меняет облик территории. Такой подход, как правило, не учитывает характер местных растительных сообществ и способствует созданию биологически неустойчивых экосистем, внедрению агрессивных заносных растений и уменьшению природного биоразнообразия. В результате ухудшается состояние почв, грунтовых вод, нарушается и без того хрупкое экологическое равновесие городских и природных ландшафтов.

Данный проект основан на использовании концептуально нового для российского городского ландшафтного дизайна принципа Low Impact Design — щадящего воздействия на окружающие экосистемы. Данный подход уже достаточно давно применяется во многих городах Европы, США, Австралии и Новой Зеландии, а в свете постоянно ухудшающейся экологической ситуации, становится все более и более популярным.

Ключевым моментом такого дизайна является создание среды с использованием естественных для данного региона типов сообществ растений, возможность использования принципа сукцессии, а также модулирование естественного стока воды с поверхности земли и ее инфильтрации в грунт. Проект позволяет справиться с ливневым стоком без создания сети традиционных дренажных систем, которые в нашем случае заменяются цепью «дождевых садов», благоприятствующих естественному стоку вод на территории. Упраздняется как традиционный газон, требующий тщательного благоустройства, еженедельного скашивания и ухода, так и посадка растений, несвойственных для Северо-Западного региона России. Вместо этого на территории предлагается устройство лугов, требующих минимум ухода и сохраняющих биоразнообразие. Проектом предусматривается применение живописных групп кустарников и деревьев, состав которых повторяет естественные сочетания пород в лесу, что позволяет сохранить в городе «дух» Карельского перешейка.

Проект также предлагает устройство «общественного огорода» (где жители соседних домов могли бы выращивать простые садовые растения и овощи без использования пестицидов и удобрений) и обучающих интерактивных площадок и садов: «Сада жуков», «Сада прикосновений» и «Сада звуков». Традиционно уход и создание городских зеленых зон являлось задачей специализированных предприятий, однако опыт европейских городов, уже несколько лет использующих концепции экодизайна в реальной практике, доказывает, что отношение к ландшафту, в создании которого участвуют сами жители, становится совершенно иным, более бережным. А значит, вполне вероятно снижение уровня вандализма и увеличение социальной заинтересованности населения в поддержании и улучшении состояния жилых районов.

Еще одним положительным моментом данного проекта является его экономическая эффективность по сравнению с традиционными способами благоустройства, а также возможность сохранения и преумножения биоразнообразия городской среды.

Луговой участок в парке Александрия как важная часть зеленого наследия Петергофа. Проблемы восстановления.

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Парк Александрия расположен на северо-западе Восточно-Европейской (Русской) равнины, в пределах Прибалтийской низменности. Парк находится в 35 км от Санкт-Петербурга, на южном побережье Финского залива. Рельеф территории представлен морской террасированной равниной. По территории парка проходит уступ Литориновой террасы, у подножия которой, на прибрежной территории, находится нижнетеррасный луговой участок парка. Видовая площадка для этого участка находится у дворца «Коттедж» – памятника архитектуры, входящего в состав ГМЗ «Петергоф».

К началу строительства парка Александрия в 20-е годы XIX в. приморская территория представляла собой лесной массив, покрывавший всю нижнюю террасу. Это была болотистая местность к востоку от Нижнего Петергофского парка с характерными признаками подобных территорий Северо-Запада: сероольшанники и ивняки с примесью ели обыкновенной (Picea abies), березы повислой (*Betula pendula*) и сосны обыкновенной (*Pinus sylvestris*). Для введения в массивы широколиственных пород терраса была осушена с помощью сети мелиоративных канав. После частичных вырубок и подсадок деревьев по маршрутам с верхней террасы на нижнюю стали открываться красивые виды парка, включавшие в себя морские просторы. Открытое луговое пространство участка, живописные группы декоративных кустарников и лиственных солитеров, составляли главную объёмно-пространственную композицию нижней террасы.

Акватория Финского залива, на берегу которого расположен луг площадью 12,5 га, относится к бассейну Балтийского моря. Территория луга местами переувлажнена, несмотря на то, что в 1980-е гг. здесь была проложена сеть дренажных канав. Присутствие выраженного глеевого горизонта на глубине 15–20 см, а также большое количество видов осок (Carex), в определенной степени указывает на первые признаки процесса заболачивания. В связи с этим луговой участок в ближайшее время станет объектом реставрационных работ, проводимых на территории парка Александрия с 2008 г.

По результатам почвенных исследований выяснилось, что почва на участке серо-гумусово-глеевая или дерново-глеевая. В ней хорошо развит дерновый и серо-гумусовый горизонт, а глубже более выражен процесс оглеения. Первоначально территория луга была смешанным лесом, но уже почти 200 лет как это место антропогенно изменено (вырубка леса, проведение дренажных канав, подсыпка грунта, засевание злаками и многолетними травами и т.д.), поэтому в почве практически не наблюдается следов оподзоливания, а наиболее выражены в настоящее время процессы оглеения и дернообразования.

Парк Александрия расположен в зоне тайги (южная подзона). Данная территория относится к низменному южно-таежному озерно-ледниковому типу ландшафта с преобладанием легких наносов. В 2009 г. студенткой 4 курса факультета географии и геоэкологии Санкт-Петербургского государственного университета Поповой Я.О. (научный руководитель к. г. н., доцент Нехуженко Н. А.) было выполнено геоботаническое обследование Нижней террасы парка Александрия, в результате которого выяснилось, что на луговом участке произрастают деревья в количестве 89 шт., а также их подрост. В основном, это дуб черешчатый (*Quercus robur*), береза пушистая (*Betula alba*), остальные виды представлены отдельными экземплярами: ива остролистная (*Salix acutifolia*), клен остролистный (*Acer platanoides*), липа сердцелистная (*Tilia cordata*), ольха серая и черная (*Alnus incana* и *Alnus glutinosa*), сосна обыкновенная (*Pinus sylvestris*), черемуха обыкновенная (*Padus avium*), ясень обыкновенный (*Fraxinus excelsior*). Основу растительных сообществ составляют многолетние злаки и разнотравье. Из наиболее привлекательных растений, обладающих эстетическими качествами, можно выделить пальчатокоренник Фукса (*Dactylorhiza fuchsii*), который принадлежит к семейству Орхидных. Распространены такие виды, как гравилат речной (*Geum rivale*), норичник шишковатый (*Scrophularia nodosa*), борщевик сибирский (*Heracleum sibiricum*).

При выполнении реставрационных работ необходимо сохранить сложившиеся природные сообщества, подчеркнув красоту луговых ландшафтов в пейзажном парке.

Проблемы защиты озелененных пространств в условиях новой градостроительной политики

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Сохранение и развитие зеленого пространства городов в условиях экономической реорганизации общества и дальнейших урбанизационных процессов становится одной из главных проблем их устойчивого эколого-градостроительного развития в будущем. Этому способствует формирование опорного экологического каркаса озелененных и водных пространств, сообщающихся с крупномасштабными зелеными зонами пригородных территорий.

Рациональное и полноценное использование природного ландшафта г. Брянск и его пригородной зоны представляет собой сложную, трудоемкую и продолжительную во времени работу, начало которой было положено в 1960-х гг. Основу зеленого пояса города составляют крупные массивы хвойно-широколиственных лесов. При этом левобережная часть поймы реки Десны рассматривается как главная рекреационная зона, включающая систему лесопарков. В эту единую и целостную систему рекреационных территорий, определяющих пространственную композицию города, органически входят крупномасштабные балки-овраги, пересекающие нагорную часть правобережья с их живописным рельефом, которые могут и должны рассматриваться как мощный резерв в системе озеленения центральной части города и как важнейшее звено взаимосвязи и непрерывности озелененных пространств пригородной и городской территории Брянска.

К сожалению, до сих пор зеленые территории Брянска представляют собой разрозненные, не связанные между собой участки, требующие значительных работ по их ландшафтному преобразованию. За последние 40 лет в городе не создано ни одного крупного зеленого массива, а в связи с увеличением индивидуального жилого фонда площадь озеленения общего пользования уменьшится в ближайшем будущем до 5–8 м^2/чел.

Это, в целом, неудовлетворительное положение усугубляется экологически безграмотными градостроительными изменениями, в ходе реализации которых происходит сокращение площадей, занятых зелеными насаждениями. Примером могут служить так называемые «реконструкции» территорий исторического центра города – бульвара Гагарина, «круглого» сквера, площадей Воинской славы и Революции. Проектами благоустройства этих территорий не предусматривалось сохранение старого зеленого фонда. Так, в реализованном проекте реконструкции бульвара Гагарина, полностью были уничтожены 54 экземпляра каштана конского, 10 – березы бородавчатой, линейный травяной газон протяженностью около 200 м. Более 50 деревьев, в т. ч. и хвойных видов было уничтожено в ходе изменения внешнего облика площади Воинской славы. Расширение транспортных магистралей центральной части города также привело к уничтожению газонов и около 50 деревьев липы крупнолистной. Характерно, что в защиту зеленых насаждений не было слышно голосов ни архитекторов, ни природоохранных служб города. Более того, необходимые в этом случае демократические процедуры изучения общественного мнения, также не были проведены.

В связи с негативными фактами в градостроительной политике Брянска для города остается актуальной проблема первоочередного благоустройства и превращения в удобные рекреации овражных территорий. Во всех генпланах города, разработанных в советское время, овраги рассматривались как несомненное достоинство города. Намечался постепенный вывод с их территории индивидуальной застройки, планировалось их озеленение и благоустройство, превращение в места отдыха горожан. Но, к сожалению, воплощение в жизнь этих проектных решений так и не началось. Новые градостроительные подходы к этим территориям обозначились сокращением границ охранных зон оврагов, выделением под застройку склоновых участков, случаями самовольного строительства.

Озабоченность сложившейся экологической ситуацией в городе и обеспокоенность общественности привела к созданию инициативных групп, которым с помощью судебных органов удалось организовать общественные слушания по ряду значимых объектов озеленения, в ходе которых гражданское общество единогласно высказалось против подобных реконструкций.

Потери в озеленении центральной части города трудно восстановить. В определенной степени их можно возродить дополнительными усилиями по воссозданию утраченного. Позитивную роль может сыграть и так называемое компенсационное озеленение территорий, находящихся в центре города, в реализации которого могут активно участвовать и жители города.

Перед архитектурными службами города стоит задача разработать архитектурно-планировочные и дендрологические решения парков и других рекреационных объектов на сложном рельефе оврагов и балок. Умелая обработка рельефа брянских оврагов могла бы усилить их своеобразие, город получил бы несравненные пейзажные парки, замечательные острова природы. Важно иметь в виду, что овраги – это клинья, приходящие от зеленой поймы Десны через крупные жилые

массивы центрального района Брянска. Они служат как бы входом в лесопарковую зону города. Совместно с оврагами в систему организации озеленения должны быть включены ценные природные массивы рекреационных лесов с последующим преобразованием их в лесопарковые зоны отдыха.

Необходима дальнейшая инвентаризационная работа по выявлению, сохранению и обследованию различных категорий озеленения. Большую помощь здесь может оказать специалистам и население города, которое справедливо встает на защиту участков зеленых насаждений, которые безжалостно и безнаказанно уничтожаются. Город остро нуждается в осуществлении проектов озеленения не только крупномасштабных, но и более мелких объектов и территорий, вплоть до «скверов одного дерева» на свободных участках, порой неоправданно замощенных бетонной плиткой или пребывающих в бесхозном состоянии.

Зелёная инфраструктура: здание-парк как часть архитектурной среды

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Стремительная деградация городских территорий и полное исчезновение внеархитектурных пространств, происходящие в последнее время в крупнейших российских городах, неизбежно привели к усилению экологической напряжённости на наиболее проблемных для города территориях, к которым в первую очередь можно отнести транспортные, промышленные и инженерные объекты. В ситуации сильнейшей функциональной нагрузки и острого нарастания дефицита свободных от застройки территорий на подобных объектах требуется произвести не только актуальный анализ существующих проблем, но и разработку качественно новых подходов к архитектурно-ландшафтной организации, включающей возобновление природной и функциональной среды с определёнными экологическими параметрами.

Поиск таких решений невозможен изучения проблем взаимодействия архитектурных объектов с их природным окружением, ориентации на включение природных компонентов в новые постройки, что способствовало бы реализации концепции ресурсосбережения и экодевелопмента. Для большего понимания содержания термина «новые зелёные технологии» необходимо обозначить направления взаимодействия подобных объектов с окружающим ландшафтом, совмещающих функции инженерных сооружений со свойствами природных территорий «нового поколения».

1. Совместное рассмотрение городского инженерного объекта и его ближайшего ландшафтного окружения в аспекте ресурсосбережения (задержание и сбор дождевой воды, создание благоприятных условий для развития не только флоры, но и фауны, экономия тепла, сохранение гидроизоляции, уменьшение расхода электроэнергии, социальные преимущества при рекреации и т.д.).

2. Взаимная интеграция природной среды и бывших промышленных объектов, при которой присутствует экологически позитивный ресурс природы (нацеленный на подбор устойчивого ассортимента зелёных насаждений с приоритетом

местной флоры, сохраняющий свои качества в течение максимально продолжительного периода времени и не требующий дополнительных затрат на последующее поддержание).

3. Использования природных компонентов в качестве горизонтальных и вертикальных элементов городских инженерных объектов.

Так как прежний подход к организации архитектурных пространств в большинстве отечественных городов далеко не всегда был ориентирован на включение природы в качестве компонента новых построек и не способствовал реализации концепции ресурсосбережения, то использование новых «зелёных» технологий должно привести к снижению уровня экологической напряженности на наиболее проблемных для города территориях.

На этих участках природа вместо «мертвых» материалов «работает» на построение единого природно-архитектурного пространства с чередованием традиционных, «неживых» и «живых» компонентов и становится дополнительным ресурсом в изменении экологических качеств новых строений, которые условно можно распределить на три смысловые группы: зелёное архитектурное пространство на крыше транспортных объектов, зелёное архитектурное пространство на крыше бывшего виадука и зелёное архитектурное пространство — здание-парк вместо промышленного объекта.

Общественно-деловые центры как ресурс для развития зеленой инфраструктуры

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Значительные территории Санкт-Петербурга подвергаются активным градостроительным преобразованиям. По данным консалтинговых агентств наиболее активной сектором девелопмента и редевелопмента в последние годы является формирование общественно-деловых зон и строительство офисных и торговых зданий. Современные многофункциональные общественно-деловые центры привлекают для работы и отдыха одновременно тысячи горожан, формируя ключевые открытые общественные пространства.

Проведенные нами в течение последних трех лет исследования на территориях новых общественно-деловых центров Санкт Петербурга показали не только отсутствие комфортной и безопасной среды, зон отдыха, озелененных пространств, но выявили следующую тенденцию в формировании окружающего ландшафта: как правило, здание занимает максимально возможную площадь выделенного под застройку участка и впоследствии захватывает прилегающее общественное открытое пространство под обеспечение необходимых функций, преимущественно для парковки и хранения автотранспорта. Результаты исследования показали необходимость разработки системных и нормативных подходов ландшафтной организации территорий многофункциональных общественно-деловых центров в целях улучшения качества городской среды.

В процессе исследования были выявлены ресурсные для целей озеленения участки как на территории, так и в структуре архитектурных объектов, которые могли бы стать областями для расширения и развития зеленой инфраструктуры города, при условии целостного подхода к проектированию здания и окружающего ландшафта. Для реализации такого подхода мы предлагаем эффективные приемы размещения зеленых насаждений во входных, пешеходно-транзитных и рекреационных зонах (с функционально-планировочной целью) и на неэксплуатируемых кровлях, искусственных основаниях, террасах, фасадах, во внутренних дворах (для улучшения показателей комфортности среды и в целях ресурсосбережения).

Для системного применения разработанных приемов нами создана пространственная теоретическая модель (рис. 1), которая отражает новые подходы к формированию единого природно-архитектурного пространства и способы размещения растений. Модель основана на использовании всего трехмерного пространства здания для эффективной интеграции озеленения и требует максимальной адаптации структуры здания под приемы озеленения уже на стадии проектирования. В целом наш подход позволяет создать единое озелененное буферное пространство, объединяющее как окружающую территорию, так и сам архитектурный объект. Использование рекомендуемых нами видов растений, характерных для природной флоры Северо-Западного региона России позволит подчеркнуть местную природную идентичность создаваемого ландшафта и внести вклад в повышение биоразнообразия городских территорий.

Основываясь на полученных результатах, мы предлагаем на законодательном уровне ввести ограничение на застройку территории общественно-деловых центров, повысить обязательные нормы озеленения, в том числе нормы размещения средорегулирующих насаждений, озеленения искусственных оснований, кровель, фасадов.

Для реализации такой модели необходимо участие не только ландшафтных архитекторов, но и ведущих архитектурных мастерских, профессиональных девелоперов, администрации города. В этом случае активно развивающиеся общественно-деловые зоны реализуют существующий ресурс для формирования непрерывной системы озелененных пространств, органично вплетающихся в существующую зеленую инфраструктуру города, что приведет к созданию современных комфортных публичных пространств в Санкт-Петербурге.

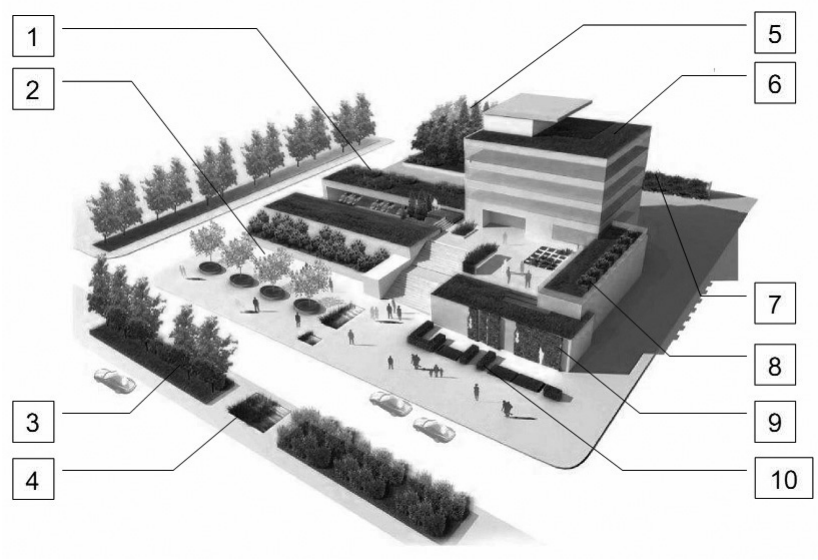

Рис. 1. Теоретическая пространственная модель для многоярусного построения систем озелененных пространств в буферном пространстве общественного здания

Александрова дача в Павловске — «воспитательный сад».

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Во второй половине XVIII в. в единой системе парковых комплексов Павловска сформировался уникальный ансамбль — Александрова дача. Основой замысла и создания его послужило художественное произведение — «Сказка о царевиче Хлоре», написанная в 1781–1782 гг. Екатериной II для внука, будущего императора Александра I. Сказка повествует о похождении царевича Хлора в поисках добродетели. Композиционной основой для организации парка и построения прогулочного маршрута послужила сюжетная линия, последовательно разворачивающая перед зрителем события, происходящие в сказке. Ансамбль должен был восприниматься как сказочная декорация с павильонами, малыми архитектурными формами, где посетители попадали в ландшафтно-архитектурную среду, построенную на фабульной основе.

Композиционной основой парка Александровой дачи стал овраг, образованный в русле реки Тызвы. Его природная форма, частично скорректированная, определила расположение композиционных узлов. Увеличение водной поверхности позволило зрительно расширить пространство и организовать визуальные связи.

Из архитектурных декораций парка Александровой дачи сохранился павильон — «Храм Флоры и Помоны», который в настоящее время находится в неудовлетворительном состоянии.

На вершине одного из склонов оврага сохранился фундамент «Храма Розы без шипов», который точно определяет местоположение сооружения и его композиционную роль. Павильон-ротонда, трактуется как фокусный элемент, собирающий основные визуальные лучи и парковые перспективы — это кульминационная точка сюжетной линии и прогулочного маршрута Александровой дачи.

Замысел организации насаждений во многом определялся условиями рельефа и формой водного зеркала. Древесные массивы подчеркивали линию береговых склонов оврага, формировали фон для архитектурных сооружений, образовывали веерные перспективы. Вероятно, породный состав массивов был близким к составу насаждений Павловского парка, так как объекты формировались в практически одинаковых лесорастительных условиях в близкий временной период.

В настоящее время на территории Александровой дачи преобладают стихийные зарослевые насаждения. Ведущими породами являются: ольха серая *Alnusincana*; тополь дрожащий (осина) *Populustremula*; черемуха обыкновенная *Padusavium*.

Развивая исходную концепцию «воспитательного сада» на современном уровне, можно восстановить этот уникальный ансамбль на основе сохранившихся литературного сюжета и выразительного ландшафта.

Перспективы строительства и реконструкции парков города Воронежа.

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Городской экологический каркас выполняет средообразующую, природоохранную, рекреационную и оздоровительную функции, обеспечивая тем самым благоприятные условия для жизни горожан. Обладая способностью нивелировать высокую антропогенную нагрузку, природные сообщества (благодаря биологическому разнообразию) позволяют урболандшафтам поддерживать комфортную для человека среду обитания.

Реконструкция экологического каркаса, помимо преобразования уже существующих зеленых зон общего пользования, включает в себя создание сети новых функциональных парков. Эта сложная задача связана не только с финансово-экономическими трудностями, но и с грамотным функционально-территориальным зонированием городской среды и отдельных ее фрагментов. В сложившейся городской структуре, где всю территорию можно поделить на несколько зон, следует обратить особое внимание на ландшафтно-экологическое благоустройство жилых территорий города путем реконструкции зеленых насаждений и создания новых рекреационных мест в пределах административных районов для всех категорий граждан.

В 2011 г. нами было поставлено две задачи: 1) разработать проект реконструкции Муниципального предприятия «Центрального парка культуры и отдыха» (более известный среди горожан как парк «Динамо»), расположенного в историческом центре города Центрального административного района; 2) создать проект нового ландшафтно-рекреационного парка «Зеленый город» в экологически неблагополучном Железнодорожном районе г. Воронеж, который расположен на «бросовых» землях. В первом случае реконструкции подлежит небольшая часть особо охраняемой территории. Рельеф его холмистый и в наибольшей степени соответствует концепции создания первого городского горнолыжного центра «Каньон» (рис. 1, 2).

Для решения этих задач необходимо было: провести ландшафтно-экологическое описание территории размещения парков; дать социально-экономическое обоснование организации парков; разработать бизнес-план их строительства; определить инвестиционную привлекательность планируемых объектов; выяснить долгосрочность и рентабельность проектов; подготовить проектно-сметную документацию на строительство и ввод объектов в эксплуатацию; провести ландшафтно-функциональное зонирование проектируемых парков; подготовить базу данных рекомендуемого ассортимента древесно-кустарниковых пород для зон парков.

В результате проведенной работы был сформирован полный пакет необходимых документов, позволяющий создать и обосновать целесообразность и перспективность создания двух парков на правом и левом берегу Воронежского водохранилища. Эти данные отображены в табл. 1.

Предложенные проекты многофункциональных ландшафтно-рекреационных парков позволяют решить ряд экологических, экономических, культурных, спортивных составляющих социальной сферы Воронежа и Центрального Черноземья

в целом. Парки является объектом социально-экономической значимости с совокупными инвестициями в 540 млн. руб., сроком окупаемости до 7,3 лет. Их реализация служит практическим подходом решения обустройства городской территории.

Таблица 1.

Концепция и аспекты создания проектов парков на территории г. Воронежа

Территория проета занимает 54.85 га. Согласно ландшафтно-экологическим условиям она отнесена к центральному склоновому ландшафтно-функциональному району г. Воронежа. Поверхность представляет балочный склоновый тип местности с западным воздушным переносим. Растительность представляет собой совокупность лесной (остатки нагорной дубравы), лугово-степной, луговой и прибрежно-водной растительности. Многие из встечающихся здесь видов — лекарственные или декоративыне растения. Ландшафтная структура, микроклимат, почвенно-растительный покров определяют экологические условия проектирования ландшафтно-рекреационного парка.	Территория проекта составляет 24,28 га. Её ландшафтно-экологические условия определяются размещением в Левобережном долинно-террасовом ландшафтно-функциональном районе г. Воронежа. Всю территорию слагают намытые и намывные пляжи, сформированные в результате процессов естественного и техногенного рельефообразования. Рельеф равнинный. Близость крупного водного объекта — водохранилища способствует формированию частых порывистых ветров северо-западного направления. В настоящее время территория покрыта сорно-рудеральной растительностью и медленно задерновывается. Территориально-функциональная структура, особенности геоморфологии, микроклимата, почвогрунтов, растительности определяют ландшафтно-экологические условия проектируемого ландшафтно-рекреационного парка.
Парк «Каньон» расположен в историческом и культурном центре города, с высокой пропускной способностью населения, сложившимся устойчивым биоценозом и высокой степенью репродукции. Ландшафт местности позволяет разместить на своей территории горнолыжные и сноуборд трассы, а также трассы для тюбинга и роллербана.	Данный земельный участок относится к резервным территориям. Он расположен в 10 минутах ходьбы от селитьбы. Для Железнодорожного района — это первый специализированный ландшафтно-рекреационный объект для комплексного отдыха горожан.
Эта территория входит в состав земель ООПТ, что требует особого контроля за ее функциональным, экологическим и культурным состоянием. В этом случает требуется реконструкция парка с наименьшими потерями для его природного компонента, применив при этом все потребности современного общества в развитии культуры и спорта.	Близкое соседство с акваторией, близ которой располагается детская спортивная школа гребцов на лодках и каноэ удачно вписывается в спортивную зону проектируемого парка. Участок песчаной косы прибрежной территории является местом обзора живописного правобережья города Воронежа.
Парк практически не требует финансовых вложений, связанных с масштабным озеленением территории, созданием подъездных путей и парковочных мест.	Песчаные «плывучие» грунты антропогенного происхождения препятствуют быстрому и качественному строительству жилого фонда. Данная территория может использоваться для строительства ландшафтного парка с элементами социально-бытовых, культур но-досуговых сооружений.
Максимальная пропускная способность проектируемого парка составит 800 чел/час. Необходимая сумма инвестиций — до 200 млн. руб. Окупаемость составит 4,7 года.	Максимальная пропускная способность проектируемого парка составит 700 чел/час. Необходимая сумма инвестиций — до 340 млн. руб. Окупаемость составит 7,3 года.
Социально-экономический эффект, получаемый от проектов: налоговые отчисления в бюджет, в результате реализации проектов будет создано около 160 новых рабочих мест, будут обеспечены потребности населения в качественном здоровом отдыхе и занятиях спортом, будет осуществлено развитие детского спорта, создание комплексов привлечет дополнительные трудовые и инвестиционные ресурс, а так же повысит престиж г. Воронежа, в ходе реализации проектов будут использованы самые современные технические и организационные решения, обеспечивающие сохранение экологического состояния парковой зоны при строительстве и дальнейшей эксплуатации парка.	

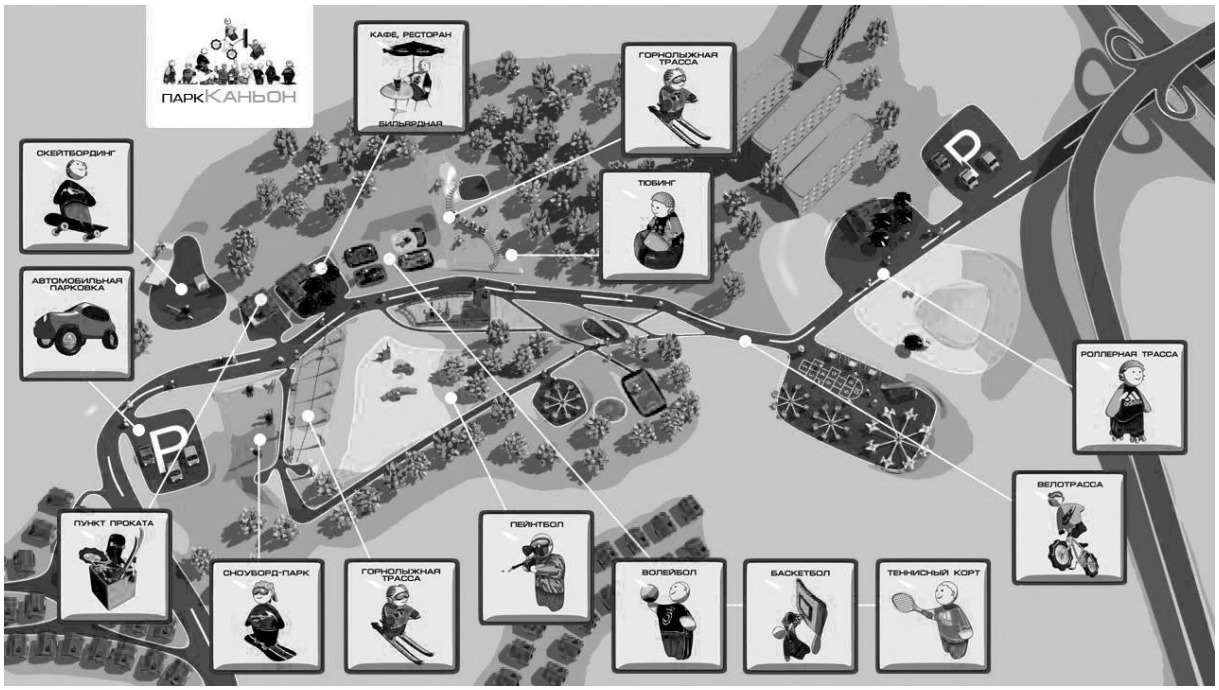

Рис.•1. Проект парка «Каньон»

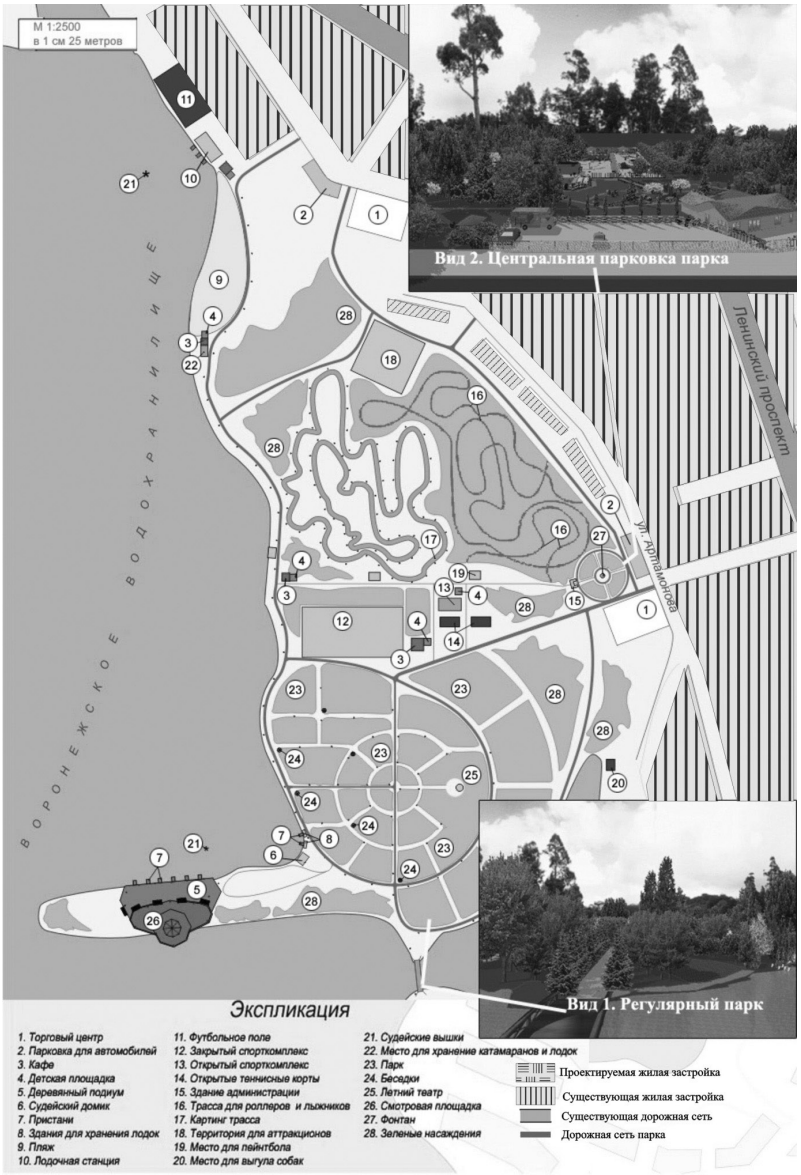

Рис. 2. Проект парка «Зеленый город»

Зеленая инфраструктура Санкт-Петербурга как фактор устойчивого развития

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Повестка устойчивого развития «sustainable development» («Agenda XXI») была принята на конференции ООН в Рио-де-Жанейро в 1992 г. Устойчивое развитие — это самоподдерживаемое развитие, улучшающее качество человеческой жизни и, в то же время, находящееся в пределах реальных возможностей экосистем. Большинство стран мира признало необходимость перехода к концепции устойчивого городского развития, которая включает в себя и формирование устойчивой зеленой инфраструктуры города.

Во многих городах России система зеленых насаждений представляет собой слу-чайное сочетание садов и парков, бульваров и уличных насаждений, в малой степени ориентированных на формирование благоприятной экологической обстановки. Наиболее существенными недостатками такой системы являются ее значительная неразвитость в центральных районах городов, большая автономность крупных элементов и оторванность от загородных пространств.

При формировании зеленой инфраструктуры города важно учитывать следующие принципы:

• преемственность: главные оси зеленой инфраструктуры города должны быть логическим продолжением тех или иных элементов зеленой инфраструктуры более крупного образования — района;

• взаимозависимость элементов зеленой инфраструктуры (инфраструктура должна представлять собой не случайную мозаику различных по назначению городских зеленых насаждений, а систему экологических осей, на пересечении которых целесообразно формировать сравнительно крупные зеленые зоны — центры экологической и рекреационной активности);

• относительную автономность отдельных частей зеленой инфраструктуры: эле-менты зеленой инфраструктуры должны проникать во все наиболее значительные структурные звенья города разного масштаба — жилые и промышленные районы, мик-рорайоны и др.;

• функциональное соответствие зеленой инфраструктуры конкретным природным и экономическим особенностям города, что должно выражаться как в построении структуры, так и ее биологических характеристиках;

• одновременное формирование зеленой инфраструктуры и городской застройки, как части архитектурно-планировочной структуры города.

• Формирование зеленой инфраструктуры Санкт-Петербурга должно включать сле-дующие направления:

• формирование крупных узлов зеленой инфраструктуры за счет создания новых парковых территорий, в том числе в селитебных районах Санкт-Петербурга и вновь застраиваемых районах;

• усиление связей внутри зеленой инфраструктуры за счет развития линейных насаждений вдоль основных магистралей города и набережных;

• рациональная ландшафтная организация внутриквартальных территорий, как первичных звеньев зеленой инфраструктуры Санкт-Петербурга;

• преобразование исторического центра и повышение уровня озелененности за счет внедрения новых технологий (вертикальное и контейнерное озеленение, «зеленые крыши» и «зеленые стены» и др.);

• повышение уровня озелененности территории Санкт-Петербурга в 1,5 раза за счет озеленения территорий предприятий, выводимых за границы исторического цен-тра Санкт-Петербурга;

• ландшафтное освоение береговых пространств Невы и Финского залива; создание новых садов и парков на намывных территориях Санкт-Петербурга с учетом специфики освоения таких территорий;

• преобразование транспортных территорий (озеленение прирельсовых про-странств городского транспорта, а также обширных межпутевых пространств в зоне железнодорожных вокзалов; ландшафтная организация парковок автомобильного транспорта);

• ландшафтное освоение территорий, прилегающих к КАД, а также откосов насы-пей автомагистралей и железных дорог при их укреплении;

• разработка программы рекреационного использования лесопарковой зоны в со-ставе зеленой инфраструктуры Санкт-Петербурга;

• включение водоохранных зон водных объектов, санитарно-защитных зон предприятий, особо охраняемых природных территорий в зеленую инфраструктуру Санкт-Петербурга;

• рекультивация территорий промышленных зон и бывших полигонов бытовых и промышленных отходов и их ландшафтное освоение в системе зеленой инфраструктуры Санкт-Петербурга.

Развитие зеленой инфраструктуры Санкт-Петербурга, снижение дискретности и повышение связности отдельных ее элементов повысит ее устойчивость и обеспечит устойчивое развитие Санкт-Петербурга в целом.

Туристические тропы — новый элемент зеленой инфраструктуры в городских агломерациях Байкальского региона.

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Формирование зеленой инфраструктуры является сегодня необходимым условием устойчивого и успешного развития современных городов. Города и городские агломерации Байкальского региона находятся в горно-таежной ландшафтной зоне и до настоящего времени не испытывали потребности в создании особой зеленой рекреационной инфраструктуры благодаря обилию и доступности окружающих природных ландшафтов.

В России система особо охраняемых природных территорий сложилась к концу XX в. и нацелена сугубо на сохранение природных ресурсов. В настоящее время существует 7 категорий природоохранных зон, созданных с учетом особенностей общих черт конкретных территорий и статуса находящихся на них учреждений: государственные природные заповедники, в том числе биосферные; национальные парки; природные парки; государственные природные заказники; памятники природы; дендрологические парки и ботанические сады; лечебно-оздоровительные местности и курорты.

В данный момент на территории водосборного бассейна озера Байкал существует 4 заповедника и 3 национальных парка; отсутствуют только природные парки — одна из категорий, выделенных в федеральном законе Российской Федерации «Об особо охраняемых природных территориях» от 14 марта 1995 г.

За последнее столетие на берегах Байкала сформировались 3 городские агломерации: Иркутск—Ангарск—Шелехов; Байкальск—Слюдянка—Култук; Северобайкальск—Нижнеангарск.

С 2003 г. в Байкальском регионе действует межрегиональная некоммерческая общественная организация «Большая Байкальская Тропа».

Один из возможных способов изучения, устойчивого сохранения, использования компонентов природного биоразнообразия – это создание туристических троп. Используя международный опыт, молодые специалисты-экологи и волонтеры разных специальностей стремятся создать сеть пешеходных безопасных туристических маршрутов, объединяющих города, памятники природы и особо охраняемые природные территории. Подобный уникальный для России опыт имеет большую перспективу для всех регионов РФ.

Основная цель организаторов этого проекта:

- развитие экотуризма в Байкальском регионе;
- строительство безопасных троп, рассчитанных на туристов всех возрастов, национальностей и уровней подготовки;
- охрана и защита окружающей среды;
- развитие международного сотрудничества;
- повышение экологической культуры населения;
- воспитание социально ответственного общества.

В ходе работы организации проводятся различные международные социальные экологические образовательные программы; создается система взаимодействия общественных организаций, государственных структур, бизнеса и местного населения.

Активисты и волонтеры Большой Байкальской Тропы за период с 2003 по 2011 гг. расчистили, отреставрировали, отстроили заново более 650 км тропы, проходящей по берегам озера. В ходе работы создаются мосты, ступени, ограждения, места для палаточных лагерей, небольшие подпорные стенки и прочие элементы благоустройства, которые помогают создать комфортное для отдыха место, не причиняя при этом вреда окружающему ландшафту. Всего же планируется построить около 2000 км окружного пути вокруг Байкала.

Сохранение и устойчивое развитие уникальной зеленой инфраструктуры, объединяющей между собой природные и антропогенные ландшафты, является одним из требований современного процесса урбанизации, происходящего

сейчас в Байкальском регионе. Опыт создания туристических троп может быть использован как пример формирования единой зеленой рекреационной инфраструктуры вокруг городских агломераций.

Особенности зелёной инфраструктуры коттеджных поселков.

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При функционировании современных коттеджных поселков часто встречаются проблемы с организацией ливневого и талого стока. Причины возникновения таких трудностей связаны либо с недочетами проектной документации и ее реализации, либо с невозможностью централизованного водоотведения в близлежащие гидрологические объекты.

Опираясь на зарубежный опыт в сфере инженерной инфраструктуры, нами был разработан проект ливневой канализации, с элементами экологического дизайна, по организации стока в коттеджном поселке в западной части Подмосковья. Водосборная сеть спроектирована вдоль внутренней дороги и состоит из двух взаимосвязанных частей — открытой и закрытой. В подземную (закрытую) коллекторную систему через канализационные трубы попадают сточные воды с твердых поверхностей — дорожных покрытий и крыш, проходя механическую очистку в дождеприемниках и в смотровых колодцах. Остальная часть поверхностных вод просачивается в верхние слои грунта, а излишки попадают в открытую часть ливневой системы, которая выполнена в виде водосборного понижения в рельефе, имеющего призмообразный профиль. Внешне канавы декорированы под «сухой ручей» с декоративными отсыпками из гальки и валунов, служащими верхним дренирующим слоем, под которым пролегает промежуточный песчано-грунтовый слой с дренажной трубой в нижней части призмы. В наиболее загруженные периоды — таяние снега и ливней, дрены отводят избыточную воду в общую ливневую сеть, через смотровые колодцы, которые также являются узлами подключения к ливневой канализации для частных владений поселка.

Современный европейский принцип возврата к дикой природе был реализован в декоративном озеленении канав «сухого ручья». Ассортимент был подобран таким образом, чтобы минимизировать уход за достаточно протяженным ландшафтным элементом и поддержать местное биоразнообразие. В связи с этим в основе декоративных композиции были использованы различные виды местных влаголюбивых растений — осоки (*Carex*), папортники (*Pteropsida*), таволги (*Spiraea*) и др. в нижнем ярусе с лещиной (*Corylus*), бересклетом (*Euonymus*) и ивой (*Salix*) в подлеске. Таким образом была спроектирована экосистема с принципами устойчивого дизайна.

Зеленое наследие исторических объектов ландшафтной архитектуры.

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Среди объектов ландшафтной архитектуры особое место занимают исторические парковые комплексы. Уникальность исторических парковых территорий, прежде всего, определяется дуалистическим характером сущности этих объектов: они включают в себя как памятники истории и архитектуры, так и окружающие их ландшафты.

В современном урбанизированном мире функции исторических парков изменились, что определяет противоречие между формой организации пространства парковых территорий, отражающей ушедшее время, и их современным функциональным наполнением.

В рамках исторического развития парковых территорий изменение их функционального назначения сказывается на изменении функций отдельных компонентов, что, прежде всего, относится к парковой растительности. В условиях ускоряющегося процесса урбанизации и резкого ухудшения экологических параметров окружающей среды функции зеленой компоненты исторических парков расширяются. Растительный покров исторических парков играет ведущую роль не только в создании его эстетического облика, но и выполняет важнейшие экологические функции. Парковая растительность является основой рекреационных исторических территорий: на урбанизированных пространствах создает зеленые зоны, комфортные для человека с точки зрения экологических условий, насыщает атмосферу кислородом и ограждает его от шума, запыленности, загазованности и т.д.

На территориях исторических парковых комплексов зеленая парковая компонента приобретает еще одну важнейшую функцию — природоохранную. В силу особенностей формирования, условий содержания и истории развития территории исторических парков являются весьма разнообразными с точки зрения растительного покрова. Особое экологическое и природоохранное значение приобретают те части парков, которые формировались как пейзажные.

Установлено, что на парковых территориях при снятии режимов ухода, жестко регулирующих структуру растительных сообществ, парковая растительность развиваются согласно общим законам развития природных систем, эволюционируют и по своим свойствам постепенно приближаются к естественным аналогам. В пределах исторических парковых территорий возникают растительные сообщества, которые по видовому составу и структуре полностью соответствует природным системам, которые можно рассматривать в качестве локальных экологических эталонов. Возраст древостоя, составляющего каркас таких фитоценозов, в ряде случае сопоставим с возрастом самого парка. Возникает необходимость сохранения не только каждого зрелого дерева, но и всего фитоценоза в целом, как природной системы, включая деревья всех ярусов, подлесок, подрост и напочвенный покров. Такие зрелые насаждения совместно с другими составляющими фитоценоза, как зеленое наследие парка, безусловно, являются особо ценными объектами и требуют дополнительного внимания, ухода и охраны.

В пределах урбанизированных территорий пейзажные части парков старых усадебных комплексов — практически единственно возможное место нахождения слабопреобразованных растительных сообществ, что особенно важно для сохранения естественного биоразнообразия в условиях больших городов. Это определяет необходимость комплексного обследования территорий исторических парков и проведения инвентаризации растительного покрова с целью выявления не только зон нахождения растений, занесенных в Красную книгу, а также отдельных ценных деревьев, но и выделение слабопреобразованных фитоценозов, отражающих природное биоразнообразие.

При решении задач по зонально-функциональной организации исторических парковых территорий необходимо выделять в качестве особо охраняемых экологических объектов зеленое наследие исторической садово-парковой архитектуры.

Качество и восприятие открытых городских пространства

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Открытые пространства, где проходит значимая часть жизни горожан, являются важными составляющими образа города или района. Критерии их оценки, функциональность, назначение, историческая ценность могут быть различными, но они, как правило, не характеризуют в целом качество городской среды обитания. При явной актуальности вопроса в нашей стране критерии качества городской среды с позиций социума исследованы недостаточно, здесь сегодня не существует четких терминов и определений.

Наилучшими результатами позитивной оценки пространства человеком являются радость и счастье, опирающееся на сопоставление объекта и чувств с положительным опытом и воспоминаниями. Главной задачей открытых городских пространств является стимулирование данного чувственного процесса.

Многие обустроенные открытые пространства в городе остаются пустыми. Привлекательность мест обуславливается сочетанием интересов городского хозяйства, бизнеса и, конечно, жителей. Европейские страны используют укрупнённые планы развития территорий (стратегическое пространственное планирование), направленные на улучшение качество среды.

Московский мегаполис в настоящее время является испытывает множество проблем, в том числе в вопросе привлекательности открытых пространств. Существуют многие направления решения данной проблемы. Это обеспечение чистоты зеленых территорий, безопасности, доступности качественного отдыха в своем районе, создание эмоционального, культурного и исторического пространства, побуждение людей моделировать и использовать открытые пространства в соответствии с собственными желаниями, мобильности пространства с учетом сезонной и погодной специфики, укрупнение проектов в масштабе города, архитектур-

ные решения построек-символов, опирающихся на природные достоинства территории и историческое наследие, создание модных мест отдыха, обеспечение информативности территории для воссоздания связи с природой.

При проектировании и благоустройстве незастроенных территорий дробное планирование различных секторов на одной территории и исполнение норм и правил фактически исключает качественный эмоциональный подход, основанный на восприятии их реальными посетителями. Такой подход разделяет заказчика, исполнителя и потребителя. Фундаментом объединения перечисленных сторон могут стать единые представления о качестве среды обитания.

Агрессивный и стрессовый характер жизнив большом городе порождает в людях напряжение и страх. Открытое пространство призвано дать человеку чувство безопасности и комфорта. Одиночество в толпе дополняется виртуальными методами общения, открытые общественные пространства восполняют недостаток социального общения детей и взрослых. Нехватка положительных эмоций компенсируется при контакте с ландшафтом, обеспечивая эффект возвращения к природе. Массовый побег жителей из города в конце рабочей недели подтверждает дефицит качественных мест отдыха в городской черте.

Восприятие природного ландшафта часто сводят к эстетической ценности, а рекреационное использование к функциональности.

Термин «качество среды» прочно вошел в арсенал политиков и общественных деятелей. Создание методик системного анализа и проектирования, опирающихся на восприятие открытого пространства, как части среды обитания человека с определёнными качественными свойствами, поможет двигаться к формированию гармоничной среды обитания с учётом условий, сложности и темпа современной жизни. В основу такой методики может быть положена система взвешенных тестовых оценок, например, ощущений, чувств, состояния, воспоминаний, ассоциируемых с опрделенными открытыми пространствами. Методика может быть реализована для различных групп потребителей.

Возрождение Летнего сада — зеленого «сердца» Петербурга

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В Петербурге много садов и парков, но самый известный и самый старинный из них, без сомнения, Летний сад. Созданный в 1704 г. сад стал любимой городской летней резиденцией Петра I. История сада наполнена интересными и драматическими событиями. Здесь работали известные зарубежные и отечественные архитекторы и мастера садового дела. Сад пережил природные и социальные катаклизмы, например, разрушительные наводнения 1777 г. (когда была разрушена фонтанная система) и 1824 г., а также блокаду Ленинграда. С XIX в. сад становится любимейшим

общественным садом города. В XX в. Летний сад — основная часть исторического зеленого «сердца» Петербурга, входящего в список мирового наследия ЮНЕСКО. Учитывая историческую, культурную, экологическую и рекреационную ценность Летнего сада, вопрос его реставрации поднимался, начиная с 1940-х гг., когда были проведены первые научно обоснованные реставрационные работы под руководством профессора Т.Б. Дубяго. Их продолжению помешала война. Во время блокады на территорию сада упало несколько бомб, но деревья в основном не пострадали. В 1940 и 1970 г. были разработаны два проекта реставрации сада. Первый осуществили не полностью. А ко второму даже не приступали. Шли годы, насущные проблемы сада так и не получали разрешения.

В 2004 г. Летний дворец и Летний сад перешли в состав Государственного Русского музея, и на суд общественности был вынесен эскизный проект реставрации сада. Проект, разработанный архитекторами института Ленпроектреставрация, прошел серьезное обсуждение. Далеко не все его позиции соответствовали строгим научным критериям, были признаны и приняты к осуществлению.

В процессе работ археологам удалось найти в Летнем саду 10 фонтанов начала XVIII в., добраться до мощения, по которому когда-то ходил первый российский император. Перед южным фасадом Летнего дворца были проведены раскопки гаванца. В этом году посетители сада смогут увидеть, как он был устроен при Петре I, так как заполнять его водой не планируется.

Часть из обнаруженных археологами фонтанов воссоздана по историческим образцам. На центральной аллее появились работающие фонтаны «Царицын», «Гербовый», «Коронный», «Пирамида», а остальные размещены в глубине сада.

Сейчас воссоздан ряд боскетов и несколько тематических участков, окружённых живой изгородью. Все они когда-то находились на территории сада: в боскете «Менажерийный пруд» расположен искусственный водоем, а в боскете «Крестовое гульбище» в центре перекрещенных аллей-берсо — фонтан. В третьем боскете под названием «Птичий двор» мы сможем увидеть специально сделанные домики для птиц.

Более всего специалистов беспокоило состояние деревьев сада, многие из которых являются его ровесниками. Кроны деревьев разрослись, и сад был сильно затемнен. Это создало благоприятные условия для развития болезней деревьев. Всего в саду было зарегистрировано 24 вида вредителей: наиболее опасные среди них – древесные грибки, поскольку они быстро распространяются и способны погубить не только старые или молодые деревья, но также нанести вред мраморной скульптуре. Удаленные деревья заменили новыми посадками соответствующих пород, пригодных к нашему климату.

Реставраторы вели восстановительные работы с максимально бережным отношением к саду. Сохранился общий объем зеленых насаждений, что имеет важнейшее экологическое значение для центральной части города. Воссозданы элементы ландшафтной архитектуры, шпалеры, парадный партер вдоль Лебяжьей канавки. Тем самым саду частично возвращены черты регулярного сада XVIII в. Серьезную реставрацию прошла скульптура, которая сильно пострадала от времени и загрязнения окружающей среды. Оригинальные мраморные статуи и бюсты заменены копиями.

Реставраторы и работники Русского музея при реконструкции сада стремились не потерять его образности. Важно было сохранить и оздоровить его эко-

логическое состояние. Летний сад неотделим от образа Петербурга, поистине он является культурным достоянием не только нашего государства, но и памятником мировой культуры.

Природное наследие Москвы

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На территории современной Москвы еще в XIX в. находились лесные массивы, луга и болота. В настоящее время в черте города оказалось более 10 тыс. гектаров настоящих лесов. Самые крупные из них — Лосиный Остров, Измайловский и Битцевский леса. Москва расположена в самом центре России, и московские леса отличаются ис-ключительным биологическим разнообразием. Уникальные природные ландшафты: таежные леса, пойменные и суходольные луга, непроходимые болота, лесные озера и долины, изрезанные глубокими оврагами, привлекают горожан. Здесь сохраняются и восстанавливаются растительные сообщества и редкие виды растений. В Москве также находится 51 памятник природы. Такие рекреационные территории вносят значитель-ный вклад в создание зеленого наряда столицы.

Городские леса являются не только «очагами» чистого воздуха, обогащенного ио-низированным кислородом и фитонцидами, но и улучшают качество атмосферного воздуха в районах прилегающей застройки на расстоянии 2–4 км. Так концентрация загрязнителей здесь снижается в 2–3 раза. Крупные зеленые массивы улучшают радиационный режим городской атмосферы, оказывают терморегулирующие влияние на микроклимат города. Они регулируют ветровой режим, создавая местные потоки воз-духа со скоростью 2–3 м/с. Лесные массивы — самые комфортные места массового от-дыха, создающие необходимые условия зрительной изоляции отдыхающих, акустиче-ский комфорт, они положительно влияют на эмоции человека.

Каждый год, начиная с 2005 г., факультет ландшафтной архитектуры во время учебных практик по ботанике и физиологии растений проводит изучение состояния напочвенного покрова в лесопарках Москвы. Уже проведены детальные обследования в Хлебниковском лесопарке на планируемых территориях комплексного заказника «Алтуфьевский», природного заказника «Медведково», лесопарков «Измайловский лес», Кусково и Покровское-Стрешново. Здесь изучается видовой состав и обилие напочвен-ного покрова, отмечаются редкие и исчезающие виды, численность популяций которых достигла критического уровня в пределах Москвы. Главной целью таких исследований является создание нового экологического мировоззрения у студентов и развитие проек-тов по изучению и сохранению биоразнообразия городских лесов Москвы.

Тезисы

постерных

докладов

на русском

Применение ландшафтно-экологического анализа при планировании землепользования селитебных зон вокруг Москвы (на примере «Сколково»).

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Современные тенденции расширения границ поселений, городских округов до зон локализации хозяйственной деятельности возводят планировку и эстетику любых окультуренных ландшафтов в приоритетную цель ландшафтного планирования. Обеспечение устойчивого развития населенных мест напрямую зависит от активности и направлений градостроительных преобразований. Их эффективность и целесообразность должны определяться в процессе как социально-экономического, так и ландшафтно-экологического анализа.

Одинцовский район, на территории которого разместился инновационный город Сколково, является пригородом крупнейшего мегаполиса – Москвы, специфика которого состоит в высоких темпах разрастания урбанизированных территорий за счет сокращения природных ландшафтов и резком увеличении антропогенного прессинга.

Для обеспечения эффективного формирования «с нуля» всех основных компонентов (университет, техно- и бизнес-парки, общественные структуры и жилье) необходимо создание новой, более совершенной среды. Перспективные градостроительные потребности, которые станут основой жизни населения «Сколково», включают четыре позиции: экологичность, энергоэффективность, эргономичность и экономичность.

Эти требования проявились в проекте строительства и благоустройства территории под индивидуальное проживание в селитебной зоне «Сколково», в котором приняли участие наряду с инженерами и архитекторами специалисты-геоэкологи.

Исследуемый участок находится в старой дачной зоне на западе Москвы, в 1,4 км от МКАД и в 2,6 км от Минского шоссе — основных источников атмосферного и шумового загрязнения территории. Участок с севера ограничен руслом реки Сетуни — крупнейшего правого притока Москвы-реки.

В ходе предпроектных изысканий был подготовлен комплект тематических карт, отражающих основные результаты ландшафтно-экологического анализа: карта природоохранных режимов территории, 3D модель рельефа, карта уклонов поверхности и направлений поверхностного стока, карта состояния растительного покрова с перечетной подеревной ведомостью и итоговая ландшафтная карта участка с мероприятиями по рекультивации.

Отдельным направлением стали количественные измерения состояния компонентов среды. Были проведены лабораторные и полевые анализы проб поверхностных вод и почв участка на качественные характеристики и на содержание основных загрязняющих веществ, в том числе и по санитарно-бактериологическим и санитарно-паразитологическим показателям. Одновременно производилась оценка радиационно-экологической обстановки.

Таким образом, был получен ряд особо значимых выводов, которые легли в основу рекомендаций для строителей и ландшафтных архитекторов:

1. Высокая плотность древостоя и малая нарушенность почвенного покрова поддерживают высокий потенциал самоочищения ландшафтов и предохраняют участок от внешнего негативного воздействия. В целом, геоэкологическое состояние территории следует считать благополучным. Однако есть локальные природно-антропогенные особенности, негативно влияющие на перспективы экологически сбалансированного землепользования на территории.

2. Значительное падение рельефа на участке (от 2–3 до 15–20°) способствует активному развитию эрозионных процессов – формированию водосборных понижений и ложбин, аккумулирующих поверхностный сток, росту оврага. В связи с этим рекомендуется посадка древесно-кустарниковых пород, укрепляющих склоны, а также проведение дренажных работ по отведению поверхностного стока в коллекторы.

3. Дренажная система участка должна включать в себя ловчий канал по южной границе участка, перехватывающей поверхностный сток с обширной территории, расположенной выше по рельефу, коллекторы в овраге и ложбине стока, дренажные водосборные колодцы в днище оврага, конусе выноса ложбины стока со сбросом воды в реку, система ливневой канализации в соответствии с Генпланом застройки и ландшафтного благоустройства.

4. Высокие пороговые значения показателей загрязнения верхнего почвенного слоя патогенными микроорганизмами предполагают активную рекультивацию почв либо снятие слоя 30–50 см с заменой привозным грунтом. Изъятый грунт должен быть перемещен за пределы участка.

5. При проведении земельных работ, подготовке котлованов на территории прибрежной защитной полосы – вынос изъятого грунта за ее пределы.

6. Работы по озеленению участка должны быть согласованы с рекомендациями Перечетной ведомости существующих древесно-кустарниковых растений и развиваться в нескольких направлениях:

- максимальное сохранение условно коренной растительности в прибрежной защитной полосе, леса которой выполняют важную водоохранную функцию;
- вырубка, лечение, обрезка существующих насаждений;
- посадка «технологических» видов деревьев и кустарников в зонах проблемных зонах (склоны, понижения, места активных эрозионных процессов) и декоративных видов, согласно концепции Генплана ландшафтного благоустройства.

Спортивный парк «Варяг» — сочетание спортивных объектов и ботанического сада

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Спортивный парк «Варяг» располагается в центре г. Брянск, на территории естественного оврага. Общая площадь территории парка составляет 20 га, из них 8 га приходится на собственно спортивные сооружения, 12 га — на Ботанический сад. В основе создания и функционирования парка лежит принцип его круглогодичного использования, поэтому «Варяг» содержит комплекс открытых и закрытых спортивных сооружений. Территория парка имеет четкое зонирование с выделением собственно спортивных сооружений, озелененных участков и зон пассивного отдыха. Местоположение данного объекта позволяет большому количеству жителей и гостей города отдыхать на природе в черте города, благодаря чему уменьшается нагрузка на пригородные леса.

В настоящее время материально-техническая база спортпарка «Варяг» дает возможность заниматься многими видами зимнего спорта.

Каток с искусственным льдом и необходимыми вспомогательными помещениями предоставляет условия для занятий в спортивных секциях по хоккею, фигурному и синхронному катанию; четыре учебных горнолыжных склона с бугельными подъемниками, сноупарк и лыжная база — в спортивных секциях по горнолыжному спорту и сноуборду; лыжная трасса протяженностью 5 км и лыжная беговая база — в спортивных секциях по лыжному спорту. Летом — это трасса для пеших и велопрогулок. По территории, где проходит трасса, планируется проложить познавательные экологические тропы для пеших прогулок-экскурсий. Цель — сохранить зеленую зону в центре Брянска, превратить указанную территорию в уникальное место отдыха, физического и духовного развития населения и гостей города.

Указанные спортивные сооружения позволяют одновременно заниматься детям и молодежи в количестве 500 человек. Кроме того, планируется вести в строй следующие спортивные объекты: 1) дом спорта (8 залов), 2) скалодром, 3) веревочный городок.

Два искусственных водоема, удобный рельеф местности, соответствующий ассортимент растений — все это украшает парк и может служить основой для организации солярия, пляжа.

В основу ландшафтно-планировочной организации парка положен принцип сохранения уникального облика оврага, обогащение его дополнительными элементами, подчеркивающими его своеобразие.

Создаваемый Ботанический сад станет природоохранным объектом, основное направление деятельности которого — это создание специальных коллекций растений в целях сохранения биоразнообразия и обогащения растительного мира, а также осуществления научной, учебной, методической и просветительской деятельности.

Таким образом, создание уникального объекта, сочетающего в себе функции спортивного парка и ботанического сада, не только дополнит территорию города еще одной ухоженной зеленой зоной, но и, по замыслу, будет способствовать духовному и интеллектуальному развитию посетителей спортпарка «Варяг».

Преемственность садово-паркового наследия рубежа XIX– XX веков в современных условиях Поволжья

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Центральная часть правобережья Поволжского экономического района известна своим садово-парковым наследием рубежа XIX–XX вв., т. е. периода модерна в России.

Мной проведено исследование возможности использования технологий и элементов ландшафтной архитектуры периода Серебряного века для современного зеленого строительства. Результаты исследований показаны в табл. 1.

Таблица 1.

Преемственность технологий и элементов садово-паркового наследия России и Поволжья рубежа XIX–XX вв. для современного зеленного строительства

№ п/п	Название основных элементов, технологий, приемов и т.п., применяемых в России в «Серебряном веке»	Использование элементов, технологий и т.п. периодарубежа XIX–XXвв. в Поволжье	Наличие преемственных связей в настоящее время в Поволжском экономическом районе
1.	Рулонные газоны	нет	>
2.	Живые изгороди из:	да	да
	– кизильника	да	^
	– караганы древовидной	да	очень мало
3.	Альпийские горки и каменные сады	да	^
4.	Выращивание луковичных растений	мало	>
5.	Древесно-кустарниковые насаждения в контейнерах	да	<
6.	Ковровые и узорчатые цветники	да	нет
7.	Вертикальное озеленение:	да	да
	– террасы и входы	да	^
	– беседки	да	^
	– скамьи	да	<
8.	«Цветочный» сад	да	нет

9.	Кохия в цветниках	да	^
10.	Круглые клумбы с фонтаном	да	нет
11.	Душистые клумбы и рабатки	да	мало
12.	Цветочные куртины	да	^
13.	Канны как доминанты в узорчатых цветниках	да	<
14.	«Вертикальные» объемные цветники	да	нет
15.	Однопородные куртины кустарников	да	мало
16.	«Цветные» аллеи	да	нет
17.	«Экономические» сады	да	<
18.	«Романтические» места	да	^
19.	«Мягкие» контрасты	да	<
20.	Эмблематичность в планировке	да	нет
21.	Личные символы (деревья, посаженные владельцем и в честь него, клумбы, пруды и т.п.)	да	<
22.	Спортивные площадки в планировке	нет	>
23.	Зимние сады	мало	>
24.	Дендрарии	да	^
25.	Топиарные формы из кустарников	мало	>
26.	Омолаживание и прививка деревьев	да	^
	> — преемственностьроссийских технологийв настоящее время		
	< — частичнаяпреемственностькак с российских технологийпериода концаXIX–нач. XX вв., так и стехнологий и элементовПоволжья		
	^ — полнаяпреемственностькак российскихтехнологий периода концаXIX–нач. XX вв., так итехнологий и элементовПоволжья		

Установлено, что ряд исторических садовых элементов и технологий успешно применяется в настоящее время в исследуемом регионе. Однако часть их утрачена, хотя именно она является важным художественным звеном в оформлении общественных зеленых пространств.

Особенности культурного ландшафта в территориальной планировки Татищевского района Саратовской области

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Культурный ландшафт — исторически равновесная система, в которой природные и культурные компоненты составляют единое целое и не являются только фоном или фактором воздействия одного элемента этой системы на другой. В качестве культурно-ландшафтных феноменов Татищевского района Саратовской области рассматриваются дворянские усадьбы, культовые места, археологические комплексы, исторические сельские ландшафты. При этом историко-культурное и природное наследие является опорным каркасом культурного ландшафта района,

в котором объекты наследия выступают ядрами концентрации. Основными здесь являются садово-парковые комплексы в с. Полчениновка (бывший владелец помещик А. Н. Минх, площадь комплекса 8,2 га), в д. Губаревка (вывший владелец дворянин А. А. Шахматов, площадь комплекса 19,7 га.) и в с. Большая Ивановка (вывший владелец помещик С.П. Корбутовский, площадь комплекса 5,6 га). Каждая из этих усадеб имела определенные национальные корни, то есть или ее хозяин, или садовник в ней по происхождению были немцами. К тому же у этих комплексов существовали тесные экономические и культурные связи. Следовательно, сохранение такого садово-паркового наследия гарантирует преемственность поколений.

На основе усадебных комплексов необходимо создать природно-исторический парк, охватывающий близко расположенные исторические памятники (садово-парковые комплексы), то есть обеспечить компактное размещение охраняемых объектов. Организация такого природно-исторического парка позволит спасти ценнейшие историко-культурное наследие как целостный архитектурно-ландшафтный и культурный ансамбль. В природно-историческом парке предусматривается охрана и восстановление как памятников истории и культуры, так и окружающего исторического антропогенного, природного или традиционного сельского ландшафта, который также рассматривается как важное национальное достояние. Как и в случае малых населенных пунктов, при возрождении этих усадебных комплексов должен применяться ансамблевый принцип и индивидуальное проектирование каждого объекта.

Нами был проведен анализ древесно-кустарниковых насаждений (рисунок 1).

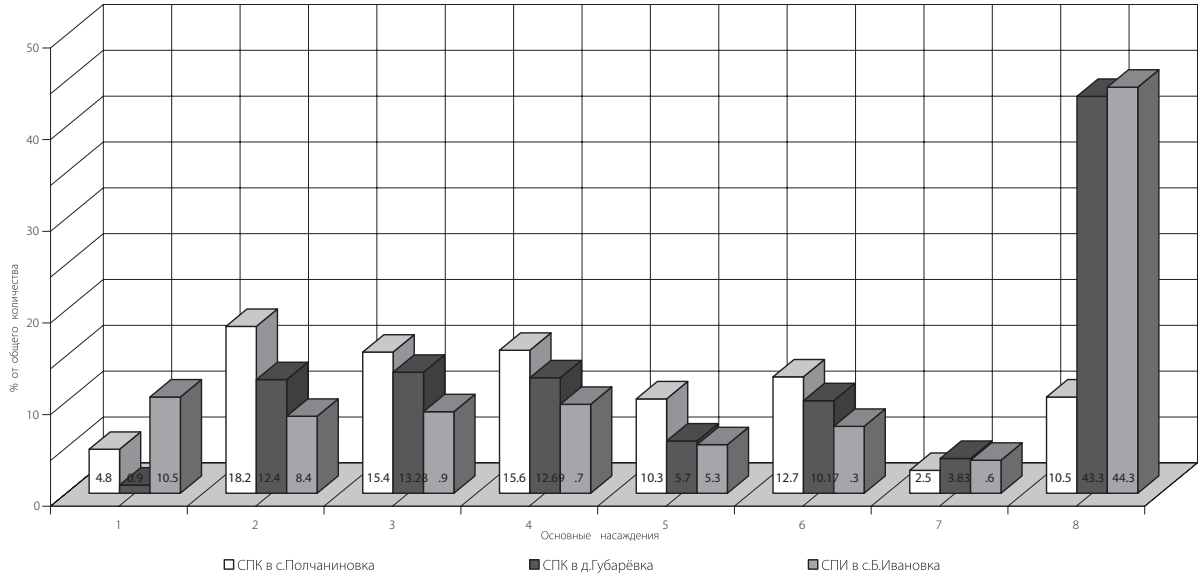

Рисунок 1 1 — сосна обыкновенная; 2 — дуб черешчатый; 3 — липа мелколистная; 4 — клен остролистный; 5 — береза бородавчатая; 6 — яблоня домашняя; 7 — сирень обыкновенная; 8 — другие древесно-кустарниковые насаждения

Установлено, что преобладают *Quercus robur* L. и *Tília cordata*, а в качестве акцентов применялись хвойные деревья — *Pínus sylvestris*. Поэтому сделано более детальное исследование этих старых деревьев (таблицу 1).

Таблица 1

Таксиционная ведомость исторических садово-парковых комплексов основных вековых деревьев

Название основных, исторических пород деревьев	Основные исторические садово-парковые комплексы														
	с. Полчаниновка (усадьба Минха)					д. Губарёвка (усадьба Шахматова)					с. Б. Ивановка (усадьба Корбутовского)				
	Высота, м	Диаметр ствола, см	Возраст, лет	Бонитет	Кол, шт.	Высота, м	Диаметр ствола, см	Возраст, лет	Бонитет	Кол, шт.	Высота, м	Диаметр ствола, см	Возраст, лет	Бонитет	Кол, шт.
Сосна обыкновенная	20,9+23	60+100	150+250	III	10	20,9+23	31,7+50,2	150+220	III- IV	4	20,9+25	31,7+50,2	130+220	III- IV	40
Липа мелколистная *Tília cordata*	16+21,7	52+60	130+220	IV	43	18,2+20,1	52+60	130+220	IV	22	16+18	55+65	130+220	IV	38
Дуб черешчатый *Quercus robur* L.	23,0+26,8	30+85	120+220	III	56	18,0+22,4	30+80	130+220	IV	40	16+20,8	32,8+80	130+200	III- IV	60

Таким образом, обследования садово-парковых комплексов Татищевского района позволяют сделать выводы и дать рекомендации.

1. Установлено, что культурный ландшафт представлен историко-культурным парком и имеет компактный характер размещения.

2. Выявлено, что все представленные садово-парковые комплексы района имеют давние экономическими связи.

3. Определено, что рельеф местности на всех садово-парковых комплексах-пересеченный и имеет развитую гидрологическую сет.

4. Установлено, что средообразующими породами являются *Quercus robur* L. (13 %) и *Tília cordata* (12,5 %), а в качестве акцентов применялась *Pinus sylvestris*.

5. Рекомендуется создать на основе обследованных садово-парковых комплексов познавательно-рекреационный комплекс Поволжского экономического района с культурно-рекреационным центром в с. Полчаниновка.

6. Рекомендуется провести восстановительные работы исследуемых садово-парковых комплексов, а именно: санитарные и формовочные рубки, очистку территории от мусора, реставрацию дорожно-тропиночной сети и водоемов. Кроме того, необходимо организовать площадки, подъезды, стоянки, а также гостиничный комплекс в с. Полчаниновка.

Современные аспекты сохранения усадебных парков Центральной России[1] XVIII-XIX вв.

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Согласно Перечням объектов культурного наследия и ООПТ, на учете органов исполнительной власти, уполномоченных в области охраны, сохранения и популя-

1 Под Центральной Россией мы подразумеваем в данной работе Центральный федеральный округ.

ризации объектов культурного наследия состоит около 3000 усадебных парков. В настоящее время к ним обращаются все чаще — объективные данные свидетельствуют о том, что многие парки утрачены. Еще больше парков, располагающихся вдали от туристских маршрутов, забыто.

В основу настоящей работы положены результаты натурного обследования усадебных парков (154) и сведения о парках, состоящих на учете. Анализ современного состояния парков позволил выделить следующие типы по степени сохранности (рис. 1, стр. 153):

1) высокая степень — сохранился и архитектурный ансамбль, и парк, а также окружающие его лесные и сельскохозяйственные земли;

2) средняя степень — а) практически сохранился усадебно-парковый комплекс и полностью — окружение; б) частично сохранился усадебно-парковый комплекс и окружение;

3) низкая степень сохранности — сохранились элементы планировки или редкие породы деревьев и частично — окружение;

4) усадебно-парковые комплексы утрачены — материальных носителей наследия нет, сохранились сведения в исторических документах.

Большинство парков сохранилось в средней степени (49%) — Торбеево, (Смоленская область), Омофорово (Владимирская область), Николо-Жупань, Дворяниново (Тульская область) и т.д. (рис. 2, стр. 154). Доля сохранившихся парков составляет 25,5% (Александровское, Величево (Смоленская область), Алексеевское (Ивановская область) и т.д.

Усадебные парки — одни из наиболее сложных объектов наследия с точки зрения их сохранения. Во-первых, старинные парки обладают огромным познавательным и культурно-историческим потенциалом, обогащают нас знаниями о природе и культуре родного края, развивают эстетически и нравственно. Ряд усадебных парков связан с именами людей, игравших видную роль в истории и культуре: Ясная Поляна, Кобылинка (Тульская область), Спасское-Лутовиново (Орловская область), Красный Рог и Овстуг (Брянская область), Карабиха (Ярославская область), Марьино (Курская область) и др.

Во-вторых, растительность и водные объекты при отсутствии постоянного ухода со стороны человека начинают восстанавливаться естественным путем (зарастать, загущаться и т.д.), что приводит к деградации всего культурного ландшафта и утрате его пейзажа, созданного согласно замыслу архитектора (рис. 2–5, стр. 154).

В-третьих, неопределенный правовой статус и проблемы финансирования создают трудности в разработке политики сохранения, выработке мероприятий по охране, использованию, что снижает эффективность управления этим видом наследия.

Парки многих старинных усадеб благодаря уникальным растительным сообществам и видам растений объявлены ботаническими памятниками природы, и, таким образом, являются ООПТ, — это парки в усадьбах Алексино, Вонлярово, Высокое, Герчики, Липецы, Рай, Пречистое, Приютино и др. (все в Смоленской области). Большая часть усадебных парков относится к памятникам садово-паркового искусства, при этом постройки охраняются как памятники архитектуры. Очевидно, составляющие усадьбы находятся в ведении разных министерств.

По данным Росохранкультуры (до упразднения), общий объем инвестиций, необходимый для восстановления уцелевших усадеб (включая и парки), составляет 85 млрд дол. Федеральный бюджет по целевой программе «Культура России» за период 2006–2011 гг. выделял средства, но их недостаточно. Так, на реставрацию усадьбы Нечаевых-Мальцевых (Полибино, Липецкая область) требуется 25 млн руб., а в 2011 г. из федерального бюджета выделено 4 млн 890 тыс. руб. Некоторые положительные сдвиги наблюдаются при передаче их в частную собственность. Так, НП «Русская усадьба» совместно с новыми собственниками ведет работы по обследованию и реконструкции Знаменского-Раек (Тверская область, Группа компаний «КОНКОР»), Ахлебинино (Калужская область), Богданово-Витово (Костромская область, страховая компания «МАКС»), Батыево (Ивановская область, предприниматель А. Смирнов), Варварино (Владимирская область); усадьба Стеблево (Московская область) восстанавливается потомками владельцев Егоровых (используется как частная резиденция).

Проведенное исследование показало, что намечаются следующие тенденции в решении проблемы сохранения: 1) продолжение работ по составлению реестра усадебных парков; 2) более активное привлечение бизнеса и частных лиц к охране наследия с определением режима пользования территорией парка; 3) четкое определение статуса охраны и типологической принадлежности парка.

Бульвары как связующий компонент структуры зеленого каркаса города

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Современные экономические, экологические и социальные условия определяют новые концептуальные подходы к развитию городской системы зеленых насаждений.

Обобщение и анализ теоретических разработок и опыта по проектированию систем городских насаждений позволяют определить их структуру в виде протяженных массивов, объединенных в единую систему озелененными линейными пространствами, существенной частью которых могут стать бульвары, организованные в соответствии с требованиями к современным ландшафтным объектам.

Бульвары — наиболее ранние традиционные городские общественные озелененные пространства, на систему их устройства могли оказать влияние искусственные элементы ландшафта.

Так, в процессе реконструкции старых городов при сносе крепостных укреплений бульвары проектировались по кольцу крепостных стен, поэтому современные бульвары имеют радиальную структуру. В случаях, когда бульвары были сопряжены с «линейными» городскими пространствами, они сопровождали центральную ось города и, как правило, пересекали его историческую часть, организовывались на месте каналов, рек, оврагов, рвов, располагались на набережных или выходили на набережные.

Со временем сложился своеобразный планировочный тип бульвара, состоящего из двух частей: транзитной (как правило, это главная аллея, предназначенная для быстрого перемещения) и прогулочной (система сопутствующих аллей и площадок, предусматривающих возможность спокойного отдыха). Большая ширина бульвара давала возможность изолировать площадки отдыха от транзитного пешеходного движения.

На старинных бульварах преобладали насаждения, представленные рядовыми посадками деревьев и куртинами кустарников. Активно использовалось цветочное оформление.

Современная роль бульваров не однозначна.

Частично сохранившиеся бульвары, особенно расположенные по оси улицы, не защищают тротуары и здания от пыли, выхлопных газов автомобилей и шума. Кроме того, насаждения бульваров в изменившихся условиях деградируют, и говорить о выполнении ими необходимых функций не представляется возможным.

Современные бульвары утратили исторические пропорции и представляют собой довольно узкие, часто фрагментарные линейные структуры с одной осью в виде аллеи, иногда разделенные на две-три полосы пешеходного движения, или вовсе без каких-либо прямолинейных осей. При существующем интенсивном движении транспорта подобная структура не обеспечивает современных требований безопасности пешеходов, поскольку переход с тротуаров на бульвар затруднен, что также усложняет и движение самого транспорта.

Сложнейшие проблемы современных городов — возрастающая интенсивность транспортных потоков, высокие темпы строительства, уплотненная застройка — решаются за счет площадей зеленых насаждений и приводят, в том числе, и к потере существующей системы бульваров.

Концепции развития современного города предусматривают необходимость формирования единой системы зеленых насаждений — так называемого «зеленого каркаса» города. Линейной основой такого каркаса могут служить бульвары, организованные вдоль набережных рек, каналов и водоемов, насаждений магистралей, улиц и пешеходных зон, соединенные в единую сеть.

Подобная развитая сеть озелененных пешеходных и транспортных связей, проникая вглубь городской территории, позволит не только объединить городские ландшафтные объекты в действующую систему, но и обеспечит связь с пригородной лесопарковой зоной.

Чрезвычайно актуально возрождение роли бульваров как активных пешеходных зон в системе городских ландшафтных объектов для создания повышенных комфортных условий на ключевых участках транзитов. Развитие системы разноуровневых бульваров, изолированных от транспортных потоков, обеспечит возможность развития беспрепятственных пешеходных коммуникаций различного типа — прогулочного, делового, туристического и пр. Это также создаст предпосылки для формирования структур бульваров более сложного порядка, включающих, наряду с насаждениями, центры и объекты самого различного назначения.