Swedish University of Agricultural Sciences
Faculty of Landscape Planning, Horticulture and Agricultural Sciences
Department of Landscape Architecture, Planning and Management

# Sustainability principles for St. Petersburg landscape with Scandinavian experience in mind

## Application of Swedish Green Space Research Result of “The Eight Characteristics”

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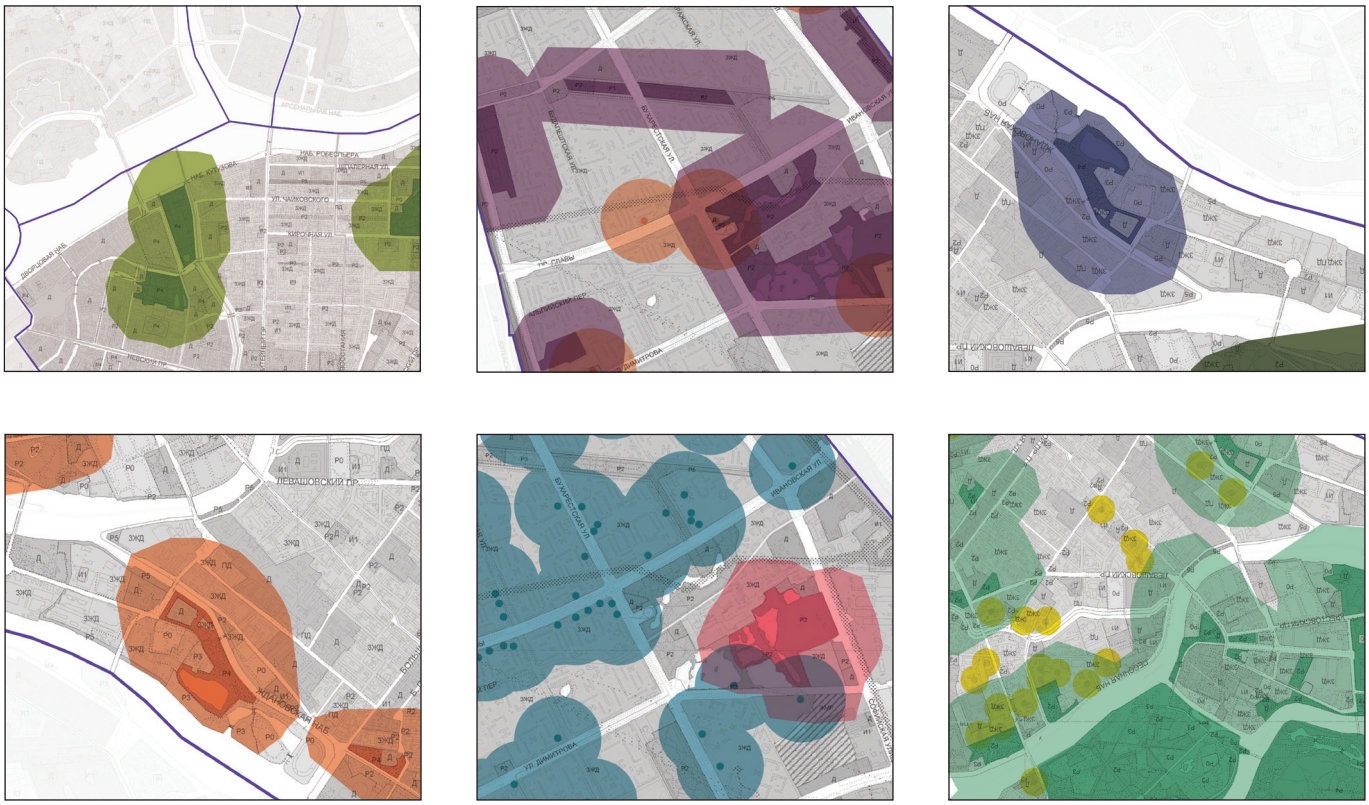

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# ABSTRACT

Today the need of the rest is playing more and more important role for human beings in the rapidly growing region such as St. Petersburg. The increasing interest in more sustainable development of the society with the respect to future generations appear among the inhabitants and city planners more frequently. Urban green spaces play an important role for the social, ecological and economic quality aspects of sustainability by enhancing feelings of psychological well-being and by improving the social and environmental conditions.

Modern classification of urban green space in St. Petersburg has roots in the Soviet Union system. The utmost importance during the Soviet Times was given to creating urban green spaces according to the functional needs of residents, public health and high aesthetical qualities of place. Therefore introduction of "The Eight Characteristics"(result of Swedish green space research) into the St. Petersburg urban green space classification at least can provide different perspectives in the modern relationships between human beings and natural environment in the cities and by this can lead to changes in the development of St. Petersburg green structure.

The main purpose of this master project is to discover how it is possible to improve relevant qualities of well-being in St. Petersburg through analyzing urban green space with both Classification of St. Petersburg urban green space and "The Eight Characteristics" and to explore people's preferences and needs perceived within the outdoor urban green spaces in the city.

To achieve these, the theoretical background is based on the literature study. The thesis discusses the influence of the urban green spaces on the sustainability of the cities in general, nature impact on public health with overview of different researches for the last decades. An investigation into the feelings and needs perceived within the outdoor urban green spaces in St. Petersburg shows that it is not only my own ideas defining an issue, but also other people's thoughts of essential improvements in urban green spaces in the city. A case study of the target area gives an understanding of the existing situation with land use, availability of urban green spaces and qualities which they can provide for visitors. Analyses with both classifications show strengths and weaknesses of urban green space qualities for St. Petersburg area.

The situation with "The Eight Characteristics" in St. Petersburg has been discussed and some suggestions and proposals on enriching the St. Petersburg urban green space classification have been given to introduce more experience qualities of urban green spaces into the planning system of St. Petersburg.

Key words: sustainable development, sustainability, urban green space, well-being, the eight characteristics, St. Petersburg, Russian Federation.

I dedicate this master thesis to my parents, Iurii and Zoia, who growth me with love to nature and for their encouragement, love and support during my long way to this final thesis.

*Silviia Aleksandrova*

# CONTENT

I grew up in a city with 5 million inhabitants - St. Petersburg, Russian Federation. I spent my childhood in a village due to my parents wish to raise a strong healthy child with love of nature, then we moved back to the city for better educational opportunities. It was a big change from rural environment to the urban. For instance, there were not so many places around the house to spend my spare time outside, the nearest park was 800 meters away and was little more than a playground from the Soviet time. I felt stressed during the first years, because of the changes. However later I fit in the harsh city environment and now feel like I belong to the place.

The emphasis of the urban green space planning system during the Soviet time was on the functional needs of the place, aesthetic qualities of place and activities which this place can provide for residents. In recent years, there has been a growing feeling that changes are needed in the urban green space planning system which has developed in St. Petersburg. There are two existing classification of urban green space in St. Petersburg: according to the St. Petersburg Master Plan and according to St. Petersburg Green Space Act. Both are similar and could be merged into the one with 7 specific groups (Sport facilities and beaches area; Forest and parkland area; Green areas for common use and restricted green areas; Area for recreation and sport activities, leisure and entertainment, tourism and spa treatments, hotels and guest houses, summer residences; Historical parks, palaces and gardens area; Green area which serves for special functions; Block green belts.). There has been a resurgent interest in sustainable development which represents part of a wider international movement that looks for the improvement of quality of life by creating new types of urban green space that are cost-effective and yet highlight design for people with features for improving their well-being. There are several theories about the nature impact on public health were created over the last decades: Psycho-evolutionary theory by R. Ulrich with the emphasis that exposure to natural surroundings fosters health recovery and reduces stress; Attention Restoration Theory by R. Kaplan & S. Kaplan argues that natural environment provide an individual with opportunities for restoration from mental fatigue; and many others which will be mentioned subsequently.

Swedish results of "The Eight Characteristics" research presents the 8 room characteristics of urban green space which visitors can experience (*Serene; Wild; Lush; Spacious; The common; The Pleasure Garden; Festive/Centre; Culture*). I decided to keep the interpretation of them for present work according to Grahn and others (Table 1, page 12) with one exception for the *Spacious* due to the unfamiliar landscape of beech forest for St. Petersburg inhabitants. Thus it was changed for forest meadow in a conifer boreal forest. The rest of the characteristics have not been changed. Result of the research shows how people use, appreciate and perceived the urban green space and which benefits they can get from the visits to urban green spaces. If we can reduce stress we can cut large costs for the society, companies and the people and families concerned for an unhealthy living. Visiting large parks have shown to be a most effective way to reduce cost, and thus an ingredient for sustainability.

The most well known definition of sustainability has been created as a part of the sustainable development concept in 1987 by the Brundtland Commission of the United Nations. According to this concept, sustainability is "*...development that meets the needs of the present without compromising the ability of future generations to meet their own needs*" (World Commission on the Environment and Development, 1987). This is a complex concept and has been created from environmental context and further developed with economic and quality of life contexts.

Sustainability principles in the sense of social aspects can be applied to modern cities, but it is still not clear how to improve the social part of sustainability by improving qualities of urban green space. How can you create a pleasant environment which incorporates different outdoor activities and stress relief?

In a healthy, livable and sustainable city, urban green spaces play an important role. They can help to improve quality of life, mitigate the harsh city climate and reduce stress. If you feel well, you can have more empathy for people around and for yourself, you work better and you improve your overall quality of life. These values are very important in modern people's lives and they will become even more important in the long term for future generations.

After several years of study and work in St. Petersburg, two years of studying in Sweden and travelling around the Scandinavian countries I can say that a lot of improvements in urban public space have taken place in the city, but yet many positive improvements can still be done. In order to make my input in these improvements, I am going to analyze St. Petersburg's urban green space. I hope to discover how to improve sustainability by improving qualities of urban green space. I believe that the Scandinavian experience with its similar climate condition and geographical position might be a good example for landscapes of St. Petersburg.

## AIMS AND OBJECTIVES

The main purpose of this master project is to discover how to improve the relevant qualities for well-being in St. Petersburg through analyzing urban green space with both the Classification of St. Petersburg's urban green space and the research into The Eight Characteristics of Swedish green space.

To see how is possible to improve the social aspect of sustainability by improving the qualities of urban green space. For example, urban green spaces in the city not only have an aesthetic value, they also create a good microclimate and offer social benefits such as meeting places.

Analyze a part of St. Petersburg's urban green infrastructure and people's preferences and feelings towards urban green space.

Planning system in St. Petersburg requires more than just a functional organization of urban green space according to the human needs and city planning purposes. It also requires a perspective of environmental psychology in order to encourage people spend more time outside and to have a positive impact on human health.

## METHODS

Development of theoretical background through study of relevant literature.

Comparison of methods used in Sweden with the existing method used in St. Petersburg (existing St. Petersburg Master Plan and St. Petersburg Green Space Act). Inventory of three districts of St. Petersburg to discover the existing situation and analyze it using the 8 characteristics of urban green space from Swedish practice. Some field work together with analyzing and interpreting the data from different planning documents.

Questionnaire for St. Petersburg residents and visitors about psychological feelings and needs of outdoor green space in St. Petersburg using a combination of quantitative and qualitative research methods. The form of the survey is a web-questionnaire with both multiple choice and open-ended questions which aims to discover and understand people's preferences and feelings towards urban green space. The questionnaire consists of 14 questions and is be divided into two parts: the first part includes questions about the personal details of the respondents such as sex, age, career field, location; the second part focuses on the respondents' preferences towards certain urban green space qualities and their motivations and expectations of urban green space in the city. The questions are mostly multiple choice with the opportunity to make individual comments, but the last question is open-ended with the aim of discovering participants' opinions about improvements of urban green space.

The situation with "The Eight Characteristics" in St. Petersburg will be discussed and some suggestions and proposals on enriching the St. Petersburg urban green space classification will be given to introduce more experience qualities of urban green spaces into the planning system of St. Petersburg. Theoretical discussion on how to reach a sustainable city, reflection and conclusion.

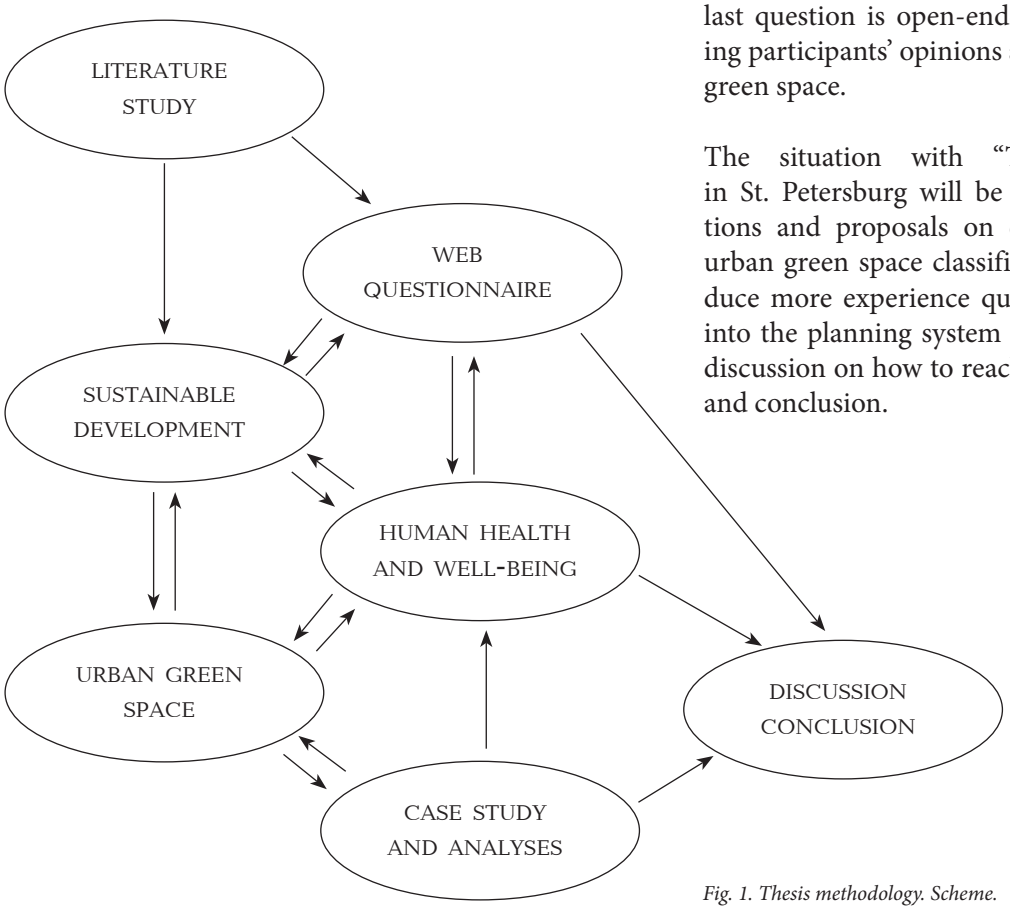


*Fig. 1. Thesis methodology. Scheme.*

## Sustainability concept.

*"Our biggest challenge in this new century is to take an idea that seems abstract – sustainable development – and turn it into a reality for all the world's people."* –
Kofi Annan, UN Secretary-General, (2001)

The most well known definition of sustainability has been created as a part of the sustainable development concept in 1987 by the Brundtland Commission of the United Nations. According to this concept, sustainability is "...development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (World Commission on the Environment and Development, 1987). This is a complex concept and has been created from environmental context and further developed with economic and quality of life factors.

At the large United Nations summit in Rio de Janeiro in 1992, the Agenda 21 was signed. It was a new understanding of the concept which highlighted three important quality parts of sustainability: ecological, social and economic (UNCED, 1992). (Berg, 2010).

Urban green spaces can contribute to the social and ecological quality aspects of sustainability by enhancing feelings of psychological well-being and by improving the ambient social and environmental conditions. By this, urban green spaces also can contribute to the economic aspect of sustainability. Let's take a closer look at the impact of urban green space to each aspect of sustainability.

Urban green spaces provide multiple benefits for the sustainability of modern cities; for example they have a positive impact of the city microclimate. Their ecological function includes: increasing of biodiversity; CO2 binding (catching the particles which can have a harmful effect for human health);slowing down rain water; erosion control; making the air humid: sound control; shading and therefore reducing of "heat island" effect (Konijnendijk et al., 2005). "The term "heat island" describes built up areas that are hotter than nearby rural areas. The annual mean air temperature of a city with 1 million people or more can be 1.8–5.4°F (1–3°C) warmer than its surroundings. In the evening, the difference can be as high as 22°F (12°C). Heat islands can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality, and water quality." (EPA, 2013).

Urban green spaces offer a wealth of recreational opportunities, can significantly improve the home and work environment and also provide opportunities for meeting places. They have an impact on not only human physical and mental health but also on a city's cultural and historical value. By these factors they also boost the social part of sustainability for the city (Konijnendijk et al., 2005). European researchers Patrik Grahn and Ulrika K. Stigsdotter in their work "The relation between perceived sensory dimensions of urban green space and stress restoration" mentioned the previous investigations by Gehl and others that the most interesting object for people is other people. The social aspect plays an important role for a sustainable, successful city. For this reason it is of great importance to have an easily accessible meeting places which have good quality recreation. People can meet, recreate themselves and look at other people activity (Grahn and Stigsdotter, 2010).Several studies from the USA have shown that urban green space can help to reduce social isolation and improve the social contact with neighborhoods (Konijnendijk et al., 2005).

Urban green spaces also have an impact on the economic part of sustainability. As was mentioned above they affect the air conditioning costs by reducing the "heat island" effect, air pollution and greenhouse gas emissions. They can provide tourism opportunities as well. Moreover they have an impact on human health and all of these positively influence the economic aspect of sustainability.

We experience stress in our everyday life in the cities. According the World Health Organization report (2008) which is also mentioned by Grahn and Stigsdotter (2010), stress-related illnesses already have become one of the biggest global problem. They claimed that stress has a detrimental effect on human health if it cannot be reduced. If the body is under prolonged stress, it changes a lot; for instance by increasing of blood pressure and even more harmful effects such as causing type II diabetes (Grahn and Stigsdotter, 2010). These health problems affect the human ability to work and communicate with other people, which can cost the economy money through healthcare costs and lost work days. Urban green space in turn provides a great range of opportunities for reducing stress and restoring people's health and well-being by its different qualities (Grahn and Stigsdotter, 2010).

## Health and Well-being.

*"One of the most important resources for a sustainable development is promoting human health"*
(Grahn et. al., 2005)

According to the World Health Organization (WHO), health is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. Health is a resource for everyday life, not the object of living. It is a positive concept emphasizing social and personal resources as well as physical capabilities" (WHO, 1948). This definition is widely distributed all over the world since its publication in 1948. It describes health as a positive, almost unrealistic and utopian, which doesn't seemsensible for modern everyday life. However for the purposes of this thesis, health has a holistic concept. The complex relationships between individual's mind, body and surroundings has been a matter of opinion for a long time. From ancient civilizations up till now there have been findings showing such a strong relationship between mind and body that the influence of emotional experience on body function can be directly measured (Grahn & Stigsdotter, 2003). To maintain a healthy state of mind and body, the individual should be more responsible for their own health by taking ownership oftheir life-style, social environment and physical environment and a collective network of different professionals should work on things which is not are under the individual control such as improving of social and environment requirements for physical, mental and social well-being (Nilsson et al., 2011).

## Man and nature.

Many indicators of nature's impact on public health have appeared over the centuries in different cultures. However, until the 1980s, the theories surrounding nature's impact on human health were not so deeply investigated. From then on the theories on nature's impact began developing. Research is based mostly on the context of environmental psychology and landscape architecture and later has been influenced by research from different disciplines dealing with human and public health (Annerstedt, 2011). Current research has given evidence that people have better health and well-being when they have contact with nature. Nature is vital for human well-being and affects human health in a variety of ways. According to Ulrich (1999) gardens have a positive impact on people.

Different kinds of research over the last decades show that man-made surroundings with a poor design quality can cause a harmful effects on human health such as elevated blood pressure, sleeplessness, delirium and others. In contrast, good environmental design of green spaces can lower blood pressure, patient anxiety and lessen pain (Ulrich, 1999).

According to Grahn and Stigsdotter (2003) nature can provide an environment for stress reduction which is valuable for modern cities as a stress is a large part of everyday life. Stress-related illnesses are one of the biggest problems in the modern society, they cause a high amount of money taken on rehabilitation from mental exhaustion. Nature as well as physical activity can reduce the level of mental exhaustion. Also, alcohol may reduce the level of stress (Sayette, 1999) by its influence on level of cortisol hormone (Badrick et al., 2007). This hormone is included in a normal stress reaction by increasing during exposure to stress along with other hormones, like adrenalin and melatonin. Physical exercises as well as exposure to daylight reduce stress by regulation of hormone levels (Grahn & Stigsdotter, 2003).The question is what is more healthy? Is there a healthy way to reduce mental fatigue? Definitely there is such as way - nature. Nature offers a wide range of possibilities to improve health quality and to reduce mental exhaustion. Theoretical approaches on the nature impact on human health will be shown later.

## Theoretical approaches.

There have been two substantial strands of research on restorative environments from the 1980s. Both of them have roots in the psychological values of the natural environment, but are also connected with theories about health, stress and mental exhaustion. They complement each other, but are operating from different academic points of view. Stephen and Rachel Kaplan adduced Attention Restoration Theory (ART). This theory is about the health benefits of restorative exposure towards nature and how it can improve the individual health in case of attention fatigue. Roger Ulrich proposed a psycho-evolutionary theory. This theory is about the effects of experiences with nature on human health by their positive emotional and psychological effects.

## Psycho-evolutionary theory.

Roger Ulrich in his psycho-evolutionary theory pointed out that exposure to natural surroundings offers an opportunity for positive emotions and reduces negative feelings, fosters health recovery and reduces stress. Stress in this theory is conceived a threat for the emotional part of well-being (Ulrich, 1991, as referenced in Hartig et. al., 2011, p. 149). Ulrich argues that people generally prefer natural environments in contrast to urban, due to the evolution of human kind people are more psychologically adapted to nature (Ulrich et al., 1991). Ulrich believes that the first response from humans towards nature and landscape is an emotional response. In his opinion emotions appear before thoughts and individual can feel something before he or she think about it. Thus exposure towards nature and landscape can influence the emotional part of well-being in a positive way, but it relies heavily on individuals preferences of natural surroundings. In his "Effects of gardens on health outcomes: theory and research" (Ulrich, 1999) he collected significant scientific evidence of nature's positive impact on human health; mostly this evidence was about the experiments on patients of healthcare facilities. The most well-known of Ulrich's works is "View through a window may influence recovery from surgery" (1984). He argues that the natural features such as a grove of trees may influence the patience's recovery from surgery in a good way compared to the patients who had only a brick wall in front of the window. For example he writes: "*the records showed that patients with window views on the trees spent less time in the hospital than those with views of the brick wall: 7.96 days compared with 8.70 days per patient*" (Ulrich, 1984, p. 420). He suggests that these results might be implemented during the design of healthcare facilities with an aim to shorten the time of a patient's recovery from surgery, improving their health quality and giving cost savings for medical care. Therefore Ulrich shows evidence of the theory that nature fosters recovery from stress, not only attention fatigue.

## Attention restoration theory (ART).

This theory is partly based on the work of an earlier psychologist-philosopher - William James. He defines two types of attention - voluntary and involuntary. The Kaplans theory is focused on the restoration from the attention (mental) fatigue. According to the Kaplans there are two types of attention. The first type is "*involuntary*" attention which is brought to mind by something fascinating or interesting in the surroundings. This type of attention does not require an effort. It also has its own limits such as individual's preferences what is interesting in the environment and what is not interesting. The Kaplans replace James' "*involuntary*" attention with the term "*fascination*", because this term is more clear to comprehend and not to be confused in James' terms of "*voluntary*" and "*involuntary*" attention . Interestingly, that the Kaplans divide "fascination' into "*hard*" and "*soft*" which are require and do not require attention. "*Soft fascination*" according to authors plays a key role in restorative experience (Kaplan, 1995; Kaplan, 1992, p. 66). The second type of attention is "*directed*" attention which is requires an effort - in contrast to "*involuntary*" attention. This type of attention has an impact on mental processes and forces the individual to think, solve problems and make plans. "*Directed*" attention is under the individual's control. The major limits of this kind of attention is that the effort is not endless, after some time the individual starts to have problems with paying attention to something important and he or she starts to suffer from fatigue (Kaplan, 1992, p. 66).

During the last decades the amount and scope of information available around the world has increased rapidly. Any information which the individual gets from the environment has to be understood by the individual. In their work "The experience of nature "the Kaplans (1989) write about two major needs of human beings: the need to understand and the need to explore. Without a possibilities to understand and explore information from the surroundings individual became lost and unsure about her or his role in the environment. The Kaplans argue that "*even reasonable, kindly people can become hostile and angry when cannot comprehend material that seems to be necessary to functioning*" (1989, p. 51).

Today the need of rest is playing a more and more important role for human beings. In concordance with the Kaplans theory of "*restorative experience*", people have a models of the world which they need to follow to feel good and if they cannot run these models easily, they became fatigued. What can help to run the model naturally? According to the Kaplans, the natural environment is rich in characteristics for restoration. From the research they found out four vital aspects of "*restorative experience*" which can support in restoration from attention fatigue. This aspects are "*being away*" which means

avoiding mental activity and somehow relaxation; "*extent*" which could be a well setting of the environment with diverse and scope characteristics; "*fascination*" which is explaining individual's mental attention and a point of focus that individual can have for an object such as view of nature for example; "*compatibility*" which is about individual's expectations of the environment together with suitable for these expectations environment. Obviously these four aspects in the context of the natural environment and landscape can provide an individual with opportunities for restoration from mental fatigue (Kaplan, 1992).

## Research on Eight Characteristics.

During the last decades of research in Alnarp, Sweden, the investigation on the relationship between people's preferences and green areas has been developed. The results show how people use, appreciate and perceive the urban green space and which benefits they can get. Researchers from the field of landscape architecture have identified several spatial characteristics of urban green spaces which can provide a visitors with an experience which is valuable for their health and well-being. The health promoting effect is a big advantage of urban green spaces, due to its independent effects on people; these effects are equal for everyone regardless of their gender, age, race or socioeconomic circumstances. Thus urban green spaces can be an important part of sustainable development in the modern cities (Grahn et. al., 2005; Stigsdotter, 2005).

Some urban green spaces are more visited then the others. Therefore urban green space should have some basic spatial characteristics which can provide a different kind of experience for visitors and by this to be more attractive and thus more frequently visited. It is important for landscape architects to recognize these basic characteristics and use them in the designing and planning of urban green spaces for visitors health and well-being. Consequently these eight basic characteristics were concluded over several years of research at SLU, Alnarp. The investigation was aiming to understand how people use and experience urban green space as well as why people prefer certain urban green areas and which qualities attract them to use it (Grahn et al., 2005). The study was conducted in three Swedish cities (Uppsala, Västerås and Lund)which were rather similar in socio-demographic situation, but different in green structure. A combination of qualitative and quantitative methods in the survey for different kinds of organizations and individuals along with photos, drawings, deep interviews and diaries produced a significant amount of data for analysis. As a one of the results the eight basics experiences characteristics of urban green space were classified. Later they were interpreted as eight room characteristics of urban open green space: *Serene; Wild; Lush; Space; The common; The pleasure garden; Festive; Culture.* According to Grahn et. al., (2005) "*these characteristics consist of symbols manifesting themselves through many different sensations via sight, hearing, loco-motion, etc.*" (Table 1). Some of the characteristics are more popular among the visitors than the others. If a certain urban green space contains a number of these characteristics it will be more popular among the visitors compared to a place with one characteristic or deficiency of it. Therefore it is within the interest of urban planners to attract people to visit urban green spaces; these places should have a high quality design of green environment as well as provide an opportunities for visitors to experience what they are looking for (Stigsdotter, 2005).

| The Eight Characteristics | Characteristics of the Space |
|---|---|
| Serene | A place of peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no weeds, no disturbing people |
| Wild | A place of fascination with wild nature. Plants seem self-sown. Lichen and moss-grown rocks, old path |
| Lush | A place rich in species. A room offering a variety of wild species of animals and plants |
| Spacious | A room offering a restful feeling of "entering another world", a coherent whole, like a forest meadow |
| The common | A green open place admitting vistas and stay |
| The pleasure garden | A place of imagination. An enclosed, safe and secluded place where you can relax and be yourself, let your children play freely and also experiment |
| Festive/centre | A meeting place for festivity and pleasure |
| Culture | The essence of human culture; A historical place offering fascination with the course of time. |

*Table 1.The Eight Characteristics that meet recreational needs, from Grahn et al., 2005.*

The results of the investigation show that along with eight experienced characteristics there are also relationships between the size and shape of urban green space and distance to urban green space which have an effect on the way people use urban green space (Grahn et. al., 2005).

### Size and shape.

Size and shape turnout to be very important qualities of urban green space (Fig. 2). The results from the investigation show that the clearest relationships occur between the size and shape of the urban green space and the basic experienced characteristics which together can influence people's frequency of visits and length of visits. Two size categories are more popular among the visitors: 1-5 hectares and 10-50 hectares, due to the opportunities to experience qualities such as *Culture* and *Festive*, then *Serene, Wild, Lush* and *Space*. Also one more bigger category is important for experience of wilderness, the area should be around 100 hectares, due to its sensitivity to disturbance from noise, traffic and other people. These categories of sizes are the most frequently visited and the most popular among the visitors, because they can proved a wide range of different activities which visitors are looking for (Grahn et. al., 2005). However smaller urban green spaces also can be good for people in terms of promoting health qualities. The shape of the area becomes more and more crucial with decreasing of the size of urban green space. Sensitive characteristics such as *Serene, Wild, Lush* and *Space* will be lost at first. The trend is that the more coherent the shape of the urban green space, the more basic experience characteristics this urban green space can provide for visitors (Stigsdotter, 2005).

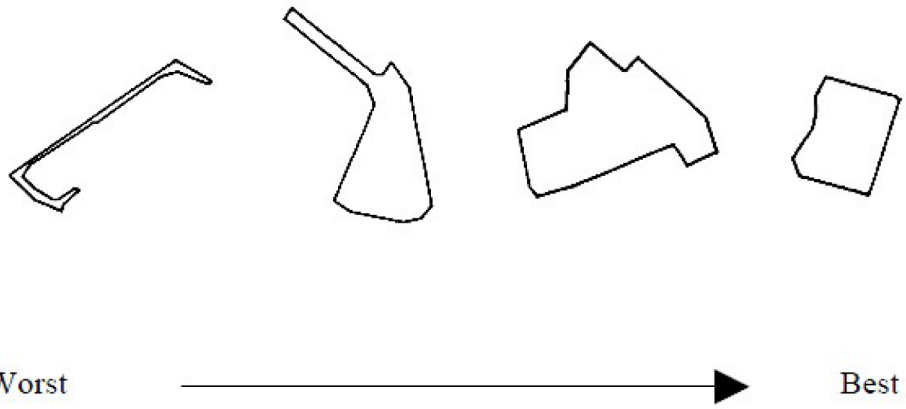


*Fig. 2.The more coherent the shape of green area, the more developed The Eight Characteristics can become. Modified picture by Ulrika A. Stigsdotter (2005).*

### Distance to nearest urban green space.

Accessibility and distance to the nearest urban green space also plays an important role in people's wish to visit an urban green space. These qualities can affect the use of the area, but also it affects people's health. In their work "Landscape planning and stress" Patrik Grahn and Ulrika A. Stigsdotter (2003) were aiming to observe how the level of stress can be related to use of public urban green open spaces. They found out that the more stressed an individual is, the less this individual visits urban green spaces. However if the individual wishes to visit urban green space, the more than likely this individual suffers from stress. The study shows that the great obstacles for individual to visit urban green space are time and distance to the nearest green area which make urban green space less accessible. Grahn and Stigsdotter write: "the shorter distance to urban open green spaces, the more often people use them and the less often they suffer from stress". Even after 50 meters distance to the park, the frequency of visits decrease and the level of stress occasions increase (see Diagram 1). If the individual has an access to urban green space within 50 meters distance, the frequency of visits is three to four time per week in general. If the distance is 300 meters or 5 min walking distance for average person, the frequency of visits decrease to 2.7 times per week. If the distance is 1000 meters the person often decides to postpone the visit until the weekend (Grahn & Stigsdotter, 2003). The conclusion is that it is important to have a close access to urban green space from home as well as from a workplace. Even a view of urban green space through a window can positively affecthealth and decrease a level of stress. So a view is as much important as having an easy access to urban green space (Stigsdotter, 2005). The overall conclusion from the investigation was that sev-

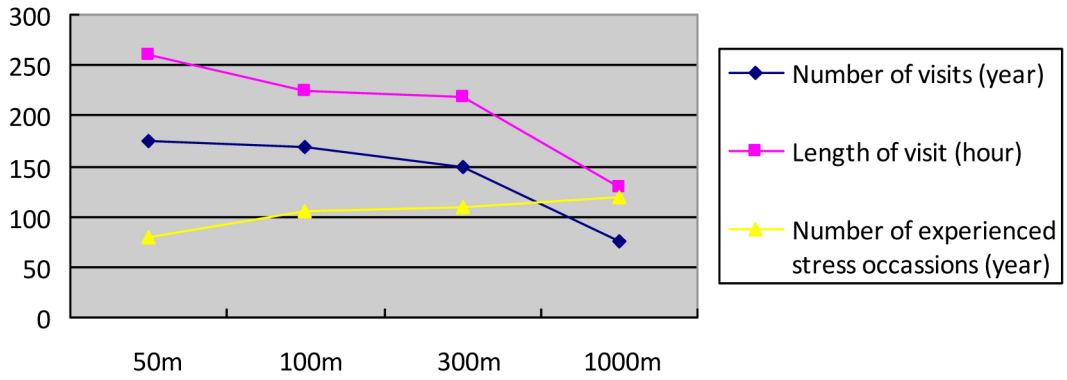


*Diagram 1. Relationships between distance from home to the nearest green area and three factors: Number of visits (a year): Length of visit (hours); Number of experienced stress occasions (a year).*

eral aspects should be taken into account for planning of urban green spaces with health promoting perspectives. These aspects are of particular value for smaller neighborhood urban green spaces. The urban green space should (Grahn et. al., 2005):

- Be situated near the people's homes or workplaces.
- Have a coherent or rather coherent shape.
- Include several basicexperienced characteristics in the design.

## What will it be in St. Petersburg?

The research on Eight Characteristics was conducted and concluded in Sweden, but I believe that the Scandinavian experience with its similar climate condition and geographical position might be a good example for landscapes of St. Petersburg. As mentioned in the background part of this thesis, the emphasis of the urban green space planning system during the Soviet time was on the functional needs of the place, activities which this place could provide for residents and sanitary standards. In recent years there has been a growing feeling that changes are needed in the urban green space planning system which has developed in St. Petersburg. There has been a recent resurgent interest in more sustainable development which represents part of a wide international movement that looks for improvement ofquality of life by creating new types of urban green spaces that are cost-effective and yet highlight design for people with qualities for improving their well-being.

The Classification of St. Petersburg urban green space has varied continuously, but at the same time has been permanent over the many years. The introduction of the Eight Characteristics into St. Petersburg's urban green space classification at least can provide different perspectives in the modern relationships between human beings and natural environment in the cities and by this can lead to changes in the development of St. Petersburg green structure.

However St. Petersburg is a rapidly developing region in Russia, and with almost 5 million population it is a major trade, industrial and financial centre. The city is very attractive for investors all over the world by its good geopolitical position close to European countries, well-developed transportation system, diversified economy and industry. So what we can say about quality of urban green spaces in such a huge city as St. Petersburg compared to highly developed and good qualities of urban green spaces in Sweden? What would the application of the Eight Characteristics will look like? Can we improve aspects of sustainability by improving relevant qualities of urban green space in the city?

Further analysis and discussion will be given with an aim to understand the urban green space situation in St. Petersburg, possibilities on how to improve the relevant qualities for well-being and public health.

## Leningrad region.

The Leningrad region is a federal subject of Russian Federation with St. Petersburg as a capital of the region. The region is located in the western part of Russia and has borders with Finland and Estonia. It is a very dynamically developed region because its proximity to Europe and an outlet to the Baltic sea. The geopolitical position of the region is very important for its economic growth. Together with rich natural resources, human and industrial resources, investor-friendly legislations, the Leningrad Region has an advanced economy. The region has a rich history; one of the largest medieval world's trade centers was situated here on the trade route from the Varangians to the Greeks. This trade route connected Scandinavia, Kievan Rus and Byzantine Empire. There was a long distance waterway including Baltic sea, few rivers flowing into the Baltic Sea and Black Sea. The region has a large amount of historical and cultural monuments -there are more than 3,900 of them - some monuments have a global importance and are placed on a list of UNESCO World Heritage Sites. The Leningrad Region also has beautiful nature; the flora and fauna of the region are rich and diverse. The region has a unique landscape and it is mixture of granite rocks of the northern part of the region and limestone deposits of the south part of the region. There is a combination of conifer and deciduous forest, dunes, beaches, an infinity of underground water springs and an extensive system of lakes and rivers which create great opportunities for tourism. (Official Representation of the Leningrad Region, 2013)

## St. Petersburg.

St. Petersburg is a city and a federal subject of Russian Federation. It is located in the Neva river delta on the shore of Gulf of Finland on the Baltic Sea. St. Petersburg is the second largest city in Russia. It has 4.8 million population and as such is the third largest city in Europe after Moscow and London. The total area of the city is 1,430 sq. km. It is quite a dense city in terms of the population density it comes to 3.3 thousand people per sq. km. St. Petersburg is divided into 18 city districts, which are subdivided into smaller municipal districts or okrugs in Russian direct translation (82), municipal cities and towns (9) and municipal settlements (21) (Law On the Territorial Structure of Saint Petersburg, 2012).

St. Petersburg is rapidly developing region; it is a major trade, industrial and financial centre. St. Petersburg is very attractive for investors all over the world by its good geopolitical position close to European countries, well-developed transportation system, diversified economy and industry. There are numerous of well-known industries located in St. Petersburg. LMZ, Admiraly Shipyard, Baltic Shipyard, LOMO, Kirov Plant, Izhorskiye Zavody, Elektrosila are the major local industries which are operate on the international market. There are also numerous international companies situated in the city.

St. Petersburg was founded by Tsar Peter the Great on May 27, 1703with the aim to become a window toward Europe. St. Petersburg is the most Westernized city of Russia as well as a cultural capital. It was a capital of Russian Empire from 1712 to 1918 when St. Petersburg lost the leading position to Moscow and was renamed as Leningrad during the communist era. St. Petersburg regained its name after the Soviet Union's demise in 1991 (Committee for Investment and Strategic Projects, 2011).

St. Petersburg is well-known as a cultural capital. It is also called "The Venice of the North", because more than 10% of the city area is occupied by rivers and channels and known the city of White Nights. St. Petersburg is one of the most beautiful cities. It has significant historical and cultural heritage, for example the Historic Centre of Saint Petersburg and Related Groups of Monuments is in the list of UNESCO World Heritage Site ( United Nations Educational Scientific and Cultural Organization, 2013). There are 182 museums and 135 galleries. The most widely-known museum is Hermitage. There are a lots of exhibitions and events hold in St. Petersburg all the year round. These makes St. Petersburg very attractive for tourists from all over the world (Committee for Investment and Strategic Projects, 2011).

There are 95 institutions of higher education and it is the second biggest centre for higher education in Russia. Three different types of institution of higher education exist: institutes, academies and universities. There are a wide range of different professions from technical to classical. (Federal service for supervision in the sphere of science and education, 2011)

St. Petersburg was established on the swamp area. Tsar Peter the Great was travelling around the Europe and was impressed by European and Dutch construction traditions. He wanted to implement them in Russia and choose St. Petersburg to create a beautiful and powerful capital of Russian Empire (The St. Petersburg of Peter the Great, 2013). Parks and gardens of the Tsar era with parks established under the Soviet Union piece together around 80% of green space cover. Also the city is surrounded by protected forest green belt which comes to 142 000 ha. Urban green space covers around 30% of the

St. Petersburg area, but its distribution is not equal in the city. Several districts in the central part of St. Petersburg have low green-space cover, while the suburban districts have better spatial distribution of urban green space (Nilsson, et al., 2007).

Flora and fauna is very diverse in the area. There are 12 conservation areas currently, however according to the St. Petersburg Master plan 11 new conservation areas will be created by the year 2025. The Red List of St. Petersburg area is now including 424 rare species. (Environmental Portal of St. Petersburg, 2012).

Today green areas for common use occupy 10413,9 hectares of St. Petersburg's total area. There are 55 public parks, 159 public gardens, 686 pocket parks, 214 avenues, 775 verdured streets and 9 other urban green space objects within the city area. Total area of green belt is 3305 hectares(Government of St. Petersburg, 2012).


*Fig. 3. Position of St. Petersburg towards European countries.*


*Fig. 4. Division of St. Petersburg districts. Division of St. Petersburg districts. 1. Admiralteysky district; 2. Vasileostrovsky district; 3. Vyborgsky district; 4. Kalininsky district; 5. Kirovsky district; 6. Kolpinsky district; 7. Krasnogvardeysky district; 8. Krasnoselsky district; 9. Kronshtadtsky district; 10. Kurortny district; 11. Moskovsky district; 12. Nevsky district; 13. Petrogradsky district; 14. Petrodvortsovy district; 15. Primorsky district; 16. Pushkinsky district; 17. Frunzensky district; 18. Tsentralny district;*

## City districts.

As mentioned above there are 18 districts in St. Petersburg. I chose 3 districts which are situated within the boundary of St. Petersburg as a scope for further study. The chosen objects are Petrogradsky, Tsentralny and Frunzensky districts. They are spread out from the north-west to the south-east part of the city, from very central districts of Tsentralny and Petrogradsky to the suburb district of Frunzensky. In my opinion, comparison of these objects can show the difference in availability of urban green space for citizens which can influence peoples preferences for future living and working places and might have an effect on urban sustainability in the long term.

## Petrogradsky district.

The Petrogradsky district is an administrative and territorial unit of St. Petersburg. The present boundaries of the district was formed in 1973. There are 6 municipal okrugs under the district's jurisdiction. The total area of the district is 24 sq. km, with a total green space cover of 494,8 hectares. The district has a population of 130,4 thousand inhabitants (Petrogradsky district statistic info, 2013).

The Petrogradsky district is situated on the seven islands of the Neva delta, including Zayachy, Perogradsky, Aptekarsky, Petrovsky, Krestovsky, Kamenny and Elagin Islands. These islands became a cradle land of St. Petersburg three centuries ago. The development of the district began on May 1703 with the establishment of the St. Peter-and-Paul Fortress on Zayachy Island. This part of the St. Petersburg became a commercial and administrative centre of the Russian Empire in year 1712. A botanical garden was established in 1714 on the Aptekarsky Island. After the death of Tsar Peter the Great in 1725, the commercial and administrative centre was moved to the other side of the Neva river and this part was forgotten for a while. It became a place for country seat and military purposes. Rich people started to build palaces and country houses. Later in the 19th - 20th centuries an intensive development of the residential and industrial areas began. All of these shaped the modern architectural look of the district.

Rivers and canals separate the islands from each other and with the entire city, but they are connected by the bridges and 5 underground stations located in the district. There are five major medical centers, eight higher education establishments and around 51 cultural establishments. There are numerous headquarters of huge industries located here (Petrogradsky district general info, 2013). Due to its rich cultural history the district has more than 300 architectural and historic monuments, including the Peter-and-Paul Fortress complex, Elagin and Kamennoostrovsky palaces, Mosque, The Aurora cruiser, the Cathedral of Prince St. Vladimir and many others which are under the state protection. These cultural and entertainment landmarks characterize the district. For instance Central Park of Recreation and Culture together with Primorsky Park Pobedy are very popular for leisure time among the inhabitants (Saint Petersburg encyclopedia, 2003).

## Current land use situation the district.

As you can see on the map (see next page), the district is situated among the rivers and looks rather green on the north-east part. Residential areas along with areas of social, cultural and business development create the mosaic pattern of Petrogradsky district. The development of recent years is mostly focused on densification of the existing residential areas and construction of residential areas on spaces which were industrial estates previously and were moved to outskirts of the city with aim to clear a space for new development. Widespread green areas of parks along with neighborhood and pocket parks create a green structure of the district. Further in-depth study of these urban green spaces will be given later.

# CURRENT LAND USE SITUATION IN PETROGRADSKY DISTRICT

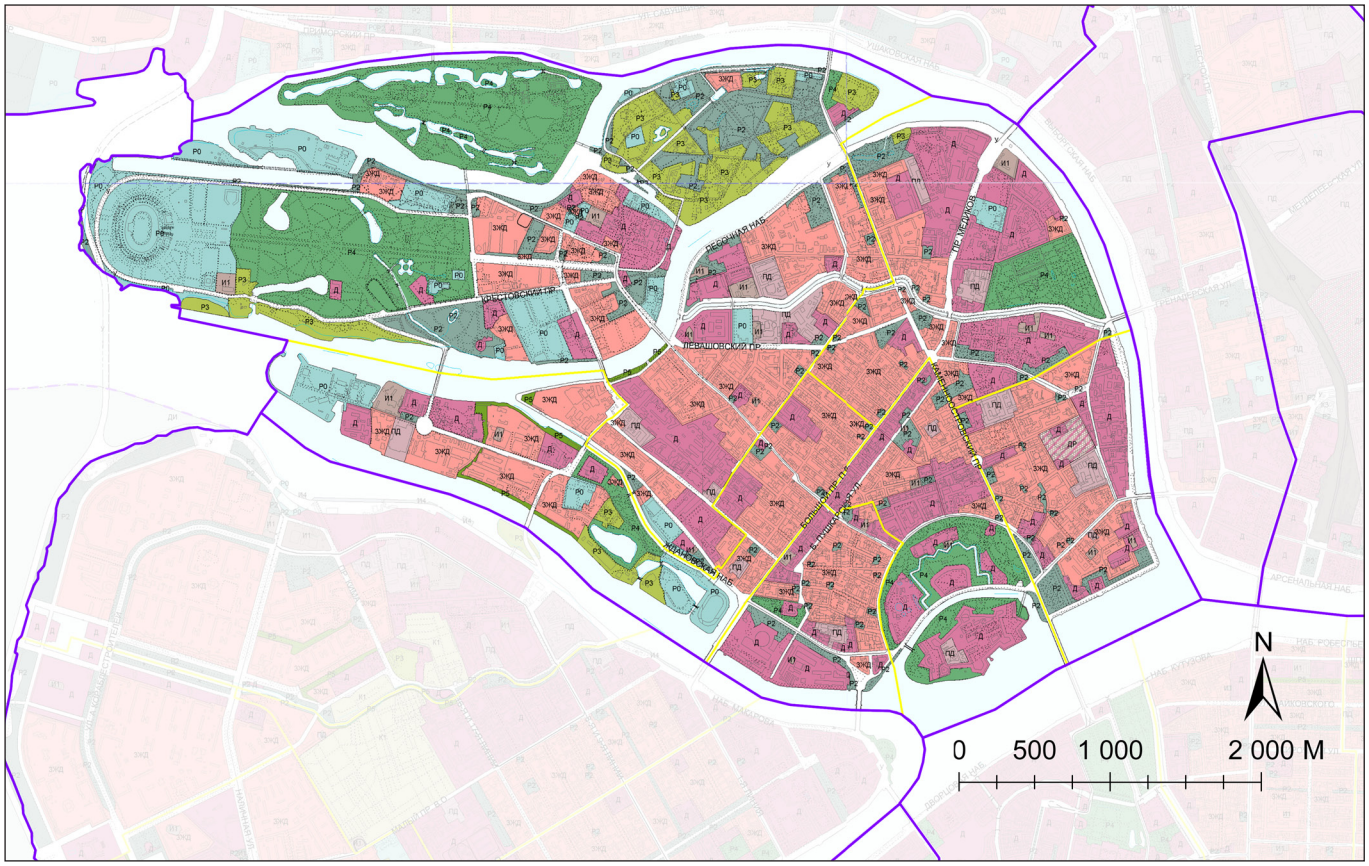


*Fig. 5. Current land use situation map of Petrogradsky district with legend below.*

- *ЗЖД – area of medium and high-story residential development (include areas with social, cultural and business development and utility infrastructure services)*
- *Д – area of social, cultural and business development (include areas with residential development and utility infrastructure services)*
- *И1 – area of utility infrastructure services (include public utilities, sanitation and cleaning services, warehouse facility, industrial estates)*
- *И3 – area of railway service (include areas with social and business development and utility infrastructure services)*
- *К1 – area of cemetery and crematorium*
- *К3 – area of military services and sensitive facility (include areas with social and business development , areas with residential development and utility infrastructure services)*
- *ПД – area of industrial estates, transportation and logistics services, warehouse facilities and utility infrastructure services (include areas with social and business development)*
- *ДР - area of social, cultural and business development in a long term (include areas with residential development and utility infrastructure services)*
- *ЖМР - area of medium and high-story residential development in a long term (include areas with social, cultural and business development and utility infrastructure services)*
- *Р0 - Sport facilities and beaches area. They include utility infrastructure for area maintenance.*
- *Р2 - Green areas for common use and restricted green areas. They include objects accepted in accordance with green planting protection legislation. They also comprise plate sport structures.*
- *Р3 - Area for recreation and sport activities, leisure and entertainment, tourism and spa treatments, hotels and guest houses, summer residences. It includes utility infrastructure for area maintenance.*
- *Р4 - Historical parks, palaces and gardens area.*
- *Р5 - Green area which serves for special functions . It include objects accepted in accordance with legislation.*
- *Water area*
- *District boundaries*
- *Municipal district boundaries*

## Tsentralny District.

The Tsentralny district is an administrative and territorial unit of St. Petersburg. The district was formed in 1994 through consolidation of three districts. There are 6 municipal okrugs under the district's jurisdiction. The total area of the district is 17,12 sq. km with the total green space cover of 103, 6 hectares. There are 200 objects of urban green space (14 gardens - 41,8 ha; 6 boulevards - 2,7 ha; 98 pocket parks - 31,6 ha; green space attached to 82 urban roads - 27,6 ha).The Tsentralny district has a population about 270 thousand inhabitants (Tsentralny district statistic info, 2013). It is the most densely populated district in the city. During the day time the population of the district increases, due to the numerous institutions and establishments (Saint Petersburg encyclopedia, 2003).

The Tsentralny district is a historically the city centre. Most of the area is included in the protected zone of the city as a important piece of historical and architecture heritage. Thus new building and industry development is restricted or prohibited here. The area situated between the Bolshaya Neva River and Obvodny Canal.

The intense development of the district begun in the 1700s. The planning structure of the district has almost got its present shape by the late 18th century. The architectural look of the district was formed in the period Catherine the Great's rule in the middle of 19th century. It is defined by numerous palace complexes which were build by famous architects such as Carlo Rossi, Antonio Rinaldi and others. For instance the Winter Palace and the Hermitage, Marble Palace, Mikhailovsky Palace, Kazan Cathedral and Smolny Cathedral, Taurida Palace and many others created a matchless and unique look of the city. Therefore St. Petersburg became one of the most beautiful cities in the world.

The district has a good connection with entire city because of its very central position and bridges across the rivers. There are 11 underground stations located in the districts. Moskovsky Railway Station is located here and connects St. Petersburg with Moscow and the entire Russian Federation. There are numerous of major traffic roads of the area such as Nevsky Prospect, Liteyny and Ligovsky avenues. There are numerous institutions, establishments and human services in the district. For instance Administration of St. Petersburg and the Government of Leningrad Region; shopping centers such as Galeria, Gostiny Dvor and The Passage; Kuznechny Market.

There are 357 monuments of the history and architecture, 20 of monumental sculptures adorn the squares. There are not so many places in the world with this concentration of the historical monuments and architectural masterpieces. This can be said also about the cultural institutions. Tsentralny district comprises 18 concert halls and 37 theatres, among them: Bolshoi Drama Theatre, Mussorgsky Opera and Ballet Theatre, Tovstonogov Theatre, Jazz Phillarmonic Hall, Chapel and Oktybrsky Grand Concert Hall and many others. 28 museums are located here which can give a reason to count the district as a key museum area. For instance The State Hermitage and The Russian Museum are some of the most well-known establishments in the world. The district is also famous by a number of monuments of landscape architecture such as the Summer Garden, Mikhaylovsky Garden, Taurida Garden (Tsentralny district general info, 2013).

During the centuries the greatest masters of the Russian culture lived and created here: Pushkin, Lermontov, Tolstoy, Dostoevsky. Streets, squares and quay areas still remember the names of the great poets and are mentioned in their poems.

*"I love you, Peter's great creation,*
*I love your view of stern and grace,*
*The Neva wave's regal procession,*
*The grayish granite – her bank's dress,*
*The airy iron-casting fences,*
*The gentle transparent twilight,*
*The moonless gleam of your nights restless,*
*When I so easy read and write*
*Without a lamp in my room lone,*
*And seen is each huge buildings' stone*
*Of the left streets, and is so bright*
*The Admiralty spire's flight,*
*And when, not letting the night's darkness*
*To reach the golden heaven's height,*
*The dawn after the sunset hastens –*
*And a half-hour's for the night."*

(The Bronze Horseman by Aleksandr Pushkin).

## Current land use situation in the district

It is a very central district with old areas of residential, cultural, social and business development along with industrial estates. The recent years' development was focused on densification of the existing residential areas and construction of residential areas on spaces which were industrial estates previously and were moved to outskirts of the city with aim to clear a space for new development. There is a cemetery, military services and railroad on the south-west part of the district. Tsentralny district is less green compared to the Petrogradsky and Frunzensky districts. A few historical parks along with neighborhood and pocket parks create the urban green structure of the district. Further in-depth analysis of urban green structure will be given later.

# CURRENT LAND USE SITUATION IN TSENTRALNY DISTRICT

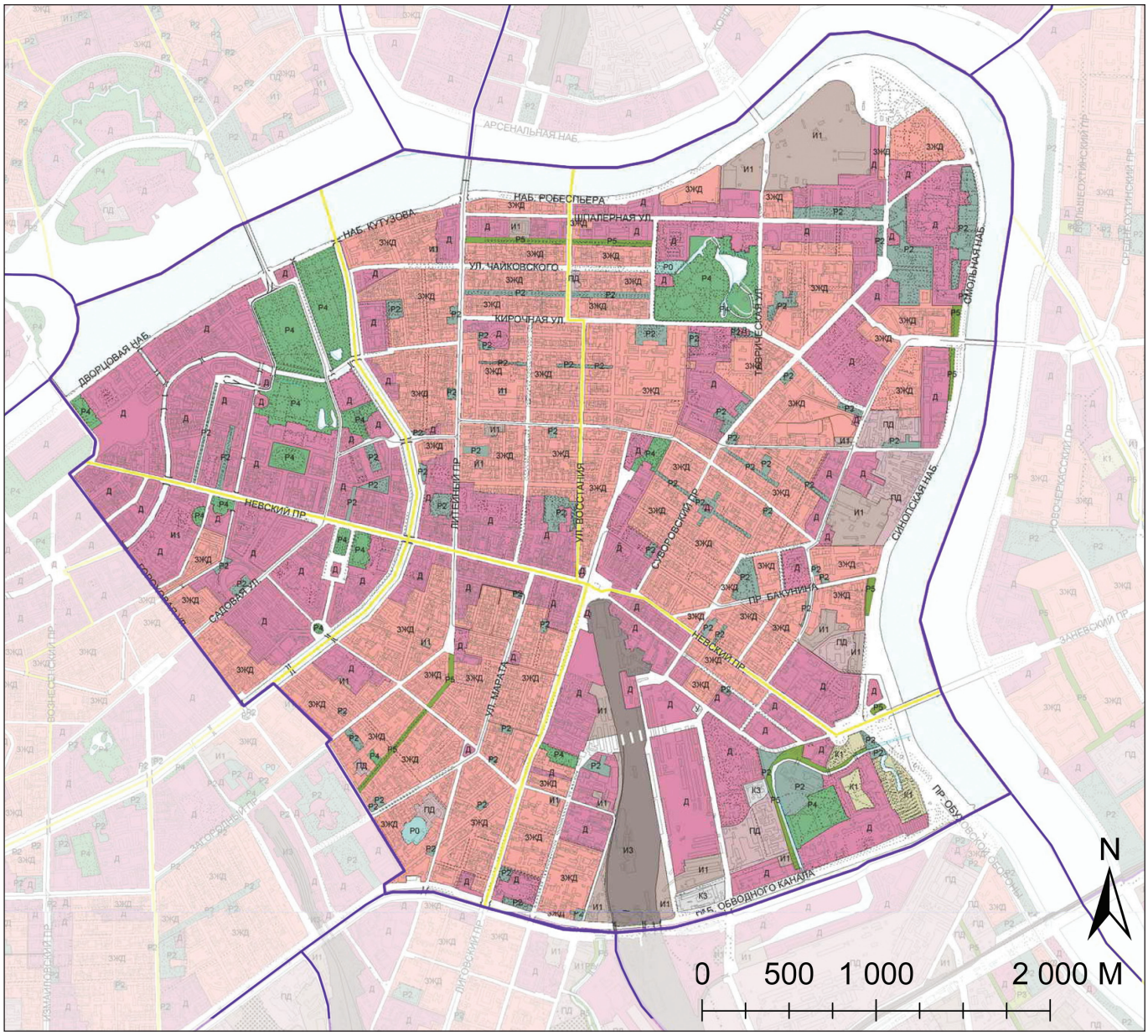


*Fig. 6. Current land use situation map of Tsentralny district with legend below.*

- *ЗЖД – area of medium and high-story residential development (include areas with social, cultural and business development and utility infrastructure services)*
- *Д – area of social, cultural and business development (include areas with residential development and utility infrastructure services)*
- *И1 – area of utility infrastructure services (include public utilities, sanitation and cleaning services, warehouse facility, industrial estates)*
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- *Р0 - Sport facilities and beaches area. They include utility infrastructure for area maintenance.*
- *Р2 - Green areas for common use and restricted green areas. They include objects accepted in accordance with green planting protection legislation. They also comprise plate sport structures.*
- *Р4 - Historical parks, palaces and gardens area.*
- *Р5 - Green area which serves for special functions . It include objects accepted in accordance with legislation.*
- *Water area*
- *District boundaries*
- *Municipal district boundaries*

## Frunzensky District.

The Frunzensky district is an administrative and territorial unit of St. Petersburg. The district was formed in 1936 and named in honor of Soviet military commander M.V. Frunze. It has its present boundaries since 1978.There are 6 municipla okrugs under the district's jurisdiction. The total area is 37,5 sq. km (3% of the St. Petersburg area). It is one of the biggest districts in the city (Frunzensky district general info, 2013). The total green space cover is 1 389 ha which is around 34,2 sq.m of urban green space per district inhabitant (St. Petersburg gardens. History and modernity. Monography, 2011). The district has a population about 404,7 thousand inhabitants which is 8,2 % of the city population (Frunzensky district general info, 2013).

It is a southern district of the city and located between the Obvodny Canal on the north, Vitebskaya and Moskovskaya lines of Oktyabrskaya Railway and belt highway on the south. The area is served by 5 underground stations and 3 stations on the Vitebskaya railway. The city bus terminal is located along the Obvodny Canal embankment. The underground line is still under construction and 2 more stations will be built by 2015.The district infrastructure includes many thoroughfares which connected the district with entire city. There are numerous industry enterprises which are located here along with storage facilities. Few universities have their branches there. However the district is mostly residential.

The Frunzensky district includes two historical villages which known from 17th century - Volkovo village and Kupsino (Kupchino later) village. A small part of the district area had been developed by the 20th century. In the beginning of the 18th century the Frunzensky district territory belonged to the monastery. The area near Ligovsky Avenue which goes from the central part of the city to the south was built as a residential area. The areas along the railway lines were mostly storage and industrial. Also, in the middle of the 18th century the Volkovskoe Cemetery was established on the north of the Volkovo village.

The majority of the present-day territory was mostly pastures, wastelands, pits and military testing areas. The area's development started in the 1960s. A large residential area was created by 1980 and named Kupchino.

Architectural heritage in the district is represented by the Necropolis Literatorskie Mostky where many Russian and Soviet writers, musicians, actors, architects, scientists and public figures are buried and the Victims of 9 January Memorial Cemetery (St. Petersburg encyclopedia, 2003).

## Current land use situation in the district.

As you can see on the map the district mostly consists of residential areas along with warehouse facilities and small industrial estates. Few cemeteries are situated here. The north part of the district is much older that the south part. The recent years development was focused on densification of the existing residential areas and development of the residential areas on the wastelands. The district is rather green; made up of public parks together with neighborhood and pocket parks, wide green spaces attached to both urban roads and to the houses create a green structure of the district. Further in-depth study of urban green space of the district will be given later.

## Legend for the map of current land use situation in Frunzensky district.

*ЗЖД – area of medium and high-story residential development (include areas with social, cultural and business development and utility infrastructure services)*

*Д – area of social, cultural and business development (include areas with residential development and utility infrastructure services)*

*И1 – area of utility infrastructure services (include public utilities, sanitation and cleaning services, warehouse facility, industrial estates)*

*И3 – area of railway service (include areas with social and business development and utility infrastructure services)*

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*Р0 - Sport facilities and beaches area. They include utility infrastructure for area maintenance.*

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*Р3 - Area for recreation and sport activities, leisure and entertainment, tourism and spa treatments, hotels and guest houses, summer residences. It includes utility infrastructure for area maintenance.*

*Р5 - Green area which serves for special functions . It include objects accepted in accordance with legislation.*

# CURRENT LAND USE SITUATION IN FRUNZENSKY DISTRICT

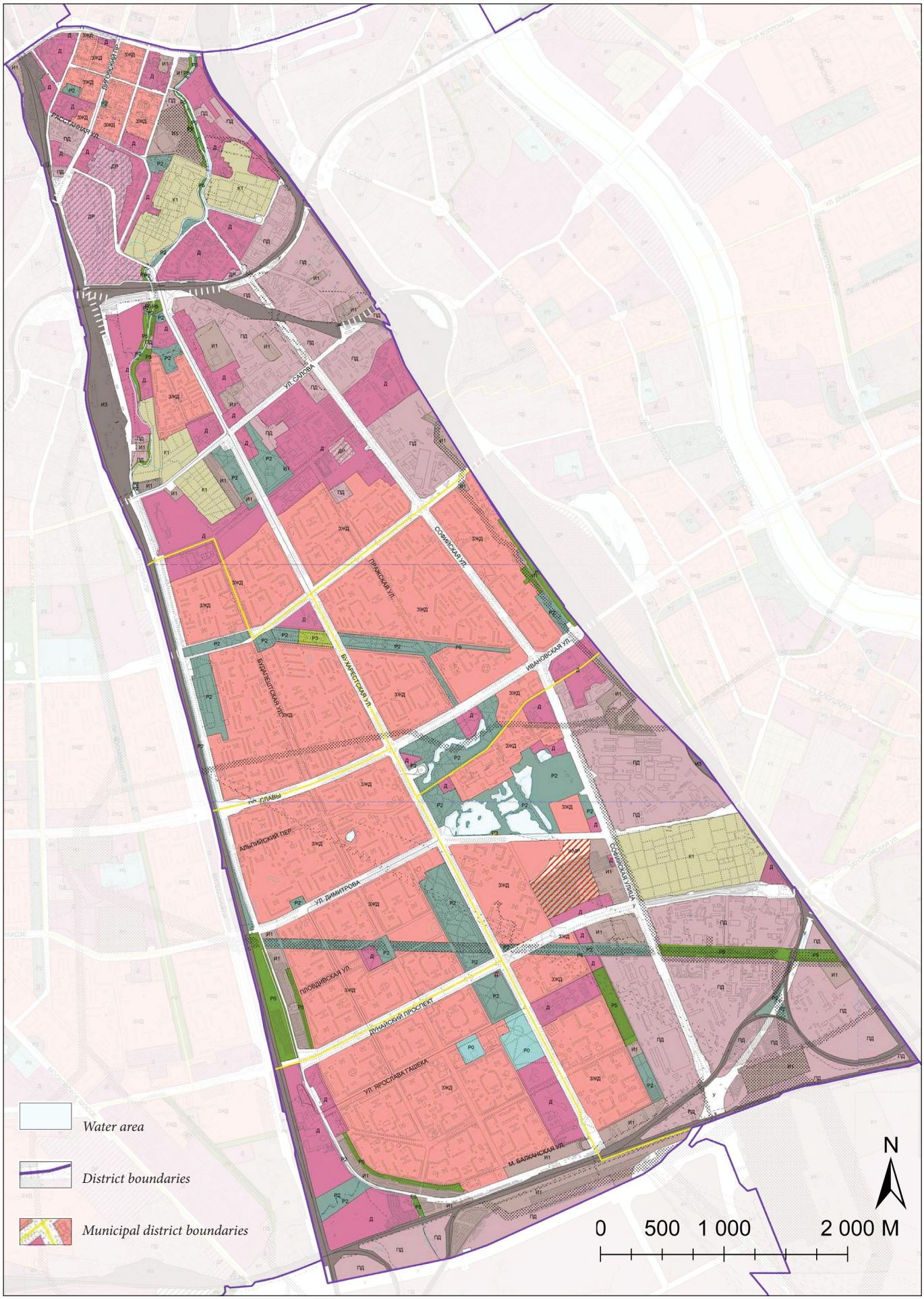


*Fig. 7. Current land use situation map of Frunzensky district with legend on the page 21.*

This investigation was made as a questionnaire for St. Petersburg residents and visitors with the aim of discovering and understanding people's preferences and feelings towards urban green space within the city. The results showing that it is not my own ideas defining of the issue, it is also other people's feelings and preferences of urban green space in St. Petersburg area. A questionnaire was created and published online from the 12th March 2013 until 5th April 2013. It was active for 23 days.

The questionnaire was available for anyone. The respondents were partly chosen randomly. I created the survey on the web-page where everyone can create their own survey and publish it. I also put clickable link on few social networking sites which allows people to communicate with each other (Facebook, LiveJournal, VK - a Russian alternative of Facebook). Many people were interested to participate and asked their friends to do this too.

I can say that to a large percentage of the respondents come from young person's which are typically more active for this kind of web questionnaire. They are usually more positive from the beginning to parks and greening. It could be used as an alternative method. The traditional method is to choose the respondents randomized and only send the survey to them. Such a kind of study would give true answers of the percentage of different answers reflecting the whole population. However such a study takes a lot more time and money than possible for a master thesis. This does not make my study less valuable. I think it reflects the opinion of respondents that they are probably motivated, young, educated and active, and they can be pioneers indicating future preferences among broader population groups. I believe that habit and preferences what people have got at young age they keep follow during the whole life.

The language of the questionnaire is Russian, however it was translated in English and attached in the appendix. Some of the respondents' comments were also translated in English. Here is a link to the open questionnaire http://virtualexs.ru/cgi-bin/exsurveys/survey.cgi?ac=8784.

A combination of quantitative and qualitative research method were used in survey including both open and closed questions. It contains 14 questions and starts with general questions about the gender, age, place of residence and profession of participants. Then there are more specific questions about urban green space provision and people's perception. The last question was not compulsory for participants, but aimed to discover what kind of improvements the participants felt should be made in St. Petersburg's urban green space. This questionnaire has been based on an investigation from a previous year's student - Lu Wen from China (Wen, 2012) - due t to a combination of circumstances both of these works have a common strand connected with people's preferences and feelings of urban green space.

The survey was both anonymous and voluntary. It involved 161 participants. Among these 161 participants, 113 come from St. Petersburg, 14 from the Leningrad Region, 23 from other parts of the Russian Federation and 11 came from Europe (specifically Finland, Germany, Latvia and Lithuania). However, all of these respondents had visited St. Petersburg at least once and have had experience of St. Petersburg's urban green space.

## Analysis of answers from the questionnaire.

### Gender and age.

100 women and 61 men took a part of this investigation. The diagram below (Diagram 2) shows the gender division of respondents.

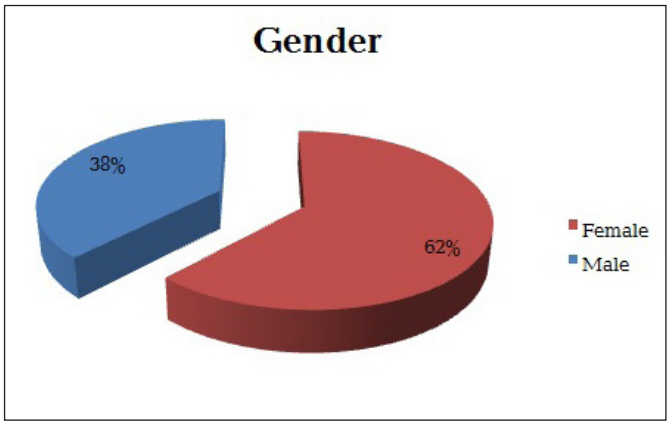


*Diagram 2 . Gender of the respondents.*

The next diagram (Diagram 3, see next page) shows that the age of respondents varied from those younger than 18 to those older than 66 years old. The majority of the participants are aged between 18 and 25. The youngest age group comprises respondents younger than 18 years old and the oldest age group comprises those older than 66 years. Almost all respondents (90%) are younger than

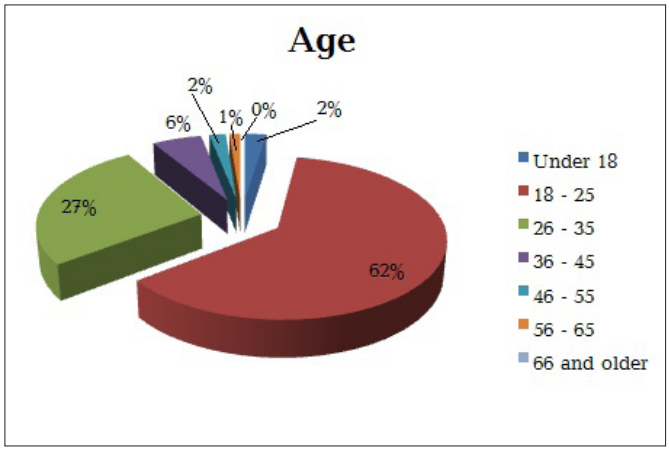


*Diagram 3. Age of the respondents.*

36 years. So the results do not cover the older generation. Unfortunately there were no respondents from the oldest group. This might be connected with less access computer and the Internet among the elderly. Indeed, there are two thirds of people in the age group between 65-74 years who never used the internet in Europe; the main reason for not having an internet connection is a lack of interest (Life online, 2012).

### Where participants come from.

There are 161 respondents who participated in this investigation. 113 participants came from St. Petersburg and 14 participants came from the Leningrad region and therefore were in St. Petersburg often. These respondents knew the area very well.

23 respondents are from other parts of the Russian Federation and 11 from all over the world, mostly from Europe countries (Finland, Germany, Latvia and Lithuania). They were in St. Petersburg at least once and have an opinion about urban green space in the city. So I can summarize that all of the participants' opinions about St. Petersburg's urban green space are relevant for this investigation.

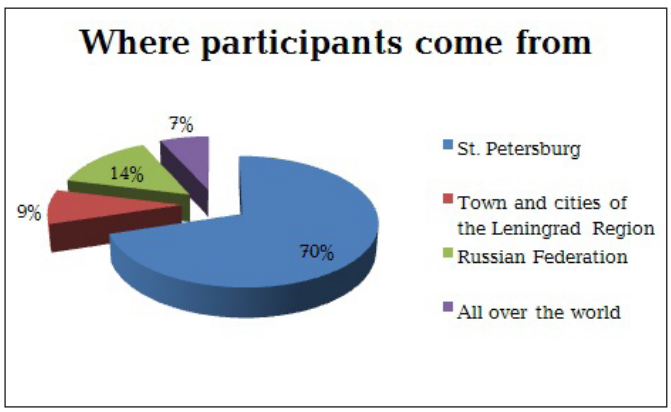


*Diagram 4. Where participants come from.*

### Career field.

This kind of question is an important influence on people's perception of urban green space. Participants were asked whether they were familiar or not with the landscape, planning or gardening career fields. It could be that there is a different perception of urban green space between people from landscape or planning professions and people who are not familiar with these disciplines. Cross analysis will be shown later.
There were 45 participants who are familiar with landscape architecture, planning or gardening and 116 participants who are not familiar. Among these 116 respondents there are people from teaching, forestry, IT, art, economy, medicine and many other career fields including a few schoolchildren and students.

### Availability of green areas close to home or working place.

The question about the availability of green areas close to the respondent's home or work place were put in with the aim to confirm that the standards about urban green space which were set up during the Soviet Union are still working and that they are easily accessible for people.

There were 152 (95%) respondents with a positive answer, 7 (4%) respondents with a negative answer and 2 (1%) respondents with an uncertain option.

I am not surprised of the 7 negative responses. At average probably an even larger percentage of the population do not visit green areas so often. Instead a low number of negative answers is a result of the methodic that only motivated persons, probably of young age, answer this kind of web questionnaire. They are positive from the beginning. All together the respondents' answers give an image that the standards which were set up during the Soviet Union are still working and St. Petersburg is considered to be a green city.

I was quite surprised when I found that two people chose uncertain option. Both of them lived in St. Petersburg and both of them were not familiar with landscape or planning career field; they visited open green public space less than once a month.

I am assuming that people who answered negatively or uncertainly live and work in the central part of St. Petersburg where these is a high level of dwelling unit density or in an area which is surrounded by the industry. They probably have no close access to green spaces such as parks, neighborhood parks or pocket parks and may only have access to the limited green space attached to urban roads.

## Frequency of visits to open green public space.

How many times per month do you visit an open green public space? The answers to this kind of question is important to discover investigations into people's perception of urban green space. Answers can show an attention value and also the importance of urban green space in St. Petersburg to its population.

16 participants answered that they visit open green space at least once month, 20 participants go there twice a month, 63 visit every week, 46 visit every day and 16 respondents answered that they visit a different amount of times. These answers are more interesting to evaluate. Among these Other options were answers like "*it depends which season*", "*more than once a day*", "*few times per year, mostly in summer time*", "*from time to time*" or "*occasionally*".

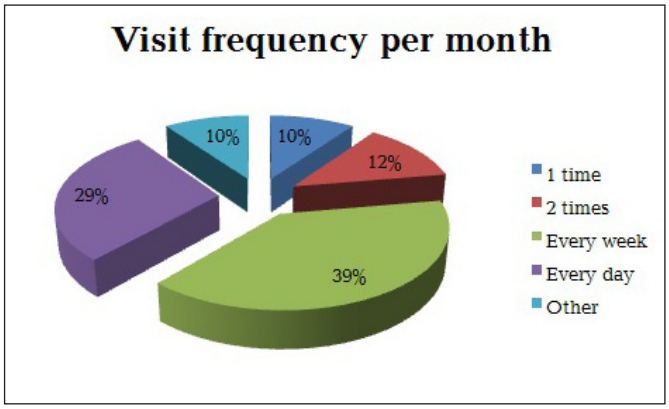


*Diagram 5. Frequency of visits to open green public space per month.*

## Motivation to visit open green space.

Respondents were asked about their motivation to visit green areas. This question had a multiple-choice option; respondents could pick one or few options from the list and also add their own option with comments.

According to the questionnaire results (Table 2; Diagram 6, see next page), the *Getting outdoors* option reached the highest amount of responses - 126, then the *Interest in nature* had got 72 responses. *Meeting/visiting friends* and F*amily day out* options collected an almost equal amount of responses, 64 and 62. *Specific event* got 37 responses. *Walking with dog* took the last place with 21 responses, except the *Other option* which collected 20 responses and comments.

These comments I found very interesting to know. Most of them were about relaxation and calmness in the city. Respondents were going out to the urban green space to find calm places for mental restoration. These kinds of comments were mostly mentioned from 20 respondents who picked the *Other option* - "*relaxation after the day's toil*"; "*relaxation*"; "*recovery*"; "*calmness and stress reduction*". Also, many people used public green space as a transit route to get to work or other important places. The survey confirms this with some of the respondent's answers such as "*passing through on the way to work*", "*passing through on the way to important places such as shops, underground stations*".

| Type of motivation | Number | Percentage |
|---|---|---|
| Family day out | 62 | 14,4 |
| Specific event | 37 | 8,6 |
| Meeting/visiting friends | 64 | 14,9 |
| Walking the dog | 21 | 4,9 |
| Keeping fit | 28 | 6,5 |
| Getting outdoors | 126 | 29,3 |
| Interest in nature | 72 | 16,7 |
| Other | 20 | 4,7 |
| **Total** | **430** | **100** |

*Table 2. Motivation to visit green open space.*

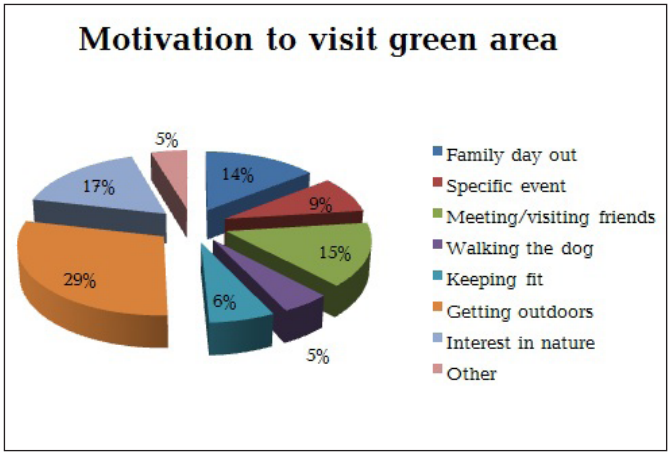


*Diagram 6. Motivation to visit open green space.*

EXISTING TYPES OF URBAN GREEN SPACE IN THE RESPONDENTS' SURROUNDINGS ACCODING TO THE ST. PETERSBURG CLASSIFICATION.

According to the classification of St. Petersburg urban green space (St. Petersburg Green Space Act, 2010) there are 6 types of urban green space in the city. In the survey, examples of urban green space were put with these classification types of St. Petersburg urban green space. It makes it clearer and easier for the respondents who are not familiar with the landscape planning fields to pick the right answer without being confused by technical terms. An "Other" option was also added to the list with aim to find out other types of green areas which can exist in respondent's opinion. I asked respondents to choose the types of green areas which they have in their surroundings. It was a multiple-choice question aimed to find out what kind of green areas dominate in the respondents' local area.

Pursuant to the investigation results (Table 3) *Green areas for common use* such as parks, pocket parks, public gardens, avenues are the dominant type of urban green space with 127 responses. *Block green belts* type such as neighborhood parks comes second with 97 responses. *Protected green belts* such as city forest and parkland zones take the third position with 46 responses. Next is 36 responses for the *Green areas which serve a special function* type (green space attached to urban roads, green space for ecological protection of water supply, sanitary protected zones,and buffer zones). The last place is taken by *Conservation areas* (reserves) with 10 responses; the amount of responses directly corresponds amount of conservation areas in the city. This type of urban green space is rare in St. Petersburg area - takes only 4% of the city's total area, coming to 5 689,4 ha in total. There are 12 conservation areas within the St. Petersburg border and they are mostly situated along the Finnish gulf shore line. According to the St. Petersburg Master plan 11 new conservation areas will be created by the year 2025 (Environmental Portal of St. Petersburg, 2012). The option *Other* got 3 responses with comments like "*I live in my own house with a garden*"; "*I work in a factory surrounded by forest outside of St. Petersburg*"; "*I live in my own house in the forest outside the city*".

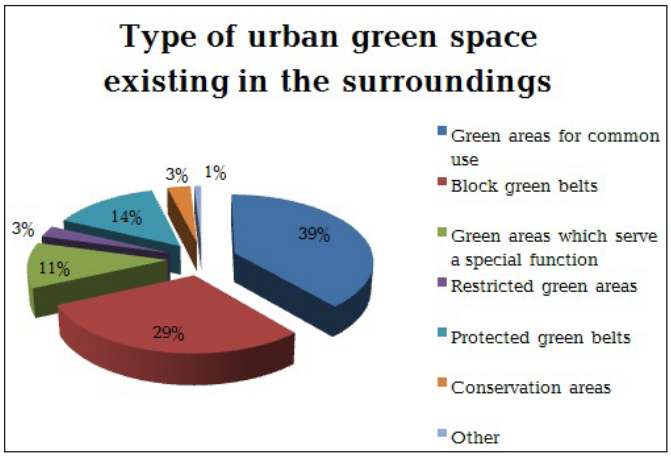


*Diagram 7. Type of green urban space existing in the respondent's surroundings.*

| Type of urban green space in St. Petersburg | Number | Percentage |
|---|---|---|
| Green areas for common use | 127 | 38,7 |
| Block green belts | 97 | 29,6 |
| Green areas which serve a special function | 36 | 11 |
| Restricted green areas | 9 | 2,7 |
| Protected green belts | 46 | 14 |
| Conservation areas | 10 | 3 |
| Other | 3 | 1 |
| **Total** | **328** | **100** |

*Table 3. Type of green urban space existing in the respondent's surroundings.*

## Respondent's expectation of good public green open space.

I believe that landscape architecture is fundamentally connected with people's perception of urban green space. In order to get to know what people expect from good public green open space in St. Petersburg city, I asked participants to choose few characteristics that they expect of urban green space from a certain list (*Good car access; Good access by foot; Good public transport; Events and activities; Interpretation of nature/history; Wild/natural areas; Meeting places (cafe or restaurant); Planted/garden areas; Opportunity for schools/kindergartens group to visit; peace/calm places*). This list include various characteristics of green space chosen by the author which I believe is very important for good quality urban green space.

According to the investigation results there are 585 responses for this question. It means that participants are really interested in good quality urban green spaces in the city. Some of the results were surprising to me, for example, I thought that *Good car access* would take a higher place in people's expectation, but it got only 28. *Good access by foot* was the most important characteristic for participants - it collected 127 responses. Then comes *Peace/calm places*. This characteristic got 126 responses. *Meeting places* such as cafes and restaurants are also very important for respondents and this characteristic collected 86 responses. *Wild/natural areas* in the outdoor green space got 76 responses. I got few comments from the respondents about this characteristic. Some of them wrote that they are afraid of wild nature within the city, because they do not feel that it is safe for their children and themselves. For example, they are afraid of shrubbery close to the children's playground which means that they cannot see their children at all times. E*vents and activities* characteristic collected 39 responses. *Good public transport* is more important than good access by car. These characteristics reached 36 and 28 responses respectively. *Interpretation of nature/history* as well as *planted/garden areas* were not so important compare to the previously mentioned characteristics.

I believe that a lack of interest in *planted/garden areas* within the city could be linked to the availability of private allotment gardens. It is popular to have a plot of land outside the city where you can go for a weekend and grow your own vegetables and fruits. So, therefore only a limited number of people appreciate *planted/garden areas* within the public green open space. It got 16 responses. *Interpretation of nature/history* collected 20 responses. Percentage distribution of these characteristics is shown on the Diagram 8.

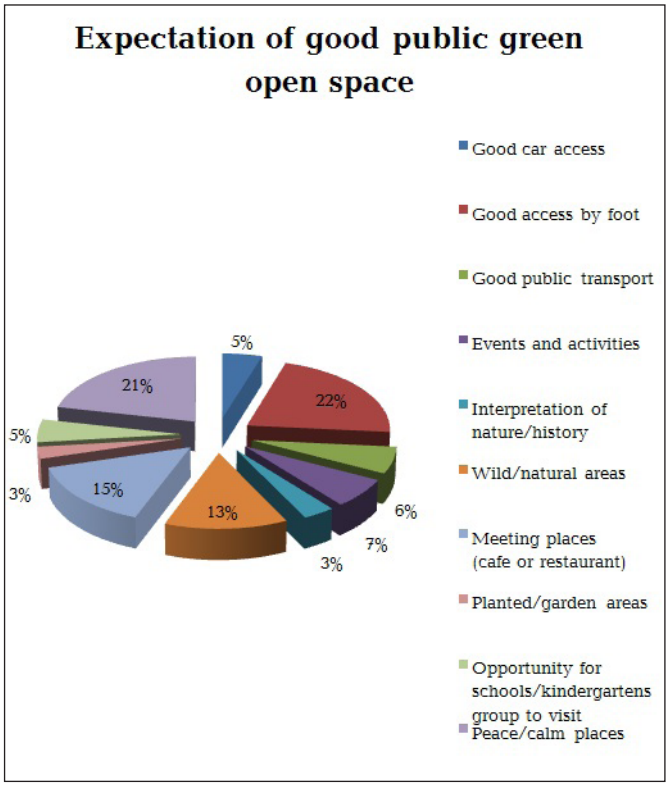


*Diagram 8. Respondent's expectation of good public green open space.*

| Characteristics of urban green space | Number | Percentage |
|---|---|---|
| Good car access | 28 | 4,7 |
| Good access by foot | 127 | 21,71 |
| Good public transport | 36 | 6,15 |
| Events and activities | 39 | 6,67 |
| Interpretation of nature/history | 20 | 3,42 |
| Wild/natural areas | 76 | 12,99 |
| Meeting places (cafe or restaurant) | 86 | 14,7 |
| Planted/garden areas | 16 | 2,74 |
| Opportunity for schools/kindergartens group to visit | 31 | 5,3 |
| Peace/calm places | 126 | 21,54 |
| **Total** | **585** | **100** |

*Table 4. Expectation of good public green open space.*

### Most important qualities of green area for respondents to go visit according to Swedish classification.

This question is based on "The Eight Characteristics" of urban green space from Swedish practice. Respondents were asked to pick the most relevant qualities of outdoor green space. The Eight Characteristics were translated by author (see table 6) and the description of the *Spacious* characteristic was slightly modified as beech forest was mentioned in original description as an example, whereas St. Petersburg area is southern subarea of boreal forest and it does not have native beech trees. So people are not familiar with this type of forest. Therefore, I chose forest meadow as example which is clearer for respondents to understand. Conifer boreal forest with its meadows can give a proper image of "*entering another world*" for people who grew up in St. Petersburg area. The option "*Other*" was also added to the list to encourage comments from respondents.

According to the results shown in Table 5 the most relevant quality of outdoor green space is *Serene*. This quality collects 127 responses from 161 respondents. *The pleasure garden* and *Spacious* got almost equal amount of responses, 81 and 79 accordingly. *Festive/centre* characteristic got the smallest amount of responses. I believe that it could be connected with high amount of cafes and restaurants in the city. Amongst the *Other* option responses were few comments which could be somehow connected to 8 characteristics. Respondents mentioned open green spaces with high quality of maintenance and many places for rest such as benches and tables.

Respondents prioritized their choice of qualities in the next question. The most relevant for many respondents was the *Serene* characteristic. Then three options were mostly chosen *Spacious, The pleasure gardens* and *Wild*. The *Other* options were characterized as less important.

Next question discuss type of green areas which is good in St. Petersburg and I would like to explain the difference between "*Important*" and "*Good*" before. *Important* is something which has a major effect on peoples and environment, for example urban green space affects inhabitant's life in a direct way by providing opportunities for stress restoration after the work day. *Good* is something which has a high quality/standards and having the necessary qualities, for example urban green spaces reduce the "heat island" effect in the city.

| **8 characteristics of urban green space** | **Number** | **Percentage** |
|---|---|---|
| Serene - Peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no weeds, no disturbing people | 127 | 25 |
| Wild - Fascination with wild nature. Plants seem self-sown. Lichen and moss-grown rocks, old path | 65 | 12,8 |
| Lush - Rich in species. A room offering a variety of wild species of animals and plants | 44 | 8,7 |
| Spacious - A room offering a restful feeling of "entering another world", a coherent whole, like a forest meadow | 79 | 15,6 |
| The common - A green open place admitting vistas and stay | 60 | 11,8 |
| The pleasure garden - A place of imagination. An enclosed, safe and secluded place where you can relax and be yourself, let your children play freely and also experiment | 81 | 16 |
| Festive - A meeting place for festivity and pleasure | 18 | 3,6 |
| Culture - The essence of human culture; A historical place offering fascination with the course of time. | 28 | 5,5 |
| Other, please specify | 5 | 1 |
| **Total** | **507** | **100** |

*Table 5. Most important qualities of green area in general.*

### Type of green areas which is good in St. Petersburg.

Participants were asked to choose characteristics of urban green space which are of particularly good quality in St. Petersburg area. The same list of options was chosen as in previous question (*Serene; Wild; Lush; Spacious; The common; The pleasure garden; Festive/centre; Culture; Other*). The option "*Other*" was also added to the list to encourage comments from respondents.

According to the question results (Table 6) *Festive/centre* and *Culture* area were the most well developed characteristics in the city. They collected equal amount of responses - 68. *The common* got almost the same amount of responses as previous mentioned characteristics - 66. *Wild* characteristics collected the smallest amount of responses, only 8 responses from 161 respondents. I believe that this characteristic is varies a lot in different districts. It is poorly developed in the central districts and well developed in the districts situated in city outskirts such as Kurortnydistrict, Pushkinskydistrict and others.

I found comments to the state of urban green space quite similar. Some of these comments are presented below.

*"Historical, places and gardens areas where historical heritage is well developed"*

*"Generally urban green space which is open for public access has a lot of rubbish, many disturbing people and unequipped picnic places"*

*"Cannot say. Urban green space is in neglected state, except the historical parks"*

*"Urban green space is in state of neglect"*

*"I cannot specify. Festive and Culture are well developed in the central part of the city; Serene, Wild and Spacious are well developed in the Pushkinsky district; Spacious, The pleasure garden, Festive/centre and Culture are well developed in the Pushkinsky and Petrodvortsovy district"*

| **8 characteristics of urban green space** | **Number** | **Percentage** |
|---|---|---|
| Serene - Peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no weeds, no disturbing people | 35 | 9,6 |
| Wild - Fascination with wild nature. Plants seem self-sown. Lichen and moss-grown rocks, old path | 8 | 2,2 |
| Lush - Rich in species. A room offering a variety of wild species of animals and plants | 26 | 7,1 |
| Spacious - A room offering a restful feeling of "entering another world", a coherent whole, like a forest meadow | 50 | 13,7 |
| The common - A green open place admitting vistas and stay | 66 | 18 |
| The pleasure garden - A place of imagination. An enclosed, safe and secluded place where you can relax and be yourself, let your children play freely and also experiment | 34 | 9,3 |
| Festive - A meeting place for festivity and pleasure | 68 | 18,6 |
| Culture - The essence of human culture; A historical place offering fascination with the course of time. | 68 | 18,6 |
| Other, please specify | 11 | 3 |
| **Total** | 366 | 100 |

*Table 6. Type of green areas which is good in St. Petersburg.*

Type of green areas which could be improved in St. Petersburg.

Participants were asked to choose characteristics of urban green space which could be improved in the St. Petersburg area. The same list of options was chosen as in the previous two questions (*Serene; Wild; Lush; Spacious; The common; The pleasure garden; Festive/centre; Culture; Other*). The option "*Other*" was also added to the list to encourage comments from respondents.

The results of the investigation are shown in Table 8. Serene is the most relevant characteristic most needing improvement with its 111 responses from 161 respondents. I guess that it can be connected with the average amount of noise in the St. Petersburg area. According to the publication made in year 2009, the average amount of noise in St. Petersburg is 66 dBA. St. Petersburg is eighth noisiest among the European cities. London is the quietest city in Europe with its 57 dBA (Information-analytical portal "Gorzakaz", 2009).

*Wild, Lush* and *The pleasure garden* characteristics collected almost equal amount of responses. *Spacious* got 56 responses and has a fifth place. *The common* and *Festive/centre* took the last places and collected 30 and 29 responses respectively. Among the last few comments to the *Other* option I found two the most interesting ones. They are presented below.

*"Innovation, new approaches to urban green space construction and development, wider list of plants with decorative features"*

*"Developing of urban green space infrastructure, comfortable conditions to spent time outside in urban green space"*

| **8 characteristics of urban green space** | **Number** | **Percentage** |
|---|---|---|
| Serene - Peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no weeds, no disturbing people | 111 | 23,8 |
| Wild - Fascination with wild nature. Plants seem self-sown. Lichen and moss-grown rocks, old path | 68 | 14,6 |
| Lush - Rich in species. A room offering a variety of wild species of animals and plants | 61 | 13,1 |
| Spacious - A room offering a restful feeling of "entering another world", a coherent whole, like a forest meadow | 56 | 12 |
| The common - A green open place admitting vistas and stay | 30 | 6,4 |
| The pleasure garden - A place of imagination. An enclosed, safe and secluded place where you can relax and be yourself, let your children play freely and also experiment | 63 | 13,5 |
| Festive - A meeting place for festivity and pleasure | 29 | 6,2 |
| Culture - The essence of human culture; A historical place offering fascination with the course of time. | 44 | 9,4 |
| Other, please specify | 5 | 1,1 |
| **Total** | 467 | 100 |

*Table 7. Type of green areas which could be improved in St. Petersburg.*

### What kind of improvements should be made in St. Petersburg green outdoor space?

This question was not compulsory to fill in, but it got 92 answers. There are various answers, some of them were in quite explanation with a lot of details, others are contained just few words. A number of respondents found it difficult to answer this question and left it with small explanation or did not fill it in at all.

I can say that it is really valuable for me to get so many different opinions. Participants gave their own personal positive or negative evaluation of current situation. As an expert I cannot criticize their picture, because I asked them to give an honest opinion. This is mostly a subjective opinion. So these comments show the respondents' view, feelings and emotions about improvements of St. Petersburg urban green space. I can add that I partly agree and partly disagree with these comments, but I think they are pieces of a treasure for this investigation. I found many interesting aspects which I can use in this master thesis and my future work. It is an inspiration for me to make one's contribution to the improvements of urban green space in St. Petersburg.

After reading all of the participants' answers, I have detected consistent patterns among the answers. The answers can be divided implicitly into two big groups.

The first group is combined with comments about innovations, new ideas and approaches in urban green space planning. There are even some comments about changes in government-level management structure concerning city planning.The most common and interesting comments for the investigation are mentioned below.

*"Interdisciplinary approach to the city townscape. Including large recreational areas to the Master Plan. Increasing of green space within the blocks. Leisure-time activities outdoors for citizens and pupils particularly. Citizens should be educated with conation towards calmness and serenity of city parks, landscape aesthetics, desire to take the air and spend more time within the nature."*

*"I suppose that it should be more urban green areas in the city that I could go out of the house and turn out to be in the park where I can walk for a long time by different pathways."*

*"Urban green space should be easy accessible (Why cannot we sit on the grass in the parks?). It is forbidden in the half of the city parks."*

I would like to comment this answer. It is forbidden to sit on the grass in many historical parks, palaces and gardens area in a very central part of the city. They should keep a presentable appearance - people can destroy it by sitting on the lawn. This makes it very uncomfortable for citizens who are living close to these places and want to spend leisure time outside in the park.

*"Expansion of financing of urban green space development.improvement in treatment of urban green space development with Scandinavian experience in mind."*

*"First and foremost it is arrangement of existing urban green spaces. Then it is complete rejection of old Soviet Union planning methods where the most important was to keep the image of the place generally. Instead of it use European planning methods as example. Where is the most emphasis to devote into the human perception and human wants. Much prominence should be given to the details."*

*"Wide range of species which is used in planting."*

*"Landscape designers should use not old-fashioned Soviet Union solutions, but create their own new original ideas. These ideas will attract the citizens, make changes in people's mind and habituate to careful attitudes towards the nature all at ones."*

*"Green space should appear in every micro district. It should be designed in unique style. Cleaning of the green space area should be carried out on a regular basis. Urban green space should be equipped with trash cans and benches. Combination of green space with leisure time areas (children playgrounds; fitness machines; ping pong tables and etc.). Bike paths should be well planned."*

*"Changes in a management level should happen and well-defined structure should build up. These are the best improvements from a "head". Expansion in the number of trash cans along the pathways should be mentioned, If we are talking about day-to-day changes. Urban green spaces within the city are often in the waterlogged conditions. Some of the existing drainage network are in a state of disrepair. They should be reconstructed. It would be interesting to see billboards with information if the green space are valuable from historical point of view or other interesting aspects such as wildlife of the place."*

The second group embodies information on the social aspect. It is a subject to consciousness of people. Around 20 participants mentioned it in their comments. The most relevant of them are shown below.

*"It is necessary to keep people informed of environmental vandalism and dropping a litter not to the trash can from childhood. All innovations and traditions are good in the city, but people fall them into decay."*

*"We have to be more environmental friendly."*

*"Before everything else, changes in conscious of people need to be happen. Visitors of urban green space have to be more careful with surrounding nature and manmade environment."*

*"It is important to begin with changes in state of mind."*
*I have found a few participant comments which are combined elements of both groups mentioned before. Respondents connected urban green space planning and social aspects in their own way.*

*"In my opinion the problem is not mostly in a quality of urban green space in St. Petersburg, but it is in the case of attitude to them. So it is a problem of people's environmental negligence. A condition of urban green space is quite good in the city. It is necessary to be skilled professionals for people who work in this area. So they can understand the value of their work. I would really appreciate if information such as wildlife of the place and importance of environmental friendliness might be shown. It could be billboards and exhibitions under the open sky or inside the pavilions. This is because any "green island" within the city is a reminder of nature generally."*

*"I regret to say that St. Petersburg inhabitants are not ready for improvements, because they are doing vandalize. It is necessary to create a new approach to urban green space, because the classical approach for landscape planning in St. Petersburg is too behind the times."*

*"It is essential to make think citizens that urban green space are meant for admire the landscape and leisure pursuits. These are not a landscape architect worries. Concerning specific actions for landscaping I would like to see a wide range of planting material and more ambitious landscape design. I also would like to see urban green space is connected with townscapes, but at the same time is given a relaxation for eyes from urban landscape."*

*"Education of coming generation with attitude towards nature.Construction of new parking lots outside of urban green space and courtyards.Introduction of new planning methods such as different levels of project development, perennial plants which are suitable for city environment and usage of natural forms in landscape architecture."*

## Cross analysis of questionnaire.

Cross analysis was undertaken based on questionnaire and made with aim to compare different group preferences. Also, cross analysis gives a deeper understanding of urban green space in St. Petersburg.

### Gender.

I found interesting to analyze gender preferences in the investigation. I made few different comparisons connected with gender which are shown further.

#### Comparison of gender and motivation to go visit green area

According to the comparison shown on Diagram 9, female respondents prefer to go visit open green space with motivation such as *Family day out, Walking the dog* and *Interesting in nature* more than other motivations. In return male respondents prefer to visit open green space in such as situation like *Specific event, Meeting/Visiting friends* and *Keeping fit.* For the other two reasons to go to visit open green space (*Getting outdoors and Other*) both groups have almost similar percentage amount.

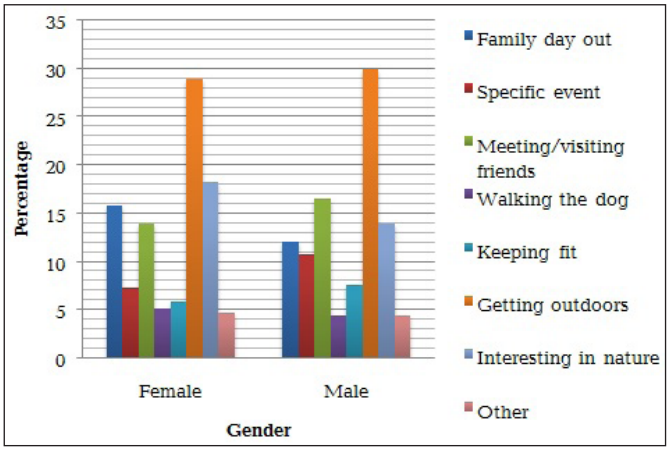


*Diagram 9. Comparison of gender and motivation to go visit green area in percentage terms.*

| Type of motivation | Female | Male |
|---|---|---|
| Family day out | 43 | 19 |
| Specific event | 20 | 17 |
| Meeting/visiting friends | 38 | 26 |
| Walking the dog | 14 | 7 |
| Keeping fit | 16 | 12 |
| Getting outdoors | 79 | 47 |
| Interesting in nature | 50 | 22 |
| Other | 13 | 7 |
| **Total** | **273** | **157** |

*Table 8. Comparison of gender and motivation to go visit green area.*

| Characteristics of urban green space | Female | Male |
|---|---|---|
| Good car access | 19 | 9 |
| Good access by foot | 79 | 48 |
| Good public transport | 20 | 16 |
| Events and activities | 26 | 13 |
| Interpretation of nature/history | 15 | 5 |
| Wild/natural areas | 46 | 30 |
| Meeting places | 59 | 27 |
| Planted/garden areas | 12 | 4 |
| Opportunity for schools/kindergartens group to visit | 22 | 9 |
| Peace/calm places | 76 | 50 |
| **Total** | **374** | **211** |

*Table 9. Comparison of gender and expectation of good green open space.*

### Comparison of gender and expectation of good green open space.

In comparison of gender and expectation of good green open space it comes clear that respondents chose frequently characteristics such as *Good car access, Events and activities, Interpretation of nature, Meeting places, Planted/garden areas* and *Opportunities for schools/kindergartens group to visit* . Male respondents chose mostly characteristics such as *Good access by foot, Good public transport, Wild/natural areas* and *Peace/calm places* (Table 9, see previous page; Diagram 10).

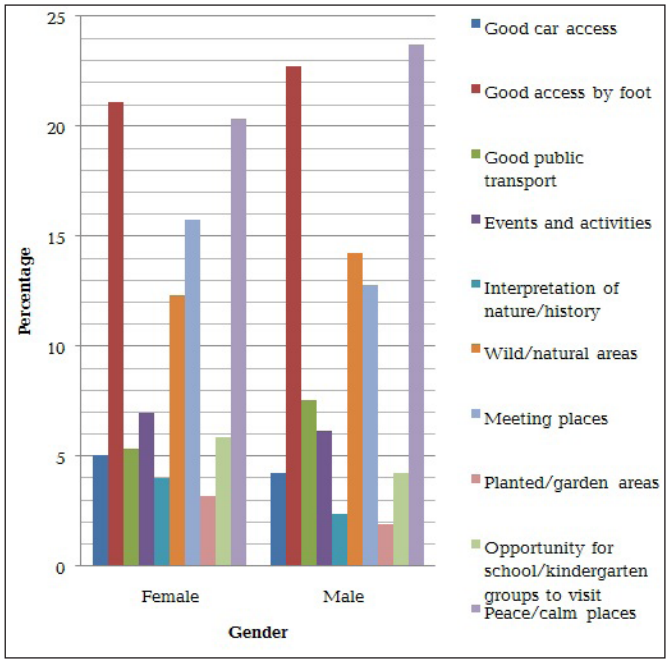


*Diagram 10. Comparison of gender and expectation of good green open space in percentage terms.*

### Comparison of gender and type of urban green space existing in the surroundings.

If we compare gender and type of urban green space existing in the surroundings it comes clear that there is no big difference between female and male respondents choice. However in the case of Green areas for common use, female respondents selected this option more often than male respondents. In turn male respondents picked Protected green belts option on a more frequent basis (Table 10; Diagram 11).

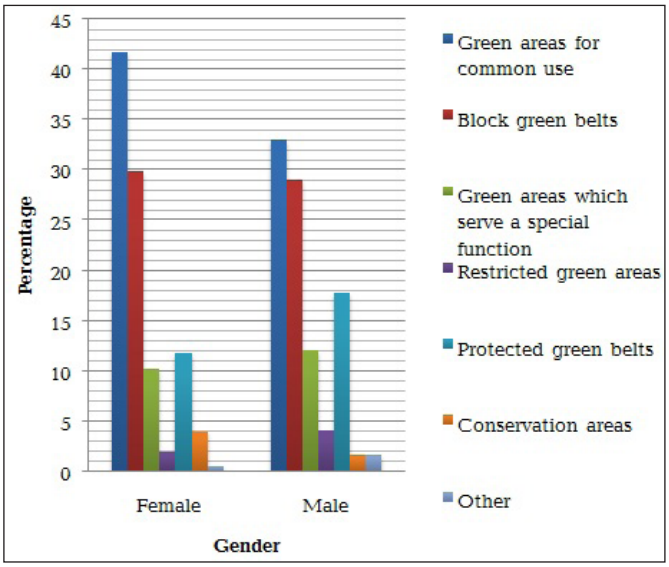


*Diagram 11. Comparison of gender and type of urban green space existing in the surroundings in percentage terms.*

| Type of green area | Example | Female | Male |
|---|---|---|---|
| Green areas for common | Parks, pocket parks, public | 85 | 42 |
| Block green belts | Neighborhood parks | 61 | 36 |
| Green areas which serve a | Green space attached to the urban | 21 | 15 |
| Restricted green areas | Industrial area, schools, | 4 | 5 |
| Protected green belts | Forest and parkland zones | 24 | 22 |
| Conservation areas | Reserves | 8 | 2 |
| Other | - | 1 | 2 |
| **Total** | - | 204 | 124 |

*Table 10. Comparison of gender and type of urban green space existing in the surroundings.*

## Comparison of gender and qualities of green area for respondents to go visit.

The comparison of gender and qualities of green area for respondents to go visit open green space shows virtually the same selection of options between female and male respondents. It is possible to see a more or less visible difference in *The pleasure garden* option, because female respondents chose it more often. As was mentioned before the *Other* option was added to encourage participants for comments.

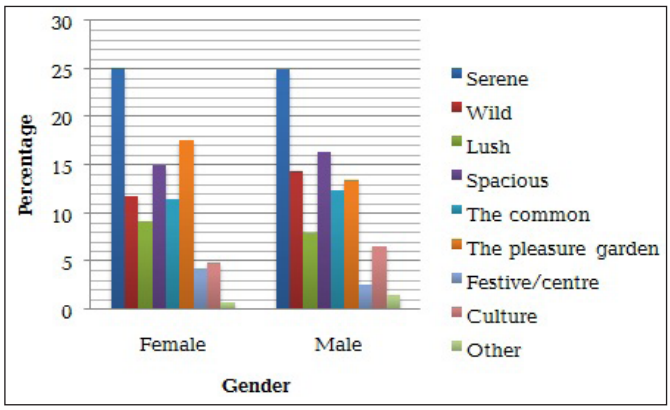


*Diagram 12. Comparison of gender and qualities of green area for respondents to go visit in percentage terms.*

| 8 characteristics of urban green space | Explanation | Female | Male |
|---|---|---|---|
| Serene | Peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no weeds, no disturbing people | 77 | 50 |
| Wild | Fascination with wild nature. Plants seem self-sown. Lichen and moss-grown rocks, old path | 36 | 29 |
| Lush | Rich in species. A room offering a variety of wild species of animals and plants | 28 | 16 |
| Spacious | A room offering a restful feeling of "entering another world", a coherent whole, like a forest meadow | 46 | 33 |
| The common | A green open place admitting vistas and stay | 35 | 25 |
| The pleasure garden | A place of imagination. An enclosed, safe and secluded place where you can relax and be yourself, let your children | 54 | 27 |
| Festive/centre | A meeting place for festivity and pleasure | 13 | 5 |
| Culture | The essence of human culture; A historical place offering fascination with the course of time. | 15 | 13 |
| Other | - | 2 | 3 |
| **Total** | - | **306** | **201** |

*Table 11. Comparison of gender and qualities of green area for respondents to go visit open green space.*

### Career field.

This kind of cross-analysis is important in the matter of urban green space perception. According to the questionnaire participants who are familiar with landscape/planning or relevant career field were absolutely sure in closeness of green areas to their home or working place. Others were mostly agreeing with it, but 7 respondents weren't and 2 participants were not absolutely sure about the closeness of green areas to their home or work place. I can draw a conclusion from this part of investigation that participants who are familiar with the landscape career field can define any green area much clearer than the other respondents. There are a few different comparisons connected with carrier field which are shown below.

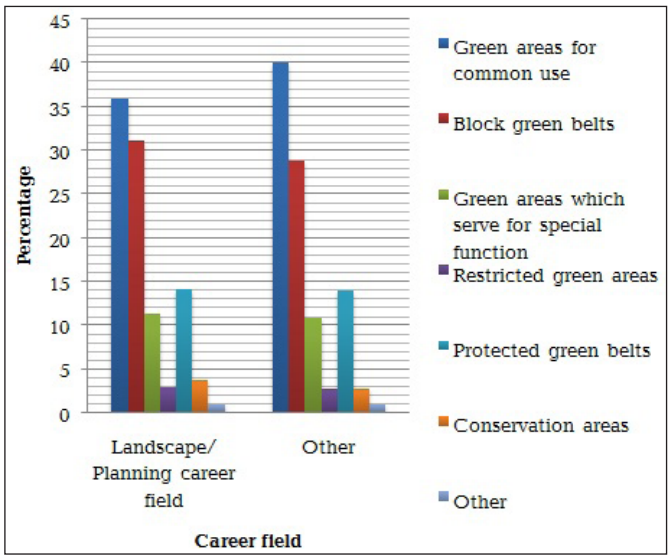


*Diagram 13. Comparison of career field and type of urban green space existing in the surroundings in percentage terms.*

### Comparison of career field and type of urban green space existing in the surroundings.

In comparison with the respondents who are not familiar with the landscape disciplines, the respondents who are familiar with the landscape/planning or relevant professions are more precise within the meaning of urban green space type. Thus in some comparative data such as *Green areas for common use* respondents from other career field are sure that they have it close to their surroundings, but they are less sure about *Block green belts* than the respondents who are familiar with landscape disciplines, who can define the difference between *Green areas for common use* and *Block green belts*. Apart from that, *Other* types of green areas have got almost an equal percentage of responses from both groups.

| Type of green area | Example | Landscape/ Planning career field | Other career fields |
|---|---|---|---|
| Green areas for common use | Parks, pocket parks, public gardens, avenues | 38 | 89 |
| Block green belts | Neighborhood parks | 33 | 64 |
| Green areas which serve for special function | Green space attached to the urban roads, green space for ecological protection of water supply, sanitary protected zones, and buffer zones | 12 | 24 |
| Restricted green areas | Industrial area, schools, kindergartens | 3 | 6 |
| Protected green belts | Forest and parkland zones | 15 | 31 |
| Conservation areas | Reserves | 4 | 6 |
| Other | - | 1 | 2 |
| **Total** | - | 106 | 222 |

*Table 12. Comparison of career field and type of urban green space existing in the surroundings.*

### Comparison of career field and the most important type of green area to go visit.

This comparison (Diagram 14; Table 13) shows that both groups of respondents mostly agree with two of the most important types of green areas such as *Wild* and *Lush*. Other types such as *The pleasure gardens*, *Festive/centre* and *Culture* are more popular for respondents who are familiar with landscape career field, but less relevant for other respondents. On the other hand, *Serene, Spacious* and *The common* are more popular for people who are not familiar with landscape career field. Also, participants from the other career field find more *Other* options of the most valuable type of green space.

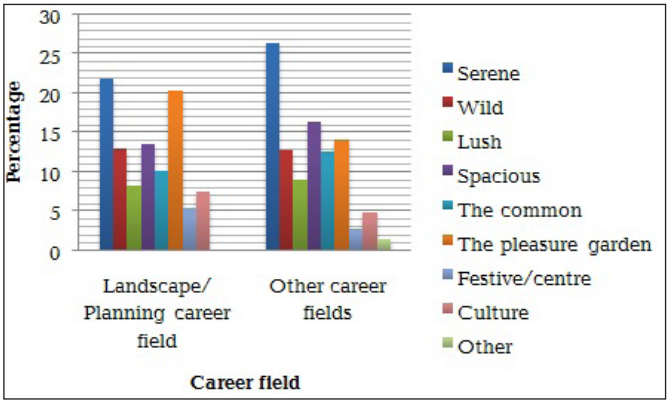


*Diagram 14. Comparison of career field and the most important type of green area to go visit in percentage terms.*

| 8 characteristics of urban green space | Explanation | Landscape/ Planning career field | Other career fields |
|---|---|---|---|
| Serene | Peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no weeds, no disturbing people | 32 | 95 |
| Wild | Fascination with wild nature. Plants seem self-sown. Lichen and moss-grown rocks, old path | 19 | 46 |
| Lush | Rich in species. A room offering a variety of wild species of animals and plants | 12 | 32 |
| Spacious | A room offering a restful feeling of "entering another world", a coherent whole, like a forest meadow | 20 | 59 |
| The common | A green open place admitting vistas and stay | 15 | 45 |
| The pleasure garden | A place of imagination. An enclosed, safe and secluded place where you can relax and be yourself, let your children play freely and also experiment | 30 | 51 |
| Festive/centre | A meeting place for festivity and pleasure | 8 | 10 |
| Culture | The essence of human culture; A historical place offering fascination with the course of time. | 11 | 17 |
| Other | - | - | 5 |
| **Total** | **-** | **147** | **360** |

*Table 13. Comparison of career field and the most important type of green area to go visit.*

### Comparison of career field and type of green outdoor areas which is good in St. Petersburg.

This comparison (Diagram 15; Table 14) shows that respondents who are familiar with landscape disciplines more often chose options such as *Festive/centre* and *Culture*, because these types of green areas are well-developed in St. Petersburg. Participants who are not familiar with landscape career field picked *The common* and *The pleasure gardens* more often than others. I believe that the option *The pleasure garden* connected with existing building surrounding grounds which is around 3-5 m from the houses and is mostly planted by people who live in the house. These areas are planted and organized in very diverse styles. Some people just plant flowers, some create different art objects from old car tyres , others even plant trees and bushes (which are forbidden on the ground close to the building foundations). By these methods they create their own small pleasure gardens.

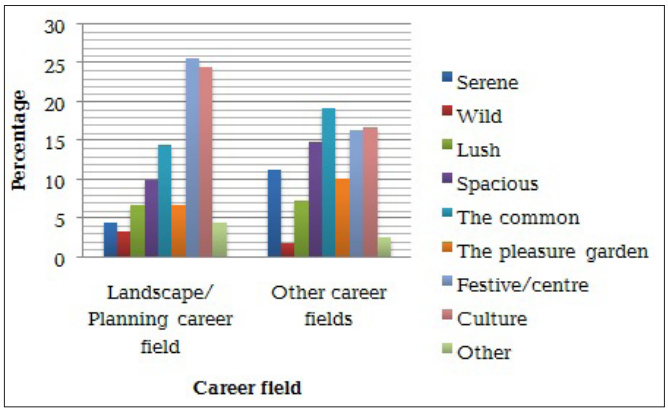


*Diagram 15. Comparison of career field and type of green outdoor areas which is good in St. Petersburg in percentage terms.*

| 8 characteristics of urban green space | Explanation | Landscape/ Planning career field | Other career fields |
|---|---|---|---|
| Serene | Peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no weeds, no disturbing people | 4 | 31 |
| Wild | Fascination with wild nature. Plants seem self-sown. Lichen and moss-grown rocks, old path | 3 | 5 |
| Lush | Rich in species. A room offering a variety of wild species of animals and plants | 6 | 20 |
| Spacious | A room offering a restful feeling of "entering another world", a coherent whole, like a forest meadow | 9 | 41 |
| The common | A green open place admitting vistas and stay | 13 | 53 |
| The pleasure garden | A place of imagination. An enclosed, safe and secluded place where you can relax and be yourself, let your children play freely and also experiment | 6 | 28 |
| Festive/centre | A meeting place for festivity and pleasure | 23 | 45 |
| Culture | The essence of human culture; A historical place offering fascination with the course of time. | 22 | 46 |
| Other | - | 4 | 7 |
| **Total** | **-** | **90** | **276** |

*Table 14. Comparison of career field and type of green outdoor areas which is good in St. Petersburg.*

Comparison of career field and type of green outdoor areas which could be improved in St. Petersburg.

This comparison (Diagram 16; Table 15) shows that both groups mostly agree in the types of green areas which could be improved in St. Petersburg. There are two main visible differences between the choices. Respondents who are familiar with landscape career field more often picked *The pleasure garden* option, because this type of open green space requires changes in people's mindset and should be designed according to the micro district plan in one style. Participants who were not familiar with landscape/planning or relevant career field picked more often the *Culture* option. I believe that by this they would like to see more clear connection of a place with its cultural heritage.

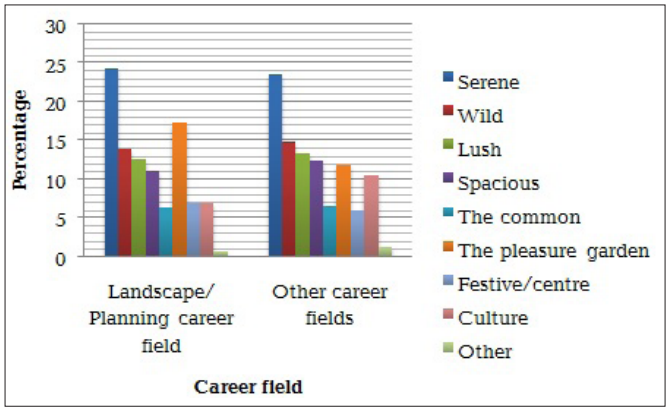


*Diagram 16. Comparison of career field and type of green outdoor areas which could be improved in percentage terms.*

| 8 characteristics of urban green space | Explanation | Landscape/ Planning career field | Other career fields |
|---|---|---|---|
| Serene | Peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no weeds, no disturbing people | 35 | 76 |
| Wild | Fascination with wild nature. Plants seem self-sown. Lichen and moss-grown rocks, old path | 20 | 48 |
| Lush | Rich in species. A room offering a variety of wild species of animals and plants | 18 | 43 |
| Spacious | A room offering a restful feeling of "entering another world", a coherent whole, like a forest meadow | 16 | 40 |
| The common | A green open place admitting vistas and stay | 9 | 21 |
| The pleasure garden | A place of imagination. An enclosed, safe and secluded place where you can relax and be yourself, let your children play freely and also experiment | 25 | 38 |
| Festive/centre | A meeting place for festivity and pleasure | 10 | 19 |
| Culture | The essence of human culture; A historical place offering fascination with the course of time. | 10 | 34 |
| Other | - | 1 | 4 |
| **Total** | **-** | **144** | **323** |

*Table 15. Comparison of career field and type of green outdoor areas which could be improved in St. Petersburg.*

### Where participants come from.

I suppose that the place where participants have grown up and also their current location can make difference in their perception of urban green space. Comparisons which are shown below are my attempt to show these differences.

I decided to divide all of the respondents into two groups instead of using the division which was already made in the questionnaire. The first group is involved participants who come from St. Petersburg and in the second group I combined the rest of the participants (those who come from towns and cities of the Leningrad Region, Russian Federation and all over the world). There are 113 participants in the St. Petersburg group and 48 participants from Other parts of the world group.

### Comparison of the place where participants come from and type of urban green space existing in the surroundings.

According to the comparison (Diagram 17) the selection of options from both groups is quite similar. There are however a few differences in the selection which can arise interest. Participants who come from St. Petersburg more often chose *Green areas for common use.* I suppose that it is connected with the location of St. Petersburg citizens, they can reach green areas for common use within a 20 minute journey by public transport (Building Regulation СП 42.13330.2011). Participants who come from other parts of the world chose *Green areas which serves a special function* and *Protected green belts* on a more frequent basis.

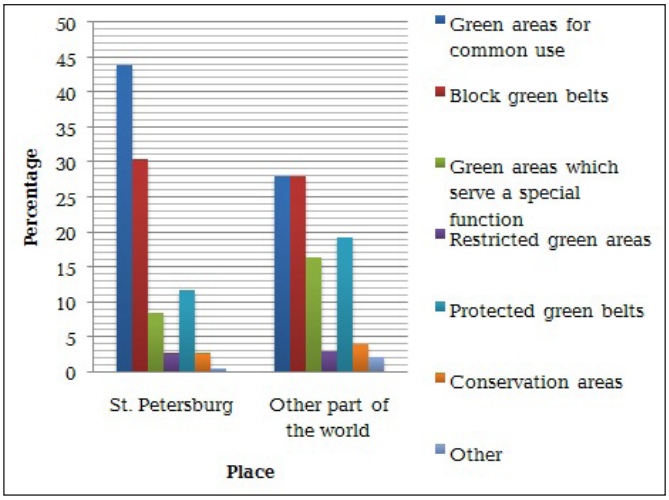


*Diagram 17. Comparison of the place where participants come from and type of urban green space existing in the surroundings in percentage terms.*

| Type of green area | Example | St. Petersburg | Other parts of the world |
|---|---|---|---|
| Green areas for common use | Parks, pocket parks, public gardens, avenues | 98 | 29 |
| Block green belts | Neighborhood parks | 68 | 29 |
| Green areas which serve a special function | Green space attached to the urban roads, green space for ecological protection of water supply, sanitary protected zones, and buffer zones | 19 | 17 |
| Restricted green areas | Industrial area, schools, kindergartens | 6 | 3 |
| Protected green belts | Forest and parkland zones | 26 | 20 |
| Conservation areas | Reserves | 6 | 4 |
| Other | - | 1 | 2 |
| **Total** | - | 224 | 104 |

*Table 16. Comparison of the place where participants come from and type of urban green space existing in the surroundings.*

Comparison of place where participants come from and the most important type of green area to go visit.

According to the comparison which shown below (Diagram 18; Table 17) respondents from St. Petersburg value the *Culture* characteristic of landscape more than participants who come from the other parts of the world. However the most important characteristics for both groups are *Serene, Spacious, The Pleasure garden* and *Wild.*

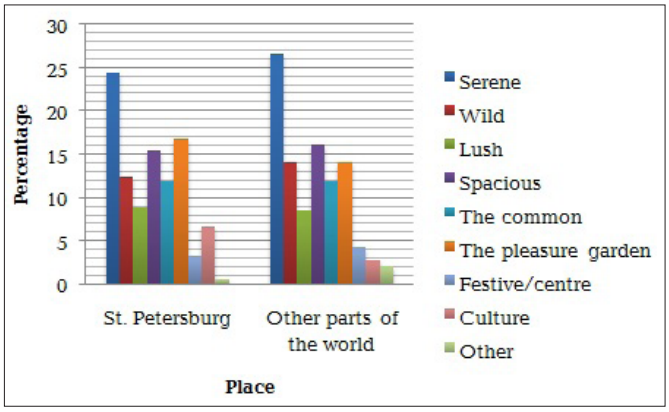


*Diagram 18. Comparison of place where participants come from and the most important type of green area to go visit in percentage terms.*

| 8 characteristics of urban green space | Explanation | St. Petersburg | Other parts of the world |
|---|---|---|---|
| Serene | Peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no weeds, no disturbing people | 89 | 38 |
| Wild | Fascination with wild nature. Plants seem self-sown. Lichen and moss-grown rocks, old path | 45 | 20 |
| Lush | Rich in species. A room offering a variety of wild species of animals and plants | 32 | 12 |
| Spacious | A room offering a restful feeling of "entering another world", a coherent whole, like a forest meadow | 56 | 23 |
| The common | A green open place admitting vistas and stay | 43 | 17 |
| The pleasure garden | A place of imagination. An enclosed, safe and secluded place where you can relax and be yourself, let your children play freely and also experiment | 61 | 20 |
| Festive/centre | A meeting place for festivity and pleasure | 12 | 6 |
| Culture | The essence of human culture; A historical place offering fascination with the course of time. | 24 | 4 |
| Other | - | 2 | 3 |
| **Total** | **-** | **364** | **143** |

*Table 17. Comparison of the place where participants come from and the most important type of green area to go visit.*

Comparison of the place where participants come from and types of green outdoor areas which are considered to be good in St. Petersburg.

Participants who come from St. Petersburg often chose the *Wild* option, but the other participant group did not choose this option at all (Diagram 19; Table 18). It is possible that people who are not from St. Petersburg visited the city at least once. They did not see so many wild areas inside the city; if visiting as tourists, they saw mostly city centre areas with historical parks and palaces with gardens. So they picked *Culture* as the most well-defined characteristic.

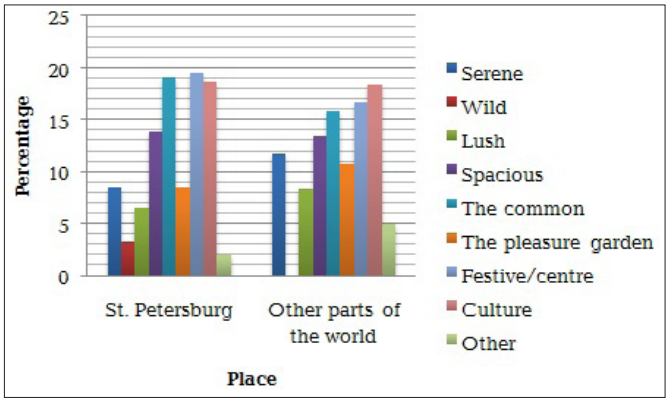


*Diagram 19. Correlation of the place where participants come from and types of green outdoor areas which are considered to be good in St. Petersburg in percentage terms.*

| 8 characteristics of urban green space | Explanation | St. Petersburg | Other parts of the world |
|---|---|---|---|
| Serene | Peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no weeds, no disturbing people | 21 | 14 |
| Wild | Fascination with wild nature. Plants seem self-sown. Lichen and moss-grown rocks, old path | 8 | 0 |
| Lush | Rich in species. A room offering a variety of wild species of animals and plants | 16 | 10 |
| Spacious | A room offering a restful feeling of "entering another world", a coherent whole, like a forest meadow | 34 | 16 |
| The common | A green open place admitting vistas and stay | 47 | 19 |
| The pleasure garden | A place of imagination. An enclosed, safe and secluded place where you can relax and be yourself, let your children play freely and also experiment | 21 | 13 |
| Festive/centre | A meeting place for festivity and pleasure | 48 | 20 |
| Culture | The essence of human culture; A historical place offering fascination with the course of time. | 46 | 22 |
| Other | - | 5 | 6 |
| **Total** | **-** | **246** | **120** |

*Table 18. Comparison of the place where participants come from and type of green outdoor areas which are good in St. Petersburg.*

Comparison of the place where participants come from and the type of green outdoor areas which could be improved in St. Petersburg.

According to the comparison (Diagram 20) participants from St. Petersburg marked *The pleasure garden* as the green outdoor areas needing most improvement in the city. The other options are rather similar for the both groups. Serene characteristic is needing the most improvement in the city for both groups.

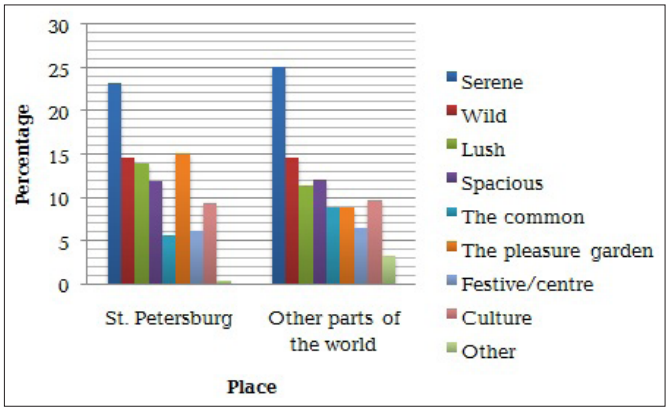


*Diagram 20. Comparison of the place where participants come from and the type of green outdoor areas which could be improved in St. Petersburg in percentage terms.*

| 8 characteristics of urban green space | Explanation | St. Petersburg | Other parts of the world |
|---|---|---|---|
| Serene | Peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no weeds, no disturbing people | 80 | 31 |
| Wild | Fascination with wild nature. Plants seem self-sown. Lichen and moss-grown rocks, old path | 50 | 18 |
| Lush | Rich in species. A room offering a variety of wild species of animals and plants | 48 | 13 |
| Spacious | A room offering a restful feeling of "entering another world", a coherent whole, like a forest meadow | 41 | 15 |
| The common | A green open place admitting vistas and stay | 19 | 11 |
| The pleasure garden | A place of imagination. An enclosed, safe and secluded place where you can relax and be yourself, let your children play freely and also experiment | 52 | 11 |
| Festive/centre | A meeting place for festivity and pleasure | 21 | 8 |
| Culture | The essence of human culture; A historical place offering fascination with the course of time. | 32 | 12 |
| Other | - | 1 | 4 |
| **Total** | **-** | **344** | **123** |

*Table 19. Comparison of the place where participants come from and the type of green outdoor areas which could be improved in St. Petersburg.*

## Reflections.

When I started this investigation I scarcely believed that I would get more than 100 participants, but by the end of the survey I collected 161 respondents. I am pretty satisfied with this result and hope that this survey is representative for my master thesis. I had trying to attempt to gain at least 100 participants, because I think that it is important to have a large number of randomly selected participants in order to have more or less representative result. Of course someone can say that it is not enough to collect 161 participants in order to obtain the average person's opinion in the city of 5 million inhabitants. However, I believe that this small group of people gave me an essential data to work with and many comments and thoughts to think about in this thesis and future work.

Results shows that young persons were more motivated to take a part of this investigation. They gave many comments on the existing situation with the green infrastructure of the city and how it could be improved as well. Thus I can say that it seems to me that young group of respondents are more positive towards the green areas in the city and probably they will keep their positive feeling towards nature during the whole life and will try to give the same to their children. They wish to see St. Petersburg as a modern green city with the attitude towards cultural background and nature.

I had also not expected to get so many comments and would like to thank participants for responding to this survey. Some of the comments I received were later continued in discussion with their owners. The majority of the comments were valuable for me to get closer to understanding participants' preferences and feelings towards urban green space in St. Petersburg.

Some more obvious results came up from the investigation, like I expected that amount of the female participants would be bigger than amount of male participant. I noticed that women were more active in the taking part of the investigation than men, because of that I got more comments from women than from men.

Other results were not so obvious and even surprising for me, like only 29% of the participants visit open green space every day and others do it more rarely down to 10% of the participants visit green open space only 1 time per month. It is really difficult for me to imagine that people go outside to take a walk in the open green space so rarely, this was completely unexpected.

In the question about availability of green areas close to home or working place rather interesting result came out. There were 152 respondents with a positive answer, 7 respondents with a negative answer and 2 respondents with an uncertain option. I am not surprised of the 7 negative responses. At average probably an even larger percentage of the population do not visit green areas so much. Instead a low number of negative answers is a result of the method that only motivated persons of young age, answer this kind of web questionnaire. The other option is to use the traditional method as was mentioned above.

The results of the data analyses including cross analysis were not so surprising and unexpected. People's preferences within different gender, career field and location groups were rather similar with some exceptions.

One of the interesting results from the cross analysis shown in the correlation between career field and the most important type of green area to go visit. It shows that both groups (people familiar with landscape/planning career field; other career fields) of respondents mostly agree with two of the most important types of green areas such as *Wild* and *Lush*. Other types such as *The pleasure gardens*, *Festive/centre* and *Culture* are more popular for respondents who are familiar with landscape career field, but less relevant for other respondents. On the other hand, *Serene, Spacious* and *The common* are more popular for people who are not familiar with landscape career field.

In the last question about the improvements that should be made in St. Petersburg's outdoor green space I used a qualitative method to give a chance for participants to express and to share their thoughts. For myself it gave me an opportunity to focus on individual's interpretation with their complex and broad multiple realities. It gave me an understanding what kind of improvements are more valuable and worth counting in this thesis and future work.

Finally I can say that combination of quantitative and qualitative research methods in this investigation gave me a chance to observe social and symbolic reality of my work. Fresh perspectives from participants comments together with collected data for analyses have enriched my work and created many new lines of thinking about people's preferences and feelings of urban green space.

According to the Monography (St. Petersburg gardens. History and modernity, 2011), urban green spaces and landscape architecture of St. Petersburg has been in the public interest for more than 300 years. Peter the Great developed, introduced and strictly controlled specific regulations with name "Model Projects to create gardens" at the beginning of the construction of the new capital. It was a Dutch garden model which was changed later into the French garden model. The "Garden office " was established in 1710. The most important functions of the office were to maintain and create new urban green spaces in the city. Development of the theory and practice of landscape architecture and planning began in 1933 in Leningrad (St. Petersburg). Aesthetic and public health qualities were the most important aspects for landscape planning from 1917. The construction of urban green spaces continued even during the Second World War, with the aim to protect the city from bombing using fast-growing species of trees. Damage from bombing during the Siege of Leningrad were extremely huge - 700 ha of urban green spaces. A close cooperation between science and landscape planning department was important for the development of urban green spaces. Implementation of sustainable range of hardy-shrub species in the urban greening was the topic of interest for the construction of the urban green spaces. The first technical specifications for landscape construction were established in 1939. They were reissued many times and still are valued for the landscape professionals (St. Petersburg gardens. History and modernity, 2011).

The modern classification of urban green space in St. Petersburg has roots in the Soviet Union system. The priority during the Soviet Times was given to create urban green spaces according to the functional needs of residents, public health and high aesthetical qualities of place. Many new wide urban green spaces were established for recreational purposes of the inhabitants. Various National State Standards which were established in the USSR and are still used in the modern planning system. There are also a few important enactments for urban green space development in St. Petersburg.

St. Petersburg Master Plan is the most important enactment for city development. The latest edition was accepted by the Legislative Assembly of St. Petersburg in 23rd June 2010. One of the goals is providing a conducive living environment for present and future generations of citizens in St. Petersburg; restoration of natural resources; preservation of biosphere (St. Petersburg Master Plan, 2005). This goal is similar to the sustainability definition. There are several aims for urban green space development:

1. Increasing of urban green space of St. Petersburg by half times through decreasing of factory areas in a historical part of St. Petersburg; unused land plots; agricultural land; recreational use of forest.

2. Increasing of green areas for common use such as parks, public gardens, avenues and green space attached to roads.

3. Organization of urban green space system through new amenity planting; provision of amenities and planting of water protection zones, sanitary protection zones and space attached to roads.

4. Strengthening of the environment protection role of urban green space with preservation of valuable landscapes.

According to the St. Petersburg Master Plan recreational zones are divided into 6 groups:

1. *Sport facilities and beaches area.* They include utility infrastructure for area maintenance.

2. *Forest and parkland area.*

3. *Green areas for common use and restricted green areas.* They include objects accepted in accordance with green planting protection legislation. They also comprise plate sport structures.

4. *Area for recreation and sport activities, leisure and entertainment, tourism and spa treatments, hotels and guest houses, summer residences.* It includes utility infrastructure for area maintenance.

5. *Historical parks, palaces and gardens area.*

6. *Green area which serves for special functions. It include objects accepted in accordance with legislation.*

Urban green space area should be 29% of total St. Petersburg area.

Various National State Standards were established in USSR and are still used in the modern planning system. The National State Standard 28329-89 is one of them; it has the name "Urban planting. Terms and definitions". It was formed in 1989 in the USSR and then was reissued in 2006 in Russian Federation. This standard determines the definition for urban planting.

There are a few National State Standards which ensure biodiversity of plants in the cities. According to them there are 132 deciduous trees, 44 conifer trees, 289 decorative shrub species, 88 annual flower species and 42 species of bulbs and tubers of flower cultures which are preferable to use in the Russian cities. There is also a special standard which provides the species compatibility if there is the need to replace one species for another. Not all of them are possible to use in St. Petersburg due to the climate condition, but the list of plants used in the city is rather big. There are many exotic plants growing in the Botanical gardens and on the private plots. Perennial plants are not so widely used in the city, but they are very popular to use in allotment gardens.

The National State Standard (СНиП 2.07.01-89) which was formed in 1989 in USSR and then was reissued in 2011 like Building Regulation (СП 42.13330.2011). It has a name ''Urban development. Urban and rural planning and development". These regulations cover the design of new and reconstruction of existing urban and rural communities. They include the basic requirements for planning and building. Specification of these requirements should be implemented at the regional regulations.

According to these regulations, a standard for average amount of urban green space per person was established (table below). For such a big city as St. Petersburg the standard should be 16 sq. meters of green areas per person for common use and block green belts.

| Green areas for common use | Planting areas, sq. m. per person | | | |
|---|---|---|---|---|
| | Big cities/Big towns | Medium city/Medium towns | Small towns | Settlements/ Rural settlements |
| Population | More than 100 000 | 50 000 - 100 000 | 10 000 - 50 000 | 50 - 5000 |
| City wide green areas | 10 | 7 | 8 (10*) | 12 |
| Block green belts | 6 | 6 | - | - |
| * for small towns with population less than 20 000 people | | | | |

*Table 20. National standard on average amount of urban green space per person.*

The urban green space cover in the microdistricts should be around 25% without areas of schools and kindergartens. The playgrounds for children together with recreation areas should be around 10% of the microdistrict total area, so people can have an easy access and can watch children while they are playing (Ibid.). According to Swedish standards set before 1975, the distance to children playground should be 150 m (SvenskBuggnorm, 1975). I can add that it looks like in St. Petersburg we have a playground for children almost in each yard and they are easily accessible.

The proximity to urban green spaces should be within the 20 min distance by public transport for city and microdistrict park, without time waiting period on the public transport stops. The walking distance to the neighborhood parks should be within 500 m (5-10 min) and 1000-1500 m to the city parks (10-15 min) (СП 42.13330.2011).

The size of urban green spaces in the city should be no less than: for city parks - 15 hectares; parks - 10 hectares; Block green belts - 3 hectares and for pocket parks - 0,5 hectares (Ibid.).

These National Standards and Regulations have not changed a lot from Soviet Union time, in contrast to the St. Petersburg Master Plan and St. Petersburg Green Space Act which keep developing with evolution of society and economic of Russian Federation. Even if these documents are based on standards and regulations from Soviet Union they keep changing through time. The latest edition of St. Petersburg Green Space Act was formed and accepted in 23d June, 2010, but it is still changing. A few amendments of this act were accepted for past years. The St. Petersburg Green Space Act updates an average amount of urban green space per person (Article 5, 2010). These modifications are based on biological factor of environment and sustainability of ecosystem.

Minimal standards for average amount of urban green space per person are vary in different city districts:

- 6 sq. m. per person in: Admiralteysky district, Vasileostrovsky district, Petrogradsky district, Tsentralny district, Kolpinsky district.

- 12 sq. m. per person in: Vyborgsky district, Kalininsky district, Kirovsky district, Krasnogvardeysky district, Krasnoselsky district, Moskovsky district, Nevsky district, Primorsky district, Frunzensky district.

- 18 sq. m . per person in: Kronshtadtsky district, Kurortny district, Petrodvortsovy district, Pushkinsky district.

The average amount of urban green space per person in St. Petersburg areas is determined for each district in Saint Petersburg. It is the ratio of the amount of all green areas for common use, restricted green areas and block green belts which located within the area of St. Petersburg divided by the general number of persons registered in this district of St. Petersburg.

Nielssonet. all (2007) made an investigation about the concept of urban greening in the St. Petersburg area based on GIS map analysis. The results show that green space cover in the districts is rather varied. For Petrogradskyand Frunzensky districts the green space cover is varied between 35% and 49%; for Tsentralny district - between 15% and 24%.

## Definition of the 6 urban green area groups.

1. *Green areas for common use* - these areas are situated in various areas of common use and are occupied with planting or are aimed for it. They are used for recreational purposes with free access for public.

2. *Block green belts* – areas which are situated within the boundaries of blocks. These areas are covered with planting or are aimed for it; they don't have direct access to the road network facilities and are used mainly by block inhabitants for recreational purposes. Block green belt areas don't include following territories: green areas for common facilities; restricted green areas; green areas which serve for special functions; protecting forest areas; nature conservation areas and land plots which are made available for use to natural and legal persons without opportunity for sitting green planting within these areas.

3. *Green areas which serve for special functions* - areas are covered with planting or are aimed for it. They are situated in following protected zones: drinking water protective areas; sanitary protected zones; noise-protected zones; water protected zones; fire protected areas; cemetery areas; space attached to urban roads and railways. They also include other zones which involve planting of buffer zones and include green space attached to urban roads of St. Petersburg street and road network.

4. *Restricted green areas* - land plots or parts of land plots which are situated in different zones under the jurisdiction of St. Petersburg. These areas are covered with planting. Access to these green areas is limited or can be limited by property owner. They are government facilities with statutory obligations to maintain green space.

5. *Protected green belts* - city forest and parkland zones which are situated within the boundaries of St. Petersburg. Protected green belts borders are defined by forestry legislation requirements.

6. *Conservation areas (reserves)* - green areas which are situated within the boundaries of specially protected natural reservations of St. Petersburg .

Urban green space objects are a part of social infrastructure of St. Petersburg and St. Petersburg's inner municipalities(St. Petersburg Green Space Act, Article 7, 2010).

## How to merge two classifications.

In the further analysis, I decided to combine the two classifications of urban green space in St. Petersburg into one according to St. Petersburg Master Plan and St. Petersburg Green Space Act. By this I hope to show an overall picture of the urban green space in chosen districts and somehow for the whole city. The classification of urban green space according to the St. Petersburg Master Plan comprises each group of St. Petersburg Green Space Act except for *Block green belts*. However due to the more holistic nature of St. Petersburg Master Plan, I decided to use it as the main basis for analysis, but enrich it by using the aspect of *Block green belts* which will bring neighborhood parks into the classification and will show their availability and distribution around the city districts. Usually the *Block green belts* are present in the city as small sized green space. The results of study presented in the paper "Use of Small Public Urban Green Space" (Peschardt et. all, 2012) show that the main reason to visit this kind of urban green space is the opportunity for socializing, rest and restitution, which seems to be important for improving sustainability in cities. The study shows that small urban green spaces are very popular amongst visitors and provide them with components of sunshine, grass, water and trees. Therefore people can fulfill some of their needs even with this small type of urban green space.

The classification includes:

1. *Sport facilities and beaches area* (Athletic fields, football fields, beaches).

2. *Forest and parkland areas* (Conservation areas and protected green belts)

3. *Green areas for common use and restricted green areas* (Parks, gardens, industrial areas, schools, kindergartens etc.)

4. *Areas for recreation and sport activities, leisure and entertainment, tourism and spa treatments, hotels and guest houses, summer residences.*

5. *Historic parks, palaces and gardens* (Green areas for common use which have an old history).

6. *Green areas which serve a special function* (Green space attached to the urban roads, sanitary protected zones, green space for ecological protection of water supply).

7. *Block green belts.*

The classification of urban green space in St. Petersburg has been illustrated on the maps which will be shown subsequently with district division. Maps include all of above mentioned groups apart from green spaces attached to urban roads (which form part of the *Green areas which serve a special function* group) due to their inconspicuous dimension in comparison with other groups. Green spaces attached to the houses is also not included in the analysis for the same reason. However this two types of urban green spaces are the most widespread in the city and the most commonly visited among the inhabitants in their everyday life. People usually passing by these areas and do not pay many attention for them, but urban green space attached to the houses and roads affect human beings and continue to improve quality of the harsh city climate conditions.

Some of the groups like *Forest and parkland areas* are missing in the chosen districts because of the districts' position in the city structure.

I would like to explain a few aspects of the classification with the aim ofavoiding any misunderstanding of further analysis.

The St. Petersburg Master Plan is the main policy for city development. It possible that some urban green space areas are not included in this policy, but it does not mean that they are not green. If the area is not included in the St. Petersburg Master Plan it could mean that this areais:

- A restricted green area

- A green areas which serves a special function which by mistake has not been taken into account, but will be added later to the list.

- A green area for common use which by mistake has not been taken into account, but will be added later.

- A block green belt area which is considered in the St. Petersburg Green Space Act, but is not included in the St. Petersburg Master Plan.

Also in the St. Petersburg Master Plan, the areas for cemeteries are not included in urban green space and have a different category, but in the St. Petersburg Urban Green Space Act cemetery areas are included in the *Green areas which serve a special function*. Thus the cemetery areas are not included in the map below, but it is possible to see on the current land use situation maps which were shown previously.

According to the St. Petersburg Master Plan some parks in the district are included in the *Historical parks, palaces and gardens area* and other parks are included in the *Green areas for common use and restricted green areas*, but according to the St. Petersburg Urban Green Space Act some historical parks are excluded from the list of the *Green areas for common use*. In the further analysis, some data with numbers of the urban green space will be given from St. Petersburg Urban Green Space Act Classification. *Historical parks, palaces and gardens area* are under the state and regional jurisdiction; they are not included in the St. Petersburg Green Space Act. Therefore this gives some complications whilst assessing the different classifications.

During my work on the thesis, I found a very useful information source from St. Petersburg city Government (Regional Information system, 2013) where everyone can find current information of interest. The source is Geo-Information system of St. Petersburg. The urban green space classification used in the source is the St. Petersburg Urban Green Space Classification along with other interesting information. Unfortunately whilst it is open to view for everyone, access to work with data on the GIS programs is only available for Government and some other organizations. So I used it mostly as a source for comparison of the Classification and for data.

The St. Petersburg Urban Green Space act provides data only for *Green areas for common use* and *Block green belts*. Other information is possible to find for detailed analysis only on the government level and the scope of this master thesis unfortunately does not let me to find and analyze it.

So each district will be shown separately and I hope to give a more overall impression of the classification of urban green space in the St. Petersburg according to both classifications.

### Petrogradsky district.

It is possible to see that Petrogradsky district looks rather green compared to others. There is a mosaic pattern of different green areas around the district. The northwest part is more green compared to the south-east part. According to the data mentioned above, we can find an average amount of urban green space per person for the district (see Introduction to study area, Petrogradsky district). The total green area is 494,8 hectares for 130,4 thousand inhabitants which gives 37,9 sq. m. per person. The quality of urban green spaces here is to a high level.

*Sport facilities and beaches areas* are mostly present in the Petrogradsky district in the form of football stadiums, and different sport training facilities for football, tennis and other sport activities. The size of the area depends on the type of the facilities and varies from small areas to the huge area for the football stadium.

*Forest and parkland areas* are not present in the district at all. These kind of areas are more common for outskirt districts which are connected with forests of Leningrad Region.

*Green areas for common use and restricted green areas* are the most well-developed and well-distributed group in the district. The size varies considerably from the huge park area of Primorsky Victory Park with its 115,64 hectares to small avenues and tiny pocket parks with a size of 0,01 hectares. There are 156 objects of *Green areas for common use* with total area of 222,81 hectares (St. Petersburg Green Space Act, 2010). They are open and have an easy access for visitors. The main purpose of the area is recreational.

*Historic parks, palaces and gardens* are well-developed in the district due to its history. The size is varied from more than 100 hectares to a few hectares. The area serves mostly recreational and educational purposes, but also improves public health and ecological settings. They have a rather coherent shape. Some of them are closed at night time and have a small entrance fee, such as the Botanical garden, others are open constantly for the public. The area is well maintained due to its historic value.

*Areas for recreation and sport activities, leisure and entertainment, tourism and spa treatments, hotels and guest houses, summer residences* are not so common here and are mostly situated by the side of sport facilities and green areas for common use. This type of area is partly open for public but some have entrance fees.

*Green areas which serves a special function* vary greatly in function; some areas are for recreational and educational purposes, others serve as a buffer zone for the ecological protection of water, sanitary protected zones, and buffer zones. Also it includes green space attached to urban roads. Sizes, shapes and accessibility are varied with the purpose of the areas.

*Block green belts*. As was mentioned before, Block green belts are areas which are situated within the boundaries of blocks. These areas are covered with planting or are aimed for it; they don't have direct access to the road network and are used mainly by block inhabitants for recreational purposes. There are 29 objects of Block green belts in the district with total area of 3, 89 hectares due to their tiny size, most are less than 1 hectare (St. Petersburg Green Space Act, 2010). They are mostly neighborhood parks a with more or less coherent shape, situated within the blocks of the houses which protect the areas from the traffic noise.

*Fig. 8. A part of urban green space inside the courtyard in Pertogradsky district with high amount of vegetation. It is rare for old parts of the city to have this amount of vegetation. Usually the green areas are very small there (number 1 on the map on page 50) (picture by Eugene Kibler).*

*Fig. 9. Urban green space attached to urban roads together with urban green space for common use (left side of the picture) in Petrogradsky district. Diverse in vegetation and quality of urban green spaces is at a high level (number 2 on the map on page 50).*

# URBAN GREEN SPACE MAP OF PETROGRADSKY DISTRICT

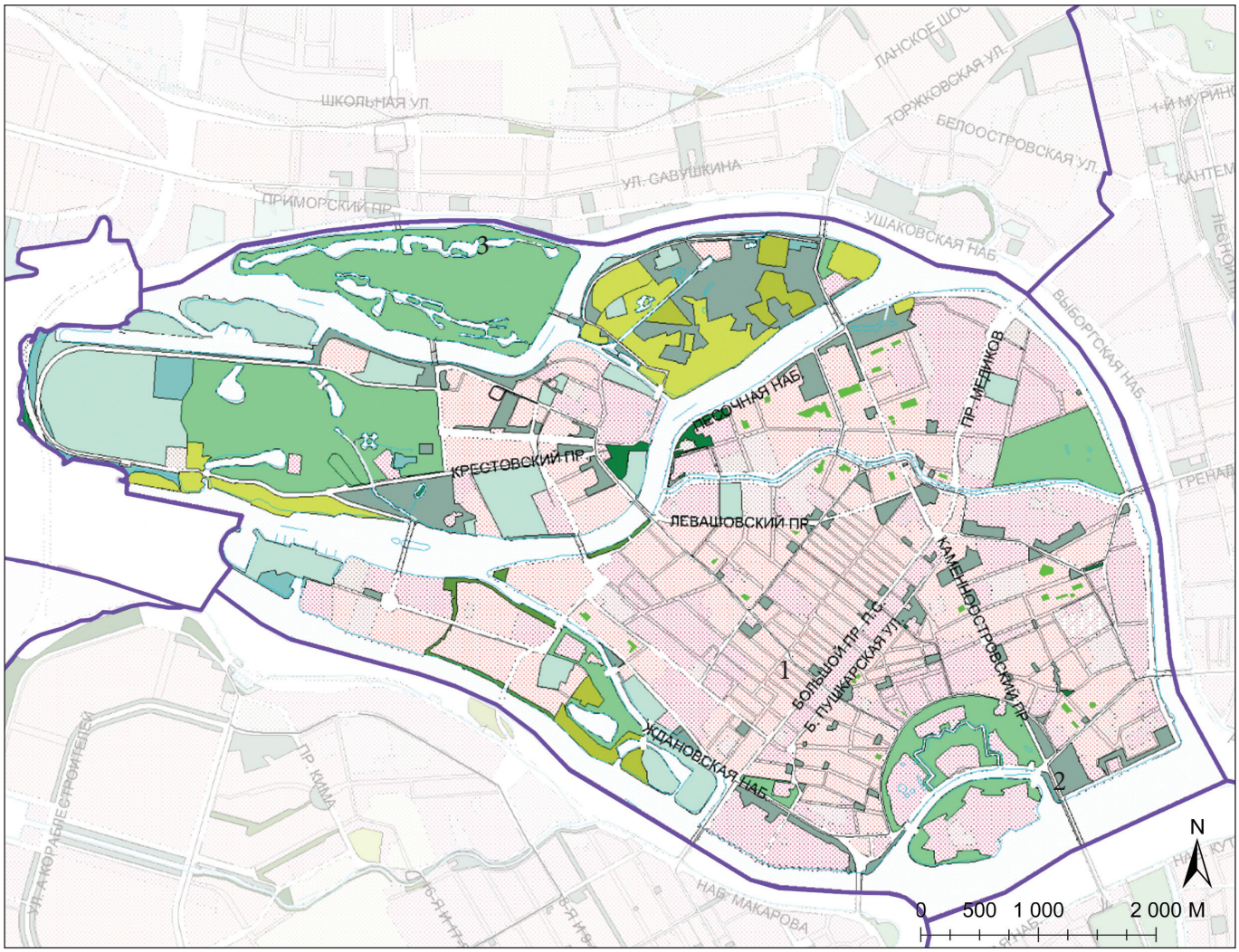


*Fig. 10. Urban green space map of Petrogradsky district according to classification of St. Petersburg urban green space with legend below.*

*Areas for recreation and sport activities, and entertainment, tourism and spa treatments, hotels and guest houses, summer residences.*

*Block green belts*

*Green areas for common use and restricted green areas*

*Green areas for common use on newly formed or converted areas*

*Historic parks, palaces and gardens area*

*Green areas which serve a special function*

*Sport facilities and beaches areas*

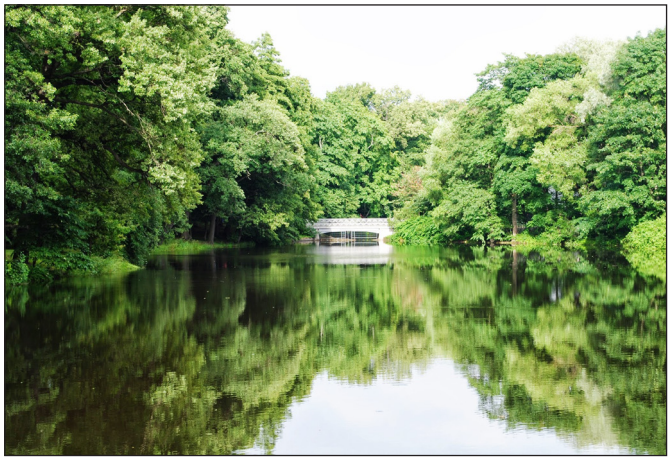

*Fig. 11. Elagin island is also known as a Central Park of Culture and Recreation. Place rich in experienced qualities of urban green space (number 3 on the map above).*

## Tsentralny district

According to the data mentioned above we can find an average amount of urban green space per person for the district(see Introduction to study area, Tsentralny district). The total green area is 103,6 hectares for 270 thousand inhabitants which gives around 3,84 sq. m. per person. Obviously Tsentralny district is poor in quantity of urban green space, but the quality of urban green spaces is at a high level, due to the very central position and attractiveness for tourists.

*Sport facilities and beaches areas* are mostly present here in the form of small football and basketball fields. The size of the area is very small, around 0,5 hectares. The beach area is not present here at all, the waterfront of rivers and canals is covered by granite.

*Forest and parkland areas* are not present in the district at all. These kind of areas are more common for outskirt districts which are connected with forests of Leningrad Region.

*Green areas for common use and restricted green areas* are the most well-developed and well-distributed group in the district. The size varies considerably from the rather big area of The Taurida Palace garden which is 19,61 hectares to small pocket parks with size of 0,02 hectares. Most of them are open and have an easy access for visitors except for restricted green areas, but some of them are only open during the day time. There are 129 objects of Green space for common use with total area of 77,55 hectares. The main purpose of the area is recreational (St. Petersburg Green Space Act, 2010).

*Historic parks, palaces and gardens area* are well-developed in the district due to its history. The size is varies a lot from the 19,61 hectares of The Taurida Palace garden and The Field of Mars (Marsovo Polye in Russian) with its 10,39 hectares to very small historic pocket parks. The area serves mostly recreational and educational purposes, but also improves public health and ecological settings. They have a rather coherent shape. Some of them are closed at night time, the Summer Garden for instance. The area is well maintained due to its historical value.

*Areas for recreation and sport activities, leisure and entertainment, tourism and spa treatments, hotels and guest houses, summer residences* are not so common here and are often situated by the side of sport facilities and green areas for common use. This type of area is partly open for public as some have entrance fees.

*Green areas which serve a special function* have a variety of functions; some areas serve as buffer zones for the ecological protection of water, sanitary protected zones, and buffer zones. Also it includes green space attached to urban roads. The most well-known and the oldest cemetery is situated in this district -the Necropolis of the St. Alexander Nevsky Lavra of the Holy Trinity (see Current land use situated map of Tsentralny district, the K1 category of lands). Sizes, shapes and levels of accessibility are varied along with the purpose of the areas.

*Block green belts*. As was mentioned before Block green belts are areas which are situated within the boundaries of blocks. These areas are covered with planting or are aimed for it; they don't have direct access to the road network and are used mainly by block inhabitants for recreational purposes. There are 24 objects of Block green belts in the district with a total area of 2,45 hectares, due to their tiny sizes, less than 1 hectare (St. Petersburg Green Space Act, 2010). They are mostly neighborhood parks with a more or less coherent shape, situated within the blocks of the houses which protect the areas from the traffic noise. These areas are very popular among tourists, because of the interesting features in the yards of the old historic buildings.


*Fig. 12. A good example of urban green space creation on the street with the lack of vegetation in Tsentralny district. An unexpected experience for visitors of the shop and people who is passing by (number 1 on the map on page 52).*

*Fig. 13. Very small Chinese pocket part in Tsentralny district. Provide with experience of different culture, but low quality and small size of the area (number 2 on the map on page 50).*

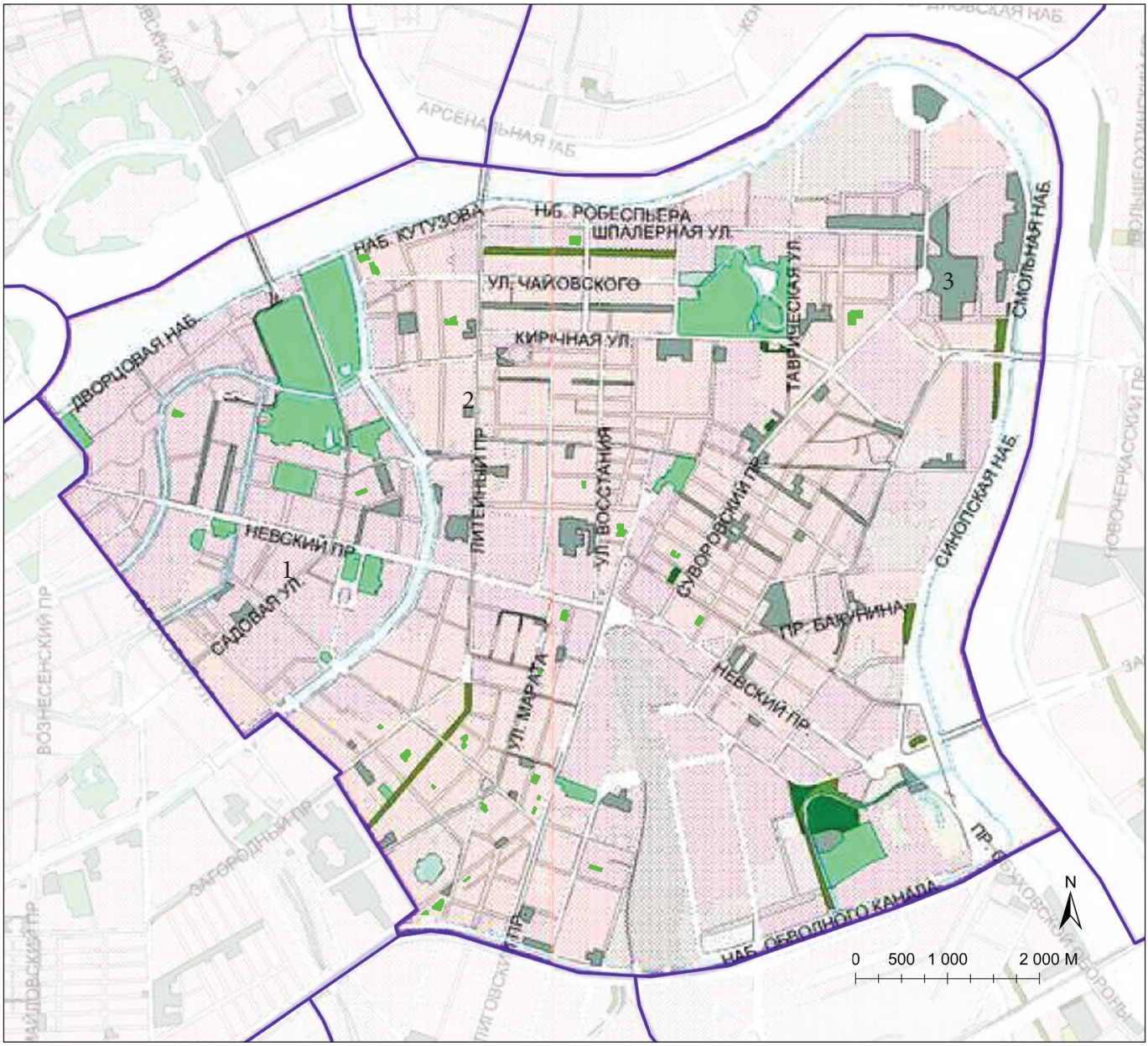


*Fig. 14. Urban green space map of Tsentralny district according to classification of St. Petersburg urban green space with legend below.*

- *Block green belts*
- *Green areas for common use and restricted green areas*
- *Green areas for common use on newly formed or converted areas*
- *Historic parks, palaces and gardens area*
- *Green areas which serve a special function*
- *Sport facilities and beaches areas*

*Fig. 15. Green areas for common use with a view on the Smolny Cathedral in Tsentralny distrcit (number 3 on the map above) (picture by Eugene Kibler).*

## Frunzensky district

The Frunsensky district looks rather green compared to the Tsentralny district. There is a mosaic pattern of different green areas around the district, but some areas are missing in the map and looks poor. The north-western part is more green compared to the south-eastern part. According to the data mentioned above we can find an average amount of urban green space per person for the district(see Introduction to study area, Frunzensky district). The total green area is 1 389 hectares for 404,7 thousand inhabitants which is 34,3 sq. m. per person. The quality of urban green spaces here is on the medium level, some green urban spaces look like an open fields with few bushes and trees.

*Sport facilities and beaches areas* are mostly present in the district in the form of football fields, different sport training facilities for football, tennis and other sport activities. The size of the area depends on the type of the facilities. There are only a few of them shown on the St. Petersburg Master plan and small areas with football, basketball and tennis fields are not shown.

*Forest and parkland areas* are not present in the district at all. These kind of areas are more common for the outskirt districts which are connected with forests of Leningrad Region.

*Green areas for common use and restricted green areas* are the most well-developed and well-distributed group in the district. The size varies considerably, from big green areas with a size of 46,66 hectares and 34,7 hectares to medium size parks around 10 hectares to the smallest ones with 0,41 hectares. There are 58 objects of Green areas for common use with total area of 227,01 hectares (St. Petersburg Green Space Act, 2010). They are open and have an easy access for visitors. The main purpose of the area is recreational.

*Historicparks, palaces and gardens area* are not present in the district.

*Areas for recreation and sport activities, leisure and entertainment, tourism and spa treatments, hotels and guest houses, summer residences* is present in one rather small spot.

*Green areas which serve a special function* are mostly present as a buffer zones for the ecological protection of water, sanitary protected zones, and buffer zones. Also it includes green space attached to urban roads. Sizes, shapes and levels of accessibility are varied along with the purpose of the areas. Two cemeteries are present in the district and they have a historic value, both of them are covered by plants and look like a nice urban green space (see Current land use situated map of Frunzensky district, the K1 category of lands).

*Block green belts*. As was mentioned before Block green belts are areas which are situated within the boundaries of blocks. These areas are covered with planting or are aimed for it; they don't have direct access to the road network and are used mainly by block inhabitants for recreational purposes. There are 77 objects of Block green belts in the district with total area of 63,96 hectares (St. Petersburg Green Space Act, 2010).This group is well-developed in the district and very attractive for the visitors due to its proximity to the houses. They are mostly neighborhood parks with a more or less coherent shape, situated within the blocks of the houses which protect the areas from the traffic noise.

*Fig. 16. A part of a garden attached to the hospital in Frunzensky district. Provide opportunities for rest, restitution and meeting places patients and their relatives (number 1 on the map on page 54).*

*Fig. 17. Children playground as a common urban green space in the park area (Frunzensky district). A typical constructions for children playground in dwelling areas, but size are bigger due to the position in the park (number 2 on the map on page 54).*

# URBAN GREEN SPACE MAP OF FRUNZENSKY DISTRICT

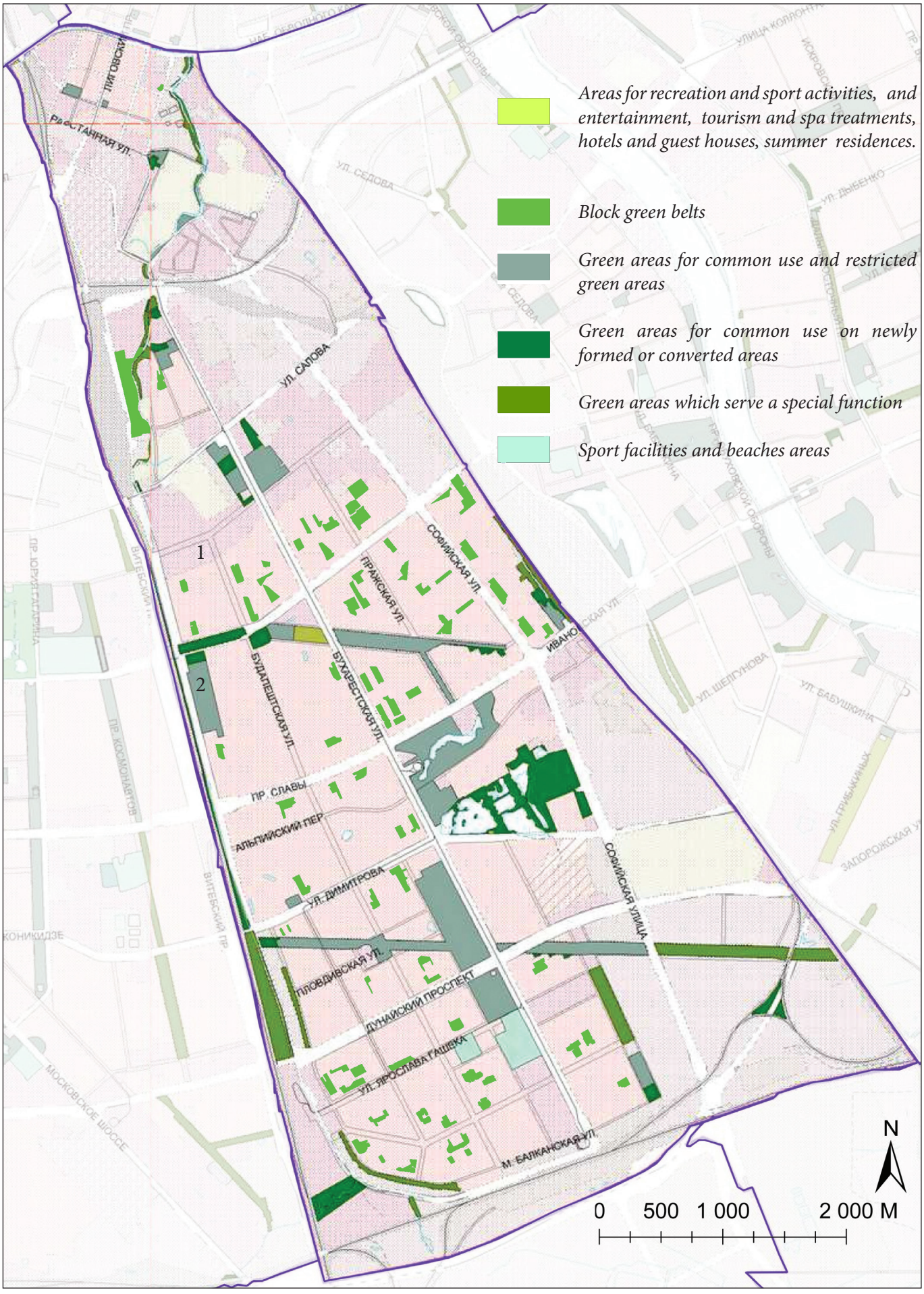


*Fig. 18. Urban green space map of Frunzensky district according to classification of St. Petersburg urban green space with legend.*

In the discussion of health and urban green space characteristics in their paper, P. Grahn and U.A. Stigsdotter& P. Grahn (2003)show that characteristics influence the visitors of urban green space directly. The 8 room characteristics of urban green space can have an effect on different people's needs. It is possible to define the Eight Characteristics into the 3 main groups by their impact on visitors.

Thus room characteristics like *Serene, Spacious, Lush* and somehow *Culture* appeal to many people. They are also appeal to people who are looking for a balance with themselves, who are ill or suffer from stress. These characteristics are the most important for improving of public health and should be the most easily accessible.

The next group contains *The Common* and *The Pleasure Garden* room characteristics. They are more attractive for people who are less stressed and vulnerable, but they are also appeal to people who would like to watch other people activities or would like to do something by themselves.

The last group contains *Festive/Centre* room characteristics. This group appeals to some stressed people who would like to socialize with the other people, but at the same time it frightens others who would like to be in a peaceful and calm place (Stigsdotter & Grahn, 2003).

One room characteristic is missing here - *Wild*. This characteristic is also appeals to some people who are looking for opportunities to be alone and enjoy the wild nature and frightens others who are afraid to be lost in nature or by other reason do not like this kind of places.

In the further analysis I will use these groups, but change them a little for better readable maps. So the first group with *Serene, Spacious, Lush* and *Culture* will be divided into two groups: *Serene - Lush* and *Spacious- Culture*. The third group will not be changed: *The common - The Pleasure Garden*. The last group will be filled by *Wild* in order to show all of the Eight Characteristics and because of the small amount of wild areas in the city and will look like: *Festive/Centre - Wild.* By the end you will see the map with the Red areas which will show the places with a lack of the Eight Characteristics around the selected districts. The analysis includes the areas with characteristics and the 300 m distance which these characteristics will cover. The colors for five characteristics chosen according to the paper "Malmöborsupplevelseav fem utemiljökaRiraktärer" (Stoltz et. all., 2012).

### Situation with Serene - Lush in St. Petersburg.

It is rather difficult to find *Serene* characteristics in a modern city of 5 million inhabitants. So the situation varies from district to district. In the outskirt districts this characteristic is more widespread due to the strong connection with the Leningrad region's forests and parkland zones, but for the city centre and suburbs *Serene* is a rarer characteristic. However St. Petersburg's inhabitants and visitors would like to have a place with *Serene* characteristics in the city and you can see it in the investigation results that the most popular quality of outdoor green space for respondents is *Serene* - 25% of respondents picked this characteristic among others. The size of the places is best when it is more than 5 hectares and when the shape is rather coherent. They are accessible by public transport.

### Petrogradsky district.

There are several places where you can find Serene; they are mostly parks with a size of more than 5 hectares, but not everyone. Some parks have a big area and at the same time do not give a feeling of silence and peace, due to the amount of people around, noise from traffic and sometimes anti-social behaviour. The shape is more or less coherent. Most of the places are easily accessible by public transport.

### Tsentralny district.

According to the map the district does not have any *Serene* room characteristics of urban green space. During the field study I was trying to find some places with *Serene* and recognize that it is only possible during the day time on the working week, when most of the people are busy. So I decided not to map these places due to their inconspicuous size within the park areas.

### Frunzensky district.

There are only two places with the Serene characteristic in the district. Both places have a high amount of vegetation and provide places with peace and silence for visitors to enjoy it.

Obviously it is not enough to have this amount of places with *Serene* characteristic, especially for the Tsentralny district with a complete lack of *Serene* places. Serene is the most essential characteristic as was mentioned before and people are looking for it with the aim to recover from stress and find a balance with themselves.

# DISTRIBUTION OF SERENE - LUSH CHARACTERISTICS WITH 300 M DISTANCE FOR THE AREA


*Fig. 19. Distribution of Serene - Lush cratacteristics with 300 m distance for the area.*

The modern generation is under a big threat of growing psychological diseases due to the industrialization and urbanization of the city. So the city planning departments should give special consideration for creating the atmosphere of silence and peaceful places within the city boundaries.

*Fig. 20. Elagin island is also known as a Central Park of Culture and Recreation. Place rich in experienced qualities of urban green space. Provide characteristics such as Serene, Wild, Lush, Spacious, The common, The Pleasure Garden, Festive/centre and Culture (number 1 on the map - page 56).*

The *Lush* room characteristic of urban green space has a similar relationship with the size of the area as Serene. There are obviously many places in the city with this characteristic due to the amount of plants which are preferable to use for planting in the city. The city planners are already trying to use more species of plants to attract different types of birds and animals in the city and by this to enrich biodiversity. The older parks often have higher levels of biodiversity compared to new ones. Thus district green space maintenance workers are trying to introduce new species of plants, replace old trees with new, plant an annual flowers list of plants with the aim of creating an attractive atmosphere for visitors. Parks which are rich in species attract more people than green space attached to urban roads, which is usually covered by lawn, annual flowers and few species of trees. However urban green space attached to the houses sometimes have even more species than the parks due to the inhabitants wishes to create a nice view from a window or to have a small garden within the city.

The size is from 1 hectare up to more than 100 hectares; shape is more or less coherent. The areas are easily accessible by public transport.

### Petrogradsky district.

There are several places where you can find the *Lush* room characteristic. They are mostly parks with a size of more than 5 hectares. Most of them were built more than 50 years ago and have a historic value and at the same time a wide biodiversity. Rare bird species like to have a nest there, squirrels are climbing the trees and asking for some food from visitors. The place with the biggest biodiversity in the whole city is situated here - the St. Petersburg Botanical Garden with 934 different species of plants.

### Tsentralny district.

The situation with *Lush* room characteristic of urban green space is rather similar with Petrogradsky district. So the most of the places which are rich in species are the historic parks and one more area along the small river, which has a rather natural riverfront. The shape is more or less coherent.

### Frunzensky district.

Different boulevards, parks, public gardens and riverfront have a *Lush* room characteristic in the district even if they are rather young and were built either along with the district or after all.

The educational value of *Lush* characteristic is very important for city inhabitants. So the rich in species urban green spaces can provide opportunities for learning many species of plants, birds and animals which is interesting not only for children. Sometimes city inhabitants can recognize many trade names of cars and only few species of trees and flowers. Also *Lush* places can attract more species of birds, insects and animals in the city and by this enrich biodiversity which is important for sustainability as a source of resource preservation for future generations.

*Fig. 21. Rich is species park in Frunzensky district with many lakes which provide a nesting places for birds. Offer characteristics such as Serene, Wild, Lush, Spacious, The common, Festive/centre and Culture (number 2 on the map - page 56).*

## Situation with Spacious - Culture in St. Petersburg.

*Spacious* is a room offering a restful feeling of "*entering another world*", a coherent whole. In the investigation this characteristic of urban green space has got almost 16 percent from the participants and third position from the list of the most important qualities of urban green space. It is especially important for those people who are living in the central district of the city due to the dense building structure of the Tsentralny and Pertogradsky district and partly for Frunzensky district. There are several places in each district which can offer the experience of entering another world. All of them are quite big areas with fairly coherent shape. They are accessible by public transport. Some people are lucky enough to live within walking distance to this kind of urban green spaces.

### Petrogradsky district.

Only two places can provide a feeling of entering another world. One is situated on the Elagin island and has a name of Central Park of Recreation and Culture which is very popular among the inhabitants for leisure time with its isolation from the entire city character and area with lakes and islands. The other one is the Botanical garden with its enclosed space character and arboretum with different species.

*Fig. 22. View over the lake in Primosrky Park Pobedy (Petrogradsky district). The feeling of another world a coherent whole in the middle of the park (number 1 on the map - page 60).*

### Tsentralny district.

The district has four places of *Spacious* character. These

*Fig. 23. Alley in Summer Garden. An example place with Spacious character. The feeling of another world together with essence of human culture from the 18th-19th century (number 2 on the map - page 60).*

areas are spread out around the district area, but all of them correspond to historic gardens with enclosed space character which can create the feeling if entering another world.

### Frunzensky district.

There are several places with *Spacious* character. They are situated along the roads, but protected from noise by high amount of vegetation. The enclosed space character together with lakes and different kind of vegetation can create a feeling of entering another world. These places are very popular among the district inhabitants for leisure in summer time, when they can hide on the meadow between the bushes or trees and take a sun or read a book.

Attention from city planners should be paid to creating the urban green space quality as spaciousness. This kind of place can provide opportunities for restoring after the stressful week by laying on the lawn and reading a book or enjoying the view over the lake and at the same time can provide opportunities to be by yourself alone and find a balance in your mind.

*Culture* is a historic place offering fascination with the course of time. St. Petersburg has a significant historic and cultural heritage as was mentioned in the Introduction. The inhabitants are very proud to live in such a beautiful and rich in history city as well as many tourists visiting St. Petersburg to see beautiful historic parks, palaces and gardens. Central city districts are rich on historic places, suburbs as Frunzensky district is also have some historic value of place, but it is mostly spots in comparison to Petrogradsky and Tsentranly districts with their beautiful parks. The size of the most visited historic places varies a lot, for example The Summer Garden has 11,7 hectares, The Fields of Mars has 10,39 hectares, but at the same time there are many small

pocket parks with a rich history, for instance the pocket park in front of the Cathedral of the Virgin of Kazan. All of the above mentioned places are situated in the Tsentralny district, but the other two districts have a historic and culture values as well.

### Petrogradsky district.

The Central Park of Recreation and Culture, Primorsky Park Pobedy, Alexandrovsky Park together with green spaces around the Peter and Paul Fortress are very popular for recreational purposes among the inhabitants and have a historic value as well. The Botanical Garden serves for recreational, educational and has a cultural value. Other urban green spaces with the essence of human history are used mostly for recreational purposes. The size of them are rather big; some object are more than 100 hectares, for example Primosrky Park Pobedy (115, 64 hectares).

### Tsentralny district.

Many historic parks and gardens are situated here. They are very popular among the inhabitants and tourists. St. Petersburg's residents use them for a recreational purpose and also as meeting places, because almost everyone knows where they are situated, so it is easy to meet each other and spend some time there. The size is varies a lot whilst the shape is coherent. They are easily accessible by public transport.

*Fig. 24. View over The Field of Mars or Marsovo Polye in Tsentralny district. An example of urban green space for common use and historical place (number 3 on the map - page 60).*

### Frunzensky district.

There are several spots of urban green spaces with historic value. The size of them are usually not so big. Eight of them are situated within the boundaries of the cemeteries and not so popular for visitors, except for memorial dates. Other places with memorials, for example a pocket park for a memory of G. K. Zhukov, the general of the Red Army during the Second World War. They are accessible by public transport.

The cultural and historical aspect of the urban green space is very diverse in the city. Some places are very popular among the visitors, others do not have a proper promotion and hide in the shadow of the more popular places. The proper promotion of places with a regard to historical and cultural aspects can make a stronger sense of belonging to a place for inhabitants.

*Fig. 25-26. Urban green space attached to Hermitage building. As an example of urban green space importance in the historical part of the city for recreation opportunities (number 4 on the map - page 60).*

# DISTRIBUTION OF SPACIOUS - CULTURE CHARACTERISTICS WITH 300 M DISTANCE FOR THE AREA

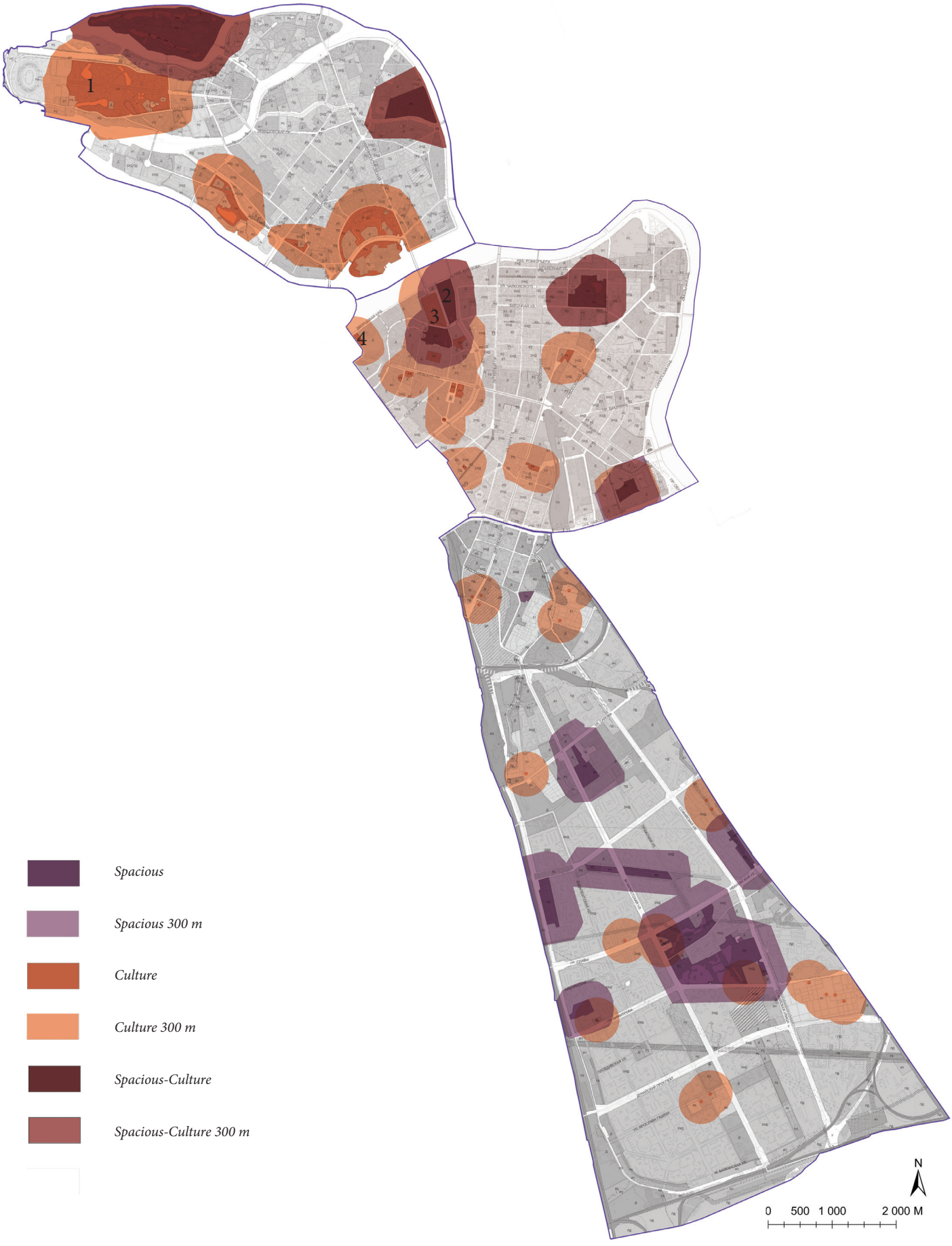


*Fig. 27. Distribution of Spacious - Culture characteristics with 300 m distance for the area.*

## Situation with The common - The Pleasure Garden in St. Petersburg.

*The Common* is an urban green space with room offering vistas and stays. We can say that *The Common* urban green space is the everyday life urban green space for inhabitants. I have not pointed out all of them on the map, due to their tiny character, but if you will look on the map of the current land use situation in the different districts, you will see the green areas mapped by P2 symbol. They are *Green areas for common use and restricted green areas*, which include parks, pocket parks, public gardens, avenues, urban green space attached to schools and kindergartens. The rather big areas are mapped, the smallest not, but they are still a piece of urban green space of St. Petersburg. The mapped areas have many spots which allow stays and vistas for visitors. The neighborhood parks are not included in *The common* too, but they are included in *The Pleasure Garden* and they are shown below.

*The Common* room characteristic of urban green space is not sensitive to the size of the space. Most of them have a more or less coherent shape with appendages, few have an elongated shape. They are spread out around the districts.

*The Common* is on the second place in the qualities which is good in St. Petersburg area according to the investigation mentioned above.

The small urban green spaces bring benefits for human health and well-being as well as bigger parks. The results of investigation presented in the paper "Use of Small Public Urban Green Space" (Peschardt et. all, 2012) show that the main reason to visit this kind of urban green space is the opportunities for socializing, rest and restitution, which seems to be important for improving of sustainability in the cities. The study shows that small urban green spaces are very popular amongst visitors and provide them with components of sunshine, grass, water and trees and this kind of urban green spaces are used in everyday life on the way home. So people can fulfill some of their needs even with this small type of urban green space.

Urban green spaces such as parks usually have in their structure enclosed spaces, created by vegetation. This kind of rooms can bring to mind feelings of enclosed and safe place during the day time, where you can relax, enjoy and let your children play freely. So they are not shown on the map with aim to not put too much information and make it easy to read. Neighborhood parks and very nice yards are mapped; these areas are created both by municipality and by citizens by themselves. During my field study I found many nice urban green spaces which are situated between the blocks of houses and created by the blocks inhabitants or the municipality. The size is varied and depends of the amount of blocks which decided to consolidate and create a nice living environment for their own benefits and benefits of visitors. Unfortunately some of the yards between the blocks are closed for people who are not living there, but many of them are opened and can provide the visitors with very diverse experience. Neighborhood parks are open for visitors; they have a lower level of maintenance, but still can provide the visitors with experience of pleasure gardens.

For the area covered by *The Pleasure Garden* characteristic I decided to reduce the distance to the nearest places down to 100 m, because many people do not go far away from home to play with a child or to relax and sometimes they even sit on the bench close to the house. This kind of places are important for the elderly people who do not have an opportunity to go far away from the house or for the mothers with children. There are standards for children's playgrounds and rest places from the building regulations, that the playgrounds for children together with recreation areas should be around 10% of the microdistrict total area, so people can have an easy access and can watch children while they are playing. Thus I have not pointed out this kind of urban green spaces either. However I mapped interesting spaces from my point of view which are very popular among the inhabitants and even among the tourists.

It is obviously good for public health to have more areas with quality of *The Pleasure Garden* in the modern cities with high density of buildings. The close position of them to home or work places is even more valuable for the inhabitants. The qualities of these kind of places should be enhanced along with the amount of them.

*Fig. 28. An example of The Pleasure Garden in Tsentralny district made by inhabitants in cooperation with municipality. With painted walls, lush vegetation and high level o maintenance (number 1 on the map - page 62).*

# DISTRIBUTION OF THE COMMON - THE PLEASURE GARDEN CHARACTERISTICS WITH 300 M DISTANCE FOR THE AREA

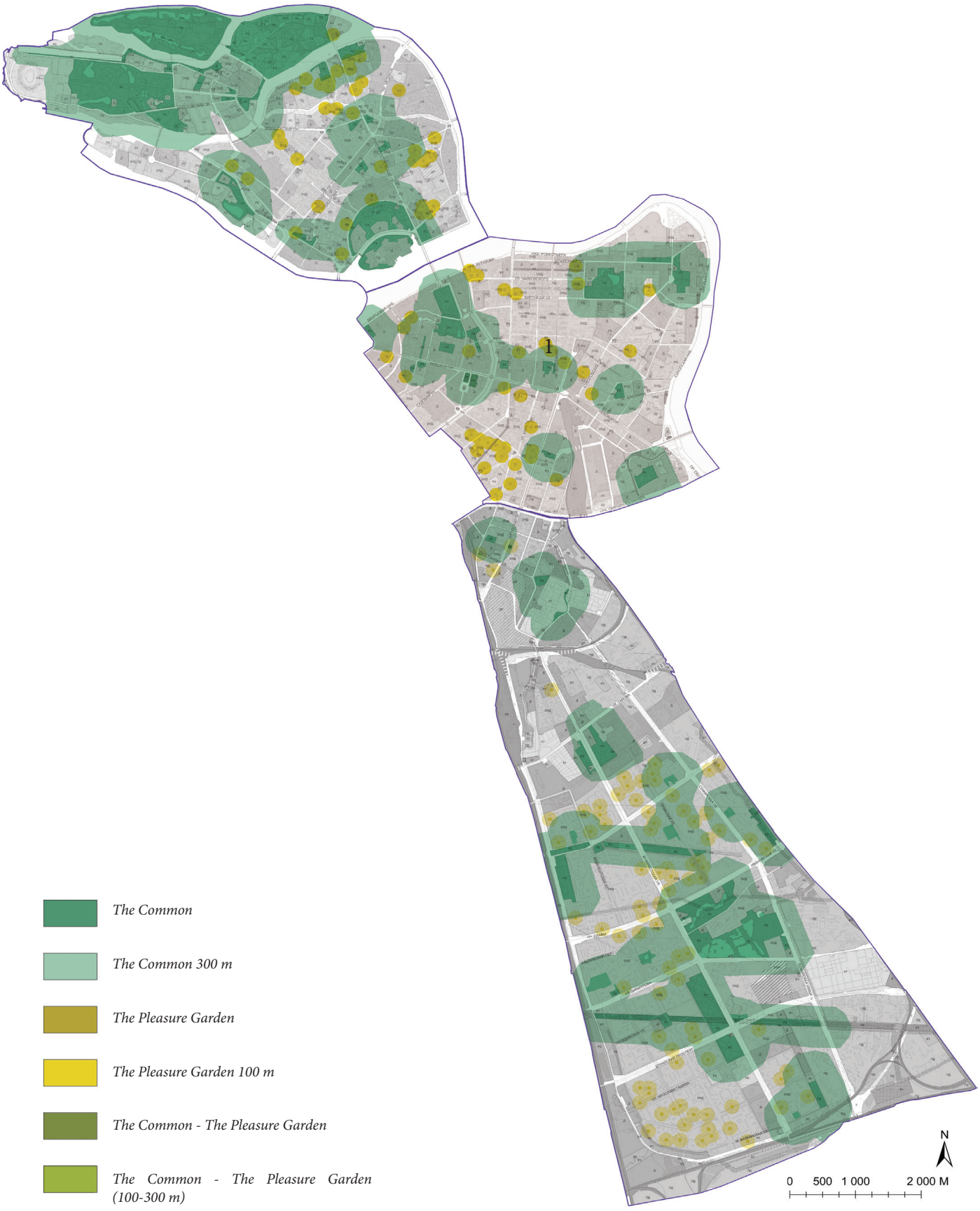


*Fig. 29. Distribution of The Common - The Pleasure Garden characteristics with 300 m distance for the area.*

## Situation with Wild - The Festive/Centre in St. Petersburg.

The great need of people is the need to be a part of the society. People like to talk, meet each other and enjoy the time of watching other people's activity. The most popular places of urban green space for this need are public squares and parks along with many restaurants. Due to the weather conditions outside meeting places are not so popular during the autumn, winter and half of spring time in St. Petersburg. It has become more and more popular to do exercises together in the parks or green roof lately. There are several places in different districts where you can do yoga classes or daily physical exercises in the morning time. The government is trying to provide more places for this kind of activity. The places for activity are supposed to have a good quality of the environment, have a fresh air, lush vegetation to protect from traffic noise and pollution. These kind of places create feelings of security which is also good for mental health. During the colder time it is more common to meet friends and other people in the restaurants to have meal together, a cup of coffee or hot tea. So the restaurants are popular among the citizens and could be counted as a places for festivity. The combination of restaurants together with a view over the city or over the green area with lake makes this place more visited and thus more popular among the inhabitants.

*The Festive/Centre* along with Culture shared the first place in the characteristics which is good in St. Petersburg area according to the investigation results. So inhabitants and visitors of St. Petersburg who participated in the questionnaire think that there are enough of the places which can provide an experience of *The Festive/centre*. Also it is possible to see that people think that no more improvements should be given for this kind of experienced characteristic.

The size varies a lot and for urban green spaces is mostly around 1 to 5 hectares which correspond to many urban green spaces in the city. So it is possible to enhance the amount of the areas and the quality of them with the future aim to provide more places for different kind of activities. They are usually easily accessible for visitors.

More urban green spaces with *The Festive/Centre* characteristics should be provided except for the restaurants. There is a bigger need to have a place for yoga classes or daily physical exercises classes with professional trainer than to have one more place to sit and eat. The promotion of the places for collective training classes should be done with aim to enhance public health. Better management of the places should be done with aim to attract more people.

I can say that it is not easy to find the *Wild* experience characteristic in the selected districts. *Wild* areas are more common for the outskirt districts which are connected with forests of Leningrad Region and possible to find Forests and parkland areas. As was mentioned before in the introduction part there are 12 conservation areas for a moment. According to the St. Petersburg Master plan, 11 new conservation areas will be created by the year 2025. The Red List of St. Petersburg area is including 424 rare species, but none of them are situated in the selected districts.

In the social aspect of the urban wilderness there are certain benefits and disadvantages of the *Wild* experience characteristic of urban green space. *Wild* can provide a good educational values for the children, but at the same time can be dangerous for them. The research results shows that children like to play more in groups and more complex games in the natural wild areas than on the ordinary playgrounds. However *Wild* at the same time is associated with dirt and rubbish areas with low maintenance level which have an uncertain character and can create a feeling of insecurity. This statement appeared through the history of industrialization and urbanization of the cities, that urban wilderness it perceived as a bad, because urban wastelands were associated with decline and pure value of the place in the well-planned city. In the European countries the phenomenon of the urban wilderness is becoming more and more accepted for the urban planners. The wilderness in this context is about urban wastelands. For example urban planners in Germany tried to established new kind of green spaces on the old industrial areas (Naturerfahrungsräume) which became very popular among the visitors. Actually it does not correspond to the idea of the *Wild* from the Swedish green space research, so this kind of places have not been counted in the analysis. Therefore urban wilderness is not only is bad for city inhabitants, but also good. It provides educational opportunities for the children, new type of green areas where urban planners can test new management approaches in nature conservation and new aesthetical sense of place for adults by informal green spaces (Rink & Herbst, 2012). Some Swedish research results also shows the difficulties with conclusion if the *Wild* bad or good in the urban context (Stoltz et.all., 2012). It is a matter of inhabitants perception to evaluate the areas which are good for them and which are bad.

The investigations results show that the *Wild* experienced characteristic could be improved in the city as well as *Serene, Lush* and *The Pleasure Garden*. However at the same time I have got comments from several friends with children, that they do not need any wild areas close to their home in the city and if they want to go into the wild area they easily go outside the city.

# DISTRIBUTION OF WILD - THE FESTIVE/CENTRE CHARACTERISTICS WITH 300 M DISTANCE FOR THE AREA

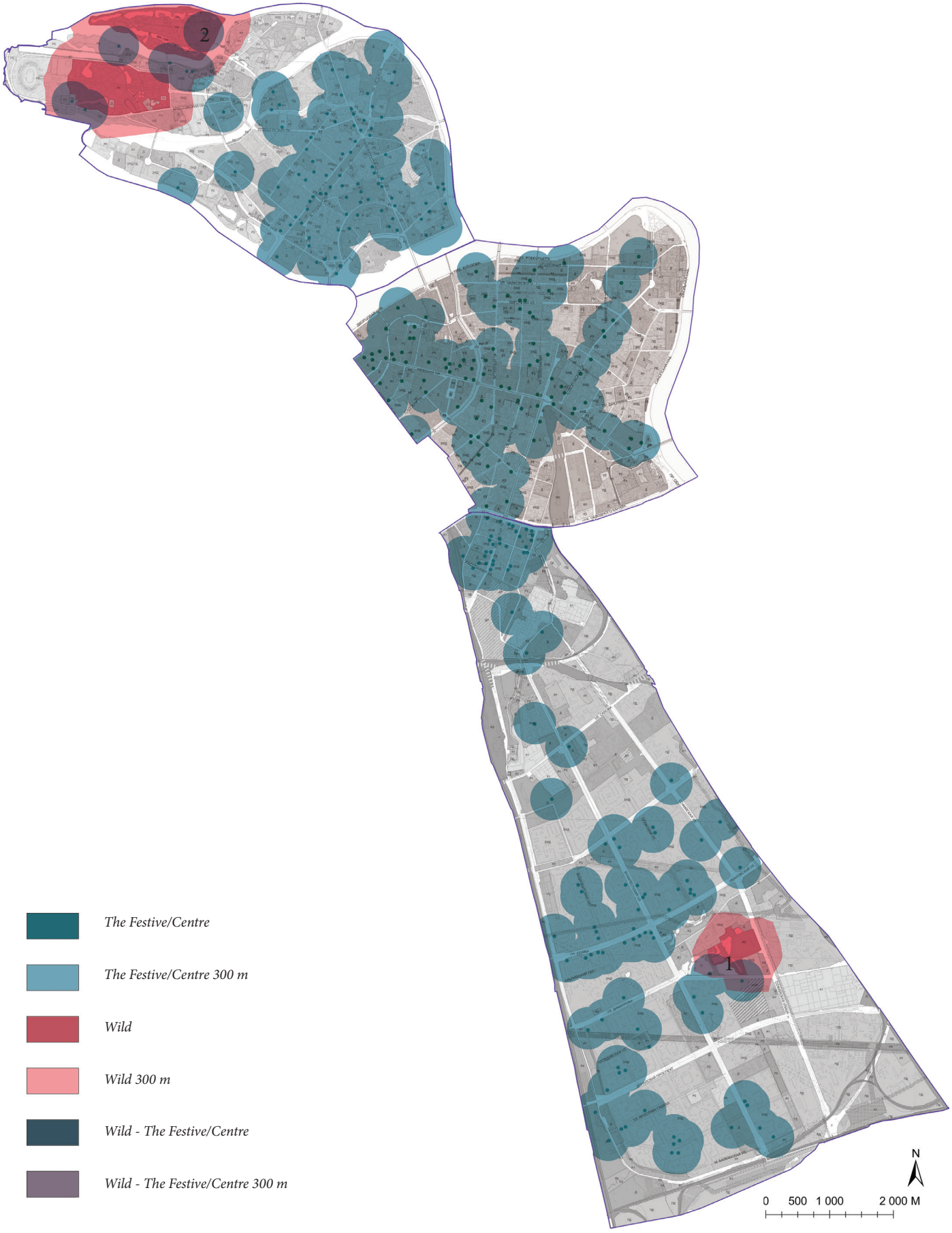


*Fig. 30. Distribution of Wild - The Festive/Centre characteristics with 300 m distance for the area.*

According to the classification *Wild* is the "*fascination with wild nature. Plants seems self-sown. Lichen- and moss-grown rocks, old paths*" (Grahn et. all, 2005) I found only few places which suits this description of the *Wild*. Two huge parks with an area around the 100 hectares in the Petrogradsky district - The Central Park of Recreation and Culture and Primorsky Park Pobedy. There are many species of plants, which seem to be self-sown, many species of birds are nesting there, squirrels are wild but at the same time asking for food. Both places look rather wild along with the good level of maintenance. They are easily accessible during the day time. The other place is in the Frunzensky district. This place has taken a part of the park area which soon will be under construction for new nice park. The area looks wild and untouchable, there are several paths leading into the grove. This area does not have any maintenance now. Tsentralny district does not have any places with the *Wild* experienced characteristic which is answer to the description.

So there is a clear need of urban green spaces with characteristic of *Wild* in the city. These areas should provide visitors with experience of wilderness along with a good level of maintenance for feelings of a secure and safe place.

*Fig. 31. Rich is species park in Frunzensky district with many lakes which provide a nesting places for birds. The area with low level of maintenance which provide a feeling of wilderness (number 1 on the map - page 64).*

## Situation with the lack of The Eight Characteristics in St. Petersburg.

According U.A. Stigsdotter (2005) there are few of the characteristics which are more popular among the visitors than the others. If a certain urban green space contains a number of these characteristics it will be more popular among the visitors compared to the place with one characteristic or deficiency of it. Therefore for health promoting interest of urban planners to attract people to visit urban green spaces, these places should have a high quality design of green environment as well as provide opportunities for visitors to experience what they are looking for. However it is clear from the presented analysis that there are many areas with a lack of the Eight Characteristics or areas with only one or two characteristics in St. Petersburg. It is of the outmost importance for city planners to point out the places which are not supported by the characteristics and try to improve the qualities of urban green spaces there for the health promoting effect.

The red coloured areas on the map show the situation with the lack of the characteristic in the St. Petersburg area. These areas do not have any experienced characteristic and do not include any in the 300 m distance of them.

### Petrogradsky district.

The district has not so many places with the lack of the characteristics. They are usually small spots and could be improved by enhancing of urban green space qualities close to the spots. There is a visible domination of the Eight Characteristics in the north-west part of the district compared to the south-east. In general the Eight Characteristics look to be well-developed and the district looks as a good living and working place which provides all of Eight experienced characteristics.

### Tsentralny district.

The district has bigger areas not covered by the Eight Characteristics in comparison to the Petrogradsky district. These areas are possible to divide into the small spots which are need of small improvement of the Eight Characteristics and wider areas which are covered by industrial facilities and need bigger improvements such as the creation of new urban green spaces and improvements to the existing. Two characteristics are missing in the district - *Serene* and *Wild*. Generally the distribution

*Fig. 32. Festival of Opera under the open sky on the Elagin island (2013). Example of combination Festive/centre,Culture in the city centre (number 2 on the map - page 64).*

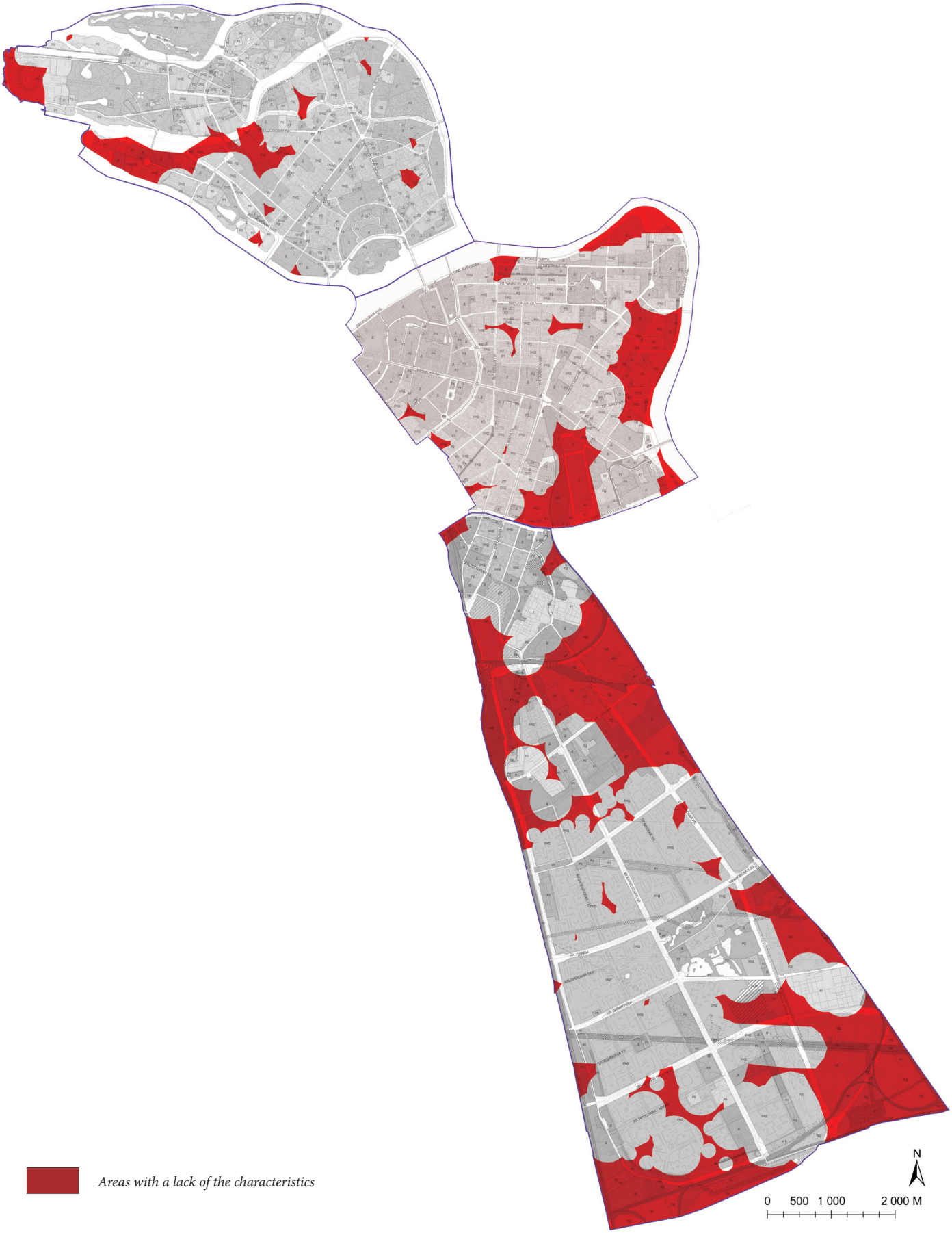


*Fig. 33. Situation with the lack of the Eight Characteristics in the area.*

of the Eight Characteristics looks rather regular, some urban green spaces have several of the experienced characteristics, others have only one. Improvements of urban green space qualities should be done with the aim to enrich the district by the Eight Characteristics and provide a better living and working environment.

### Frunzensky district.

The district looks bright by the red colored areas in the part where industrial estates and warehouse facilities are situated. There are small spots with the lack of the characteristics also present in the residential areas, but they could be improved by small changes. The larger areas require redevelopment into the residential areas with new urban green spaces of high quality.

### Mitigation measure.

The main mitigation measure for the reducing of the wider red colored areas is to create new urban green spaces there which has a design informed by the Eight Characteristics. It is some kind of medicine for poor areas and if the planners want to solve the problem of red colored areas they should create new wider urban green spaces which can offer different kinds of experience for visitors. This mitigation measure is important for social welfare and the health promoting effect of urban green spaces. It can attract people to stay in the area for a longer time rather than passing by on the way to home or work place (Stigsdotter, 2005).

It is also important to get stress-reduction during the day. To have a view over an urban road or industrial areas with the low quality of urban green space is not so pleasant for employees and does not give any benefits for stress-reduction during the working day. There is obviously a need of access to the urban green space close to work or opportunities to have even a view throught a window on the green areas. There have been different studies around the positive relationships between the access to urban green spaces at work and decreased stress level which show the importance of it for developed and developing countries. One of the study results shows the significant value of physical and visual access to the urban green space close to the work place for men with the great stress-reduction effect, but a not so significant effect in stress-reduction for women. Anyway there were many pieces of evidence of the positive benefits from access to urban green space at the work place which create a positive feeling toward the workplace from employees (Lottrup et. all, 2013). So it is a matter of sustainability to provide future working places which stimulate a positive attitude towards the workplace. This also increases the use of the outdoor urban green spaces during the daytime.

I can conclude that if the area is well supported by the Eight experienced characteristics the inhabitants and visitors wish to spend more time there, live there and have children to grow there. So the area will be popular in a long term. The central district is much more popular among the inhabitants compared to suburban areas. Many people wish to live there due to the better connection with the entire city districts, better infrastructure and proximity to the city centre. This can be proved by the July, 2013 report about the situation on residential property market for houses under construction in St. Petersburg (Real estate newsletter, 2013). According to the report the higher prices for the housing area are in the Tsentralny and Petrogradsky districts. The prices for Frunzensky district aremuch lower, but it is not the cheapest district in which to buy an apartment. An average price for 1 sq. m. of single-bedroom apartment is:

- Petrogradsky district - 149 013 rubles (around 29 600 SEK).
- Tsentralny district - 140 490 rubles (around 27 900 SEK).
- Frunzensky district - 82 136 rubles (around 16 300 SEK).

### Do you like the neighborhood where you are living?

It is also interesting that a well-being aspect of the sustainability is very much about the matter of perception and feelings. The importance of natural surroundings for neighborhood satisfaction was shown in one of the recent years research (Björk et.al, 2008). The researchers argue that if you are poor then you are more dependent on the quality of green environment compare than if you are rich. It is a matter of sustainability. According to the study results, the most important qualities within the 300 m distance is Serene, Wild and Lush for people who are living in their own houses, own flats and for the tenants.

I can say that I live in Frunzensky district, work in Petrograsdky and like to spend my spare time in the Tsentralny district. I would like to move to the Pertogradsky district if I will get an opportunity for this. However I think that I live in a nice district which in a long term will be more popular among the inhabitants to live by its housing area, growing underground which will connect the district with a city centre and surely by wide urban green spaces which exist and can be created on the wastelands, industrial and warehouse areas with aim to improve public health and develop the city for further generations with respect to their needs.

The situation with "The Eight Characteristics" in St. Petersburg districts was given above. Here I am going to present the summary of situation with "The Eight Characteristics" in the city in general, based on the mentioned above information. Here in the Table 21, you can see the application of Swedish green space research results for St. Petersburg area, where "+" means that the experience characteristic is possible to apply; "-"means that the experience characteristic is not possible to apply; "+-" means that experience characteristic is applicable for the area to some extent. Some comments given according to the result from the analysis and sur-

| **The Eight Characteristics** | **Explanation of The Eight Characteristics** | **Applicative or not for St. Petersburg** | **Statements from previous analyses** |
|---|---|---|---|
| Serene | Peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no weeds, no disturbing people | + - | 1. One of the most important for the restoration.<br>2. Appeal to many people.<br>3. Difficult to find in the city.<br>4. The most significant quality of outdoor green space for St. Petersburg residents. |
| Wild | Fascination with wild nature. Plants seem self-sown. Lichen and moss-grown rocks, old path | + - | 1. Possible to find urban wilderness as urban wastelands which some people do not appreciate.<br>2. Exists in the forest and parkland zone.<br>3. Great health restoration, educational and recreational value.<br>4. Inhabitants wish to have better situation with Wild in the city. |
| Lush | Rich in species. A room offering a variety of wild species of animals and plants | + | 1. Beneficial for well-being and ecological value of the area.<br>2. Exist in many places, but can be increased.<br>3. Great educational capacity.<br>4. Easily introduced. |
| Spacious | A room offering a restful feeling of "entering another world", a coherent whole, like a forest meadow | + | 1. More places are required.<br>2. Great restoration capacity.<br>3. Appeal to many people.<br>4. New park areas development and improvement of quality on existing areas. |

*Table 21. Comments on differences between the Classification of urban green space of St. Petersburg and The Eight Characteristics of Sweden (with the extension on the next page)*

| The Eight Characteristics | Explanation of The Eight Characteristics | Applicative or not for St. Petersburg | Statements from previous analyses |
|---|---|---|---|
| The common | A green open place admitting vistas and stay | + | 1. Very diverse in the city.<br>2. Quality of the maintenance should be increased.<br>3. Great benefit of small public urban green spaces for human health.<br>4. More areas are required. |
| The pleasure garden | A place of imagination. An enclosed, safe and secluded place where you can relax and be yourself, let your children play freely and also experiment | + | 1. Popular among the inhabitants.<br>2. More areas are required.<br>3. Quality of the maintenance should be increased.<br>4. Easily introduced. |
| Festive/centre | A meeting place for festivity and pleasure | + - | 1. Inhabitants are satisfied with the amount of places.<br>2. Quality should be increased.<br>3. Better promotion of the activities on the open air such as yoga classes or daily physical exercises.<br>4. Appeal to some, but frightens others. |
| Culture | The essence of human culture; A historical place offering fascination with the course of time. | + - | 1. Great value for the city.<br>2. Appeal to many people.<br>3. The aspect of culture is very diverse in the city.<br>4. Better promotion of the small urban green spaces with culture heritage. |

*Table 21. The extension of table with comments on differences between the Classification of urban green space of St. Petersburg and The Eight Characteristics of Sweden.*

vey. It can give a better understanding of situation with "The Eight Characteristics" and their application for St. Petersburg area.

I assume that the existing classification of "The Eight Characteristics" does not need any changing or reclassification for St. Petersburg area due to the similarities with Sweden and could be used as an addition to Classification of St. Petersburg urban green space with some exceptions. Thus the characteristic of *Wild* can be changed a bit according to previous mentioned studies in the analytical part of the thesis. The real *Wild* character is difficult to find in the rapidly growing cities, therefore the interpretation of *Wild* can be changed a little due to the city character. The explanation of "*Fascination with wild nature. Plants seem self-sown. Lichen and moss-grown rocks, old path*" in the city context can be extent with second explanation of *Urban Wilderness -"Urban wastelands with some level of maintenance, no ruins of buildings, rubbish and dirt. Pioneer plants, old paths, feelings of solitude*".

Characteristic of *Spacious* was slightly modified, because St. Petersburg residents do not familiar with "beech forest" interpretation. St. Petersburg area is southern subarea of boreal forest and it does not have native beech trees. Thus I changed the interpretation of "*beech forest*" into the "*forest meadow*" as example which is much more clear for respondents to understand. And now the interpretation of the Spacious is "*A room offering a restful feeling of "entering another world", a coherent whole, like a forest meadow.*" Spacious characteristics is took a third position among the most popular for the respondent of survey. This quality is especially important for people who live in the city centre, because of the dense building structure. There are several places in each district which can offer the experience of entering another world. Spacious provide visitors with opportunities to be yourself

| **Classification of St. Petersburg urban green space** | **Types of urban green spaces from the classification** | **The Eight Characteristics presented in the group** |
|---|---|---|
| Sport facilities and beaches area | Athletic fields, football fields, beaches, etc. | The common<br>Festive/centre |
| Forest and parkland area | Conservation areas and protected green belts | Serene<br>Wild<br>Lush<br>Spacious |
| Green areas for common use and restricted green areas | Parks, gardens, pocket parks, industrial areas with green spaces, schools, kindergartens | Serene<br>Wild<br>Lush<br>Spacious<br>The common<br>The Pleasure Garden<br>Festive/centre<br>Culture |
| Areas for recreational and sport activities, leisure and entertainment, tourism and spa treatment, hotels and guest houses, summer residences | | Lush<br>Spacious<br>The common<br>The Pleasure Garden<br>Festive/centre |
| Historical parks, palaces and gardens area | | Serene<br>Wild<br>Lush<br>Spacious<br>The common<br>The Pleasure Garden<br>Festive/centre<br>Culture |
| Green areas which serves for special functions | Green space attached to the urban roads, sanitary protected zones, green space for ecological protection of water supply | Wild<br>Lush<br>Spacious |
| Block green belts | Neighborhood parks, areas attached to the houses | Lush<br>Spacious<br>The common<br>The Pleasure Garden<br>Culture |

*Table 22. Typical distribution of "The Eight Characteristics" for the St. Petersburg area.*

and alone far away from busy city. More places are required.

Also people want to be a part of the society. People like to talk, meet each other and watch other people's activity. Public squares and parks together with many restaurants and cafes a very popular as meeting places in the city. It is getting more popular to do exercises together with others outside during the summer time. During the colder time it is more common to meet friends and other people in the restaurants and cafes. So this places could be counted as a places for festivity and for St. Petersburg they are become a part of everyday life and *Festive/centre* - "*A meeting place for festivity and pleasure*" particularly topical during the cold time of the year. According to the survey people do not want to have more restaurants and cafes in the city, but they do wish to have more places for daily exercises. The promotion of the places for collective training classes should be done with aim to enhance public health. The other characteristics do not need any reclassifications. According to the investigation they were clear for the most of the participants to understand.

*Serene - "Peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no weeds, no disturbing people."* It is rare characteristics for the big city. So the situation varies from district to district. There are many areas of Serene in the outskirt districts due to the connection with forest zones, but the city centre is very poor on this quality. According to the survey the inhabitants call Serene the most popular quality of urban green space.

*Lush - "Rich in species. A room offering a variety of wild species of animals and plants".* There are many places with lush characteristic due to the plant list of species used in the city. The older parks often have higher levels of biodiversity compared to new ones. This parks attract more people than poor in species urban green space attached to the roads. In comparison urban green space attached to the houses sometimes have a higher biodiversity that parks due to the people's with to have an Eden close to their living place. Lush places are important for educational value as well as for enrichment of biodiversity in the cities.

*The Common* - "*A green open place admitting vistas and stays*". This kind of urban green space is the everyday life places for inhabitants. In the city this characteristic are presented by parks, pocket parks, public gardens, avenues, urban green space attached to urban roads etc. More places are required along with the better maintenance of the existing places

*The Pleasure Garden* - "*A place of imagination. An enclosed, safe and secluded place where you can relax and be yourself, let your children play freely and also experiment.*" The small urban green spaces bring benefits for human health and well-being as well as bigger parks. They provide a feeling of socializing, rest and restitution as well as bigger urban green spaces. They used in everyday life and people can fulfill some of their needs even with this small urban green space. The Pleasure Garden provide a feeling of safe places where many activities are possible. Many people do not go far away from home to play with a child or to relax and sometimes they even sit on the bench close to the house. This kind of places are especially important for the elderly people and mothers with the children. Quality and amount of The Pleasure Gardens should be enhanced.

*Culture* - "*The essence of human culture. A historical place offering fascination with the course of time*". St. Petersburg has a significant historic and cultural heritage. The inhabitants are very proud to live in such a beautiful and rich in history city as well as many tourists visiting St. Petersburg to see beautiful historic parks, palaces and gardens. Central city districts are rich on historic places, suburbs are also have places with culture heritage. The cultural and historical aspect of the urban green space is very diverse in the city. Well-known places for example The Summer Garden are more visited others are forgotten. The proper promotion of places with a regard to historical and cultural aspects can make a stronger sense of belonging to a place for inhabitants.

It is clear that not each urban green space is a well-designed, maintained and thus good urban green space which supported by any of "The Eight Characteristics" (Stigsdotter, 2005). It may be that green spot on the map does not look green in reality. So the difference in methodological approach of classifications in clear now. Classification from St. Petersburg is based on functional, esthetical and human health standards in turn "The Eight Characteristics based on experience and feelings of urban green space experienced by visitors. It is possible that if we choose a green spot on the map and go there to visit with the aim to get some rest after the work day or enjoy other people activities, as a result we will not find it attractive for as to stay there. The place can be urban wasteland in reality with a lack of "The Eight Characteristics", but mapped as a green spot on the map for example. Therefore application of Swedish green space research result of "The Eight Characteristics" for St. Petersburg area can give an opportunity to evaluate urban green spaces from the perspective of their attractiveness for the visitors at least.

Each experienced characteristic from "The Eight Characteristics" could be used in the area to evaluate it from the human preferences and needs of outdoor urban green spaces. In recent years there is a growing feeling of needing changes in the urban green space planning system which has developed in St. Petersburg. There has been a resurgent interest recently in sustainable devel-

opment which represents part of a wider international movement that is looking for improvement of life qualities by creating new types of urban green spaces that are cost-effective and yet highlight design for people with qualities for improving their well-being. "The Eight Characteristics" research results together with Classification of St. Petersburg urban green space at least can provide different perspectives in the modern relationships between human beings and natural environment in the cities and by this can lead to changes in the development of St. Petersburg green structure.

On the Table 22 (see previous page - 70), you can see a typical distribution of "The Eight Characteristics" related to the Classification of St. Petersburg urban green space. The aim is to show which experienced characteristics it is possible to meet in different urban green areas within the city boundaries. This table can be used as a tool for planners in evaluating which characteristics are present in the area and which can be added with the aim to enhance the quality of urban green space by experienced characteristics. Therefore the standards of urban green space which were created with respect to functionality of place, aesthetic value of place, health and safety regulations can be supplemented by spatio-experimental characteristics according to feelings and needs of human beings.

"The Eight Characteristics" together with the Classification of St. Petersburg urban green spaces work very well when it comes to a sustainability concept. As was mentioned in the beginning there are three parts of sustainability which are like pillars supporting the sustainable development concept: ecological, social and economic. Thus if one of the pillars was in an inappropriate condition we can say that the whole system in precarious state. During this project there were many pieces of evidence that urban green space can provide a social sustainability in the aspects of human well-being, impact on physical and mental health, recreation opportunities, cultural and historical value and meeting places. Urban green space can also provide the ecological sustainability in the aspects of increasing biodiversity, CO2 binding outcome, catching particles, slowing down rain water, erosion control, sound control, humidify the air and reducing the "heat island effect" in the cities. This two pillars in turn can provide aspects of the economic sustainability such as improvements of home and work environment, reducing of air conditioning costs, tourism opportunities.

Therefore two classifications together can give a better understanding in analyzing of which kind of urban green space created by planners and inhabitants can provide sustainability in a long term by both the functional use of place and people's perception.

One of the important roles of landscape architects is to support the city inhabitant's health by offering them natural surroundings with different experience qualities for restoration and physical activities. We can help to reduce stress and increase mental and physical restoration after the working day by creation of urban green spaces which are well-designed and filled with different kind of experienced characteristics. Therefore an abstract idea of the sustainability concept can be turned into the reality by the contribution of landscape architects. City planning for present and future generations with the health promoting effect of natural environment near the residential areas should be considered as a one of the main tools in achieving sustainability in the cities.

### Improvements suggested for the urban green space development in St. Petersburg.

Now I can conclude with the reflection part and give some suggestion on the development of urban green space for St. Petersburg.

First, more urban green spaces are required in the city. They should be well-designed and supported by "The Eight Characteristics". Total amount of urban green spaces should be extended along with the well-functional organization, qualities which informed by the experienced characteristics and distribution among the city districts.

Secondly when it comes to a choice of vegetation and enrichment of biodiversity, more native species should be used in the urban green space development along with the new design solutions. Constriction of urban green spaces and their management should be done with the perspective of sustainable development, because well-design and constructed urban green space does not required to much of management in future.

Thirdly not only urban green spaces in the city should be extended. Wide areas of city forest and parkland zones around the city should be enhanced as well. Nowadays this areas provide St. Petersburg inhabitants with the experience of Wild and Serene foremost. This areas also should have better connection with the urban green spaces in the city with aim to enrich biodiversity.

Finally, participation of the city inhabitants in the planning process should be done in a better way. According to the survey many people wish to see a good changes in urban green space in the city and they are positive for this kind of investigations. So they also would like to be a part of the planning process in their city. Now public hearings are getting to be more and more popular among the inhabitants, but they are usually in a day time while people at work. Thus some changes should be done with aim to attract more people to participate.

# CONCLUSIONS

This thesis has been an interesting journey for me with different kind of pitfalls which have been challenging for me. The journey allow me to learn a lot through analyzing and discovering of new knowledge to the point of sustainability, urban green spaces and people's preferences and feeling. When I started the thesis I thought that this work will look like the application of knowledge which I have got during the years of studying landscape architecture field, but later it came out to be very cognitive. The major aim of the study was to see how is it possible to improve relevant qualities of well-being in St. Petersburg through analyzing urban green space from both St. Petersburg classification of urban green spaces and Swedish research results of "The Eight Characteristics" and how is possible to improve social part of sustainability by improving qualities of urban green space. To reach the goal I began with the search for relevant literature and realized that the topic is already widely discussed in the public realm. Therefore I started with classical and then continued with more recent years research.

The growing interest in a more sustainable development of society with respect to future generations appear among city inhabitants and planners more and more frequently. Much evidence of nature's impact on public health have appeared over the centuries in different cultures. The importance of urban green spaces in facing the sustainability issue and for human health in general, which has confirmed through the literature study, gave me an understanding of why the qualities of urban green spaces should be improved and more areas should be promoted. This encouraged me to analyze the existing situation with urban green spaces in the city and apply the Swedish green space research results of "The Eight Characteristics". So both analyses were done according to St. Petersburg Classification of urban green spaces and Swedish "The Eight Characteristics". An internet questionnaire was made for St. Petersburg's residents and visitors with aim to understand and discover people's preferences and feelings of urban green space. Personal reflections were made accordingly.

I found that the basic requirements for urban green spaces in St. Petersburg are similar with Swedish, therefore relationships between human and nature are similar in Russia and Sweden. Also the goals for city development are rather similar with the sustainability concept. The similarities are possible by the proximity of St. Petersburg with Scandinavian countries and Europe. There are rather similar climate conditions and geographical positions as well as some culture traditions which became possible with the developing of the city towards the Europe from the foundation in 1703. St. Petersburg is a rapidly developing region in Russia, with its almost 5 million population it is a major trade, industrial and financial centre. However there are many increasing problems at the same time. In recent years there has been a growing feeling that changes are needed in urban green space planning system has developed in St. Petersburg. Also, there has been a resurgent interest recently in sustainable development which represents part of a wider international movement that is looking for improvement of quality of life by creating new types of urban green spaces. The situation with "The Eight Characteristics" in St. Petersburg has been discussed and some suggestions and proposals for enriching the St. Petersburg urban green space classification have been given with aim to introduce more experience qualities of urban green spaces into the planning system of St. Petersburg urban green space which is currently more functional and based on the Soviet Union system.

When I started this master thesis I was absolutely sure that I would find all material which I was looking for. I can say that I was too much optimistic! I found many complications with the information from the government. At first I was looking for the noise map of St. Petersburg which were created in 2008, but I only found general information about the noise pollution in the districts and no map in the public access. This map only can be used for the government and planners needs and public access may cause a storm of complaints from the inhabitant that some standards for noise protection are neglected and they suffer from noise pollution. Then when it comes to the health statistics from the city districts which I planned to use in this thesis with the aim of comparing different qualities of urban green spaces and their possible effect for the district inhabitants, I also did not find them in the public access. The only information which I have got from analytical portals of the city districts is the general info which I used in the introduction part about the amount of inhabitants, total area of the districts, amount of urban green space in the district. Although I have not find many document which I was intended to use in this master thesis, this work might be valuable for future research and even interesting for present researchers who is working with application of "The Eight Characteristics" in Sweden and all over the world.

The target area of the project consists of three St. Petersburg districts which can represent the general situation in the city. I hope that the analyses of the selected districts together with the investigation of feelings and needs can give a general impression of the situation with urban green spaces in St. Petersburg. Central

districts together with suburbs represent only a sixth of the whole city, but provide this thesis with the significant information for present and future work in the field of landscape architecture, sustainability and public health. In addition, there is a possibility that St. Petersburg situation can represent other rapidly growing cities of the Russian Federation, but only for some extent due to the country size, cultural background, geographical position and proximity to different countries and therefore different cultures.

In conclusion, this work has not yet provided definitive evidence for or against the use of "The Eight Characteristics" for St. Petersburg urban green space classification. However, it confirms that "The Eight Characteristics" as suggested by Grahn and others and changed a bit for the St. Petersburg together with the St. Petersburg classification of urban green space, are better for people mental and physical health, their perception of good quality urban green spaces and for sustainability in the city, than only organization of urban green spaces according to classification of St. Petersburg urban green spaces (functional, aesthetic and public health). In addition, there o big differences between "The Eight Characteristics" according to Grahn and others and the interpretation for St. Petersburg city from this paper, but the need of the change is much more clear now.

Finally it is possible that this master project raises more questions about relationships between urban green spaces, sustainability and human beings than answers and further research should be done for a better understanding of the connections between the complex city environment and human role in it. This can even arise a bigger discussion about the need of changes particularly for St. Petersburg  area among the city planners and inhabitants, but in general there was much evidence that people are very positive for "The Eight Characteristics" in this paper. The discussion about how is possible to improve urban green spaces and sustainability in the growing city of does not finish here. It is only the beginning of the study of this particular topic and landscape architecture in general.

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DIAGRAMS



All diagrams, tables, photos, maps and illustrations are my own unless anything else is stated. All maps based on the maps and information provided by the Government of St. Petersburg.
Map used as a base for Fig. 3 is available from: http://maps.google.com/

TABLES

ILLUSTRATIONS

# APPENDIX I

Investigation into the feelings and needs perceived within the outdoor urban green space in St. Petersburg city, Russian Federation.

My name is Silviia Aleksandrova. I am a master student in Swedish University of Agricultural Sciences. This survey is part of my master thesis, aiming to discover people preferences and feelings of outdoor green areas in St. Petersburg city.

This survey is both anonymous and voluntary. All data collected from this survey will be used for my master thesis research only. Please fill the survey according to your first feeling and impressions from the questions. Try to specify some answers if it is necessary. Thank you very much!

1. Please, choose you gender:
   - ☐ Male
   - ☐ Female

2. Please, choose your age period:
   - ☐ Under 18
   - ☐ 18 - 25
   - ☐ 26 - 35
   - ☐ 36 - 45
   - ☐ 46 - 55
   - ☐ 56 - 65
   - ☐ 66 and older

3. Where are you from?
   - ☐ St. Petersburg city
   - ☐ Town and cities of the Leningrad Region
   - ☐ Other places in Russian Federation. Please, specify the name _____
   - ☐ Other places all around the world. Please, specify the name _____

4. What is your career field?
   - ☐ Landscape/Planning or relevant
   - ☐ Other, please specify

5. Is there any green areas close to your home or working place?
   - ☐ Yes
   - ☐ No
   - ☐ Uncertain

6. How many times per month do you visit open green public space?
   - ☐ 1 time
   - ☐ 2 times
   - ☐ Every week
   - ☐ Every day
   - ☐ Other, please specify _____

7. What is your motivation to visit green area? Please, choose few from several options below.
   - ☐ Family day out
   - ☐ Specific event
   - ☐ Meeting/visiting friends
   - ☐ Walking the dog

☐ Keeping fit
☐ Getting outdoors
☐ Interest in nature
☐ Other, please specify _____

8. What type of green areas do you have in your surroundings? Please, choose few from several options below.
☐ Green areas for common use (parks, public gardens, avenues)
☐ Block green belt (neighborhood parks)
☐ Green areas which serves a special function (green space attached to the urban roads and green space for ecological protection of water supply, sanitary protected zones, buffer zones)
☐ Restricted green areas (access to these green areas could be limited by owner of property)
☐ Protected green belt (protected green belts, city forest, parkland zones)
☐ Conservation areas (protected natural reservation)
☐ Other, please specify _____

9. What do you expect from good public green open area? Please, choose few from several options below.
☐ Good car access
☐ Good access by foot
☐ Good public transport
☐ Events and activities
☐ Interpretation of nature/history
☐ Wild/natural areas
☐ Meeting places such as cafe or restaurant
☐ Planted/garden areas
☐ Opportunity for schools/ kindergartens groups to visit
☐ Peace/calm places

10. What do you think is the most important type of green area? Please, look into them and find the most relevant for you by choosing qualities from the list below.
☐ 1. Serene - Peace, silence and care. Sounds of wind, water, birds and insects. No rubbish, no weeds, no disturbing people.
☐ 2. Wild - Fascination with wild nature. Plants seem self-sown. Lichen and moss-grown rocks, old path.
☐ 3. Lush - Rich in species. A room offering a variety of wild species of animals and plants.
☐ 4. Spacious - A room offering a restful feeling of "entering another world", a coherent whole, like a forest meadow.
☐ 5. The common - A green open place admitting vistas and stay.
☐ 6. The pleasure garden - A place of imagination. An enclosed, safe and secluded place where you can relax and be yourself, let your children play freely and also experiment.
☐ 7. Festive - A meeting place for festivity and pleasure.
☐ 8. Culture - The essence of human culture; A historical place offering fascination with the course of time.
☐ 9. Other, please specify _____

11. Prioritize your choice using the numbers. The most important put as first:
_____

12. What kind of green outdoor areas is good in St. Petersburg in your opinion?
☐ Serene
☐ Wild
☐ Lush
☐ Spacious
☐ The common
☐ The pleasure garden
☐ Festive
☐ Culture
☐ Other, please specify _____

13. What type of green areas could be improved in your opinion?

- ☐ Serene
- ☐ Wild
- ☐ Lush
- ☐ Spacious
- ☐ The common
- ☐ The pleasure garden
- ☐ Festive
- ☐ Culture
- ☐ Other, please specify

14. What kind of improvements should be made in St. Petersburg green outdoor space?

_____