



# Strategic Development of Petrodvorets District in Saint- Petersburg, Russia

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# Introduction

## Description of the aim of diploma work

The location of diploma work is determined by the potential of Saint Petersburg waterfront territories, valuable, but yet not properly developed. The territory to be analysed is located on the southern shore of the Gulf of Finland, being a part of the city of Saint Petersburg. It has a number of heritage sites, included to UNESCO list, including one of the major cultural touristic attractions of the area - Peterhof Palace.

Located at the head of the Gulf of Finland on the Baltic Sea, Saint Petersburg has two major shores, Northern and Southern, both with unique natural features, distinct from each other. In the diploma work the Southern shore will be analysed.

The subject of further analysis is Petrodvorets district. Being a suburban area, it is fully located within the border of KAD. Petrodvorets district is potential area for future development, nevertheless, the district has valuable structures in poor condition to be preserved. At present, the territory does not have a proper infrastructural network to be used by local residents, resident of Saint Petersburg and tourists.

The aim of diploma work is to emphasise present benefits of the area, to propose up-to-date development and design solutions in order to improve district's functionality and connectivity, using modern urban strategies to cope with current problems of the territory.

## Terms

Dacha. A dacha is a seasonal or year-round second home, often located in the exurbs of Russian-speaking and other post-Soviet countries.

KAD. KAD is a Saint Petersburg's Ring road, an orbital freeway encircling the city.

Oblast. Oblast is type of administrative division in Russia, a federal subject within the Russian Federation, can be translated as a «province».

# Diploma Project Analytical Part

## 1. The city of Saint Petersburg

Saint Petersburg is the second largest city in Russia. The city occupies northern coast of the Gulf of Finland, in the North of the country. Being founded in the very beginning of the 18th century, the city yet got a rich history, and considered to be the cultural capital of Russia.

Saint Petersburg is known for its Empire architecture, numerous palaces and parks.

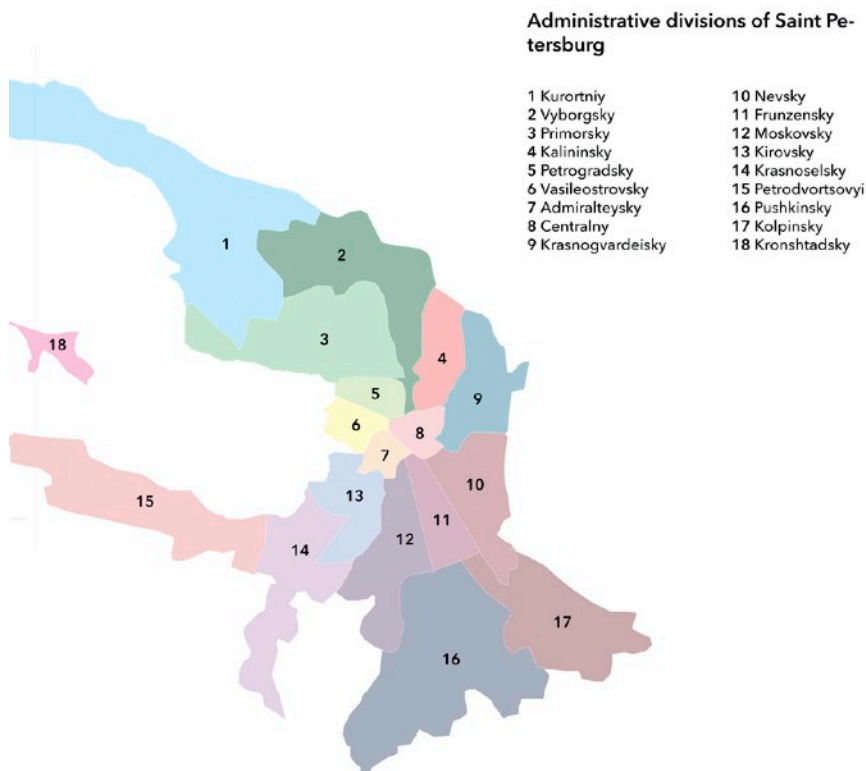
The city is encompassing the shore of the Gulf and faces the West and stands on the banks of Neva river. The entire urban centre is situated on 33 islands which occupy the territory of 80 square kilometres and is inhabited by 1/6 of the population of the city.

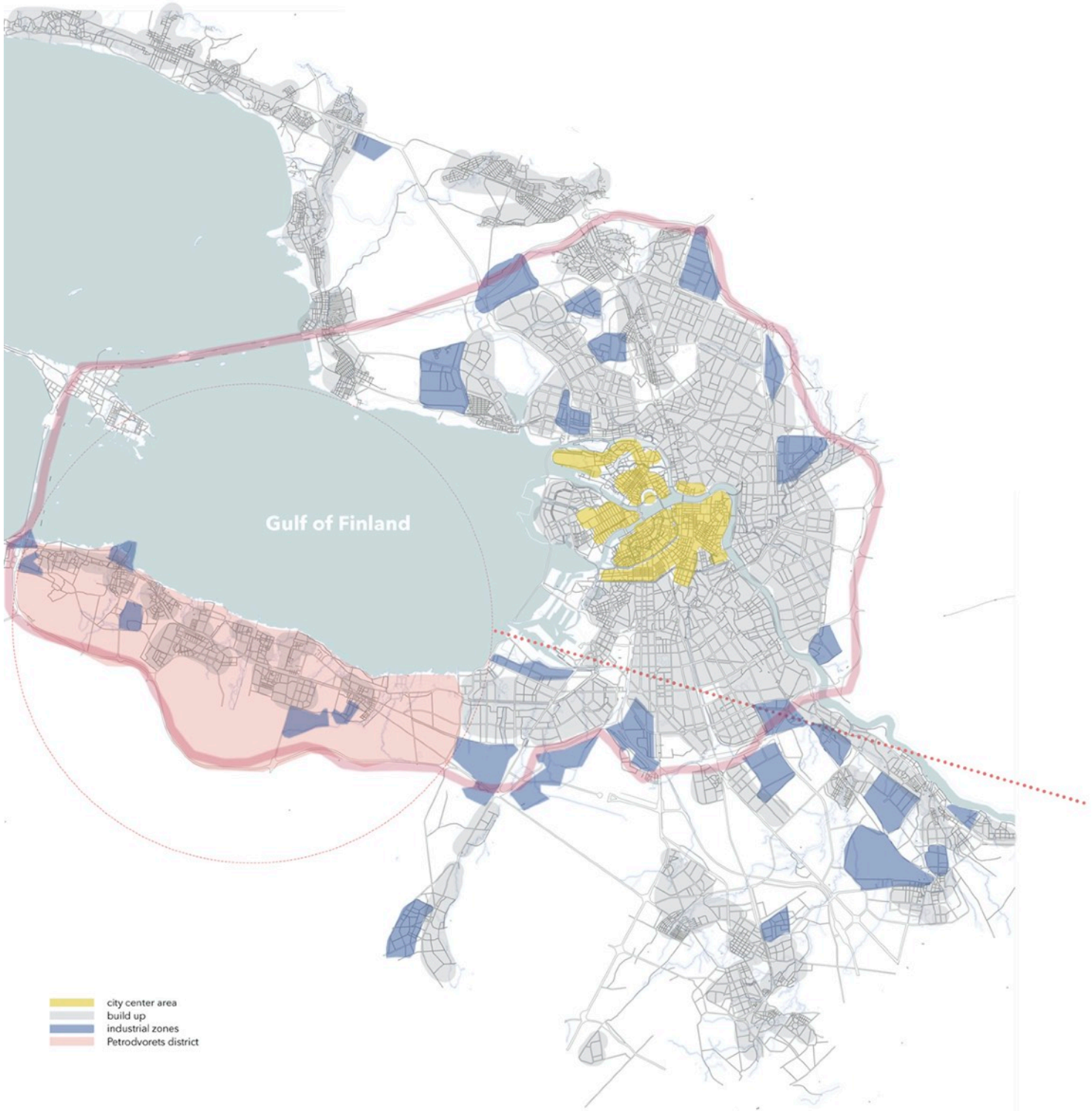
Islands can be divided into 3 main groups, first one with a major residential function, second one with industrial function and the last one with recreational function.

City centre is located on the banks of Neva river, and partly on Vasilievsky and Petrogradsky Islands. Main built-up is spread around city centre and enclosed by KAD, on the southern side is crossing KAD line and goes further. There is no particular zone for industries, and they are distributed across the city, sometimes being located next to the waterfront.

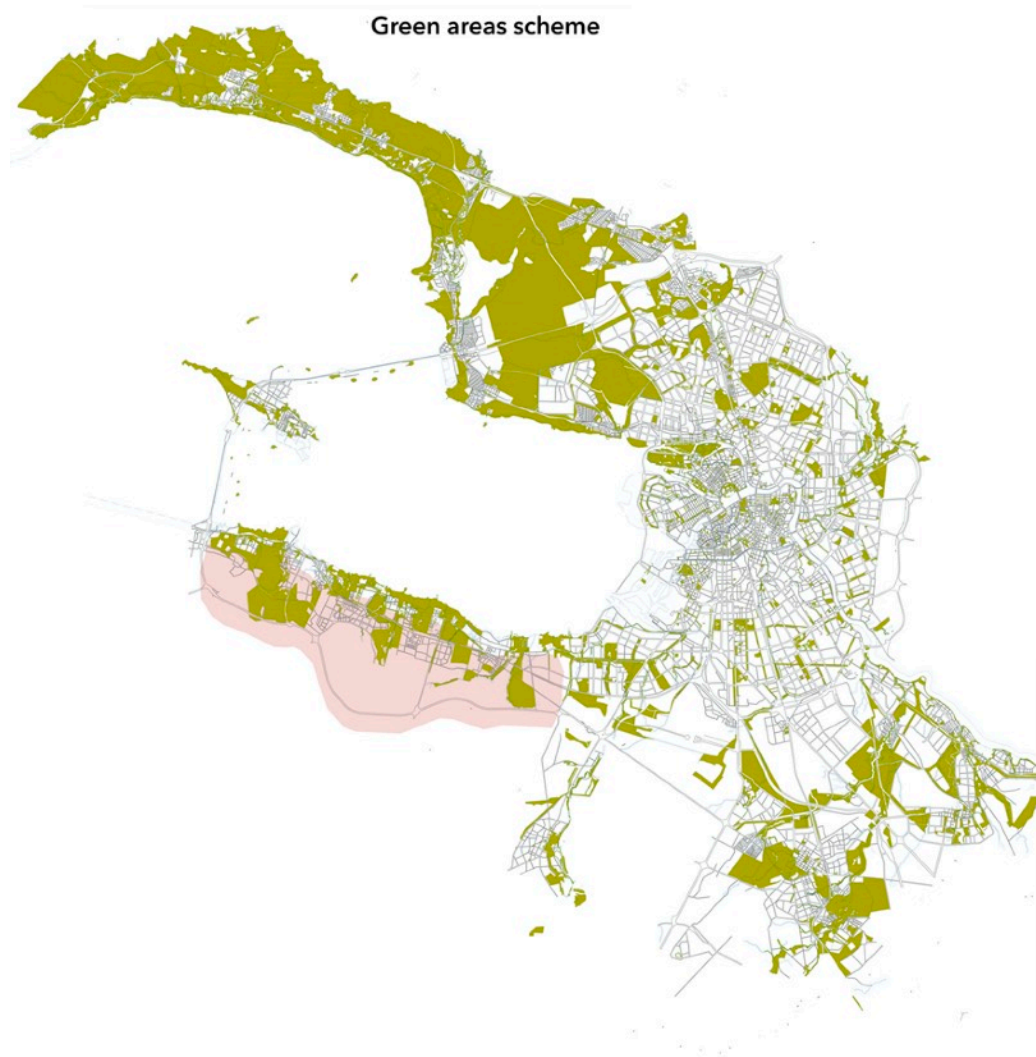
The most important monuments of Saint Petersburg are situated in the city centre, Park and Palace complexes are distributed around the city, with the highest concentration in Petrodvorets district on the southern shore, while northern shore is considered to be recreational and with less intense build up.

Saint Petersburg is composed by 18 administrative districts.





Saint Petersburg has a network of green spaces, parks and forests. As it can be seen on the following scheme, Northern part of the city is the greenest one. City centre has a number of historic parks, while in Petrodvorets district there is a dense network of historic park and palace complexes.

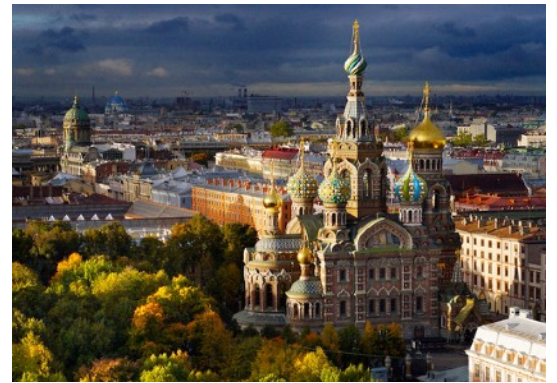


Being a cultural capital of Russia, Saint Petersburg is a city of various architectural and cultural monuments, such as Hermitage museum, Peter and Paul Fortress, Church of the Savior on the Spilled blood, Russian Museum, Kazan and Saint Isaac's Cathedrals, Winter Palace, Peterhof and Oranienbaum.





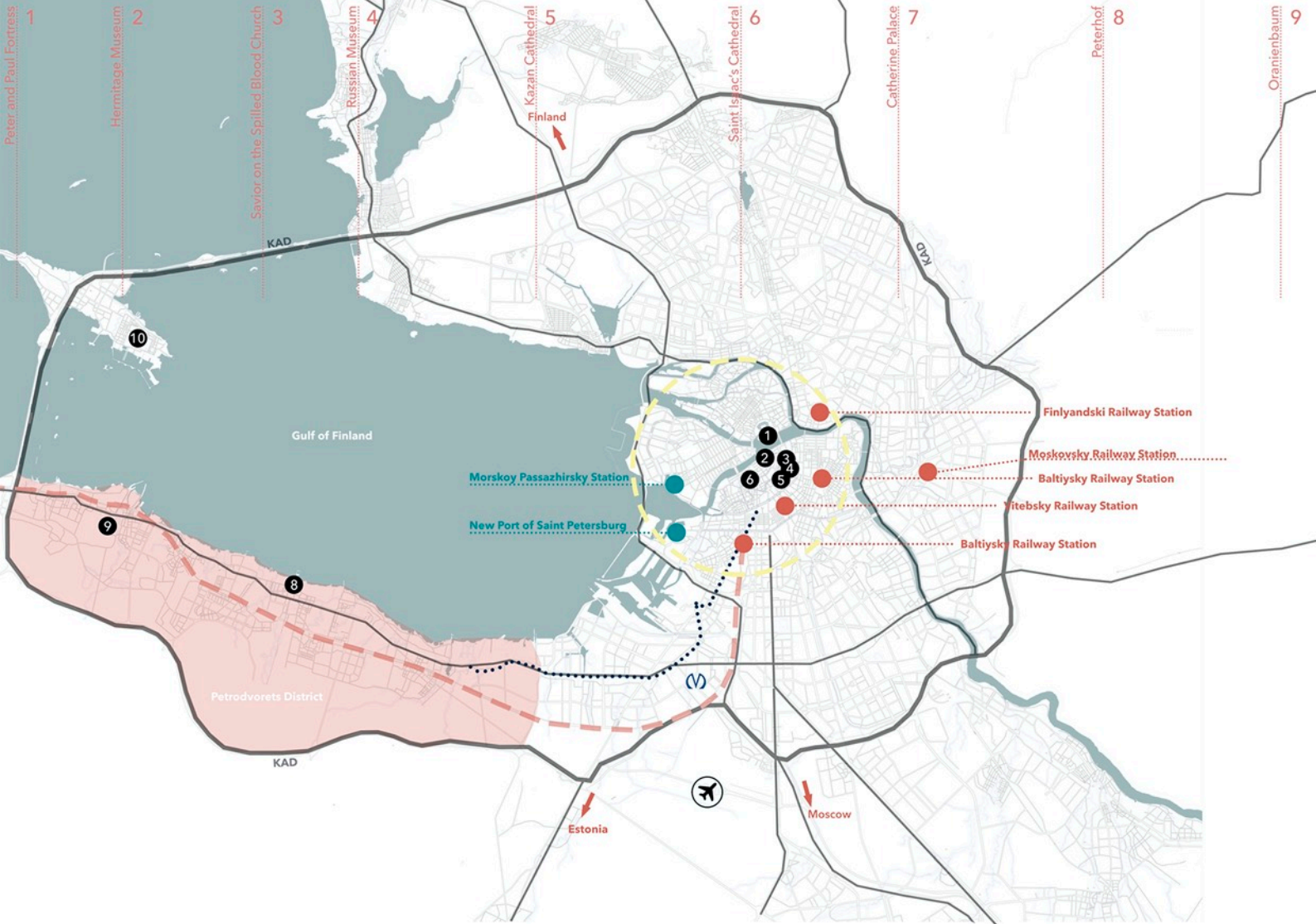
- 1, 2 Hermitage Museum
- 3 Peter and Paul Fortress
- 4 Oraniebaum



- 1 Kazan Cathedral
- 2 Saint Isaac's Cathedral
- 3 Church of Savior on the Spilled Blood
- 4 Peterhof

There are 5 railway stations in Saint Petersburg - Finlyandsky, Vitebsky, Baltiysky, Moskovsky and Ladozhsky, which connect the city with other Russian and European cities. Futhermore, there are two major ports, public one and industrial one, situated in the city centre. The main airport is Pulkovo, located in the southern part of the city, outside KAD road. Main roads, going in and out Saint Petersburg are connecting the city in different directions with Finland, Estonia and Moscow.

The city also has a wide network of public transportation, including metro, tram and buses systems.



**Transport Connection scheme  
of Saint Petersburg in relation to  
the Petrodvorets District**

- ..... City centre
- ..... Petrodvorets district
- Railway stations
- Sea transport stations
- Railway
- KAD
- Highway
- ..... Tram line
- Metro station
- Airport

- 1 Peter and Paul Fortress
- 2 Hermitage Museum
- 3 Savior on the Spilled Blood
- 4 Cathedral
- 5 Russian Museum
- 6 Kazan Cathedral
- 7 Saint Isaac's Cathedral
- 8 Catherine Palace
- 9 Peterhof
- 10 Oranienbaum
- Naval Cathedral of Saint Nicolas

## 2. Historic development of Saint Petersburg

Peter and Paul Fortress was the first structure in the city of Saint Petersburg, that lays the foundation for the further development of the city. It was built to protect the shores of Neva river from the Swedish invasion. Instead of the first earthy reinforcements, from 1706 to 1740, new masonry walls were created in the second half of the 18th century.

In the centre of the fortress the Peter and Paul Cathedral was built in between of 1712 and 1733.

A year after the foundation of the city, on the opposite side of the river, Admiralteystvo - shipyard and the second fortress of the city was built. Across Admiralteystvo, the canal was dug. The very first built structures were made of wood and so-called 'mazanka' (note: Mazanka is a construction technique for the walls, which consists of a frame (thin branches of a tree or even brushwood) or raw bricks and are coated with clay), but afterwards, were replaced by brickwork.

At the same time, on Kotlin Island in the Gulf of Finland another fortress was built - Kronstadt.

Under the protection of these three fortresses, the city started its development, by digging canals and draining the soil. Primarily, all of the structures were made of wood, then using mazanka technique and only then were replaced by brickwork.

Peter the Great was guiding the construction of the city personally. Builders were ordered to build buildings in continuous rows along the streets, 'exemplary' projects of residential buildings were developed in order to achieve an architectural integrity of the city.

In 1716 an architect Leblon developed a plan of Saint Petersburg, but the plan was not accepted due to its unreality. The plan was made taking into consideration the geographical location of the city, its districts and current construction conditions.

The main development of the area took place on the area east from the Peter and Paul church, the place where foreign ships were coming at. Trade square, as a necessary element of the urban space, appeared nearby (Troitskaya square).

Vasilievsky Island area aimed to be the centre of the new city, but due to its lowland and isolated location, the city centre was formed on the southern shore of Neva, next to Admiralteystvo.

According to Trezini plan, on Vasilievsky Island, straight avenues were created, so called 'lines'.

At the times of Peter the Great, the construction was held only on the southern part of the city, until the Great Prospect, on the territory of the first thirteen lines. After the death of Peter the Great, when the Port was moved from the Petrograd side to the Vasilievsky Island,

its eastern part gained a great importance, where barns for goods, living yard, exchange and customs have appeared.

The city centre on left side of Neva river was growing fast. Field of Mars was an important place for people to gather as well as for military purpose. Closer to Admiralteystvo, the first, no that big, Winter Palace was built. In 1716, the second Winter Palace appeared. Both those palaces were quite small, while the Winter Palace that we can see nowadays, was constructed only in the middle of Xvlll century.

The main avenue of the city - Nevsky Avenue, was founded in 1709 as a road, connecting the city centre and the road to Moscow, which coincided with a modern Ligovsky avenue.

Apart of Nevsky Avenue, in 1715 from Admiralteystvo another road was founded, the road toward Narva. (Voznessensky Avenue)

Another important period of Saint Petersburg's construction is a period of late 1730's. Back then, the special commission, regulating all construction processes in Saint Petersburg was created. The commission made a project of new city districts. According to this plan, a new Gorohovaya Street appeared, together with Nevsky and Voznessensky Avenues it created a three avenues system, characterising a planning system of the city centre nowadays.

The commission as well set a new entrance to the city, Moskovsky Avenue, and proposed a development plan for Petrograd Side with a number of parallel streets.

Architecture of Saint Petersburg in the middle of XVIII century was different from the one of Peter the Great. 40's and 50's - is a period of construction of more decorated ceremonial and church buildings, while before the attention was paid more to the construction of public buildings.

One of the most important architects of that time was V. Rastrelli, an author of many monumental buildings in Saint Petersburg, such as a new Winter Palace (1754-1762). He reconstructed palaces in Peterhof and Tsarskoe Selo.

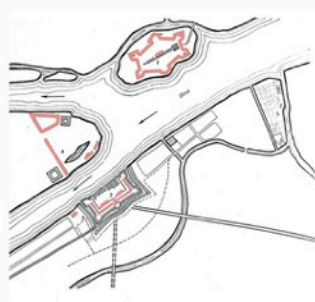
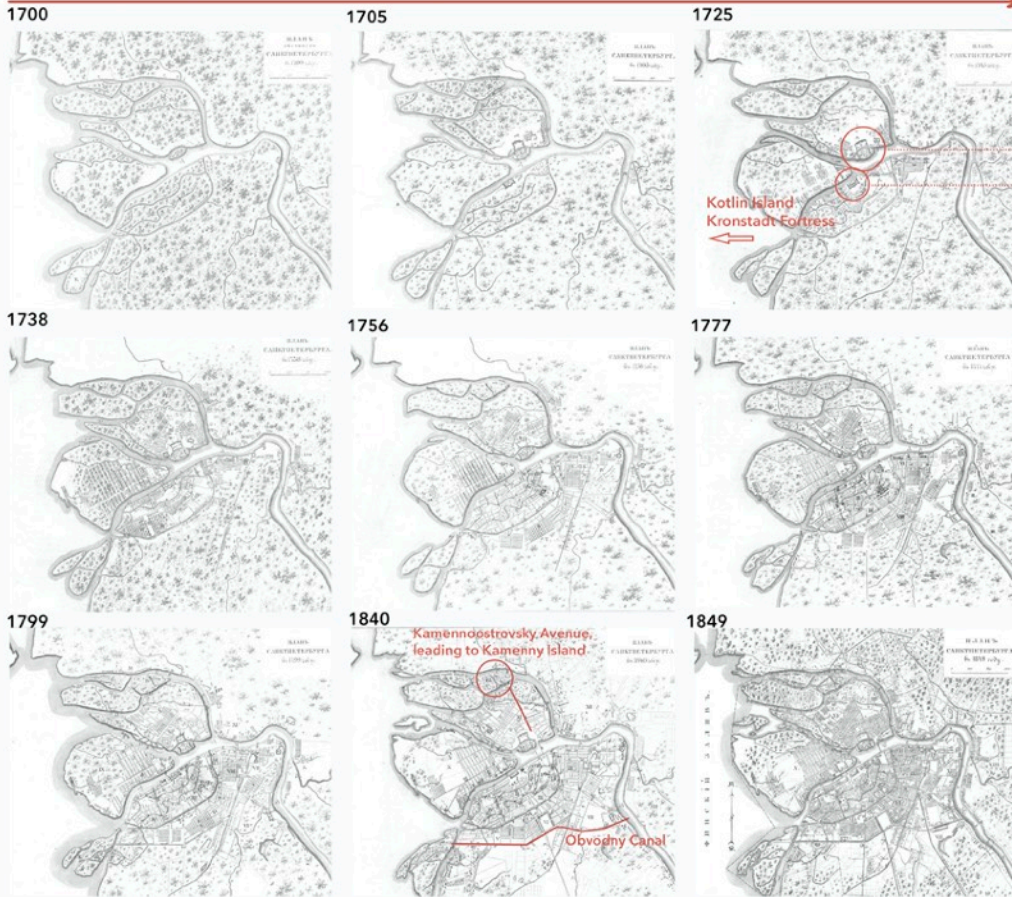
From the middle of Xvlll century the port of Saint Petersburg has experienced a significant growth. A lot of attention was paid to the public and utility buildings, such as scientific and educational facilities, commercial, healthcare buildings, warehouses.

In 1762 a 'Comission of masonry construction of Saint Petersburg and Moscow' aimed to deal with an urban structure without expanding its territories, without construction of wooden buildings, but replacing it with a masonry buildings, as well as improving city planning. It led to the construction of squares.

In the third quarter of the XVIII century a lot of attention was paid to the creation of general city plans, with specification of development for every part of the city. The need for this plans was dictated by a necessity of regulation of construction and definition of its

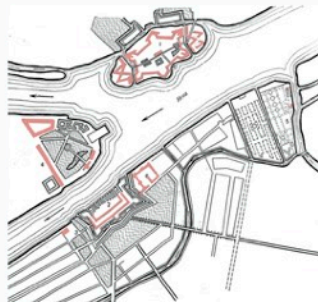
further development. For the first time such work was made for the 50th anniversary of Saint Petersburg. In 1753 a big plan of capital city appeared, made by M. Mahaev and I. Sokolov. In 1764-1773 was made a perspective plan of Saint Petersburg.

# Saint Petersburg: Historical Development



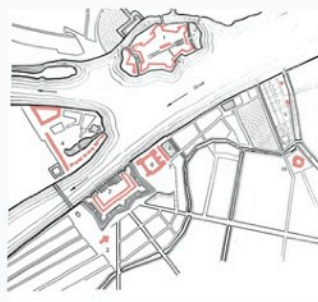
Schematic plan of the central part of the city 1725

1. Peter and Paul Fortress
2. Admiralteystvo
3. Isaac's Cathedral
4. Twelve Collegia
5. Summer garden



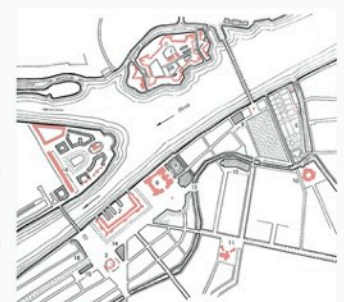
Schematic plan of the central part of the city 1750

1. Peter and Paul Fortress
2. Admiralteystvo
3. Isaac's Cathedral
4. Twelve Collegia
5. Summer garden
6. Old Winter Palace



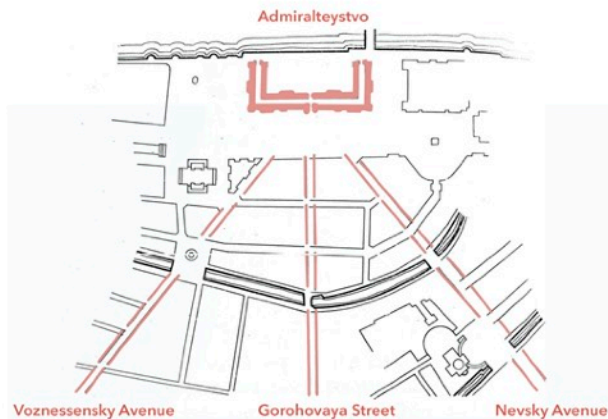
Schematic plan of the central part of the city 1800

1. Peter and Paul Fortress
2. Admiralteystvo
3. Isaac's Cathedral
4. Twelve Collegia
5. Summer garden and the Field of Mars
6. Winter Palace
7. Small Winter Palace
8. Hermitage
9. Marble Palace
10. Mikhailovsky Castle



Schematic plan of the central part of the city 1850

1. Peter and Paul Fortress
2. Admiralteystvo
3. Isaac's Cathedral
4. Twelve Collegia
5. Summer garden
6. Winter Palace
7. Small Winter Palace
8. Hermitage
9. Marble Palace
10. Mikhailovsky Castle
11. Kazan Cathedral
12. Court Stables
13. General Staff Building
14. Lobanov-Rostovsky Palace
15. Exhibition Hall
16. Senate and Sinod Building



Voznessensky Avenue      Gorohovaya Street      Nevsky Avenue

### 3. Historic development of Petrodvorets district

The development of the Petrodvorets district was associated with the development of the Peterhof road, which connected the two most important fortresses of the developing city - Kronstadt and Peter and Paul fortress. Both fortresses were of strategic importance, as they protected the city from the attack of the Swedes.

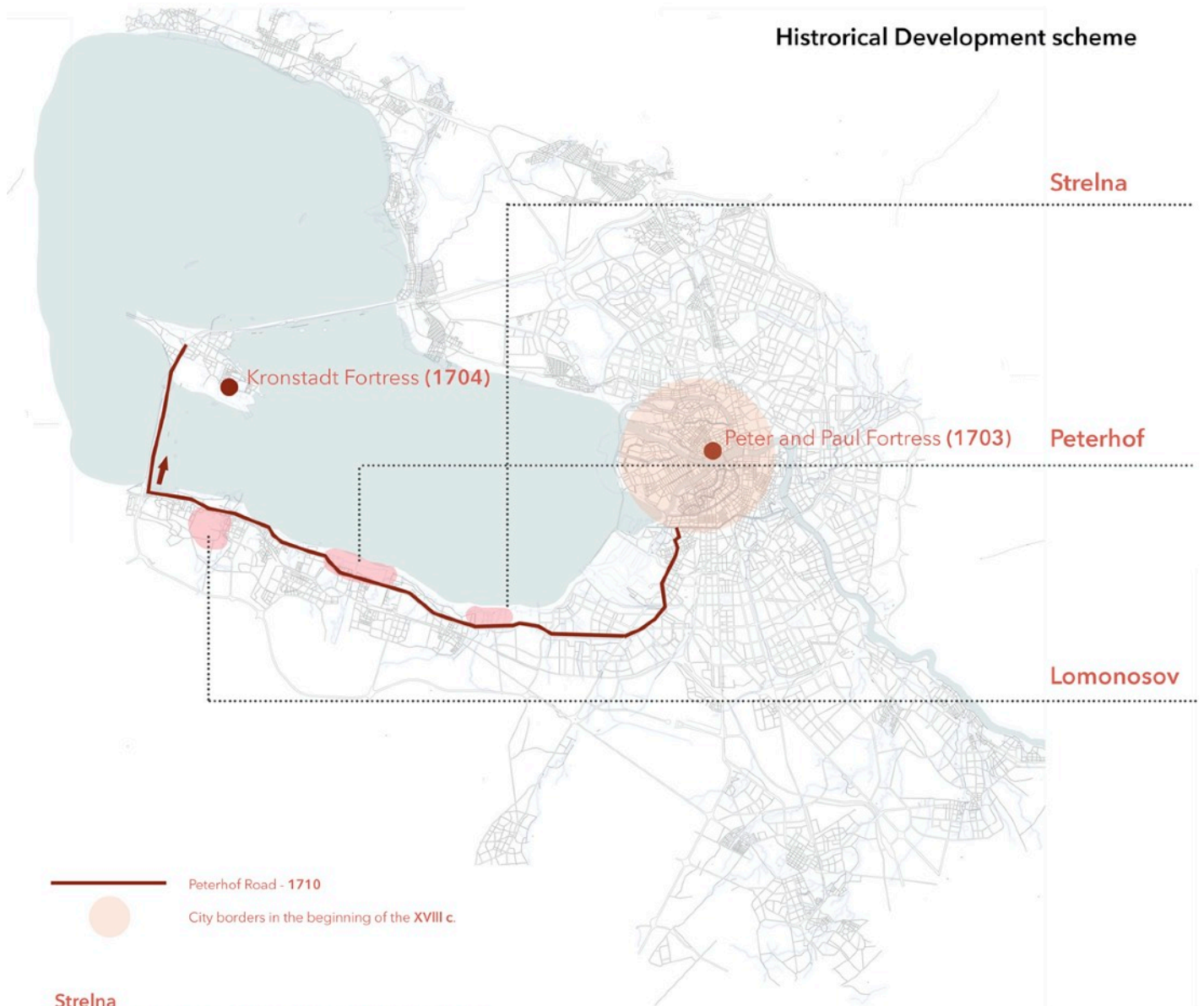
From the very foundation of the city, Petrodvorets was a resting place for those close to Peter the Great. Proximity to the sea and picturesque views towards the Gulf contributed to the emergence of estates and so-called "ensembles", complexes of a palace and a regular park. This type of architectural complex was first seen by Peter in Holland and France, and was adapted to Russian landscapes.

The beginning of the formation of the Peterhof road as a system of estates was laid in July-August 1710. From the very beginning, the estates were conceived primarily of «entertainment», serving for recreation and entertainment. On the first place was not economic, but aesthetic principle. Thus Peter taught his subjects to rest "in the European manner", using compositional principles of European architecture and art of parks, and at the same time created a ceremonial marine facade. The latter became especially important with the increase in the value of Peterhof road as the main highway connecting St. Petersburg with its port on Kotlin Island. A traveler who arrived in Petersburg by sea usually sailed from Kotlin to Oranienbaum, and then followed the road along the coast.

Peter the Great's affection for Holland, in particular for its gardens, had great influence on the composition of the gardens of Petrodvorets district, its landscape and urban planning principles.



## Historical Development scheme



### Strelina

- 1707 The appearance of first structures for Peter the Great to stop at his way to Kronstadt
- 1714 Creation of a Regular Park
- 1715 Orlovsky Pond
- 1716 Creation of a master plan of the complex by Rastrelli
- 1720 Strelina Palace was established
- 1847 The park and palace complex named after the son of Nikolas I, Grand Duke Konstantin Nikolayevich of Russia

### Peterhof

- 1710 Wooden Palace was founded for Peter the Great
- 1714 Creation of a country residence
- 1716 Creation of a water infrastructure, canals
- 1721 Creation of fountains
- 1723 Opening of the whole complex
- 1714-1725 Lower Park, Upper Garden, Naval Canal, Palaces of Monplaisir, Marli etc. were built

### Lomonosov/Oranienbaum

- 1707 The land of Oranienbaum was given to A.D. Menshikov by Peter the Great
- 1710 45 small wooden houses of peasants were constructed
- 1710 - 1727 Construction of the Great Palace
- 1710 Creation of the Regular Gardens
- 1712-1713 Creation of the Naval Canal, connecting the Palace with the sea
- 1727 The Great Palace was confiscated to the State Treasury

# Petrodvorets district

## 4. Location of Petrodvorets district

The territory is located within the borders of Saint Petersburg, founded on the shores of the Gulf of Finland in the North-West of Russian Federation. The district is situated 30 km away from the centre of Saint Petersburg in the western part of the city. In the East the district neighbours Krasnoselsky district. The population is around 143 thousand people (on 01.01.2019). There are three municipal formations within the district, the cities of Strelna, Peterhof and Lomonosov (previously Oranienbaum).



## 5. Connections and transport network

Petrodvorets district is located in-between KAD and the Gulf of Finland, in-between the main city and Kronstadt (a city-port on Kotlin Island and its adjacent smaller islands).

Connection from the centre of the city is organised via Saint Petersburg highway, or Peterhof road, passing through Strelna, Peterhof and Lomonosov, that later prolonged along the coastline of the Baltic Sea.

The Peterhof road was founded in 1710 as a highway connecting Saint Petersburg with the imperial country residences: Strelna, Peterhof, Oranienbaum (from where the ferry to Kronstadt begins). The road starts from Fontanka (the 18th century city border), passes

through the Narva outpost and stretches along the southern coast of the Gulf of Finland for 40 kilometres to Krasnaya Gorka.

*The development of modern Petrodvorets district was majorly based on development of Peterhof Road, as a unique landscape and architectural system of imperial residences, gardens and parks, a combination of buildings of different styles and periods. According to the plan of Peter I, evenly cut sections along the road on both sides should be handed out to the nobility for the construction of their estates, and the resulting gigantic architectural ensemble was supposed to resemble the road from Paris to Versailles. At first, the construction of estates was a kind of duty for the nobility, but gradually the road became a prestigious building site. The cutting and distribution of plots begun by Peter I and continued until the middle of the 19th century.*

*In the second half of the XIX century, the development of imperial estates was gradually replaced by picturesque green territories. The beginning of the road passes through the emerging industrial outskirts of the city, the land is bought by owners and industrialists for the construction of factories, utility buildings (taverns, shops, barracks for workers).*



Oranela tram rails nowadays

*ORANELA (The Oranienbaum Electric Line) is the first project of suburban electric train in the Russian Empire. In 1915, a unique ORANELA railway line began operating along the Peterhof road. This commuter train line, called Oranela, is an ambitious project of imperial times. It was planned to connect the Saint Petersburg suburbs - Narva outpost and the city of Oranienbaum with a tram line, going along the Peterhof Road. Oranela was built primarily for summer residents of Strelna, Peterhof and Oranienbaum. After*

*the October Revolution, an image of the road was almost completely lost, as a result of mass construction on the territory next to Narva outpost.*

Nowadays, the last stop of this tram line is located in Strelna. Strelna, as the nearest city to the Saint Petersburg, can be reached by tram number 36.

The district as well has a railroad connection, from Baltiysky railway station in Saint Petersburg, the railroad is passing through Petrodvorets stations until the Krasnaya Gorka fort in the West. In the territory of Petrodvorets district there are 10 railway stations (Strelna, Krasnyye Zori, New Peterhof, Old Peterhof, Universitet, Martyshkino, Oranienbaum, Oranienbaum-2, Kronshtadtskaya Kolonia and Bronka).

Transport scheme

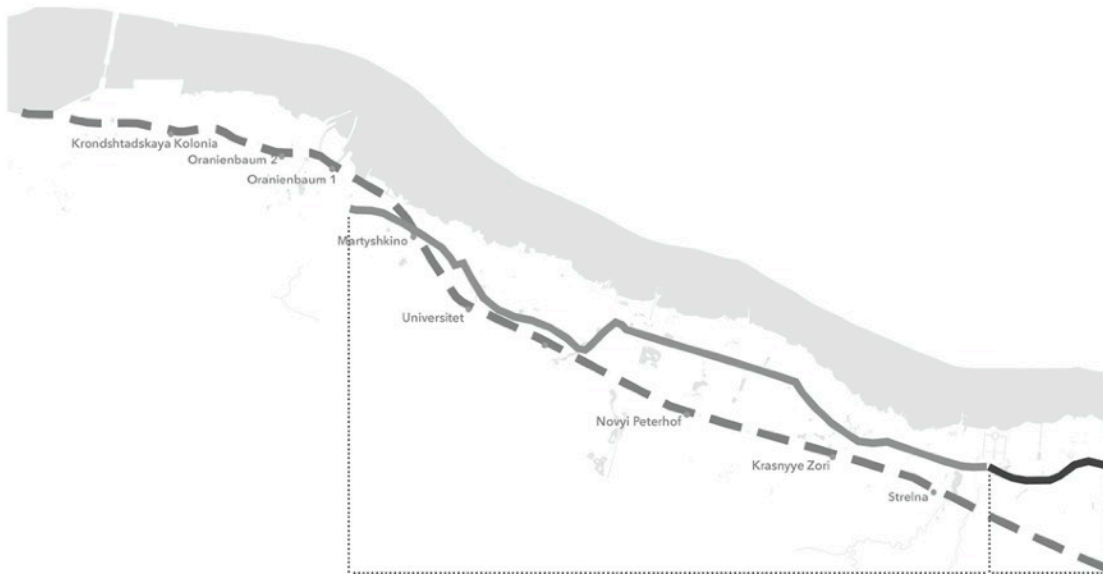


Meteor ferry



Oranella rails

- - - railway
- railway station
- KAD
- ⋯ Meteor ferry route
- Meteor ferry stop
- ⋯ tram line
- tram stop
- district border
- national road

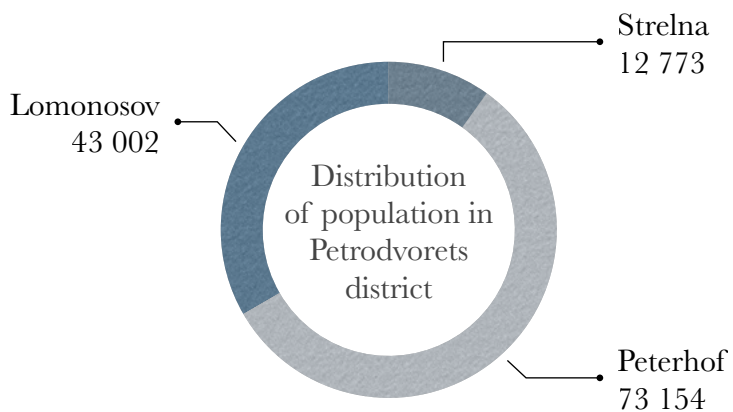
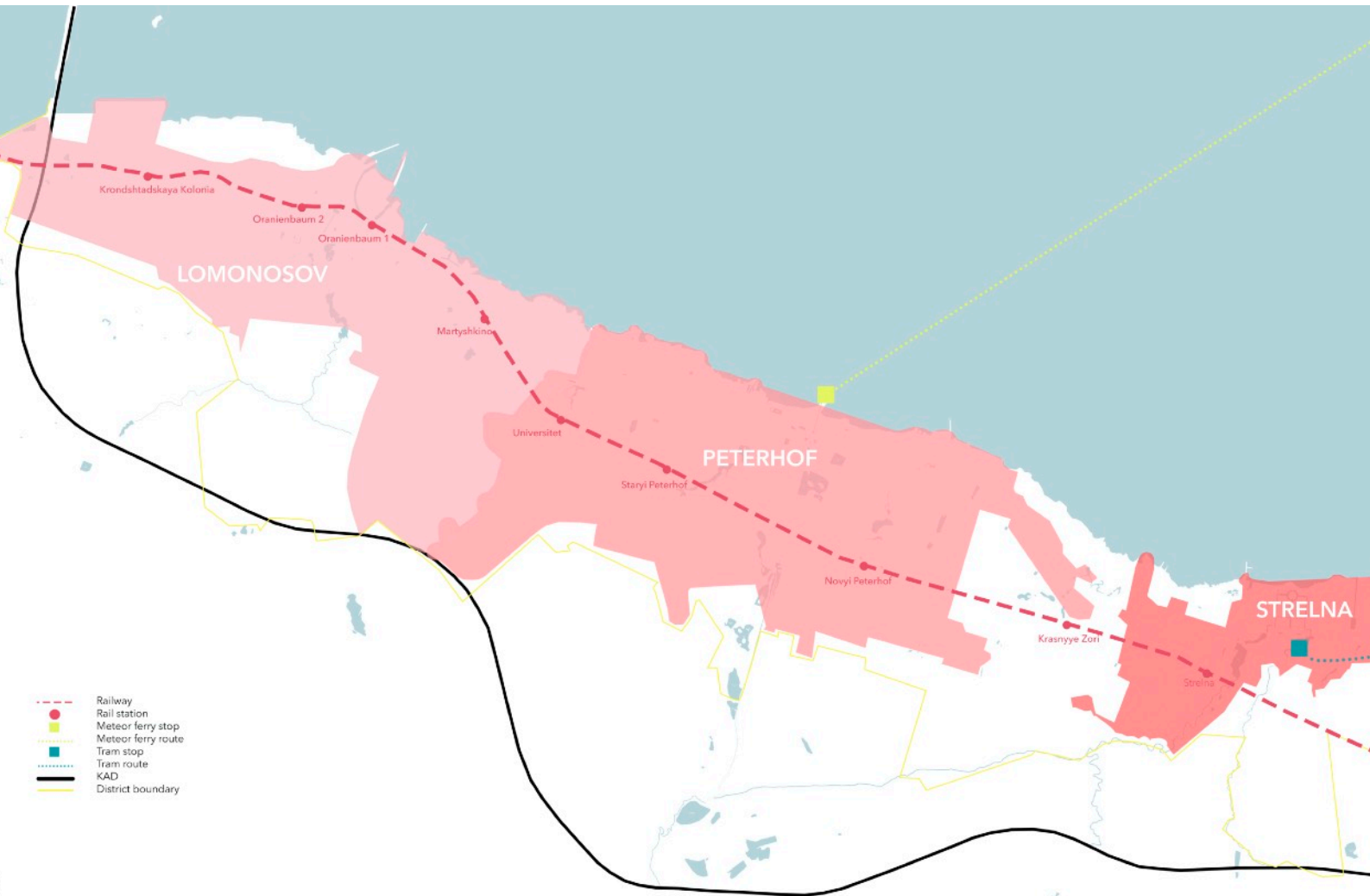


old ORANELLA route

existing tram route



## 6. Structure



In its structure, Petrodvorets comprises three cities: Strelna, as municipal settlement, Peterhof and Lomonosov (Oranienbaum) as municipal towns, all together are a part of federal city of Saint Petersburg.

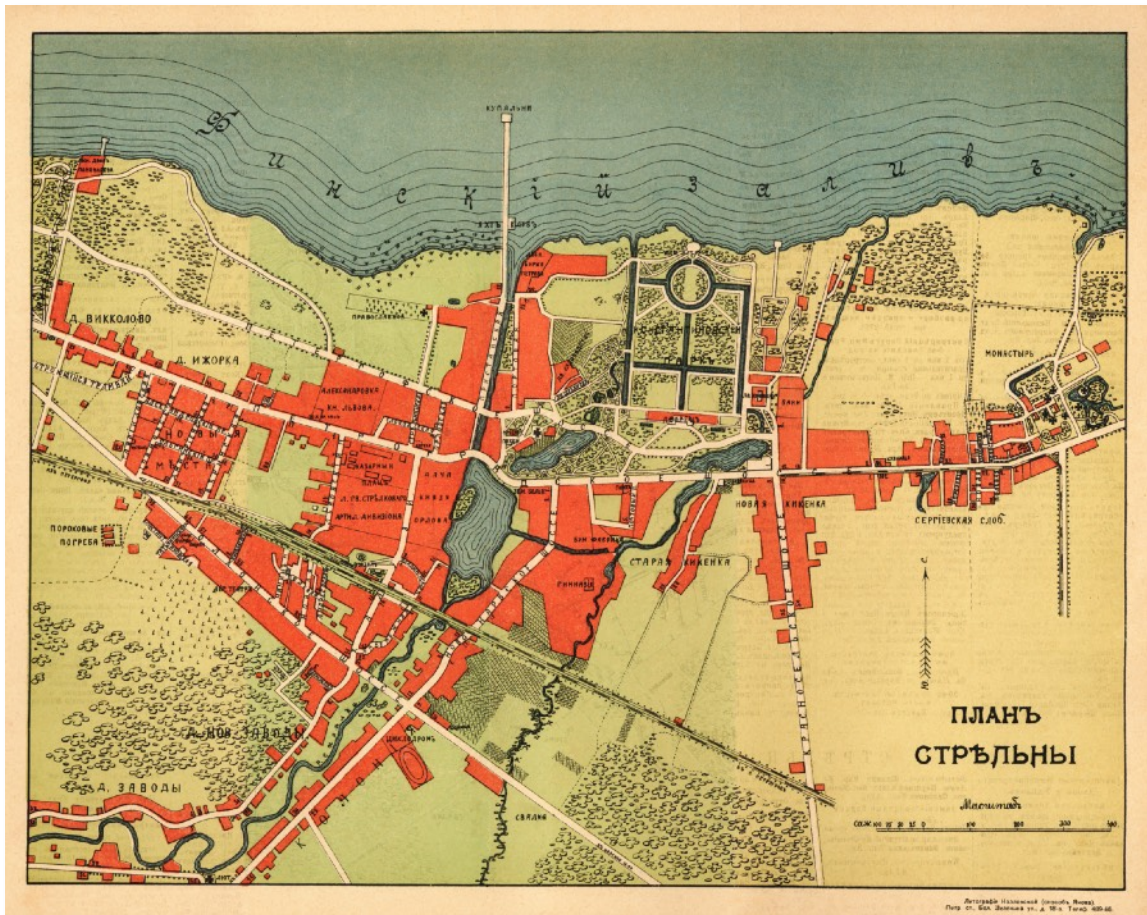
## 7. Strelna



Strelna's satellite image

Strelna is a municipal settlement, overlooking the Gulf of Finland, situated 30 km from the centre of Saint Petersburg on rivers Strelka and Kikenka. It dates back to the year 1500. After the Ingrian War the territory of Strelna was taken over by Sweden. The Strelna settlement was mentioned on the map of Ingria in 1676. In the beginning of 17th century, Peter the Great intended to create a country residence in Strelna - Konstantinovsky palace, which later on was converted into the «travel» residence, while Peterhof Palace acquired the status of country residence in 1722. In the beginning of 19th century, the area next to Strelna started to develop as an area for suburban summer residences - dachas.

Currently, the city is a weekend destination for residents of Saint Petersburg, either they own dacha or not, Strelna offers an access to the waterfront of the Gulf of Finland, though, in many places the access is hardly possible.



Strelna's plan, lithography by M.V. Kozlovskaya, 1915.

## 8. Peterhof



Peterhof's satellite image

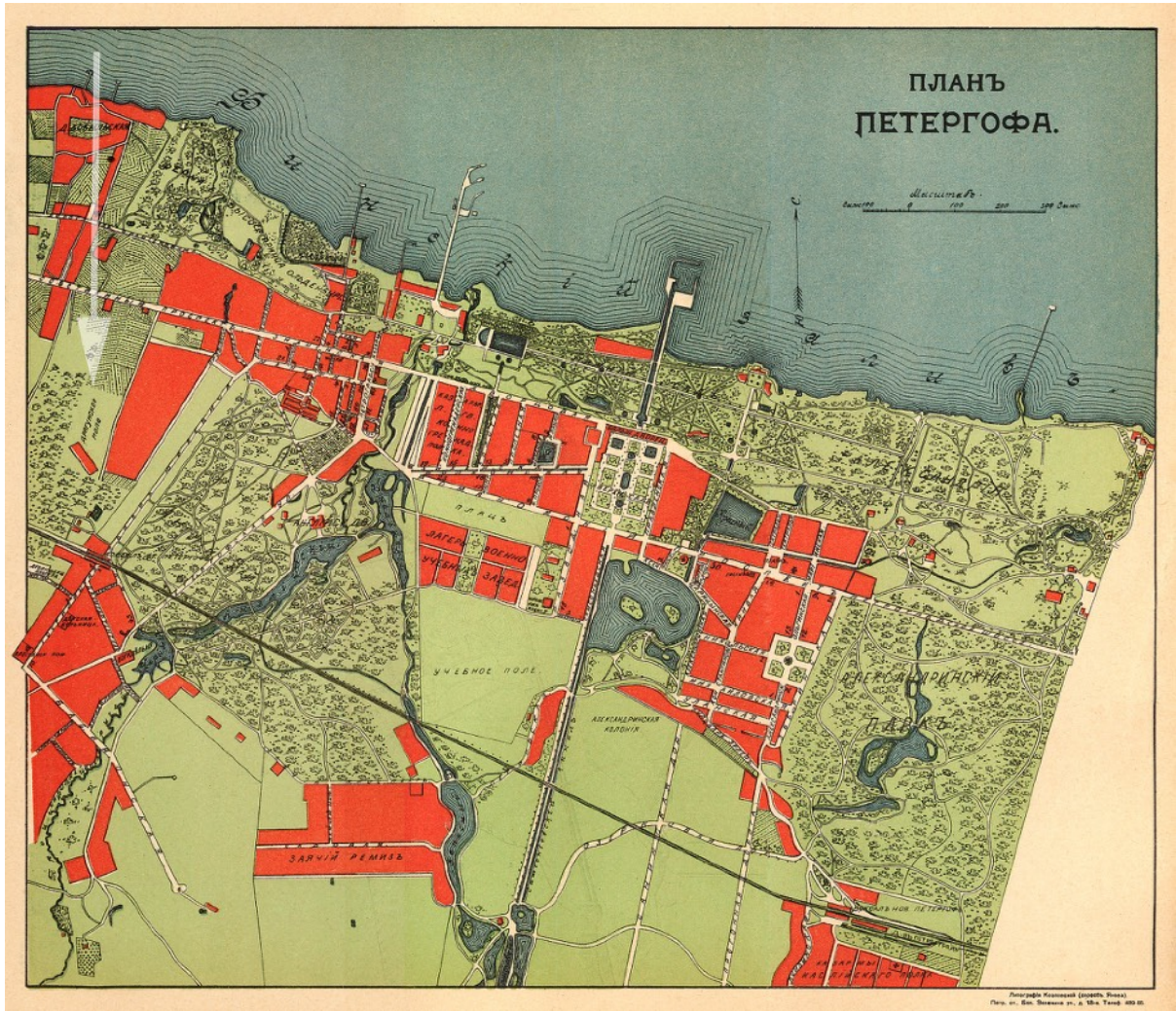
Peterhof is a municipal town within the city borders of Saint Petersburg, located on the Southern shore of the Gulf of Finland. It is a large touristic, scientific centre, western from Saint Petersburg and Strelna, 29 km from the centre of the city.

Peterhof was founded in 1710 as a country residence of Peter the Great, and got a status of the city in 1762. The city is a popular touristic destination, well-known for a series of palaces and gardens, the Palace of Peterhof - imperial residence, in 1918, after the October Revolution transformed into museum. The city of Peterhof consists of four historically formed parts that arose as initial settlements nearby the residences: Old Peterhof, Middle Peterhof, New Peterhof and Egerskaya Sloboda.

Nevertheless, Peterhof is also a «science city», with a number of research facilities and institutions. Some of the faculties of Saint Petersburg State University are located in Peterhof, including institutional infrastructure.

In 1990 parks and palaces of Peterhof were included into UNESCO world heritage list, together with the other monuments of Saint Petersburg, entitled «Historic Centre of Saint Petersburg and Related Groups of Monuments».





Petrhof's plan, lithography by M.V. Kozlovskaya, 1915.

## 9. Lomonosov (Oranienbaum)



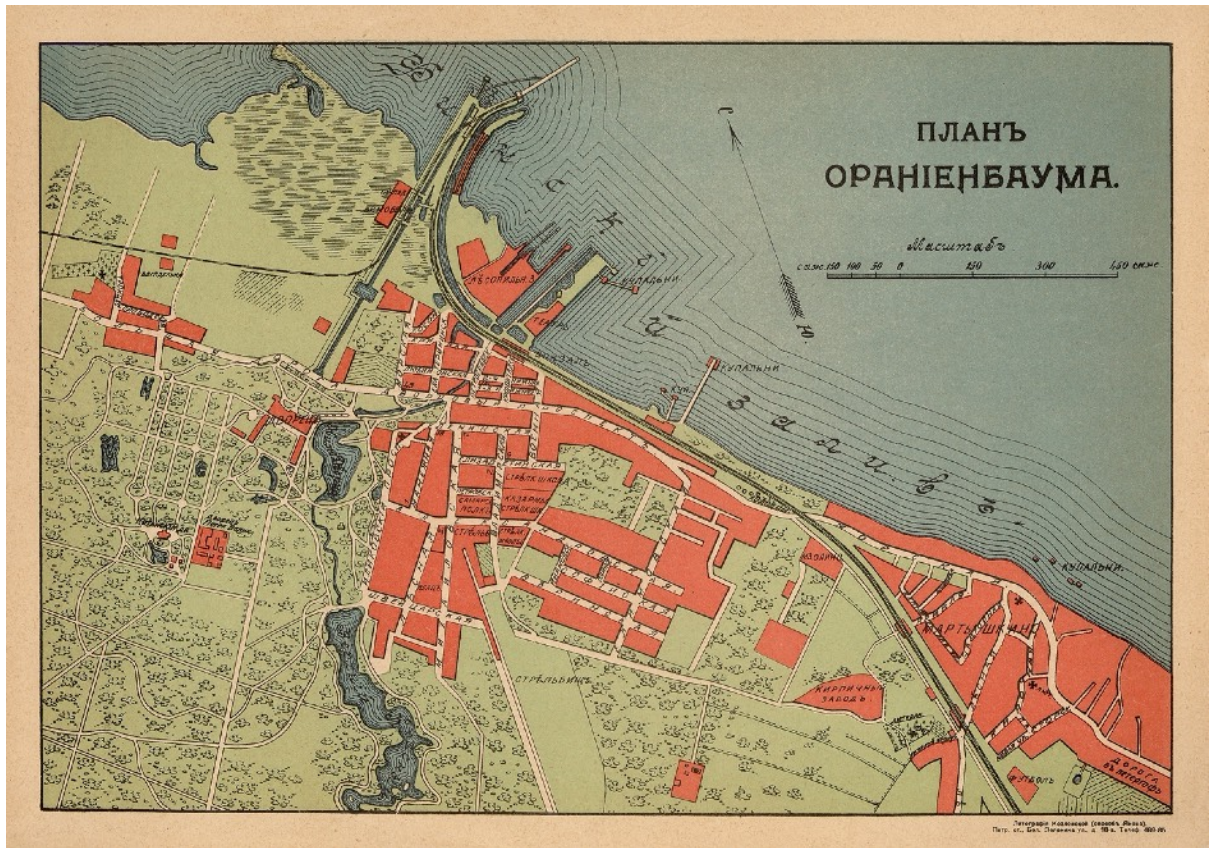
Lomonosov's satellite image

Lomonosov (Oranienbaum, before 1948) is a municipal town, within the borders of Saint Petersburg. The city is the western territory of Saint Petersburg, a city-port, situated on the southern shore of the Gulf of Finland, in the estuary of the river Karasta.

The city was founded in 1710 as a country residence of A. Menshikov, in 1780 acquired the status of a city. The original name of the city is Oranienbaum, but in 1948 it was renamed after a famous Russian scientist Mikhail Lomonosov. On the territory of Lomonosov there is a number of historic districts, such as Mordvinovo, Martyshkino, Kronshtadtskaya Kolonia. Martyshkino, in the east of Lomonosov, is an area for summer residences, or dachas, since the beginning of the 19th century.

One of the main infrastructural elements of the city is port Bronka, which operates in the structure of the Big Port of Saint Petersburg. The port has connection to the railway stations, Oranienbaum-2 and Bronka.

The city has a grid structure, with an access to the waterfront area.



Oranienbaum's plan, lithography by M.V. Kozlovskaya, 1915.

# 10. Land use structure

Land use scheme



- garden houses
- single family houses
- large scale housing
- commercial
- educational and scientific
- healthcare and sanitary
- sport
- military
- industrial
- garages
- social
- cultural heritage zones under protection

- district boundary
- national road

The major land use types in the district:

- Garden houses - temporary structures, used during the summer period
- Single family houses - detached residential houses, often dachas
- Large scale housing - mass construction housing, mainly from the Soviet Era
- Industrial - mainly, light non-polluting industry often warehouses
- Sport facilities - stadiums and sport complexes
- Educational and scientific - Saint Petersburg State University faculties, Peterhof scientific district
- Social - all social services
- Healthcare and sanitary - hospitals and sanatoriums
- Commercial - markets, supermarkets and shops
- Military - a port, military warehouses and military dislocations
- Garages - Soviet era warehouses
- Areas under protection - natural sanctuaries, Palace and Park complexes, country residences

# Values Of The Territory

## 1. Connections

One of the most valuable features of the territory is its strategical location, the area is easily accessible by train from Baltic station in Saint Petersburg. It allows the residents of the city to travel to Petrodvorets district during the weekend, taking the territory into account as a weekend destination for recreational use. The territory is also connected with Kotlin Island, where Kronstadt fortress and town are situated, with an automobile bridge.

The tram route number 36 to Strelna is an example of unique commuter train line, Oranela, which also might be interesting, at first, as the alternative for getting to the district, but not the most popular one. The line is used mostly by the residents of Strelna in order to get to the nearest metro station, Avtovo, but this way is not the most relevant.

Bus network is well-developed in the district, especially *marshrutka*, a form of public transportation, organised by private companies, acting as a shared taxi which uses minibuses for up to 30 people. Peterhof is the major touristic attraction of the district, therefore, a lot of companies have organised routes to Peterhof, passing through Saint Petersburg and Strelna.

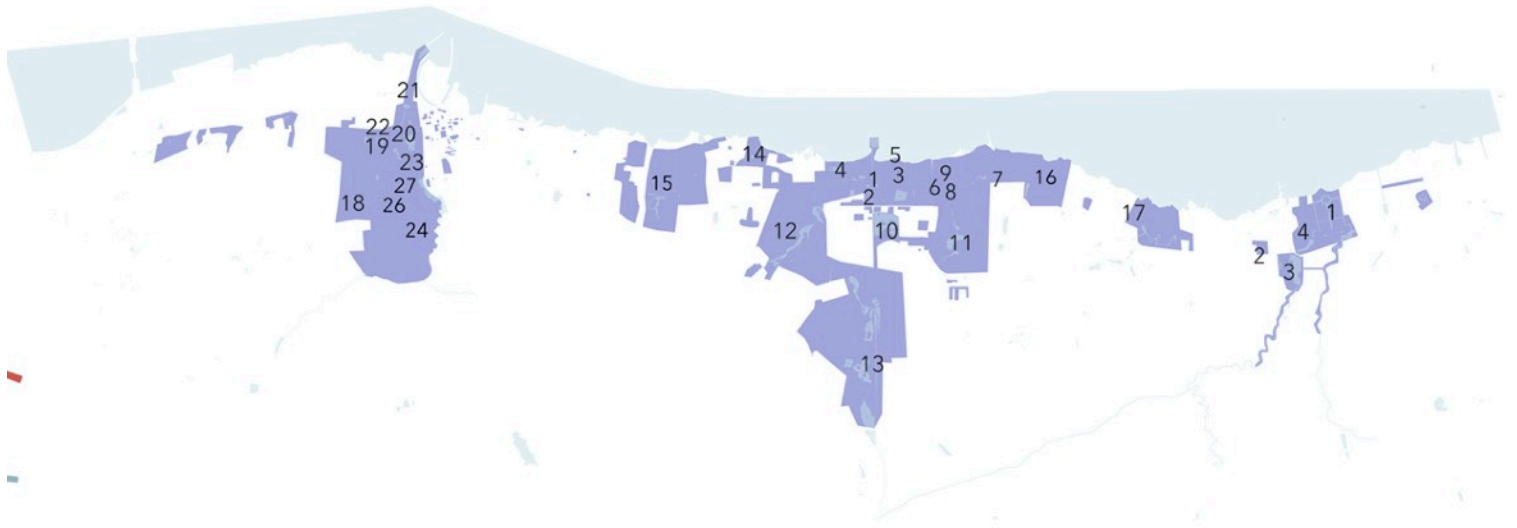
Public transport is developed, the bus system is created across the Petrodvorets district and on the territories of Strelna Peterhof and Lomonosov in particular, but frequently, because of the traffic load on Peterhof road, the traffic jams cause obstructions in the movement of public transport.

As an alternative way to Petrodvorets district, Meteor boat can be used, a boat, departing from historical centre of Saint Petersburg, arriving to the pier in the Lower Garden in Peterhof. However, this option can be used only during the summer, during another season the use is not possible because the Gulf of Finland is frozen. Though, this way of transportation is majorly used by tourists, due to its price, not always affordable for the local residents of the district.

## 2. Park and Garden Complexes

Petrodvorets district has a large network of Palace and Garden Complexes, worldwide famous for their history and unique examples of a landscape garden art. The majority of the structures are recognised as UNESCO world heritage sites. All of these factors make them attractive for tourists, local residents of the district and the residents of Saint Petersburg. While the major flow of tourists is generated mostly during the summer period, the use of the territories by local users is distributed throughout the year. Therefore, touristic flow is mostly concentrated around Peterhof and its surroundings, the parks of Strelna and Oranienbaum do not get that amount of visitors from abroad. Nevertheless, Park and Palace ensembles are highly popular as a weekend destination for locals.

## Heritage protection sites



### Peterhof Heritage Sites

#### Peterhof park and palace complex

- 1 The Grand Palace
- 2 The Upper Garden
- Dubovyi Fountain
- Neptun Fountain
- Fountains and Square Ponds
- Mezheumnyi Fountain
- 3 The Lower Gardens
- The Samson Fountain
- 4 Marli Palace
- Roman Fountains
- 5 Monplaisir Palace
- Pyramid Fountains

#### Alexandria Park and Palace Complex

- 6 Alexandria Park
- 7 The Cottage Palace
- 8 The Farmer Palace
- 9 The Gothic Capella
- 10 The Colonists' Park
  
- 11 The Alexandriyski Park
- 12 The English Park
- 13 The Lugovoy Park
- 14 The Park of the Farms of Prince of Oldenburg
- 15 Park and Palace Complex Sobstvennaya Dacha
- 16 Park nad Palace Complex Znamenka
- 17 Park and Palace Complex Mihaylovka

### Lomonosov Heritage Sites

#### 18 Historical centre of the town of Lomonosov, including the Palace and Park Ensemble of the Upper Park and Lower Garden

- 19 The Grand Menshikov Palace
- 20 The Lower Garden
- 21 The Sea Channel
- 22 The Painting House

#### Peterstadt fortress:

- 23 Palace of Peter the III
- The Main Gates
- 24 Petrovsky Park
- 25 The Upper Park
- 26 The Chinese Palace

### Strelna Heritage Sites

- 1 Konstantinovskiy Palace and Park
- 2 Lvovskiy Palace
- 3 A.F. Orlov's Datcha and Park
- 4 Putevoy Palace



### 3. Heritage

#### Strelna heritage sites

N.	Name	Year	Status	Description	Current use
1	Konstantin Palace and park	1720	F UNESCO	Former residence of the Grand Dukes of the house of Romanovs.	The National Congress Palace, used for the meeting of G8 heads of state and government, G20 leaders summit.
2	Lvovsky Palace	1838	F UNESCO	Victorian gothic palace, built for P. Alexandrov.	Administration of Strelna Music school
3	A.F. Orlov's Datcha and Park	1833	F UNESCO	Neogothical country villa of Orlov family.	Park with ponds and gardens. The villa destroyed during the WWII.
4	Putevoy Palace	1716	F	The earliest structure in Strelna, built for Peter the Great to stay on the way to Peterhof.	Informational centre of the History of Strelna

#### Peterhof heritage sites

N.	Name	Year	Status	Description	Current use
1	Peterhof park and palace complex				
2	The Grand Palace	1714	F UNESCO	The main baroque building of the complex, rebuild in 1747 according to the model of Versailles. Has 30 decorated halls.	Museum
3	The Upper Garden	1714	F UNESCO	A regular garden, South from the Grand Palace, build according to the project of Italian architect Rastrelli. It has 5 ponds and cascade fountains.	Park
4	Dubovyi Fountain	1734	F UNESCO	The first fountain of the Upper Garden	Fountain
5	Neptun Fountain	1736	F UNESCO	The compositional centre of the Upper Garden.	Fountain
6	Fountains and Square Ponds	1720	F UNESCO	The ponds serve as a water reservoirs for the fountains of the Lower Park. The ponds and its fountains are decorated with sculptures.	Fountain
7	Mezheumnyi Fountain	1738	F UNESCO	The fountain is situated next to the main entrance to the Lower Gardens. In the centre of the round pool there are sculptures of a dragon and dolphins.	Fountain

N.	Name	Year	Status	Description	Current use
8	The Lower Gardens	1716	F UNESCO	Regular garden along the coast of the Gulf of Finland, designed in a style of the French formal gardens. The Sea channel divides the park into two parts.	Park
9	The Samson Fountain	1735	F UNESCO	The sculpture of Samson is located in the centre of the Grand Cascade.	Fountain
10	Marli Palace	1720	F UNESCO	The main building in the western part of the Lower Garden, built in baroque style.	Museum
11	Roman Fountains	1739	F UNESCO	10 meters high fountains, whose design was inspired by the fountains in the square in front of St. Peter's Basilica.	Fountain
12	Monplaisir Palace	1714	F UNESCO	The palace is located in the eastern part of the Lower park, where Peter the Great used to stay.	Museum
13	Pyramid Fountain	1724	F UNESCO	The fountain, located in the eastern part of the Lower Garden.	Fountain
12	Alexandria Park and palace complex				
13	Alexandria Park	1826	F UNESCO	A park, situated on the shore of the Gulf of Finland, made for the summer residence for an emperor family.	Park
14	The Cottage Palace	1826	F UNESCO	A gothic style palace, build for the family of Nicolas I of Russia.	Museum
15	The Farmer Palace	1828	F UNESCO	Build as a pavilion next to the milk farm of the royal family, later transformed to the country residence of the Alexander the II family.	Museum
16	The Gothic Capella	1830	F UNESCO	A small church, build in the gothic style for Romanov family.	Church
17	The Colonizer's Park	1837	F UNESCO	A park, located in the southern part of the city, with Olgin pond, and pavilions in Renaissance style.	Park
18	The Aleksandriyski Park	1734	F UNESCO	Located in the South from Alexandria, the park was named after the spouse of Nicolas the I, and was used for hunting.	Park
19	The English Park	1779	F UNESCO	The biggest park in Peterhof, made for Catherine the Great in the style of English parks.	Park

N.	Name	Year	Status	Description	Current use
20	The Lugovoy Park	1825	F UNESCO	The park has 9 ponds, which serve as a source of water for the fountains of the Upper and the Lower Gardens of Peterhof.	Park
21	The Park of the Farm of Prince of Oldenburg	1838	F UNESCO	A former dacha of Prince of Oldenburg. Located along the sea in the territory of Old Peterhof.	Park
22	Park and Palace complex Sobstvennaya Dacha	1727	F UNESCO	Located three kilometers west of the Lower Park of Peterhof. Emperor Peter I gave this place to the famous publicist and associate in church affairs - Feofan Prokopovich.	Park
23	Park and Palace complex Znamekna	1760	F UNESCO	A former manor on Peterhof Road, next to Alexandria Park, a monument of landscape garden art.	Park
23	Park and Palace complex Mihaylovka	1718	F UNESCO	Situated on Peterhof Road, it comprises a number of dacha's territories.	Faculty of Saint Petersburg State University

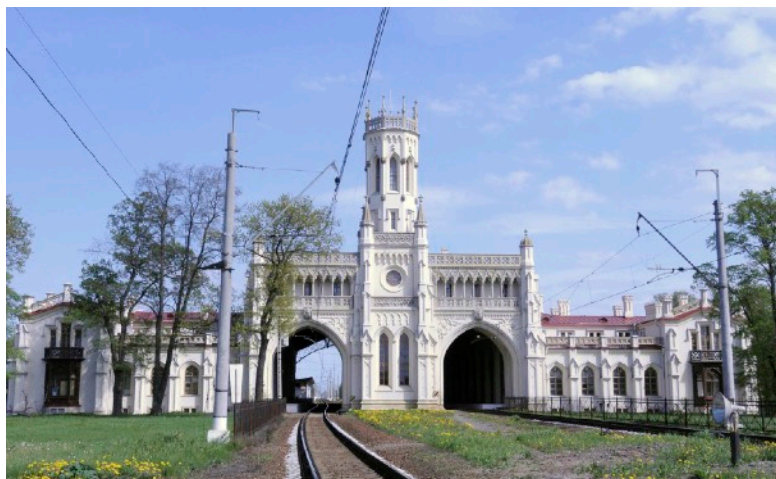
#### Lomonosov heritage sites

N.	Name	Year	Status	Description	Current use
1	Historical centre of the town of Lomonosov, including the Palace and Park Ensemble of the Upper Park and Lower Garden				
2	The Grand Menshikov Palace	1710	F UNESCO	A baroque palace, build for A.Menshkiiov. An example of Petrine baroque.	Museum
3	The Lower Garden	1713	F UNESCO	The park is located on the shore of the Gulf of Finland. A monument of landscape garden art.	Museum
4	The Sea Channel	1719	F UNESCO	A sea channel, connected to the Baltic Sea, as a typical element of palace ensembles of Petrine times.	Museum
5	The Painting House	1719	F UNESCO	One storey building, an art gallery, with a collection of paintings.	Museum

N.	Name	Year	Status	Description	Current use
6	Peterstadt fortress:				
7	Palace of Peter the III	1758	F UNESCO	A small, two-storey pavilion, build for Peter the III in Baroque style.	Museum
8	The Main Gates	1757	F UNESCO	The main entrance gates, designed by an architect A.Rinaldi	Museum
9	Petrovsky Park	1830	F UNESCO	A landscape park, located on the left bank of the river Karost.	Park
10	Sobstvennaya Dacha	1760	F UNESCO	The dacha was build by an architect A.Rinaldi for Catherine the II.	Museum
11	The Upper Park	1758	F UNESCO	The park consists of two historical parts - the Peterstadt ensemble and Sobstvennaya dacha.	Park
12	The Chinese Palace	1762	F UNESCO	Build by an architect A.Rinaldi, the palace has a collection of Chinese art.	Museum

#### 4. Connected railway network as a basis for development

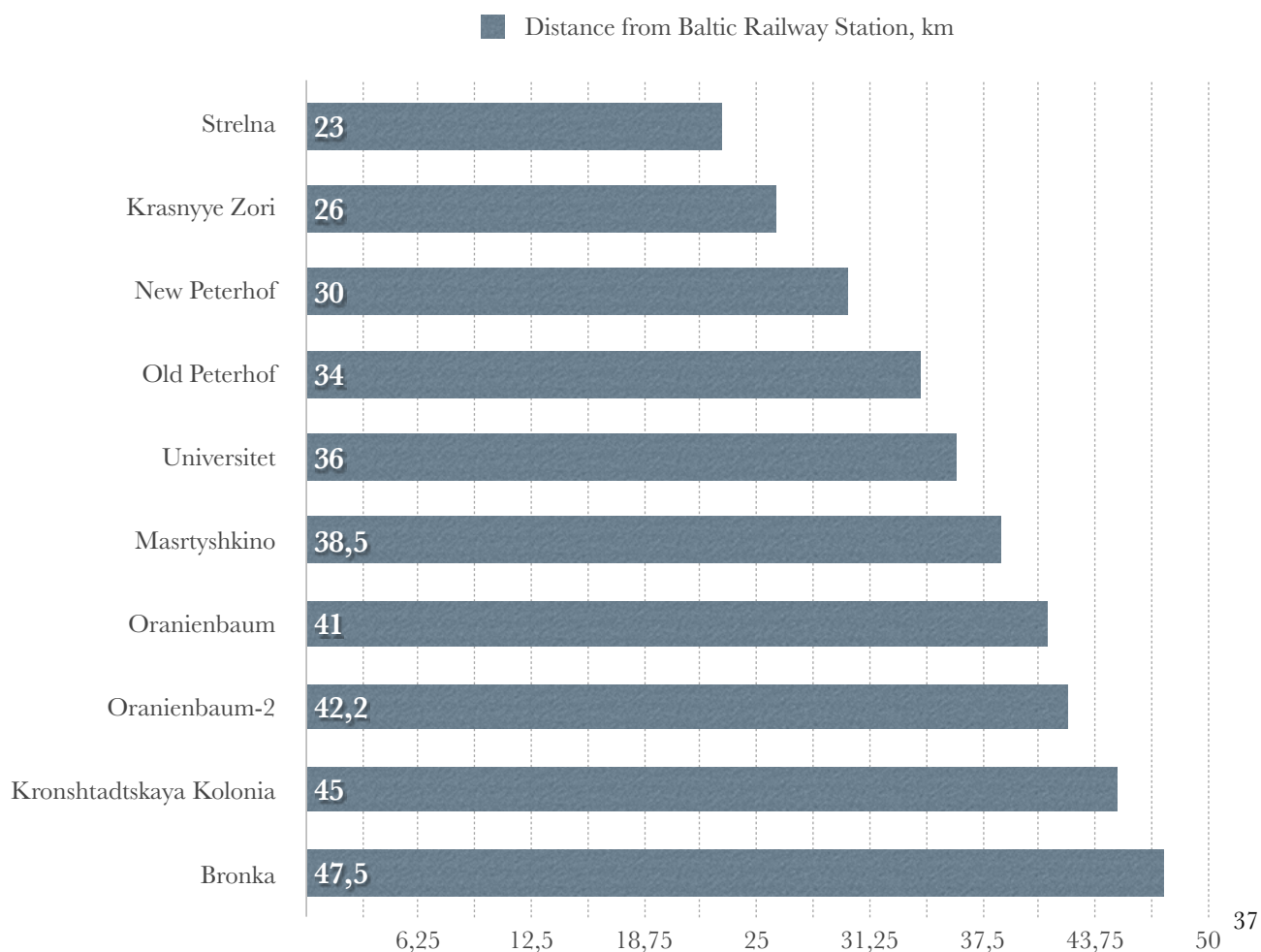
The main axes of development of Petrodvorets district is a Baltic railway line of Oktyabrskaya Railway, the oldest railway in Russia, operating in the northwestern part of the country. Baltic railway station in Saint Petersburg is a major railway station to get from the city centre to Petrodvorets district.



New Peterhof Railway Station

10 railway stations are distributed East-West along Petrodvorets district, within a short distance in-between. This factor increases the possibility of Transit-Oriented Development approach to be applied in the district, as stations are the major infrastructural nodes in the area.

The railway system is used mostly by local residents and residents of Saint Petersburg. The majority of tourists visiting touristic sites are coming by organised buses, with an exception for those using the private bus companies to get to the area.



## 5. Natural sanctuaries and bio diversity

One of the valuable features of Petrodvorets district is its natural sanctuaries. There are four of them on the territory of the district: Kronshtadtskaya Kolonia, Sobstvennaya Dacha, Znamenka and Strelninsky Bereg. The last three are forming a regional natural reservation called the Southern Shore of the Gulf of Finland.

Natural sanctuaries are protected areas of coastal black alder swamps, camps of migratory birds on coastal shallows, sandy beaches overgrown with grass vegetation, as a food plot of migratory and wintering granivorous birds, and habitats of rare bird species. Within the protected areas, construction, production activities, gardening, dredging, cutting down trees, making fires, burning reed beds and any other actions leading to pollution or destruction of the monument are prohibited.

Strelninsky Bereg is an example of coastal black alder swamps, which almost disappeared as a result of development and organisation of recreation in the eastern part of the Gulf of Finland. Thickets of trees and shrubs are a habitat for about 80 species of migratory birds. Coastal shallows and littoral zone serve as a site for waterfowl during seasonal migrations. There are habitats of rare species of birds and plants, including nesting of renez on the northeastern border of its range.













Reed beds in Strelna

On the territory is prohibited: pollution of the territory; movement and parking of cars and motor vehicles; making fires, setting fire to reed and reed thickets and grass; walking and grazing pets; disturbance of birds during nesting from April 15 to July 15, including violation of silence; felling of trees, collection of plants; violation of soil and vegetation; hunting and harming animals; construction; holding mass events.

## Existing greenery scheme



-  water
-  forest
-  parks
-  park and palace complex
-  regime area
-  natural reservoirs
-  swamp
-  district boundary
-  national road
-  railroad



## Existing natural sanctuaries

## 6. Dachas



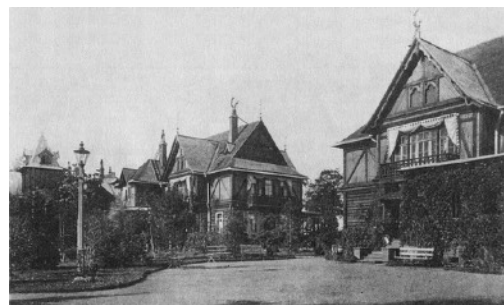
Dacha Benua



Dacha Krona



Dacha Grube



Dacha Benua. Historic appearance

Petrodvorets district was formed along the Peterhof Road, a historic road where country summer residences for nobility were created, making the district a prestigious summer destination. The distance from the city centre, the access to the seaside and natural diversity made the district an attractive place for the development of dachas, suburban short stay summer houses. Dachas are distributed across the district, including those protected as a cultural heritage. Unfortunately, many of historic dachas are abandoned, and no steps for their restoration are made. They could be a unique monuments to visit if further steps for their reservation will be made.



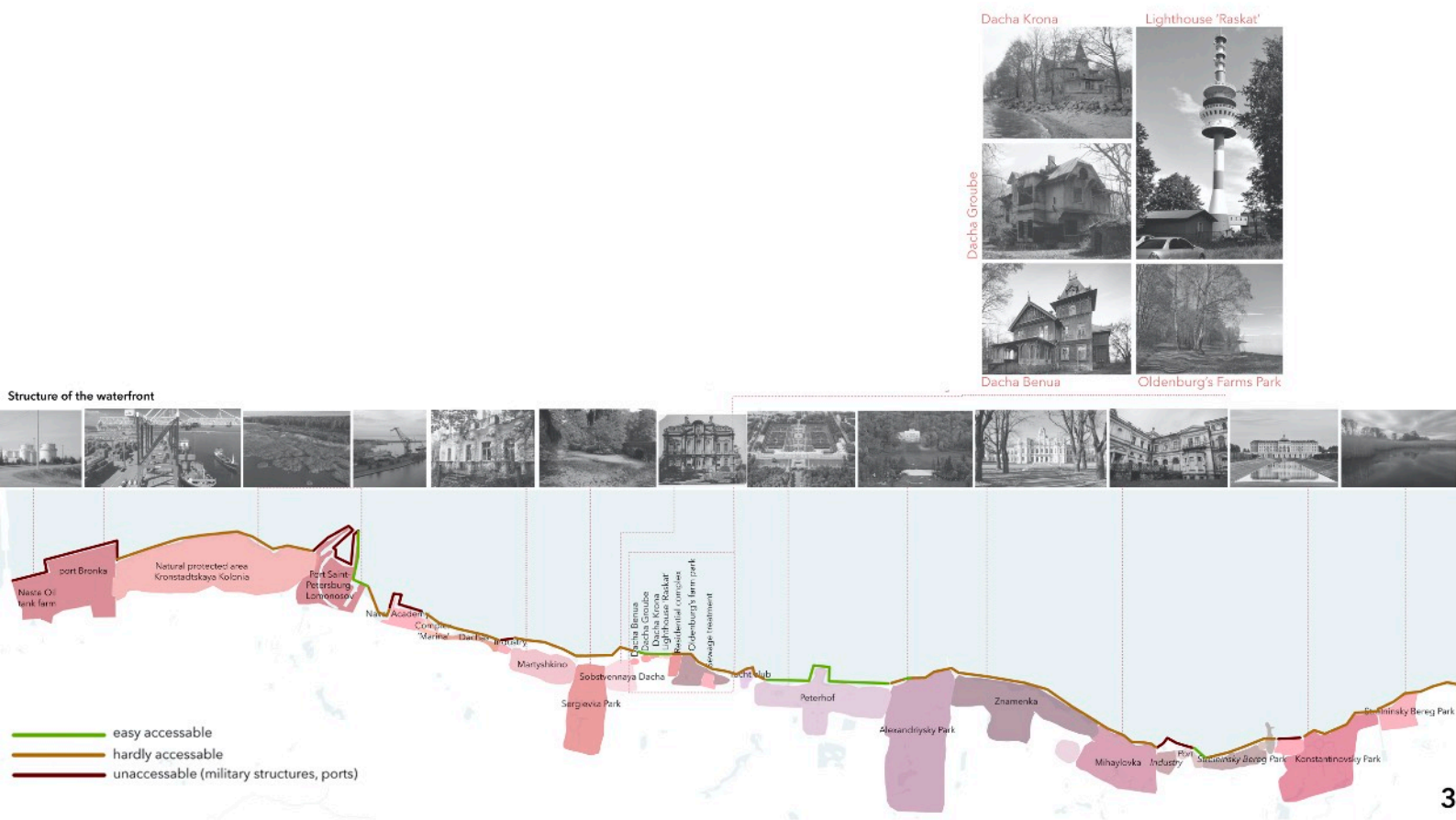
## 7. Structure of the waterfront

The structure of the coastal zone of the Petrodvorets district can be divided into three categories: accessible, inaccessible and hardly accessible zones.

During its development in Soviet era, spatial planning policies did not take into account all the values of the open coastal space, consequently, at the moment the majority of sites of the southern coast are difficult to access. On their territory there are industrial structures and warehouses. Also, on the extended coastal area there are natural sanctuaries, swamps and impassable places.

However, there are also areas accessible to people, for example, the beaches in Lomonosov and Strel'na. The extended coastal zone of Peterhof is a protected park area, therefore it is accessible to people at certain times.

Also, there are many dachas on the coast, including those of cultural significance, however, a lot of them in a degraded state (Martyschkino district and the area in-between Lomonosov and Peterhof).



## Problems And Issues Of The Territory

### 7. Industrialisation of the district

Year by year, a lot of valuable, authentic architectural structures and monuments disappear. These are the elements, which are characteristic for the district, and have many years of history and historical memory of the region. Historical and cultural potential of the region is annually decreasing due to the construction of ports and oil terminals. Even if some elements will be preserved, they will no longer be valuable without the proper historical, cultural and landscape context.

### 8. Priorities

The governments is more interested in construction of new industrial areas, ports and oil storages in the district, than in preservation of its architectural heritage. There is no program that prevents wooden structures, dachas and smaller palaces from degradation. These structures, unlike ceremonial and sleek Peterhof palace, are visited only by local residents and some single admirers of such kind of heritage.

### 9. Mass construction

Modern large scale housing and soviet mass construction have destroyed the atmosphere of traditional garden landscape of the area, arguing with smaller structures and picturesque gardens. But not only large scale housing disturb the aesthetics of the district, but also modern structures, placed in important panoramic locations, such as endless fences, garages, warehouses, small industries and utility buildings, frequently located on the territories of historic manors.

### 10. Infrastructural gaps

The distribution of infrastructural facilities in Petrodvorets district is rather poor. Well-developed railway structure is not supported by the infrastructural facilities next to the stations, even if it could be a strategic point for local businesses. The major concentration of public services are situated in vicinity with touristic attractions, that makes them not suitable for the use by local residents.

## 11. Undeveloped territories

A big number of existing garden structures are used only during the summer period, what leads to their poor condition at winter time. A lot of areas, occupied with temporary structures are almost abandoned throughout the year; the majority of these structures are chaotic, exploiting the landscape.

## 12. Connectivity

The absence of interconnected routes is one of the major urban problems of the district. The well-developed railway structure is not supported by infrastructural elements, neither by a proper pedestrian network towards the waterfront. Pedestrian routes are only organised to access the residential territories, but are not suitable for recreational needs, except of those located in the park complexes. The cities of Strelna, Peterhof and Lomonosov are not connected via a proper cycling or pedestrian route.

## 13. Waterfront accessibility



Water transport station for local residents in Lomonosov

there is no infrastructure created for people to enjoy the waterfront.

Throughout the shore of the Gulf of Finland in Petrodvorets district, the waterfront is not always accessible. There are various reasons causing this problem, one of them is location of military objects along the coastline, what makes the territory inaccessible for the majority of users. Secondly, at some places there are swamps along the coastline, usually, they are situated in the natural sanctuaries. In other cases,

## Redevelopment principles of the territory

The principles to be taken into consideration for future development of the area:

- The principle of Transit-Oriented Development - consolidation of services and public facilities in vicinity with railway stations.
- The principle of interconnection of routes - to develop connection from the stations water-vice, creating a network of pedestrian and cycling paths.
- The principle of identity - to create a network of public spaces, connected within the whole territory, but at the same time having their own unique features.
- The principle of effective distribution of resources - to concentrate services and facilities in the nodes of activity.
- The principle of the usage of waterfront - creation and development of water infrastructure.
- The principle of preservation of nature - development of activity zones and protected zones.
- The principle of conservation of cultural heritage - the use and restoration of existing architectural objects.

Cultural tourism is one of the best ways to preserve the architectural heritage, to have their preservation financed and to get a profit. Tourism and preservation of heritage are closely connected, because both of them need restored and well-conditioned elements., territories with historical character, pleasant urban landscapes. The elements of touristic infrastructure, well distributed across the district would help to get a proper and sustainable development for the region.

The named principles were elaborated according to the theoretical part, which follows.

# Lomonosov City

Following analysis includes the definitions of development conditions and design, necessary for further development of the city.

## 1. Compositional structure of the city

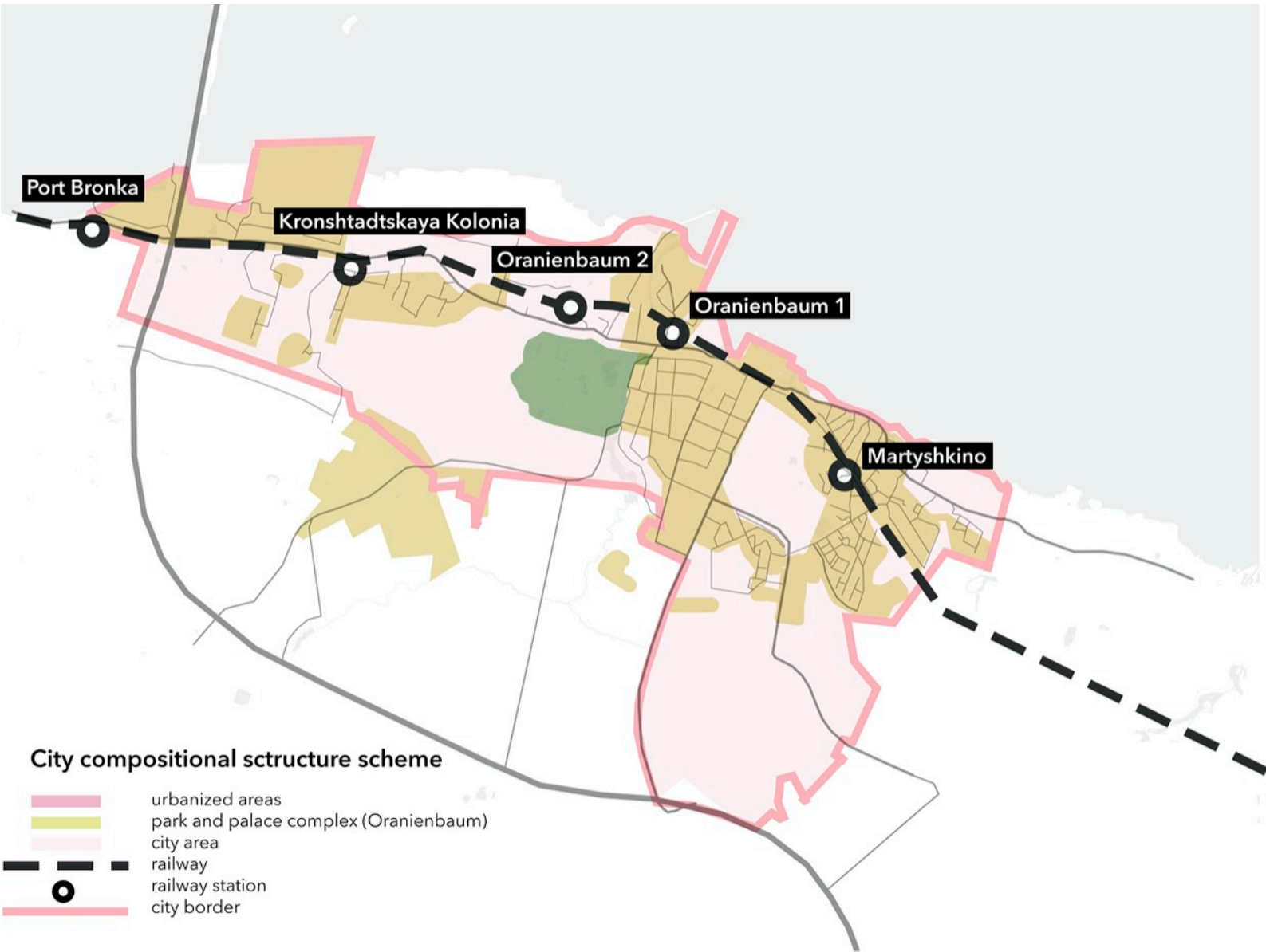
The city of Lomonosov (Oranienbaum until 1948) has its history from the foundation of Menshikov Palace in 1711, which now is Oranienbaum palace complex. For artisans, fishermen, soldiers, labourers were built huts and barracks, taverns, breweries. Most of the the construction projects introduced at that time had a purely practical character and only a few carried the architectural idea.

Nowadays, Lomonosov is the western town in Petrodvorets district. It has 5 railway station of Baltic line on its territory, connecting the city with Saint Petersburg.

City centre is limited by Oranienbaum park and green area from both sides. It has its extension to the Lomonosov port, interrupted by the railway. City centre is organised according to the grid structure, with residential blocks and service buildings.

The second largest area is Martyshkino, limited by the city border from the east. Martyshkino is a historic district with dachas and gardens.

Western part of the city is industrial, it is detached from the city centre and can be connected only by Peterhof road.



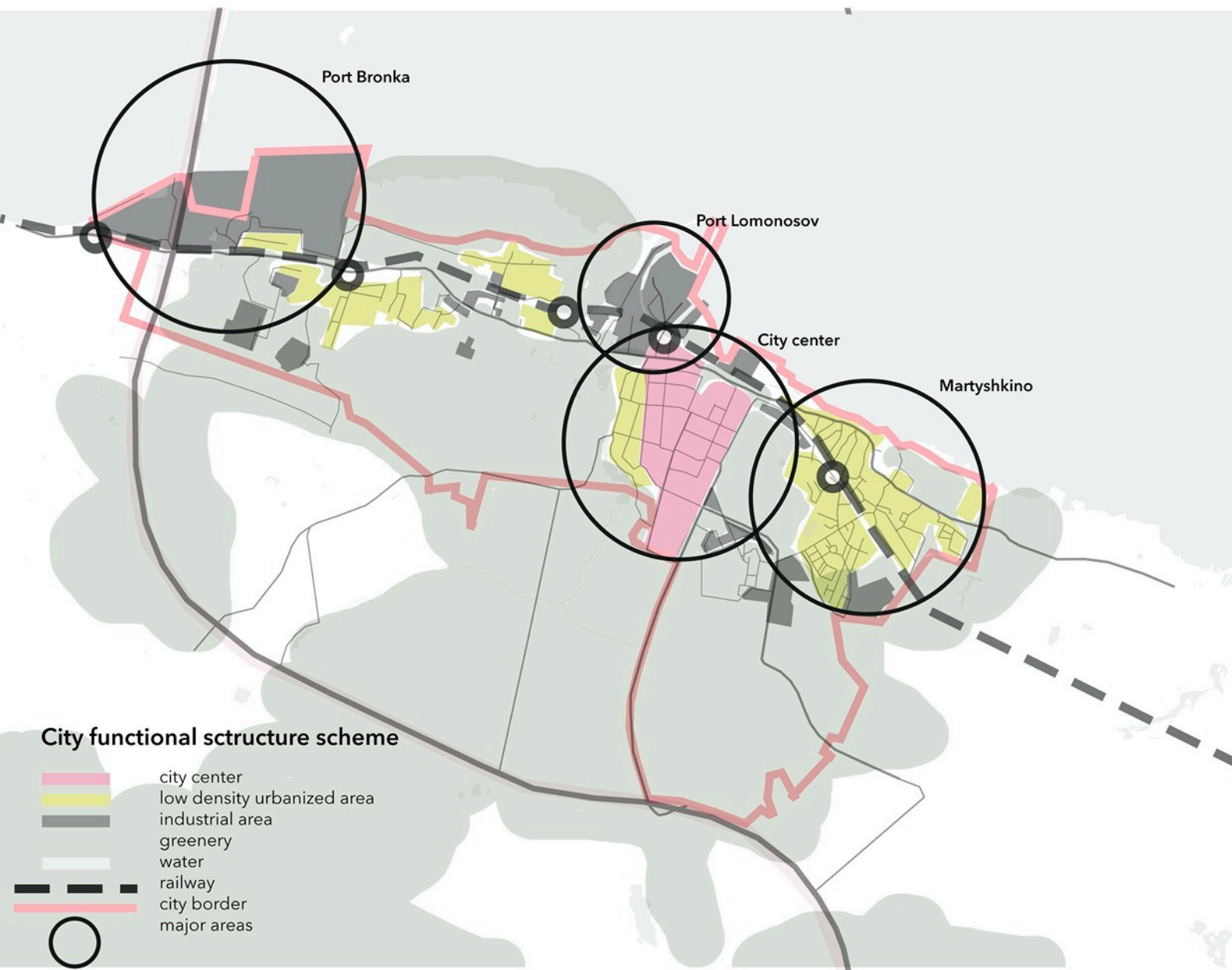
## 2. Functional structure of the city

One of the main city-forming enterprises is the port, there are two of them on the territory of Lomonosov - the new port of Bronka in the west and the old port of Lomonosov to the east. The new port is of great importance for the city's economy, while the port of Lomonosov is in degradation and has a scattered structure of storage facilities and factory facilities on its territory. Between these two ports is the Kronstadt colony nature reserve, which is of ecological importance for the region.

The city-forming cultural object is the Oranienbaum park complex. It is located in the city centre and divides it into industrial and residential parts. In the centre of the city is the main residential area with predominantly Soviet-era housing developments.

In the east of the city is the Martyshkino district, with dachas and low-rise buildings.

Between Martyshkino and the city centre there is a forest area with a warehouse for fuel and lubricants.





### 3. Road structure of the city

The hierarchy of the streets is following:

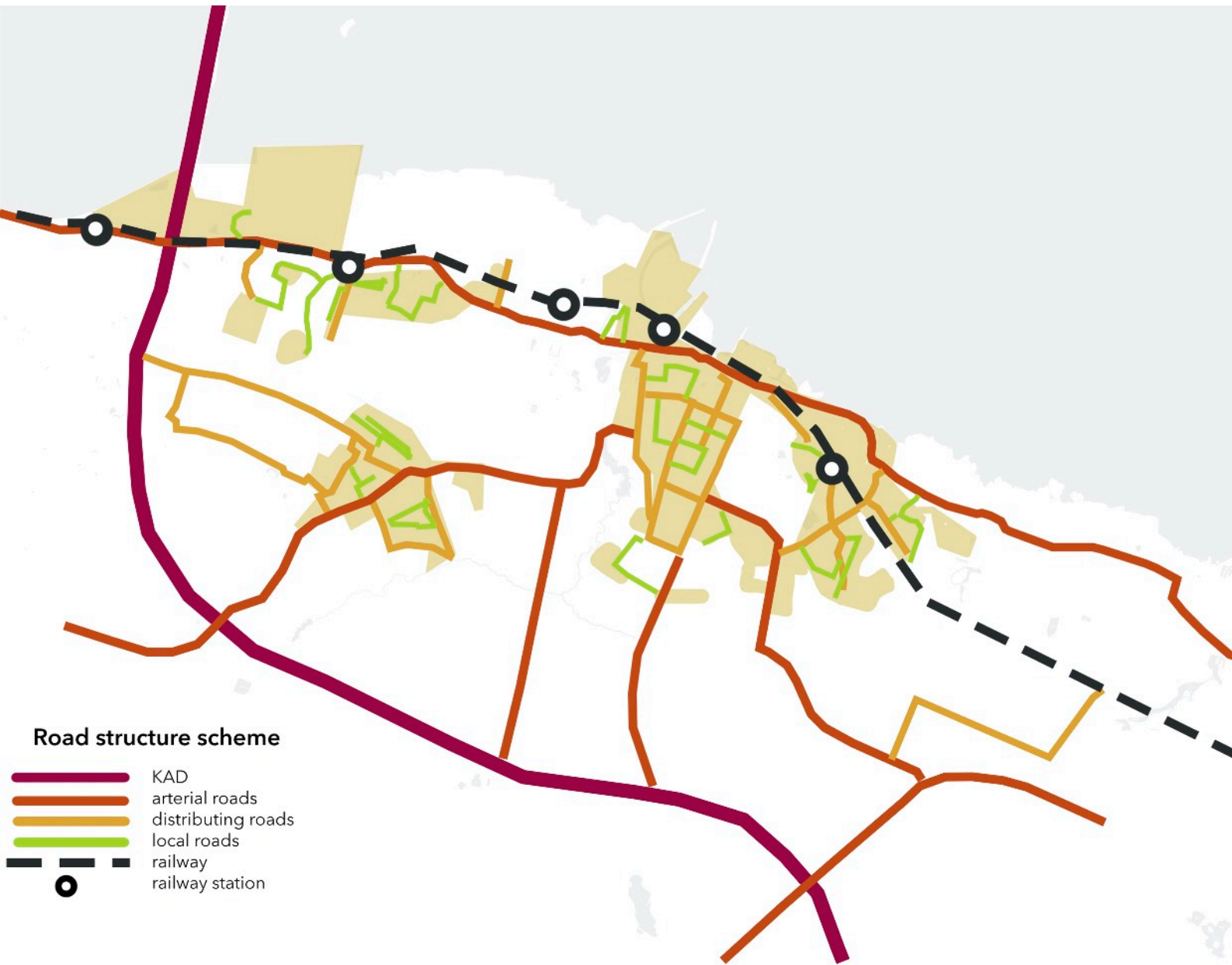
KAD - the road encircling the city and passes by the southern border of Lomonosov.

Arterial roads are connecting KAD with the main urban cores of the city. The main arterial road of Lomonosov is Peterhof road which starts in Saint Petersburg and passes along the waterfront of the Gulf of Finland longitudinally to the Petrodvorets district. This is the oldest historic road of the district being the axes of district's development.

Distributing roads are the main roads of the main urban cores and distribute traffic from arterial roads to the local roads.

Local roads circulate the traffic around urban blocks.

Railway is crossing Lomonosov along the waterfront and has 5 railway stations on the territory of the city.



#### 4. Green structure of the city

Lomonosov has an extensive network of green areas, from forests to parks.

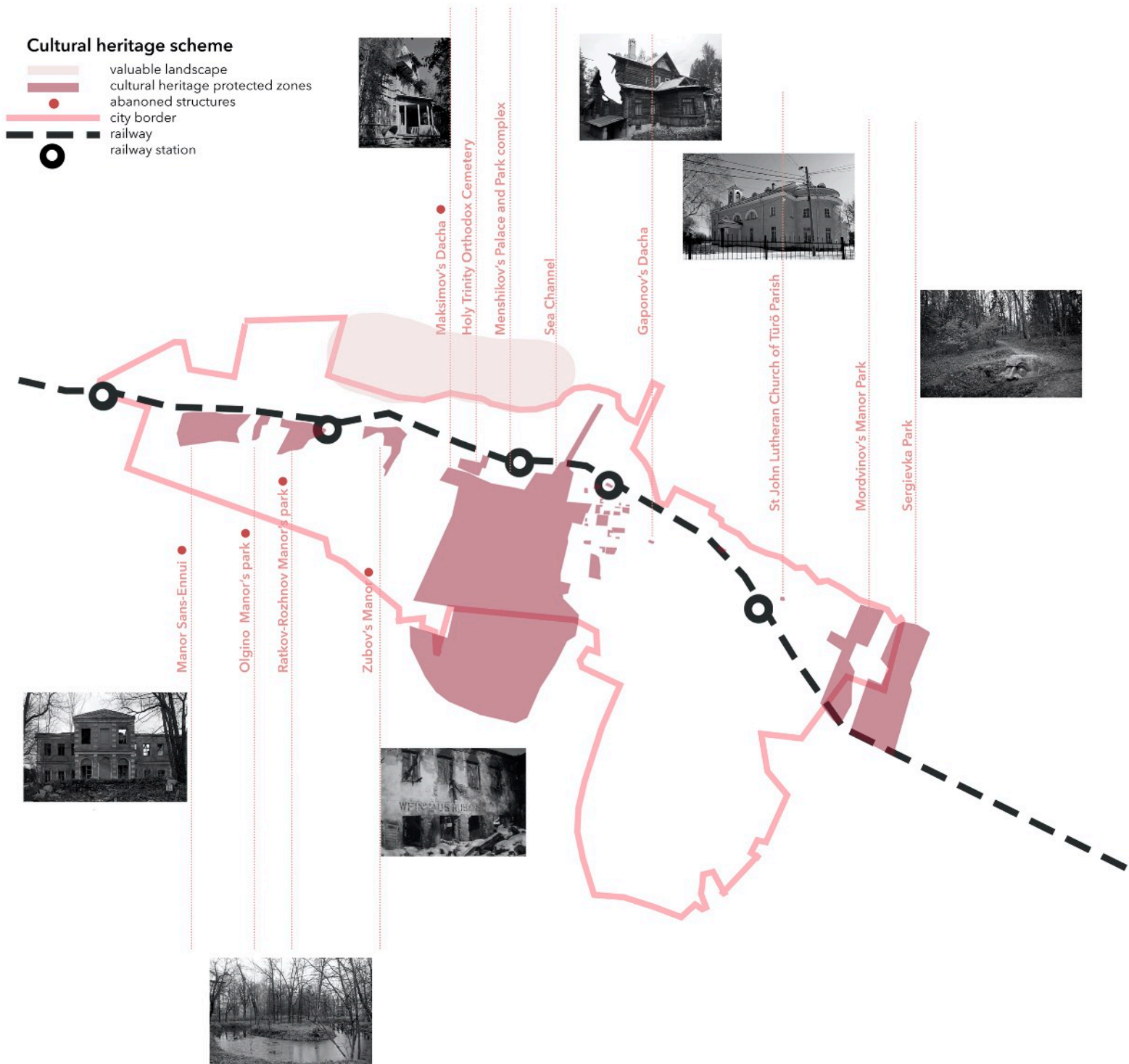
The city is covered by forestation from its southern border until urbanised territories. Lomonosov is also famous for its park complexes. The main one is Oranienbaum park and palace complex, followed by smaller protected areas such as park of the manor Sans-Ennui, Olgino manor's park, Ratkov-Rozhnow manor's park and Mordvinovka and Sergievka parts in the northern part of the city. Green territories are attached to the railway route and Peterhof road from both sides.

Parks of Sans-Ennui, Olgino and Ratkov-Rozhnow manor's are in poor, half-abandoned condition despite its cultural heritage status.

The other valuable natural feature of the city is Kronstadskaya Kolonia sanctuary, located in-between two ports. Its area is covered by swamps and hardly accessed area due to the specific soil and vegetation.



## 5. Cultural heritage



## 6. Problems and opportunities

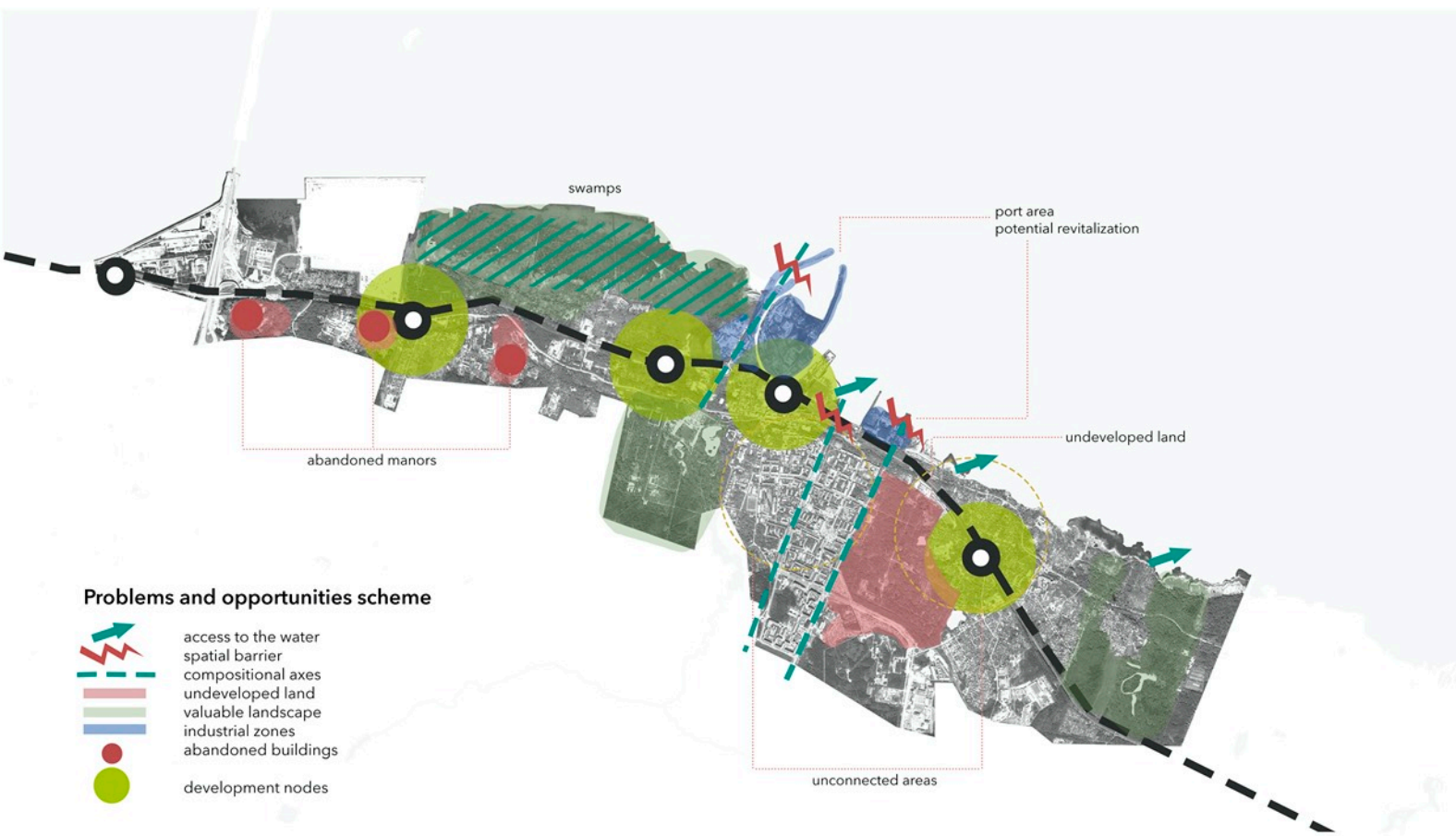
The scheme below shows problematic areas of Lomonosov and opportunities for its revitalisation.

### Problems:

1. *Access to the water* is one of the main problems in the city, due to the inaccessible waterfront and location of industrial areas and warehouses on its shores. The city centre does not have any connection to the water. The reason for that is industrialised waterfront and railway actin as a barrier.
2. *Spatial barriers* are areas which do not allow free movement. In Lomonosov the main spatial barrier is railway without a proper system of pedestrian crossings, industrial zones and warehouses, fences.
3. Inappropriate location of *industrial areas* on the waterfront results in its degradation, such zones do not have any use for public and local communities.
4. *Abandoned buildings* is another problem of the area. In Lomonosov there is a number of unique architectural heritage as dachas, manors and parks surrounding palaces, but some of them are in degraded state, and can not attract any visitors.
5. *Degraded areas* are zones without proper maintenance, located all around the city, including the most valuable central area. They must be assumed as zones for further revitalisation, restoration or modernisation.

### Opportunities

1. The *railway* is the main transport artery in the region, which connects Lomonosov with neighbouring cities and centre of St. Petersburg. The frequency of the stations allows it to compete with automobile transport, the movement of which is hampered by a single main road. The railway is also the main axis of development in the city, around which all the main functional areas are organised.
2. The proximity of *water* as an important factor for successful development. The long coastal zone makes it possible to implement projects to improve the quality of the urban environment and create an extensive system of public spaces.
3. *Cultural heritage* of the region create attractiveness and contribute to the development of a certain image of the region. It can be used as anchor points for development of the surrounding infrastructure.
4. The rich and varied *natural resources* of the city, such as protected area and the historic parks, add points to the attractiveness of the city and may also contribute to its future development.

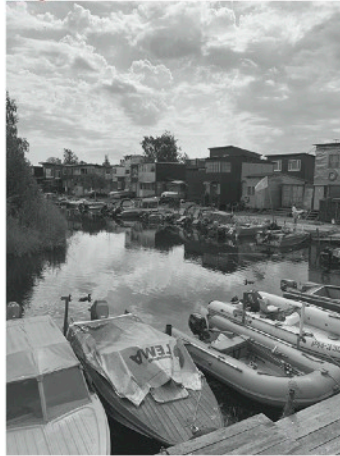


## 7. Vision of the city and principles of development

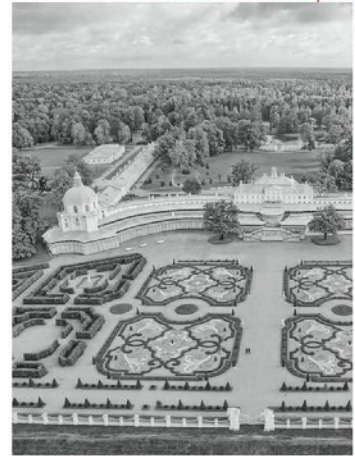
The city is closely connected to the marine industries, in both industrial and recreational scales. Besides, Lomonosov has a historic park complex, private elings (dwelling and boat storage at once), big international port area, natural sanctuary and old authentic dachas and manors.

Further changes and revitalisation processes in the city must be made taking into account all of these image shaping factors contributing to the development of a certain theming of the place.

Elings



Oranienbaum complex



Oranienbaum Avenue



Port Bronka



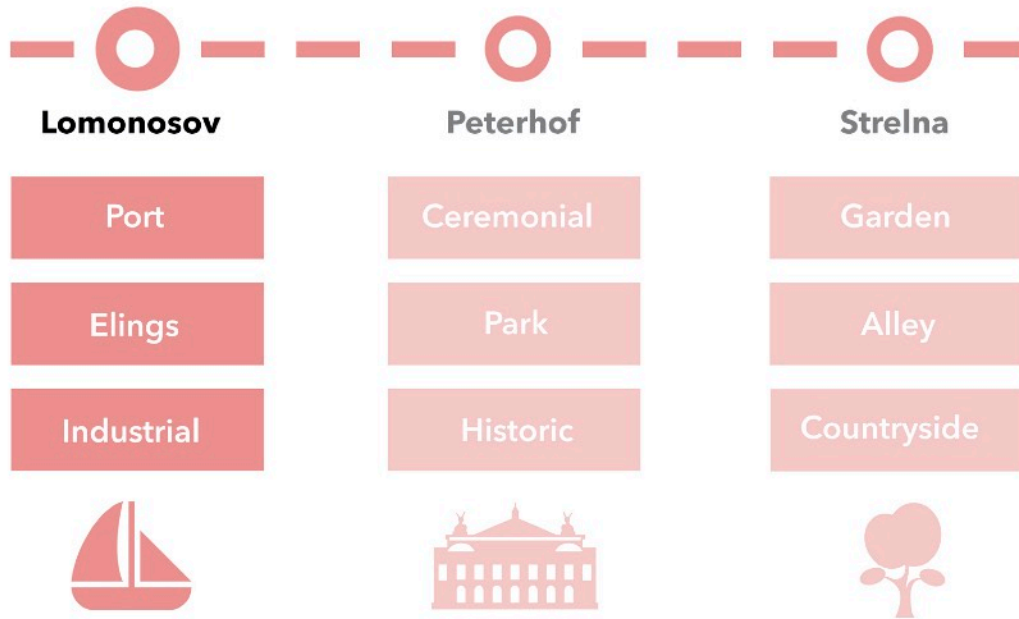
Kronshtadskaya Kolonia sanctuary



Dacha Maksimova



**Vision of the city** The schemed is prepared by author



**Development principles**

Development principles	Development strategies
Improve connectivity within the district	Railway as the main communication arteria of the district Integrated public transport route with united ticket Development of pedestrian and cycling route for the whole district Pedestrian connection in-between stations
Development respecting nature	Creation of eco-route, making sanctuaries available for people to observe Integration of natural parks into touristic route Development of local beaches within the shore Densification vs. urban sprawl
Highlighting the character	Development of city according its characteristical features, mentioned above To introduce Lomonosov and Strelna to tourists
City for walking	Development according to TOD principles, walking as the main transportation mean Improve city's walkways, lighting in order to improve safety in the city No spatial barriers, such as fences, unaccessible territories, closed streets
Create nodes	The main development, reconstruction and revitalization taking place nearby railway stations. Railway station as the main transportation hub. Development of bicycle network (sharing stations)
Bring waterfront to people	Revitalisation of port territories, e.g. Lomonosov port and industrial areas nearby to become publicly accessible. Transfer of production areas to the suburbs of the city. To open-up undeveloped areas for public spaces.
Enhance heritage	Restoration of abandoned manors and dachas. Integration of abandoned territories into cycling and pedestrian route.
Introducing new housing options	Renovation of houses on water and boat storages (elings). Introduction of new building typologies. To promote renting of houses and hotels business.
Compact city	Complementing build-up in the districts. Renovation of dachas' areas. Densification of build-up in city center. Development of courtyard territories.

### 3. Selected Concepts And Relevant Case Studies

The following part is theoretical elaboration which serves as a basis for the design part of the diploma work.

The chosen concepts

Implementation strategies and concepts

Transit Oriented Development (TOD)

Transit-Oriented Development is an urban development policy, where mixed-use multifunctional residential or commercial area has an easy access to the public transportation and the area is pedestrian-oriented.

The Institute for Transportation and Development Policy (ITDP) in USA presented a set of standards as a guideline for transit-oriented build up.

- The area must be pedestrian oriented, with a network of interconnected pedestrian paths, urban furniture and landscape elements to transform walkways into public spaces. The character of build up area should aspire people to walk more instead of using a car.
- Cycling is prioritised over the cars. The cycling routes must be safe and continuous.
- Walking and cycling routes must be dense and interconnected, resulting in short and varied connections.
- Public transport is prioritised over the use of personal motor vehicles. Public transportation network must be reliable, frequent and accessible to the majority of population.
- The space for traffic and motor vehicles must be reduced to no more than 12% of the total area. Parking prices must manage demand.
- To densify commercial and residential uses around transit nodes to give an access to the public transport to the majority of people, with the higher density to be created within 400m from the station.
- The mix of residential and non-residential facilities to be diverse in order to reduce the need to travel.
- The existing urban fabric to be redeveloped in order to create more compact and dense urban tissue, to give the opportunity to people live closer to their jobs and reduce travel time on job and backwards.

## Pedestrian mobility environments and walkability

According to numerous scholars, the notion of a «place» is evaluated by a mobile society. Modern urbanists (Read, Myers) describe place-making not as generation of facilities and infrastructural elements, but as an entity to be generated by flows and its interaction. The urban space is not a stable, monumental architecture, but a dynamic flow. The major role in this process is played by hierarchy. Hierarchy is described by the pattern of movements and their overlap.

«Mobility environments» is a strategic characteristic of modern cities. It is locations, determined by proximity and accessibility.

The principles could be taken into consideration for the future development of Petrodvorets district, due to the lack of interconnected paths and the network of railway stations.

Pedestrian mobility environment is closely connected to the term «walkability», which refers to the measure of how friendly the area is to walking. The factors, which can influence walkability are:

- Implementation of sidewalks, with priority of their implementations in where pedestrian traffic is higher, such as schools and transit stations.
- The connectivity of the streets
- Mixed land use
- Residential density
- Trees and vegetation, landscape elements
- Frequency and variety of buildings
- Entrances and other elements along street frontages
- Transparency, which includes glazed windows and doors, orientation and proximity of homes. Store fronts are also the considerable elements
- Plenty of places to go to near the majority of homes
- Placemaking, such as street designs that work for people and urban furniture
- Retail floor area ratio

## Cases

### Delawer River, Philadelphia, USA

#### Aim of intervention:

Transformation of Delaware river waterfront is a large scale urban transformation program, consisting of a number of smaller intervention for revitalisation of the river's waterfront.

At the moment, some of the projects are already realised, for example, Cherry Street Pier, Washington Av. Pier, Pier 68.

The project aims to transform the waterfront to a destination for both locals and foreign visitors, creating cultural, recreational and commercial activities.

The Philadelphia Master Plan, elaborated in 2012, aimed to transform the waterfront of the Delaware River into an "extension of the city" - a recreational pedestrian area with bicycle paths. One of the most characteristic features of the project was to reconstruction of abandoned piers, in order to adopt them for residential and commercial use, with some of them converted to the small parks.

In addition to the creation of green spaces network on the waterfront, so-called "connectors" were planned - green stripes, which connect the waterfront with the network of city streets. There are also plans to build a large park directly facing the river.

#### What was made:

##### Cherry Street Pier

Cherry Street pier is a waterfront project, aimed to create a pleasant mixed-use space on a century-old municipal pier.

The public space designed to serve the community needs. The project includes construction of a food hall, market, exhibition space, recreational area in front of the river.

The original structure is a large warehouse and former shipping pier, built back in 1919. The function of the area was changed, but the spirit and image of the space remained.

The pier was divided into major activities parts, such as waterfront garden, food market, art garage and elected platform.

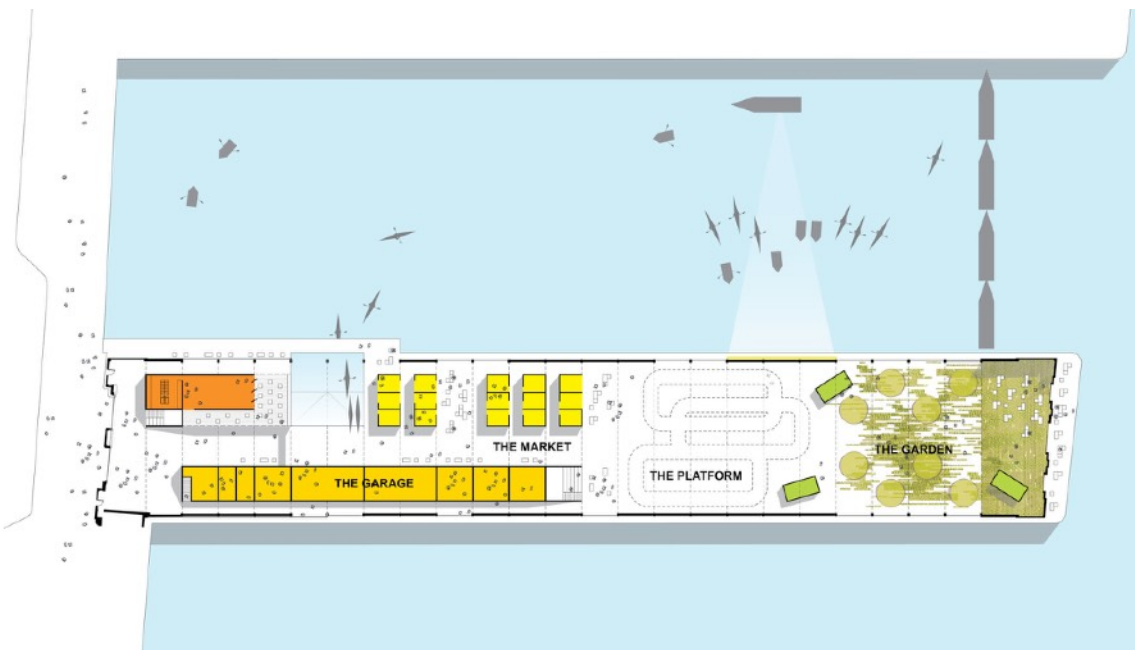
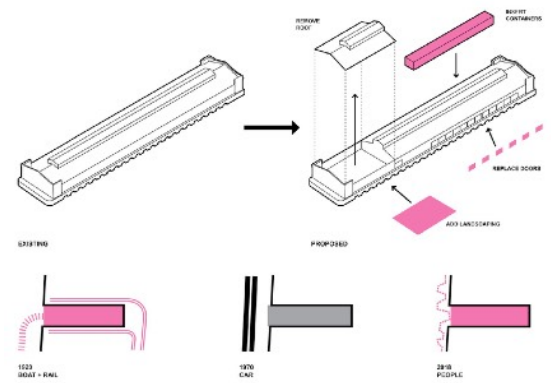
#### Lessons learned:

For urban transformation it is not necessary to destroy the existing distressed and degraded areas, better solution is to keep the historic structure, and with minor intervention,

materials and costs which could be spent for entirely new construction, renovate the existing building.

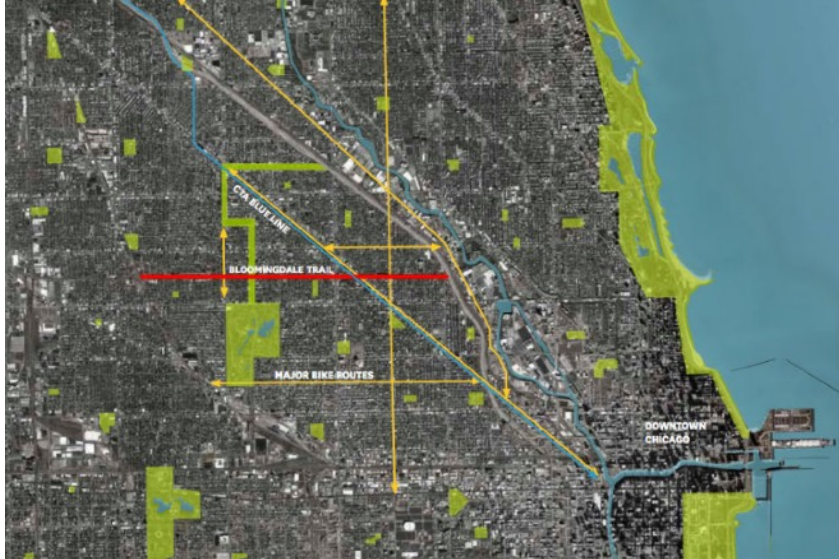
It does not only has the advantages of reusing the building, but also helps to keep the authenticity of the place.

The second lesson which might be learnt from this example, is a principle of a large scale project which consists from the number of smaller ones. This way of implementation helps the project to find investors easier and to be realised faster.



## Bloomington Trail, Chicago, IL - importing walkability

### Aim of intervention:



The Bloomington Trail is a system of parks and railway called «The 606» having a length of 4.3 kilometres, and opened in 2015.

The Bloomington Line is an elevated railway which was constructed in 1873 in the northern part of Chicago. In 1910's the trail was elevated about 6 meters above the ground

in order to reduce pedestrian fatalities at the crossings. The line was used for both passenger and freight trains, and was used to reach industrial district on Goose Island. The City of Chicago planned to convert the line into a greenway back in 1997, but for some more years it remained unchanged.

The aim of the construction was to improve environmental quality of the area, to create an area for public art and public space, connected into a network of public parks along the line.

### What was made:

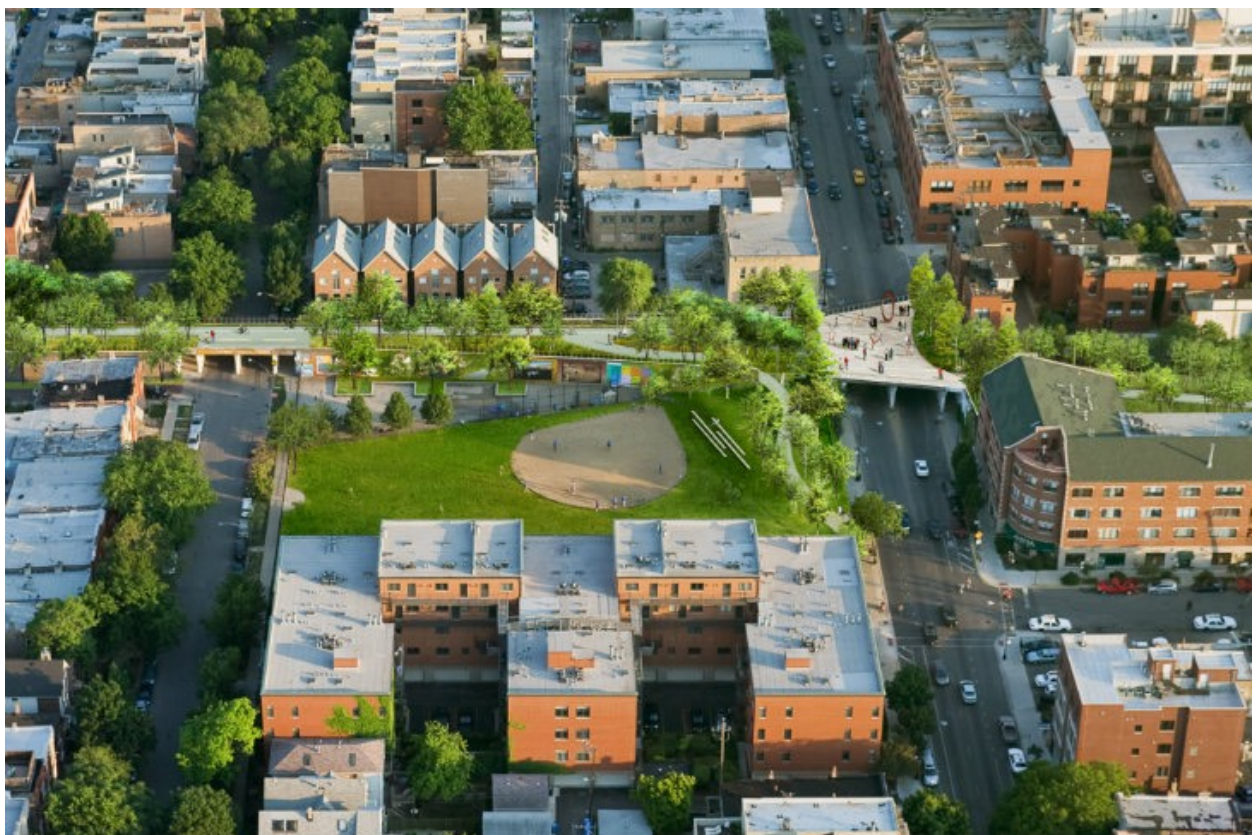
- The Greenway concept was introduced in 2002-2004, proposing a linear park with ramps for public access every couple of blocks apart. Previously, the train trails were used to separate the communities along both sides, but the new plan proposed to use this area as a connection between the neighbourhoods, schools, restaurants with bike share and transit stations.

- 3 meters wide paved path
- 8 entrances all along the trail line make it accessible for local pedestrians to use for cycling, walking and running.
- Playground for children, gathering places for families,

The City selected the ARUP company to lead the project and after that has created a documents that describes the background, the location and the future of the project.

## Lessons learned:

The Bloomingdale Trail is a good example of transformation of industrial infrastructure into the public amenity using a method of adaptive reuse. As it is visible on the scheme, Chicago previously had a number of unconnected green areas, spread all over the area, and the Bloomingdale Trail aims to connect all of them into a developed network of green and public spaces. The case of Chicago can be applied in a smaller scale to the redevelopment of old tram line, Oranela, going through Petrodvorets district. It is a good practice, which allows both: to deal with historical urban elements, respecting the past, and to create a modern public space, allowing degraded areas to obtain a new life.



## Island Brygge, Copenhagen, Denmark - as an example of harbour's regeneration

### Aim of intervention:

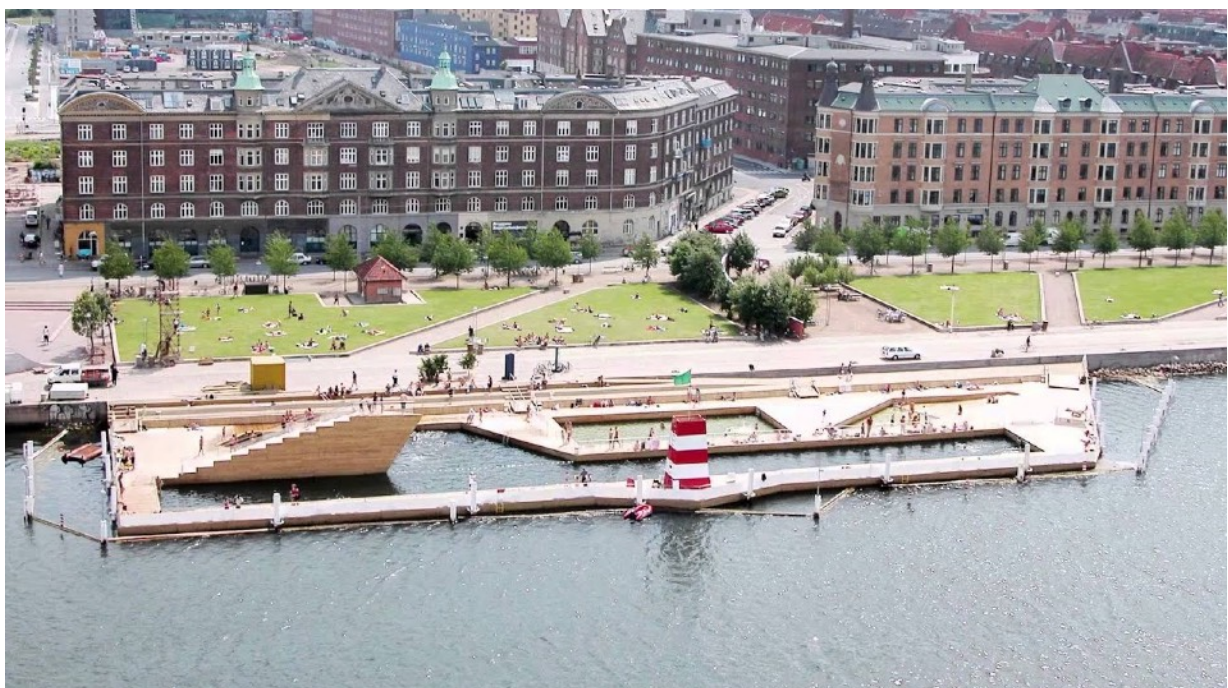
The Islands Brygge district in Copenhagen used to be a port area, facing the canal. In the second half of the 20th century the area was consolidated as a major industrial sector, a marginal area with a high crime rate. The aim of the intervention was to revitalise the district, what later on resulted in the most prestigious place to stay in Copenhagen. A part of its industrial heritage was replaced with new residential structures, and it became an attractive place with social and cultural activities.

### What was made:

- At first, Havneparken, or port park was established, using the platforms stretching 250 m along the bank.
- The public baths were created, the ones that replaced older public baths, closed in 1954 due to the contamination of water, extending the park over the water.
- As a result, a great social space was created, used for recreation and meeting, for all kind of users.

### Lessons learned:

This is a good example of how previously degraded area could become one of the best examples of modern public spaces. In this case, transforming a small piece of land resulted in regeneration of the whole district. The revitalisation of the territory often starts from small steps wisely taken.





## Summary And Conclusions

Petrodvorets district, in the context of Saint Petersburg, has a great development potential. According to the analysis, its strongest points are natural resources, cultural heritage and a proximity to the centre of Saint Petersburg. All of these factors act as a strong base for its future development, which should be proceeded taking into consideration modern urban tendencies and strategies, such as transit-oriented development, pedestrian mobility environments, walkable city concept.

The users of the territory can be divided into four groups:

- Residents of Petrodvorets district, working within the district
- Residents of Petrodvorets district, working in Saint Petersburg
- Residents of Saint Petersburg, visiting the district
- Tourists

The future development should be made according to the needs of these four categories of users, each one of them have their needs and requirements for the infrastructural network to be considered.

The major issues the district is experiencing nowadays are the following and possible solutions accordingly:

- The lack of local identity / Creation of clear image of every city inside the district
- Fragmentation of planning/Spatial integration of urbanised areas into the urban tissue
- Unconnected routes/ Walkable community
- Car dependancy/ Motor vehicles to be replaced by railway and cycling
- Infrastructural gaps/Creation of transit nodes within existing railway stations

## 4. Diploma Project Design Part

### Regional development concept

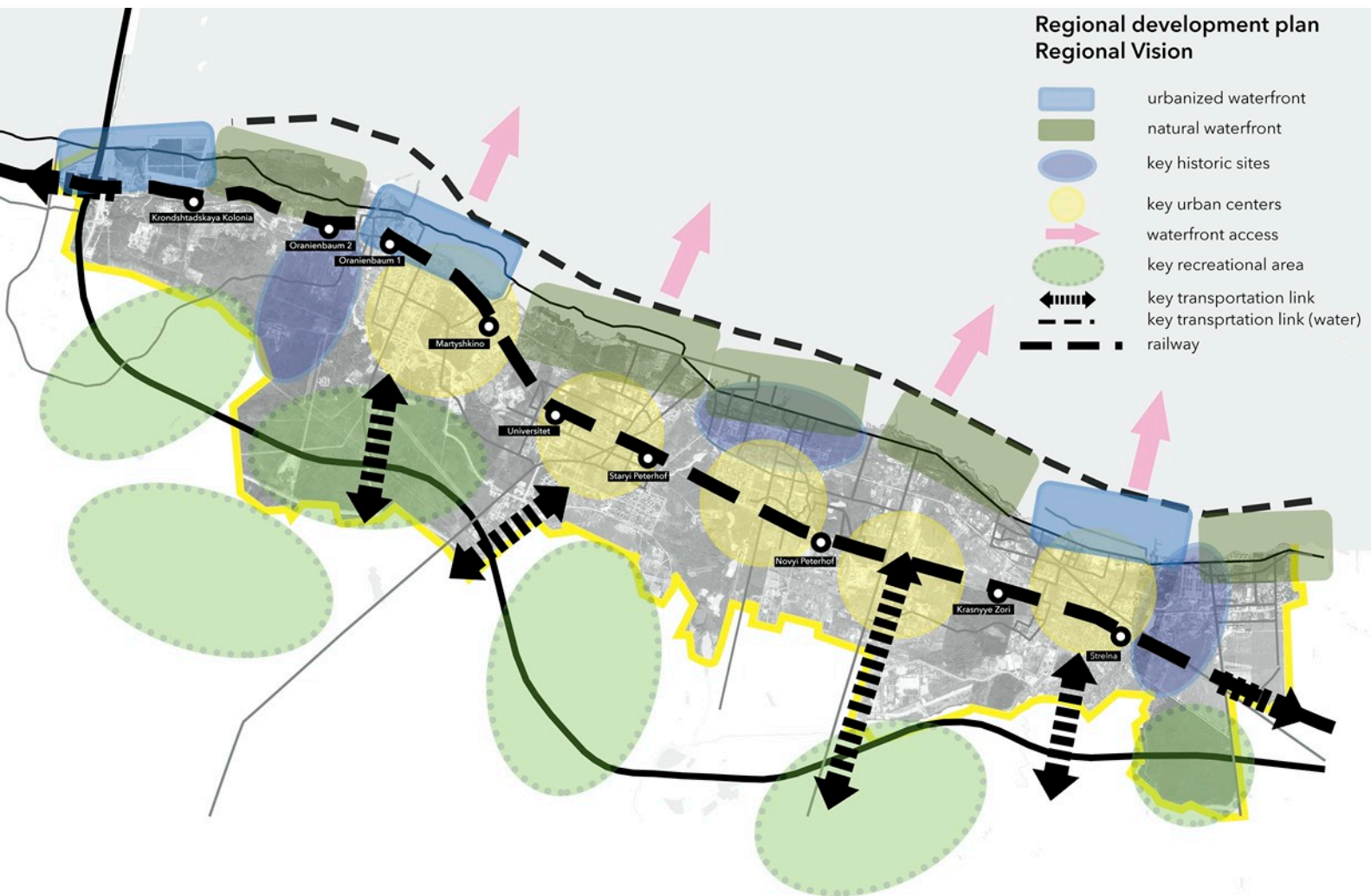
#### 1. Principles and strategies of regional development

- The railway acts as the main transport artery of the district, which means that its stations should be the main transportation hubs.
- The built-up waterfront is a continuation of the urban development.
- Green waterfront is a continuation of green areas.
- The built-up territories of three cities should be connected compositionally.
- The development priority is the waterfront of the Gulf of Finland.
- In the structure of the city, densification is prior to extension.
- It is necessary to overcome the main spatial barrier - the railway.
- Priority should be given to the mixed-use built-up.
- Public spaces must be interconnected.
- Touristic route must be organised throughout the three cities.

## 2. Regional vision

The scheme below shows a schematic plan for the transformation of the area. It shows the main urbanised territories of each city in the district, the railway connecting them to the stations, the main historical sites and green areas.

The main development goal is to connect urban cores of each city with green areas and to organise access to the waterfront for elements of the spatial environment.

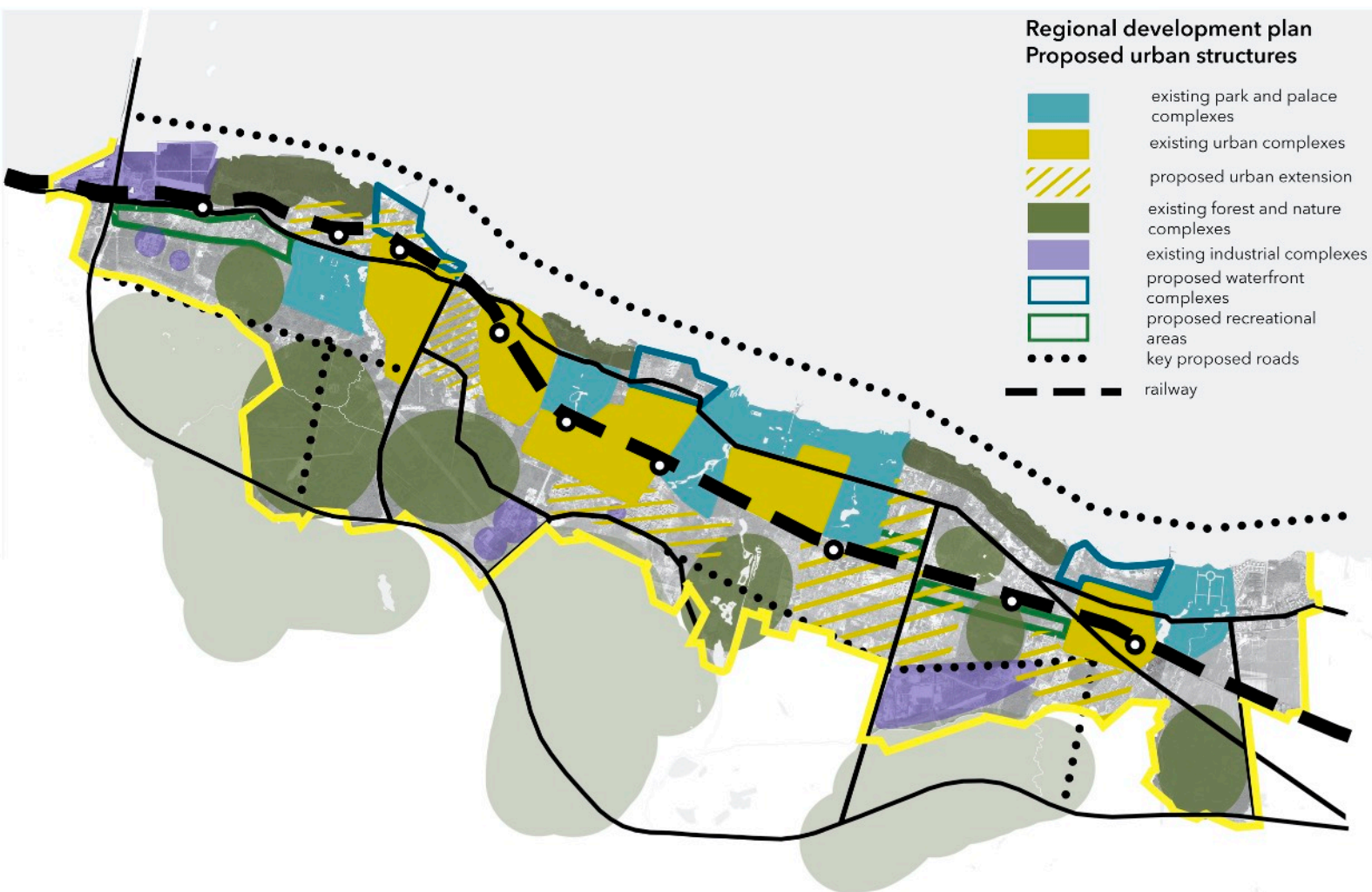


### 3. Proposed urban structures

The following scheme shows a more detailed proposal for reorganisation of the urban and natural environment. The scheme shows the main elements of the regional scale, such as urban complexes with the proposed extension, proposed natural complexes on the waterfront, proposed recreational areas, as well as proposed road network.

The main goal was the extension of urban cores and their connectivity. Another aim was to open up the waterfront and to create new recreational areas.

As for the shore, instead of the ubiquitous industrial zones, it was proposed to create new public places in their place.



#### 4. Identification of key intervention areas and projects

This diagram shows the main projects for the Petrodvorets district.

##### Lomonosov

###### Conservation

In the western part of the city, there are *abandoned estates* and dachas with an adjoining park. It was proposed to renovate and restore abandoned buildings and transform the park. It is also necessary to connect these remote areas with the city centre and include them in walking and cycling routes.

###### New types of housing

It is proposed to introduce new types of housing into the traditional fabric of the city. The presence of water gives grounds for various experiments with forms, for example, rethinking the concept of boathouses making them more modern.

###### Give the shore to people

For decades, the coast, as the most attractive part of the city, has been isolated from people by ubiquitous industrial zones. It is proposed to return it to the people by creating new recreational and public spaces. For example, revitalise an old, semi-abandoned port by bringing it back to life through the creation of a new residential area, offices, commerce and public spaces.

###### Beach transformation

The city beach is going through hard times. It must be made safe and provided with the necessary infrastructure for the visitors to use.

###### Elimination of spatial barriers

Elimination of spatial barriers between the city and the coast. At the moment, the main city square of Lomonosov has no connection with the coast and water, which is a problem. They are separated by a railway without any pedestrian bridge, therefore, getting from the city centre to the coast is not so easy. It is necessary to strengthen spatial connections.

###### New residential district

A new residential area at the site of a fuel and lubricant storage facility. A valuable part of the city that could be used by its inhabitants is now a storage of flammable substances. It is necessary to relocate the repository, creating in its place a park area connected with the waterfront, and new modernised residential areas with public spaces.

###### Densification of city centre

In the centre of the city there is a rectangular grid of streets, and somehow formed neighbourhoods. However, it is obvious that the entire central area of the city

lacks more dense block buildings and mixed functions. Consequently, it was proposed to compact the building and demolish buildings destroying the integrity of the neighbourhoods.

## Peterhof

### Urban extension and connectivity

Peterhof is known for its famous palace, but the buildings around it are very scattered and not connected. The main urban core of the city is broken, consequently, it was proposed to connect these areas with closer build-up, extending it.

### Small scale monuments conservation

The preservation of smaller-scale monuments is currently not performed. It is necessary to restore the Benua dachas, located in the immediate proximity of Peterhof, and include them in the city pedestrian route.

### Industrial zone revitalisation

The revitalisation of the industrial zone near the park is necessary in order to open up the coast and create a recreational area instead of polluting industries.

### Eco-trail

On the territory of the sanctuary Sobstvennaya dacha was proposed a creation of an eco trail, which will be located along the coast and make the area more attractive, at the same time protecting the natural variety. It is desirable to create a trail with the smaller possible intervention into the environment.

## Strelna

The point above also applies to the Strelninsky Bereg sanctuary.

### Public space

An abandoned tramway is located in the city centre, which could become the theme for a new public space that Strelna lacks.

### Transformation of industrial zones on the waterfront

The industrial zone on the waterfront must be transformed into an area accessible to people. This could be the creation of a public park near the estate.

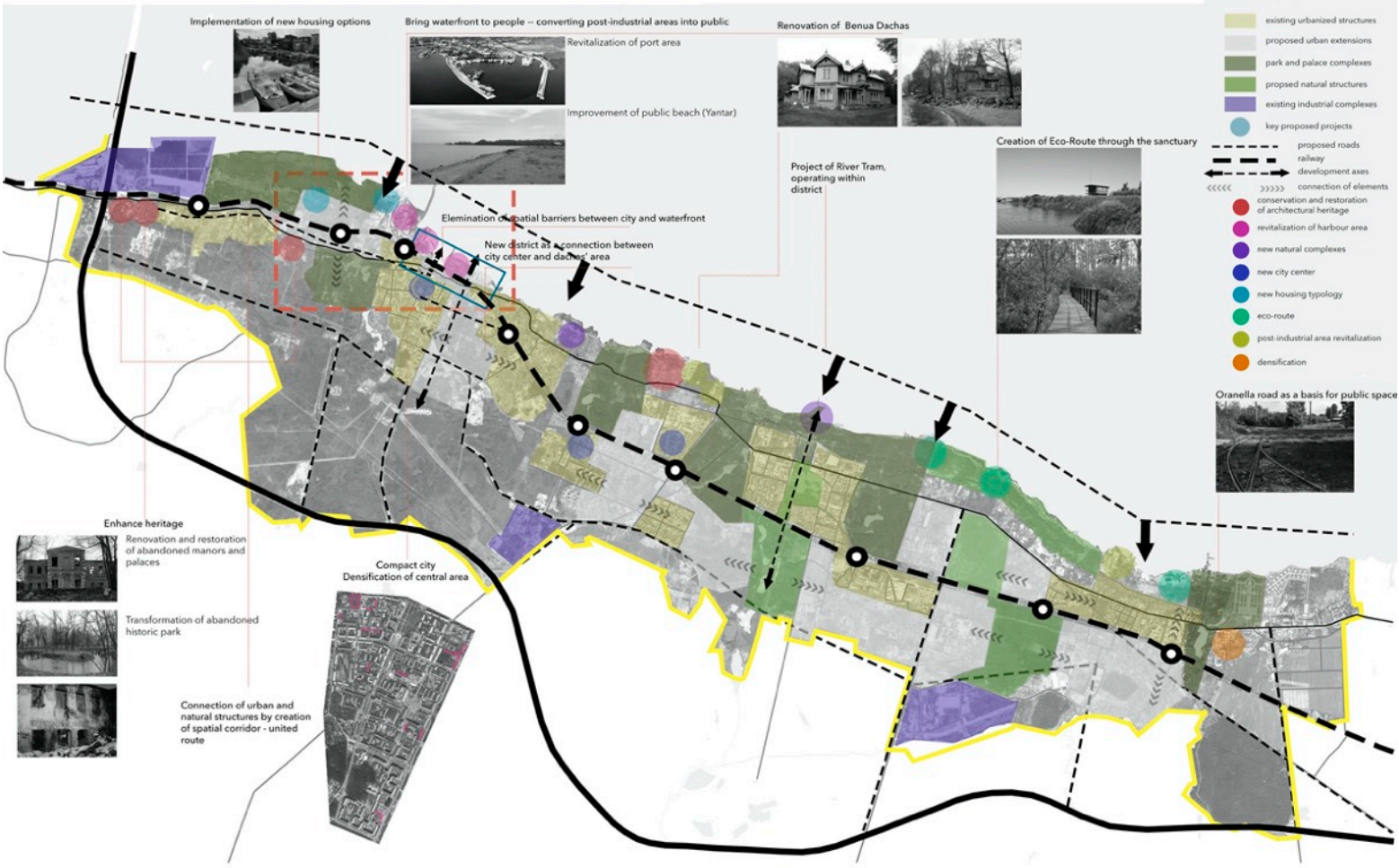
### Connectivity

It is necessary to connect the railway station building with the waterfront. At the moment, there is no infrastructure that could allow residents and visitors to take walks along the waterfront.

**Regional development plan  
Identification of key intervention  
areas and projects**

- existing urbanized structures
- proposed urban extensions
- park and palace complexes
- proposed natural structures
- existing industrial complexes
- key proposed projects
- proposed roads
- railway
- development axes
- connection of elements
- conservation and restoration of architectural heritage
- revitalization of harbour area
- new natural complexes
- new city center
- new housing typology
- eco-route
- post-industrial area revitalization
- densification

**Oranella road as a basis for public space**



**Enhance heritage**

- Renovation and restoration of abandoned manors and palaces
- Transformation of abandoned historic park
- Connection of urban and natural structures by creation of spatial corridor - united route



## Spatial development of Lomonosov city

### 5. Reasons for transformation

After the comprehensive analysis of the entire Petrodvorets district was carried out, the city of Lomonosov was chosen for the subsequent transformation. There are several reasons for this.

First, Lomonosov, along with Peterhof and Strelna, is an important historical site with many architectural monuments. However, unlike neighbouring cities, the least attention is paid to the preservation of these monuments. In addition to the Oranienbaum Park, in Lomonosov there are the Sant-Ennui Estate, the Olgino Estate, the Ratkov-Rozhkov Park, the Zubov Estate, and the Maksimov's Dacha. All these monuments are in an unsatisfactory state, without proper inspection, renovation and conservation. It is hoped that the transformation of the city will also address the issue of proper control of them and their inclusion in tourist and walking routes.

Secondly, Lomonosov is the most industrial city in the entire district. Peterhof is called a cultural city, with a flow of tourists and investments, Strelna is a gathering place for G8, and in Lomonosov the most characteristic sites are Port Bronka and Oranienbaum Palace. I would like the infrastructure of the city and the quality of its urban environment to be adequate and developed regardless of the tourist flow, and changes in the environment will enhance its attraction for tourists and residents of St. Petersburg.

Thirdly, the potential of Lomonosov is high in terms of the proximity of the coast of the Gulf of Finland, natural resources, parks and gardens. The structure of the city is there, it only needs improvement.

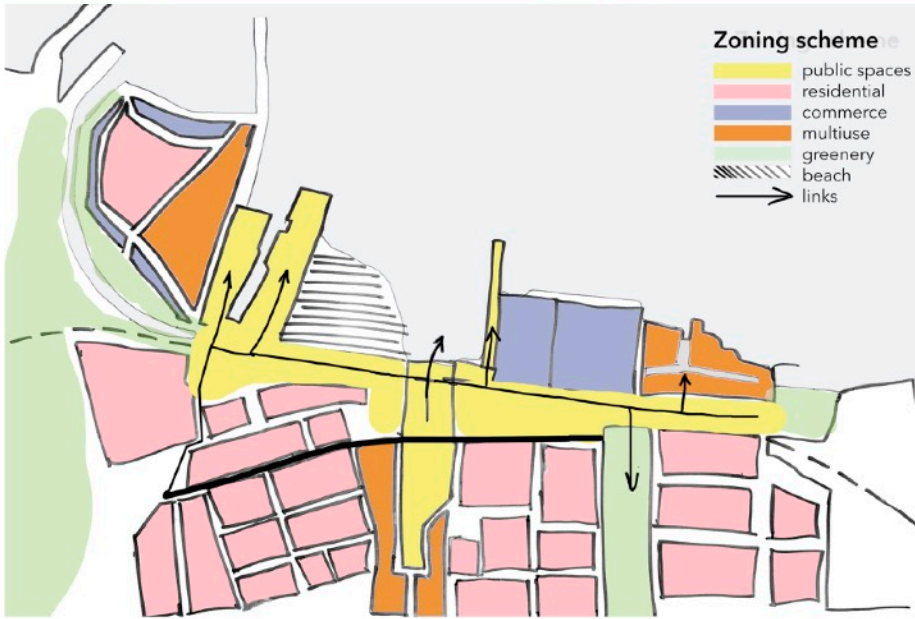
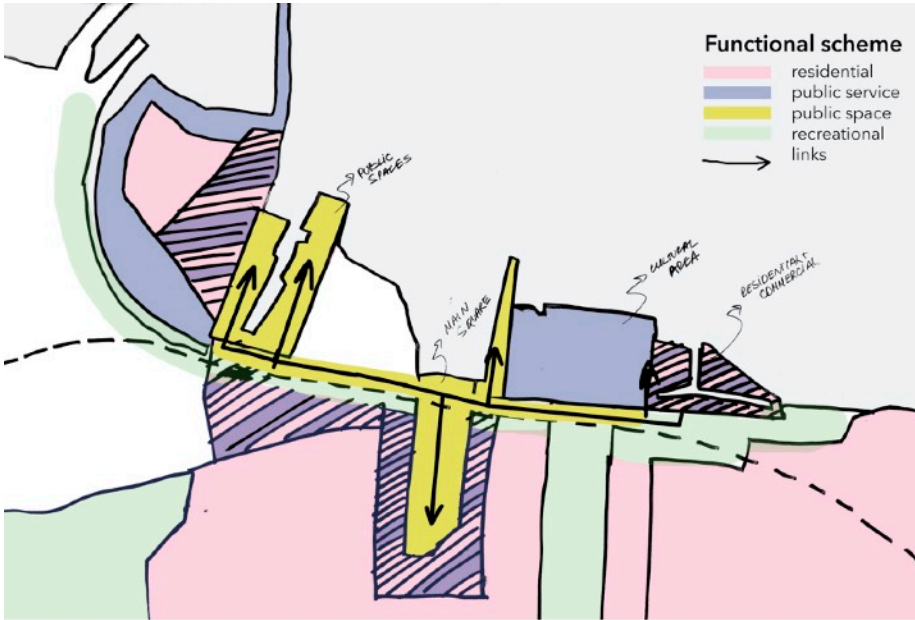
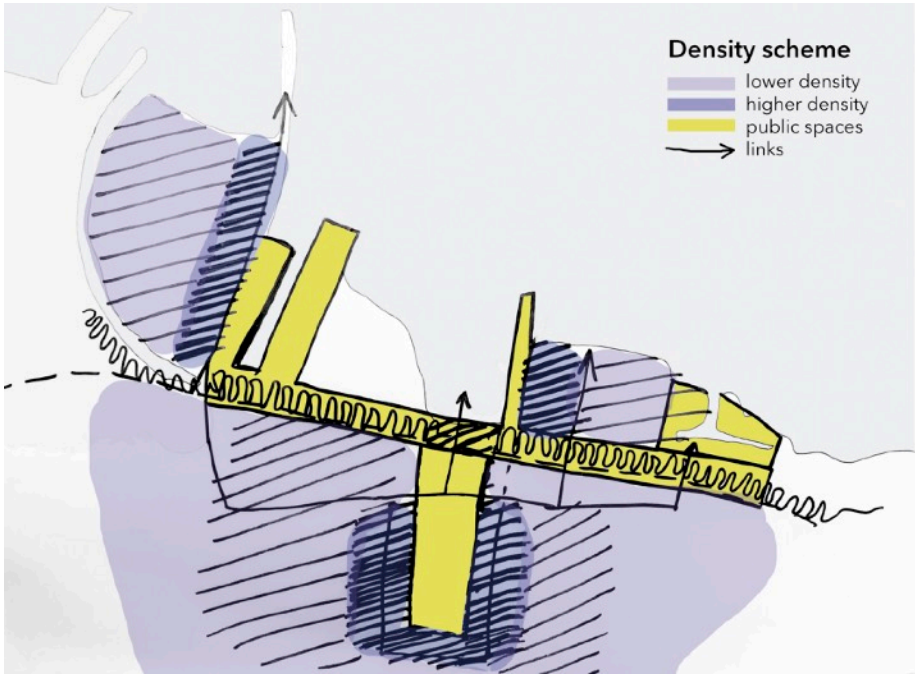
Fourthly, the most vacant place on the shore of the Gulf is currently occupied by the Lomonosov's port, which can no longer compete with the Bronka port, and is currently in a semi-abandoned state. The possibility of revitalising it, as well as modernisation of the surrounding objects is the main goal of my diploma.



## 6. Principles of transformation

After a comprehensive analysis of the urban environment and connections, it is necessary to establish the principles that must be taken into account during the development of the territory.

1. Creation of a continuous public path along the coast, connecting the port, harbour, main square, and elings' bay.
2. Densification of areas adjacent to public places, with the development of commercial and recreational functions.
3. Creation of continuous access to the coast, breaking its isolation caused by a railway line.
4. Establishment of residential areas within the port area, and mixed-use development along public areas.
5. Creation of recreational areas, in particular between old and new buildings in the central part.
6. Creation of mixed-use development as a priority in the city centre.
7. Densification of Soviet era's built-up in the central part of the city.



## 7. Functional transformation

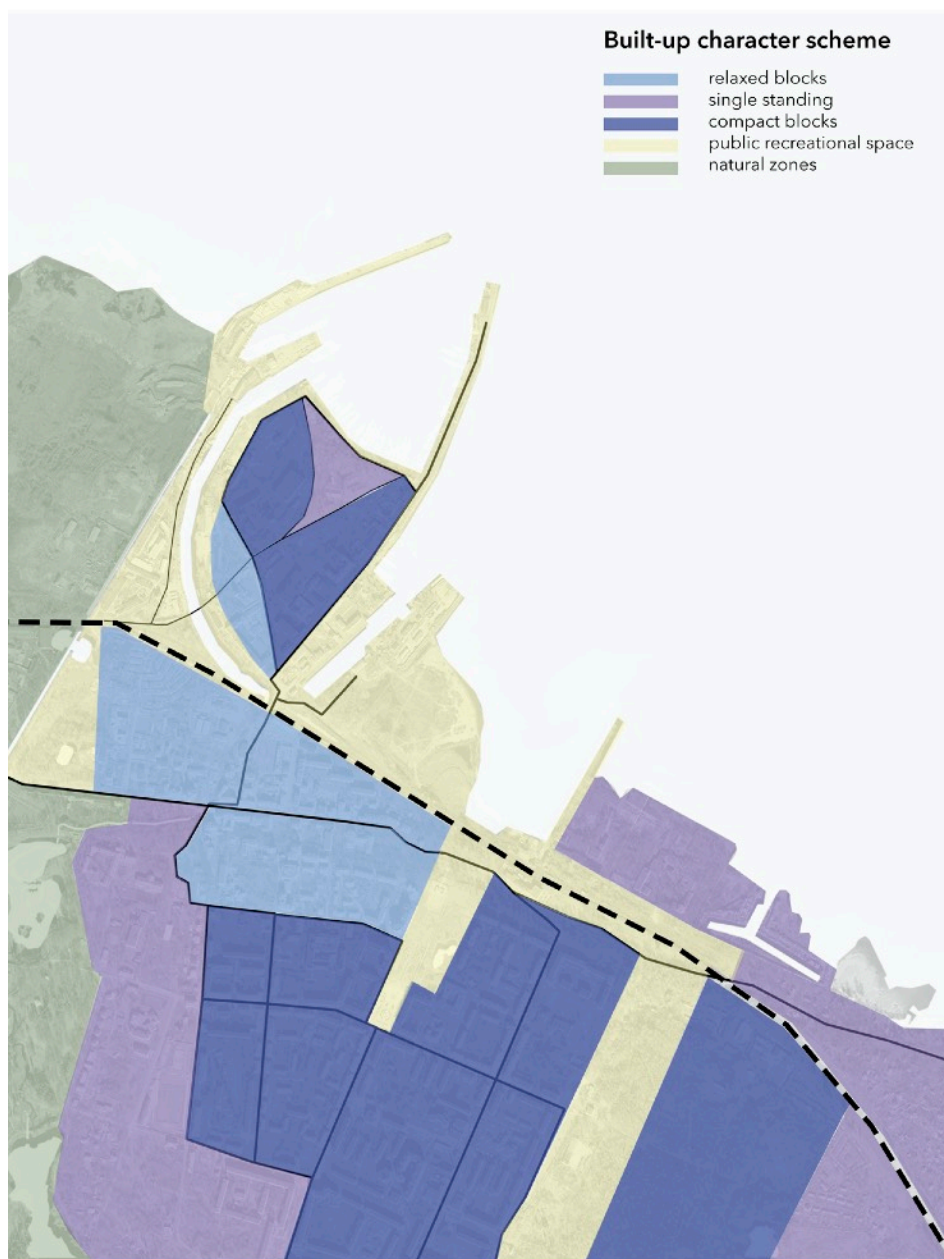
- The functional division of the territory is formed as follows:
  - The city centre is dominated by residential development, with commercial functions on the ground floors.
  - Commercial function predominates along the coast and parallel to the railway, along the main public areas.
  - Residential, commercial and public buildings are located on the port peninsula.
  - Public buildings prevail in the area of the station square.



## 8. Character of built-up

Following scheme shows the build-up character of the buildings.

- Compact blocks are situated in the central part of the city, where residential buildings are located.
- Relaxed blocks are located in the area of Railway station, where public buildings are located.
- Single standing buildings are located in low-rise areas, such as Martyshkino and the area near the Oranienbaum park.



## 9. Character of public spaces

A network of public areas was organised along the railway line.

The main walking route is located along the coast, with branches to the city squares. On the Port's peninsula, pedestrian traffic is organised along the entire coast, and flows into the main walking route.

The main public areas are located between the historic built-up and new buildings in the east of the city, along the coast of the bay, on the public beach, in the harbour near the port, on the Port's peninsula, as well as along the channel of the Oranienbaum park.

Semi-public areas - areas that are adjacent to public buildings in the city centre, near the railway station and on the peninsula.

**Character of public spaces scheme**

- walking routes along water
- main walking routes
- public space
- semi-public space

The image is an aerial photograph of a coastal urban area, overlaid with a color-coded scheme. A legend in the top right corner defines the colors: a solid orange line for 'walking routes along water', a dotted orange line for 'main walking routes', a yellow area for 'public space', and a solid red area for 'semi-public space'. The map shows a network of these routes and spaces along the coast and inland. A prominent black dashed line runs diagonally across the lower half of the image, likely representing a railway line. The background is a grayscale aerial view of buildings and terrain.

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## Master plan

### 10. Master plan elements

The selected area for the detailed master plan is the waterfront part of Lomonosov, which includes the central area part of the city, the main square, the railway station area, the old Lomonosov's Port, public beach, a site with a naval academy and, finally, the marina with elings.

The main points where development starts are the main square and the green zone to the east of it.

As for the main square, it was decided to form a façade, enclosing it, and add commercial function.

Regarding the green zone, at the moment it is quite extensive. There is a warehouse for chemical fuel. Due to the value of its location, it was decided to leave the main part along the historic part of the city, and to make new quarters of residential built-up in the east.

The main axis of development is the railway, which divides the city into two parts. Due to the problem of impossibility to cross it, the waterfront area is cut off from the main part of Lomonosov. Therefore, the main square and green area, which was mentioned earlier, were connected by a pedestrian bridge with the coast of the Gulf. The bridges cross two main spatial barriers: the railway and the Peterhof road (an important transport artery of the city). The pedestrian bridges in both cases are prolonged with a public space/observation point and end at the harbour.

During the master plan design, the coastline and public beach were preserved.

In the Elings' marina, where private boat docks and temporary accommodation for fishermen are located, it was decided to leave the main layout of the area, but introduce alternative types of housing, modernised houses, which would still combine the functions of a boat dock. It is also planned to introduce commercial facilities, restaurants and a small market in this area.

Along the entire waterfront there is a pedestrian zone, which starts from the station building and goes all the way to Martyshkino.

To this pedestrian zone, a network of public spaces and squares has been connected, thanks to which the waterfront becomes open to the public.

To the west of the marina is the Naval Academy, which needs modernisation. The new buildings are located near the water with public walkways formed around them, so the academy is no longer a place that restricts access to water. To the west of the academy there is also a public building with an adjoined pier.

The public beach has not undergone any changes, except that it was extended to a pedestrian zone, and is hidden from it with the help of kiosks for trade and public pavilions.

Regarding the port of the city of Lomonosov. At the moment, the port is in a semi-abandoned state, and clearly needs revitalisation. It is an extremely attractive place for locals, tourists and investors.

During the planning process, it was decided to convert the existing railways to the main streets of the peninsula while preserving the historical layout.

Along the water, a pedestrian zone was organised throughout the entire peninsula. Along the pedestrian zone commercial functions are located, including shops and restaurants. Most of the territory is occupied by residential buildings. On the northern part of the island there is an office area with dominant buildings, which forms the facade of the waterfront.

On the territory of the peninsula, valuable historical buildings were preserved, mainly located on the eastern part of the peninsula. Next to them there is the harbour, cut by the bay. On both sides of the harbour, a public space is formed, ending with two dominant buildings.

From the railway station building, along the Karasta river, another pedestrian zone was formed, connecting the station area and the Oranienbaum park. It goes through historical buildings. The easiest way for a tourist to get to the park and palace complex.

Regarding the regulation of cars, two large car parks have been set up on the territory of the new master plan. This was done primarily for visitors who wish to visit the city during weekend.

One of the parking lots is located in vicinity of the railway station building to significantly reduce the traffic flow on the waterfront zone.

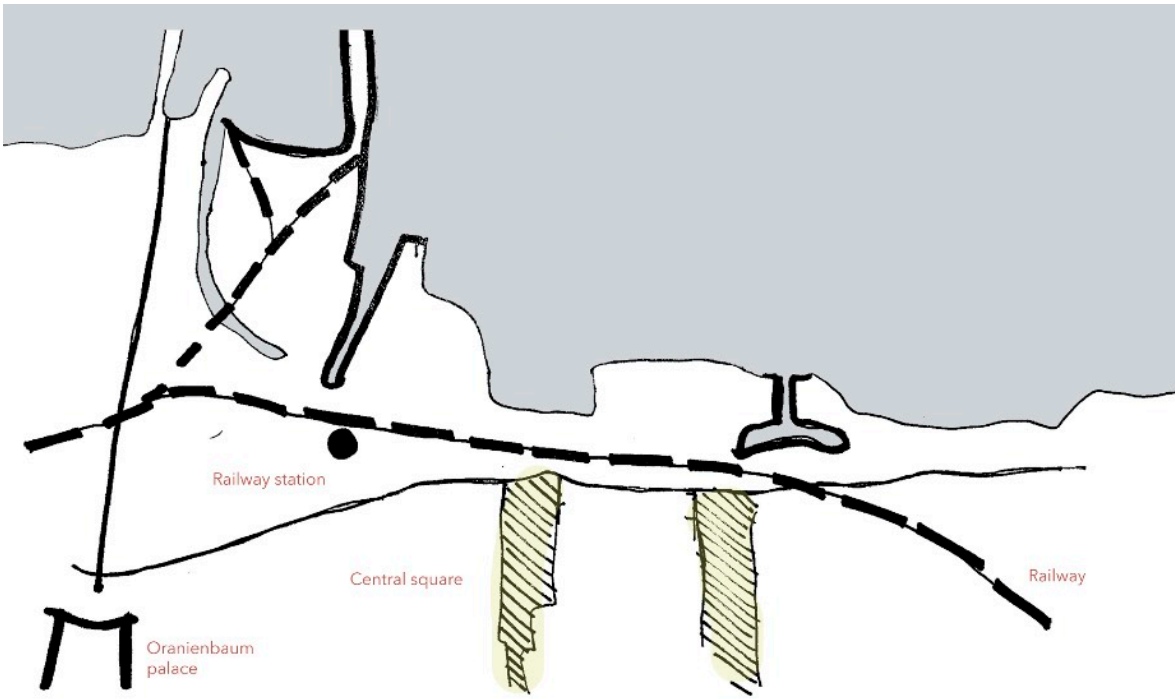
The second parking lot is located near new residential area. It can be reached by the main Peterhof road. It is designed to serve those who want to get to the city center.

To summarise, the waterfront zone has undergone major changes, which were aimed primarily at resolving the problems of accessibility of the waterfront, as well as regulating development near the water. The problem of spatial barriers caused by the location of the railway along the coast was partially solved.

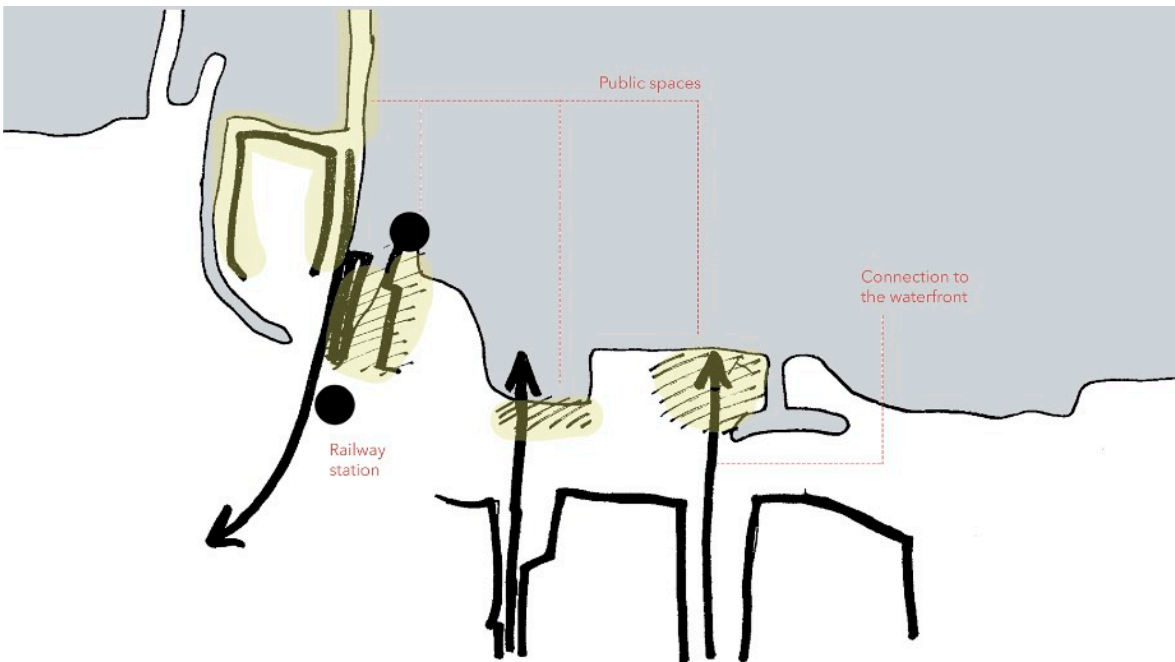
Also, the network of public spaces, so necessary for a modern city, has been developed. It included not only the newly formed areas, but also the historical square, which until that moment had been isolated.

In the central part of the city, building densification was also carried out. Residential quarters formed in the 60's-70's, as well as their courtyard territories, needed transformation. This issue was resolved by densification of the building tissue in the central part, with the maximum preservation of the existing architecture.

Key design determinants scheme



Key design elements scheme





## 11. Urban tissue

Two master plans have been created. The first one concerns land-use regulations of the territory. It indicates the functional division of the territory, which includes the main functions such as economic zones, new residential buildings, recreational areas, public facilities.

This plan also shows the planned facade lines, mandatory and free. They are necessary for the regulation of development and are aimed at preserving the compositional integrity of the territory.

Black dots highlight compositional dominants - buildings, which are important for the formation of complexity of the city, preventing it from repetition.

The second plan is detailed, developed according to the initial concept indicated in the previous plan. Following the functional division of the territory, architectural elements, buildings, roads, bridges, squares, etc. were organised.

Land-use master plan



Detailed master plan



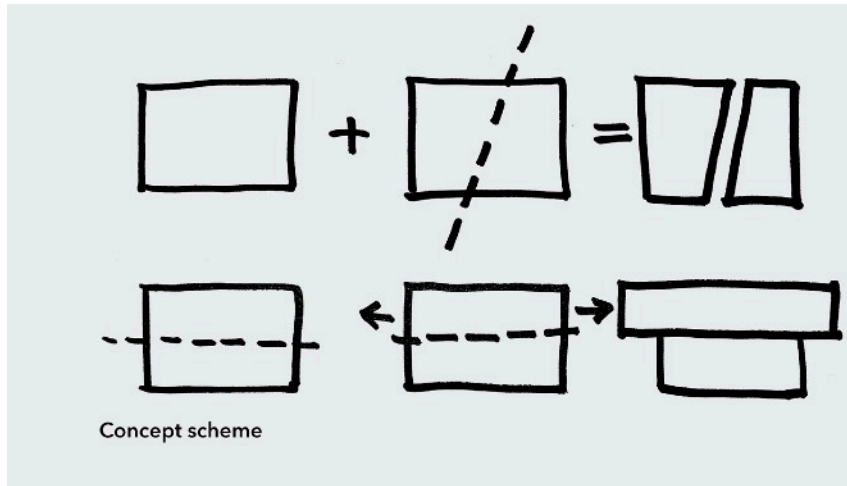
## Design Of A Key Building



The harbour between the city beach and Oranienbaum port was chosen for the detailed design for architectural part of the project.

The harbour is divided into two parts by the Gulf of Finland and has been transformed from a warehouse area into a public space. On the two edges formed there are two buildings, one of which was chosen for the architectural design.

It was decided to create a multifunctional center for the locals and visitors from Saint Petersburg, which would have various functions. Two volumes house a library, a concert hall, a restaurant, a cafe, conference rooms and exhibition spaces. These functions were selected based on the analysis of urban spaces available for citizens. It was necessary to place these functions in one building, so that the locals would have the opportunity to spend time in close proximity to water and urban spaces.



The building consists of two parts that are not connected to each other. In order to continue the town square in the harbour, the volume was cut in two, thus providing direct access to the water through the formed corridor.

At the end of this corridor is a pier overlooking the Gulf of Finland.

The building is surrounded by water on three sides, which makes it possible to have beautiful views from every point. Therefore, the main attention was paid to the glass shell and the degree of its transparency.

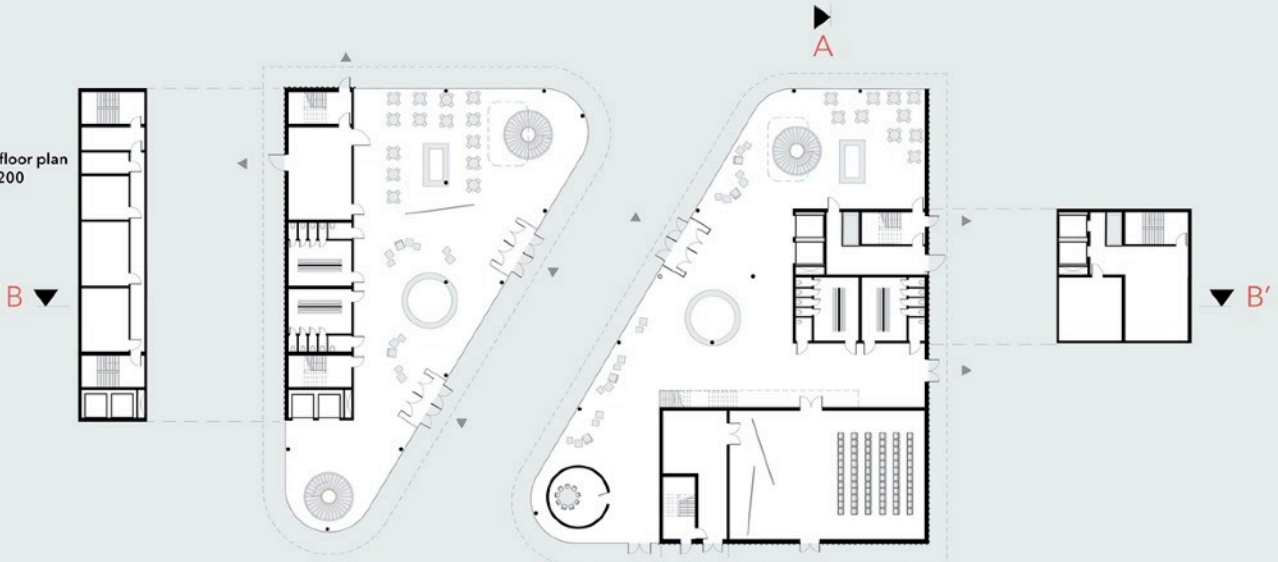
The building consists of two irregular volumes with rounded corners. These volumes have two main levels and two technical ones. There are completely opaque volumes inside the transparent ones. They contain technical rooms, vertical communications, fire exits, as well as concert halls.

There are a concert hall in the eastern building, including cafe, exhibition space. In the western one there is a restaurant and a library.

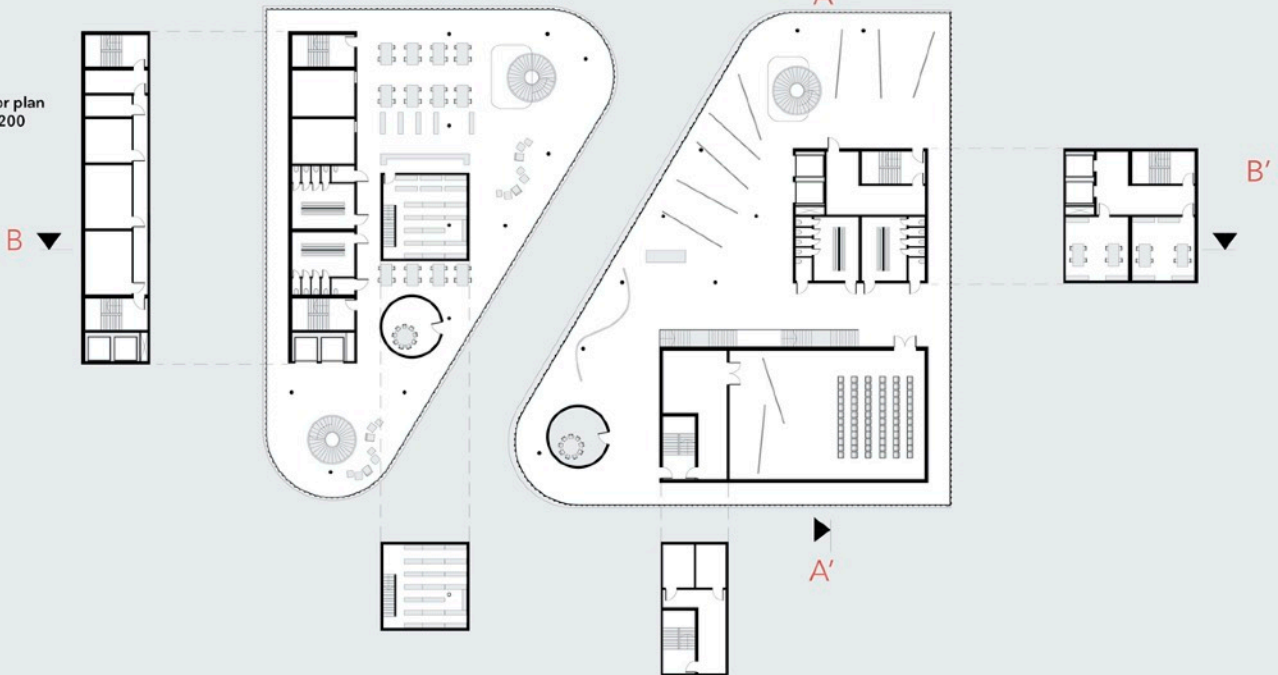
The main concept is to create a building action as a lighthouse, which would emit light at night. This was achieved by transparent glazing on the first floor and translucent curved panels on the second. These panels create a veil around the entire second floor of both buildings.

The back of the buildings is covered by concrete panels that follow the shape of the glass. The second floor protrudes above the first, creating an interior-exterior effect.

Ground floor plan  
Scale 1:200



First floor plan  
Scale 1:200



The height of the two main levels is about 6 meters, therefore, in order to save space, the internal technical volumes were divided into two additional levels between the two main ones. This allows you to increase the usable area of the building and place technical and administrative premises.

Spiral staircases are located at two different sides of both buildings, which provide access to the second level. There are additional staircases in the concert hall building.

In both buildings, the ground floor is organised according to the principle of free space, which does not restrict the circulation of people and does not impede free movement.

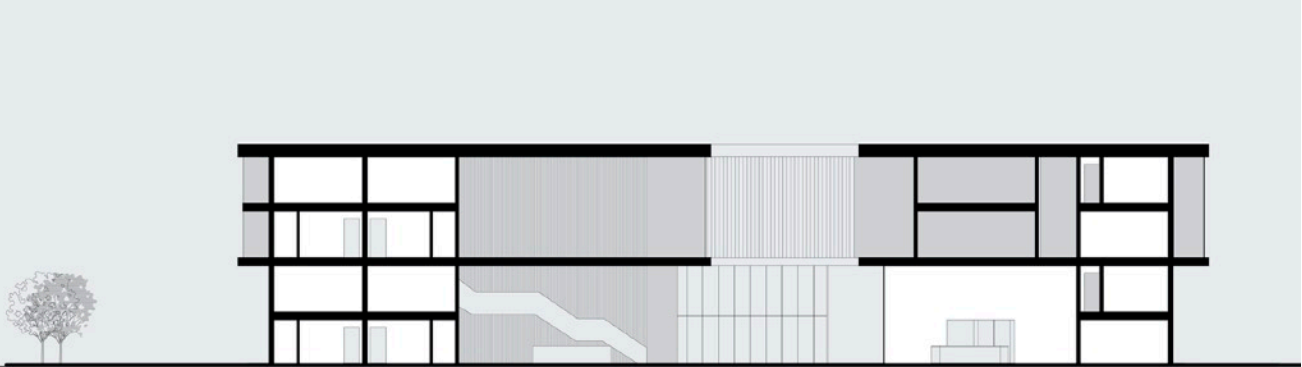
The library building houses a book depository, located on two levels. Around it there is a reading room overlooking the bay, administration desk and administrative offices nearby.

Fire exits and staircases for evacuation in case of fire in both buildings are located in accordance with fire regulations. In the building of the concert hall, evacuation staircases are located in the internal volumes and have direct access to the street. There is also an evacuation exit from the auditorium.

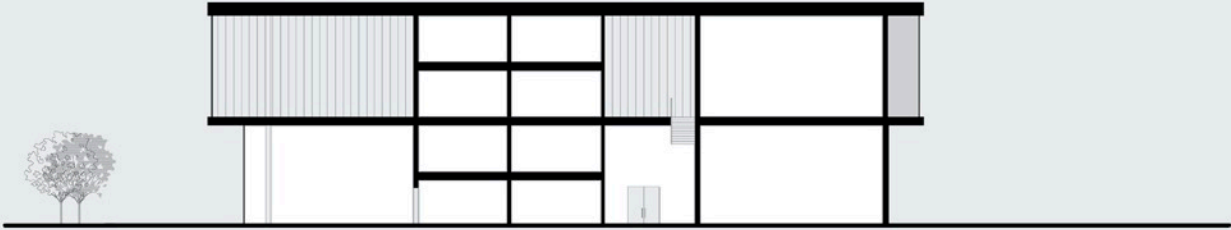
In the library building, evacuation staircases are located in the internal volume and also have direct access to the street.

A fire road is organised around the building, at a distance of 5 meters from the facade.

For restaurants, both buildings have a technical cargo driveway with direct access to the kitchen.



Section A-A'  
scale 1:250



Section B-B'  
scale 1:250





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All pictures of Saint Petersburg and Petrodvorets District are taken from the Internet.

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