

# Current state of Gagarin Park: its problems and the ways to improve the comfort of recreational environment

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**Abstract.** The state of recreational facilities and their accessibility for citizens is an integral part of life quality. Within the scope of work aimed at transition to comfortable urban environment, one of the most significant recreational facilities in Samara - Yuri Gagarin Park— has been examined. The following indicators have been researched and evaluated as the indicators of the park environment's comfort:

- the character of the established functional zoning has been described;
- the zones of acoustic comfort have been defined;
- the quality of water in water bodies has been evaluated;
- the recreational load has been measured;
- the expression of the recreational landscape has been evaluated.

The recommendations how to improve the comfort of the environment have been worked out, and they may be in demand while developing urban special-purpose programs.

## 1. Introduction

In large cities park zones play an important role in ensuring the comfort of the environment in large areas adjacent to them. They are essential for forming and maintaining public health [1]. The efficiency of parks performing their functions depends on the structure and condition of the park environment.

Promyshlenny District is the second most populated district of Samara, which houses 11 large and medium-sized enterprises. In the district there are several leisure areas, including quite big and popular recreational facilities - Voronezhskie Oзера Park and Yuri Gagarin Park. When they were created, these facilities were similar in many respects: they were recreational facilities within walking distance for the residents of Housing Developments 6, 7, 7A and 10, as well as large green spaces in Promyshlenny District, where the anthropogenic load from industrial enterprises and traffic was very high. Lately, as shown in a number of works [2], a kind of specialization of recreational facilities in Promyshlenny District has taken place: a number of them, like Voronezhskie Oзера Park, retain some features of natural objects, and due to this they have even been awarded the status of nature monuments (the decision of the Executive Committee of Samara City Council of People's Deputies No. 1037 dated 12.24.1991). Others, like Yuri Gagarin Park, have acquired the features of a fun fair, and as a result the quality of their recreational environment has become less important. Partially, the



role of recreational facilities within walking distance is now played by inner-block spaces: the administration of Promyshlenny District of Samara has developed and approved the municipal program "Comfortable Urban Environment" for the years 2018-2022, which already includes the landscaping of six areas of such kind. It is regrettable to note that the optimization and landscaping of recreational facilities often take place without assessing their current state basing on the recreational environment's components (air, water, soil, acoustic comfort, visual environment, security of recreants). Lately a number of studies have been published, devoted mainly to two aspects of the recreational environment - acoustic comfort and water quality [3]. Within the frames of this work, we have evaluated the state of the recreational environment of the most important facility of Promyshlenny District - Yuri Gagarin Park, in order to substantiate a number of measures aimed at improving the comfort of the environment, which are a part the municipal program "Comfortable Urban environment."

## 2. Experimental part

Yuri Gagarin Fun Park was opened on July 9, 1976, within the boundaries of the streets Stara Zagora, 22 Partsjezda, Sovetskoi Armii and Moskovskoe Shosse. In the 1920s and 40s on the site of this park there were dachas located in an oak grove. The oldest oak is over 300 years old, and it is recognized as a nature monument of national importance.



**Figure 1.** Location of the object of research – Yuri Gagarin Park

The area of the park is 39.3 hectares, the main tree species are oaks, poplars, maples, chestnuts and fir trees. There is almost no shrubbery. On its area there are numerous fun rides and two artificial water bodies - a pond and a rowing canal. The park is characterized by good transport accessibility, due to the proximity of Moskovskoe Highway, and it can also be considered a facility within walking distance for the residents of Housing Developments 6, 7 and 10.

The recreational load was evaluated in June 2019 under the conditions of sunny warm weather, on weekdays and weekends, from 11 a.m. to 6 p.m. For the purpose of counting the recreants, the park was divided into 11 zones.

The research of the acoustic situation in the park was carried out in accordance with the requirements of MG 4.3.2194-07 "Monitoring the noise level in residential areas, in residential and public buildings and premises" [5]. Hygienic assessment was carried out in accordance with SS 2.2.4 / 2.1.8.562-96 "Noise at workplaces, in the premises of residential and public buildings, as well as in residential areas" [6].

Water samples were taken according to the current requirements [7], then the hydrochemical characteristics of the water were determined using generally accepted methods. Landscape expression was also evaluated in 11 zones, using a scale [8].

### 3 Results and discussion

#### 3.1 The established functional zoning

As a result of analyzing the types of recreation, only active recreation was found: games at the sports ground, cycling and skateboarding, roller skating, horse riding. Obviously, there are currently no conditions in the park for passive and hidden recreation (relaxation, reading, bird watching, etc.) The optimization of the recreational environment, improving its comfort due to the wise use of small architectural forms and the allocation of functional zones will help to expand the range of activities and to increase the attractiveness of Yuri Gagarin Park for such categories of citizens, for whom having a recreational facility within walking distance is critically important (parents with young children, elderly people, physically disabled people). These are the groups of recreants that prevail in Voronezhskie Ozera Park.

#### 3.2 The level of acoustic comfort

The area of the park is surrounded by high-speed motorways on four sides:

- Sovetskoi Armii str., the length is 400 m;
- Moskovskoe Shosse, the length is 500 m;
- Stara Zagora str., the length is 670 m;
- 22 Partsjezda str., the length is 700 m.

We measured the noise levels in June and September 2019 at the borders of the park and at a distance of 30 meters from them. The results of these noise levels measurements are shown in Table 1.

**Table 1.** Level of noise from motorways on the area of the park

№	The borders of the park	The equivalent levels of acoustic pressure, dBA	
		At the park's borders	At a distance of 30 m from the borders
1.	Moskovskoe Shosse str.	67,0	61,0
2.	22 Partsjezda str.	65,0	62,0
3.	Stara Zagora str.	66,0	56,0
4.	Sovetskoi Armii str.	65,0	61,0

Besides, measurements were made in the zone of the fun rides and in the "quietest place" according to subjective criteria. The noise levels were 67.0-80.0 dBA and 54.0 dBA respectively.

Instrumental studies of the acoustic situation in Yu. A. Gagarin Park showed that even in its farthest part the noise levels do not comply with sanitary standards, the permissible equivalent level being 45 dBA. The main sources of noise pollution in the park are the closest motorways, and possibly other noise sources located in the park, in particular the rides. The most appropriate way of creating acoustic comfort in the park will be the use of noise screens around the perimeter of the park to protect it from

the noise from the motorways. Taking into account the significant levels of noise created by the equipment of the rides, it is necessary to conduct their maintenance and check their compliance with regulatory documents.

### 3.3 Recreational load

It has been found that out of 11 zones only one is recreational for its functional purpose, all the others are transit. The only recreational area is the rides' site, where the amount of recreational load is 142 people / ha, while the average for the park is 11 people / ha. So, the average recreational load value conforms to the norm for urban forests [9], while the maximum – for squares and boulevards. Consequently, the growing recreational load should be accompanied by a serious transformation of the park: the creation of a well-thought-over network of roads and paths, as well as the development of landscaping, etc.

### 3.4. Water quality

The rowing canal is characterized by high attractiveness for recreants; therefore, evaluating the quality of water and its safety for humans is an important task. The rowing canal is an artificial water body. Bank protection was performed using concrete slabs, which currently have got no visible signs of destruction. The source of water supply is partly rainfall, but mainly it is the replenishment of water from urban utilities. Thus, water quality has predictably turned out to be at the level of requirements for drinking water [9]. The exception is the indicator of permanganate oxidizability: it has been found to be 1.2 MAC, and the reason may be the development of aquatic vegetation at the bottom of the rowing canal.

### 3.5 Landscape Expression

The maximum point of landscape expression was noted only in one of the examined zones – the one near the rowing canal - since there is open water surface, groups of trees nearby, and the relief is quite peculiar. In other zones, landscape expression did not exceed 3-4 points, i.e. was low. In all cases, we noted inexpressive colors, lack of dominant and repetitiveness. Of course, insufficient landscape expression, as well as badly thought-over landscaping, are obstacles to the fulfilment of the rather significant recreational potential of Yuri Gagarin park.

## 4. Conclusion

The performed research allows making a conclusion about the insufficient level of comfort in Yuri Gagarin park, based on a wide range of indicators. It is necessary to perform a deeper research of this problem, and then to develop a comprehensive program aimed at creating comfortable conditions in Yuri Gagarin park.

## References

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