

SCIENTIFIC CRITICISM, CONTROVERSY

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UDK: 796:711.2

DOI: 10.7251/SIZ0118038K

SPORT AND URBAN PLANNING SETTLEMENT AND SPORTS FACILITY

Abstract:

The location of a sports facility must satisfy a large number of urban requirements. In order to plan construction or management of a sports facility, it is necessary to know its functional and urban connections with the settlement. It is necessary to know the requirements of functions in a sports object for their proper spatial location. The paper analyzes the following elements of a sports object: organization, design standards, internal traffic design and greenery design. The first group analyzes the impacts of the settlement on the organization of the plots, the location of the central terrain, the zoning of the site of the sports facility, the necessary features of the location, the world experience in estimating areas per capita, the vehicle and pedestrian traffic on the plot, the organization of parking on the plot and the role of the greenery.

Key words: *settlement and sports facility, location of the sports field, standards for sports facilities, zoning of the plot of a sports object, greenery on the plot.*

01. INTRODUCTION

Sports facilities, are complex systems and require precise planning whether it's construction, reconstruction or adaptation. In addition, sports facilities are being built in phases, the final shape of a sports facility will be acquired after a few years only. Therefore, it is necessary to reserve space which allows the desired development. Also, not only the object but also the capacity of the auditorium should be shaped well. In the shortest, the basic characteristics of a sports facilities are determined by: the settlement - the sports facility and the competitive level of the club are connected. The sports facility is designed for the comfort and safety of visitors / users. Therefore, the security element must always be in the foreground when defining a project task and designing an object.

This paper use the scientific results by the following authors and institutions: FIFA (FIFA, 2004; FIFA, 2011a; FIFA, 2011b), UEFA (UEFA, 2011a; UEFA, 2011b; UEFA, 2011c), OECD (OECD,2011), specialized services (Department for Culture, Media and Sport, 2008), Geraint, Sheard &Vickery (Geraint, Sheard, Vickery, 2007), B. Gallant (Gallant, 2008),

McGregor & Shiem-Shin Then (McGregor, Shiem-Shin, 2003), Rick & Langston & de Valence (Rick, Langston, de Valence, 2003), R. Ortner (Ortner, 1956), S. Ilić (Ilić, 1998) and M. Mitrović (Mitrović, 1983). This paper is the original, detailed and different variant of the paper presented at the scientific conference (Kuzović, 2016). The objectives of the paper are to analyze the functional relationship of a sports facility and the settlement it gravitates, the correct determination of the location of the object, the conditions for locating individual functions on the lot, the list of required characteristics of the potential location of the sports object, the recommendations for the organization of vehicle, pedestrian and idle traffic on the plot and the concept of greenery on pitch of a sports object.

02. DOCUMENTATION

01. Standards

The standards adopted by countries reflect the goals of social development, the needs of the population and the financial viability. Standards are useful for defining certain elements of sports facilities. Also, the standards must be part of the technical documentation. An object that is built with respect to the project is simply treated during a final control check (which is done handing over the facility to use). In the process of assigning the area, and during the urban design, the number of inhabitants gravitates to the sports facility should be taken as the relevant factor. The area per user varies, and under the influence of the social objectives and economic strength of the region: USA - 35 m² / inhabitant, Russia - 28 m² / inhabitant, Germany (eastern part) – 26 m² / inhabitant, Germany (western part) – 19 m² / Switzerland – 26 m² / inhabitant, England 20 m² / inhabitant, Cuba 18 m² / inhabitant, Czech Republic and Slovakia - 17 m² / inhabitants, etc. The total area expressed (square meters per inhabitant) is the sum of the surfaces of all types of facilities (open and closed) can be found in the sports center. For example, in the Czech Republic (a surface of 17 m² / inhabitant), The typical sports center has the following structure (Ortner, 1956):

Table 01. Structure of surfaces in the sport facilities in the Czech Republic:

<i>type of the building</i>	<i>organized</i>	<i>unorganized</i>	<i>school</i>	<i>total</i>
Playground	5	2	5,86	12,86
Physical Training in Hall	0,4	2	0,422	0,822
Covered pools	0,045	2	0,422	0,045
Open pools	0,15	2	0,422	0,150
Special terrain	0,3	2	0,422	0,3
Other terrains	0,855	2	0,422	0,855
Greenery and communication	1,25	0,131	0,586	1,967
Total <i>m²/inhabitant</i>	8 (47,05%)	2,131 (12,53%)	6,868 (40,40 %)	17,00 100%

02. Required Location Features

The location of a sports facility must meet a number of specific requirements that are not identical to public or residential functions. In the shortest terms, the conditions placed before the site of the sports object are the following:

1. *Topography*: the terrain should be flat or slightly inclined.
2. *Orientation*: allows the correct orientation of the main and auxiliary sports grounds.
3. *Composition of soil*: the ground for the sports facility should allow for a rational depth of funding, that there are no landslides, a seismic hazards, races, etc.

4. *Underground and surface water*: Groundwater in the site must be balanced in volume and height throughout the year. Surface waters must be without flash floods or occasional impact bays (occur after heavy rains or snow).

5. *Accessibility to visitors*: The location must be accessible to public transport and private vehicles. If good accessibility to public transport is ensured, certain facilities may reduce the area for vehicle's parking. Also, if public transport is used, the traffic will not be exposed to great constraints during and out of the sport event.

03. Location of sports facility and village

A sports facility draws energy from the settlement (audience, finance, space renter, etc.). Therefore, the location of a sports facilities in relation to a settlement, gravities him, must be very carefully defined. In relation to the settlement, the sports facility can be located: 1. In the central zone of the settlement, 2. On the periphery of the settlement, 3. Outside the settlement.

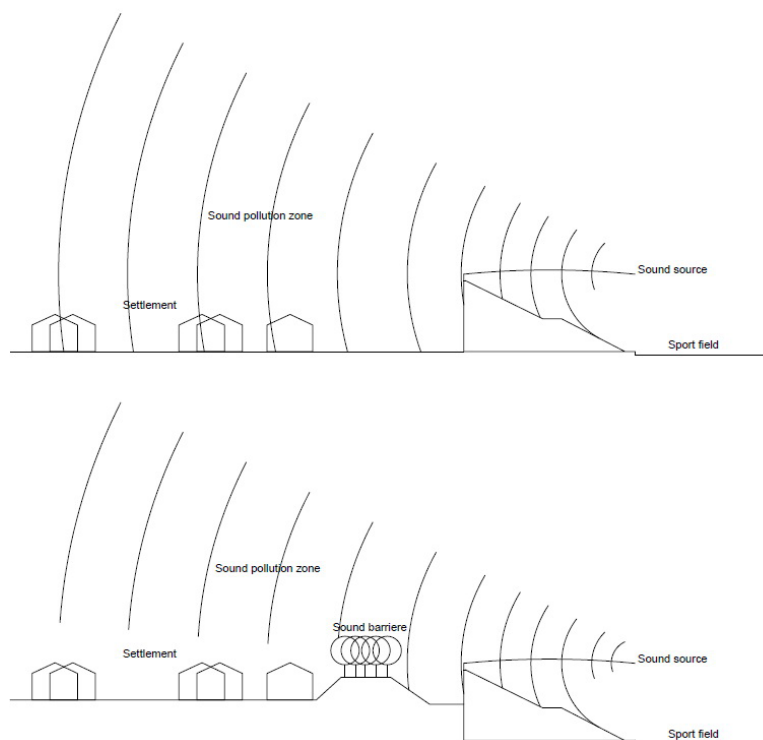


Figure 01: The influence of topography of terrain and greenery on the direction of noise propagation from sports facilities. (Origin: Author to FIFA (2011b). *Football Stadiums, Technical Recommendations and Requirements*, Zurich: FIFA.)

The influences that determine the location of the sports facilities are as follows (Russ, 2009):

Land price: a sports facility requires a large surface therefore allocations for land make a big item in the budget.

Urban planning of the location: the location must be planned for the construction of sports facilities. Also, compliance with urban planning also implies environmental planning in order to avoid conflicts in land use.

Traffic accessibility: access to public roads must have a satisfactory cross-sectional profile, and the possibility of establishing public transport lines.

Infrastructure equipment: as sports facility is a large consumer of energy (electricity, water) and generator (sanitary water, mobile and internet communication), it is necessary to provide a public network with adequate profile.

Microclimate location: microclimatic location is of high importance (ventilation, sunshine, extreme temperatures, etc.).

Parking spaces: the price of land makes it possible to build a parking space more cheaply. Also, parking space is directly connected with public transport.

Green space: without greenery, a sports facility is harmful for the city and its users. Therefore, a part of sports object's pitch must be separated for green areas.

Opportunities for complex development: phase construction of a sports facility is a necessary condition that must be planned on time, and the reserved space is carefully guarded.

Possibility for organizing security: Increasing security requirements mean not only the safety of a sports object, but also the surrounding facilities that can be compromised by the various types of hazards generated by the sporting event.

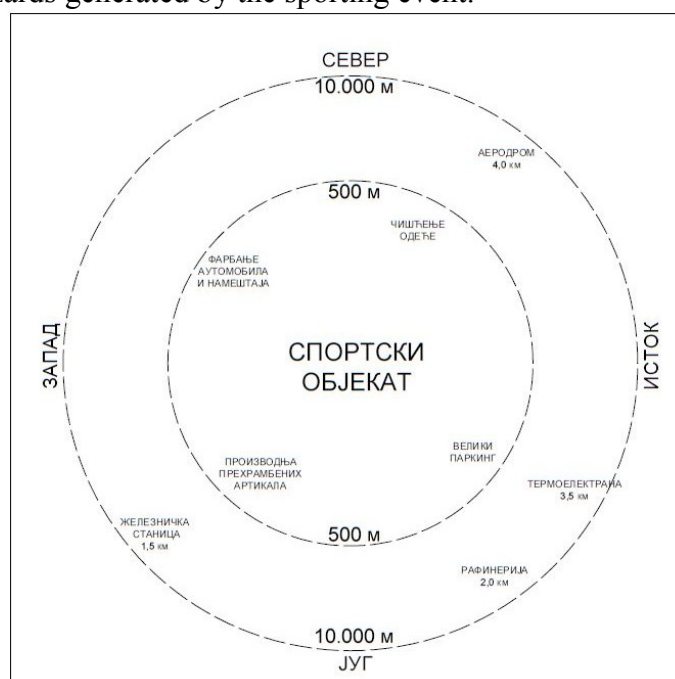


Figure 02: Minimum distance of the pollution source from the sports object. (Origin: Author to: Greeno Roger, Hall Fred (2011). *Building Services Handbook*, Amsterdam: Elsevier.)

04. Traffic connection of the location

A sports facility generates vehicle and pedestrian traffic that is not balanced during the week or month. Also, the largest number of visitors arrives in private cars. It is therefore necessary to plan roads that have the capacity to accept traffic at the moment of the biggest impact. Also, the equipment of the roads is required to accept the mechanical load on the carriageway. High-quality public transport lines (city bus, tram, rail, metro, taxi) are necessary. In times when sports events are not held, the traffic load of the streets around the sports facility is a several times less. This traffic distribution determines the construction of specialized roads (only for the needs of a sports facility) or a sports facility needs to be connected with another traffic generator. The protection of users and objects from various types of vandal and terrorist attacks is realized through the design of the facility, the organization of traffic on the plot, the formation of protective zones on the plot / facility, and the establishment of security controls and, building a barrier.

Zoning the parcel of a sports object

The lot of the sports facility must be able to accept all contents for the current functioning and to keep the areas reserved for the future development of the facility (Geraint, Sheard, Vickery, 2007):

1. *Sports field* (main and auxiliary),
2. *Auditorium* (can be realized in one or more phases),
3. *Traffic flow* (road traffic, pedestrian traffic, parking for various types and vehicle categories),
4. *Green areas* (the total area of the plot with greenery is divided into several zones: parking lots, roads, greenery in functional units, and greenery in the protection zone along the plot boundary),
5. *Reserved areas for expansion* (expansion of the theater, construction of auxiliary terrains, reconstruction and extension of the yard or all facilities in the complex, etc.

06. The position of the central court in the lot

The design of sports facilities takes a few steps. In a first step, the centered sports ground is defined. In the second step, the auditorium is formed (provide the possibility of phase development). In the third step, the auxiliary and accompanying contents are defined. The central terrain is a key element of the sports facility, which is the reason for the arrival of visitors. Therefore, it must meet a large number of requests. The characteristics and design of the main sports field depend on the following elements: 1. The type of sport, 2. The hemisphere, 3. The period of the year, 4. The part of the day, 5. Local microclimate conditions.

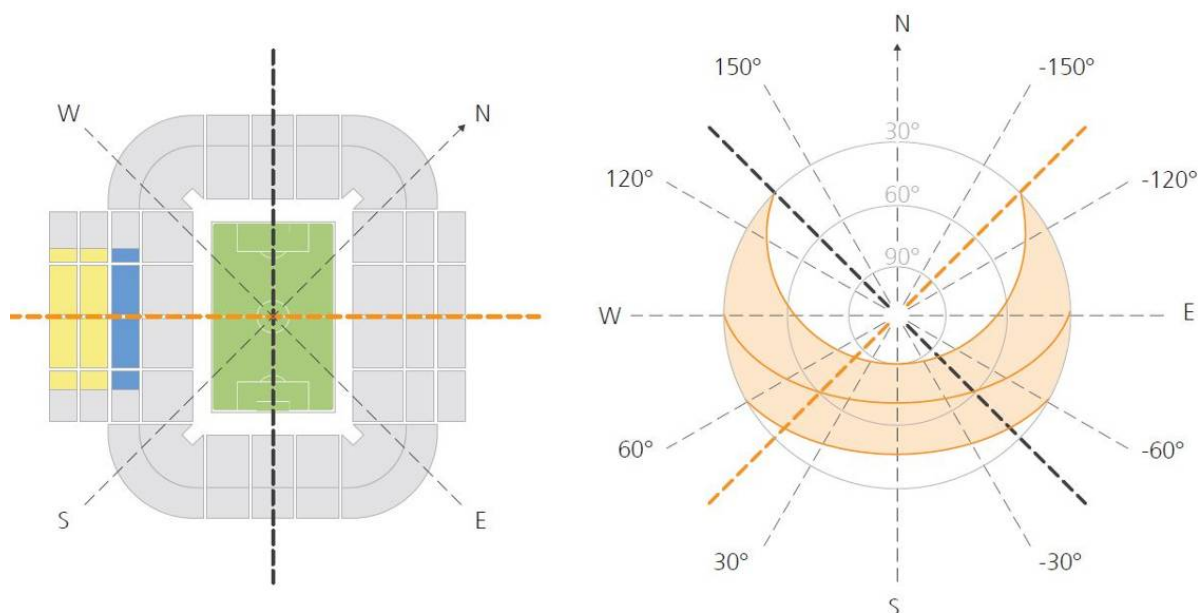


Figure 03: Position and orientation of the central terrain. (*Origin: UEFA (2011a). UEFA Guide To Quality Stadiums. Genève: UEFA.*)

07. Traffic on the plot

Traffic within the plot must be differentiated according to the types, and traffic flows (in particular pedestrians and pedestrians) must be avoided. Bearing in mind the different

types of traffic within the plot, it is necessary to organize the following flows (Geraint, Sheard, Vickery, 2007):

1. *Pedestrians* (pedestrians flow from: parking to the entrance / bus parking, to the entrance to the sports facility / entrance to the auditorium),
2. *Vehicles* (from entry to parcel to parking provided for a particular type and category of vehicles),
3. *Public transport stations* (public transport should have its own position near the entrance to the plot),
4. *People with disabilities* (corridors must be arranged for the movement of persons with disabilities),
5. *Signalization* (flows of pedestrian and coarse traffic must be clearly and unequivocally marked).

08. Parking on the plot

All vehicles must be parked within the plot on the designated and equipped zones. Off-site parking (public spaces, adjacent plots, etc.) is allowed only with the consent of the owner of the site. All parking lots, regardless of location, must be equipped in accordance with applicable regulations and regulations. In design process, it is necessary to correctly assess the number of vehicles and their structure in order to define the area on the plot for that purpose. On the plot, parking the vehicle is as follows: a) Parking on the ground, b) Parking in a multi-storey garage, c) Additional parking d) parking on access roads and surrounding roads, e) parking on a neighboring plot provided under a separate contract. In relation to the type of users, it is necessary to provide parking for the following characteristic groups: 1. parking for passenger vehicles, 2. parking for buses, 3. parking for motorcycles. For the following user groups, parking areas must be provided: 1. parking for spectators, 2. parking for toys, 3. parking for judges, 4. parking for VIP persons, 5. parking for TV teams, 6. parking for services and delivery vehicles. (Geraint, Sheard, Vickery, 2007)

09. Greenery on the plot

Greenery on the plot of a sports facility is required by the urban planning, and the microclimate. Also, the greenery can be located on the plot or in the immediate vicinity of the sports facility. Greenery can be located in several locations on the plot, alone or in combination with other functions. Greenery according to the position on the plot can be in combination with several functions: 1. *Park* (located between rows with parking spaces), 2. *Between functional zones*, 3. *On reserved areas* (for the construction of a sports facility), 4. *Along internal roads* (from one or two sides of the road), 5. *Along the boundary of the plot* (the edge of the plot). Greenery on the plot requires regular maintenance, which contributes to the longevity and aesthetic quality of the building as a whole.

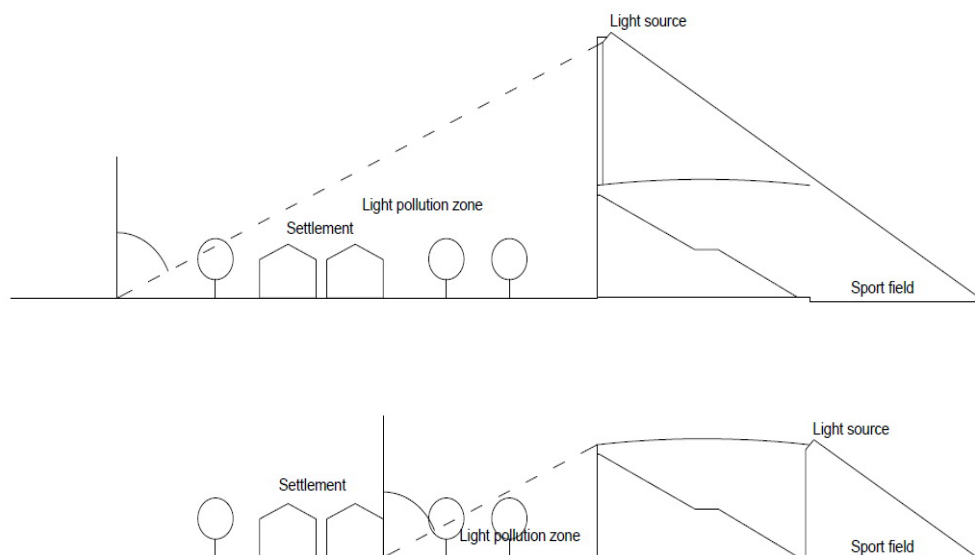


Figure 04: Influence of the position of the main sports field reflectors on the light pollution of the environment of a sports facility. (Origin :Author to: FIFA (2011b). *Football Stadiums, Technical Recommendations and Requirements*, Zurich: FIFA.)

3. CONCLUSION

Planning a sports object is a complex process that requires the engagement of professionals with the necessary experience. Modern practice in the Balkans (the sports facilities are built or reconstructed in unsuitable places, disturbing the life of parts or complete settlement), it is necessary to make an analysis of the connections between the sports facility and the city. As the sports facility is complex and expensive, knowledge of the needs and requirements of both a sports facility and a settlement is needed. Also, it is necessary that the necessary connections of the sports facility and the settlements be known to sports managers. In this way, both sides, in the planning process, of any activity at a sports facility, would be able to start their plans from a common ground. The location of the sports facility is in some of the parts of the settlement (center, semi-periphery or periphery). Without a settlement (inhabitants), a sports object loses its sense of existence. Also, the settlement (can be evolved for centuries) should be priority, the sports facility should take the second place. Therefore, the sports facility must be subordinated to the rules and future of the settlement, and not vice versa (as is the case in contemporary practice). The location of the sports facility in the settlement must be in accordance with the type of planned sporting events. This paper analyzes the relationship between the location of a sports object and the settlement as well as the conditionality and requirements imposed by the function and standards of the location of the sports object.

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Received: May 9. 2018

Revision received: June 29. 2018

Accepted: June 30. 2018

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