



CAMPUS LANDSCAPES AND CAMPUS MASTER PLANNING PROCESS: A CASE STUDY OF DÜZCE UNIVERSITY KONURALP CAMPUS

Kampüs Peyzajları ve Kampüs Master Plan Süreci: Düzce Üniversitesi Konuralp Kampüsü Örneği

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ABSTRACT

University campuses, due to their functional structures, are educational areas that cover different functions together or side-by-side and tend to grow physically. They are defined as places that bring different people and their thoughts together within a certain boundary to provide an intellectual environment and also provide a ground for social exchange. University campuses, which constitute an important part of the urban landscape, are important social, cultural, ecological, and economical places for both campus users and urban residents. Therefore, the decisions to be taken in the planning and design of these spaces directly affect the campus users and the spaces on the campus as well as are of important for the city and the city dwellers. Within the scope of this study, some basic criteria that should be taken into consideration during the planning and design of high-quality campus landscapes were put forward and in line with these criteria, planning and design goals were determined and strategies were developed. Finally, a master plan I was realised for Düzce University Konuralp Campus in the light of these strategies. Thus, an exemplary model that can guide future projects regarding how these criteria can be realized was put forward.

Key Words: University campuses, master plan, landscape design

ÖZET

Üniversite kampüsleri, işlevsel yapıları gereği farklı fonksiyonları iç içe ya da yan yana kapsayan ve fiziksel açıdan büyüme eğiliminde olan eğitim alanlarıdır. Ayrıca entelektüel bir ortam sağlamak amacıyla farklı insanları ve onlara ait düşünceleri belli sınırlar içinde bir araya getiren ve sosyal alışverişe zemin sağlayan mekanlar olarak da tanımlanmaktadır. Kent peyzajının önemli bir parçasını oluşturan üniversite kampüsleri hem kampüs kullanıcıları hem de kentli için ayrıca bulunduğu kent için sosyal, kültürel, ekolojik ve ekonomik yönden önemli mekanlardır. Dolayısıyla bu mekanların planlanması ve tasarlanmasında alınacak kararlar doğrudan kampüs kullanıcılarını ve kampüsteki mekanları etkilemesinin yanı sıra kent ve kentli için de önemli olmaktadır. Bu çalışma kapsamında kaliteli kampüs peyzajlarının planlanması ve tasarlanması aşamasında göz önünde bulundurulması gereken bazı temel kriterler belirlenmiş ve bu kriterler doğrultusunda planlama ve tasarım hedefleri belirlenerek bunlara yönelik stratejiler geliştirilmiş son olarak bu stratejiler ışığında Düzce Üniversitesi Konuralp Yerleşkesine yönelik bir fikir projesi geliştirilmiştir. Böylece bu kriterlerin nasıl gerçekleştirilebileceğine yönelik ileride yapılacak projelere yol gösterici olabilecek örnek bir model ortaya konulmuştur.

Anahtar Kelimeler: Üniversite kampüsleri, master plan, peyzaj tasarımı

1. INTRODUCTION

University campuses, due to their functional structures, are educational areas that cover different functions together or side-by-side and tend to grow physically (Dober, 1992; Karaşah et al., 2016). They are defined as places that bring different people and their thoughts together within a certain boundary to provide an intellectual environment and also provide a ground for social exchange (Atik & Zulfikar, 2020).

The term "campus" was first being used in Princeton in the United States in the second half of the 18th century for defining the distance between the college area and the university buildings. Today, the campus is referred to all open and closed areas structured or unstructured within the boundaries of the university (Gül et al., 2016; Yerli & Ozdede, 2017).

Campuses are the areas, which are a part of the urban landscape, that have functions same as cities such as working, housing, rest-recreation, transportation and social communication on a smaller scale (Yıldız &

¹ The project discussed in this study was developed within the scope of the national, two-stage, urban design project competition organized by Düzce University in 2015 for Konuralp Campus and was awarded the 3rd Honorable Mention Award.

Şener, 2006; Yılmaz et al., 2019); function as a whole with their buildings and landscape areas, have a unique identity and have significant effects on the quality of life of those who use it.

Campuses, which serve important functions such as providing opportunities for all kinds of activities, protecting the natural environment and ensuring aesthetic satisfaction are of great importance for students, faculty staff and other members of society (Yang, 2007).

The physical character and quality of the campus are defined by its buildings and open green spaces. And particularly, its open green spaces constitute the skeleton of the outdoor environment (Dober, 1992; Matloob et al., 2014; Yerli & Ozdede, 2017).

Quality campus landscapes should not only be a place that meets the basic needs of campus users but also should be functional, original and sustainable spaces that create a meaningful and sense of belonging for the users (Broussard, 2009; Yalçın, 2012; Yılmaz, 2015).

In this context, some basic criteria should be considered in the planning and design process of quality campus landscapes. These criteria are;

- ✓ **Establishing connections among spaces:** To provide connections among the spaces, a unifying system that covers the entire campus by integrating and organizing different places and elements should be created. In this context, a green space hierarchy that is interconnected at various scales should be designed.
- ✓ **Accessibility:** A pedestrian-oriented and safety circulation system should be established. In addition, attractive, inviting and easily navigable pedestrian paths that provide direct connections between spaces should be designed.
- ✓ **Ensuring social and cultural interaction:** Universities are not only places where students acquire a profession through academic education, but also institutions where they develop themselves socially and culturally. The individual and social development of students is directly related to the social and cultural activity areas and uses in universities (Erçevik & Önal, 2011). In this context, campuses are gathering areas where social and cultural interaction takes place and they should be designed considering these aspects (Kurtoğlu, 2010).
- ✓ **Meeting recreational needs:** Activities relaxing and entertaining that people do outside of their daily routine are defined as recreational activities, and areas that have the potential to realize these activities are defined as recreational areas (Timur, 2021). Campus users, specifically students, need recreational activities such as relaxation, entertainment, socialization and sports to overcome the mental fatigue of studying (Kalin et al., 2019). Therefore, in the design of the campus, places that provide various active and passive recreation opportunities that can meet this need should be included.
- ✓ **Constituting a campus identity:** The specific structural and natural environment characteristics of the campus should be evaluated, and the planning and design principles fostering them should be determined. In addition, the cultural atmosphere of the campus should be developed by designing distinctive spaces and landmarks (Li, 2017).
- ✓ **Ensuring sustainability:** The purpose of a sustainable campus is defined as meeting the current needs without compromising the needs of future generations (Ehsan, 2012; Putri et al., 2020). Sustainability affects all areas within the university such as buildings, green areas, transportation and social life, and that shows us the sustainability should be addressed from every aspect. In this context, landscape and infrastructure emerge as the two basic elements in achieving sustainable results (Anis et al., 2018; Putri et al., 2020).

Within the scope of this study, how a campus design should be within the framework of the basic criteria mentioned above was evaluated on Düzce University's Konuralp Campus, and in this direction, a master plan was developed.

2. MATERIAL AND METHOD

The main material of this study is Düzce University Konuralp campus located in Düzce city where is in Turkey's Western Black Sea region. The campus area is located on approximately 180 hectares of land and includes 12 faculties, 3 institutes, a research hospital, a sports centre, social activity buildings and a recreation forest.

The materials used in the study are the university development plan approved 2013, maps showing the current situation scaled 1/1000 (existing, campus area boundary, open spaces, structures, transport and circulation, infrastructure, geology, hydrology, vegetation), panoramic photos and campus satellite photo.

For field analysis ArcGis desktop, two-dimensional drawings AutoCAD, three-dimensional modelling 3D Studio Max and graphical representation and visualization Photoshop, Corel Draw were used.

The method of the study consists of the stages of collecting data, analysing, determining the planning and design goals, developing strategies and finally designing the campus master plan.

3. RESULTS

3.1. Identifying the Current Problems

The current situation regarding the campus area was evaluated and the existing problems were determined.

3.1.1. Problems of the circulation system

The current circulation system of the campus consists of vehicle and pedestrian roads. The vehicle road constitutes the basis of the circulation system and this system circulates on the entire campus area at the same intensity. Besides, the pedestrian circulation is solved with a sidewalk system parallel to the vehicle circulation (Figure 1). This situation is an important problem in terms of pedestrian safety and interactions and also causes spatial connections to remain disconnected and weak from each other.

The parking lots on campus are scattered and resolved on a building basis (Figure 2). In the area where there are problems in terms of topography, there is no search for a solution for disabled accessibility. The use of bicycles, which is an important part of the circulation system, especially in terms of sustainability, is not included on the campus.

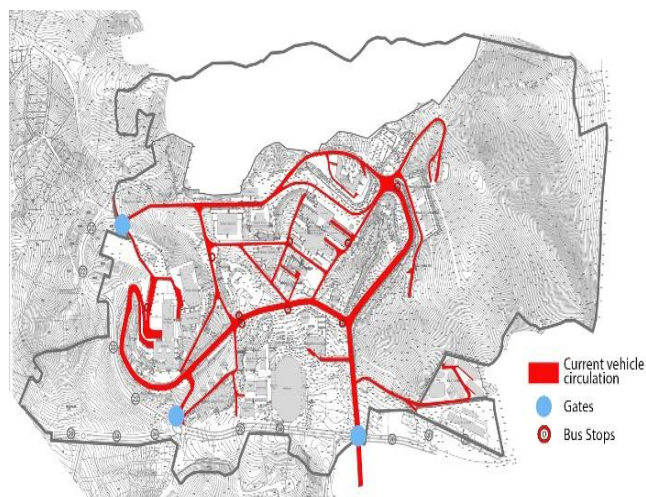


Figure 1. Current vehicle circulation

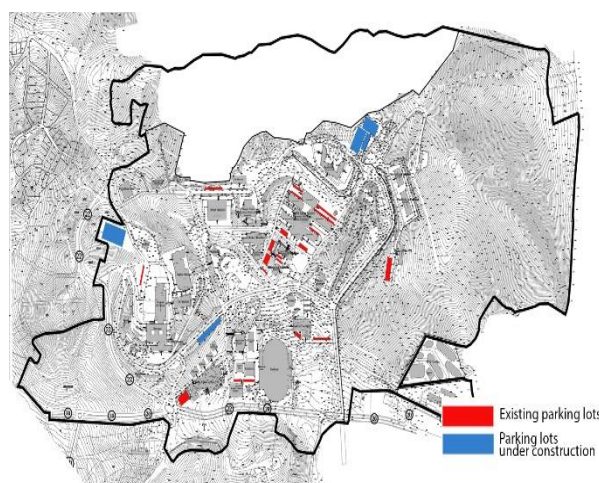


Figure 2. Existing parking areas

3.1.2. Problems of spatial character

One of the most important problems of the existing campus is that there is a disconnection among the existing spaces (Figure 3). The disconnection is seen not only in terms of the circulation system but also in terms of the harmony of the building-structure, building-landscape. It is thought that this situation affects the perceptibility of the space, thus preventing the formation of a clear campus identity.

Also, the symbolic places that will strengthen the campus image are not existing on the campus.

3.1.3. Spatial diversity- Problems of space usage

The insufficiency of spaces that bring students and other users together causes the users to interact only with limited places and people. This situation affects the dynamism of campus life and causes the campus to remain weak in terms of social-cultural-academic-recreative functions (Figure 4).

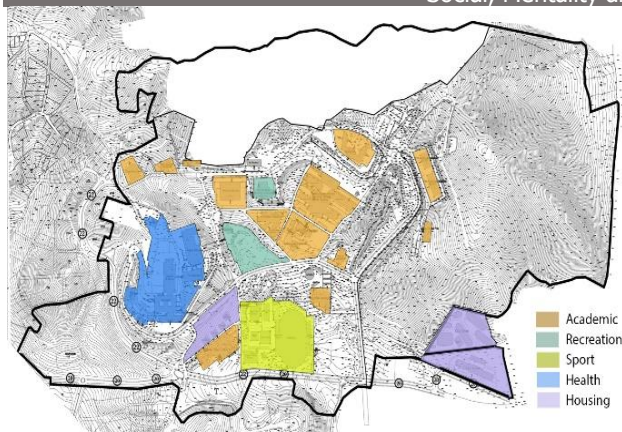


Figure 3. Current space usage

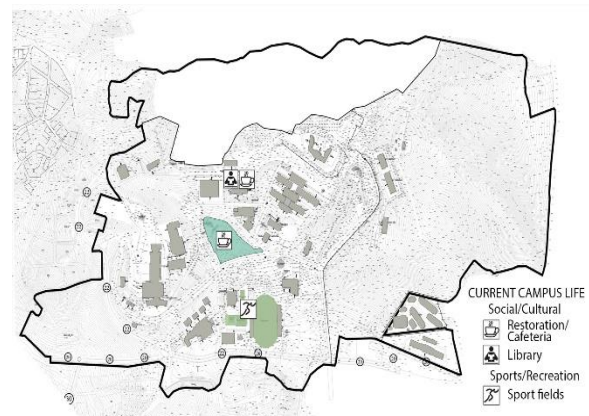


Figure 4. Current campus life

3.2. Determining Campus Design Goals

When the problems related to the area were examined, it was seen that the existing campus had deficiencies in terms of three important elements of the spatial formation (movement - spatial character - function), and accordingly, the design objectives were grouped under three main headings.

3.2.1. Organising of the movement

Roads and empty spaces guide the expectations and behaviour of people in motion. So, the best transport system should be clear, coincide with the natural tendencies of people and guide them.

In the current campus design, there are no connections that can direct campus users and provide inter-location relations. The system intensely supports vehicle circulation. This situation negatively affects pedestrian access in terms of direction, safety, and comfort.

Therefore, within the scope of the solutions for the organization of the movement in the proposal of the campus design, it is primarily aimed to create strong connections to provide security, comfort, sustainability designs for the disabled and parking systems.

3.2.2. Organising of the space

The physical proportion and dimension of the open spaces and structures and their relationship with each other are of great importance in terms of the formation of the campus identity.

The proposed campus design aims to ensure the integrity of the connection between these features and to create a "sense of space" in the users by creating clear, perceptible, human-scale spaces. The proposal aimed at ensuring spatial organization in campus design, firstly to strengthen the connections and to ensure the integrity and then to develop the campus identity.

3.2.3. Organising of the use

Campus life is one of the important factors affecting student success. So, it is necessary to create dynamic, attractive and diverse living and learning spaces by enriching campus life in every aspect (social, cultural, academic, recreational). In this context, creating a dynamic campus life is aimed.

3.3. Determining the Design Strategies for the Campus

After the design goals were determined, in the direction of these goals, design strategies were created. These strategies were determined in a way that supports the formation of a sustainable campus.

3.3.1. Creating a unifying system covering the entire campus

The campus area should be a whole consisting of buildings and outdoor spaces. Therefore, within the scope of the design, a system that handles the circulation system, open spaces and the physical environment as a whole was proposed.

✓ Campus spine

By creating a "spine system" in the existing campus, it is aimed to strengthen the connections of the spaces with each other (Figure 5). For this purpose, a pedestrianized main corridor "allée" was created from the main gateway to the mosque.

Designed as the main pedestrian corridor, this system also constitutes the basis of pedestrian circulation. Other pedestrian paths (2nd-degree corridors) are scattered over this spine and the campus area for which no settlement decision has been made is connected to this spine system by a pedestrian bridge (Figure 6).

While creating this system, attention was paid to obtain that pedestrian access is directly related to squares, building entrance and sidewalks.

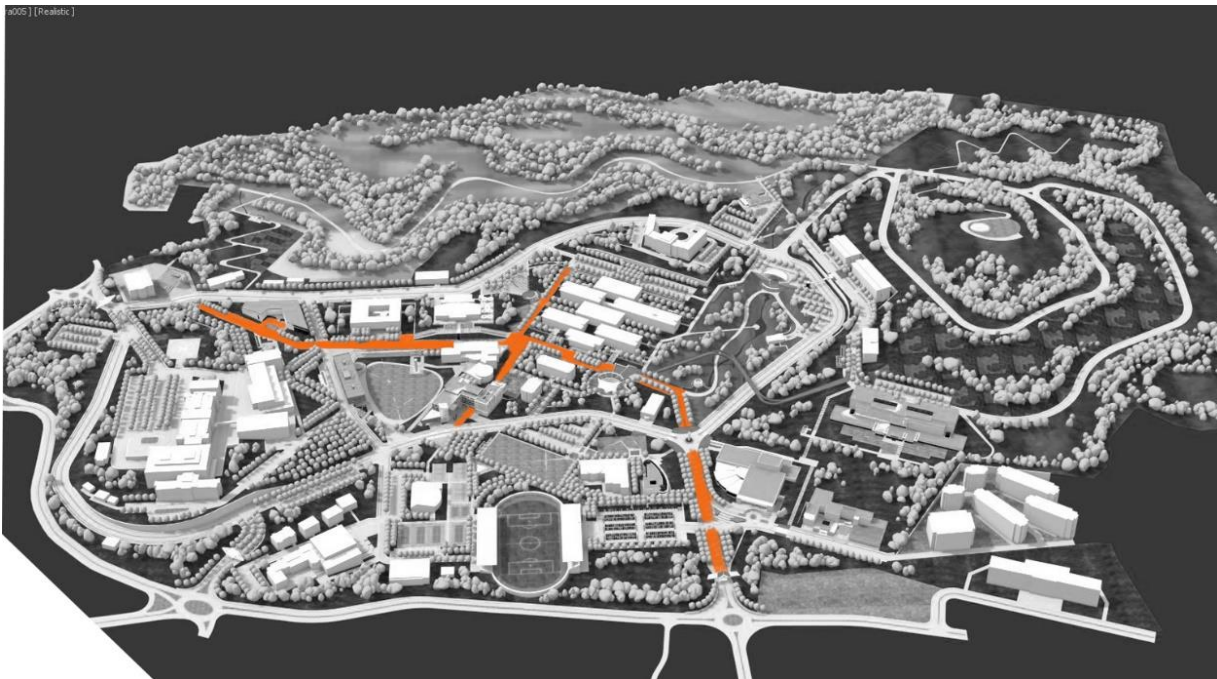


Figure 5. Campus spine system

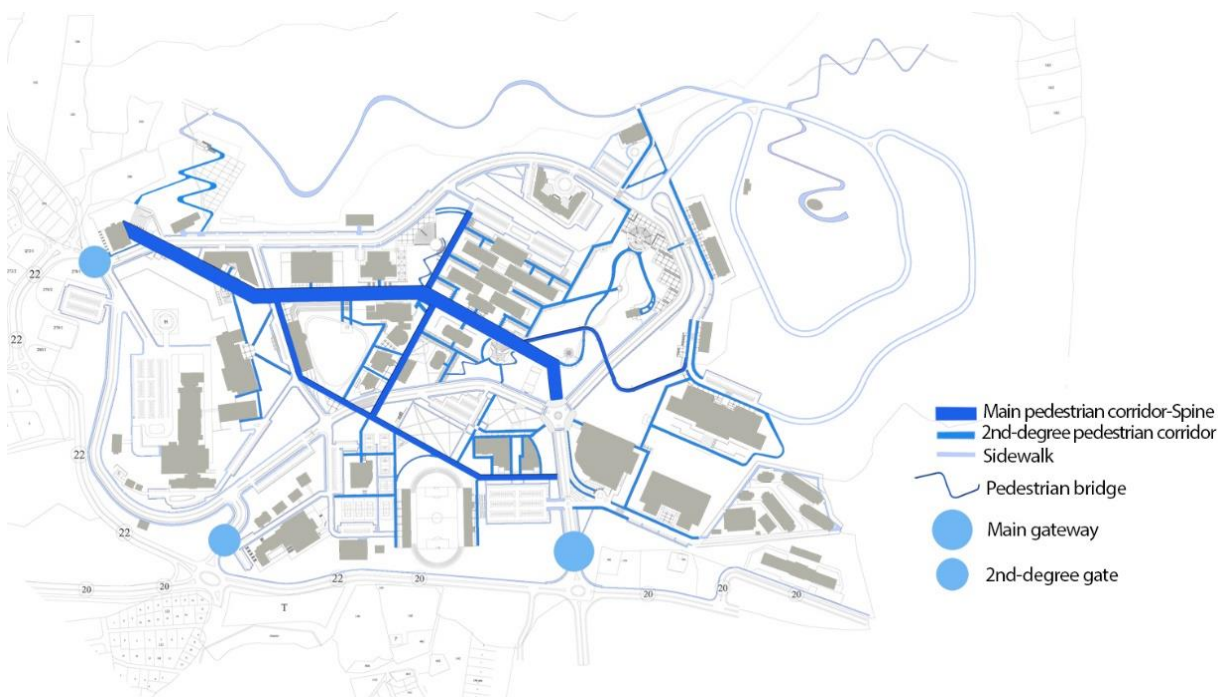


Figure 6. Proposed Pedestrian Circulation

3.3.2. Establishing a safe circulation system with pedestrian and bicycle priority

While establishing the circulation system, the main goal was to ensure accessibility and security. In this context, a model that encourages walking and cycling was created and the current circulation system was rearranged accordingly.

✓ Vehicle circulation

A hierarchical system was created in which the mainline loops from the campus periphery. Accordingly, the main road was preserved as a 1st-degree vehicle road on the campus periphery (Figure 7). A large part of the roads which are on the campus spine and around were pedestrianized and so vehicle and pedestrian encounters were prevented as much as possible.

The part between the hospital zone and the student centre is determined as the 2nd-degree road where the density decreases. This road has been foreseen to be used intensively by on-campus service vehicles. For this purpose, the main bus stop has been placed between the student centre and the hospital zone.

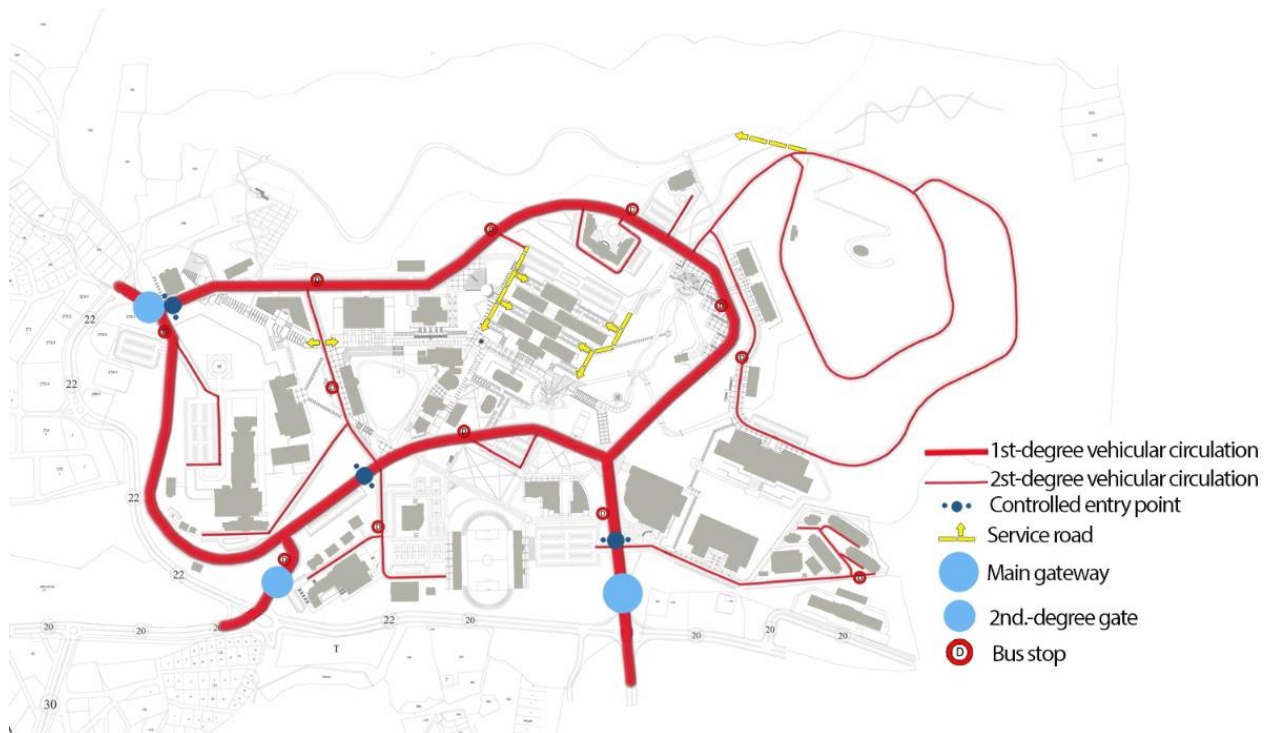


Figure 7. Proposed vehicle circulation

✓ Bicycle circulation

Bicycle road was designed parallel to the ring road and for circulating the whole campus area. In addition, the spine system and the pedestrian bridge were designed for bicycle-pedestrian common use.

Also, bicycle roads were designed as safer line by separating them from pedestrian and vehicle road by using landscape elements.

✓ Parking lots

A total of 1911 parking lots were placed in the whole area, whose parking needs were determined depending on the current density of the spatial uses and the future population change. While placing the parking lots 2.5 minutes walking distance (200m) is taken into consideration. In addition, attention was paid to ensure easy access to central points (Figure 8).

Also, bicycle parking lots are placed close to building entrances.

✓ Circulation solutions for the disabled

The quality of life of disabled individuals was aimed to increase by proposing circulation solutions that will make campus life as easy as possible for them.

In this direction, considering the sloping structure of the campus terrain, in addition to ramp solutions vertical and horizontal elevator systems also were proposed (Figure 9).

Parking lots were placed by taking into consideration the points accessible by the disabled.

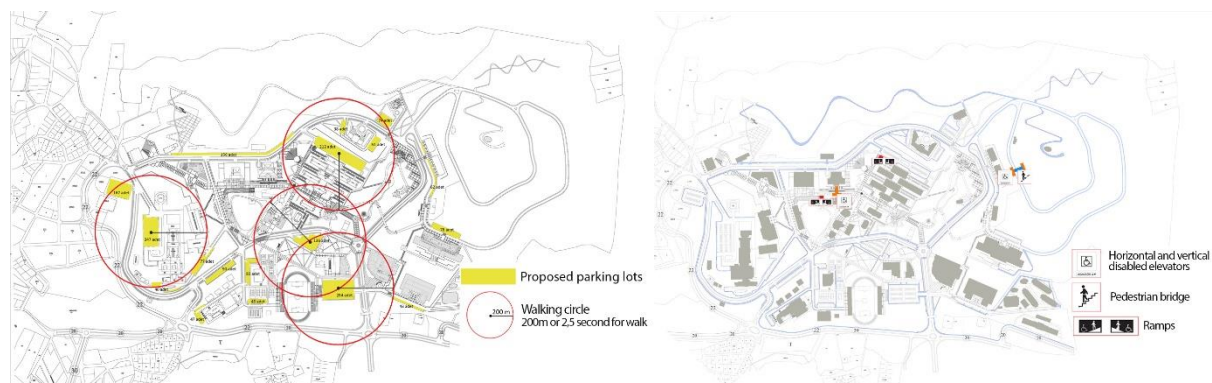


Figure 8. Proposed parking lots

Figure 9. Circulation solutions for the disabled

3.3.3. Developing campus identity

The specific structural and natural features of the campus were evaluated, and planning and design principles for their development were determined.

- ✓ Landscape character

Primarily existing natural systems (vegetation areas, valleys) were planned to protect and to develop them in a balance between protection and use.

These landscapes, which have aesthetic and ecological importance, are currently located as independent areas from each other and cannot form integrity within themselves and with other landscape areas. This situation weakens perceptibility and negatively affects the spatial character.

For this reason, primarily a holistic, clearly perceivable green space hierarchy was aimed to create (Figure 10). For this purpose;

- ✓ The existing forest area and valleys were preserved.
- ✓ An allée was designed that strengthens both circulation and landscape connections and at the same time forms the spin of the campus.
- ✓ To create habitable environments at the human scale that support socialization,

A central gathering courtyard surrounded by the student centre-library, art and design faculty and central classroom, which also forms the core of the campus, was proposed.

An art and design courtyard, surrounded by the engineering faculty, the art and design faculty and the central classroom buildings, was proposed.

Apart from these, gathering areas for free activities were proposed.

These proposed courtyards and gathering areas were designed as large grass areas defined by the plants surrounding their perimeter.

- ✓ At the main points where pedestrian circulation lines intersect, the squares were defined.
- ✓ To diminish the sense of the building density in the existing campus area and to offer comfortable spaces to the users,

The car parks between the technical education faculties and the engineering faculties were removed and tree areas were settled.

Pedestrian, bicycle and vehicle roads were separated from each other by vegetative solutions and shade trees were used densely.

To reduce the structural effect of the existing retaining walls, vertical garden solutions were proposed.

- ✓ Within the scope of the open green area system, new sports areas were added in addition to the existing sports fields.



Figure 10. Proposed green system

3.3.4. Constituting A Dynamic Campus Life

To ensure that the campus users interact not only with certain places and people but also with all the places within the campus and different users, so that to meet the need to be included in a community and constitute a sense of belonging to the place uses were proposed that will enrich the campus life in every aspect (social-cultural- recreational- academic) (Figure 11)(Figure 12).

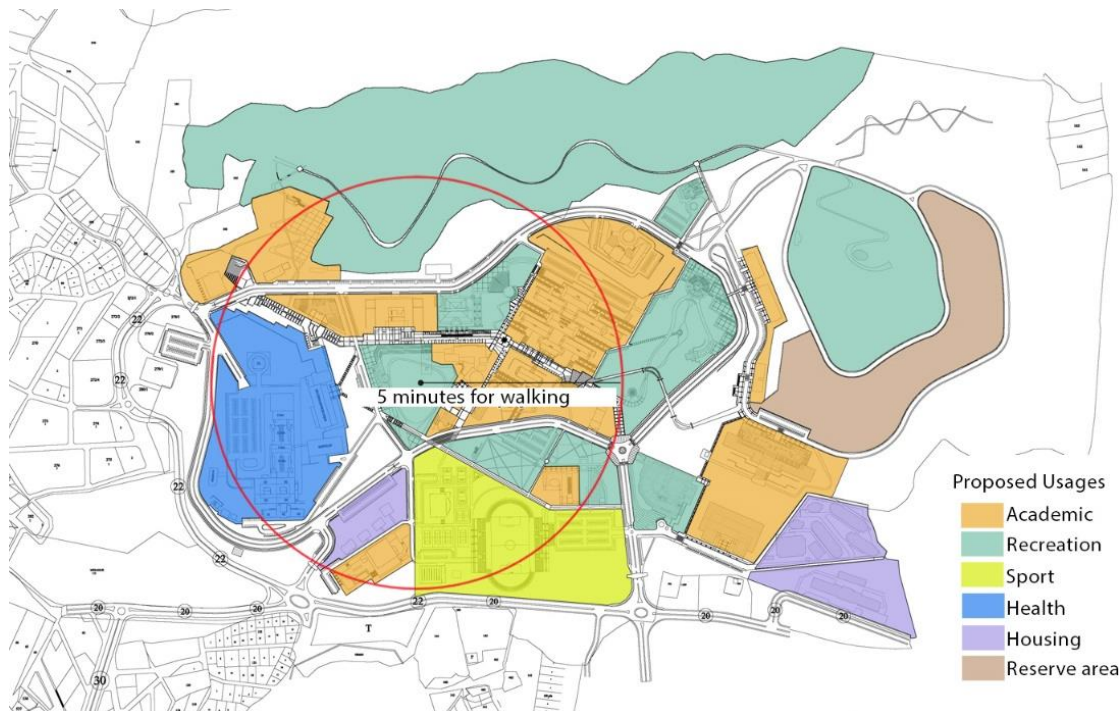


Figure 11. Proposed space usage

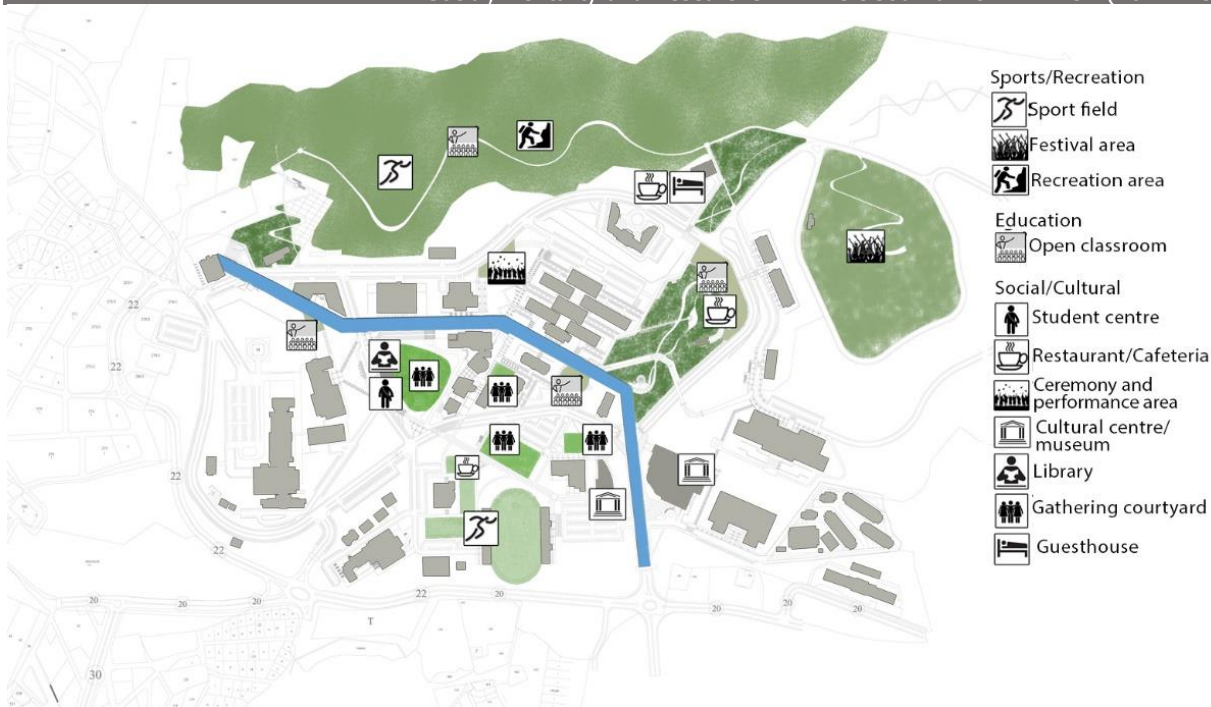


Figure 12. Proposed campus life

In this context, the student centre-library and art and design faculty were placed in the area defined as the campus core.

The student centre-library, whose outdoor use is supported by a lawn amphitheatre, and a gathering court (green core) where free activities can be held within this core surrounded by the existing central classroom and the faculty of art and design, which is thought to complement this system, were designed (Figure 13). Thus, it was aimed to provide integrity between the functions of the buildings and functions of the exterior.

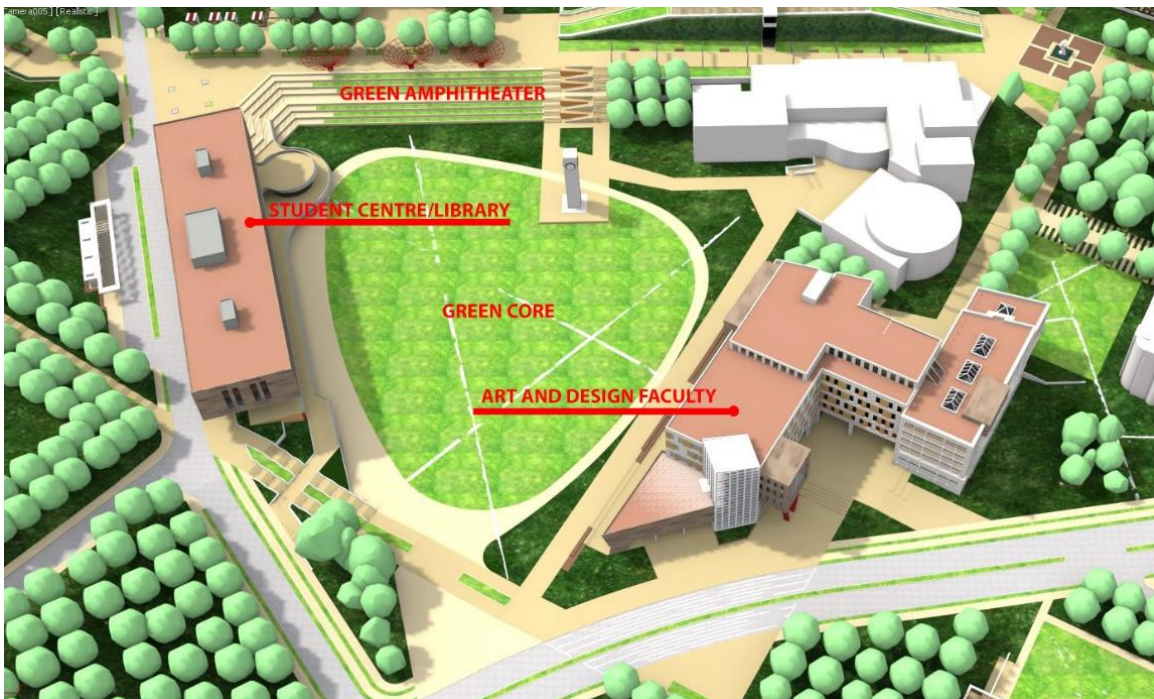


Figure 13. The core of the campus

Likewise, an art and design courtyard was created among the art and design faculty, engineering faculty and the central classroom, and this courtyard was intended to function as a space where art and design faculty students can perform and exhibit their works (Figure 14).

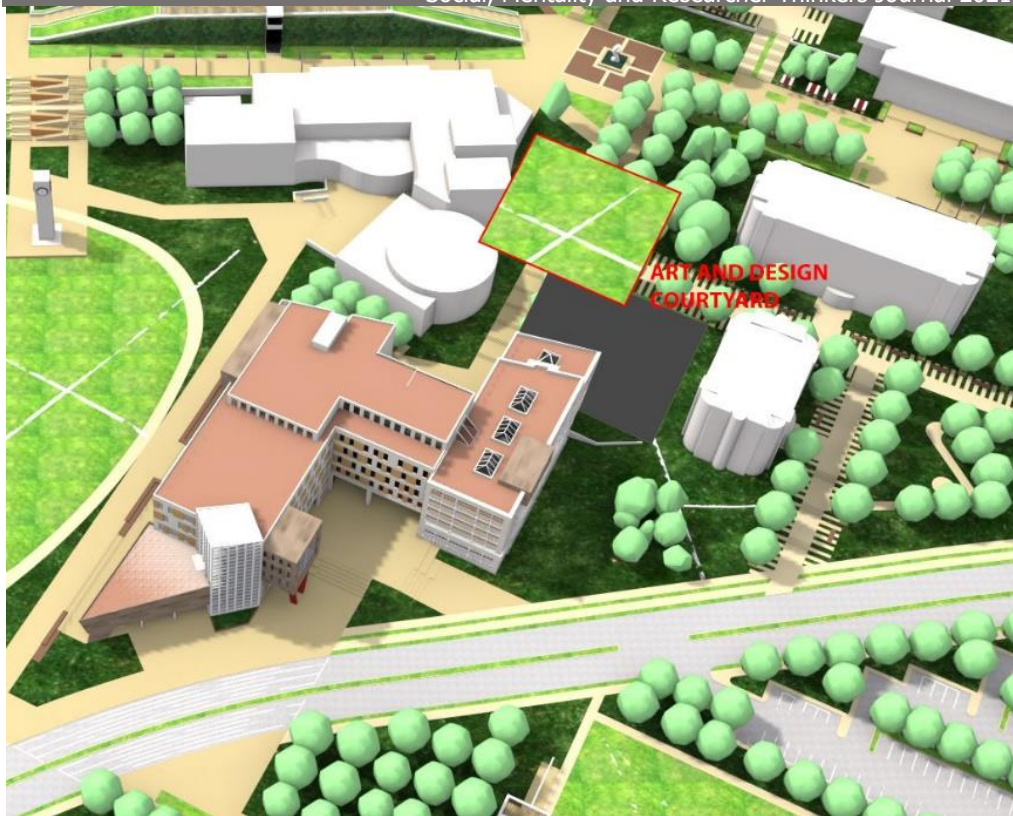


Figure 14. Art and design courtyard

Another gathering area was placed within the sports field so that it can be used as a free field sports and training area.

The cultural centre and the archaeology and nature museum were placed on the right and left sides of the main entrance axis of the campus (Figure 15). The purpose of this placing is that these spaces should be located at a point where they can be easily accessed, considering that they will serve not only the university students but also the public. In addition, these places will strengthen the image of the campus.

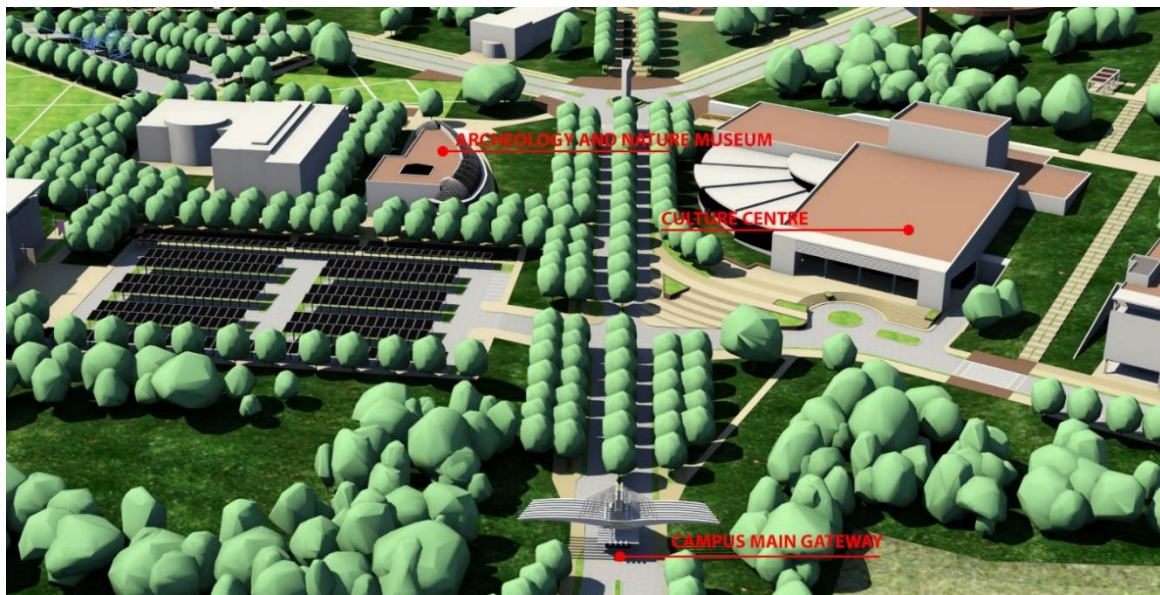


Figure 15. Campus main gateway

The guesthouse, which can be used by both the university and the public, was located at the entrance of the forest area, which was enriched with recreational activities (walking, cycling, horse riding, canopy tours and nature observation) and is thought to be used for educational purposes.

Within the scope of the protection-usage balance in the valley area, the observation terraces, water show area and a cafeteria are included, and the existing amphitheatre was preserved (Figure 16).

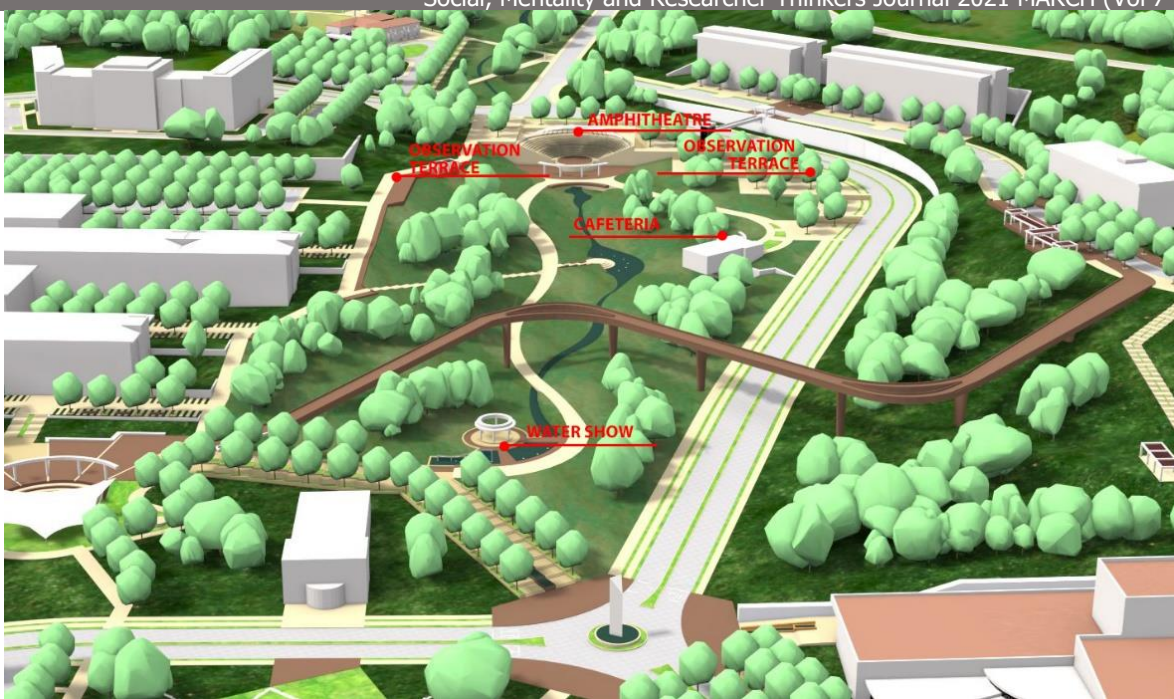


Figure 16. Valley area

In addition to the existing academic units, education-training spaces that can be defined as "flexible" supporting learning outside the classroom were created. In this context, those were proposed, agricultural practice and experimentation areas near the existing greenhouses, open classrooms near the faculty of engineering and theology, and archaeology and a natural museum, which is thought to support the faculty of agriculture and natural sciences. Protected areas (valley and forest area) were considered as places that can be used especially for nature observation and plant recognition.

An open area, which connects the food and beverage service area and the allée, where academic ceremonies and stage performances can be held, was placed on the slope between the technical education faculty and the social facility (Figure 17).

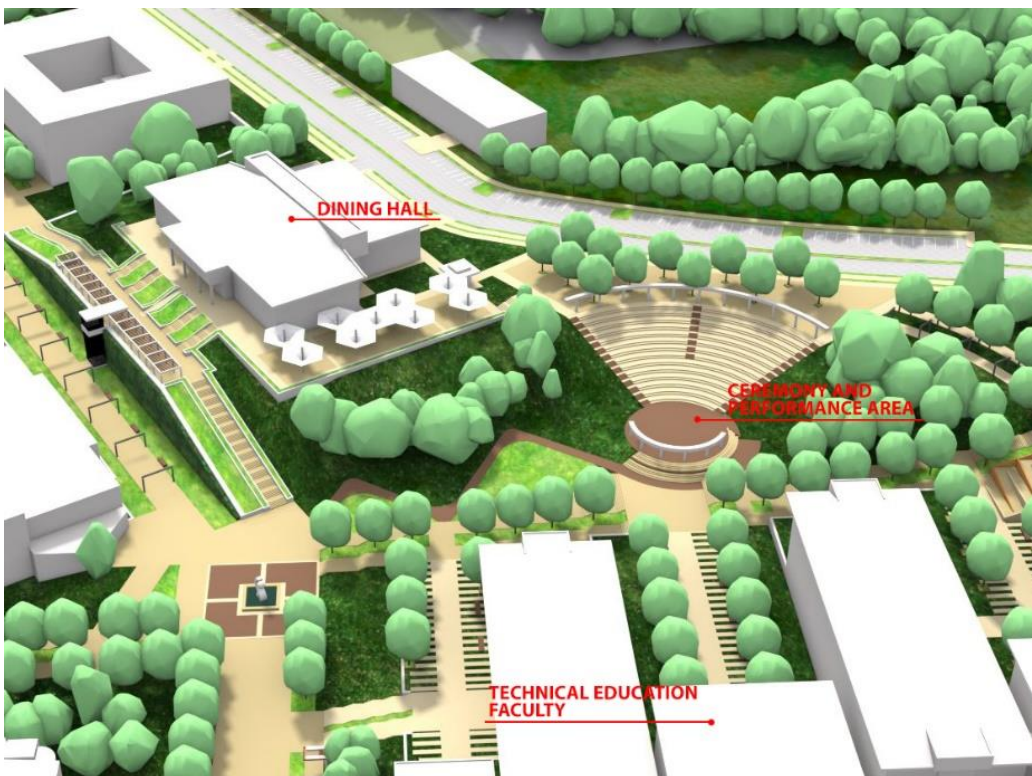


Figure 17. Ceremony and stage performance area

3.3.5. Ensuring Sustainability

Within the scope of ecological sustainability, primarily, proposals were developed for the protection of existing natural systems (forests and valleys).

To diminish the existing building density perception of the campus area and to create comfortable spaces for the users, an open green area system was created, which is considered as the continuation of the protected areas and ensures the integrity of the campus.

In the afforested areas, which are a part of this system, it was planned to create shadow areas, especially by choosing tree species that can create shade, thus it was aimed to provide spatial comfort by reducing the ambient temperature.

In this context, the retaining wall located in front of the food and beverage service area was designed as a vertical garden.

For the effective use of water in the campus area, care was taken to ensure that the plant species to be used belong to that region, and those that are resistant to drought were selected among the species that do not belong to that region.

For the irrigation of the plants within the campus, rainwater is considered to be collected and recycled. In this context, the use of sealed floors in outdoor areas was kept as low as possible, and permeable surfaces were preferred. In addition, parking lots with large surfaces were designed in such a way that water can be harvested. It was planned that the water collected from the campus area will be directed to the parking area with solar panel systems at the entrance of the campus and collected in a cistern placed here and pumped back to the campus area for irrigation with the energy to be obtained by solar panels.

When we consider the circulation system in terms of sustainability;

Aiming to reduce the use of individual vehicles, a circulation system that takes pedestrians, bicycles, public transport and private vehicles holistically was proposed.

It was aimed to reduce car-oriented mobility and to develop solutions that will increase pedestrian safety as much as possible, increase walkability and encourage bicycle use.

To ensure social sustainability, places, where different users can be together, were created and also some use to bring university students and citizens together were proposed. In addition, pedestrian mobility was highlighted, and the public transport system was supported to reduce the use of private vehicles. Thus, it is aimed that campus users interact with each other.

3.4. Designing Campus Master Plan

With the determination of the design strategies, a campus master plan was developed in light of these strategies. The campus master plan is given in (Figure 18).



Figure 18. Master plan

4. CONCLUSION

University campuses, which constitute an important part of the urban landscape, are important places in terms of social, cultural, ecological, and economical terms not only for themselves but also for the city they are located in. Therefore, the decisions to be taken in the planning and design of these spaces directly affect the campus users and the spaces on the campus as well as are important for the city and the city dwellers.

Within the scope of this study, some basic criteria to be considered during the planning and design of high-quality campus landscapes were put forward and in line with these criteria, it was concluded that quality campus landscapes should not only be a place that meets the basic requirements but also functional, original and sustainable spaces.

The sample campus area evaluated in this context was seen to have problems in terms of the circulation system, spatial character, spatial and usage diversity. Therefore, planning and design goals were determined by targeting these problems first and strategies were developed for them.

As a result, a pedestrian-oriented and sustainable campus master plan has been developed for Düzce University, which has a unique atmosphere, spatial integrity is ensured, social and cultural interaction is experienced more intense, recreational opportunities are diversified.

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