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KIRKLARELI UNIVERSITY KAYALI CAMPUS PLAN: DESIGN FRAMEWORK AND DEVELOPMENT

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Abstract

The social, residential, recreational, cultural, and sports activities provided within university campuses play a significant role in higher education. In Turkey, numerous universities have been established in the last 20 years, and construction continues within the planning criteria on the designated campuses, parallel to the education provided. Kırklareli University was founded in 2007 with a large campus area outside the city. Since its establishment, the Kayalı Campus has provided many buildings, infrastructure, and environmental construction, dependent on master plan design criteria and other conditions. Priority design principles include separating pedestrian and vehicular traffic, defining building areas functionally, and ensuring accessibility and balance in placing squares and open distribution areas. In this study, the Kayalı Campus, an example of a significant out-of-town campus plan, was evaluated as a case study, and its structural development was observed over time. Firstly, a literature review was presented on university campus design, followed by a design brief on Kırklareli University Campus design project completed in 2009. Satellite images taken from the start of construction to the present day were presented, and the development was evaluated based on the master plan. The change in the transportation and zoning framework defined by the campus plans' regulatory and guiding role was compared with the current construction. Thus, the feedback on the campus plan development process was revealed over a long period with development decisions, management, and budget inputs. This study can be used as a framework for evaluating the development of different campuses and supporting subsequent decision-making processes with advanced land-use analysis.

Keywords: Kırklareli University, Observation of Development, Campus Plan, Satellite Images.

KIRKLARELİ ÜNİVERSİTESİ KAYALI YERLEŞKE PLANI: TASARIM ÇERÇEVESİ VE GELİŞİMİ

Özet

Üniversite kampüslerinin, içlerinde sağladığı sosyal, konaklama, rekreasyonel, kültürel ve spor aktiviteleri ile, yüksek öğrenimde önemli bir rolü vardır. Türkiye'de özellikle son 20 yılda kurulan çok sayıda üniversite belirlenen kampüslerinde planlama kriterleri çerçevesinde yapılaşmaya devam etmekte ve buna paralel olarak eğitim vermektedir. Kırklareli Üniversitesi 2007 yılında kurulan ve şehrin dışında belirlenen geniş bir kampüs alanına sahiptir. Kurulduğu günden bugüne kadar Kayalı Kampüsü'nde master plan tasarım

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kriterlerine ve diğer koşullara bağlı olarak önemli bir miktarda bina, altyapı ve çevre yapılaşmasını sağlamıştır. Yaya ve taşıt ulaşımının ayrışması, bina bölgelerinin tanımlanarak fonksiyonel olarak ilişkilendirilmesi, erişim eşitliği ve dengeli yerleştirilmiş toplanma ve dağılma açık alanları içermesi öncelikli tasarım ilkeleri içinde gösterilebilir. Bu araştırmada, bir şehir dışı kampüs planı örneği olan Kayalı Yerleşkesi örnek vaka olarak değerlendirilmiş ve yapısal gelişimi zamana bağlı olarak gözlemlenmiştir. Öncelikle üniversite yerleşke tasarımı hakkında literatür araştırması sunulmuş, devamında 2009 yılında proje çalışmaları tamamlanan Kırklareli Üniversite Yerleşke tasarımı anlatılmıştır. Yapılaşmaya başlama tarihinden günümüze kadar alınan uydu fotoğrafları zaman aralığı içinde sunulmuş ve gelişimi master plan üzerinden değerlendirilmiştir. Kampüs planlarının sahip olduğu kural koyucu ve yönlendirici rol nedeniyle tanımlandığı ulaşım ve bölgeleme çerçevesinin değişimi mevcut yapılaşma ile kıyaslanmıştır. Bu sayede; gelişim kararları, yönetim kararları ve bütçe girdileri ile uzun bir zamana yayılan gelişme süreci kampüs planı proje çalışmasının geribildirimi olarak ortaya konmuştur. Çalışma ileri düzey arazi kullanım analizleri ile desteklenerek sonraki karar verme süreçlerine destek olmak ve farklı kampüslerin gelişimini değerlendirmek için bir çerçeve tanımı olarak kullanılabilir.

Anahtar Kelimeler: Kırklareli Üniversitesi, Gelişim Gözlemi, Yerleşke Planı, Uydu Resimleri.

1. INTRODUCTION

University campuses can exist by establishing different relationships with the city through their various functional and spatial contents. They can be divided into urban and suburban universities depending on their location, distance from, and contact with the city (Güneş & Gökçe, 2022). The relationship and interaction between the university and the city it is located differ in both cases (Kuyrukçu & Alkan, 2021). The campus land's size, shape, and location directly affect the planning and construction of the campus within or outside the city. For these reasons, the selection of the location for the university and the corresponding campus and development plans guides all kinds of activities within the university and their relationship with the city.

After 2000, approximately 140 state and foundation universities were established in Turkey, bringing the total number of universities to 208 (YÖK, 2023). Some were established in cities where universities already existed, while others were the first to be established in that city. The recent increase in the number of higher education institutions can be attributed to establishment of 16 universities in 2006, 22 universities in 2007, 15 universities in 2008, 9 universities in 2009, and 17 universities in 2010 (Mevzuat Bilgi Sistemi, 2023). The newly established universities have started to develop and construct one or more campuses of different sizes, which are designed according to the project conditions they possess and the strategic plans they prepare, either within or outside the city.

Kırklareli University, founded in 2007, continues its activities and structural development in Kayalı Campus and other campuses (‘Kırklareli University’, 2023). The land of the Kayalı Campus, which is the scope of this study, is the outer university campus, 10 km from the Kırklareli City Center. The University Campus plan was prepared in 2009, in which the surroundings had no urban or rural development. Due to these features, it is a valuable and instructive example of an outer city campus among recently established universities. Initially, a literature survey was explored regarding university campus plans and features of the planning criteria. Subsequently, the project's design brief was presented, including the conditions of the land and the university, the design concept of the university campus plan,

transportation, and zoning schemes. Finally, the university's development from the foundation time interval until today was evaluated and discussed over the captured satellite images.

2. LITERATURE SURVEY

2.1. University Campuses

The word "campus" was first used at Princeton University in the 18th century (Turner, 1984). Campuses have different effects when located inside or outside of a city. Furthermore, the size of the city also diversifies the interaction with the university campus. For example, universities established in small towns significantly impact shaping their surroundings (Merlin, 2006). This relationship is relatively closer near the city in large cities and less in the remaining areas.

Important educational institution models belonging to different cultures and examples of structures such as madrasahs and colleges exist. However, the general campus planning issue was not a subject that was studied and researched until the 1940s (Sun & Chiou, 2019). As a precursor, Dober (1992), in his study containing four different series, discussed three important topics about the campus; planning, architectural, and landscaping issues, and revealed important planning modules and building standardizations. Developing the relationship between universities and the city they are located in and going beyond being a scientific hub is a topic being re-evaluated according to current conditions (Oktay, 2007). According to this evaluation, it is expected that every university established should establish a relationship with the city. Universities are designed as self-sufficient campuses with all the necessary accommodation, shopping, sports, health, and cultural units in addition to education, research, and service buildings on their campuses (Türeyen, 2002). With these functions, universities plan activities and events that can be participated by not only academics and students but also people in the city.

Planning for internal pedestrian and vehicle transportation networks is done during the university campus's urban design stage. This planning evaluates connection locations and forms to the urban transportation network. Entrance gates and transportation elements designed for the designated areas comply with these main principles and campus transportation criteria. Over time, university structures and their immediate surroundings, shaped by the transformation and change of old functions, may have other situations. For example, universities that emerged as urban institutions in Europe have educated in college buildings in cities and then moved to larger settlements outside the city that can grow and develop (Kuyrukçu & Alkan, 2021). In newly established settlements outside the city and neighboring cities, there are no situations such as the mandatory elements of existing building conditions, inability to build, or inability to establish connections to transportation networks. For the proper and rapid development of a university campus, rational design decisions which consider functionality and flexibility and a transportation network that is in relation with buildings zone with pedestrian and vehicle scale are important (Çalışkan, 2023a).

Important topics in the design of educational campuses are listed as follows(Terro, Soliman, & Angell, 2021):

- Urban characteristics, Climatic characteristics
- Access, Traffic

- Services and amenities, Land use
- Pedestrian and vehicle circulation
- Building placement and features
- Sustainability and Flexibility
- Phasing and Life Cycle Cost

The above headings should not only be considered technical problems but should also be thought of together with identity, belonging, and being a place during the design process. Universities established within or outside of cities are important actors contributing actively and passively to the city's cultural and social aspects and activities (Gürsoy, 2018). They participate in the city's activities, daily life, and long-term plans, far beyond being a collection of buildings. The scientific and cultural events, sports and social activities, recreation areas, and opportunities offered by the campus are important for academics and students who use the university and the entire city, starting from the surrounding area.

The development of the relationship between universities and the city, beyond being a center of science, is a subject that is constantly re-evaluated with updated and ever-changing trends (Oktay, 2007). In this regard, universities established, especially within or near cities in Turkey, are expected to contribute to the city. How a university develops relationships with the city in which it is established and what changes it brings are different for every city and university (Kuyrukçu & Alkan, 2021). Factors such as the size and mission of the university, history, social fabric, industry and production, and the city's cultural diversity affect this relationship.

When universities are established in Turkey, they plan their campuses with strategic plans prepared at the institutional level. There is a need for needs analysis created by evaluating building analyses, educational programs, campus, and environmental issues (Lidsky, 2002). All state universities established in Turkey provide services with the method of approving the strategic plans they prepared and implementing these plans in the short, medium, and long term (‘T.C. Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı’, 2023). The university system in Turkey offers diversity for some social, administrative, and geographical reasons, and establishing a dynamic university structure requires long and gradual planning (Güneş & Gökçe, 2022). In addition, many universities have experienced this long process by moving outside the city due to rapid urbanization. Universities outside the city also need to provide many opportunities that the city offers inside and within themselves (Körmeçli, 2022).

2.2. Transportation, Services and Planning

In literature, planning typologies are diversified and are called by different names. Some examples include (1) dispersed settlement, centralized settlement, molecular settlement, network settlement, and linear settlement; (2) core-based approach, linear approach, and grid approach; (3-outside the city) scattered planned, centrally planned, radial planned, clustered planned, network, and multi-polar; (4-inside the city) developing in organic tissue, developing in building blocks, network, and can be given linearly (Erçevik, 2008; Erkman, 1990; Güneş & Gökçe, 2022; Türeyen, 2002).

It is possible to see designs and practices in many universities prioritizing pedestrian circulation and building access. Universities must plan transportation with vehicle options,

an essential requirement of today's world (Kahveci, 2021). Therefore, how much and in what quality the relationship between pedestrian scale and vehicles will be maintained determines how directly that university interacts with people. It is not easy to control this in parcel-based universities located within the city because transportation is provided from the city transportation network that does not belong to the university. This create a design problem to solve in which integration of existing building, connection to urban transportation network and proper relation with open and dense areas of city should be sustained (Çalışkan, 2023b). A campus is expected to establish its relationship with the city in individual and mass transportation, pedestrian, and bicycle scales. The city is having this system which will contribute greatly to this situation.

In the design of university campuses, internal pedestrian and vehicle transportation networks are planned to establish a connection with the city. The connection points to the city's transportation network are determined based on campus design criteria and urban transportation network principles. The entrance gates designed for the designated areas also comply with these main principles and campus transportation criteria. Naturally, since universities established in urban areas have developed following the existing urban structure, they may not have the ideal transportation relationships in their planning. For example, universities that emerged in Europe as urban institutions initially started their education in college buildings in the cities where they were established. Some later transitioned to independent campuses that could grow and develop outside the city (Kuyrukçu & Alkan, 2021). Universities that stayed in the first settlement areas of the city and wanted to continue to stay there adapted to these conditions.

According to Erkman (1990), a campus should include the functions of working, housing, resting and recreation, and transportation. These functions should work together and establish a relationship within a pattern. Urban universities may have the option or obligation to provide functions such as housing and nutrition within the city infrastructure. Therefore, strategic decisions are made based on the size of the campus land and the urban texture of urban universities in this regard.

The elements that make up the circulation system on campus can be considered into four main groups: entrances, roads, squares, and parking lots (Türeyen, 2002). Roads are separated into vehicle, pedestrian, and bicycle lanes according to their usage, and they also have different length and width measurements for the transportation network. The entire campus should be planned to support easy access to buildings, considering the walking distance of pedestrians, and should not be affected by vehicular traffic. Considering that universities are centers for development, research, and innovation, it is natural to expect a campus that prioritizes people and nature, is innovative and research-oriented, and offers indoor and outdoor spaces. The physical form of the university is an important principle of being a sustainable campus that provides access to open and recreational spaces at a pedestrian scale (Yerli & Ozdede, 2017). Therefore, transportation networks alone should not be evaluated; they should also include access and usage methods to open spaces at a pedestrian scale.

Accessibility and equal access are universal concepts that need to be considered for universities and all building and urban elements. In addition to being holistic, sustainable, and improvable, universities must also be accessible (Osman, 2018). Accessibility, which results in building design level, begins with the main concept of campus planning, and therefore, elevation, level, and transportation network must be considered collectively at the planning stage.

3. MATERIAL and METHOD

The research method includes three parts (Figure 1). The first part presents Kırklareli University Kayalı Campus Plan as research material. The main features of the campus, transportation, building zones, and land properties are given. Secondly, the satellite images from Google Earth are presented, and evaluation through observation is conducted. The images were captured before the construction period until today and compared with the planned, designed campus. The time sequence availability regarding images limits the system's released analysis.

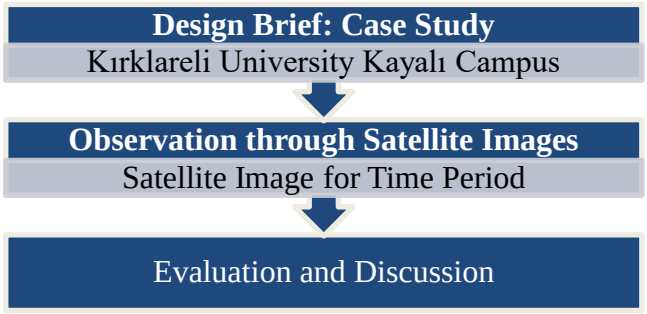

Figure 1.Research Flow

4. KIRKLARELİ UNIVERSITY KAYALI CAMPUS: DESIGN BRIEF

4.1. Kırklareli and Campus Location

Kırklareli is one of the west border cities of Turkey. The location of Kayalı Campus in relation with Kırlareli City Center is shown in Figure 2. The campus area is approximately 10 km from the city center, and the surrounding settlement density is almost nonexistent. These situations are an obvious example of campuses for the outer city universities. It was founded on 29.05.2007 and serves 12 faculties and three institutions with 24.000 student enrolment today (‘Kırklareli University’, 2023). Some other faculties and schools of the university in diverse villages of Kırklareli include Lüleburgaz, Vize, Pınarhisar, and Babaeski. The total area of Kayalı Campus is approximately 3.450.000 m2, which the planned campus is fewer. The land is next to the Pond of Kayalıköy Dam from the north direction.

Figure 2.Location of the Campus[2] ('Google Earth', 2023)

4.2. Campus Plan

The design studies of the Kayalı Campus were finished at the end of 2009, and the construction and development works have started on the site in parallel with the completion. An important advantage of the location is being free from any surrounding settlement and city services. It is the general situation of outer city university development. From the opposite perspective, the need for many buildings completed to start education is a disadvantage. The education buildings and services facilities for transportation, dining, and recreational developments should be completed at a level. Before construction, the existing map of the campus land (Figure 3) underlined the area's division into two parts by valley morphology from northwest to southeast. In the figure, every contour shows one meter level difference. By exploring the contour lines, the height changes from all directions can be followed. One part is in the north with an area of 2.500.000 m2, and the other is in the southwest. The pre-ground examination of the land showed that rock distribution on the surface makes it harder for excavation work. The north part starts at 250.0 m, rises to 273.0, and decreases to 261.0 m in the southwest-northeast direction. For the perpendicular direction, the level starts at 260.0 m at the northwest, decreases at the valley to 220.0 m, and rises to 260.0 again at the southeast corner of the land. Examining the land slope is important to find a proper layout of the zone and transportation axis, considering the views, minimum excavation, and accessibility. It should be noted that the slope is near 2.00% in the direction from southwest and northwest in the north part of the area. Besides, deciding the overall settlement areas is critical to be approved by the government agencies for sustainable and manageable development of newly founded universities.

[2] Figure is oriented due North up direction.

Figure 3. Map of the Kayalı Campus (Project Author, 2009)

There are various examples of campus universities in the world and Turkey. As a result of meetings between administrators and designers at the pre-design stage, Kırklareli University Kayalı Campus Plan was decided to be based on functional areas, and a transportation scheme was developed that associated regions with their respective distances and orientations. This transportation scheme should adopt an approach that emphasizes the importance of transportation and offers development opportunities in parallel to the existing terrain features, slope, surface typology, and orientation. During the design phase, a certain framework was established that complied with the conditions proposed by the State Planning Organization ('T.C. Cumhurbaşkanlığı Strateji ve Bütçe Başkanlığı', 2023), legal regulations, budget constraints, and the university's strategic plan. Accordingly, the main settlement area should not exceed approximately 1.000.000 m2, and a compact development plan should be designed to consider infrastructure costs and accessibility. Faculties should be integrated, and classrooms and laboratories should be used jointly. Based on these preliminary decisions, an initial plan was developed that emphasized accessibility criteria and energy efficiency goals, encouraged bicycle use, and focused on common areas that would serve as the center of activity and connect building areas with different centers.

The existing features of the campus area, surface conditions, slope, view angles, sun direction, and wind effects were studied at pre-design stages, and they have governing contribution to the design at diverse levels. Pre-design observations and features are crucial for any designer to shape the process of solving any design problem. The dam pond has a vista from the north and northwest areas of the campus. Besides, the slope direction makes possible to make visual relations possible. The campus area was not surrounded by any urban settlement in which any pre-constructed building can affect the wind and sun. By founding the campus transportation framework and related building zones in the proper orientation, it is possible to increase the utilization of sunlight. Considering these facts and requirements of a university campus, the transportation framework and zones were first figured out. The

transportation network and building zones are shown in Figure 4, and the master plan is shown in Figure 5. It was thought that the transportation axis created from southwest to northeast would benefit the settlement of the building zones and the service of the transportation network. It also aimed to create a pedestrian-friendly campus plan for all regions with non-vehicle traffic and pedestrian and bicycle paths. In light of all these definitions, a main pedestrian road was created that did not exceed 2% slope in the southwest to northeast direction. Building areas were associated with this pedestrian road's northern and southern facades. The total length of this pedestrian road is 1000 meters, and two different squares were planned on it. The first square, located to the east, was shaped by functions such as the rectorate, library, and cultural congress, while the student center and central classroom buildings defined the second square to the west. The second square also provides access to the development area and sports zones in the southeast direction. The main settlement area is approximately 7.000.000 m2 hectares and does not interrupt the pedestrian road that will receive sufficient transportation services.

The entrance road, which is planned parallel to the campus settlement from the state road coming from the east and provides access to the land, divides into right and left directions at a main intersection and provides transportation to the square defined by the library, rectorate, and culture congress center until it reaches there. The building areas on both sides of the main pedestrian axis are approximately 250 meters deep and have a width between 200 and 300 meters, depending on the characteristics of the buildings they contain. In addition to the main settlement area, the second vehicle road planned with the axis has created a development area with seven building zones within an area of approximately 250.000 m2. The pedestrian path starts with the student center in the north and ends with the sports areas passing through the development area in the south. In the east, the main axis starting with the campus entrance, passes through all building zones and ends with the amphitheater by establishing relationships with different types of squares and open areas. Kırklareli University campus plan is an organized settlement with building zones that offer development opportunities to the land and investment conditions prioritizing pedestrian transportation.

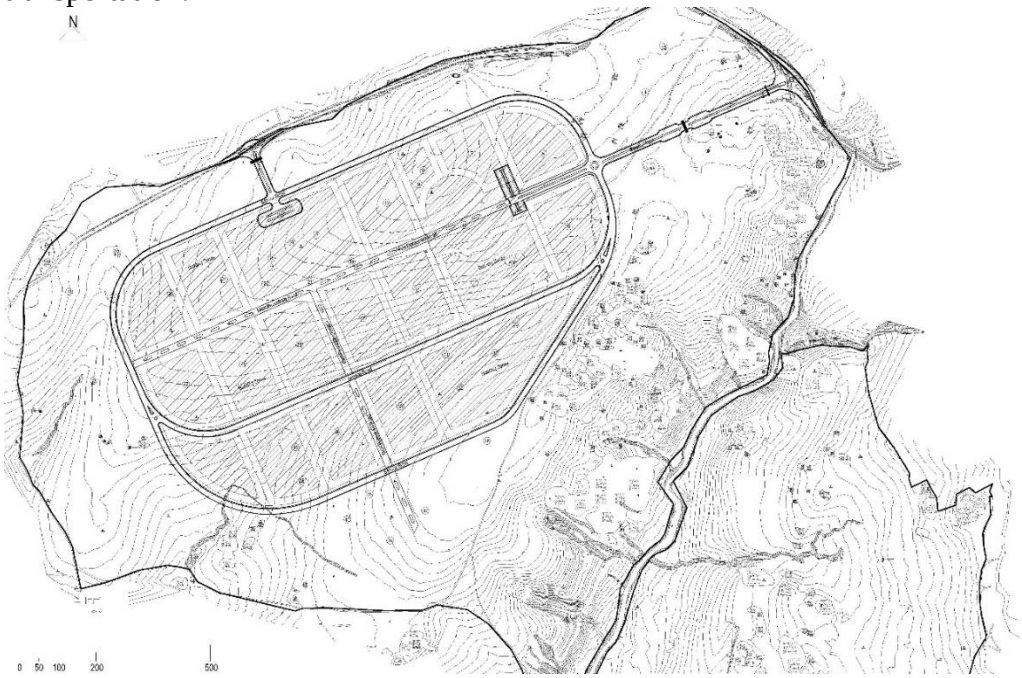

Figure 4. Transportation and Zones (Project Author)

Figure 5. Master Plan (Project Author)

The building zones, open areas, and main nodes were defined in the design process. Besides, the analysis of buildings was conducted as a mass study at an urban design level. The relationship between building activities, levels, pedestrian circulation, and pedestrian and vehicle access was examined. Table 1 shows the building zones, open areas, and main nodes with the master plan.

Table 1. Buildings and Zones

1	Entrance Crossroad		**21**	Student Square
2	Entrance		**22**	Central Classrooms
3	Gate		**23**	Central Classrooms
4	Guest House		**24**	Faculty of Literature
5	Faculty of Tourism		**25**	Faculty of Engineering
6	Faculty of Law		**26**	Faculty of Science
7	Library		**27**	Faculty of Technology
8	Rectorate		**28**	Amphitheatre
9	Admin. Building		**29**	Vocational School of Health Services
10	Square		**30**	School of Health
11	Convention Centre		**31**	Vocational School of Social Sciences
12	Faculty of Education		**32**	Vocational School of Technical Sciences
13	Faculty of Administrative Sciences		**33**	Student Centre
14	Entrance Gate		**34**	School of Foreign Languages
15	Bus Service Zone		**35**	Research Centre
16	Social Building		**36**	Stadium
17	Bazaar		**37**	Open Sport Areas
18	Bazaar		**38**	Indoor Sport Hall
19	Open Sport Areas		**39**	School of Physical Education and Sport
20	Open Sport Areas		**40**	Indoor Swimming Pool

5. EVALUATION of the DEVELOPMENT

5.1. Observation through Satellite Images

In this section, evaluations will be made on nine satellite images scaled in relation and master plans showing the development of the Kirklareli University campus from its establishment to April 2023, when construction had not yet started. Based on observation, the evaluations aim to present a timeline of the campus development from its establishment to the present day. The objective is to capture and record one satellite photo per year from Google Earth. However, for some dates, no satellite images could be reached, which should be noted as a

limitation of the research. Figure 6 shows the master plan and satellite photos from 2008 to 2023. The major changes showing the construction of building are shown in red boxes.

On September 2008, there was no construction on the site, and on June 2011, only the construction of a sports hall and nearby landscaping were visible. It can be seen that the absence of transportation road and surrounding usage of the sports hall. Even if the construction of the building was completed, the utilization had not started. In the photo taken in April 2013, it can be seen that the roads surrounding the development area of the campus and the connection of this road to the state road in the main settlement of the campus were constructed. However, the finish coverings of these roads were not completed. The construction of the student center, bazaar buildings, two central lecture halls, research center, and sports hall has been partially completed.

In November 2016, the student center, bazaar, central lecture halls, mosque, research center, building in Area 25, and stadium can be seen. The construction in area 5 has been completed, which is the rectorate building. The zone of the rectorate building was changed according to the original plan, which could be a stated flexibility feature of the master plan. Even if it is considered this way, there is a curiosity for the development considering the first square establishment. It can be observed that the surroundings of these buildings have also been substantially completed. When the photos taken in May 2017 and April 2018 are examined, it can be said that construction has started in building area 13 in addition to these buildings. This construction was almost completed in October 2019.

In February 2021 is examined, it can be said that construction work started in the dormitory area reserve land, located to the east of the main settlement area, where there is no drawn building mass in the area. However, this land was reserved for several buildings which could not be defined during the design phase. In addition, it can be said that the landscaping around the buildings, especially the greenery and pavements, appeared in a smoother texture in April 2023 compared to the master plan prepared in 2008.

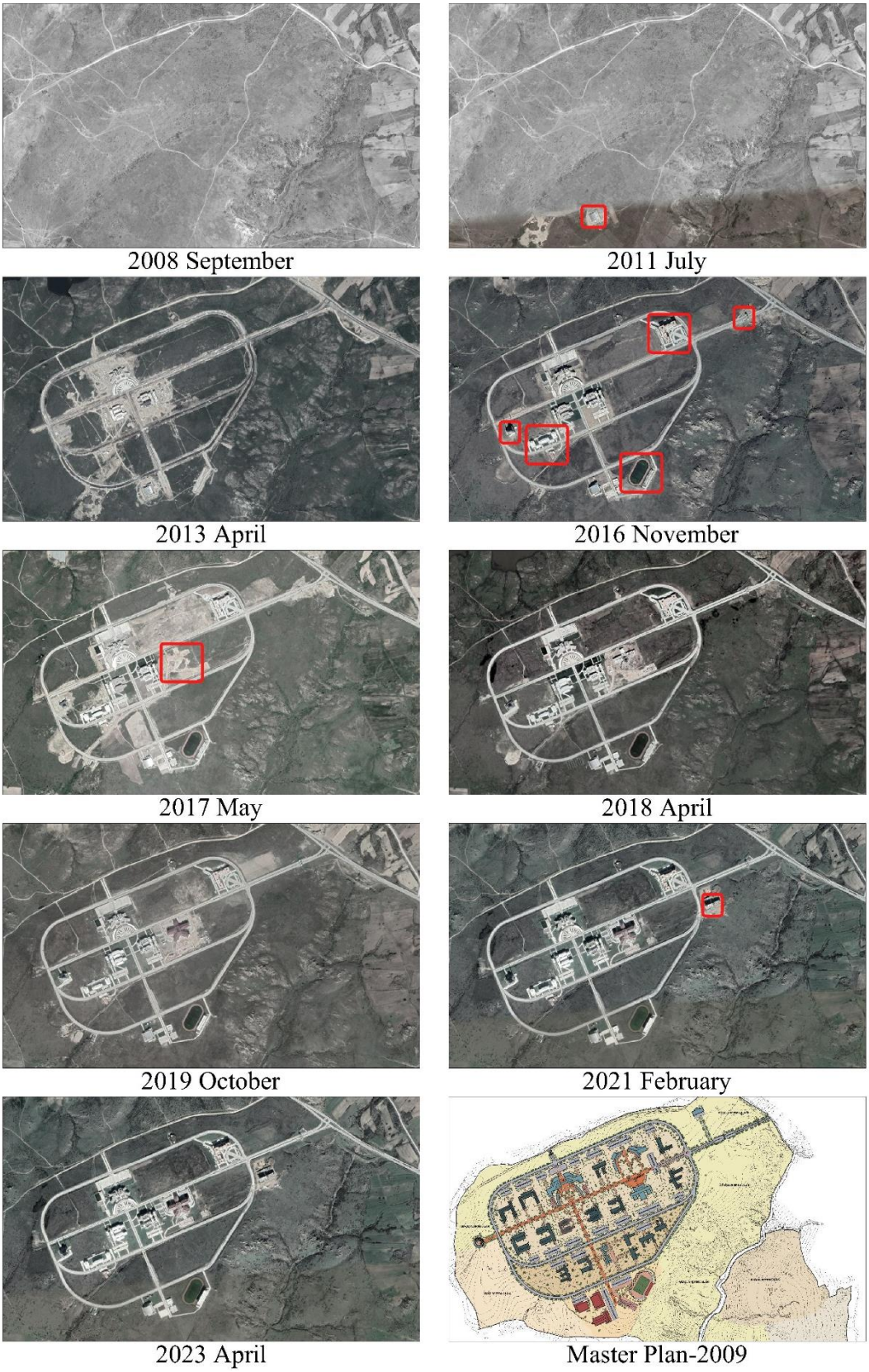

Figure 6. Progress of the Development ('Google Earth', 2023)[3]

[3] All images given are oriented due North up direction.

6. DISCUSSION

Although certain differences for specific buildings are observed, it can be said that the main framework is in integrity and consistency. The differences observed are the inclusion of the mosque building in the main settlement area, the relocation of the rectorate building, which is one of the three buildings planned around a square, to another building area in the east, and the start of construction in the dormitory area reserve land, which was left as a reserved area, but shown as a building area. In light of all these evaluations, it can be said that the main criteria of the campus plan are maintained through 14 years, such as building areas and construction principles, have been preserved, and construction continues under these principles. It was important to track development to actual state situation, compared with objectives of the original master plan, since the new decision on investments can be done by the management of instruction with the perception of the design. The campus plan and development knowledge need to be created, validated, and stored to utilize any activity or construction work.

7. CONCLUSION

The master plans of the universities stand at a point that includes knowledge of urban planning and building features. Thus, it is key for developing campuses with possible changes and relocations. Besides, the function and context of building zones could be refined through the years. Because the development of any newly founded university could not finish quickly, it spread over a wider period in which the institution's management, intentions and objectives may change. The university plan principles and framework's significant contribution is ensuring the development's integrity and consistency. In this study, Kırklareli University Kayalı Campus plan was examined with the implementation of the design brief and observation of development through satellite images. The actual situation of completed buildings and landscape stands at good compatibility. The evaluation outcomes could be used for further investment or feedback decisions and improved by detailed land use exploration. It can also be implemented in other case studies to evaluate contemporary campuses in Turkey.

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