Planning of Campus Greenways: K.T.U Example

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Abstract:

University campuses are areas that include various functional units, and large number of lecturer, student and personnel. New buildings are being added as more faculties are getting opened and more personnel are being hired. Parallel to this, green spaces in campuses are being fragmented and destroyed. This causes sufficiency problems for green space needs of people in campus. Campus green spaces are places that students from different cultures and social structures spend their time in outside their lessons. Greenway model, a possible solution to fragmentation of green spaces in campus and, also, an option of recreational activities and creating functions to raise educational, health and nature awareness, assumed to be the correct approach when modeling campus green spaces. Study site was Karadeniz Technical University, a university that has similar problems as stated above. The main purpose of this study was to give suggestions to create a model sufficient enough to fulfill people’s need of recreation, alternative transportation and education while creating ecological corridors that supports wildlife and plant variety as a solution to green space fragmentation of campus. Current state of campus green space set up was examined and suggestions were given based on “conservative” and “efficient” greenway strategies.

Key words: University Campuses, Greenways, Karadeniz Technical University

Introduction:

Recently usage of urban areas and surrounding areas have intensified this decreased landscape diversity and increased fragmentation of natural areas. Common view between landscape planners and landscape ecologists is that sustainable landscape requires an ecological frame (infrastructure). Fundamental component of this frame is the creation of the connection between fragmented natural areas in metropolitan landscape (Ahern, 1995). In fragmented landscapes, minimizing the negative effects of isolation depends on corridors that will increase the functionality of natural cycles and species movement in these areas. The most effective way to improve landscape connection is either preservation of existing natural and artificial corridor or to create new corridors (Deniz et al., 2006).

Greenway is a protected open field corridor that is created for recreation and motorless transportation. Greenways usually follow natural geographic pattern (valleys, rivers and ridges). Also they can also use long canals, other suitable corridors or abandoned railways (Flink and Searns, 1993). According to The European Greenways Good Practice Guide book, published by European Commission, greenways are; areas that allow people to use it for daily short distance traveling, such as going to work, shopping, etc. and generally created for recreational purposes (European Commission, 1998). On greenways open air recreational activities such as walking, riding bicycle, skating, having picnic, riding horse, etc. can be performed. These are active and passive activities that are generally about social, cultural and sportive interests (Kurdoglu, 2005).

Greenway is a linear open space that follows natural corridors, a canal, a landscape or a route. These areas are left in their natural state or organized for pedestrian or bicycle traffic. Greenways are linear open areas that connect parks, natural sites, historical or cultural areas and residential areas. Greenways connects public with land, parks with natural sites, historical areas to other open spaces, and associate protection with economic development, environmental conservation with life standards (Flink and Searns, 1993).

Greenways create the strategic landscape planning idea which is based on connected linear systems. There are four basic strategies
that can be used one by one or together. These are “conservation focused”, “defensive”, “aggressive” and “opportunist” approaches (Ahern, 1995). Social and cultural activity areas in universities are very important by social interaction stand point because students from different cultures, ethnics and social structures spend their spare time on these areas during their education (Ercevik and Onal, 2011).

University campuses are being planned for their recreational functions as well as for education and housing functions (Yılmaz, 1998). Functions of open green spaces in campuses are as following (Karakas, 1999);

- Creates a whole with buildings and campus,
- Provides the needed space for circulation system,
- Allows outdoor organization for recreational needs,
- Creates a connection between human and his environment within campus borders,
- Creates reserve areas for physical development of campus,

Serrano et al. (2002) described fragmentation as the missing part of landscape and next stage of the changes in the ecological processes. Balsas (2003) explained that expansion of campus makes people depend more on motor vehicles and this increases the air pollution, also, traffic load is being increased as a result of this and with more parking areas green spaces in campus gradually being destroyed.

**Study area and reason:**

Study area is Karadeniz Technical University Kanuni Campus where is located in Trabzon province of Turkey (Fig. 1,2). Karadeniz Technical University is in Trabzon province where is located in northeastern part of Turkey and has 4000 years of history. Trabzon is also located on historical Silk Road. Province population is approximately 750,000 and city population of Trabzon is 230,000. Geographically it is one of the easiest reachable centers of Turkey. It is connected to centrals of Turkey with its airport, seaport and highway network. From east to west Karadeniz Technical University has 8 different campuses. These are Of, Sürmene, Merkez (Kanuni), Maçka, Söğütlu (Fatihi), Akçaabat, Vakifkebir and Beşikdüzü campuses. Kanuni campus is located 5 km east of the city center. Kanuni campus is close to all transportation and located next to international airport of Trabzon. Main campuses of Karadeniz Technical University are Merkez-Kanuni and Söğütlu-Fatih and total area of 8 campuses is 1.422 acre. In all of these campuses total indoor area is 467.581 m². 84.210 m² of this area are classrooms (18,4%), 54.110 m² laboratories (11,6%), 6.751 m² indoor sport facilities (1,4%), 12.258 m² cafes and canteens (2,6%), 61.008 m² apartments (13%) and 226.563 m² administration buildings (48%). Total area of open sport facilities is 22.681 m² (5%) (URL 1, 2010).

It can be seen in these data that for open air sport activities only 5% of the total campus area was used. Two campuses approximately have 955 m² open green space but only 22.681m² of that area is being used for sports. Green spaces provide limited recreational usage. Other green areas that can provide recreational functions have accessibility problems. Limited alternative transportation opportunities, having no green continuity, limited roads and pedestrian routes beside main motor vehicle road make it difficult to access some activity areas. This prevents some people in campus to use these areas and limits its functions only to those who are near.

Campus hosts many students from different countries and this feature makes the university special among other universities in Turkey. New buildings are being added as faculties and academic staff increases. This fragments, breaks down and eventually destroys the green spaces (Fig. 3). This creates problems for people in campus that needs green spaces. According to a study of Kurdoğlu et al. (2013) the most important element of campus identity is its green spaces. However, green spaces don’t offer much diversity for activities. This means that landscape plan of the campus only meet 52% of people’s expectations.

Campus can affect green spaces but lately fragmentation affects campus-green space relation. This situation affects natural systems
negatively and interferes with people-green space relation. Having no activity on or near green spaces to support continuity makes things worse. Existing vehicle roads aren’t sufficient for the increasing number of students and academic staff. Some of the pedestrian roads are tried to be used for vehicles. Insufficient parking spaces force people to park on the curb. Solution of this problem is creating indoor parking lots and sometimes preventing students to bring their own vehicles to campus. However, these solutions aren’t enough to deal with the main problem which is students that can’t use green spaces enough. Instead of deteriorating the relation between students and these green spaces which have huge influence on campus identity, this relation must be improved. If campus keeps this pace in irregular building then, even though it has rich green areas, recreational needs of students won’t be satisfied because of the fragmentation of green spaces.

Elements of recreation in campuses are; sport facilities, cultural facilities, open green spaces, and circulation system that connect these areas (Yılmaz, 1998). Students in KTU Kanuni campus usually uses motor vehicle roads to go to their faculties. There are no alternative roads (for walking, riding bicycle, skating, motorless vehicles transportation, etc.) to reach their faculties. A system that will help handicapped transportation, reduce motor vehicle usage, and encourage pedestrian and other motorless vehicle transportation is needed. According to Kurdoglu et al. (2013) walking, excursion, resting and sightseeing are the most performed activities in KTU Kanuni campus. Other than these activities there are no alternative roads that were planned with green continuity strategy for activities like riding bicycle, skating, running, handicapped transportation, etc.

Focusing on these problems and needs, a greenway model for KTU Kanuni campus was created and suggestions for functions of this greenway were given;

Alternative transportation opportunity,
Recreation, sightseeing opportunity,
Connection between green spaces, people, campus zones and outside of the campus
Creating socialization and awareness,
Campus identity,
An example for other campuses,
Road networks with green continuity strategy

Materials and Methods:

Literature review on greenways, a possible solution for connected fragmented areas of the campus due to expansion, was made as the first thing in this study. Greenway descriptions, classifications, functions and strategic approaches were examined.

According to Bahari and Said (2009) after literature review of greenways, it is realized that greenways, as open spaces, other areas and especially as green connection points, were missing in the campus plan. There are no examples, in Turkey, of connecting fragmented areas of a campus with greenways which are the solution for this problem.

Secondly, KTU Kanunu campus was selected for this study (Figure 1). Current transportation status of the campus and fragmentation of green spaces were evaluated (Fig. 2,3,4).
Figure 1. Location of KTU Kanuni Campus

Figure 2. KTU Kanuni Campus Plan

Figure 3. Greenway Fragmentation of the Campus
After literature reviews and with Bahari and Said (2009)’s method; 3 zones were created based on units faculties, academic buildings (rector building, library, conference halls), social facilities and housing facilities (student-academician housing, dormitories, dining halls, sport facilities, market, bank and ATMs), that require connection most. Nodes and other connection roads were determined within these three zones. Existing roads were analyzed and mapped out. Greenways were classed differently according to connection hierarchy. Greenway order is primary, secondary and tertiary.

Campus will have connection system, thus, a plan will be created to fulfill recreational, transportation, and educational needs of people in campus while finding a solution to fragmentation of green spaces with corridors and help wild life and plant species diversity.

**Result and Discussion:**

Primary greenway will include the main route of the campus and will connect selected 3 main zones. Secondary greenway will connect selected zones to nodes. Tertiary greenway will connect nodes with road networks (Figure 5,6).
Figure 5. Zones, nodes and greenways

Figure 6. Greenway Hierarchy Schematics of the Campus
Usage of motor vehicles in campus for transportation during nationwide exams, spring festivals, graduation ceremonies, hamsi festival, theater, concert, etc. increases the traffic; thus, parking needs increased so more parks built this caused losses in green areas. Greenway will be used as a tool to connect fragmented green spaces in campus. There aren’t enough recreational activities on green spaces of the campus. Greenways will create sustainable areas that support open air activities like walking, riding bicycles, running, skating which are good practices for a healthy life.

People in the campus will have options to use route that is easiest and fastest for them.

Wider greenway systems or networks generally take their form by natural terrain features like valleys and ridges. Recommended greenways will be connected to outside of the campus with 2 valleys located on eastern and western borders.

**Conclusions:**

It is important to establish transportation network within campus to have circulation between units and to provide functions like education, research, management, housing, sports and recreation, social activities,

In an ideal university campus pedestrian prioritized movement system should be essential,

The planning model in this study;

Tools to create a physical environment that will help learning,

Guides that will connect fragmented areas in the campus,

Possible solutions for traffic problem and make campus safer for pedestrian movement

Walking and riding bicycle will be prioritized; transportation will be faster and cost nothing,

Walking and running are good habits and good practice for a healthy life,

Greenway in the campus will be open to everyone and it can be used by people to socialize,

Campus will gain an identity and awareness will be raised,

Areas that people can spend their spare time will be created and campus will be more alive.

This model will be an example for other campuses.

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