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ID 1751 | SOCIO-SPATIAL DIMENSIONS OF HOW TO MAKE A CITY BICYCLE-FRIENDLY: THE CASE OF KAYSERI, TURKEY

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1 INTRODUCTION

Traditional transport policies based on automobile usage are regarded as no longer sustainable all over the world and governments are seeking new methods to encourage other modes of transportation such as walking, cycling and public transport. In Turkey, there is a big increase in the awareness of importance of the sustainable and integrated urban transport in the last ten years. Cycling in Turkish cities has also increasing importance both in national and local level. Parallel to this interest, the Ministry of Environment and Urbanism released a new regulation about the design and construction of bicycle paths, bike stations and tracks within the city in 2015. In addition to this, governmental bodies have been carried out a number of projects that aimed to encourage bicycle usage. This willpower has also influenced local authorities to make cities more bicycle-friendly.

Kayseri is a middle-sized Central Anatolian city with approximately one million population. The city has been doubled its population in the last 20 years and it is still growing rapidly. The local government has been built 34 km tramlines and 35 bike-sharing stations within the city and tried to integrate bike stations with tram stops. However, the overall development of the city is still automobile-oriented and the modal share of bicycles in daily commuting is almost zero. There are also safety problems for cyclists in the city.

Within this study, we aimed to examine the bicycle experience of the city from socio-spatial perspective and evaluate it according to the Copenhagenize Index criteria. Within this scope we will firstly reveal the existing condition in terms of bicycle infrastructure and bicycle usage in Kayseri. Secondly we will evaluate the experiences of cyclists in the city. For this, we conducted a survey with 125 active cyclists that cycle in daily base. We asked them both the physical conditions in the city and their experiences of cycling. Finally, we will propose a framework to be able to become bicycle friendly city.

2 BACKGROUND

Cycling transportation in cities is very common today. Bicycle sharing schemes offer a valid alternative cycling mobility in urban areas combined with public transport for longer distances. A lot of research (Pucher, et al., 1999; Pucher & Buehler, 2008; Forward, 2003; McClintock, 2003; Jacobsen, 2003; Pikora, et al., 2003) has extensively examined the role of cycling for transport. These researchers have listed the advantages and disadvantages of biking, and found how it influences the transportation pattern in cities.

There are also benefits for cycling such as ensuring public health in cities, reduced trafic congestion, improved accessibility, better air quality, less noise, lower carbon foot print, costs reduction, education-it helps children improve their physical health and fittness, land use-ten bicycles can be parked in the space taken up by one car. Additionally, Cycling is the most green house gas efficient transport mode.It has created new and huge transportation sector in economically. For example, 21 million bicycles were sold in the EU, in 2014 year.

The use of public bicycles has quickly expanded, although as a newly-developing mode of transportation its related theory and research is still in the early stages and largely focuses on site planning and scheduling, changes to and influence of transportation mode, analysis of the operation model, evaluating user satisfaction, and the characteristics of public bicycle users.(Yang R, Long R,2016:2)

Meanwhile, There are following policies and programmes concerning with the cycling in Europe. Especially, It is important that The European Union policies on transportation and bicycle programmes in cities. European Union has taken care of the priorities and action plan on bicycle within the public transportation. In 2011 dated White paper, It is called as In this report, It is declared that Individual transport is preferably used for the fiscal miles of the journey and performed with clean vehicles (White paper report:2011:5) Clean urban transport and commuting, public transport choices are more widely available as well as the option of walking and cycling.

On the other hand, EU action plan supported that road safety, air quality, use alternative fuels that best fit their local strategies, EU standarts for new infrastructure, continuing the ambition for a model shift towards more sustainable modes. Additionaly, EU supports to cycling in cities. (According to Eurobarometer, %7.4 of European citizen used the bicycle as their primary means of transportation in 2010, By 2020 We want to see the level of cycling at %5 of the modal split. (www.eurociites.eu.sustainable, 2015)

The EU has taken an active role in promoting cycling trying to maket he best use of this mode ofPap transport by involving it in it’s efforts to achieve the European 2020 strategy targets. When EU Ministers of transport declared their commitment to promoting cycling as a climate friendly and efficient transport mode. In recent years , two particular features of our society have come to be recognized as serious problems that require urgent action climate change and sedentary life style. (Pape M, 2016:5)

Eurocities network suggested that more funding for public transport, cycling and walking strategies should be available. European commission supports the transition towards clener and more performing cities through sustainable urban mobility plans. Mean while, European Cyclist Federation annouced ECF manifesto interesting with the title ECF manifesto for a call for ACTİON 10 key measurement to get more people cycling more of ten in Europe. There is a cobenefits of cycling as consist of environmental, economical and social . The other legal document as declaration on cycling as a climate friendly, transport mode (European Council, 2015) For cities the visible promotion of cucling through meavoures such as bicycle share scheme feeds into wider brsnding strategy. For cities, visible promotion.

There must be increased that streghten international, national, regional cycling networks. So, It should be integrated cycling to the multi modal transport policy for realising to smart mobility because of improving the urban mobility action plan. For example, EU action plan consists of many items: air quality, use alternative fuels, standarts for new infrastructure, streengthening city involvement. Cycle plans should be designed to create networks for destination oriented daily cycling and to encourage cycling demand. For instance, There are still using cycle superhighways, cycle rote network, cycle tourism routes in England. On the other hand, This process also should integrated sustainable urban transportation system as well comprehensively. It will lead that minimize energy cost in transportation in economically, ensure healthy living in daily life for every city dwellings, enforcement to social entity and ties in urban social structure. For this reason, Cycle-friendly cities have been planned mostly. Those cities attract investment, encourage neighbourhood revitilasition and can improve citizens quality of life.

It has been observed that bicycle and uses of it in sustainable and integrated transportation systems has increased all over the World. As We know that urban transportation and traffic safety and passes with different transportation modes by urban dwellings. It has existed Which has consist of walking and bicycle transportation integrated with public transporation in cities for urban mobility. Netherland and Denmark cities have top of the cities for cycling. Those cases are suitable cities for efficient use of bycling. For instance, in The capital city of Denmark as Copenhagen, According to the EPOMM Modal Split tool results in 2012, It has been identified that Daily total trips by users has made %28 by using bycle and has made

%20 walking. According to another research in 2014, (Special EuroBarometer, Quality of Transport 2014) The users mostly prefer the transporation modes that bycle use has an %8 in totally. And walking as %14. At the same time, different indicators as examined that bycle use, traffic safety, bycle tourism, market size, make an advocacy of bycle riding for European Cycling Federation Additionally, The results of a research in 2014 by ECF (European Cycling Federation) as following as emphasized.

Content	Ranking	Countries
Bicycle use	1.rank	Denmark
Traffic security	1.Rank	Luxembourg, Malta
Bicycle Tourism	1.Rank	Finland
Market Size	1.Rank	Slovenia
Advocacy	1.Rank	Denmark

Table 1: The ranking distribution of cycling parameter for countries
Source: European Cycling Federation publish, 2014

In our metropolitan cities, There are dependent upon car oriented transportation system versus on public transportation system included walking and bicycle transportation. This case has lead to many problems environmentally, economically and socially. In the Ninth Development Plan for the term 2007¬2013 the plan, “pedestrian and bicycle transportation would accompany public transport services in a way to allow the establishment of a sustainable intercity transportation system and these modes of transport would be prioritized and encouraged.” The Environment and Urbanism Ministry declared a legal document as law that bcycle routes in inner urban roads, bycle stations and design and construction of bycle park spaces in 2015. This act only consists of main issues about the bcycle routes stations and design and construction of it. Whereas, What It should be role of walking and bcycle transportation integrated with sustainable urban mobility plans. This kind of plans have realized on meusure mobility in cities that priority to pedestrian, not automobile and other mobile vehicles based on. Moreover, Bcycle roads infrustructure are unefficient that commonly no longer and safer for users in big metropolitan cities in Turkey. But, The municipalities have deal with the bcycle transportation integrate to the other modes of transportation.

3 CYCLING IN KAYSERİ: BICYCLE-FRIENDLY CITY?

3.1 EXISTING SITUATION

Kayseri is a rapidly growing industrial city in the middle of Anatolia, Turkey. While the population of the city center was 536.392 in 2000, it has surpassed 1.000.000 people by the end of 2016. The number of university students, academics and tourists has also increased at this period. Today the city is more dynamic and cosmopolitan city, and it necessitates meeting a wide spectrum of needs and expectations of new inhabitants.

Figure 1: KAYBİS bike share stations (2017)

The local government has been built 34 km tramlines and 35 bike-sharing stations within the city and tried to integrate bike stations with tram stops.

KAYBIS bicycle sharing system, which started to operate with 25 stations and 300 bikes in 2010, serves with 35 stations and 600 bikes by 2017 and uses the system 453 people per day (URL-4). The locations of the bicycle sharing stations in the city are seen in the map. As it is seen in the map, if there is available bike in a station, it looks green in the interactive map.

However, the overall development of the city is still automobile-oriented and the modal share of bicycles in daily commuting is almost zero. There are also safety problems for cyclists in the city.

The bicycle infrastructure of the city is insufficient in terms of bicycle paths and bicycle facilities. There are totally 17,2 km bike lanes and 20,2 km shared paths (bike boulveards) in the city. The government planned to built just 2 more km bike lanes in the near future. The existing bikeways can be seen in the figure 2.

Figure 2: Existing and Planned Bikeways in Kayseri (2017)

3.2 BICYCLE EXPERIENCES: SURVEY RESULTS

We conducted an online survey with 125 active cyclists in the city between the dates of 22.04.2016 and 02.05.2016. With this survey, we aimed to understand their profiles and cycling experiences in the city.

PROFILE: AGE, GENDER, EDUCATION LEVEL, INCOME LEVEL, AND CAR OWNERSHIP

The demographic profiles of respondents also show what kind of people is cycling in a daily base. According to survey results, although there are active cyclists at all age groups, the people who are between 15 and 39 years old are mostly cycling in the city. The gender split reveals an unbalanced situation. Only 14,4% of total respondents are women. It can be easily seen in the city that most of cyclists are men because of socio-cultural background and safety issues.

Education level is another determinant to understand what degree the bicycle usage turned into a 'bicycle culture' in the city. While 36% of respondents are university students, 39,2% of respondents is graduated from a university (undergraduate or graduate level). So there is a tendency to cycle after graduation. Because a big percent of cyclists are students, the income level of 47,2% is seem a bit low. However there are a considerable number of cyclist in middle and high income levels. 39,5% of active cyclists has their own private cars. It also shows that cycling isn't regarded in the city as only a job of poor people who can't afford private or public transport.

BICYCLE USAGE: FREQUENCY, PERIOD, PURPOSE, DURATION, AND PREFERENCE

According to survey results, while half of respondents cycles every day, 32,8% of them cycles at least twice or three times in a week. 56% of them cycles throughout the year both in winter times and summer times. 72,8% of cyclists uses their bicycle as a means of transport in addition to sports and recreational

purposes, and half of respondents cycles each time more than one hour. Cyclists think that cycling is healthy, safe, environmentalist, practical and economic transport mode respectively.

These results demonstrates that despite the fact that the modal share of cycling in daily commuting is almost zero in the city, there is an increasing awareness that bicycle is not only a sports vehicle but also a mode of urban transportation, and it should be facilitated to use them in daily base and in winter times.

BICYCLE USAGE: SAFETY ISSUES

Safety is the most important factor that affects bicycle usage. There should be both individual safety requirements and administrative measurements to protects cyclists. 32,8% of active cyclists says that they had an accident while they are cycling, and 44,8% of them says that they are almost to have an accident while cycling. The first reason is other motor vehicles (57,4%) in the city traffic. The other reasons that the respondents remarked are related with another cyclists, pedestrians, physical problems (sidewalks, walls, city furnitures..etc) and so on.

Especially drivers in the city traffic are the nightmare for the ciyclists because there aren't enough bicycle facilities in the city and cyclists have to use motorways in their trip. So drivers and cyclists come across many times throughout the day.

BICYCLE USAGE: BIKE SHARING PROGRAM (KAYBİS)

Only 18.4% of active cyclists reported that they used the KAYBIS bicycle sharing system. Those who do not use the KAYBIS system firstly say that they don't really need it because they have their own bicycle, when asked why. In addition to this, the other reasons why they don't use the system are the charge system, the long duration of the acquisition of the KAYBIS use card, the location of the KAYBIS stations and the feeling of that the shared bicycles are bulkier and less comfortable than their bicycles.

Respondents basically suggest that the KAYBİS system would be more efficient if there are some arrangements as follows:

- Facilitating KAYBİS card purchases or allowing to rent bicycles with credit cards only
- Increasing the number of bike stations
- Building separated and continuous bicycle paths between stations
- Preferring faster and more comfortable bikes.

MAIN PROBLEMS AND SOLUTION RECOMMENDATIONS

According to the survey results, the most important problem that cyclists encounter in Kayseri is the insensitivity of drivers and the lack of respect for cyclists. The second major problem is the inadequacy of bicycle paths. Apart from these two basic problems, the other issues mentioned are as follows:

- Bicycle roads intersect with motorways/ no separated bicycle path
- Existing bicycle paths occupied by vehicles
- Intense vehicle traffic
- Bus drivers
- Road safety
- Pedestrians and drivers do not respect cyclists
- Car-oriented planning of the city / arrangement of traffic lights according to cars
- Inadequate warning signs
- Bicycle thieves
- No suitable environment for ladies with bicycles
- Bicycle parking problem
- Selection of materials used on bicycle paths.

However, in order to increase the use of bicycles in Kayseri, the following must be done according to respondents:

- Providing adequate physical infrastructure (separated bicycle paths; safe bike stops in city center, in front of health and education institutions, at tram stops, at stations and terminals, in parks; facilitating bicycle transport on trams and buses; signalization…etc)
- Legal and administrative arrangements (regulations to protect bicycle drivers, heavier penalties and sanctions for possible violations of drivers, strict controls)
- Training, promotion and awareness raising (training of bus drivers; hanging posters to raise awareness on billboards at certain intervals; sending SMS to all vehicle drivers, emphasizing that the bicycle is a vehicle and has the right to use the motorway, cycling and awareness trainings in primary, secondary and high schools; festivals and activities)
- Cooperation (Collaboration and cooperation with bicycle associations, NGOs, local and central government units, bicycle shopkeepers)
- Incentives (Providing bicycle users with discounts on municipal cafes and restaurants, allocation of certain streets for bicycle use only one day a week).

BICYCLE USAGE: MOSTLY USED ROUTES

Those who participated in the survey were asked about the routes they used most frequently in cycling in Kayseri and these routes were processed on the map (See Figure 3). As seen in the figure, while the city center and Talas stand out as the most frequent used destinations, Erciyes University and Anayurt are marked as other important destinations. However, it is seen that there are routes used by cyclists both east- west and north-south directions. When this map is evaluated together with existing bicycle routes, the inadequacy of existing roads is once again seen.

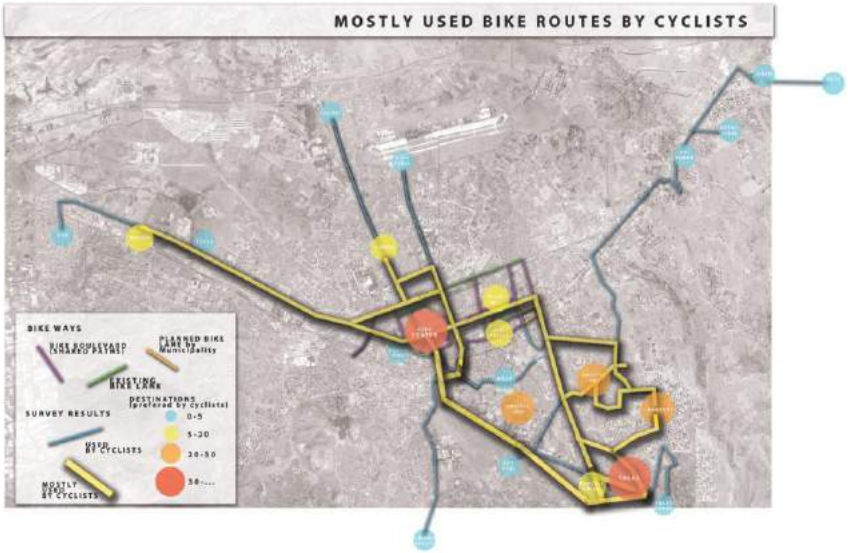

Figure 3: Mostly used bike routes by cyclists

3.3 HOW TO MAKE KAYSERI BICYLE-FRIENDLY: CHALLENGES AND OPPURTUNITIES

The Copenhagenize index is a system of scoring cities that have strived to adopt bicycles and make them a practical transportation form. The scoring system was developed in 2011 along with James Schwartz, inspired by Monocle's Liveable Cities Index and Economist's rankings.

In this system, cities are scored between 0 and 4 in 13 different categories. In some cases, in addition to these points, 12 additional points can be given to appreciate the extra efforts of the cities. After all, the city with the highest score is selected as the most bicycle-friendly city.

The 13 categories used in the Copenhagen index are as follows: Advocacy (NGO's), bicycle culture, bicycle facilities, bicycle infrastructure, bike share programme, gender split, modal share for bicycles, modal share increase since 2006, perception of safety, politics, social acceptance, urban planning, traffic calming (URL-1)

In this section, the potentials of Kayseri to become a bike-friendly city and the factors that make it difficult will be evaluated according to the above-mentioned 'Copenhagen Index' criteria.

Advocacy: It can be said that the decisive influence of civil society on public policies in Kayseri is weaker than in other cities in Turkey. Nevertheless, it is observed that there has been an increase in awareness on this subject in recent years. Currently there are 10 different associations or groups in Kayseri that are involved in cycling (URL-2). Among them, 'Thursday Evening Cyclists' (PABs) are actively engaged and are working to increase awareness of safe cycling and the spread of bicycle use in the city. However, the impact of these groups on local government is quite negligible.

Bicycle culture: Kayseri offers a very convenient environment for cyclists thanks to its flat topography and wide roads. Nevertheless, due to increased vehicle ownership and car-centric transportation planning, the city is becoming less and less bicycle friendly and the importance of bicycle as a mode of transportation is reducing day by day. As can be seen from the above survey results, the fact that drivers and pedestrians do not respect bicycles and that existing cycling roads are constantly occupied by car owners shows that cycling culture has not developed enough in the city.

Bicycle facilities: It can be easily stated that Kayseri has a long way to go in terms of bicycle facilities such as accessible bike racks, ramps on stairs, space allocated on trains and buses and well-designed wayfinding.

The number of bike racks in the city is very inadequate, there is no safe parking lot to be tried. Although the vast majority of bicycle tracks in the city are now invisible, they have not been renovated. In addition, it is not possible to ride a bicycle on the buses. However, they can carry their bike on the tram, except during peak hours (07: 00-10: 00 and 16: 00-20: 00) and with a one-pass payment for the bicycle (URL-3).

Bicycle infrastructure: As mentioned above, the total length of bicycle routes in Kayseri (including shared roads marked with signs) is 38 km. These roads, which are located only on certain streets in the city center and on a section of the Talas road, show that the infrastructure of the bicycle in the city is very inadequate. When we examine the most common routes used by cyclists according to the survey results, the inadequacy of bicycle routes is better understood.

Bike share program: KAYBİS bicycle sharing system, which started operation with 25 bicycle stations in 2010, is the first urban bicycle sharing system in Turkey. Within 7 years the number of stations has increased from 25 to 35 and the number of users has increased. However, the lack of bicycle routes between some bicycle stations and the problems listed above make it difficult to use bicycles safely. Bicycles can only be rented in April-November period, and they are not in use in winter period.

Gender Split: According to the survey results, only 14.4% of the active cyclists are women. This rate shows that the city needs to provide adequate infrastructure and safe environment for women to use bicycles.

Modal Share: Since there is no available data about modal split in the city, it seems difficult to determine the changes in modal share of cycling over time. However, it is observable that bicycle use has declined in recent years as a mode of transport in the city.

Perception of Safety: Although there is no binding regulation for bicycle safety and helmet use, it is observed that there has been an increase in the use of helmets recently as a result of the work of NGOs.

Social acceptance: Traveling on a bicycle in Kayseri is the most difficult and dangerous type of travel. The reason for this is that both car owners and pedestrians do not care about bicycles and do not give right-of-way. This is the main complaint of the survey respondents.

Urban policy and planning issues: In Kayseri, car-centered planning has been adopted since the 1950s. Especially in recent years, the number of bridges that are increasing rapidly, accelerates the car traffic in the city and makes crossing of cyclists difficult. Cycling-oriented applications such as the signaling system

for bicycles, bicycle bridges have not yet been passed on. Unfortunately, bicycle routes are not designed on newly opened roads, and new routes are planned only as roads and pedestrian walkways. As a result, the car-based planning approach makes the city more difficult and dangerous for bicycles every day. Although there is a willingness to build a bicycle route in the central government, it seems that local authorities' willpower is in the direction of car-centered planning.

4 CONCLUSION

Kayseri, with its flat topography and medium size, is a city with initial advantages for being bicycle friendly. Kayseri, an industrial city, has been designed as a car-centered spatial organization since the 1950s, with the influence of socio-spatial relations originating from the nature of the industry. This process has improved the sprawl patterns of the city against the bicycle, and the bridged junctions built in the city made it difficult to use the bicycle.

The fact that the industrial city's logistics-labor-market relations have put the wheeled vehicles in the forefront has caused that the city's economic power has put pressure on local governments to keep car-centered planning. Eventually, the city is very far from becoming a bicycle-friendly city today.

In this paper, both the existing bicycle infrastructure of the city as well as the results of the survey, which reflects the city experiences of the active cyclists, have been evaluated together with the above-mentioned Copenhagen index criteria. It is very clear that the city does not come to an adequate level in bicycle infrastructure, bicycle use, bicycle culture, planning approach, social acceptance, modal split, and gender split. On the other hand, trends in the world, as well as the interest of the central government, are compulsory for all cities to reconsider the bicycle issue. Kayseri's efforts to get away at least partly from industrial city identity and to become a tourism city require a new spatial organization. It is expected that this new trend will lighten the industrial pressure on the city and open up the investments that will make the city bicycle friendly.

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