

CYCLING AS A NEW MODE OF URBAN TRANSPORTATION FOR TURKISH CITIES

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ABSTRACT

Cycling is a fast, efficient and clean mode of transportation and fits very well into the sustainable transportation concept. Some countries such as the Netherlands, Denmark and Japan have relatively high cycling mode shares and a strong cycling culture. The history of cycling in Turkey goes back to the older times, but as in many other countries, fast motorization and urban sprawl caused a dramatic decline in bicycle use. Cycling has not been perceived as a popular means of transport since the 1970s. However, the interest in cycling has now started to increase with a number of local governments initiating cycling projects. Therefore, we aim to make an overall assessment of the current state of cycling and its future in medium and small scale cities of Turkey from both the user's, the planner's and the policymaker's perspective to promote slow modes towards more sustainable cities in the country.

Three medium scale cities were selected in which to conduct surveys with bicycle users. The case cities are: Sakarya which is a fast developing industrial city and very close to Istanbul; Antalya which is the most important tourist city in Turkey having more than 10 million visitors every year; and Eskisehir which is a city of students where two big universities are located. Traffic accident statistics involving cyclists were collected from the Police Department records.

Cycling is an important tool for sustainable mobility aims that needs to be considered in fast developing medium and small-scale cities. Turkish cities with growing economies are interesting cases as cycling has not been well accepted as a means of transport by both users and planners and therefore it is timely to increase the social and policy-makers' awareness of cycling by designing the cities for bicycle users and by creating a habit of cycling for shorter distance trips among different socio-economic classes. This paper will highlight the policy and strategies to promote cycling in such developing cities which are yet designed for the cycling as a means of transport and where there is very little or almost no cycling habit.

Keywords: Urban transport, Bicycle transportation, Sustainable transportation, Road safety

INTRODUCTION

Today transportation is one of the biggest urban problems regardless of the economic stage or size of the cities. The rapid population growth, urban sprawl and fast motorization has created many problems which effect human health, city life and decrease the quality of life. Cycling being a healthy, cheap, fast, fun and clean mode of transportation, is an effective solution to these problems and well fits into the sustainable transportation aims (CROW, 2006; Forester, 1994). Cycling potentially replaces cars for short distances (Zlot and Schmid, 2005). Countries like the Netherlands, Denmark and Japan have strong cycling culture and habit and relatively high cycling mode shares (Ministerie van Verkeer en Waterstaat, 2007; Fietsberaad, 2006; Koike et al., 2000).

However, cycling has not been much favored in many countries such as Turkey as a means of transportation by both the users and the planning agencies. Despite the suitable climate, topographic and natural conditions and high ratio of younger population in Turkey, the share of cycling is still very low and it is mostly seen more of a fun or a part of sports activity. On a simple interpretation, the social and cultural characteristics and the image of bicycle as the lower social class are the main reasons for the very low rate of cycling in Turkey. The lack of cycling infrastructure improvements is obviously one of the reasons why cycling is far behind what is required within the framework of sustainable urban development in Turkish cities. Yet, there are still a few cities with significant rate of cycling and more importantly there are more potential cities which will favor cycling once the required investments and urban design is provided.

This study presents the results of user surveys conducted in three different cities of Turkey to analyze the profile of bicycle users and to draw on the discussions as to how the cycling habit and mode share in Turkish cities can be improved. The paper also looks at the accident records involving cyclists to underline the critical safety issues.

BICYCLE USER PROFILE IN TURKEY

Three medium scale cities were selected in which to conduct surveys with bicycle users. The case cities are: **Sakarva** which is a fast developing industrial city and very close to Istanbul; **Antalya** which is the most important tourist city in Turkey having more than 10 million visitors every year; and **Eskisehir** which is a city of students where two big universities are located.

Sakarva is located in the Marmara region (where Istanbul is also located) and by the Black Sea. It has a total area of 4,817 km² and a population of 888,556 people (2011). The 75% of the population lives in the urbanized city center and sub-centers (district centers). Sakarya, with its fast growing industry, is the 5th largest city in the Marmara Region. The city has grown continuously since the mid-1950s. In 1999 a strong earthquake rocked the city and delivered substantial damage. It is located on a flat terrain in general and has a temperate climate.

Eskisehir is located in north-west Turkey, has a total area of 13,652 km² and population of 781,247 people (2011). The 90% of the population lives in the urbanized city center and sub-centers (district centers). It is located on the banks of the Porsuk River. The city is known in Turkey as “the city of students” with its two big universities, thus it has a great young (student) population. Eskisehir is one of the main stations of the railway network of Turkey (including high speed rail) and a tramline runs 12 hours a day in the city center. It has a unique continental climate.

Antalya is a city on the Mediterranean coast of south-west Turkey with a total area of 20,815 km². It has a population 2,043,482 people (2011). The 71% of the population lives in the urbanized city center and sub-centers (district centers). Antalya is the 4th largest and 8th most populated city of Turkey. It is the country's biggest international sea resort and has experienced large growth in the tourism sector since the 1970s, having more than 10 million visitors every year and attracting 30% of the foreign tourists visiting Turkey. It has a Mediterranean climate and the weather is sunny on most days of the year.

The above three cities with distinct socio-economic characteristics were chosen to conduct the user surveys for: firstly each having a significant number of cyclists and an existing cycling culture; secondly, having a topography and climate suitable for cycling; and thirdly, the macro form of each city allowing short distance trips. The survey sampling is: 636 cyclists in Sakarya; 706 cyclists in Eskisehir; and 167 cyclists in Antalya.

Figure 1 shows the demographic profile of the cyclists in these cities as derived from the above samples. The majority of the cyclists are men, which is not unexpected given the cultural profile in Turkey for the negative view of cycling women in some areas. The variation of male-female ratios is highly related to the social and cultural differences among the three cities (in particular comparison of Sakarya to Eskisehir and Antalya). The majority of the cyclists belong to the working population in all the three cities. In Eskisehir, students also have a significant share. In Sakarya, the rate of students is low – even lower than the retired population. This is mainly attributable to the location of the only university (which is one of the biggest universities in the country) on a hilly part of the city.

Cycling is more common among the younger population. This is more obvious for Eskisehir and Antalya as the age group 20-29 constitutes the clear peak and contains the largest portion as much as 36 % for Eskisehir and 40 % for Antalya among all the age groups. In contrast there is no clear peak as the age distribution more uniform and the average age of the bicycle users lies within the groups of 30-39 year old. This is mainly for the longer cycling habit in Sakarya (16 years) attracting more users from different age groups.

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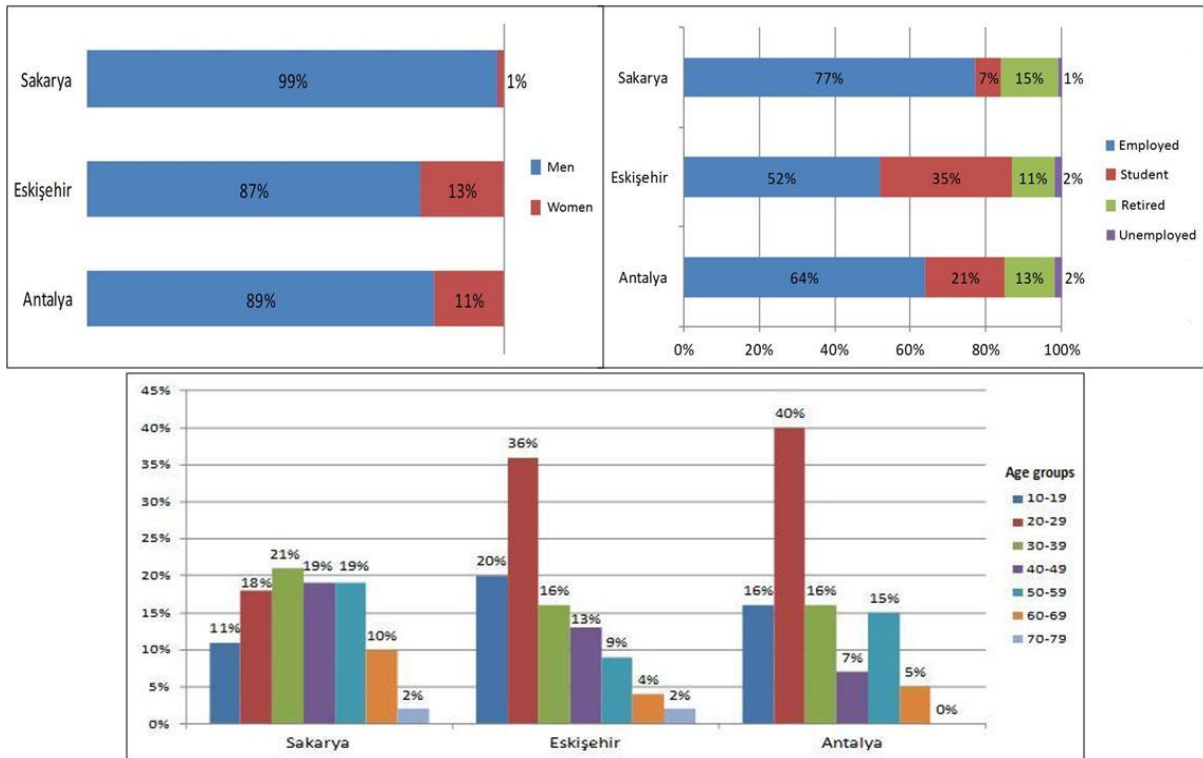


Figure 1 – The demographic profile of the cyclists

Figure 2 shows responses to the two questions of: 1) trip purposes; and 2) reasons to prefer cycling. The share of commuting trips is the highest among all trip purposes (Sakarya, 50%; Eskişehir, 32%; Antalya, 38%). “Sports / Exercise” option comes as the second purpose of cycling trips. By most of the users, the primary reason to prefer cycling for daily trips has been stated as it is the cheap means of transportation. Positive health effects of cycling and short travel distances are also amongst the important stated reasons for cycling. However the positive local and global environmental impacts have received almost no attention by the bicycle users.

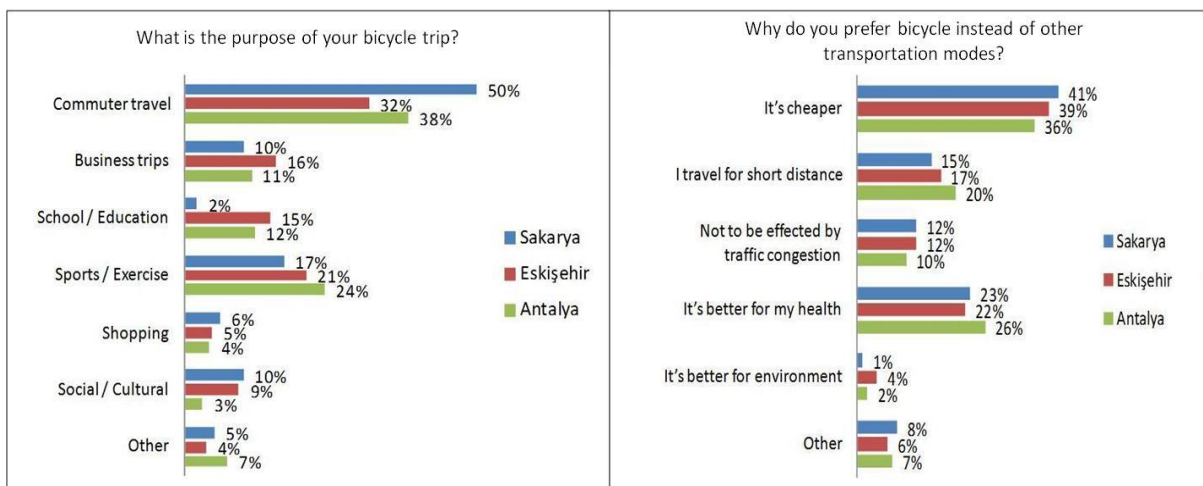


Figure 2 – Trip purposes for cycling and stated reasons to prefer cycling.

The majority of cyclists (73% in Eskisehir and 65% in Antalya) do not own a car or a motorcycle (This question was not asked in Sakarya). This also proves as to why cycling is yet to be socially perceived as a mode which is used by those who cannot afford a private vehicle. This also explains why the economic reasons have been stated by the users as the primary reason to prefer cycling.

The users were also questioned about their frequency of cycling in their daily trips. In Sakarya, 73%, in Eskisehir 47% and in Antalya 41% of the users have stated that they make cycling trips on a daily basis and more than once a day. This clearly means most are regular cyclists and use it as their main mode of daily transportation.

The average duration of cycling trips per direction stands at around 16 minutes for Sakarya, 20 minutes for Eskisehir and 25 minutes for Antalya. Most directional trips are within 30 minutes and the distances range from 4 km to 8 km. One of the important questions was on the level of public transportation and cycling integration and the users were asked if they make a transfer to a transportation mode in connection with their cycling trips. However, majority of cyclists (Sakarya, 91%; Eskisehir, 80%; Antalya, 83%) have responded that they don't transfer to any mode of public transportation which is in line with the fact that cycling is mainly for shorter distances and bicycle parking facilities by public transportation stations are poorly managed.

The cyclists were also asked to rate the improvements required for cycling. The urgent requirements were rated as the cycling lanes and signs. This was chosen by the users as having the top-priority in all the three cities. Cyclists' urgent need for the proper planning and infrastructure development for safe and comfortable trips has received the most criticism by the bicycle users (Table 1).

Table I – The required improvements as rated by the cyclists

	Sakarya	Eskisehir	Antalya
Cycle paths/lanes and signs	1	1	1
Better road surface	2	4	3
Training/informing drivers and police about the rights of cyclists	3	5	5
Intersection design	4	3	2
Bicycle parking places	5	2	4
Traffic calming	6	7	7
Educational campaigns at schools to promote cycling	7	6	6

Safety is the main concern for the cyclists. The users were questioned as to whether they have had an accident over the past 12 months. Critically, a significant number of respondents have stated that they have either been involved or nearly missed an accident (20% of the cyclists in Sakarya, 30% of the cyclists in Eskisehir, 25% of the cyclists in Antalya). This shows that current conditions are far from being safe even in these three cities where cycling has been a long habit and means of transportation in Turkey.

Road safety

Cyclists are vulnerable road users and they are exposed to numerous dangers while travelling. More people die in motor vehicle collisions while walking and cycling than while driving (Nantulya and Reich, 2002). A further analysis on safety issues was conducted by the accident records as collected from the Police Department in Sakarya which show all accidents with fatality and injury in 2008, 2009 and 2010. Table 2 compares the total number of accidents to those involving cyclists.

Table 2 – Number of all accidents and the accidents involving cyclists (Sakarya, 2008-2010)

	All accidents			Accidents involving cyclists		
	Accidents with injury	Accidents with fatality	Total	Accidents with injury	Accidents with fatality	Total
2008	505	8	513	44	3	47
2009	529	8	537	50	0	50
2010	590	7	597	50	1	51

The rate of accidents involving cyclists is approximately 9% within all type of accidents between 2008 and 2010 in Sakarya. Out of 148 bicycle accidents, 4 accidents have resulted in fatality and 144 have resulted in injury. The most common type of bicycle accident is the “crashed from side”. Only 2 out of 148 accidents have occurred between a cyclist and a pedestrian. Other 146 accidents involve motor vehicles.

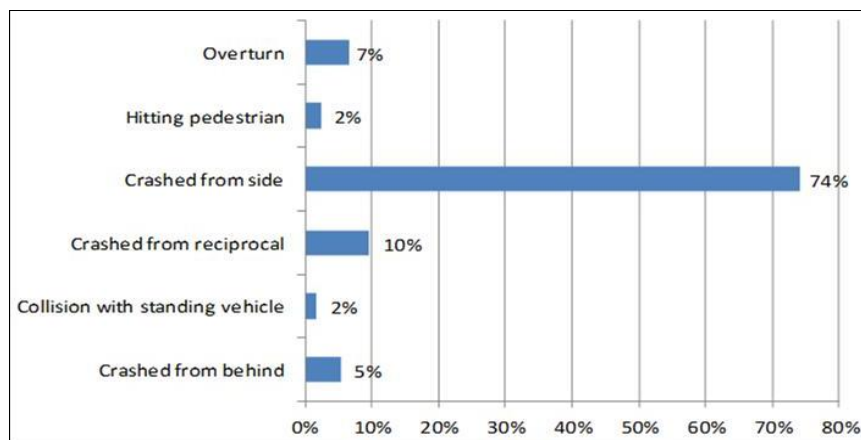


Figure 3 – Types of accidents involving cyclists

The number of accidents increases in spring and summer and the weekends has fewer accidents than the weekdays. The 79% of the bicycle accidents have occurred in daytime and 36% of accidents during the evening peak period that is from 4:00 to 8:00 p.m. The 94% of the accidents are in sunny weather and cloudy weather. Accident rates are very low in rainy and snowy days as people tend to cycle less under such bad weather conditions. The rate of accidents on divided highways is also high (68%) given the reason of higher speeds on this type of roads. The 70% of the cycling accidents have occurred in urban areas where most cycling trips take place. Importantly, 57% of the accidents are at the intersections and the 2 fatalities (out of 4) belong to such intersection accidents where 87% was at the un-signalized

intersections. This clearly shows that special consideration is required for the redesign of cycling lanes and intersection for a bicycle friendly urban formation.

OUTCOMES AND SUGGESTIONS

Obviously there is insufficiency in planning and infrastructure improvements by the local governments and lack of cycling habit / culture and understanding as a means of transportation. However many medium and small sized cities in Turkey are potential candidates to accommodate cycling lanes and develop a cycling habit for the suitable topography and climate and the younger population. Recently a number of local governments have initiated planning and designing cycling lanes. For more effective planning and implementation of cycling policies, the above analysis has highlighted the below facts and suggestions.

- The primary need of the cyclists in Turkish cities is the lack of infrastructure for cycling. Being able to travel safely and comfortably is the most effective enabler of cycling. Therefore proper cycling infrastructure should be provided by making new cycle lanes and networks throughout the city, by improving the existing ones and by creating bicycle parking spaces. When a new road is planned in any part of the city, planners should consider the bicycle transportation and include cycling infrastructure to the plans. The planning should be made in a way that cyclists can easily locate their routes to their destinations.
- For people to cycle, social influences are as important as the physical environment. The main reason for the low level of bicycle use in Turkey is explained as social/cultural factors. The bad image of cycling and the negative attitude towards cyclists in traffic make people not to prefer cycling in daily transportation.
- The role and the attitude of authorities are very important on improving bicycle transportation and the image of it. In Turkey, local governments are the decision makers for transportation projects in urban areas. Therefore both national government and local governments should believe in cycling, make room for cycling in the whole transportation system, make plans, projects and policies to increase the modal share of cycling and apply these seriously. Legal regulations should be made about cyclists in traffic so that their rights are specified.
- The survey results give an idea about the bicycle user profile in Turkey. Social-cultural factors also have impression on the user profile. The majority of the cyclists are men, since there is a negative perspective on women's cycling. Cycling is more important in younger age categories, in general 16-35 range is the biggest age group. The majority of cyclists are the working population; there are more student cyclists in cities with higher student population. The primary reason to choose cycling for daily transportation is stated as financial reasons and most of the cyclists do not own a private vehicle; cycling is still socially perceived as a mode which is used by people from low-income groups. To

increase the level of cycling at every segment of the society, specific studies should be made to focus on different groups such as women, students, elders, car-owners, etc.

- Cycling is mainly for short distances in Turkey. The duration of cycling trips per direction is around 10-30 minutes in general and cycling is more preferred for distances around 4-8 km. In small- and medium-scale cities, travel distances are shorter. It is also easier for the local authorities to make decisions and to apply them. Therefore, to improve the bicycle transportation in Turkey, small and medium-scale cities should be chosen as the first step and projects should be initiated right away. Bicycles should be offered as an alternative for cars especially for the short distance travels.
- Safety is the biggest concern for cyclists in Turkey. Current conditions are far from being safe for cycling, a significant number of cyclists have been involved or nearly missed an accident. The accident records show that the majority of the cyclists killed and injured are under the age of 20. Reducing the total number of traffic accidents involving cyclists and the number of deaths and injuries should be the main purpose. Safe cycling environment should be created for cyclists by increasing the safety of the cycling infrastructure. Most of the accidents occurred at intersections where bicycles and motorized vehicles meet. Special attention should be given to the intersection designs so that cyclists can make safe crossings.
- Integration of bicycle transportation with public transportation systems is an important issue. Cyclists should be able to transfer easily to public transportation to make long distance trips. Therefore transfer points should be created by making bicycle parks at public transportation stations.
- Communication works are also very important to develop a cycling culture, to improve the image of cycling and to increase the level of cycling. Therefore communication plans should be created in cities and several methods should be applied such as organizing campaigns, using media, making events and festivals, etc.

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