

Preliminary communication

UDK: 796.1-057.87

Ivan Ivić (Croatia)Faculty of Science, University of Zagreb
iivic@geog.pmf.hr**Martina Jakovčić (Croatia)**Faculty of Science, University of Zagreb
mjakovci@geog.pmf.hr**Ružica Vuk (Croatia)**Faculty of Science, University of Zagreb
rvuk@geog.pmf.hr**BICYCLE TRAFFIC IN THE FUNCTION OF DAILY
HIGH-SCHOOLER COMMUTING: AN EXAMPLE OF
ĐAKOVO****Abstract**

The bicycle renaissance or the sudden return of bicycles and cycling to the public space has been a characteristic of Western societies for several decades. In the last thirty or so years, bicycle traffic has become a sort of paradigm of spatial and urban planning. This paper detects the physical, social, and contextual elements influencing the choice (or lack thereof) of a bicycle as a means of transportation among the high-schoolers in the city of Đakovo.

Keywords: bicycle traffic, daily commute, high-schoolers, Đakovo

Introduction

The bicycle renaissance or the sudden return of the bicycle and cycling to the public space has been a characteristic of Western societies for several decades. This social phenomenon can be witnessed at every step, from personal experience in the streets through media space, all the way until the scientific circles which have recently started to intensively deal with this topic. Historically speaking, social omnipresence of the bicycle is not a new thing after all. The time prior to the mass spreading of the automobile as the means of personal transportation recognized the bicycle as the basic individual means of transportation. However, the process of automobilization, which put a distance between the place of work and place of residence, pushed the bicycle to the back until the appearance of new initiatives of traffic and space planning in the countries of Western and Northern Europe in the 1970s. These new planning impulses have started an avalanche which is turning more and more into a paradigm of contemporary spatial and urban planning and is also skillfully fitted into the context of the so-called sustainable development. The story of the bicycle is becoming wider and wider and, in certain social groups, is also gaining a distinctly fashionable, overly romanticized note. For instance, Marc Augé (2010), in his "In Praise of the Bicycle" says that the bicycle phenomenon is partly a consequence of the need to have and express one's own opinion, which is omnipresent today.

The aim of this paper is to attempt to detect possible personal, psychological, and physical obstacles which can detract children and adolescents from using the bicycle as a means of transportation for their commute to school in the example of the high-schoolers of the city of Đakovo.

Scientific discourse on bicycle traffic is extremely wide and encompasses a series of professions, ranging from the technical, through social, all the way to medicinal sciences which, each from their own aspect, studies the influence of bicycle traffic on space and society. However, the greatest number of papers deals with organizing bicycle traffic in large cities. Among the papers dealing with traffic and the youth, the works of S. Gašparović, who does not deal directly with bicycle traffic but rather with the involvement of youth in traffic, their habits and the influence of mobility on their everyday life, stand out. In the Croatian scientific bibliography regarding geography with the topic of bicycle traffic, the paper of Lukić et al. (2011) stands out, dealing with the issue of bicycle traffic and the youth through the prism of student expectations regarding bicycle traffic in Zagreb. The international scientific bibliography is significantly more encompassing. In international literature, Pucher and Buehler (2007, 2012)

provide an immeasurable contribution to the understanding of bicycle traffic in the city, but also the ways of advancing it. They, in their papers, give a cross-examination of the problem of bicycle traffic, from its appearance, through the problems and challenges, all the way to the suggestion on how to popularize riding a bicycle in the cities. The aforementioned authors are definitely some of the greatest authorities regarding the research of bicycle traffic. For the purpose of this paper, the work of Lorenzo et al. (2008) is also important, giving an overview of the majority of the published research with the theme of the attitudes of children and adolescents towards riding a bicycle and hiking as an alternative for a motor-driven performing of everyday tasks. Timperio et al. (2006) dealt with a similar topic in their paper on personal, familial, social, and environmental predictors and obstacles of using the bicycle in everyday life. Benson and Scriven (2012) also dealt with psychological predictors of using a bicycle to commute to school.

By analyzing the relevant domestic and international scientific and expert literature, it was noted that using a bicycle in a group of high-schoolers and adolescents is significantly more related to free time and recreation, especially when compared to the habit of using the bicycle to perform everyday duties, such as going to school (Nelson et al., 2008; Babey et al., 2009). Some European countries, such as Denmark, Netherlands, and Germany, represent an exception to this rule because the bicycle is frequently used as the primary personal means of transportation when performing daily tasks (Pucher and Buehler, 2007). There is no research on the frequency of using the bicycle to commute to school in the area which is the focus of this paper. What is more, there is not a single piece of research on the territory of the Republic of Croatia which deals primarily with this issue.

The elements influencing the frequency of using the bicycle to perform everyday tasks are very difficult to determine unambiguously. Also, it is important to highlight that certain factors can be sorted into different element groups. For instance, parents could be sorted into the group of social elements, but also into the contextual elements of the environment or surroundings. It is a similar case with friends living in the same neighborhood. In the research published so far, many different elements from the perspectives of various professions and scientific areas dealing with this topic were highlighted. For a better understanding, they can be divided into three groups: physical, social, and contextual. The distance of place of residence is singled out as one of the key physical elements. For instance, 84% of those who decide on cycling to school

live within a radius of 4 kilometers, and the probability of taking the bicycle to school is cut in half for greater distances and for each additional 1.6 kilometers is reduced additionally by as much as 71% (Nelson et al., 2008). Apart from distance, traffic security can also be sorted into the group of physical elements, which is tied into the development of cycling infrastructure (Timperio et al., 2006; Pucher and Buehler, 2007), the weight of the school bag (Nelson et al., 2008), etc. In the group of social elements, the influence of friends i.e. peers was proven to be unusually important. In the cases where the individual has an acquaintance of friend with the intention of going to school via bicycle, the probability of his/her decision to do the same is doubled (Titze et al., 2007 according to Benson and Scriven, 2012). The claim that children from the neighborhood and city districts with a higher number of children i.e. their peers take their bicycle to school more often is also tied into this (Timperio et al., 2006). Apart from the aforementioned, the so-called culture of the automobile can also be sorted into social elements (Lorenc et al., 2008), as well as parental prohibitions of using the bicycle without their supervision and the existence of fear of stealing the entire bicycle or some part of it. Parental prohibitions are often caused by a desire to increase the security of their own children, but they are also a part of nurturing the reputation of a caring and good parent which, without similar elements, loses its basis (Lorenc et al., 2008). The most important contextual elements in using the bicycle to commute to school are gender, age, and living environment. For instance, Nelson et al. (2008) state that the probability of using the bicycle to go to school is 36% more likely in boys. Speaking of the living environment, the probability of using the bicycle among the observed population drops when moving towards the edges of the city and it is significantly lower in urbanized and rural areas (Babey et al., 2009).

Methods

This paper deals with the habits of riding a bicycle among high-schoolers, the elements influencing the choice (or lack thereof) of the bicycle as a means of transportation in the daily commute of high-schoolers in the city of Đakovo. The target group are students of high schools living in suburban areas of Đakovo which are still under its jurisdiction. Having in mind the aforementioned relations between the distance and frequency of cycling, only those students from places which are adjacent to the central one i.e. those closest to it, are taken into consideration. When determining the area used for the research, the critical distance of eight kilometers was used, above which cycling traffic in the sense of a

daily commute is a very rare phenomenon. According to such criteria, five places were selected which are under the jurisdiction of the city: Budrovci, Kuševac, Pisak, Piškorevci and Selci Đakovački. Apart from the aforementioned places within the jurisdiction of Đakovo, the research also includes the settlement Satnica Đakovačka, the center of the municipality of the same name which is northwest of Đakovo. The reason this settlement is included in the research lies in the fact that it is immediately next to the center of the city and has all the characteristics of a suburban settlement, especially considering the function of work. Apart from that, the distance of the settlement from the main part is similar to the other places encompassed by the research. The settlement of Pisak should definitely be mentioned, which still does not officially have a settlement status but is rather considered a street in Đakovo. However, given that the street is morphologically separate from the rest of the settlement almost as much as all other suburban settlements, Pisak will be observed as a separate settlement in this paper.

When measuring the road distance, the calculations from the interactive map of the *Croatian Automobile Club* (hrv. Hrvatski autoklub) were used, and the centers of the aforementioned settlements were used as reference points. This is especially important when considering the fact that all of the high schools in Đakovo are in the immediate vicinity of the city center. This calculation provided the data according to which Pisak is the closest settlement to the city center. The organization of bicycle traffic is done by analyzing the existing and planned cycling infrastructure.

The attitudes and habits of high-schoolers were gathered by applying the in-depth interview method. Using the method of an in-depth semi-structured interview, 15 students of all three high schools in the city of Đakovo were interviewed: A.G. Matoš Grammar School (hrv. Gimnazija A. G. Matoš), the Radić brothers School of Economy (hrv. Ekonomska škola braće Radić), and the Vocational School Antun Horvat (hrv. Strukovna škola Antuna Horvata). Three students of the first grade, seven students of the second grade, three students of the third grade, and four students of the fourth grade took part in the research. This structure was chosen purposefully in order to encompass students who could have gained an experience of riding their bicycle to school during the year and will, for a time, still remain in the school system and could be asked about future plans regarding their choice of a means of transportation. Considering the place of residence, five interviewees were from the suburban settlement Selci Đakovački. Four interviewees are residents of the suburban settlement

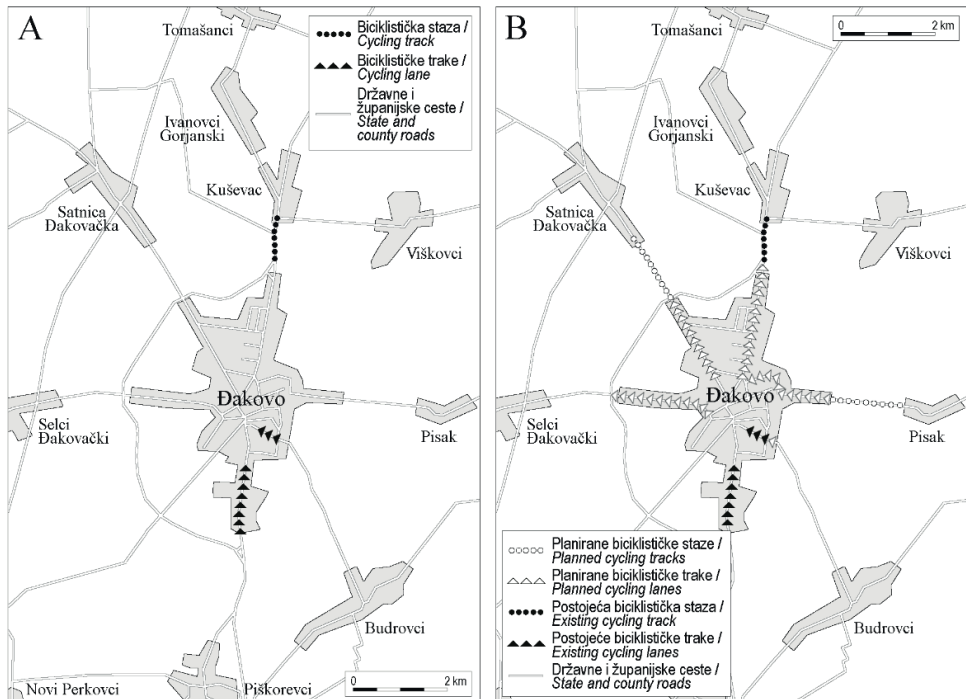
Budrovci, and three of the suburban settlement Piškorevci. Out of the other settlements encompassed by the research (Kuševac, Pisak, Satnica Đakovačka), one interviewee came from each.

During the research, a method of a semi-structured interview was chosen, which enables a conversation based on prepared questions and, depending on the course of the conversation, enables adding different sub-questions and topics. The basis of the interview was made of 23 questions. The questions attempted to touch upon the physical and social elements which are considered possible to have an important role when making a decision on using the bicycle to go to school with the same measure. Additional sub-questions detected various specific circumstances, but also attitudes and considerations of the interviewees. The questions can be divided into several groups. After the introductory questions regarding the settlement of residence, as well as the age and gender of the interviewee, the first group of questions was made up of those regarding the mode of transportation to and from school and the duration of the travel. The second group of questions was made up of those regarding the possession or the possibility of accessing a bicycle and the frequency and intent to use it. The third group of questions was made up of questions regarding the obstacles when riding a bicycle. The final group of questions was made up of those regarding the attitudes of family and friends towards riding a bicycle. The choice of these questions provided a framework to determine all three groups of elements (physical, social, and contextual) influencing the choice of bicycle as a mode of transportation.

Results

Compared to some other Croatian cities, the development of the cycling infrastructure in Đakovo started relatively late. The first projects were realized only in 2017. As is seen in the graphic attachment (Picture 1), the existing state of the cycling infrastructure is at a very bad level. Namely, the network of cycling tracks i.e. routes is almost non-existent and the existing ones are not connected and are partial. In the conditions of such a discontinued system of the cycling infrastructure, traffic safety is endangered (Prinz, 2006). It is important to also mention that the tracks completely go around the center of Đakovo, which, according to its functions, attracts the majority of people, high-schoolers being among them. The fact that all suburban settlements, apart from Kuševac, are completely disconnected in a cycling manner from the central settlement is especially troubling. In such conditions, potential cyclists use the high traffic

state roads which are the shortest, but also the only logical connection with Đakovo. An especially interesting fact is that the existing infrastructure has been operational only for several months now, which brings the conclusion that the situation was even worse just a few months back.



Picture 1 – the existing and planned cycling tracks
in the area of Đakovo in 2017

Source: The governing board for communal activities and spatial layout of Đakovo (hrv. Upravni odjel za komunalne djelatnosti i prostorno uređenje Grada Đakova)

According to the data of the governing board for communal activities and spatial layout of Đakovo, there is a plan to build seven additional cycling tracks in the area of the city with a total length of 11,16 km. The planned routes of the cycling infrastructure largely relate to the main streets and roads, whereby the narrow center of the city is completely bypassed. Also, the tracks are tied to the most traffic-heavy roads, not the side roads with a lesser traffic density.

The central portion of the interview was made up of questions tied to owning a bicycle, the habits of riding it, and the reasons (not) to use it in a daily manner, especially for commuting to school. Only 2 out of 15 interviewees, at the time of the interview, did not have their own bicycle. Out of those two interviewees, one of them had their bike stolen not long before that. The other examinee does not own a bicycle because they do not have the habit of riding it nor the intent to use it, even though they did in the past. It is an unusual fact that several students answered this question with laughter, which created an atmosphere of the senselessness of the question because it is assumed that a person their age owns a bicycle. Speaking of the bicycles they own, the majority of the students characterized their bicycle as medium priced and, in that sense, adequate and safe for their needs. Only one interviewee described their bicycle as cheap. When the sub-question about the price of the bicycle was asked, the understanding of medium priced assumed a price of 1500, 1600 kuna up until 3000 or 4000 kuna. In conclusion, everyone graded the quality and security of their bicycle with a positive grade.

The majority of interviewees arrive to school by bus, while one of them arrives mostly by car. However, the majority of interviewees stated they sometimes come by car to school. Their parents take them to school by car and the main reasons for that are: being late to school, early first class, time outside of the bus lines or if the school is on the parent's way while doing something. Three out of 15 students sometimes arrive to school by bicycle and one of them sometimes hikes. Interestingly, 14 out of 15 students stated the car as the main alternative to the bus when going to school. When asked about using the bicycle to arrive to school, the majority of interviewees stated they use it extremely rarely or do not use it at all to commute to school. Out of the 15 students interviewed, 11 of them never came to school by bicycle. What is more, out of the 4 students who stated they used the bicycle to go to school, one of them only did it once and that is when they went for their diploma, while one of them only did it a few times. Only two examinees, when the weather permits it, regularly use their bicycles. According to their statements, they only use it two times a week on average. The aforementioned points to the conclusion that using a bicycle to commute to school among the high-schoolers of suburban settlements of Đakovo is very rare and infrequent, even in the months when the weather is ideal for that. It is interesting that among those who used their bicycle to go to school there are two male and two female students, but only the two male students use their bicycles regularly. The two female students who used their bicycles only on several

occasions are residents of Budrovci and those who stated that they use their bicycles regularly are residents in Pisak and Satnica Đakovačka, respectively.

For the majority of examinees (73%), the most frequent reason to use their bicycle is to go shopping within their place of residence. The second most frequent reason is recreation and that is mostly in the company of friends. Those rides most often assume several peers which travel several kilometers using their bicycle and, most often, go outside of their place of residence while doing so. They usually pass through several neighboring settlements while they ride. Some state that they use it to fill their lax schedule during the summer months:

“...in my free time, when I have nothing to do, I take a ride. Better than being on my phone all the time” (hrv. „...u slobodno vrijeme, kad nemam što raditi, idem se vozati. Bolje nego da sam na mobitelu stalno“) (Student, Braća Radić School of Economy, 16).

Apart from that, several examinees also mentioned going to Đakovo during the summer months to the city pool. When asked about how often they do so, they state it is only a few times during the holidays, fifteen at the most. Apart from going to the pool, they rarely go to Đakovo by bicycle and the motives are either socialization with friends or shopping when they do not have access to a car. It is also interesting that several of them highlighted visiting family and friends within their place of residence and the so-called “going for a cup of coffee”. This can point to social connections which are still relatively strong in the rural surrounding of this portion of Croatia.

Having in mind the existing traffic infrastructure, it is possible to assume that the physical elements, and especially safety, extremely important when choosing a bicycle as a means of transportation for all inhabitants, high-schoolers included. Safety, as a physical element influencing the choice of bicycle as a means of transportation, assumes a feeling of safety related to the rest of traffic, but also a sense of security in one’s own ability to ride. In the way of a general feeling of safety on a bicycle, there was also a question about the self-assessment of their skills when riding a bicycle. For this question, two interviewees highlighted their bad and “not so good” skills of riding. One interviewee is a male student, and one is female. One of them stated that the cause of their bad skills is the fact they learned to ride a bicycle too late. The same person stated:

“Well, given the fact I learned to ride late, when I was in the 6th grade, I am a little bit worse than the others” (hrv. Pa pošto sam kasno naučio voziti, u 6. razredu, malo sam lošiji od ostalih) (Student, A. G. Matoš Grammar school, 14).

The female interviewee stated that her riding skills are lower because she uses her rollerblades more often. The other interviewees largely stated that their skills are good or “normal”. Four interviewees highlight that they are very good or excellent in riding. The majority of them confirmed they can ride without hands. On the other hand, we also sort security and insecurity in traffic in physical elements and bad spatial awareness. One interviewee, a first-grader, stated that his greatest fear is his bad spatial awareness in the city. The majority of interviewees consider the lack of cycling infrastructure and the lack of traffic security in general as a negative element. Among the interviewees, major differences were noticed considering the geographical predictor of a place of residence. Taking into consideration the answers of all the interviewees, it is possible to highlight several problem areas and traffic points the appearance of which was the most common in the answers. In order to systemize everything which was stated, the traffic obstacles mentioned by students will be divided into those tied to the traffic among settlements and those tied to the traffic within Đakovo. This brings about the conclusion that the most problematic traffic points outside of Đakovo are the crossings above the overpass i.e. a part of the state road DC 7, especially for the students from Selci Đakovački and Satnica Đakovačka. One of the interviewees stated:

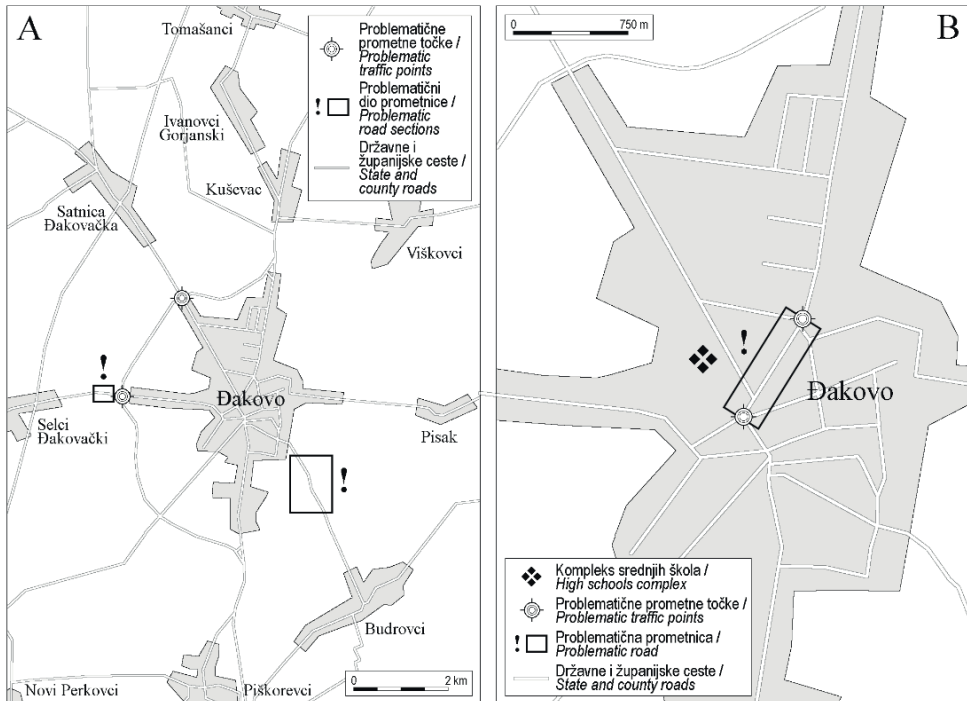
“The greatest obstacle are the cars on the road. I heard multiple times that a car ran into a cyclist on those overpasses.” (hrv. Najveća su prepreka automobili na cesti. Više sam puta čula kako je auto naletio na biciklista na tim obilaznicama) (Student, Braća Radić School of Economy, 16).

The second problem which was mentioned often are the lesser terrain obstacles in light of hills, especially on the road between Budrovci and Selci Đakovački on one side and Đakovo on the other (Picture 2). The following statement corroborates this:

“Well, for example, from Budrovci to Đakovo there is a small hill so it’s pretty hard to go to and from Đakovo. It’s pretty short but exhausting.” (hrv. Pa na primjer, od Budrovaca do Đakova ima malo brdo pa je dosta teško i u Đakovo i iz Đakova, dosta je kratko, ali naporno) (Student Braća Radić School of Economy, 16).

The mentioned morphology and terrain dynamic in this area is the result of carrying of loess shaped by numerous exogenous elements, mostly local watercourses. In the area between Budrovci and Đakovo, this dynamic is the most highlighted so the terrain element is more apparent than anywhere else in the researched area. Apart from everything already mentioned, the majority of students consider the thick traffic on the roads connecting the suburban

settlements and Đakovo to be another problem. This fact should not be surprising because those are all state roads. Apart from the thick traffic, the disobeying of traffic rules is also mentioned:



Picture 2 – The most problematic traffic points for cyclists in Đakovo in 2017

Source: Interview, Ivić, 2017

The interviewees highlight the street Ulica bana Josipa Jelačića to be the most problematic one for cyclists in traffic within Đakovo, as well as roundabouts at the start and the end of that street (Picture 2). One of the examinees stated:

“People don’t really pay attention, especially in the ban Jelačić street when they exit the parking lot, you really have to go slow and pay attention.” (hrv. Ljudi ne paze baš, posebno tu kroz bana Jelačića kad izlaze s parkirališta, moraš baš ići polako i dobro paziti) (Student, Antun Horvat Vocational School, 18).

Another student stated:

“Well, those idiots who don’t pay attention to the rules in the ban Jelačić street. I mean, I’m not a driver, but I still know some rules” (hrv. Pa one budale kad ne voze po pravilima u Jelačićevoj, mislim, ja nisam vozač automobila, ali ipak znam neka pravila).

He continued:

“...especially when I go through two roundabouts and there are older people there who don’t really understand the rules so they fly in without respecting the left-hand side rule. However, I could get off my bicycle at the roundabout and take the way around, but then again, the roundabout is there to be used.” (hrv...pogotovo kada prolazim kroz dva kružna toka, a na njima stariji ljudi i žene ne razumiju baš pravila pa ulijeću ne poštujući pravilo lijeve strane. Mada, mogao bih kod kružnog sići s bicikla pa ići okolo, ali opet, kružni tok služi da se njime prolazi) (Student, A.G. Matoš Grammar School, 15).

Apart from security, distance is also an important factor. Nelson et al. (2006) stress that the majority of those deciding to cycle to school have their place of residence four kilometers away from the location of the school at the most and that the distance of 8 kilometers is critical when we talk about using the bicycle to perform everyday tasks (Nelson et al., 2008). All examinees, apart from two of them, self-assessed that the distance from their place of residence to the school where they go is equal or less than 8 kilometers. The smallest estimated distance was 2 kilometers and the greatest was 12. The importance of personal distance estimates is important in this context as much as the exact distance because it affects the decision to use a bicycle. The average distance of all interviewees is 6 kilometers. The smallest distance was stated by the interviewee from Selci Đakovački, and the greatest by one from Piškorevci. The most common estimation was 5 kilometers.

We also categorize the weight of the school bag into the physical elements. Both female and male students spoke of heavy school bags bothering them when riding a bicycle.

The second significant group of elements determining the (lack of) choosing a bicycle as a means of transportation is made up of social elements. One of the important social elements is also the perception of people who use their bicycles on a daily basis in society. The majority of students have positive thoughts about those who use their bicycles often as a means of transportation. The most

frequent words used when expressing their opinions were: good, positive, super, interesting, etc. For instance, some of them stated:

“Well I find that great...” (hrv. Pa super je to meni...) (Student, A. G. Matoš Grammar School, 15)

or

“This is interesting to me...” (hrv. To mi je ovako zanimljivo...) (Student, Braća Radić School of Economy, 15),

...when describing their impressions on using the bicycle in general. It is also interesting that students, in most cases, mentioned the personality traits of people using the bicycle. Namely, they connect cyclists to traits such as persistence, taking care of oneself, ecological awareness, an interesting personality trait, etc. One of the interviewees stated:

“...a good person who tries i.e. they don't surrender easily.” (hrv...dobra je osoba, trudi se, znači ne odustaje lako) (Student, Antun Horvat Vocational School, 18).

One of the students also stated that those who ride their bicycles are “cool” (Student, Braća Radić School of Economy, 16). This perception could be tied to the positive images connected to young people who are physically active and take care of their body and health in the last several years. One student also mentioned a lecture by a cyclist who, during wintertime, arrived to Nordkapp with his bicycle and stated that the lecture intrigued and motivated him. In order to examine the attitudes towards the people using their bicycle to perform daily tasks, such as going to work, further, the interviewees were asked to give their opinion on a fictitious new neighbor who goes to work every day with their bicycle, even though they own a quality car. The positive attitudes remained, but some other thoughts emerged as well. For instance, some students were surprised with that:

“Well, I would be a little surprised that they don't take the care, sure, but they probably have a reason.” (hrv. Pa malo bih se začudio onda zašto ne ide automobilom, da, ali vjerojatno ima neki razlog) (Student, Braća Radić School of Economy, 14).

At the same time, some would be amazed by the usage of the bicycle in poor weather conditions:

“However, if he would use it in bad weather then I would look at him funny. We had a professor like that in primary school.”(hrv. Ali, ako bi

išao po lošem vremenu, onda bih ga malo čudno gledao. Imali smo takvog profesora u osnovnoj školi) (Student, Braća Radić School of Economy, 15).

Despite these highlighted statements, the majority still kept a positive attitude and opinion on personality traits for such a man:

“Well, he probably takes care of his health and recreation, wakes up until work and comes to work rested and ready!” (hrv. Pa vjerojatno drži do zdravlja i rekreacije, razbudi se do posla, odmoran i spreman dođe na posao!) (Student, A. G. Matoš Grammar School, 15).

Apart from the perception of others, the environmental factors, and the consequential quality of life also enter into the group of social elements. The interviewees connected riding a bicycle with a positive influence on the environment, their own health, and the quality of life as a whole. One student stated:

“Well, first I save time for my dad. He doesn’t have to take care of driving me and getting me there on time. Then, I also feel better because I have some exercise before school where I sit 5 to 6 hours a day. My bicycle comes in handy. It is much easier and I like to take my bicycle much more and that’s it!” (hrv. Znači, prvo uštedim vrijeme tati. On se ne mora brinuti da me vozi i da stignem na vrijeme. Zatim, i meni je isto bolje jer se malo razgibam prije škole u kojoj sjedim 5 do 6 sati, bicikl mi super dođe. Puno mi je lakše i draže biciklom i to je to!) (Student, A. G. Matoš Grammar School, 15).

We can also categorize the influence of friends into the group of social, but also contextual, elements which influence the decision on the choice of a mode of transportation. The importance of the social function in an active commute to school is visible from the words of one of the interviewees:

“I made a deal with one of my friends from Budrovci and then we went together. That is actually interesting. I don’t know, to me it’s more interesting than taking the bus. It’s very exhausting taking the bus, this is better.” (hrv. Dogovorila sam se s jednim prijateljem iz Budrovaca i onda smo išli zajedno. To je zanimljivo zapravo, ne znam, meni je to zanimljivije nego ići busom. Jako je naporno ići busom, ovako je bolje) (Student, Braća Radić School of Economy, 16).

On the other hand, some don’t decide on taking their bicycles to school because the rest of their friends don’t either. One of the interviewees stated:

“Well, I don’t know. It’s just that there’s the bus. I travel alone and I would have to take the bicycle alone and there is a lot of traffic and then I really don’t feel like it!” (hrv. Pa...ne znam, jednostavno tu je bus. Putujem sama i morala bih ići sama, a dosta je prometno i onda mi se ne da baš) (Student, Braća Radić School of Economy, 16).

The magnitude of the influence by society and the environment is also visible from their answer to the question would they start going to school by bicycle if some of their peers or friends from the same place of residence would also start doing so. 13 out of a total of 15 interviewees said they would, and only two stated they would still take the bus. The remaining thirteen interviewees stated they would probably or surely join their peer i.e. friend from the same place who would take the bicycle to school. The most common reason of doing so would be to be in the company of peers and friends, which is characteristic of young adolescents. The answers were most often similar to these:

“I would join so I don’t go alone, it would be much more interesting.” (hrv. Pridružio bih se, zato da ne idem sam, bilo bi puno zanimljivije) (Student, Braća Radić School of Economy, 17)

or

“I would join to be with them, in their company, so I don’t go alone.” (hrv. Pridružila bih se da budem s njima, u njihovom društvu. Da ne budem sama, jelda) (Student, Braća Radić School of Economy, 17).

Two students who stated they wouldn’t join gave the reason of a personal lack of willpower, their comfort, or laziness. Apart from a desire to spend more time with their peers, the increased feeling of security when riding a bicycle in a group was also mentioned:

“Yes, I would join, I would feel safer that way.” (Student, A. G. Matoš Grammar School, 14).

We could also count personal willpower, fear, and the unattractiveness of traveling by bicycle alone, as well as peer acceptance, into social elements. This is put simplest in the statement of one of the interviewees:

“Well, it’s just easier somehow to take the bus.” (hrv. Ma, lakše mi je nekako ići autobusom) (Student, Braća Radić School of Economy, 15). One interviewee, however, stated: “I don’t know, I’m lazy.” (Student, Braća Radić School of Economy, 17).

The third group of elements is made of contextual elements such as gender, age, and living environment. Taking into consideration the gender of interviewees, it is interesting that, out of the four students claiming they used their bicycle to go to school at least once, there are two male and two female students. However, only two male interviewees stated they regularly use their bicycles to commute to school. For the other questions, there wasn't a significant difference noticed in the answers of male and female interviewees. The parental environment could also be counted within this group. However, the majority of interviewees confirmed their parents gave or still give them advice related to riding a bicycle, especially on traffic-heavy roads and outside of settlements. The fear of parents for the security of their children is more stressed with female interviewees, while the personal fear of theft and vandalism also appeared in male interviewees.

Discussion

The research which was performed uncovered some characteristics of usage, but also the main reasons of not using the bicycle as a means of transportation in the daily commute of the Đakovo high-schoolers. When comparing the results of this research with previously determined scientific facts, a great deal of similarity was noticed.

The research determined that the majority of high-schoolers own their own bicycle and that this fact has almost become a rule. However, despite owning their own bicycle, only a small number of them decide to use it to perform their daily tasks i.e. to commute to school. This discovery among the high-schooler population of the suburban settlements of Đakovo is in line with the results of previous research in Europe and the world. Namely, the finds of Nelsona et al. (2008) and Babey et al. (2009) are confirmed and they speak of a significantly larger attachment of using the bicycle for free time and recreation. The same research also mentions the fact that the majority of young people own their own bicycles. This, of course, does not relate to countries such as the Netherlands and Denmark where the bicycle is already one of the basic modes of personal transportation (Pucher and Buehler, 2008). The most frequent situations of using the bicycle mentioned by the students from the Đakovo area are going to the store within their place of residence, visiting family and friends within their place of residence, and recreational rides with friends. This also shows that using the bicycle is focused mostly on free time and recreation, apart from going to the store. Even though going to the store, by the nature of things, should be an

obligation, it is hard to interpret it as such due to the closeness to the place of residence.

The students stated a lack of personal comfort, their own lack of will, desire and laziness, insecurity in traffic, fear of theft and vandalism, parental prohibitions, a lesser feeling of security due to a heavy school bag or rucksack, and a personal hygiene problem as reasons for rarely using the bicycle to commute to school. If we compare these findings to those from previous international research, we see numerous similarities. For instance, the perception of students on reduced comfort and a lack of will to use the bicycle as an alternative to the bus can be interpreted within the concept of the so-called car culture mentioned by Lorenc et al. (2008). Namely, they state that this concept explains the perception of the young people that taking a motorized form of transportation, especially a car, is more suitable and comfortable in relation to all other modes of transportation. We can also connect a feeling of personal laziness to take part in an active mode of commute to school with the aforementioned concept. In the context of laziness, it can be assumed that a portion of those blaming their own laziness will fall due to a more and more obvious trend of valuing physical activity, healthy life, and taking care of one's body and health, which is ever more present even among adolescents (The Economist). The distance from the place of residence to school can also be a part of the cause for laziness and lack of will. Namely, the majority of interviewees live, on average, six kilometers from school. It is clear that this is more than the value of four kilometers within which active commute to school is most frequent (Nelson et al., 2008). The same authors also state that for every 1.6 kilometers added to that, the possibility of riding a bicycle to school falls by 71%.

Social elements also proved to be extremely significant according to the results of this research. This is especially visible in the fact that the majority of students would more often decide on taking their bicycles to school if their friend/peer living in the same settlement would do the same. The research by Benson and Scriven (2012), as well as the research by Timperio et al. (2006) stating that the probability of active commute to school is extremely larger for individuals whose friends and peers already do so also confirms the results of this research. What is more, the probability of using the bicycle to commute to school is larger in city districts and settlements where there is a larger number of children.

Within the category of social elements, we also included parental prohibitions of using the bicycle for greater distances. They also exist among the interviewees on the wider Đakovo area, often among female students. Previous research has

determined the presence of this element as well, explaining it within the context of nurturing the reputation of a caring and good parent (Lorenc et al., 2008).

Among the population researched, there is also the influence of heavy school bags and rucksacks disturbing the proper management of a bicycle and, consequently, reducing the feeling of general traffic security, especially on traffic-heavy roads.

Apart from everything that was mentioned, the interviews done within the frame of this research have also shown some specific elements, such as discomfort that sweating, as a clear consequence of using the bicycle, carries within the company of other students. Also, there is a fear of bicycle theft and eventual vandalism as a limiting factor of frequently using the bicycle to commute to school.

Conclusion

Despite the fact that the bicycle is an omnipresent appearance among the youth, especially the high-schooler population, it is very rarely used to commute to school. The exception, in that sense, is not made by the area of Đakovo with its nearest suburban settlements. Namely, this area also consists of the majority of high school students who own a bicycle, but its usage is almost always tied into the domain of free time and recreation. The students of nearest suburban settlements very rarely take their bicycles to school and the reasons for this form of traffic behavior are different.

Even though this research was started with the assumption that the most important element when making the decision on commuting to school will be a lack of cycling infrastructure and a feeling of personal traffic insecurity, this was proven partially incorrect. Namely, the feeling of traffic security and a lack of infrastructure were no more important as elements than others, especially the social ones.

The infrastructure and actions by the local government in the domain of increasing the portion of cycling traffic did not achieve the desired result. Planned activities are far too focused on building a new cycling infrastructure and are lacking a wholesome approach to the problem. Such an integral approach would assume an overview of all the mentioned elements which can influence the decision to use the bicycle to perform daily tasks. That way, one can reach the conclusion that investing into infrastructure is only the solution to a small

portion of the problem on this micro-location. It would definitely be good to list the aforementioned numerous social elements into the planning of a strategy to increase the portion of daily cyclists, but also the physical ones which do not relate solely to infrastructure. That would make it possible to see the importance of a local community in promoting cycling as a profitable option of an individual by using methods such as organizing promotional events, issuing publications, lectures, etc. The aforementioned actions should definitely be focused on elements such as lack of personal willpower and the importance of peers and friends when making decisions. Only with that approach can there be successful action towards the key elements supposed in this paper to be key in making a decision to commute by bicycle among the high-schoolers of the suburban settlements of Đakovo.

References

1. Augé, M. (2010) *Pohvala biciklu*. Zagreb: Jesenski i Turk.
2. Babey, S. H., Hastert, T. A., Huang, W., Brown, R. E. (2009) Sociodemographic, Family, and Environmental Factors Associated with Active Commuting to School among US Adolescents. *Journal of Public Health Policy*, vol. 30, no. 1, 203-220. /online/. Accessed July 15, 2017: <https://pdfs.semanticscholar.org/e374/c15790327da59e665857a7b975c4548d815f.pdf>
3. Benson, J., Scriven, A. (2012) Psychological, social and environmental barriers to cycling to school. *International Journal of Health Promotion and Education*, vol. 50, no. 1, 34-44. /online/. Accessed December 1, 2017: <http://www.tandfonline.com/doi/abs/10.1080/14635240.2012.661956>
4. Gašparović, S. (2014) *Utjecaj prometne marginaliziranosti na svakodnevni život srednjoškolske populacije Grada Zagreba*. Zagreb: Prirodoslovno-matematički fakultet Sveučilišta u Zagrebu, doktorska disertacija.
5. Lorenc, T., Brunton, G., Oliver, S., Oliver, K., Oakley, A. (2008) Attitudes to walking and cycling among children, young people and parents: a systematic review. *Epidemiol Community Health*, vol. 6, no. 2, 852-857. /online/. Accessed November 19, 2017: <http://jech.bmj.com/content/62/10/852.short>
6. Lukić, A., Prelogović, V., Rihtar S. (2011) Planning a More Humane City: Student Expectations Concerning Bicycle Use and Transportation in Zagreb. *Hrvatski geografski glasnik*, vol. 73, no. 1, 111-132. /online/. Accessed

- November 15, 2017: https://hrcak.srce.hr/index.php?show=clanak&id_clanak_jezik=106407
7. Nelson, N. M., Foley, E., O’Gorman, D., Moyna, N. M., Woods, C. B. (2008) Active commuting to school: How far is too far? *International Journal of Behavioral Nutrition and Physical Activity*, vol. 5, no. 1, 58-68. /online/. Accessed December 1, 2017: <https://ijbnpa.biomedcentral.com/articles/10.1186/1479-5868-5-1#Declarations>, 1. 12. 2017.
 8. Prinz, D. (2006) *Urbanizam, Svezak 1. – Urbanističko planiranje*. Zagreb: Sveučilište u Zagrebu.
 9. Pucher, J., Buehler, R. (2007) At the Frontiers of Cycling: Policy Innovations in the Netherlands, Denmark, and Germany. *World Transport Policy and Practice*, vol. 13, no. 3, 8-56. /online/. Accessed November 15, 2017: <https://trid.trb.org/view/869552>
 10. Pucher, J., Buehler, R. (2008) Making Cycling Irresistible: Lessons from The Netherlands, Denmark and Germany, *Transport reviews*, vol. 28, no. 4, 495-528. /online/. Accessed November 15, 2017: <http://www.tandfonline.com/doi/abs/10.1080/01441640701806612>.
 11. Pucher, J., Buehler, R. (2012) *City Cycling*. Cambridge and London: The MIT Press.
 12. Timperio, A., Ball, K., Salmon, J., Roberts, R., Giles-Corti, B., Simmons, D., Baur, L. A., Crawford, D. (2006) Personal, family, social, and environmental correlates of active commuting to school. *American Journal of Preventive Medicine*, vol. 30, no. 1, 46-51. /online/. Accessed November 15, 2017 on: <https://www.ncbi.nlm.nih.gov/pubmed/16414423>, 15. 11. 2017.
 13. Titze, S., Stronegger, W. J., Janschitz, S., Oja, P. (2007) Environmental, Social, and Personal Correlates of Cycling for Transportation. *Journal of Physical Activity and Health*, vol. 4, 66-79. /online/. Accessed November 16, 2017: <https://pdfs.semanticscholar.org/a5f7/dd61ab2e7a097b13a17aa9b987383fcba341.pdf>

Sources

1. HAK (2017) Interaktivna karta Hrvatske. /online/. Accessed November 28, 2017: <https://map.hak.hr/?lang=hr&s=mireo;roadmap;mid;I;6;12;0;;1>
2. THE ECONOMIST (2018) *Teenagers are better behaved and less hedonistic nowadays*. /online/. Accessed January 20, 2018: <https://www.economist.com/international/2018/01/10/teenagers-are-better-behaved-and-less-hedonistic-nowadays>; Upravni odjel za komunalne djelatnosti i prostorno uređenje Grada Đakova

Prethodno priopćenje

UDK: 796.1-057.87

Ivan Ivić (Hrvatska)

Prirodoslovno-matematički fakultet Sveučilišta u Zagrebu

iivic@geog.pmf.hr

Martina Jakovčić (Hrvatska)

Prirodoslovno-matematički fakultet Sveučilišta u Zagrebu

mjakovci@geog.pmf.hr

Ružica Vuk (Hrvatska)

Prirodoslovno-matematički fakultet Sveučilišta u Zagrebu

rvuk@geog.pmf.hr

BICIKLISTIČKI PROMET U FUNKCIJI DNEVNE CIRKULACIJE SREDNJOŠKOLACA: PRIMJER UPRAVNOG GRADA ĐAKOVA

Sažetak

Biciklistička renesansa ili nagli povratak bicikla i biciklizma u javni prostor obilježava zapadna društva već nekoliko desetljeća. Posljednjih tridesetak godina biciklistički promet postaje svojevrsna paradigma suvremenog prostornog i urbanog planiranja. Ovaj rad detektira fizičke, društvene i kontekstualne čimbenike koji utječu na (ne)izbor bicikla kao prijevoznog sredstva među srednjoškolcima u Gradu Đakovu.

Ključne riječi: biciklistički promet, dnevna cirkulacija, srednjoškolci, Đakovo