

**HOW TO IMPROVE CITY'S LEARNING ENVIRONMENT:
ARCHITECTURE FOR STUDENT'S CYCLING**

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This paper is motivated by the challenges facing student's way of life and university education in the context of emerging complexities of urban environment and its architectural design.

As such, nowadays opportunities arise for the development of more comfortable and efficient learning city's environment: by incorporating into city's architecture and learning design state-of-the-art bicycle transportation technologies. We believe that such an approach will also serves as response to the global social and ecological challenges of 21st century urbanization.

The key objectives of this paper are to substantiate and formulate the topic, and outline the tasks of elaboration a special architectural program for the development of a bicycle-friendly urban student's environment in Kharkiv. As the important component of Kharkov as a leading city of education.

This article significantly relies on publications related to architecture of bike-friendly urban environments, active learning, healthy cities, learning cities, smart cities, ubiquitous learning [1, 3, 5-6].

1. At the moment revolution is occurring in street design. Leading cities in the world strives to create an environment that let everyday citizens cycle for transport. Among the most visible measures designating one lane on most avenues to bicyclists only, with barriers to protect them from traffic.

Now hundreds of cities in the world are rejiggering to be bicycle-friendly.

Many city dwellers would prefer if their city were more like Copenhagen where more than 40% of all trips are by bike. The level of cyclization of cities has become a measure and a symbol of the quality of life. And naturally, many university students dream of the possibility of using a bicycle as a means of transport - as a «tool» for an active, healthy, sporty and environmentally responsible lifestyle.

This mode of transport that «whips our hearts into shape, funnels many more people down streets than can be funneled in cars, has no pollution, and costs governments and individuals an absolute pittance».

Many of the world's leading architecture companies today are thinking about «how close to 100% the bike modal share can possibly go and what we must do to achieve that» [4].

2. Kharkiv is a city of education and students. There are more than 160 thousand and more than 140 thousand schoolchildren in the city. This means that every fifth resident of the city is actively studying.

But to what extent are the current urban environment and its architecture favorable and conducive to modern education processes, create conditions and support development? Can we single out the «urban space of students and youth» in Kharkiv? What is its content? What can you do there?

What is the mobility and quality of transport connectivity of the main places and centers of student life and learning?

3. Modern approaches to building cities increasingly view the urban environment as a «continuous educational ecosystem». Campuses of universities, school, sports and educational complexes, museums and theaters, transport and different services are all interpreted as a potential source of knowledge, experience and education. The question was raised about how students, citizens and urban residents «learn» today, what elements and qualities of the urban environment can support development and education.

Despite the explosive development of virtual communications (the Internet, etc.), the real physical connectivity and integrity, the coherence of the educational environment is determined by the quality of transport. The elite educational environment in the best universities in the world still remains «contact». The transport qualities of the urban environment are an important part of its educational ecosystem.

Kharkiv is unique in that almost all the leading universities in the city are located compactly (in fact, within bicycle accessibility).

If we improve intra-city student mobility, opportunities and quality of transport for students, we will significantly improve the quality of the entire educational environment in the city. It would be step forward to build state-of-the-art «continuous educational ecosystem».

Biking is the best way to see a city and master learning potential of its environment – and it is good for the health of bikers, for entire city ecosystem and for our planet.

Today, especially in the context of the Covid-19 pandemic, there is a boom in cyclization throughout the urbanized world. The popularity of cycling has grown significantly in 2020-2021. Therefore, it would be so important and interesting to improve the quality of the special transport system of student's Kharkiv using the potential of cycling.

4. Urban areas can offer unique opportunities for experiencing the world and learning at different levels, an important one of which is to stimulate students and citizens to become aware of themselves as citizens and as part of a community or different communities (from the university campus, school community, to the street, neighborhood and urban space in overall). Getting to know the urban area reveals the socio-cultural diversity that is critical to developing empathy and tolerance, much-needed qualities, especially nowadays.

Understanding the city as a fertile learning environment is an invitation to consider what students and schoolchildren can learn in urban space, what cannot be

taught at university and school, and what urban qualities and architecture need to be improved and developed to create social bonds and empowerment. Initiatives around the world that are exploring this invitation are gaining strength and numbers.

How can the architecture of the city be improved in such a way as to stimulate learning and development processes in the urban environment that will allow schoolchildren and students to grow into socially and environmentally responsible citizens who understand that they are part of large ecosystems and become active citizens?

Italian educator Francesco Tonnucci develops the concept that it is very important to stimulate the “direct active (transformative) participation” of students and children in the life of the city, if we want cities, instead of disunity, to stimulate closer connections and more socially sustainable systems [1].

All this means that the cyclization of the student world and the educational environment of the city is not a «purely technical» or «transport-technological» issue. This is a question of architecture in its fundamental meaning, its moral and ethical component, and its aesthetics, among the issues of creation of new kind of open public spaces and the question of the availability of various universities, schools and urban facilities that are significant for education.

5. To be sure, the major cities of the former USSR are still overwhelmed by the boom in motorization. This urban concept dates back to the 1950s, when a new approach to cities was to fill cities with cars. And this is what the construction activity in the cities follows. However, today the situation in the world is completely different. The urban environment is in need of fundamental transformation. And as we can see from global trends, the idea of a cycling city, if it captures the public imagination, is likely to become an important force for positive changes in architecture and urbanism.

As we know from history, the concept of an «automobile city» was introduced to New Yorkers in an exhibition called «Futurama» at the 1939 World's Fair. The idea was to build skyscrapers, «to make buildings tall and thin so that at ground level there was as much room as possible for wide highways – mobility for mobility's sake» became the main driver of motorization [4]. As a result, today the urban environment has turned into «towers in the parking lot», and residents in this environment are in a hurry to go somewhere further.

6. Kharkiv is still following the path of the outdated concept of motorization and urbanism of the 1950s – increasing the number of storeys, expanding urban space and roads to increase the speed and capacity of automobile traffic.

As we can see, despite the general increase in the number of cyclists, they mostly ride outside the city. The urban environment of Kharkiv itself is still not bike-friendly. Moreover, the architectural environment itself is not bicycle-friendly either. There are virtually no protected bike stands, university bike clubs, or support systems for increased bike use.

As a «senior cyclist» and a representative of the student's cycling community, I believe it would be important to initiate a series of student projects aimed at building a new architecture program in the city, in order to ensure the development of

cycling infrastructure and create conditions for the increased use of cycling by students and schoolchildren in the city.

The cyclization of student Kharkiv will not only follow the "world architectural fashion". This is the way to improve the city's health and improve the quality and living conditions of thousands of active citizens. This is an increase in the quality of the urban educational infrastructure and the attractiveness of the entire city environment for new students and wealthy citizens.

The student's body of the A.N. Beketov Kharkiv National University of Urban Economy could initiate and develop a number of such projects.

7. What should be done first?

A) It would be important to create virtual maps of the city, which indicate the most convenient and «accessible» and safe for cycling traffic spaces and routes. Including walking routes, excursion routes, educational and working or «utilitarian purposes» (as access for university classes, for shopping, obtaining certain services, etc.).

These maps need to be created with the city's cycling community and architecture students, with input from design students, IT students, humanitarian students, construction-builders, ecologists and cartographers.

B) Further, maps of places and spaces around and within university campuses are needed that could be equipped as bike-friendly and safe for storing, etc.

There is also a need for maps of bicycle service shops, including information on the composition of services and architecture – how convenient and for which types of services they are most suitable.

C) Since it is obvious that for a long time the urban space will be predominantly occupied by cars, for cycling it will be necessary, firstly, to use available pedestrian paths and routes, and secondly, to reorganize and reorganize pedestrian spaces architecturally and find equipping places for cycling. Therefore, as Steven Fleming suggests, there is a need to achieve peace between bicycles and pedestrians. This is a challenge for architects – how to come up with mutually convenient routes and the safe use of common space for pedestrians and cyclists.

Ways need to be found to connect different spaces that are comfortable for cycling and vice versa, exclusively for pedestrians. These zones, if they are on a higher ground, can be connected by «footbridges», and the lower-level zones can be used for faster cycling.

D) Considering the climate of Kharkiv, infrastructure is important to protect cycling from bad weather. We need a designer search and the creation of «amenities» that could also allow cycling in «relative» bad weather. Architects might be looking for ways to protect cyclists from wind and rain. This will expand the possibility of cycling throughout the year.

E) And of course, it would be important to create such a «terrain» for cyclists, which would naturally be able to control and regulate the speed of movement of bicycles. Where bicycles need to slow down, such as at an intersection or outdoor activity, cyclists could slow down if designers actively use elevating the surface of the bike paths by one or two meters. Cyclists will naturally slow down as they climb and then pick up speed again as they go downhill.

Probably in order for such project ideas to find a way to implementation, it would be important to create at the university an architectural, design and bicycle student's club «Kharkiv: bicycle & student friendly city».

Transformation of the city into one in which an active student and children's lifestyle will be appreciated and supported – through architecture, design of open public spaces and bicycle routes, at the same time, educational programs related to the urban environment and a general approach to the formation of the architecture of the urban educational environment – will be an important step in improving the quality of life and prestige of Kharkov as a city of education.

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«ЗЕЛЕНЕ БУДІВНИЦТВО» - ВИСОКОЕФЕКТИВНА ТЕНДЕНЦІЯ 21-ГО СТОЛІТТЯ

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Популярною тенденцією 21-того століття стало «піклування» про навколишнє середовище та занепокоєність майбутнім нашої планети. Ця тема не могла оминати архітекторів та будівельників, адже вони, як ніхто інший, розуміють значущість збереження ресурсів природи та грамотного поводження з ними, а також покращення стану навколишнього середовища в цілому.

Провідною темою вискоєфективного будівництва можна назвати «зелене будівництво». Воно поєднує у собі комплексний підхід до усіх етапів від проектування до забудови. Основними компонентами, які відіграють роль у