

**SOCIO-ECONOMIC PREREQUISITES FOR DEVELOPMENT
CYCLING AND PEDESTRIAN NETWORK IN RESIDENTIAL DISTRICTS****Savytska O. S.,**PhD Arch., Professor, Department of Urban Planning,
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Abstract. The article considers the main social and economic factors that strengthen the existing state of roads in Odessa and lead to redefining of the priorities of the categories of the population traveling by road. As the city has recently been rapidly developing its territories, it is the reason for the consolidation of existing roads and driveways, causing adverse consequences for both the safety of transport users and the environment. Numerous benefits of cycling infrastructure development for the society and economy of the city are shown in this article. First of all, for people – ordinary city dwellers – these advantages are the most important: traffic safety, lower road density, less time spent on travelling to the destination, flexibility of the route, improved air quality and greater ease of maintenance and repair.

Keywords: cycling infrastructure, transport, congestion of roads, environmental friendliness, resource saving.

Introduction. Transport infrastructure is a reflection of the socio-economic situation in a settlement, and in large cities this is seen quite clearly. And since everything tends to change, it is necessary to know which processes and events in the life of society, its level of material well-being have influenced the overloading of transport routes, as well as which benefit for the society and the city's economy the development of a network of bicycle passageways along with ordinary highways can bring. The analysis of prerequisites helps to focus more on the problems of road congestion and on all the inconveniences associated with this issue (lack of parking spaces, traffic jams, road accidents), and to determine the importance of the active integration and the development of the bicycle and pedestrian network.

Analysis of the latest sources of research and publications. The theoretical and methodological basis of the study is the analysis of the carried out in practice and published research works of transport designers of Ukraine and Russia, as well as the scientific work of Odessa scientists, normative acts of Ukraine in the design of the road transport network. A large amount of information about the current state of the infrastructure of low mobility, as well as the world experience of its implementation and operation, was discovered on the webpages, since the topic is rather new. For example, the latter was found in the publications of A. Myasnikova, Z. Alekseeva, R. Goncharenko. In addition, links to the VeloForum 2021 program in Ukraine and on the website of the French regional center played a role in the writing of the article to demonstrate the possibilities of introducing velo-integration.

Formulation of the task. To find out the factors within the city of Odessa, which worsen the condition of city roads and induce to look for a more economically profitable, environmentally friendly, and socially convenient solution. Bring all the possible advantages of the introduction and

development of cycling infrastructure in Odessa and substantiate their benefits and necessity, taking into consideration world experience.

The basic material and results. Moving from one point to another in order to achieve the assigned tasks has always been of great importance, transforming and adjusting to the peculiarities of different stages of the development of society [4]. Over the course of history, the range of goods and services provided has expanded, and for some of them the demand could increase, so that more and more settlements' residents, whose number was also increased due to natural population growth, wanted to receive them (pic. 1).

At the same time, in the United States, the idea of overconsumption [7], behind which consequently lies overproduction and overdisplacement, became stronger and began to be promoted throughout the world. For example, the same purchase and supply of raw materials to an increasing number of companies is directly reflected in the transport infrastructure of the city. However, since industrial movements have their own regulations, we should pay attention to civil transportation.

As a result of the factors listed above, today we have, first of all, a significant overload of existing highways [3]. The overpopulation of economically developed populated areas at the expense of migrants is also supplemented by the consumer's choice in favor of personal light vehicles - the desire to provide himself with "the maximum comfort of movement".

However, everything has its disadvantages. Is it really comfortable to stand in traffic jams every morning, wasting gasoline, which costs money, and your own precious time? And get into an accident, in order to recompensate that time? We can give preference to public transport in this case (pic. 2), but during the coronavirus pandemic we should remember about the risk of infection in a poorly or absolutely unventilated closed space in existing buses, trams and trolleybuses in Ukraine. Of course, you cannot protect yourself from all the harmful environmental influences, but you can choose an alternative proposal that would minimize the probability of their appearance and interaction with a human. The development of transport infrastructure for low mobility in such a large city as Odessa may really act as a convenient solution.

Let's find out who may need and benefit from cycling infrastructure. First of all, ordinary citizens, who are interested in reaching their destination quickly (without being in traffic jams), rather safely and with fresh air, unlike in public transport. It should be noted that we can navigate the cycling pathways not only by bike. There are other means of low mobility suitable by size, that develop a rather high speed and can be afforded by simple citizens. These are segways, hoverboards, mono-wheels, electric scooters and even skateboards (pic. 4). So, their users would be glad to use the cycling infrastructure with the convenience and health benefits, too [9].

Speaking of health benefits, the European experience should be mentioned. Firstly, many people abroad have used to doing sports regularly before the working day, e. g., running, exercising in the gym or cycling. Secondly, some companies in which there is a lot of «sedentary», «stationary» work, care for their employees' health and support the corporate spirit of the organization in this way. After all, when people do something together, they are united and stimulated to work with common forces for one big result.

The guests of the city represent the next category. It must be remembered that despite the coronavirus restrictions, the tourism industry continues to develop and has formed much new types recently. Among them is sports tourism. Again, in Europe, several cases are known when special tourist routes were organized for tourists both to get acquainted with the city (for example, the so-called «royal routes» in the Netherlands, pic. 3) [1], and to explore the natural terrain of the region (for example, a bicycle path from Sauveterre-de-Guyenne to Bordeaux, France) [10].

In Ukraine, such events are just beginning to be introduced and are of an irregular nature (for example, a bicycle tour of the historical center of Odessa within the framework of the Veloforum 2021) [11]. We would like to note that this would significantly increase the tourist interests, who associate Odessa only with beaches and hot spots in last few years, to the particularities and charm of historical architecture, and Odessites would encourage themselves to realize the value of heritage and protect it at least on their own. Apart from that, Odessa would gradually acquire the image of a European city [2], which the government, especially at the state level, has been striving for lately.

Of course, the integration of cycling infrastructure would be very convenient for all kinds of delivery services for the above reasons: speed, movement almost without obstacles, great accessibility. And also – the flexibility of the route, which is very well felt in the courtyards built in the 80s of the last century, since not all front doors will be able to give access to the main space of the street, and the customer needs to receive his goods.

Using the social benefits for delivery services, we can conclude about the economic profits for the same category of the population. During the lockdown times, many people saw the potential in such services, in order to receive any products without leaving their homes (for example, Glovo carries an order at the door of an apartment). With the growing demand for such a service, it would be quite logical to increase the number of deliveries through the use of an adequately planned cycling infrastructure. The more streamlined it is and safer it works, the more it will be used and the more often such trade movements will be carried out.

The same is true for visitors to bike tours, and the organization itself can make a profit by renting out its own bicycles. For small businesses, cycling would be a big advantage from this point of view [8].

For the municipality workers, this would be economically beneficial in several parameters. First, let's go back to renting. Recalling the experience of Barcelona [1], the city government can rent the purchased bicycles for a certain price per day, using the parking lots with these vehicles spread throughout the city. By means of that, a city dweller can use state bicycle transport all day both for one “big” trip, and for several “small” ones, paying every time a bicycle is taken from any parking lot. Speaking about Ukraine, only private companies Bolt and Jet have adopted this experience most quickly so far, leasing electric scooters with the same system, which may well compete with bicycles.

The next advantage is that the integration of cycling infrastructure for city authorities will actually help to get even closer to the transition to green energy, as it was planned at the country level in the coming years [5]. It is obvious that replacing light automobile transport with a bicycle or other means of low mobility (see above), the need for gasoline and diesel fuel will gradually disappear. This is not only a contribution to the ecological situation of the city, but also significant savings in finances and the ability to rationally redirect them to another sphere - for example, to the development and implementation of other technologies to ensure sustainable development and energy efficient architecture.

It is also worth noting that regardless of whether a citizen belongs to one or another category of the population noted in the article, maintenance and repair of a bicycle or other means of micromobility would be much cheaper than the same for a car [2], due to the greater simplicity of the design and fewer spare parts of the latter.

We should not forget about another segment of the population, whose activity is now quite active – these are builders and developers. The development of cycling infrastructure in prefabricated new areas would be extremely useful to them. Recalling the experience of the «Raduzhny» residential area – dwellers' complaints that it is very difficult, sometimes even impossible, to provide two-way traffic with a large number of inhabitants on the existing intra-block thoroughfares – in some newly built districts an unspoken rule is applied among their residents: personal cars are allowed to be left in low-rise parking lots on the territory of this area, and the other automobiles (such as a taxi) to be parked on the border of this area (for example, the Artville residential area near the Avangard urban-type settlement and the Kadorr residential complex on the outskirts of Tairova). On bicycles, there are no such restrictions.

Taking into consideration the fact that certain new housing estates are being built closer to the borders of Odessa, it would be possible to propose to build cycle tracks near these areas, thus providing additional promotion of new buildings at the expense of the contingent that rides bicycles and has recently been associated with progress, a healthy lifestyle, and a high level of material well-being. And the latter often plays a big role in the minds of Odessites when making decisions.

Based on the requirements of building codes [6] for the design of roads in settlements, it is obligatory to supply streets with a strip of greenery both in order to reduce noise and increase air

quality and improve the conditions for the movement of pedestrians and cyclists. As a result, using these very street profiles on the borders between the existing, although often depressed outskirts of the city and newly built residential areas, it is possible to approach the implementation of the concept of the Green Belt of Odessa [12].

We would also like to note that the improvement of the environmental situation through the introduction of cycling infrastructure stipulates some savings in municipal finances in the health sector [8]. Firstly, as stated earlier, using a bicycle or other low-mobility devices instead of stifling public transport reduces the risk of contaminating Covid-19 and other airborne diseases. Consequently, we will have a smaller number of hospitalized people and less expenses for the purchase of medicines and mechanical ventilation for hospitals. Secondly, cycling is a good prevention of diseases of the cardiovascular system and musculoskeletal system, prevents obesity and some diseases of the nervous system. Thirdly, as a type of regular physical activity, it stimulates the full-fledged work of the brain throughout the day due to the involvement of its various departments and, as a result, increases overall productivity at work. This is especially true for people employed in the field of intellectual work – whose daily routine in the past two years, for known reasons, makes them tied to their office duties for more time and, as a result, makes them move less during the day.

Conclusions. Social and economic benefits are directly connected to each other, and the emergence of some is a consequence of the action of others, and all this is naturally reflected in the pedestrian and transport infrastructure of the city. So, an increase in the population requires more goods and services, for which it is required to overcome a certain distance at a given speed in a certain time. With an increased demand, a journey through a limited area slows itself down and becomes more difficult, and with a superabundance of vehicles, it is also harmful for health. The solution is the integration and development of an additional bicycle road network that relieves the traffic flow, facilitates the movement of all categories of street and road users, and provides many other benefits to different segments of the population and the general state of the city's economy.



Pic. 1. Road congestion



Pic. 2. A possible solution to road overloading



Рис. 3. “Royal routes” in Amsterdam



Рис. 4. A mean of micromobility

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СОЦІАЛЬНО-ЕКОНОМІЧНІ ПЕРЕДУМОВИ РОЗВИТКУ ВЕЛО-ПІШОХІДНОЇ МЕРЕЖІ ЖИТЛОВИХ РАЙОНІВ

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Анотація. У статті розглядаються основні соціальні та економічні фактори, що зумовлюють посилення існуючого стану доріг Одеси і нагтовхують на перевизначення пріоритетів категорій населення, що пересувається транспортними шляхами. Оскільки місто останнім часом швидко забудовується і розвивається, це є причиною ущільнення існуючих доріг і проїздів, викликаючи несприятливі наслідки як для безпеки користувачів транспорту, так і для стану навколишнього середовища. Показані численні вигоди розвитку велоінфраструктури для суспільства та економіки міста. Перш за все, для людей – звичайних жителів міста – ці переваги найголовніші: безпека руху, менша щільність руху на дорогах, менше затраченого часу на пересування до пункту призначення, гнучкість маршруту, підвищення якості повітря та більша легкість у технічному обслуговуванні та ремонті.

Економічно це теж має свої переваги. У першу чергу, для працівників муніципалітету: з огляду на світовий досвід організації велоінфраструктури, є багато можливостей налагодити систему оплати за користування велосипедами, що належать місту, і таким чином організувати альтернативне, якщо не додаткове, джерело надходжень у міську казну. З іншого боку, розвиток транспорту мікромобільності та правильна організація його руху могли б наблизити спочатку місто, а потім і область до переходу на так звану «зелену енергетику», що не тільки забезпечило б покращення стану екології в Одесі, а й дозволило б отримати статус майже «європейського» міста. У статті також розписані можливості для приватних підприємців, які можна використати для розвитку малого й середнього бізнесу – наприклад, у галузі спортивного туризму. До того ж, можна було б розробити маршрути поблизу околиць міста, де також широко будуються нові мікрорайони, і досягти одночасно двох цілей – просувати новобудови для потенційних покупців, викликати інтерес до нових та, звичайно, озелених і розвинених районів, та завдяки цьому перенести деякі транспортні потоки до них, таким чином частково розвантаживши центр міста, вулиці якого розраховані лише на навантаження транспортом від існуючої історичної забудови.

Ключові слова: велоінфраструктура, транспорт, перевантаження шляхів сполучення, екологічність, економія ресурсів.

**СОЦИАЛЬНО-ЭКОНОМИЧЕСКИЕ ПРЕДПОСЫЛКИ РАЗВИТИЯ
ВЕЛО-ПЕШЕХОДНОЙ СЕТИ ЖИЛЫХ РАЙОНОВ****Савицкая О. С.,**к. арх., проф. каф. градостроительства,
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Аннотация. В статье рассматриваются основные социальные и экономические факторы, обуславливающие формирование современной транспортной инфраструктуры Одессы, основанное на переопределении приоритетов категорий средств передвижения. Так как город в последнее время быстро застраивается и развивается, это служит причиной уплотнения существующих дорог и проездов, вызывая неблагоприятные последствия как для безопасности пользователей транспорта, так и для состояния окружающей среды. Показываются многочисленные преимущества развития велоинфраструктуры для общества и экономики города. Прежде всего для людей – обычных жителей города – эти преимущества самые главные: безопасность движения, меньшая плотность движения на дорогах, меньше затраченного времени на передвижение к пункту назначения, гибкость маршрута, повышение качества воздуха и большая легкость в техническом обслуживании и ремонте.

Экономически это тоже имеет свои преимущества. В первую очередь, для работников муниципалитета: учитывая мировой опыт организации велоинфраструктуры, есть много возможностей наладить систему оплаты за пользование велосипедами, принадлежащими городу, и таким образом организовать альтернативный, если не дополнительный источник поступлений в городскую казну. С другой стороны, развитие транспорта микромобильности и правильная организация его движения могли бы приблизить сначала город, а затем и область к переходу на так называемую зеленую энергетику, что не только обеспечило бы улучшение состояния экологии в Одессе, но и позволило бы получить статус «европейского» города. В статье также показаны возможности для частных предпринимателей, которые можно использовать для развития малого и среднего бизнеса, например, в сфере спортивного туризма. К тому же можно было бы разработать маршруты на окраине города, где широко строятся новые микрорайоны, и достичь одновременно двух целей – продвигать новостройки для потенциальных покупателей, вызвать интерес к новым и, конечно, озелененным и развитым районам, и благодаря этому перенести некоторые транспортные потоки к ним, таким образом частично разгрузив центр города, улицы которого рассчитаны только на загрузку транспортом с учетом существующей исторической застройки.

Ключевые слова: велоинфраструктура, транспорт, перегрузка путей сообщения, экологичность, экономия ресурсов.