

SMALL CARPATHIAN CIRCLE AS THE MOST SIGNIFICANT INFRASTRUCTURE PROJECT IN WESTERN UKRAINE

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Purpose: the main purpose of this paper is to analyse the new infrastructure project in western Ukraine, show its main characteristics and to forecast how it will improve the socio-economic life of this region and how it will rise tourist flows in cross-border territories.

Design/methodology/approach: The Small Carpathian Circle was chosen as it is the biggest infrastructure project in western Ukraine that covers three oblast (regions) of Ukraine and will have a cross-border impact. Literature sources, statistical information and estimates data used in this paper were gathered from various international and Ukrainian official sources and websites. Personal knowledge about Carpathian region was also used as the author comes from Lviv oblast of Ukraine.

Findings: the outcome of this paper is that the Small Carpathian Circle has to be implemented in the nearest future in order to provide the efficient mobility in Carpathian region of Ukraine on the basis of sustainable development. The main reasons for its slow implementation in 2022 were highlighted.

Originality/value: it is the first research paper about the Small Carpathian Circle, as it wasn't analysed properly by scientists yet. It is addressed to a scientific circle, politicians, investors, international organisations and all people interested in Carpathian region development.

Keywords: Carpathian region, infrastructure, project, regional economy.

Category of the paper: conceptual paper.

1. Introduction

The theoretical foundations of the category of "infrastructure" were developed in the works of the world well-known economists: A. Smith, K. Marx, R. Jochimsen, P. Rosenstein-Rodan, P. Samuelson and others.

Ukrainian scientists Hutafel V.V., L. Kuzmenko, I. Kovelska, I. Rekunencko, I. Butyraska, M. Kovalenko, A. Tkach also worked on the formation of theoretical aspects of infrastructure and determined its impact on the development of the region's economy.

The scientific research of the infrastructure problems and prospects can be found among publications of scientists from Poland, Ukraine, Hungary, Slovakia, Slovenia, Romania, Austria, Check republic and other.

Antoine Goujard investigated improvement of transport and energy infrastructure investments in Poland. He emphasises that improving infrastructure in Poland is a key requirement for keeping the economy on a steep long-term growth path, enabling productive private investment and the creation of new activities. Poland has made significant progress to update its transport and energy infrastructure over the last 20 years (Goujard, 2016).

Wojciech Zalewski, Magdalena Osinska, Miroslawa Żurek aimed to evaluate the acceptance and the actual utilization of GPS/GPRS-based telematics technology in road transport companies registered in Poland. Their study proposed using a classical and extended (to include workforce number) Technology Acceptance Model; they also estimated TAM models by micro, small, and medium-sized enterprises (Zalewski, Osinska, Zurek, 2022).

Among Ukrainian scientists we would like to mention Phd Perederko V.P. We can find useful information about development of eco- and geotourism infrastructure in the Carpathian region with the assistance of international technical assistance projects in his publications (Perederko, 2016).

Besides, Hutafel V.V. investigated the practical aspects of the current state of economic infrastructure in the Carpathian region in order to identify trends and preconditions for the further development of the region. His article provides a comprehensive assessment of the main component elements of economic infrastructure in the Carpathian region (Hutafel, 2015).

My paper contributes to the existing literature in an infrastructure development, but it adds research in a frontier regions. The project of the Small Carpathian Circle has not been discussed properly by scientists yet, because Russian full-scale aggression against Ukraine has shifted all topics and investigation directions to security issues.

Meanwhile, transport infrastructure plays an important role in ensuring the economic development of the Carpathian region and the efficiency of material production, because the transport system forms and operates the vast majority of material flows of goods, ensuring socio-economic development of the whole country and the region.

According to statistics, 23% of goods in the Carpathian region are transported by rail, 71% by road and 6% by pipeline. Accordingly, road transport can be identified as a priority in the infrastructure of economic development of the region.

The main goal of the development of transport infrastructure in the Carpathian region is the practical implementation of favourable transport and geographical location, intensification of work on building part of the national network of international transport corridors and its integration into the transport systems of European Union.

2. The Small Carpathian Circle project characteristics

The Small Carpathian Circle is a joint project of the regional authorities of Zakarpattia, Lviv and Ivano-Frankivsk regions together with Ukravtodor on the development of roads in the central part of the Ukrainian Carpathians. The project was presented In December 2019 and a relevant memorandum was signed. In February 2021, the future state investment project Small Carpathian Circle was introduced as a part of the program of the President of Ukraine «Large Construction». There is the political will in Ukraine to implement such great infrastructural projects. The Verkhovna Rada expressed readiness to adopt all necessary changes to the budgets so that the Project could be implemented. The Head of Ukrainian Government assured that such projects as the Small Carpathian Circle would have a positive result for the economy and development of the whole state.

The project would cover a network of roads with a total length of over 640 km (Figure 1). Meanwhile, a certain part of the roads had been repaired in 2020-2021. The Small Carpathian Circle project (hereinafter SCC project) will be a whole tourist complex with a length of hundreds of kilometres (Governmental portal, 2021).

The SCC project will bring together three European countries – Ukraine, Poland and Romania – around key Carpathian resorts (Figure 1) . Under the optimistic scenario, the project is expected to be completed in three years.

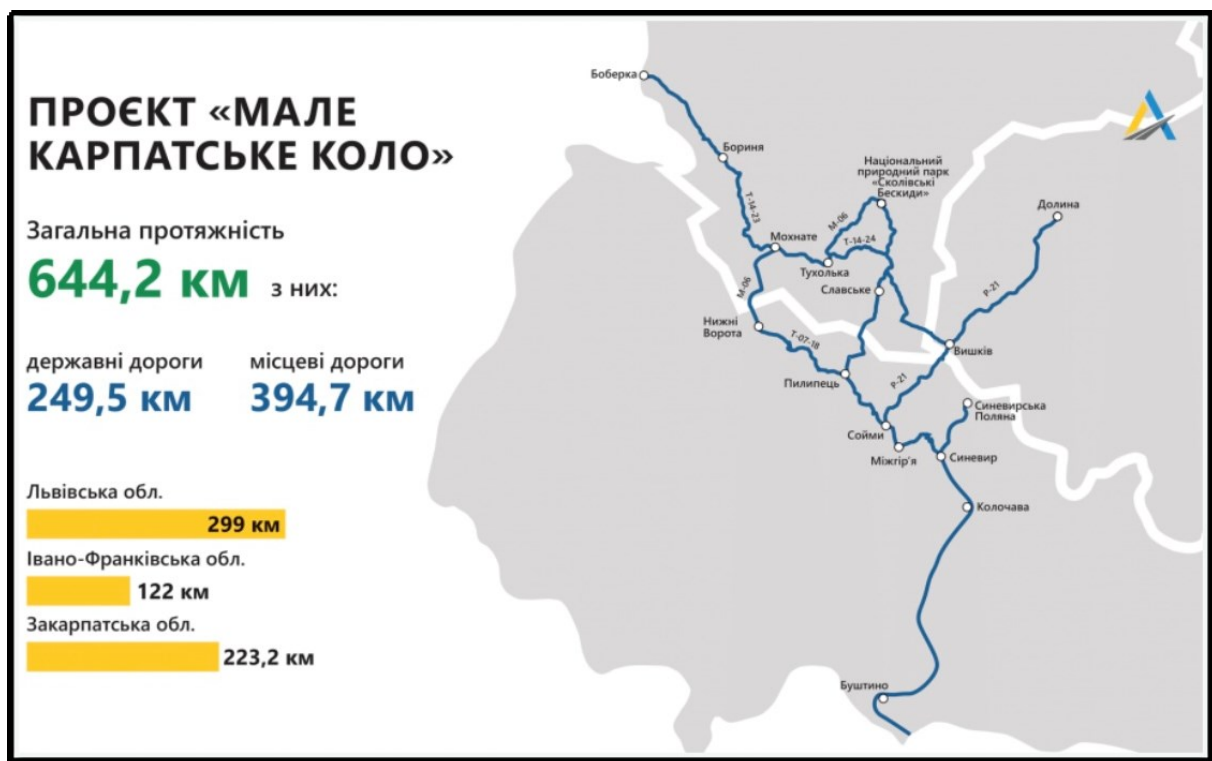


Figure 1. Small Carpathian Circle map. Source: OKKO...

To connect the key resorts of the Carpathian Mountains, to unite three European countries – Ukraine, Poland, Romania – to create European-level infrastructure and give a powerful impetus to the development of communities and their tourism potential for Transcarpathia and neighboring regions. The SCC project includes more than 400 km of highways from mountain Boberka (Lviv region, border with the Republic of Poland), through Rozhanky to Dolyna in Prykarpattia, and from Bolekhiv through Sukil to Dubyna with access to Slavske, then through Verkhny Studeny to Synevyr, to Yablunivka (Zakarpattia region, border with Romania) (Governmental portal, 2021).

It is also planned to build three new passes, which will provide better access to the recreational potential of Slavsk and Borzhava, connect Dovbush rocks with Tustanya and the resorts of Truskavets and Skhidnytsia, and create conditions for comfortable and safe travel in the Ukrainian Carpathians.

The well-known ski resort Slavsko with the legendary Trostyan will get a chance for a new round of development with better infrastructure. Very close, in a distance of two dozen kilometers, there is even a greater recreational potential of the slopes of Borzhava. However, historically, this place at the intersection of three regions was without road traffic.

A total of 16.7 billion UAH (618,5 mln USD in prices of 2021) is needed to implement one of the most ambitious infrastructure projects in western Ukraine (Governmental portal, 2021).

The SCC project is supposed to unite the resort and tourist centers of the three regions in the nearest future. Among the key centers are:

- in Lviv region – Slavske, Rozhanka (Upper and Lower), Skole and Play,
- in Zakarpattia region – Pylpets, Izky, Synevyr and Mizhhirya,
- in Ivano-Frankivsk region – Vyhoda, Vyshkiv and Bukovel.

This will increase the exchange of tourist flows, reduce travel time and, accordingly, increase investments and local budget revenues. SCC project will also have a positive social impact creating new jobs in the regions.

2.1. Zakarpattia region

Within Zakarpattia region, the SCC project includes national and local highways over 218 km long and the total cost of repair works is UAH 3.9 billion (1,4 mln USD in prices of 2021). In 2021, more than 95 km (44%) of roads were restored under this project in Zakarpattia.

UAH 1.7 billion was allocated from the state budget for the repair of state roads. With these funds, 71 km of routes M-06 Kyiv – Chop, T-07-18 Nyzhni Vorota – Volovets – Mizhhirya, T-07-37 Khust – Shayan – Vyshkovo – Bushtyno and R-21 Dolyna – Khust were provided with coverage of high quality.

Almost 100 mln UAH from the Road Fund was spent on repairing of the local roads. As of today, contractors have already provided high-quality coverage for more than 30 km of roads, and works continue.

The project also includes public roads of local importance O 070603 Synevyr – Kolochava – Bushtyno with a length of 66 km and O 071303 Vyshkovo – Yablunivka – state border with Romania – more than 9 km (Ukrinform, 2021).

2.2. Lviv region

In Lviv region 34 projects are being implemented for the overhaul and construction of new roads, as well as the reconstruction of bridges within the SCC project.

In Lviv region, the reconstruction of 5 existing roads is planned, including Slavske – Vyhoda, Slavske – Khashchovanya, Hitar – Tukhlya, Borynya – Mokhnate and Borynya – Boberka.

In addition, it is planned to build three new highways. This is the road that will connect Ivano-Frankivsk region with Slavske-Vyhoda road, which is 11 kilometers long. New construction of the highway from the village of Nizhne Studene, Zakarpattia region, to the road Slavske – Khashchovanya – 8,5 kilometers. Also, construction of a road bypassing the railway bridges connecting the Skole – Slavsk and Slavske – Vyhoda highways with a length of more than 1 kilometer.

In addition to local roads, the SCC project provides the repair and construction of 75.5 km of public roads of state importance in Lviv region. In particular, M-06 Kyiv – Chop – 51.5 km and T-14-24 Skole – Slavske – 24.0 km. Besides, it is planned to reconstruct 37 bridges (Lviv regional state administration, 2021).

It is important for international relations that there will be new checkpoints in Lviv region: Nyzhankovychi – Malkhovychi, Boberka – Smolnyk, Lopushanka – Mikhnovets in Sambir district, Varyazh – Usmezh, Belz – Budynin, Belz – Oserduv in Chervonohrad district.

The construction of new checkpoints on the Ukrainian-Polish border is necessary, because the existing ones can not provide the access of the great amount of people crossing the state borders every day, that's why we can observe huge lines on the checkpoints. But first of all, Ukraine has to build new roads and to restore the old highways to the new checkpoints.

Currently, work is underway on the Borynya – Boberka road. 130 mln UAH of subventions from the state budget were spent last year (Lviv regional state administration, 2021).

The new checkpoint Bobernyk – Smolnyk will allow tourists from Republic of Poland to take the direct road Borynya – Boberka to the Kyiv – Chop road and from here use the newly built roads to move to either Zakarpattia or Ivano-Frankivsk. In addition, the construction of these new roads will reduce the traveling time by almost half.

It has to be mentioned that the roads in the mountains are not built as fast as on the plains. There are dozens of bridges, additional drainage, retaining walls, expansion are necessary. Of course, the cost of the roads will be three times more expensive. The implementation process is not easy, but it has to be continued.

2.3. Ivano-Frankivsk region

In Ivano-Frankivsk region three roads of local importance are being prepared for repair within the framework of the SCC project. Regional authorities are working on the project documents and preproject decisions for the repair and reconstruction of the roads Vyshkiv – Senechiv, Bolehiv – Kozakivka, Kozakivka – Sukil, which have become an integral part of the state project "Small Carpathian Circle".

Ukravtodor has already agreed to transfer these roads of local importance to their balance sheet.

An important part of the SCC project is the public road of state importance R-21 Dolyna – Khust, and the project itself is carried out within the framework of the presidential program "Major construction». On the R-21 road, from Dolyna to the border with Zakarpattia, average current repairs have already been carried out on a section of 45 km. For the safety of road users and tourist attraction, bicycle and pedestrian paths and lighting are planned here.

Within the framework of the SCC project, in 2021, the current average repair of the R-21 Dolyna – Khust road was carried out along its entire length within the Ivano-Frankivsk region, on a section of almost 45 km from Dolyna to the border with Transcarpathia.

Thanks to the SCC project, not only three regions of the Western region of Ukraine will be connected with good roads, it will also allow us to revive the central part of the Ukrainian Carpathian Mountains. After all, road infrastructure plays a very important role for the region development. The repaired roads will positively affect the development of tourism and the socio-economic situation of the region as a whole. In addition to good and quality road surface, safe roads are equally important. All objects are designed according to the same technical standards with a bicycle path, sidewalk, lighting, with a width of at least 7-8 m.

3. Gaps of SCC project

Of course, SCC project has some gaps. One of the most important of them is that the SCC project doesn't possess issues concerning electrocars and charging stations for them. The network of electric cars charging stations in Ukraine is just beginning to develop, so it's complicated to travel by electric car in Carpathian Mountains. Today, charging stations are mainly concentrated in large and medium-sized cities. There are also several start-ups in rural areas.

For example, In 2019, a modern charging station for electric cars with a capacity of 50 kW was put into operation on the territory of the "Ekopal" car service in Kalush, Ivano-Frankivsk region. This charging station is designed for all existing types of electric cars. The convenient location of the charging station will allow drivers to get there by electric car along the

H10 route, for example from Lviv to Ivano-Frankivsk or Bukovel. It's also possible to get easily to Burshtyn, Rohatyn, Berezhany or Ternopil from Dolyna by highway T 0910.

So, when going on a trip to the popular Carpathian resorts: Bukovel, Palyanitsa, Tatariv, Vorokhta or Yaremche from Kyiv, Lviv or other cities, it's not a problem to find a charging station for electric cars on a way. But it's a problem for remote districts of Carpathian Mountains as we can see on an online map of charging stations for electric cars (on-line map, 2022).

That's why it is recommended to widen a network of charging stations for electric cars as a part of SCC project. It will be also very useful to install such charging stations near hotels in remote areas.

4. Travel & Tourism Competitiveness Index

Infrastructure has a direct impact on tourist attractiveness of a country. The main purpose of SCC project is to increase tourist flows and to develop tourism in Carpathian Mountains.

The Travel & Tourism Competitiveness Index measures the set of factors and policies that enable the sustainable development of the travel and tourism sector, which contributes to the development and competitiveness of a country.

Table 1.

The Travel & Tourism Competitiveness Index of some European countries

Rank in the world	Country	Value (1-7 (best))	Score*	Diff. From Global avg. (%)
1	Spain	5,4	0,3	41,4
2	France	5,4	1,5	40,4
11	Austria	5,0	2,1	28,8
42	Poland	4,2	2,9	10,0
48	Hungary	4,2	3,4	9,0
56	Romania	4,0	5,7	3,7
60	Slovak Republic	4,0	2,0	3,3
78	Ukraine	3,7	6,5	-3,2
103	Moldova	3,3	6,4	-14,5

* Change in score is displayed as a percentage.

Source: Travel and Tourism Competitiveness Report, 2019.

In the tables 1 and 2 there are displayed two countries with the highest indexes (Spain and France have been being leaders for many years); Austria as its natural resources are similar to Ukrainian Carpathian Mountains; Ukraine and neighbouring countries of Ukraine.

Table 2.
Factors of the Travel & Tourism Competitiveness Index

Rank in the world	Country	Business Environment	Prioritization of travel and tourism	Price Competness	Air. ransp I nfr	Ground infra-structure	Tourist service infrastr.	Natural resources	Cultural (Res. And business travel)
1	Spain	4,5	5,9	5,0	5,0	5,2	6,6	4,8	6,7
2	France	4,8	5,1	4,5	4,8	5,6	5,7	4,9	6,8
11	Austria	4,8	5,3	4,7	4,2	5,2	6,7	4,1	3,2
42	Poland	4,3	4,2	5,7	3,2	4,3	4,5	3,2	3,0
48	Hungary	4,3	5,1	5,3	3,4	4,2	4,8	2,7	2,3
56	Romania	4,4	4,1	5,6	2,7	3,1	4,6	3,2	2,3
60	Slovak Republic	4,1	4,3	5,4	2,0	4,2	4,4	3,4	1,6
78	Ukraine	4,1	4,3	5,9	2,7	3,1	4,3	2,2	1,9
103	Moldova	4,0	3,7	6,0	2,1	2,6	2,9	1,7	1,2

Source: Travel and Tourism Competitiveness Report, 2019.

Analysis of the indicators of the sub-index "Infrastructure" of the Competitiveness Index in the field of travel and tourism WEF (Table 2) shows that the most problematic elements of Ukrainian infrastructure are air transport infrastructure, cultural (rest and business travel) and natural resources. It is forecasted that SCC project will help to increase Ukrainian indicators and will have positive results for socio-economic life of people in this regions of Ukraine and tourism development as well.

5. Infrastructure projects while Russia's full-scale aggression against Ukraine

Russia's full-scale aggression against Ukraine has put on a pause almost all infrastructure projects implementation all over Ukraine. SCC project as a part of presidential program «Great Construction» has been stopped too. Unfortunately, not only security measures matter in this case, but also economic problems in Ukraine, such as budget deficit. There is a great lack of funds to finance great projects that are very expensive. As for now the main tasks for Ukraine are to rebuild and restore all destroyed infrastructure. Nevertheless, the positive fact is that some parts of SCC project, regarding restoring of the most important parts of state roads, are being implemented this year too.

Private investments in new infrastructure objects were also put on a pause because of the risks during the war. For example, OKKO Group Holding planed to build a great ski resort on the territory of the Slavske amalgamated territorial community in Lviv region (Interfax Ukraine, 21.12. 2020). It was planned to build the resort 15 km from Slavske in the villages of Verkhnia Rozhanka and Volosianka.

This is a long-term project that will last about four years. Austrian experts came to study the slopes, the height of the mountains, infrastructure and these settlements were included in the strategy. Now all issues with the land have been resolved, the next step is the development of the project, design estimates and the start of construction work. The resort will be eight or nine years ahead of Bukovel in technical development. The complex will include over 60 km of skiing pistes.

OKKO registered all its shares in Slavske and, accordingly, the tax paid by the company remains here in the community. These funds will be reinvested in the development of ski infrastructure, in the Slavske brand, in road repairs and community development. The project had to be implemented in three stages, but for now it's unclear when the construction will start.

Transport cooperation with Poland in the conditions of Russia's aggression against Ukraine has become a model of true good neighbourliness. Freight transport has already been partially liberalized. In particular, Ukraine is grateful to Poland for providing the possibility of unauthorized passage through its territory of trucks transporting fuel to Ukraine. Today, joint border and customs control is already carried out at four checkpoints for passenger and passenger cars on the Ukrainian-Polish border. Thanks to the "single window" approach, the duration of registration and waiting in line will be reduced by 1.5 times, which is of interest to both states. In addition to reducing queuing time, expanding jointly controlled checkpoints is expected to improve the efficiency of stationary scanning systems and reduce corruption risks (Governmental portal, 2022).

Ukrainian and Polish colleges are also working on the creation of a joint railway company to increase the export potential of the Ukrainian economy.

The potential for growth of cooperation is not exhausted, especially with regard to the capacity of road checkpoints.

It is expected that the successful experience of such cooperation will be extended to the checkpoint with other EU neighbouring countries. Ukrainian goal is the full liberalization of trucking with the European Union.

6. Conclusion

It is forecasted that the Small Carpathian Circle will improve Ukraine's key factors of tourist competitiveness. This project will facilitate the exchange of tourist flows, reduce of travel time, as well as will significantly affect the socio-economic development and increase tourism potential of the region. SCC project will contribute to developing the Carpathian region into an all-year-round resort with a wide variety of accommodation types and outdoor activities (skiing, hiking, horse-riding, rafting, berry and mushroom picking, wine and cheese festivals, folk crafts etc.).

The new infrastructure in the region has to be built on the sustainable development basis, therefore it will provide the region with convenience, reliability, comfort, high mobility, safety and tourist attractiveness.

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