

DEVELOPMENT OF THE ROAD SECTOR AS THE MAIN VECTOR OF ECONOMIC ADVANCEMENT

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Gural N. R. Development of the Road Sector as the Main Vector of Economic Advancement

Motor-roads construction along with road infrastructure development is catalyst for economic development of the country, and thus – it may serve for Ukraine as the means to get out from the lingering crisis. Undeveloped status of road infrastructure causes a number of problems, which present not just economic, but also social character. Therefore, these problems need to be investigated in details and resolved immediately. In course of investigation there was selected a list of main problems of road industry development: the breach of weight norms for cargo transportation; under-financing of the road industry; risks related to fulfillment of program on construction and reconstruction of road infrastructure; need for innovational transformations in the field of transport; problems of ecology for vehicle and motor-ways. For each of the problems there were proposed ways of solution and the stage of problem-solution was considered. There was investigated the economic benefit of investment projects into the road industry. It was determined that development of road network and improvement of their traffic-operation status present the necessary pre-condition of the further social-economic development of region, the State and society.

Keywords: road industry, road infrastructure, transport infrastructure, economic benefit, innovation project.

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Gural Natalija R. – PhD (Economics), Senior Lecturer of the Department of Economics, Lviv Institute of Interregional Academy of Personnel Management (29 Mazepy Str., Lviv, 79059, Ukraine)

E-mail: gural_n@ukr.net

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Гураль Н. Р. Розвиток дорожньої галузі як основний вектор розвитку економіки

Будівництво доріг і розвиток дорожньої інфраструктури є каталізатором економічного розвитку країни, а отже, може служити шляхом виходу України із затяжної кризи. Нерозвиненість дорожньої інфраструктури породжує ряд проблем, що носять не тільки економічний, а й соціальний характер і потребують детального дослідження та негайного вирішення. У ході дослідження було виділено перелік основних проблем розвитку дорожньої галузі: порушення вагових норм перевезення вантажів; недостатнє фінансування дорожньої галузі; ризики стосовно виконання програми з будівництва та реконструкції дорожньої інфраструктури; потреба інноваційних перетворень у транспортній сфері; проблеми екології транспортних засобів та дорожніх шляхів. Для кожної проблеми запропоновано шляхи вирішення та розглянуто стадії її вирішення. Досліджено економічний ефект від інвестиційних проектів у дорожню галузь. Встановлено, що розвиток мережі автомобільних доріг та поліпшення їх транспортно-експлуатаційного стану є необхідною передумовою подальшого соціально-економічного розвитку області, держави і суспільства.

Ключові слова: дорожня галузь, дорожня інфраструктура, транспортна інфраструктура, економічний ефект, інноваційний проект.

Рис.: 1. **Табл.:** 1. **Бібл.:** 8.

Гураль Наталія Романівна – кандидат економічних наук, старший викладач кафедри економіки, Львівський інститут Міжрегіональної академії управління персоналом (вул. Мазепи, 29, Львів, 79059, Україна)

E-mail: gural_n@ukr.net

УДК 338.49

Гураль Н. Р. Развитие дорожной отрасли как основной вектор развития экономики

Строительство дорог и развитие дорожной инфраструктуры является катализатором экономического развития страны, а, следовательно, может служить путем выхода Украины из затяжного кризиса. Неразвитость дорожной инфраструктуры порождает ряд проблем, которые носят не только экономический, но и социальный характер и требуют детального исследования и немедленного решения. В ходе исследования был выделен перечень основных проблем развития дорожной отрасли: нарушение весовых норм перевозки грузов; недостаточное финансирование дорожной отрасли; риски относительно выполнения программы по строительству и реконструкции дорожной инфраструктуры; потребность инновационных преобразований в транспортной сфере; проблемы экологии транспортных средств и дорожных путей. Для каждой проблемы предложены пути решения и рассмотрены стадии ее решения. Исследован экономический эффект от инвестиционных проектов в дорожную отрасль. Установлено, что развитие сети автомобильных дорог и улучшение их транспортно-эксплуатационного состояния является необходимым условием дальнейшего социально-экономического развития области, государства и общества.

Ключевые слова: дорожная отрасль, дорожная инфраструктура, транспортная инфраструктура, экономический эффект, инновационный проект.

Рис.: 1. **Табл.:** 1. **Библ.:** 8.

Гураль Наталья Романовна – кандидат экономических наук, старший преподаватель кафедры экономики, Львовский институт Межрегиональной академии управления персоналом (ул. Мазепы, 29, Львов, 79059, Украина)

E-mail: gural_n@ukr.net

One of the main factors ensuring the economic advancement of the country is the development of its road sector, with the focus being on the construction of roads of high European quality standards.

Problems in the road infrastructure development slow down not just the economic development of the country and its regions but influence a social sphere as well. Thus, the investigation in this field is topical and has a practical character. But the main point is that it is the road industry that in terms of new construction suffered the most from financial economic crisis while the prob-

lem of renewing the growth rate of road construction is one of the preferential problems.

Methodological and applied issues associated with the economy of construction of transport infrastructure were studied by such scientists as R. Birman, A. Vasyana, M. Grashyna, Ye. Dubinin, D. Kristensen, B. Sazonov, D. Fridman, Z. Cherniak. As far as a developed road infrastructure is important for the economy of any region and provides for development of distant territories, decrease in the time and cost of freight delivery, reduction of economic risks – the issue of economic benefit of con-

struction of motor roads constantly remains urgent and requires detailed studies.

The *aim* of the article is revealing the problems in the road infrastructure of the country and region, along with searching for the ways to resolve them.

Motor roads of Lviv region are the integral part of the unique transport system of Ukraine, and their condition inevitably influences the quality of freight and passenger transportation as well as the level of prices, rate of employment, and growth rate of the national economy.

Construction of any motor road is a catalyst for the economic development of the region through which the road passes, since it results in:

- ✦ emergence of new localities and enterprises;
- ✦ intensification and enhancement of economic activities;
- ✦ improvement of social and cultural life of the population centers;
- ✦ extension of trade and increase of competitiveness;
- ✦ growth of transport sector, which generates an increase in the number of employed people as well as in their incomes;
- ✦ improvement of the communication among localities, districts and regions.

Besides the listed above positive consequences of road infrastructure development, special emphasis should be placed on the growth of employment rate in the region.

Each one new job in the road industry creates five additional jobs in allied branches of economy. Thus, the total number of employed people increases six times. Additional financial investments into road construction have a multiplicative effect. This fact is not an exception for our country as well. Here, direct dependence is observed – the larger the amount of funding the road industry receives, the higher the rate of employment of the population is. Construction of one kilometer of a new road involves creating 70 jobs while its servicing, including fuel stations and service stations, keeps busy 460 people. Therefore, the social significance of the development of the sector is extremely high [7].

In its turn, underdevelopment of road infrastructure creates a number of problems:

- ✦ obsolete road infrastructure is one of the main obstacles in raising competitiveness of the region and country in the foreign market;
- ✦ discrepancy between the level of development of roads and the level of motorization and demand for transportation by road leads to unreasonably large budget expenditures;
- ✦ low technical level of motor roads determines the high share of transport constituent in product costs and high transport costs, which is destructive for the economy.

Unfortunately, in view of the current budget deficit, it is impossible to build in all regions of the country high-quality roads and maintain them. Thus, the size of the road network in Ukraine is extremely small in comparison with other countries. A number of experts suppose that losses of the Ukrainian economy due to the underdevelopment of the road network constitute from 2 to 6% of GNP [3].

In the state and regional budgets, substantial funds are appropriated for the road construction and maintenance. However, they are mainly spent on the repair and maintenance of the existing roads. In local and regional budgets, most of which are deficit ones, in spite of the growth of excise taxes at an increase in prices for gasoline and transport fees, the funds appropriated for road construction vanish, and the volumes of new construction steadily decrease [8].

Let us identify the main problems in the development of the road infrastructure and offer methods for their resolution (*Tbl. 1*).

Motor roads are an extremely expensive type of infrastructure: a new road costs starting from USD 1 million per 1 km. In order for the road to pay off, it will take 10–12 years, under conditions of freight transportation without exceeding weight restrictions. Otherwise, the road will not serve long. The majority of motor freight carriers, due to the actual absence of weight supervision and minor penalties, disregard the regulations. For instance, presently the movement by roads of national importance is allowed for trucks whose weight is no more than 40 tons, while the movement by roads of local importance – for those whose weight is no more than 24 tons. Often carriers exceed the weight norms twice. Mr. Noniak, Head of the State Service of Ukraine for Transport Safety (UkrTransBezpeka) estimates the annual losses due to overloaded vehicles at UAH 3 billion [6]. Till the end of 2017 UkrTransBezpeka promise to get 78 mobile labs to monitor truck traffic. This will hardly improve the situation substantially. Upon absence of a system of inevitable punishment for corruption, the supervisor will always have a temptation to let the truck pass for some minor reward. Thus, to get rid of the problem of overloaded trucks on the roads, Ukraine should follow the Polish experience and exclude the human factor in monitoring infringement of regulation. Instead, the monitoring of truck traffic should include traffic enforcement cameras, as well as electronic WiM complexes to weigh trucks on roads using sensors installed in the pavement.

At present, the Ministry of Infrastructure of Ukraine supported by the EBRD has launched a pilot project on the implementation of the intellectual Weigh-in-Motion (WiM) system. This project is developed commonly by the Ministry of Infrastructure of Ukraine, UkrAvtoDor (State Road Agency of Ukraine), and UkrTransBezpeka. Ukraine and the EBRD discussed the possibility for purchasing and determined the locations for the installa-

Problems and prospects of the road industry development

Problem	Ways of solving	Stage of solving
Violation of weight regulations in freight transportation	Establishment of an efficient system of independent freight control – based on the Polish experience	The Ministry of Infrastructure of Ukraine supported by the EBRD has launched a pilot project on the implementation of the intellectual Weigh-in-Motion (WiM) system
Insufficient financing of the road industry	Search for alternative mechanisms to fund the industry; Attraction of investments	In 2018 for roads in Ukraine there were appropriated almost UAH 50 billion, with UAH 0.4 billion being meant for the development of roads in Lviv region. Nearly UAH 6–7 billion of additional receipts is expected from conducting customs experiment
Risks related to the fulfillment of the program on construction and reconstruction of the road infrastructure	Involvement of independent specialists to monitor efficiency and transparency of the road construction and maintenance	The Ministry of Infrastructure of Ukraine intends to introduce on-line monitoring of road construction and maintenance at the end of 2018. Introduction of the rule for obligatory comprehensive reporting on road construction in electronic format
Need for innovation transformations in the field of transport	Innovation technologies in the development of transport infrastructure; Construction of toll roads	The Ministry of Infrastructure of Ukraine plan to start in 2018 three projects on reconstruction of 232 km of roads, which stipulate using cement concrete covering
Ecological problems associated with vehicles and roads	Improving ecological safety of roads due to improving the quality and increasing the length of transport communications, as well as creating a road network that corresponds to the international quality standards and safety requirements	Improvement of the legal framework in the field of environmental protection in the operation of the transport complex. Application of ISO 14001 – Environmental Management System Specification Standard

Source: developed by the author.

tion of 5 WiM complexes in Kyiv suburban roads: M-01, M-05, M-06, M-07, and H-01. It is envisaged that “WiM-complexes are to identify overloaded trucks among the traffic and transmit information about them to inspectors of the State Service of Ukraine for Transport Safety at mobile control points located further along the road. After receiving detailed information, the inspectors stop the truck and check the weight. If the violation is confirmed, the inspectors document it and impose corresponding sanctions”.

Separately, the Ministry of Infrastructure instructed UkrAvtoDor to determine throughout Ukraine the places for the future location of gantries to attach traffic enforcement cameras as well as other traffic enforcement devices, and to later include the installation of such gantries in the cost estimation of road construction and reconstruction. The Reform Support Team (RST) at the Ministry of Infrastructure together with UkrAvtoDor has developed a proposal on the installation of cameras on motor roads of state importance till 2020. It implies the installation of 500 cameras in all regions”.

The overall length of public roads with hard covering in Ukraine (not including the occupied Autonomous Republic of Crimea) by the end of 2016 constituted 159.5 thousand km. The minimum amount necessary to maintain the roads in the current level is UAH 14 billion, while the complete renovation of Ukrainian roads requires UAH 50 billion annually within 5 years. Ukraine is already approaching these figures [5].

Starting from 1 January 2018 UkrAvtoDor is in charge of 47 thousand km of motor roads in Ukraine, while the responsibility for 123 thousand km of the roads is transferred to regional and local authorities. Thus, in 2018 for roads in Ukraine there were appropriated almost UAH 50 billion, with UAH 0.4 billion being meant for the development of roads in Lviv region. Nearly UAH 6–7 billion of additional receipts is expected from conducting customs experiment. For the construction and maintenance of roads regional importance there will be appropriated more than UAH 11 billion, and that is just from the Road Fund. Considering other sources of fund-

ing, this figure will be substantially larger. As is known, in 2016 for Ukrainian roads there were appropriated UAH 19 billion, while in 2018 – a considerably larger amount of about UAH 50 billion. Thus, there observed a positive trend in the funding of road construction, although 97% of Ukrainian roads require repairing. [4].

Therefore, when funding is insufficient and there is a strong need for road infrastructure development, it is necessary to search for alternative mechanisms for financing road construction. The importance of international companies in crediting motor road construction in Ukraine is growing.

In September 2015 there appeared another source of financing of roads construction. The authorities started a customs experiment on road financing. The Customs Office of Lviv region as well as of Volyn, Chernivtsi regions, and Kyiv City appropriated a half of their excess receipts for the road construction. Thus, by the beginning of 2017, the amount of UAH 2.25 billion had been collected. The experiment proved to be successful. It was prolonged till 1 January 2018 and implemented in other regions of Ukraine [6].

Besides, starting from 1 January 2018 the Road Fund was launched in Ukraine, which has radically changed the system of road construction financing. Today the system works as follows: revenues from excise duty on petroleum products and transport get into the common budget fund and afterwards they are distributed among different regions, including social payments. Along with the establishment of the Road Fund, a purpose-oriented instrument for high-quality roads construction is being created. Pumping the fund up will be due to excise duties on petroleum products, duties on car import, penalties for overloading trucks, as well as due to concession payments (after the launch of the first concession project).

Not all of this money will go immediately to the Road Fund. Starting from 2018, From 2018, only 50% of the proceeds are deducted to the special-purpose fund (60% of the Road Fund resources – for the construction, reconstruction, repair and maintenance of public roads of state importance, 35% – for roads of local importance, 5% – for financing traffic safety), in 2019 – 75%, while starting from 2020 for the road financing there will be appropriated 100% of the receipts [6].

Infrastructure, including the road infrastructure, is the most important long-term investment object of any country. Selection and realization of such investments determines the efficiency of business and quality of life of the population for 20–30 years to come (*Fig. 1*).

It should be noted that when implementing programs for road infrastructure development there still exist risks of superficial execution of the programs – insufficient financing from the budget, failure to obtain revenues from the road experiment and absence of external control. Thus, according to the public organization “My

Road”, Order of the Cabinet of Ministers No1065 states that starting from 2017 UkrAvtoDor shall involve independent consulting engineers during the construction, reconstruction and replacement of roads; and starting from 2018 they shall control current maintenance and medium repair of roads.

According to specialists of CoST, which monitors efficiency and transparency of road repairing, another risk group includes: bid manipulations, inefficient use of money, corruption, or simply thievery. For instance, in different regions the same works may have different cost.

Today Ukraine should choose the innovation course of development for the road infrastructure. The Ministry of Infrastructure of Ukraine adopted the plan as to launching in 2018 three projects for reconstruction of 232 km of roads, which stipulate using cement concrete covering. The overall estimate for the implementation of these projects is nearly UAH 8 billion [2].

Construction of cement concrete roads is a new progressive trend considered by authorities.

There are countless arguments in favor of cement concrete roads: their construction is cheaper than of asphalt concrete ones; the roads are light-colored, which is less tiring for a driver’s eyes, especially at night-time; they have better non-skid properties, which provide for a better grip of the wheels; they have higher resistance to traffic and serve almost twice longer than asphalt concrete ones. In Ukraine such roads comprise only 1 %, and the quantity is too small comparative to Europe. In Europe the fraction of cement concrete roads constitutes 30 %, while in some of European countries – up to 50 %.

Finally, construction of cement concrete roads will become a support to domestic manufacturers – as far as Ukrainian entrepreneurs can easily provide cement and crushed stone, while a considerable share of bitumen for asphalt concrete roads is imported from the Russian Federation.

The construction and operation of toll roads as well as the construction of roads with involvement of private investors can become a priority in the road network development at the state level.

However, UkrAvtoDor believes that the current legislation does not provide for implementing the construction of toll roads in Ukraine, while in European countries such construction facilitates the practical solution of transport problems. The problem of Ukraine is that the concessionaire should have a government traffic guarantee, and if the traffic is less than stipulated in the agreement with the concessionaire, then the state should cover this difference. And that is the issue of spending considerable budget funds. Therefore, implementing the idea of construction of toll roads in Ukraine requires not only organizational and legal but also serious technical and economic substantiation and can be realized no sooner than in 3-4 years. It proves once more that the

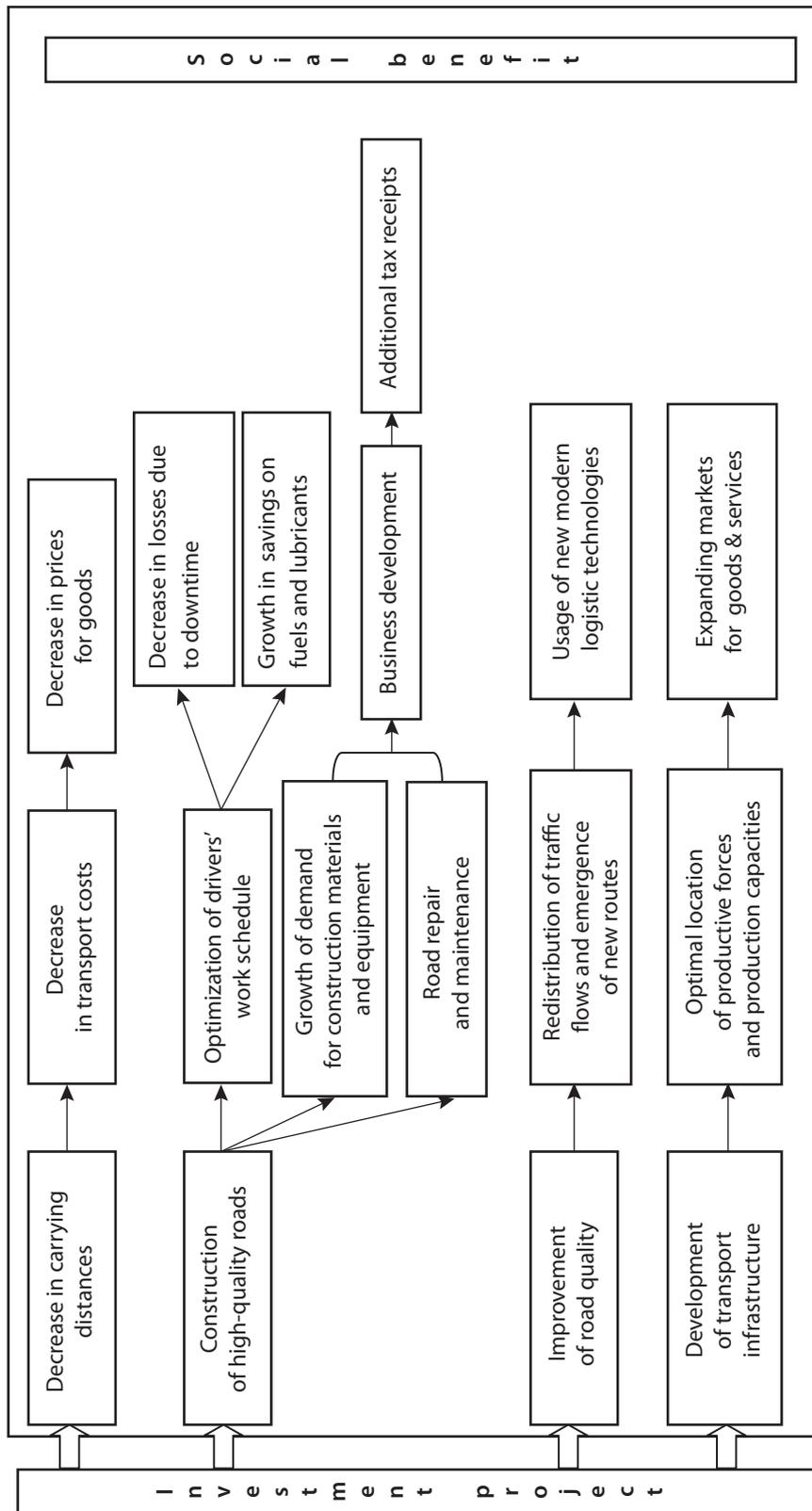


Fig. 1. Economic benefit from an investment project in the road industry

Source: developed by the author.

development of road network both in Ukraine and in Lviv region is another important social and political problem.

It should be mentioned that there exists an ecological problem associated with motor vehicles and communication routs in Ukraine, which resolution should involve, first of all, increasing their ecological safety, improving the quality and increasing the length of transport communications, creating a road network that corresponds to the international quality standards and safety requirements [1].

Currently the government is making steps to improve the situation. Thus, in October 2018 the Press Office of UkrAvtoDor informed about the intention to implement the project of a new highway connecting Lviv and Budapest. The construction of the new highway will shorten the travel time from 3.5 to 2 hours and in the future will be connected to Slovakian autobahn R-2, which will provide the communication with the system of freeways of Slovakia, the Czech Republic, and Germany. Besides, the Minister of Infrastructure, V. Omelyan states that American investors consider a possibility of participation in the construction of a highway between Chop and Lviv. The construction of a highway between Lviv and Dubno is planned for 2019.

It should be added that, according to the announcement of the Polish radio early this September, Polish companies have signed a corresponding agreement with UkrAvtoDor, according to which EUR 60 million will be spend to replace 144 km of motor ways (six road sections) leading to the border checkpoints. The Polish firms for performing road repairs, "Unnibep" and "Drog-Bud", were selected through tendering. However, the Polish companies are not the only foreign companies involved into the process of road construction in Ukraine. This October UkrAvtoDor signed contracts for performing repair works on sections of Ukrainian roads with a Chinese company Xinjiang Communications Construction Group Co., LTD. The contracts mentioned were signed within the framework of the second Road and Safety Improvement Project developed by Ukraine and the EBRD.

CONCLUSIONS

The above analysis testifies that after the many years of stagnation the motor road construction in Ukraine started to develop actively. However, the large amount of technical, economic, organizational and legal, as well as social and political problems accumulated in this field puts forward increasing requirements towards management of the Ukrainian motor road industry and its reformation.

Today, when Ukraine is involved into the war conflict with Russia, and the economy drops drastically, it is advisable to use the world experience in the field of economic development. The world practice demonstrates that investment in the road construction is very important for the state and, last but not least, has high rate of

return. There is no other way out for Ukraine than to build high-quality roads. As regards investments into the infrastructure – this is the perfect way of redistribution of resources and labor force from stagnating sectors of the economy into those which are capable of ensuring a long-term economic growth. ■

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