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The Funding of Modernization and Development of Transport Sector and its Infrastructure

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Abstract: *The main purpose of the article is to analyze the existing approaches to the financing of transport infrastructure in the world and in Ukraine. It has been studied the model of financing of transport infrastructure in the OECD, the EU countries. The appropriate recommendations has been given to strengthen the processes of modernization in the transport infrastructure.*

Introduction

The problem of diversify of the sources and finding a suitable model of financing the modernization of the transport sector and its infrastructure is timely. The literature on the need for investment in transport and identify-

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ing the relationship between investments in infrastructure and increasing production is rather extensive.

In one of the first and a well-known paper Aschauer (Aschauer, 1989) estimated the elasticity of output with respect to public infrastructure capital in the United States during 1949 to 1985 of between 0.38 and 0.56.

Although further studies demonstrated the elasticity was much smaller, for example the average elasticity in the OECD countries for the period from 1960 to 2001 was estimated at 0.2 (Kamps, 2004). His work stimulated the appearance of other empirical studies with various aspects of the problem.

An interesting topic for studies is the searching for the impact of transport development on the overall economic growth, such as research Berechman (2001) or Lakshmanan (Lakshmanan & Andersen, 2002).

In fact, policy plays a crucial role in providing infrastructure at the expense of public goods and natural monopolies sizes infrastructure, either directly through public investment or indirectly through the regulatory environment. The model of the equity financing of infrastructure development, which can vary greatly depending on the degree of socio-economic development of the state plays an important role (OECD, 2012). The influence of transport development to enhance the competitiveness discussed in this multifaceted and thorough study of Fraunhofer Institute Systems and Innovation Research, Karlsruhe, Germany (*Final Report Analysis...*, 2006).

The purpose of the article is to examine innovative approaches to financing of land transport infrastructure in the world, as well as the preparation of proposals for Ukraine based on the study of the legal and institutional framework for the diversification and improvement of tools for funding land transport infrastructure.

The paper consists of five sections. Section 1 presents the importance of transport and transport infrastructure through indicators of gross value added of transport as % of GDP, and the cost of maintenance and service of transport as a percentage of GDP. Section 2 describes the scale of the necessary infrastructural changes in the world. Section 3 looks at the common ground infrastructure financing models in the world, and give a detailed look at the phenomenon of diversification of funding sources, for example in Germany and China. Section 4 presents the results of studying the general model of financing transport infrastructure in Ukraine Section 5 presents the conclusions of the article.

Methodology of the research

The article is based on the following methodology: 1). Show the importance of the transport sector to the economy and the extent of necessary modernization reforms in the transport sector in the world and Ukraine. 2). Conduct a review of public documents concerning the modernization of the transport sector in Ukraine. 3) Describe the general methodology of modernization reforms in the transport sector at the state level, namely, the choice of priorities: the choice of transportation projects, the choice of a common methodology for funding, from the liberalization and paternalistic approach to combining, the participation of public institutions in the financing, the choice of funding sources, diversification. 4) Study the model of financing of transport infrastructure in the OECD, the EU and Ukraine. The analysis of the existing financing structure of transport projects in Ukraine and other countries. 5). Develop appropriate recommendations to strengthen the processes of modernization in the transport infrastructure.

The role of transport sector and its infrastructure in the economy

A transport sector is a key component of economic development and human welfare and its role is increasing around the world. Economic and social benefits of investment in transport infrastructure go far beyond those directly visible in traditional studies of costs and benefits of investment projects (Berechman, 2001; Lakshmanan, 2002). The transport infrastructure does not only develop the transport sector, as they also affect the economy due to the fact that infrastructure creates jobs associated with this industry, and can generate revenue for the construction and maintenance as well as the operation of transport-related companies, including suppliers of transportation and logistics services. The transport sector also has an impact beyond its traditional task of transportation of people and goods, as it contributes to the development of other sectors of the economy and expands the coverage of social services. The Table 1 shows the contribution of transport to the economy of certain countries in the world in terms of gross value added in the transportation and warehousing industry as a share of GDP. The table shows that every dollar invested in transportation and infrastructure – mainly by governments – can have a multiplied effect that goes far beyond the direct commercial benefits from the transportation of passengers and goods. In most countries of the world on the transport industry accounts for a large share of GDP, but investment and maintenance

costs of transport and its infrastructure remain at a low level. A similar situation is observed in Ukraine, where investment and transport costs are 2.1% of GDP, but the gross value added of the transport industry reached 9.1% of GDP (at current prices) – Table 1.

Table 1. Investment and maintenance costs of transport in comparison with gross value added of the transport sector (percentage)

Countries	Investment and maintenance costs of the transport sector as a % of GDP,	Gross value added of the transport sector as a % of GDP
Bangladesh	1,2	9,7
India	2,3	4,8
The Islamic Republic of Iran	1,6	6,7
Kazakhstan	2,0	11,0
Cambodia	1,0	7,0
China	4,0	5,7
Mongolia	2,1	13,0
Singapore	0,9	6,3
Thailand	3,9	8,0
Japan	2,0	6,4
The Russian Federation	4,1	8,3
Ukraine	2,1	9,1

Source: Statistical Yearbook (2005). Own calculation for Ukraine based on Statistical yearbook Transport and Communications (2010).

The scale of the necessary infrastructure changes in the world

Scheduled in the first quarter of the XXI century, investments in upgrading infrastructure suggest that the infrastructure of the world economic system will be developed basing on an updated paradigm – the infrastructure approach, which is an innovative way to ensure equilibrium and stability of the country's economic growth, because the infrastructure creates an environment of life-support company, national economy, the region and the individual household. The beginning of the XXI century can be characterized as a period of great infrastructure modernization in both developed and developing countries, as evidenced by the planned average annual investment in infrastructure for the future in 2010–2020. According to US experts (Infrastructure 2010, Investment Imperative.), the EU plans to allocate 300 billion USD, China – about 200 billion USD and Canada – 180 billion

USD. CIS countries, including Ukraine, are at the level of the Middle East (56 billion USD). In the USA Recovery and Reinvestment Act was adopted in 2009, according to which new funds for transport infrastructure were allocated: 8,4 billion USD for projects related to transit, 8 billion USD for high-speed railways, 1,3 billion USD to modernize Amtrak railways, 27,5 billion USD for highway infrastructure, 1,1 billion USD – in new projects for airports (*Infrastructure 2010...*, 2010, pp. 25-26). New innovative transportation and financial programs of Recovery and Reinvestment Act, are shown in Table 2, and include high-speed rail lines, investment in transportation projects that will support economic growth, investment in projects that reduce energy consumption and greenhouse gas emissions, as well as the bond issue "Build America."

Table 2. Innovative Transportation and Finance Programs in the American Recovery and Reinvestment Act 2009

Program	ARRA Amount	Description
High-Speed Rail	\$8 Billion	This program employed a competitive application process to award federal funding for commuter and high-speed rail investments around the country
TIGER (Transportation Investment Generating Economic Recovery)	\$1.5 Billion	TIGER awards grants of \$20 million to \$300 million to transportation projects that meet job creation, stimulus, and sustainability and liveability criteria. As a mode-neutral, competitive program, TIGER provides a model for merit-based federal funding of future transportation investments.
TIGGER (Transit Investments for Greenhouse Gas and Energy Reduction)	\$100 Million	TIGGER provides discretionary grants to public transit agencies for capital investments that reduce energy consumption or greenhouse gas emissions of public transportation systems.
Build America Bonds	No Limit	This program authorizes state and local governments to issue taxable Build America bonds to finance capital expenditures. Governments receive a direct federal subsidy payment equal to 35 percent of the interest paid to investors.

Source: *Infrastructure 2010...* (2010, p. 26).

India plans to build seven thousand kilometres of new roads. In Brazil, the state plans to invest 800 billion dollars in the modernization of the en-

ergy infrastructure over the next 25 years. Mexico has adopted a six-year national infrastructure plan, under which 270 billion dollars will be spent on the construction and modernization of 20 thousand km of roads, 1,500 km of new railway lines, expansion of port facilities, sewage systems and water supply. France considers investing 25 billion dollars as part of its strategy for the railway. In the further development of high-speed railways, it plans to build 4 thousand kilometres of new roads before 2020, and thus double the existing network. However, more high-speed rail lines – 13 thousand kilometres – are to be built in China. Only in 2009 China has invested U.S. \$ 8 billion in the construction of high-speed rail lines, and by 2013, the country will operate 42 high-speed lines. The second place, far behind China, is occupied by Spain. The Spanish AVE high-speed road system has already connected Madrid and Malaga – the distance which used to be covered in 24 hours, can now be covered in just 2.5 hours. The planned investments in economic infrastructure according to data OECD report are shown in Table 3.

Table 3. Annual and aggregate investment needs in selected economic infrastructure, 2009–2030, USD billion (in constant 2008 USD)

Global	Annual average investment		Aggregate investment		
	2009-2015	2015-2030	2009-2015	2015-2030	2009-2030
Infrastructure facilities					
Airports' capital expenditure	70	120	400	1800	2200
Port infrastructure facilities' capital expenditure	33	40	200	630	830
Rail "new construction" (including maintenance)	130	270	920	4060	5000
Oil and gas – transport and distribution	155	155	930	2325	3255

Source: Strategic Transport Infrastructure needs to 2030 (2012, pp. 56-57).

The needs of the global rail infrastructure are shown in Table 4. Global 7 includes countries USA, Japan, Canada, Germany, Italy, UK, France, Big 5 – BRIICs countries (Brazil, Russia, India, Indonesia, and China).

Table 4. Global rail infrastructure investment needs, 2009–2030, USD billions

Region	Annual rail construction and maintenance requirements		Aggregate rail construction and maintenance		
	2009-2015	2015-2030	2009-2015	2015-2030	2009-2030
Worldwide					
G 7	37	55	260	830	1090
Other OECD	30	65	207	950	1160
Non-OECD	5	7	37	105	140
Big 5	55	140	390	2090	2480
Total	130	270	920	4060	5000

Rail “construction and maintenance” includes “new investment” and capital expenditure on “maintenance”.

Source: Strategic Transport Infrastructure needs to 2030 (2012, p. 56).

Review of public documents connected with the modernization of the transport sector in Ukraine

The documents concerning the modernization of transport and infrastructure tend to include long-term strategies, detailed Transport Strategy of Russia until 2030, and plans concerning the means of transport, basing on the *strategic and scenario planning*.

Documentation concerning the modernization of the transport sector in Ukraine is quite extensive, it is above all the general priorities of the state economic documents of high level. Among them we must first call the President's Address to the Verkhovna Rada of Ukraine "Ukraine: progress in the XXI century. Strategy for economic and social development for 2000–2004 "(2000) and" The modernization of Ukraine – our strategic choice "(2011), Energy Strategy of Ukraine for the period until 2030 (2006), a number of projects of strategic programs of Cabinet Ministers of Ukraine (in particular the Strategy of development of Ukraine till 2020), strategy development in a number of regions, the Strategy of economic and social development of Ukraine for 2004–2015 "By European integration", developed in 2004 under the leadership of the Government of Ukraine (Strategy for Economic and Social Development of Ukraine, 2004), as well as the Program of economic reforms in Ukraine in 2010–2014 "The rich society, competitive economy, effective state" developed with the support of the Committee on Economic Reforms under the President of Ukraine (The program of economic reforms in Ukraine for 2010–2014, 2010). The program of economic reforms in Ukraine for 2010–2014 identified the main goal and task of reforming the transport sector. The main goal is to improve the quality of the existing infrastructure and a construction of new

transport infrastructure for the purposes of economic development and the quality of life of citizens. The tasks set out for are as follows:

- Increase funding for infrastructure development, state-owned;
- Create an attractive environment for private investment;
- Improve the management of railway transport and the road sector;
- Develop and implement a comprehensive program of privatization and sea ports;
- To increase the responsibility of local authorities for the state of local infrastructure assets.

These tasks were defined before 2014, and on the medium term and are rather tactical than strategic. At the same time, the Ministry of infrastructure of Ukraine has developed Transport Strategy of Ukraine till 2020, adopted at the end of 2010, which defines the main directions of development in the long term to 2020: a) common tasks for all means of transport and b) according to the means of transport. The common tasks for all means of transport are the following: the development of transport infrastructure, rolling stock vehicles, improving the investment climate, the availability and quality of transport services, the integration of the national transport system in the European and international transport systems, improving the efficiency of public administration (Transport Strategy of Ukraine 2020, 2010).

From the analysis of transport strategies and documents of Ukraine, one can infer the general methodology of modernization reforms in the transport sector at the state level, namely 1) the choice of priorities and funding sources, 2) the choice of partnership for development and 3) funding for projects.

Let us focus on the problems of financing of transport infrastructure in Ukraine. The program of economic reforms in Ukraine in 2010–2014 declared that "to increase the funding for infrastructure development the following actions should be taken:

- approval of infrastructure projects nationwide, providing them with funding from the state, as well as the World Bank, EBRD and other donors and private investors;
- increase budget funding for the modernization and development of transport infrastructure by 10% annually;
- increased funding of the Road Fund;
- elimination of industry discounts on rail freight transport and introduction of regulated tariffs, providing coverage of economically justified costs and the investment component;
- providing independent control of the national commission of transport.

In order to create conditions for attracting private investment to implement the mechanism of public-private partnership (PPP) it is necessary to create of organizations providing institutional support for PPP projects¹.

So the first task is defined in the reform program – a statement on a national scale infrastructure projects and ensure their funding from the state, as well as the World Bank, EBRD and other donors and private investors. This goal was achieved, which was due to the preparation for the finals of the European Football Championship Euro-2012. Major projects by mode have been presented in Table 5.

Table 5. Projects in the sector "transport" for the period 2009–2013, by source of funding

Projects in the sector "transport"	Number of Projects	Total project cost, million grivna	including the sources of funding:			
			<u>borrowed funds</u> % of total	<u>own funds</u> % of total	<u>local budget</u> % of total	<u>State Budget</u> % of total
Total	62	171 545	<u>140 472</u> 81,9	<u>26 730</u> 15,6	<u>39</u> 0,02	<u>4 304</u> 2,5
of these projects: aircraft	21	59 637,9	<u>55 403,0</u> 92,9	<u>1 397,20</u> 2,3	<u>38,6</u> 0,1	<u>2 799,10</u> 4,7
maritime transport	21	29 282,60	<u>24 063,00</u> 82,2	<u>5 219,60</u> 17,8	-	-
railway transport	13	27 525,80	<u>10 294,40</u> 37,4	<u>16 548,20</u> 60,1	-	<u>683,2</u> 2,5
road transport	3	866,3	<u>30,3</u> 3,5	<u>23</u> 2,7	-	<u>813</u> 93,8
including in preparation for Euro-2012	24	23 895	<u>6 320</u> 26,4	<u>14 870</u> 62,2	<u>38</u> 0,2	<u>2 667</u> 11,2

Source: own calculation based on data of Ministry of Infrastructure Ukraine (2011).

¹ http://www.president.gov.ua/docs/Programa_reform_FINAL_1.pdf, p. 73-75.

The next task is to "increase the budget funding for the modernization and development of transport infrastructure by 10% annually." We need to follow the dynamics of the development of capital investment in the transport sector. In Ukraine the situation is as follows. Whereas the total investment from all sources of investment in the transport sector over the last 6 years is 2,1% of GDP on average – Table 6, which is comparable with Russia, the investment in transport according to the state budget is much less than in the EU and Russia, and are only 1/9 to 1/10 of the total investment from all sources, indicating a small public expenditure on the transport sector. Investments that are made directly in the operation of transport infrastructure are at 0,42% of GDP in 2006 – 0,8% in 2011.

Table 6. Capital investments in transport, mln USD

	2006	2007	2008	2009	2010	2011
Total activity in the transport and communications from all sources	2541,06	3963,68	4069,80	3069,38	3635,56	4921,89
From all funding sources,% of GDP	1,93	2,67	2,28	1,64	2,11	2,09
<i>of them by State budget as% of GDP</i>	0,21	0,43	0,26	0,16	0,33	
<i>The share of sector in the amount of investment in the economy,%</i>	16,2	16,8	14,0	16,2	17,0	16,5
activity of ground-based transport	833,28	1423,25	1670,78	755,10	1310,73	1602,69
<i>The share of sub-sector in the volume of investment in the economy,%</i>	5,3	6,0	5,7	4,0	6,1	5,4
activity of water transport	4,30	6,54	7,10	4,36	6,56	12,96
<i>The share of sub-sector in the volume of investment in the economy,%</i>	0,0	0,0	0,0	0,0	0,0	0,0
activity of air transport	10,19	38,13	20,02	15,48	13,18	38,40
<i>The share of sub-sector in the volume of investment in the economy,%</i>	0,1	0,2	0,1	0,1	0,1	0,1
Additional transport services and auxiliary operations	456,91	934,67	1008,09	1098,40	1557,53	2437,23
<i>The share of sub-sector in the volume of investment in the economy,%</i>	2,9	4,0	3,5	5,8	7,3	8,2
including operation of transport infrastructure	285,65	686,65	684,26	673,45	1054,07	1818,62

Source: own calculation based on Statistical yearbook 2011 "Transport and communication" (2012).

The dynamics of trends in investment in fixed assets of the transport sector for the sub-sectors show that the largest amount of investment in 2006–2010 receive land transport modes (aggregate "Investing in land transport" is the sum of investment performance in 1) railway transport, 2) the activity of another land transport (urban and highway), and 3) the activities of pipelines) – from 6 to 10% of total investment in the transport sector. But in 2011, the first in terms of investments completed subsector out "Additional transport services and auxiliary operations," which includes the following: "Cargo handling and storage", "The functioning of the transport infrastructure", "Services in the organization of travel" and "Organization of transport of goods" – 2,4 billion USD – Table 6.

The land infrastructure financing models in the world

According to data of the OECD (Strategic Transport Infrastructure needs to 2030. Report of OECD, 2012) financing model of land transport infrastructure are very diverse in different countries. There are many different organizational structures and models. Most of the internal road and rail infrastructure is state-owned. As a result, taxes are often the first and only source for the formation of funds necessary for the development and modernization of transport infrastructure. Some models are dependent to some extent on user fees (access to the railway infrastructure, toll roads, and fees for trucks). The most common models are systematized and described in Table 7. In practice, there are no clean models described in the table, as they are differentiated and applied in a necessary combination in a given country in a given period.

Table 7. Financing model for inland transport

Model	Design features
1	The government (the Ministry) is the owner of the entire infrastructure. Investments in infrastructure are laid annually in the national budget from general tax revenue.
2	The government owns the rail lines, roads and inland waterways. Investments in infrastructure are provided general taxes and / or other charges (tax on overall truck, fuel, etc.) and fees for the use of infrastructure (such as access to rail lines).
3	State corporation with 1) possession of infrastructure, 2) its management, and 3) the power to borrow for infrastructure development. Infrastructure funds are generated from fees from trucks and / or other special fees.
4	Specialized (by type of transport infrastructure) or project-specific infrastructure funds, which can be formed from one or more sources.

Table 7 continued

Model	Design features
5	Multimodal infrastructure funds for specific development of transport infrastructure. Investment funds are provided by a combination of taxes from various sources (such as budget allocations, general taxes, fuel taxes, land, tax on the use, for access, for travel, cross-subsidies, for example, the needs of the railway from tolls)
6	Special purpose funds with mixed public and private capital. Investments in infrastructure are formed from combinations of equity and debt (with or without government guarantees, tax credits, etc.)
7	The public-private partnership. Governments are the owners of the land. Infrastructure built by the private sector and financed entirely from user fees (roads, railway infrastructure)
8	Funding model for the private sector. Private operators own the land; the infrastructure is funded by user fees. If the owner of the infrastructure using its own infrastructure (for example, a mining company owned by the railway line), it may allow a third party to use it, according to the policy of fair competitiveness.

Source: Strategic Transport Infrastructure needs to 2030.

Finance the modernization and development of transport infrastructure remains a major problem in the EU. Budgetary sources (national budgets, the Community budget, local budgets) are rather limited and do not address the needs of infrastructure projects. In this regard, the EU transport policy provides:

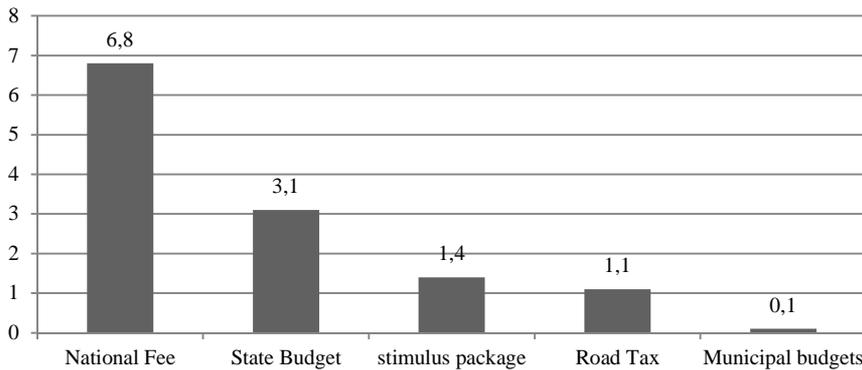
- Selectivity of funding transportation projects (mainly EU funds are allocated to projects on the development of intermodal transport, a compound related transport infrastructure, improving traffic safety);
- The involvement of private investors and the creation of companies with mixed (public-private capital);
- Payment of costs and revenues from new capital projects by receiving payment for use on competing routes (after depreciation). If implemented, the financial burden of such a scheme is transferred from the local community and local businesses (traditional financing through taxes) for transport users, including transit traffic and transport from other countries especially in countries and regions with a high rate of transit;
- Ability to use the funds received as payment for the use of one type of transport infrastructure (such as tolls on motorways) and accumulated in special national and local funds to finance infrastructure projects in the other modes.

Charges for the use of infrastructure are one of the general ideas of EU transport policy and it should be a tool to:

- Apply them to all forms of transport and calculate basing on the same principles;
- Allow the setting of a balance between the cost of the company (external costs and infrastructure costs) and the revenues that accrue to society from infrastructure charges;
- Designed in such a way as to avoid a sharp increase in taxes in the economy as a whole. Such as higher operating costs can be prevented by reducing current taxes or by sending profits to fund infrastructure.

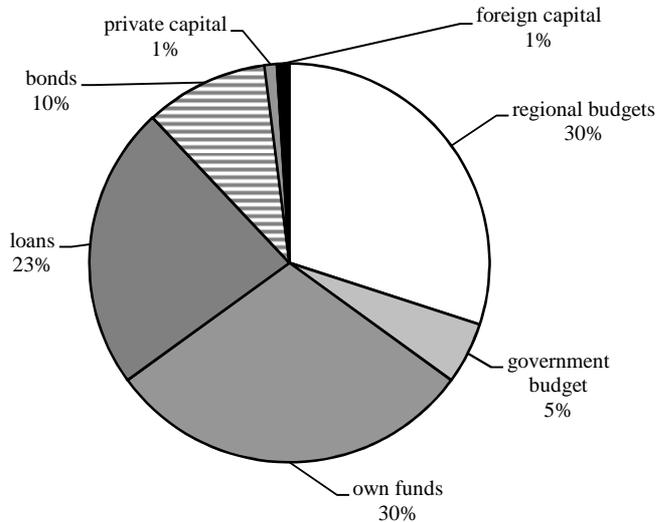
In Germany, for example, the financing of the railway transport is mainly due to the state and regional budgets, as well as its own funds of companies «Deutsche Bahn». What is important is that the cost of road infrastructure (railways, roads, waterways) in Germany is subsidized by the toll from trucks. The amount of subsidies for the railway from this source in 2009 exceeded 1.1 billion Euros – Figure 1.

Figure 1. Sources of public investment in the railways of Germany in 2009, in billions of Euros



Source: SCI Verkehr GmbH “Worldwide railway funding and investment budgets 2009. Financial resources, investment and economic stimulus packages”. Berlin, July. 2009.

Investment in railways in China is made from seven sources (Fig. 2). The maximum share of the state is about 35% (with the regional governments). A regular tool for attracting funds from private and institutional investors in rail transport in China were funded loans, as in 2006–2008, through the issuance of bonds 21 billion Euro was raised.

Figure 2. Structure of investments in Chinese railways in 2007–2010

Source: Staryh and Sulakshyn (2012).

In general, the set of possible sources and mechanisms of funding for transport infrastructure is as follows (see: Table 8): general taxes (eg, part of income taxes used to finance transport infrastructure), special taxes (taxes on gasoline, vehicle registration fee, vehicle tax, the tax on road users, etc.), fees for the use of infrastructure (promising area for the organization of markets is to sell at auction the rights to land aircraft in congested airports) regulated tariffs, fines for violation of previously established rules and procedures, insurance premiums used to reduce the likelihood of insurance risks for transport infrastructure, public-private partnerships – the main objectives of its use in transport is to solve financial problems and modernization of transport infrastructure, governance, and improving the quality of the sector through project financing. In the main instruments to increase funds on a long-term and short-term include: investment banking loans, syndicated loans, Eurobonds, leasing, mezzanine financing, and infrastructure bonds.

Table 8. The list of possible instruments for financing the modernization and development of transport infrastructure

	Financing tools	Characterization
1.	Taxes: general and special	General taxes (such as income tax is used to finance transport infrastructure), special taxes (taxes on gasoline, vehicle registration fee, tax on vehicles, taxes on road users, etc.)
2.	Fee	For example, for the use of transport infrastructure (toll roads or single lane roads, bridges, runways at airports)
3.	Tariffs	regulated tariffs should include an investment component, which lies just to the needs of transport infrastructure investment
4.	Fines	imposed for violations such as using objects of transport infrastructure
5.	Bank investment loans	In Ukraine, with the most common application for financing transport infrastructure
6.	Syndicated loans	Provided on an agreement of two or more credit institutions interconnected together to provide a loan to the borrower
7.	Bond (Eurobonds)	Issued by the borrower in obtaining a long-term loans : sovereign, bank, corporate, municipal
8.	Bill Loans	They have limited use
9.	Equity capital	Through the sale of shares provided the greatest effect relative to the inflow of funds. Creation of joint stock companies in Ukraine dictated the need for accumulation of funds to address economic issues.
10.	Securitisation of assets	Through the issuance of securities to be placed on the stock market
11.	Leasing	In the case of unavailability of medium-and long-term loans, leasing provides a real opportunity to solve the problem of investment in upgrading facilities for transport sector
12.	Mezzanine financing	Available in small volumes (10-20%) of the total project financing. It's one of the sources of financing in which the investor provides funds in the form of debt financing while acquiring an option to attract borrowers shares in the future for a certain price under certain conditions.
13.	Infrastructure bonds	Bonds that are issued specifically to finance infrastructure, with a rotation period of 15 to 20 years.

Source: compiled by the author based on Drachev and Knol (2004, pp.125-129).

Most of these tools have a practical application, some are fixed by legislation, also in Ukraine. However, despite the variety of instruments, while Ukrainian companies of the transport sector prefer such a standard form of borrowing funds as a bank loan. The main sources of funds potentially available for projects in the transport sector are the local banks, international banks and investors, local institutional investors (pension funds, insurance companies).

A promising tool to attract long-term financing of large-scale infrastructure projects is the emission of debt securities (bonds, Eurobonds, infrastructure bonds) for specific infrastructure projects. While this tool is not

widely used in Ukraine, this practice only gets spread. However, given the advantages of this tool compared to other loan products, one can consider it as a promising source of additional investment resources for Ukraine as a sovereign state, and for the Ukrainian banks and the corporate sector. Thus, Ukraine Railways “Ukrzaliznytsia” issued corporate bonds in 2011 at 1700 mln UAN by 14.5% maturing 28-29.10.2014, namely South railroad in the amount of 300 million UAH, Lviv railroad – 200 million UAH, Odessa railroad – 200 million UAH, Donetsk railroad – 200 million and 300 million UAH, South West railroad – 300 million UAH. Paying agent for these securities is UkrSibbank, which has already paid income for the first coupon period 31.01.2012 year. Ukraine Railways “Ukrzaliznytsia” can also attract up to 850 million dollars. U.S. via Eurobond issue, namely Donetsk Railway intends to issue and place in international markets bonds worth 225 million dollars, South Railway – 250 million USD, Odessa Railway – 125 million USD, Dnieper Railway – 175 million USD.

Infrastructure bonds have promise for new construction of infrastructure facilities in Ukraine. They may be issued for a special purpose by a company on the basis of concession agreements between the government and the concessionaire (issuer) in the form of debt and syndicated individual investment projects with a guarantee of the state, region, or of a major financial institution. Experts note (Podvysotsky, 2011, pp. 32-38) that the characteristic of infrastructure bonds have existing advantages, which make them more attractive to investors than other securities that are issued by the same long or even short term, but they offer investors higher returns. The attractiveness of such bonds in comparison with other instruments can be achieved through tax benefits or other guarantees of the state, which are provided as principal payments on the bonds and revenue bonds that investors receive for providing the funds for the project.

To improve the credit quality of infrastructure bonds authorities could: take all the risk of default, limit the liability of the tax revenues (income) insurance bond issue or purchase of credit, if such tools are available or pay in finance multi-year reserves established to service the debt or subsidies bond interest accounts.

The general model of financing of land transport infrastructure in Ukraine

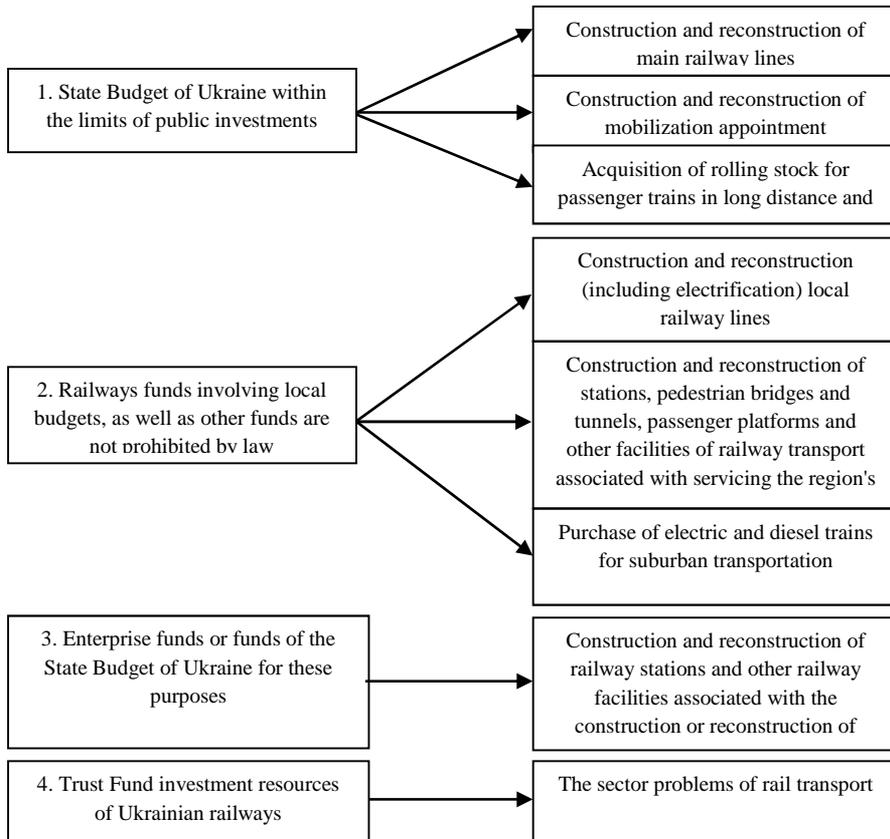
In Ukraine, the general model of financing of land transport infrastructure is as follows. In the Law of Ukraine on railway transport (1995) it has been determined that the funding can be different. That is, construction and re-

construction of main railway lines, objects mobilization purposes, purchase of railway rolling stock for passenger trains in long distance and local traffic made in the prescribed manner by the State Budget of Ukraine within the limits of public investments. Construction and reconstruction (including electrification) railway lines, stations, pedestrian bridges and tunnels, passenger platforms and other objects of railway-related public service area, purchasing electric and diesel trains for commuter made on account of railways involving local budgets, as well as other funds are not prohibited by law. Construction and reconstruction of railway stations and other railway facilities associated with the construction or reconstruction of industrial enterprises, carried out at the expense of companies or funds of the State Budget of Ukraine for these purposes. To solve the problems-wide development of rail transport in the Ukraine Railways there was created a trust fund investment – Fig. 3.

The next goal set by the Programme of reform until 2014 sounded like "expansion of funding sources of the Road Fund." Model of financing of road infrastructure in Ukraine, according to the Law of Ukraine on the sources of financing the road of Ukraine is next (Law of Ukraine about the sources of financing the road, 1991). As part of the State Budget of Ukraine established the State Road Fund of Ukraine, the revenue of which is formed from the proceeds of the excise and import duties on oil products, excise duty and import duty on imported to the customs territory of Ukraine of vehicles and tires for them and other revenues to the Ukraine state budget, in amounts that are determined by the law on the State Budget for the current year, as well as funds set out in Article 5 of this Law.

These other revenues include:

- Payment for the transfer of the roads in the concession or lease (there are no concession roads in Ukraine);
- Fares on roads vehicles and other self-propelled machines, weight or volume requirements that exceed regulatory;
- Fares on roads Ukraine vehicles and other self-propelled machinery of foreign states;
- Fares on toll roads in the manner and at the rates established by the Cabinet of Ministers of Ukraine (there are no toll roads in Ukraine).

Figure.3. Sources of financing railway transport

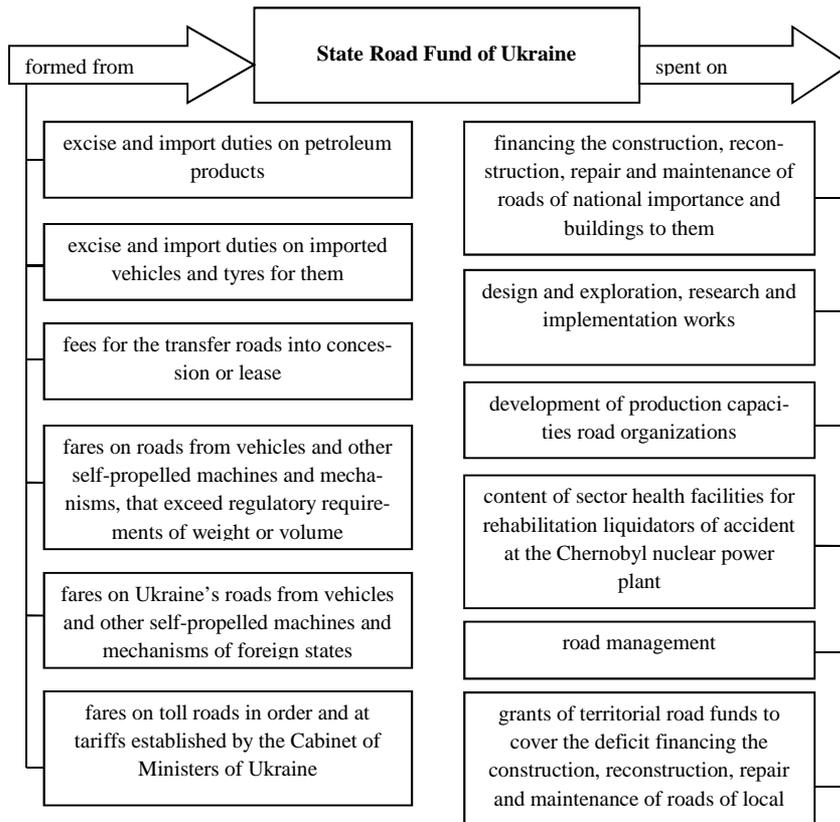
Source: compiled by the author based on the Law on railway transport (1995).

According to the Ukrainian law on the resources of financing the roads of Ukraine, the means of the State Road Fund are spent to finance the construction, reconstruction, repair and maintenance of roads and buildings of national importance, as well as design and exploration, research and promotional work, the development of production capacity road organizations, the maintain the medical institutions for the rehabilitation of the liquidators of the Chernobyl nuclear power plant, road management, and grants to territorial road funds to cover the deficit financing of the construction, reconstruction, repair and maintenance of roads of local importance – Fig. 4.

There are territorial road funds in the budget of the Autonomous Republic of Crimea, region, city, village and town budgets. The revenue part of the funds generated by the fee for the first registration of the vehicle, the fee for certain types of business activities in trading activity by oil products,

liquefied and compressed gas in stationary, compact and mobile gas stations, refuelling points, part of the State Road Fund of Ukraine under with the order of distribution established by the Cabinet of Ministers of Ukraine in accordance with the law, as well as other income in the respective budgets are determined by the decisions of the Supreme Council of the Autonomous Republic of Crimea, region, city, town and village councils on the budget for the current year.

Figure 4. Sources of content and cost of the State Road Fund of Ukraine



Source: compiled by the author based on the Law of Ukraine On funding roads of Ukraine (1991).

However since 2000, the scope of Article 3 of the Law with regard to the formation of road funds has been suspended. Thus the State Road Fund is not actually working. In the past years, road financing has been conducted only by the special fund of the State budget that consists of huge loans.

And the loans from foreign sources on the upgrade of roads in Ukraine are very significant.

Conclusions

The necessary measures to strengthen processes of modernization are next. In my opinion, the structure of sources in Ukraine through which the modernization and development of transport infrastructure looks skewed, namely, the total investment is around 15-16% of the total volume of investment in the economy, accounting for about 2% of GDP, while the state budget tools allow to invest only 0.3-0.5% of GDP in the transport sector. The remaining funds invested are 1.5-1.7% from other sources, namely the transport companies' own funds and borrowings, mainly from foreign creditors. The study shows the possible other sources of funding, based on the experiences of other countries. First of all, this issue of infrastructure bonds, as well as the use of syndicated loans and pension funds.

It is necessary to transit from the model of support for private foreign investment only to a balanced mixed model of government supervision and organization, with the participation of the private sector in the design, construction, infrastructure, and possibly management. It means more active part in the financing of infrastructure construction on internal sources of funding (private businesses, pension funds, and development banks), national and local engineering and construction companies in which foreign participants play an important, but not the leading role.

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