

NEW PARADIGM OF RAILWAY PASSENGER

Volodymyr V. Bobyl, Tetiana Yu. Charkina, Larysa V. Martseniuk

National University of Railway Transport named after Academician V. Lazaryan,
Dnipro, Ukraine

Abstract

The article describes the dynamics of the development of rail passenger transport, passenger volumes analyzed cyclical. Also studied the influence of society on the volume of passenger traffic. According to the theory of Kuhn's justified need for a new paradigm to improve the efficiency of passenger transportation. In addition, the authors identified the main factors that affect the level of profit.

Keywords: Paradigm of public and personal, Kondratieff wave, the volume of passenger traffic, a critical safety feature, influences, passenger transport performance;

Introduction

To date, passenger railway transport is at the limit of its capabilities to meet the demand for transport services (The concept of the State Target Program of implementation in JSC "Ukrainian Railway" of comprehensive

model of passenger traffic for the period to 2021 (Project). Its internal capacity is almost exhausted, with available reserves and resources it is impossible neither to develop, nor to ensure sustainable operation.

Internal problems of railway transport include the loss of transportation market and chronic unprofitability of passenger railway transportations. Total losses from passenger transportations in 2018 amounted to 8 bln. UAH, 4.3 bln. UAH of which in long-distance and 3.7 bln. UAH in suburban traffic. For the period since 2000 the share of railway transport in the passenger turnover has decreased from 46% to 34%. At this, for the period from 1996 to 2005 there was a decline in suburban traffic and transition to the automobile transport and in the period from 2010 to 2018 there was a decline in the share of distant long-distance traffic too (The concept of the State Target Program of implementation in JSC "Ukrainian Railway" of comprehensive model of passenger traffic for the period to 2021 (Project)). Most of the carriages and traction rolling stock providing passenger transportations in the distant and suburban traffic is outdated and physically worn out; it does not meet the modern requirements of comfort and economy. In this regard, the problem of development of the new requirements and renovation of the rolling stock to carry out the whole complex of passenger transportations, first of all the construction of domestic traction and rolling stock requires urgent solving. Changes in the structure of traction and rolling stock require the development of new schemes of train turnover, prospective deployment of the infrastructure enterprises, determination of the areas that require modernization and reconstruction (The concept of the State Target Program of implementation in JSC "Ukrainian Railway" of comprehensive model of passenger traffic for the period to 2021 (Project)).

Methods and course of the study

If one analyzes the expression of Kuhn (1977) "... that the history of science is not a linear process, but a change of scientific paradigms that are very tightly regulate both the choice of the problem and the methods to solve it within a sufficient period of time ...", it is clear why recently there are many new scientific paradigms in economics and management of railway transport.

Although the societal impact of transport was debated before 1987, it is fair to state that the rise of sustainability thinking boosted by the Brundtland report has resulted in a new phase of thinking on transport policy. Indeed, the confrontation of the concept of sustainable development with local and regional transport policies in the global north has resulted in the emergence of a policy discourse on sustainable transport, also known as sustainable mobility (Baeten, 2000; Banister, 2008). According to Banister (2008) four transition lines are essential to sustainable mobility: travel mode choice, urban and regional planning, technology, and travel substitution. Together, these ideas and storylines about cleaner cars, compact cities, and a modal shift to more sustainable modes of transport form the sustainable transport discourse.

Sustainable transport has become a common notion in many policy plans at almost all levels of government (Bulkeley and Betsill, 2005). At the European level, for example, the term is used to indicate a decoupling between the growth rate of transport and its associated adverse effects (Tight et al., 2004). At national or regional level, under the same heading, new technology is subsidised and efficiency increasing measures are funded. And at the local level, the notion of sustainable mobility is often used to justify investments in pedestrian areas, parking policy, and the construction of bicycle tracks (K. Boussauw and T. Vanoutrive, 2017).

Anyone familiar with transport policy in developed countries will note the similarities with today's sustainable transport agenda. An early overview of sustainable transport-related research is presented by Black and Nijkamp (2002) and 'The sustainable mobility paradigm', published in 2008 by David Banister, has become a classic.

Low and Gleeson (2001) point to the same tension between on the one hand, economic development, and on the other, social and environmental protection. They argue that the discourse of economic growth is powerful enough to legitimize unsustainable transport projects, despite the recognition that sustainability is a relevant criterion (among many others). Also Jackson (2009) points out the contradiction between the current economic system, in which growth is necessary to maintain employment levels, and the physical limits of the earth in terms of raw materials, energy and environmental space.

Growth in mobility seems inherent to present-day society, in which the increase of travel speed can be seen as the equivalent of the increasing efficiency that is typical of a growing economy. The parallel with the issue of economic growth, and its possible limits, can hardly be denied. The rise of the concept of sustainability has considerably changed transport policy and research. In this essay, we critically evaluated some Belgian cases where sustainable transport rhetoric was used to legitimate policies with questionable outcomes. These cases illustrate the paradox of the sustainability discourse having a real impact on the design of policies, while at the same time leaving behind a number of dissatisfied actors, which are unconvinced of such policy's contribution to sustainable develop-

ment of society as a whole. Such a prolonged dissatisfaction can only be understood by recognizing the normative nature of sustainability.

Several cases illustrate how 'sustainable transport' policies invest in projects that might result in more pollution and carbon emissions. However, we may not solely focus on the negative side, the harmful effects of transport, but also on the positive side. Indeed, 'sustainability' is a debate about the environment people want to live in and about the transport possibilities they need and want in this environment. This debate is not restricted to transport, as it was argued that the sustainable transport paradigm has not yet come to terms with the incompatibility of sustainability and the potentially systemic urge for growth (K. Boussauw and T. Vanoutrive, 2017).

The social-scientific analysis of national-level transport policy and practice presented demonstrated in (Henrike Rau, Michael Hynes, Barbara Heisserer, 2016) the need for greater alignment between public debates and policy development both within and beyond the transport sector. Moreover, the findings call for fresh thinking regarding public investment and divestment that incorporates insights from social-scientific and interdisciplinary transport research and that prioritizes sustainable transport. Short-term reactions to an economic crisis, especially cost-cutting measures and an over-emphasis on low- cost and no-cost transport solutions, are unlikely to produce a fully functioning, future-proof sustainable transport system. Instead, what is needed is a combination of wide-ranging, cross-sectoral policy changes and re-allocation of transport funding. Recent changes in EU transport policy and practice towards multi-annual transport budgets, closer links between transport and land use policy, investment in public transport, especially rail, and a greater emphasis on changing transport-related norms and mobility practices have opened up promising pathways.

In this context is helpful information provided by the authors (Giorgio Ambrosino, John D. Nelson, Marco Boero, Irene Pettinelli, 2016) provided a list, highlighting the fundamental role of the Public Transport Authority (local or regional, depending on the individual country legislation) to enable the implementation of the concept: recognize the Agency as an "added value" service for the area and a social cohesion tool to address the city/towns problems; support the development of intermediate transport services for the different specific areas and citizens groups; define the concept of a unique Agency for the city / urban area and town; define conditions for public tendering of Agency operation's activities; promote the definition of Public-Private Partnership for Agency operation; support possible interaction/synergy among TDC and Taxi Dispatch Centres and/or with other "Paratransit" services; integrate ride shoring schemes as last mile services with the public transport offer issue public subsidies for the needed investment, especially for TDC management; analyze and define "specific" fare schemes and the relevant implementation conditions; push the real collaboration among Transport Operators and Citizens' Associations; define a specific set of indicators measuring the quality and quantitative of service that are different from those of the conventional transport service. The authors believe that the FTS Agency and its evolution into a FTS and Shared Use Mobility Service Centre can become a key player in the enhancement and strengthening of the role of passenger transport in towns and urban areas.

By applying principal component analysis (Syed Abdul Rehman Khan, Dong Qianli, Wei SongBo, Khalid Zaman, Yu Zhang, 2017), the study constructs travel and tourism competitiveness index for inbound and outbound tourism. The main constructs of inbound tourism index include international tourists' arrival, tourism receipts, receipts of passengers' transports items and travel items while the constructs of the outbound index include international tourists' departure, tourism expenditures, and expenditures for passengers transport and travel items. The result of panel Fully Modified OLS (FMOLS) regression shows that the presence of air transportation, railways transportation, and trade openness positively affect inbound tourism index, while travel and transport services negatively affect tourism competitiveness index. The causality results confirm the bidirectional relationship between inbound tourism, air transportation, railways passengers carried, trade openness and travel and transport services, while there is a unidirectional causality running from inbound index to railway goods transported, from air transport freight to trade factor, and from travel services to air transport freight. Outbound tourism index confirmed the bidirectional causality relationship with air transportation, railways transportation, and travel and transport services, while the causality running from outbound index to trade factor, from air transport passenger carried to travel services, and from railway goods transported to trade and transport services, which support the unidirectional causality relationship between them. The variance decomposition results show that air transportation freight is the contributor that largely influences inbound-outbound tourism, while railways passengers carried and trade openness has the least share to influence inbound and outbound tourism index for the next 10-year period. The impulse response function indicates that air transportation, railways transportation, trade openness and travel services will positively impact on inbound tourism while travel and transport services will positively affect outbound tourism for the next 10-year period. The study concludes with the importance of transportation sector that deem desirable to

promote tourism worldwide. The concentration of different modes of transportation including air transportation, railways transportation, and travel and transport system would helpful to advance international tourism.

The overall results derive (Syed Abdul Rehman Khan, Dong Qianli, Wei SongBo, Khalid Zaman, Yu Zhang, 2017), the following policy recommendations i.e., the importance of transportation modes played a vital role to strengthen the international tourism infrastructure, therefore, the policies should be furnished with the appropriate destination choices in order to easily reachable and accessible places with lowering the freight charges and easily carrying goods at their pleasure destinations. The policies in order to support the travel and transport services equipped with the trained human capital and resource management, well-versed with the foreign languages, and proper guidance provided to the tourists' regarding the possible threats and opportunities in the destination points. International trade diversified with the potential tools for enhancing international tourism, as trade liberalization policies should be flexible and adjustable that helpful for building the strong international tourism infrastructure that's required for healthy and wealthy tourism across the globe. It is advisable to fairly charge transportation prices, passengers carried, and goods transportation expenditures, as its' affect on the decision of tourists' visitation and length for stay.

The proposal authors (Arritokieta Eizaguirre-Iribar, Lauren Etxepare Iginiz, Rufino Javier Hernandez-Minguillon, 2016) is based on the use of different accessibility measures and scales to achieve a common goal. The presented methodology analyses accessibility around linear systems with a multilevel approach, making a distinction between municipalities or urban and rural cores, non-urban spaces around the line and spaces in urban or rural cores. Each approach provides results of different scales, but in turn provides results of the whole line areas. These results refer to the potential of linear infrastructures as non-motorised axes, showing that disused railway infrastructures could have different uses further than greenways. Furthermore, some extra information is obtained, which is essential for the planning and future reconversion of the disused railway system.

This multilevel approach is applicable to disused railway systems in areas where urban or rural cores appear minimally spaced and do not form a metropolitan area. Nevertheless, the method could be widespread referring to type of transport (changes in distances) or system structure (linear or network, such as multi-center or polinuclear network cities), as long as the existence of urban and rural communities and non-built natural areas happens.

The analysis method does not mix transport and land-use components. Therefore the territory is only analyzed as its configuration, studying the potential of the path. However, the strategic points and areas obtained from these analyses provide the possibility to study also the potential of the nodes (old railway existing nodes and new possible found nodes). This would allow finding the connections that could be created by the future non-motorized structuring element, in order to define the potential of the comprehensive system and design future re-conversion strategies.

For example, V. V. Chorny (2013) proposed "... reproduction-optimization paradigm to provide the railway competitiveness at the market of freight transportations. The essence of the paradigm is the optimization of the technological and economic relations of the Ukrainian railways with the railways of the CIS and Baltic countries, transportation operators, owners of the freight cars, as well as the transition from the narrowed to the extended reproduction of productive forces, technical-economic and organizational-economic relations, and the relations of economic property and economic mechanism of railways. Its implementation facilitates the permanent formation of higher order competitive advantages that ensures the growth of railway competitiveness at the freight market".

O. V. Bakalinskyi in his dissertation (2012) "... justifies the introduction of customer-oriented paradigm of the railway passenger transportation marketing, which makes it possible to explain and predict consumer reaction to the changes of formation factors characteristics of transport services customer value, as a consequence of the introduction of advanced types of passenger rolling stock better."

"...The methodology of the effective functioning of railway transport in the market conditions due to the corporate restructuring and anti-crisis measures that makes it possible to take into account all major factors affecting the industry activity and choose the best variant of its prospective development", which was developed by Yu. S. Barash in his thesis (2008) one can definitely call a paradigm.

The experiences from Sweden and Norway (Hakan Johansson, Kjell Ottar Sandvik, Jozsef Zsidakovits, Grzegorz Lutyk, (2016) show that best results in strategic planning are probably obtained if the initiative to use alternative planning like backcasting from a climate scenario comes from the Government. On the other hand the Swedish Transport Administration probably had not been so well prepared if they had not taken the initiative in the previous strategic plan. One could think that it is obvious to start from the climate objectives and other important

objectives when planning for the future transport system - a transport system and infrastructure that will often be there in 50 years or more. The enquiry done in the CEDR I4 group shows however that most countries still plan using a forecast based on BAU. The examples show that using alternative methods to forecast based on BAU give other results which can work as additional basis for a more robust and sustainable decision.

The above mentioned list of the works proposing to change the paradigm of railway transport development in certain directions can be continued, but the question is, if one may change the views of science on the development of railway transport so often?

There are the thresholds values of economic security for railway transport, one of which is the wear and aging of the basic vehicles. Its value is 50-55%. Thus, in Ukraine for any and all of the railroad facilities this value has long been exceeded. In the near future the critical line of the operation safety for nearly all complex of the railway transport of public service, inability of railways to meet the demand for passenger and cargo transportations will be crossed. The competitive advantage of railway transport will be lost and transition of high-yielding freights to the other modes of transport would reduce the revenue base and would require optimization (reduction) of the network or state support. This will negatively affect the entire economy of Ukraine and its national security, and that must not be allowed to happen.

It should be mentioned that the above listed paradigms solving the particular problem of passenger transportations are not adjusted together, and we desperately need to develop a paradigm of passenger transportations development, which would take into account all the components of the transportation process.

From the above mentioned it can be concluded that it is necessary to develop a new paradigm of passenger transportations in Ukraine under conditions of the railway reform

For the further study of passenger transportations in Ukraine under reform let us use the provisions of the theory of M. D. Kondratiev and D. I. Oparin (1928). For this purpose let us construct the table of dynamics of passenger transportation volumes over time.

The Fig. 1 shows that the development of railway transportations is influenced by social processes, which took place in the Soviet Union until 1991 (thin line) and than in Ukraine (thick line). Let us learn more about these events.

After establishment of the Soviet Union railway transport began to develop slowly at the beginning but then it developed rapidly. However, during The Great Patriotic War passenger transportations significantly reduced and the passenger traffic volume for the first cycle, which had to end in about 1969 substantially changed. After the war, passenger traffic began to rise. First of all it was caused by the increase in welfare of the population, the appearance of new rolling stock and increase in transportation comfort. In the 1960s, for example there appeared open type passenger cars of the domestic production and compartment and sleeping coaches from Poland, Hungary and German Democratic Republic. The biggest development passenger transportations achieved in 1991.

Detailed investigation of change dynamics of passenger railway transportations for the period of establishment of Ukraine as an independent state is of particular interest. If we analyze these indicators of the activity of passenger facilities in the Fig. 1 (thick line) we can see at first their quick reduction (1-st period), a slight increase and stabilization since 2000 (2-nd period), and then almost down leap (3-rd period). These changes are significantly influenced by the events that took place in Ukraine.

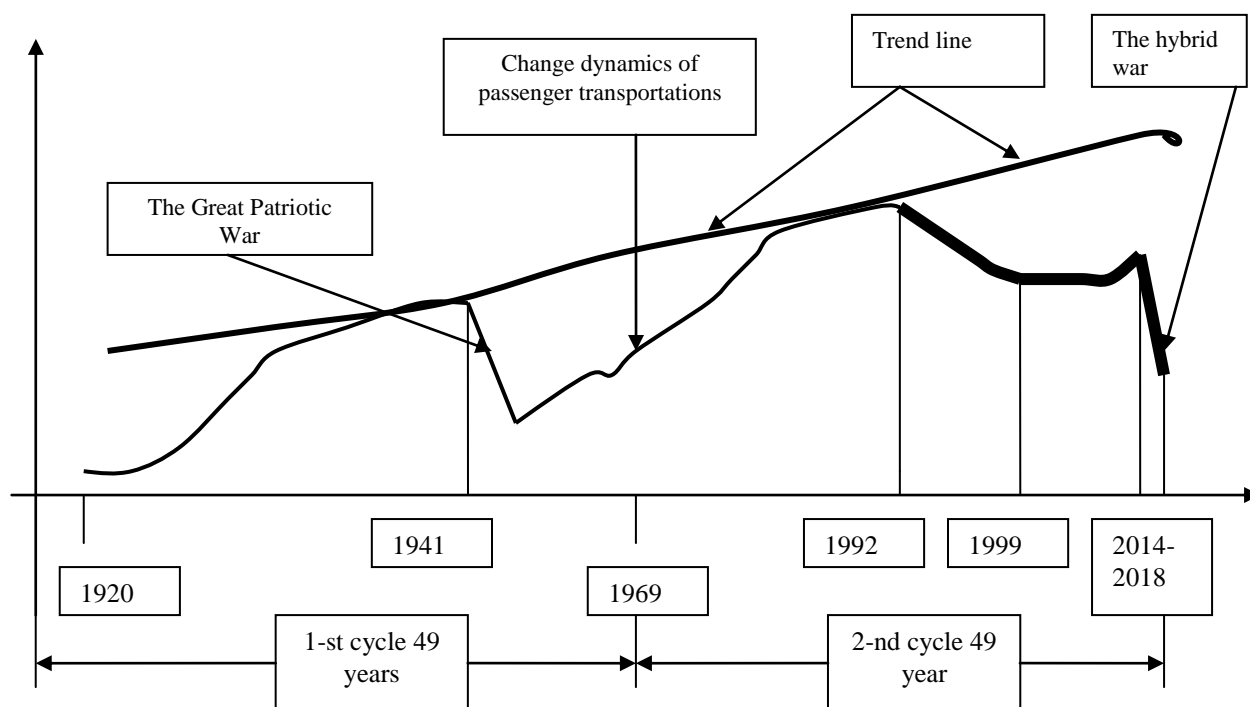


Fig. 1 The waves of development of passenger railway transportations in the Soviet Union and Ukraine. *Source:* authors' development

Each change in the passenger transportation indicators can be logically explained.

First period - 1992-1999. In Ukraine there was a break-down of relationships with the other CIS countries, the economy stagnation, the reduction of the welfare of population, default in payment between enterprises, hyperinflation and other negative consequences. In this period passenger rolling stock is purchased in a small amount of 8-20 units per year, while previously it was 350-400 of cars per year; and the passenger turnover decreased by 21%. Unprofitability of passenger transportations increases. Each and every performance indicators of passenger facilities steadily decline but they satisfy the reduced demand for railway transportations. New innovations in this period came down to periodic changes in the organizational structure of management, introduction of new technologies for rolling stock renovation at the plants and depots, developments of tariff policy and some changes in the organization of passenger train movement.

Second period – 2000-2013. In Ukraine started production stabilization and the economic relationships were gradually forged. The welfare of the population is gradually increased, and the hryvnia is being stabilized. But the corruption significantly increases at all levels of governance, the polarization of capital accumulated in the hands of oligarchs takes place. Certain changes take place at the railway transport: the railway stations are being reconstructed, Kryukov Railway Car Building Works produces 10 categories of passenger cars, which can run at the speed of 140 km/h. In 2012 the high-speed trains of the Korean and Czech production began to run. In 2014 there appeared the first high-speed train of domestic production "Tarpan", which has a design speed of 210 km/h. At the same time the negative trends in the passenger transportations continue growing. The management of "Ukrzaliznytsia" is changed almost every year, the normal investment climate is disrupted, the funding of scientific research is significantly reduced, and the corruption continues to grow. The fleet of passenger cars is reduced almost by 40%; the new cars of locomotive traction are purchased in small quantities only for the trains that ply between the capital and major regional centers. But the outdated rolling stock is still renovated by the overhaul reconditioning. If the first period can be called a period of depression, the second one can be called a period of relative stability.

Third period – 2014-2018. Ukrainian industry significantly reduces its production volumes, some enterprises have to stop their activities. The hryvnia has fallen almost three times, which resulted in lower welfare of the population. The passenger traffic volumes decreased by 35%, which resulted in the increase of passenger fares. In this period investments are insufficient for the purchase of new rolling stock and the overhaul reconditioning of rolling stock. During this period "Ukrzaliznytsia" starts reforming the railway sector. Since November 2015 Joint Stock Company "Ukrainian Railway" has been formally organized. The organizational structure of management at

the highest levels of government was restructured, but at the middle and lower levels it is still ongoing. Scientific research regarding future development of passenger transportations is carried out by individual scientists only on their own initiative. At the same time JSC "UZ" develops the concept of passenger facilities development without the involvement of scientists of Ukrainian transport universities.

Preliminary analysis showed the periodicity and wave changes in the railway passenger transport activity. The latest wave, the maximum of which accounts for 1991 indicates that in the near future it is expected increase in the passenger transportation efficiency in case of implementing the new innovation paradigm.

Consequently, now it is necessary to develop a new complex paradigm of passenger transportation development according to 9 innovative directions, which will partly take into account previous studies of some researchers, references to which are shown in square brackets:

1. Conducting market research in order to determine the projected number of passengers to capture the additional room in the market of passenger transport services upon the condition of introduction of the new innovative technologies (Бакалінський О. В., 2012).

2. Solving the problem of building a new organizational structure to control the passenger transportations in all types of traffic (Барах Ю. С., 2008; Карась О. О., 2009).

3. The introduction of high-speed movement of passenger trains at the speeds of 250-450 km/h in Ukraine (Момот А. В., 2014).

4. Revenue increase from the transportations, including the railway tourism (Марценюк Л. В., 2016).

5. Reduction of costs by optimization of the passenger train movement organization in all types of traffic (remote, inter-regional, regional, commuter and the high speed one) (Барах Ю. С., 2008; Матусевич О. О., 2015; Чаркіна Т. Ю., 2013).

6. Solving the problem of finding the new sources of financing the passenger transportations.

7. Justification of the new economic tariffs to increase the passenger transportations efficiency.

8. Solving the problem of the optimal structure of passenger car fleet that would take into account the future needs of passengers (motion speed, comfort, quality of service) in the conditions of limited investments (Бакалінський О. В., 2012; Карась О. О., 2009).

9. Improvement of passenger transportation efficiency due to the simultaneous implementation of all the above mentioned measures that will provide the maximum effect.

The question is where to get funds for the development of the railway sector? In the near future one cannot expect these funds from the state, but to attract the private funds is much more likely. Private capital accumulated by the oligarchs expects new innovative technologies for its efficient investment.

Incidentally, now in Ukraine and abroad is a group of oligarchs and sponsors who have spare money to invest in profitable innovative technologies, they are: the construction of Ukrainian part of the high-speed railway main line Lisbon – Shanghai, along which the modern highway will be built (discussion at the conference in Ukrainian State University of Railway Transport. Kharkiv 2016); for the reconstruction and building of narrow-gauge railway lines for the transportation of tourists and passengers in the Transcarpathian region there are also foreign sponsors (discussion at the conference in the Transcarpathian region).

Conclusions

On the basis of conducted research it can be concluded that:

1. The dynamics of development indicators of passenger transportations in Ukraine showed that they are completely dependent on social processes taking place in the state and are cyclical in nature, which can be described by Kondratiev cycles.

2. At present the railway transport activity is declined, because there are not enough investments for its activity. But the oligarchs and sponsors of our country accumulated lot of money that can be invested in the development of passenger transportations. They do not wish to invest in old technologies that do not allow them to profit, but they will be pleased to invest in new activities – high-speed traffic, tourist traffic and other activities.

3. The personal paradigms of passenger transportation development, which were proposed by individual scientists in certain directions of activities are not adjusted together and did not give the expected economic effect. So we desperately need to develop a new complex paradigm of passenger transportations development, which will propose new innovative technologies and significantly improve their efficiency.

4. The article proposes nine directions of the new paradigm, the development of which will make it possible to introduce the new innovative technologies in the conditions of the limited investments and to encourage the development of passenger transportations in the future.

5. For the first time in Ukraine it was proposed a scientific approach for implementing the new paradigm of passenger transportations, based on the analysis of their activities over the last 100 years, the use of Kondratiev cycles and includes nine basic directions of innovative reform of railway passenger transport.

References

1. Бакалінський О. В. Маркетинг пасажирських перевезень перспективними видами рухомого складу залізниць: Теорія, методологія, практика: Автореф. дис. ... д-ра екон. наук: 08.00.04 / О. В. Бакалінський; Держ. екон.-технол. ун-т трансп. – Київ, 2012. – 37 с.
2. Бараш Ю.С. Реструктуризація залізничного транспорту України в умовах ринку: Автореф. дис. ... д-ра екон. наук: 08.00.04 / Ю.С. Бараш; Укр. держ. акад. залізн. трансп. – Харків, 2008. – 37 с.
3. Карась О. О. Формування сучасного механізму управління підприємствами в ринкових умовах (на прикладі пасажирського господарства залізничного транспорту): Автореф. дис. ... д-ра екон. наук: 08.00.04 / Карась О. О.; Дніпропетр. нац. ун-т залізн. трансп. ім. В. Лазаряна. – Дніпропетровськ, 2009. – 23 с.
4. Кондратьев Н. Д., Опарин Д. И. Большие циклы конъюнктуры: Доклады и их обсуждение в Институте экономики. – М.: Институт экономики РАН ИОН, 1928. – 287 с.
5. Концепція Державної цільової програми впровадження в ПАТ «Українська залізниця» комплексної моделі пасажирського руху на період до 2021 року (Проект). – К., 2015. – 17 с.
6. Кун. Т. Структура научных революций. – М.: Прогресс, 1977. – 71 с.
7. Марценюк Л. В. Теоретичні та практичні аспекти управління ефективністю залізничного туризму: монографія / Л. В. Марценюк. – Дніпро: Дніпропетр. нац. ун-т залізн. трансп. ім. акад. В. Лазаряна, 2016. – 242 с.
8. Матусевич О. О. Управління економічною ефективністю залізничних пасажирських перевезень в умовах трансформаційних змін: Автореф. дис. ... д-ра екон. наук: 08.00.04 / Матусевич О. О.; Дніпропетр. нац. ун-т залізн. трансп. ім. акад. В. Лазаряна. – Дніпропетровськ, 2015. – 21 с.
9. Момот А. В. Економічна ефективність високошвидкісних пасажирських залізничних перевезень в Україні: Автореф. дис. ... д-ра екон. наук: 08.00.04 / Момот А. В.; Дніпропетр. нац. ун-т залізн. трансп. ім. В. Лазаряна. – Дніпропетровськ, 2014. – 24 с.
10. Чаркіна Т. Ю. Управління конкурентоспроможністю залізничних пасажирських перевезень на ринку транспортних послуг: Автореф. дис. ... канд. екон. наук : 08.00.04 / Чаркіна Т. Ю.; Укр. держ. акад. залізн. трансп. – Харків, 2013. – 21 с.
11. Чорний В. В. Методолого-практичні основи забезпечення конкурентоспроможності залізниць на ринку вантажних перевезень: Автореф. дис. ... д-ра екон. наук : 08.00.04 / Чорний В. В. ; Держ. екон.-технол. ун-т транспорту. – К., 2013. – 36 с.
12. Arritokieta Eizaguirre-Iribar, Lauren Etxepare Iginiz, Rufino Javier Hernandez-Minguillon. A multilevel approach of non-motorised accessibility in disused railway systems: The case-study of the Vasco-Navarro railway. *Journal of Transport Geography* 57 (2016) 35-43
13. Baeten, G., 2000. The tragedy of the highway: empowerment, disempowerment and the politics of sustainability discourses and practices. *Eur. Plan. Stud.* 8 (1), 69–86.
14. Banister, D., 2008. The sustainable mobility paradigm. *Transp. Policy* 15 (2), 73-80.
15. Black, W.R., Nijkamp, P., 2002. Social Change and Sustainable Transport. Indiana University Press, Bloomington, Indiana.
16. K. Boussauw, T. Vanoutrive / Transport policy in Belgium: Translating sustainability discourses into unsustainable outcomes. *Transport Policy*. 53 (2017) 11-19 15.
17. Bulkeley, H., Betsill, M., 2005. Rethinking sustainable cities: multilevel governance and the "urban" politics of climate change. *Environ. Polit.* 14 (1), 42-63.
18. Giorgio Ambrosino, John D. Nelson, Marco Boero, Irene Pettinelli. Enabling intermodal urban transport through complementary services: From Flexible Mobility services to the Shared Use Mobility Agency: Workshop 4. Developing inte-modal transport systems. Research in Transportation Economics, Volume 59, November 2016, Pages 179-184
19. Hakan Johansson, Kjell Ottar Sandvik, Jozsef Zsidakovits, Grzegorz Lutczyk. A need for new methods in the paradigm shift from mobility to sustainable accessibility. *Transportation Research Procedia* 14 (2016) 412 -421.

20. Henrike Rau, Michael Hynes*, Barbara Heisserer. Transport policy and governance in turbulent times: Evidence from Ireland. *Case Studies on Transport Policy* 2 (2016) 45-56
21. Jackson, T., 2009. *Prosperity Without Growth: Economics for a Finite Planet*. Earthscan, London.
22. Low, N., Gleeson, B., 2001. Ecosocialization or countermodernization? Reviewing the shifting "storylines" of transport planning. *Int. J. Urban Reg. Res.* 25 (4), 784-803.
23. Syed Abdul Rehman Khan, Dong Qianli, Wei SongBo, Khalid Zaman, Yu Zhang. Travel and tourism competitiveness index: The impact of air transportation, railways transportation, travel and transport services on international inbound and outbound tourism. *Journal of Air Transport Management*, 58 (2017) 125-134.
24. Tight, M.R., Delle Site, P., Meyer-Ruhle, O., 2004. Decoupling transport from economic growth: towards transport sustainability in Europe. *Eur. J. Transp. In- frastruct. Res.* 4 (4), 381 -404.