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DEVELOPMENT PROSPECTS OF TRACK INFRASTRUCTURE ENTERPRISES IN THE CONDITIONS OF INDUSTRY REFORMING

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Purpose: the prospect of track infrastructure development considering the cost projection of measures to make the track infrastructure facilities meet the requirements of transportation activity subjects also requires an economic evaluation. *Discussion*: to provide uninterrupted transportation process on the railways of Ukraine, taking into account the tendency of transportation volume increase, the implementation of speed lines for passenger service, separation of freight and passenger lines, and bringing the track facilities to the corresponding technical specifications are necessary conditions to perform in the near future. *Results*: the investment need to bring into effect the Conception of reforming of track infrastructure management to 2020 is calculated. The areas of absorbtion of the total investment volume providing the track infrastructure enterprises with necessary resources for reliable, fail-safe, uninterrupted operation of track infrastructure facilities were proposed. The corresponding requirements of transportation activity subjects in the conditions of new economic management and implementation of their competition policy were also taken into account.

Keywords: reforming Conception, track infrastructure facilities, repairs.

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Problem definition

Track complex plays an important role in the industrial and economic structure of «Ukrzaliznytsia». Track operational costs excluding the costs for repair are about 20% of the total expenses that significantly affects the level of transportation rates.

Nowadays, in the conditions of increasing the speed and intensity of train traffic, the quality and efficiency of track works becomes increasingly important. This calls for changes in the organization of track repair works [1, 3].

In order to make the track infrastructure facilities meet the demands of transportation process subjects one should determine the annual need for repairing works [2].

Thus, the need for modernization for the current year is determined by the ratio of track length of I-IV category to the average period of track repairing. Forecast of repairing measures need on the track infrastructure facilities to 2020 is presented in the article below [6].

Analysis of the recent research and publications

In prior periods the chronic lack of funds for implementing the planned preventive track repair works (further PPTRW) has led to an increase of unrepaired kilometers (modernization and capital repair up to 5,7 thous. km). Therefore, the need of track modernization amounts up to 880 km/year, the scope of the track capital repair will not exceed 1 thous. km per year (Fig. 1, 2).

To provide uninterrupted transportation process on the railways of Ukraine, taking into account the tendency of transportation volume increase, the implementation of speed lines for passenger service, separation of freight and passenger lines, and bringing the track facilities to the corresponding technical specifications are necessary conditions to perform in the near future [4].

In order to perform the discovered scope of PPTRW the need for special rolling stock should also be determined.

By virtue of higher quality of track alignment in plan and profile, productivity increase and improvement of working conditions, and operating cost reduction due to the track work mechanization, improvement of the track infrastructure facilities and stability increase of their technical specifications are proposed. The railways develop and implement a new model of the track maintenance section [4, 5].

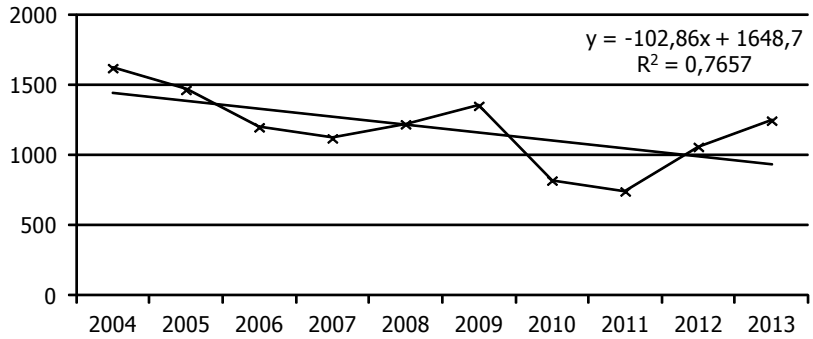

Fig. 1. Modernization dynamics of the track infrastructure facilities (Author's development)

The search for funding source for the special rolling stock renovation is the most important issue.

All these measures allow implementing so-called current and promising scope of works as a result of the load intensity increase.

One of the most important factors affecting the increase of PPTRW volume is the introduction of high-speed passenger trains on the railways of Ukraine.

Cabinet of Ministers of Ukraine approved the Conception of State Target Program for Introduction of High-Speed Traffic of Passenger Trains for 2005-2015 no. 979r from December 31, 2004.

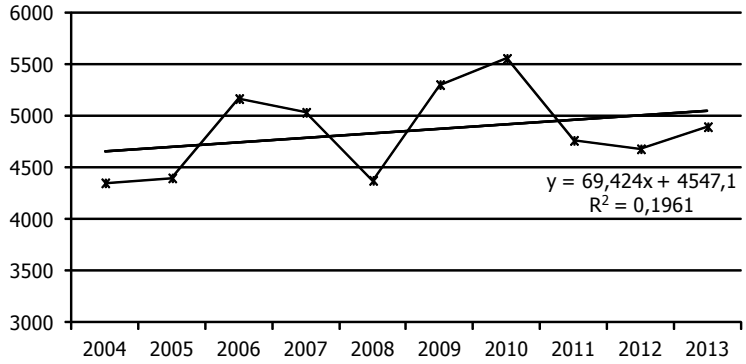

Fig. 2. Capital repair dynamics of the track infrastructure facilities (Author's development)

Implementation of the system of high-speed passenger trains is an objective need for Ukraine to solve the complex of social-economic and environmental problems of the national economics development in Ukraine.

Considering the current situation in the track industry of Ukrainian railway transport (the basic characteristics of which are described above) and the advanced experience of domestic and foreign railways, it was developed the Conception of Reforming of Track Infrastructure Management (further the Conception) as a promising direction for effective development of the track facilities [7].

Unsolved aspects of the problem the article is dedicated to

In the process of the Conception development the following tasks were solved: the task of further control centralization of the track facilities subdivisions, elimination of unnecessary control levels in both the overall system and in the subdivisions, function separation of maintenance and repair of the track. Among other tasks there are the extension of service areas of subdivisions and the optimization of stuff number while keeping appropriate level of operational activity. During the Conception implementation a particular attention should be paid to the condition of the track infrastructure facilities. The prospect of track infrastructure development considering the cost projection of measures to make the track infrastructure facilities meet the requirements of transportation activity subjects also requires an economic evaluation.

Purpose of the article

On the basis of functional model of the track infrastructure the article purpose is to calculate the investment need of the track infrastructure enterprises to 2020, as an element of the long-term strategic planning of enterprises development in the conditions of reforming.

Basic research material

According to the Conception, track maintenance section is the basic unit to maintain the track. It should be the base for monitoring the track and structures condition and for execution of immediate and urgent works on current maintenance.

The enlarged section without separation on working departments under the supervision of the section chief should be the basic structural unit of track maintenance section that provides current maintenance.

The structure first of all is introduced on the sections with mostly ferroconcrete sleepers and performed track repair works with deep cleaning or on the sections, where the terms of work frequency were not violated. The frequency of repairs and planned track surfacing according to the established standards based on the actual track condition should be provided on these sections. As a matter of priority on these sections the following works should be executed:

- rail extension,
- putting-in the switches on ferroconcrete sleepers,
- putting of insulated joints of composite materials,
- flooring of crossings with wear-resistant materials,
- use of chemical weed control and other works to ensure the maximum reduction in number of urgent track disrepairs.

The described section length is calculated on the basis of standards of labor inputs and the adopted organizational structure based on the requirements for work technique of relevant teams that are the part of the section.

After formation of regional offices to maintain the track or enlarged track maintenance sections the section teams for planed preventive works are cancelled, except for the teams serving for stations. These teams form the regional teams for planned preventive works of the current track maintenance. Instead of them the teams of 13 people are formed to perform the priority tasks of large volume.

Responsibilities of the regional office include keeping of technical documentation for the track and engineering structures and estimation of their state; organization of inspections; control of review frequency of the track and structures, organization of «gaps» in train traffic for repair works; staff, financial and material support [2] of maintenance section.

The office forms another system for collecting of current information and preparing of warning notices. A possible variant of direct subordination of regional offices for track maintenance to the railway track services.

At the level of railway the structure of track infrastructure management is built on the basis of reforming conditions for operation of the track maintenance section, the linear track maintenance section, concentration of repair and service of maintenance vehicles in specialized units, revision of accounting records, and improvement of planning and allocation of resources.

The reorganization involves more distinct separation of management functions for maintenance and repair of fixed assets and responsibility for the operation of certain units. The Track Engineer supervises operation of the whole track complex. The Track Service and the Direction of track repair are also under his supervision. The Head of the Track Service and the Head of the Direction are responsible for all aspects of operation of units they govern. The Diagnostics

Center provides work of all track diagnostic tools of the railroad, reception and processing of all data required for the analysis of management, work planning and rational resource allocation.

Reforming is implemented stage by stage to the extent of track expansion on the ferroconcrete rail seat and provision the track units with the mobile communications, modern machinery for repair and maintenance of the track.

The implementation of the Conception optimizes and reduces the work force for track maintenance by 1.6 times.

On the basis of actual state of the track infrastructure facilities, opportunities of enterprises, which maintain and repair the tracks, the requirements of transportation activity subjects, an annual demand in the implementation of planned preventive track repair works was formed. These works are: track modernization – up to 800 km (2240 mln. grn.); capital repair of the track – up to 1150 km (966 mln. grn.); midlife repair – up to 1300 km (240 mln. grn.); complex preventative repair – up to 1350 km (58 mln. grn.); replacement of turnouts on the ferroconcrete sleepers – up to 1700 sets (755 mln. grn.), engineering structures repair – 250 mln. grn. based on current prices [1].

On the basis of current condition of the track infrastructure facilities and the promising requirements of transportation activity subjects according to the Conception of Railway Transport Development to 2020 the volumes of PPTRW to 2020 (Fig. 3) were proposed.

The problem is that the fixed assets facilities are significantly worn out, including tools, equipment, repairs and maintenance vehicles that would improve the productivity and quality of work in the track industry.

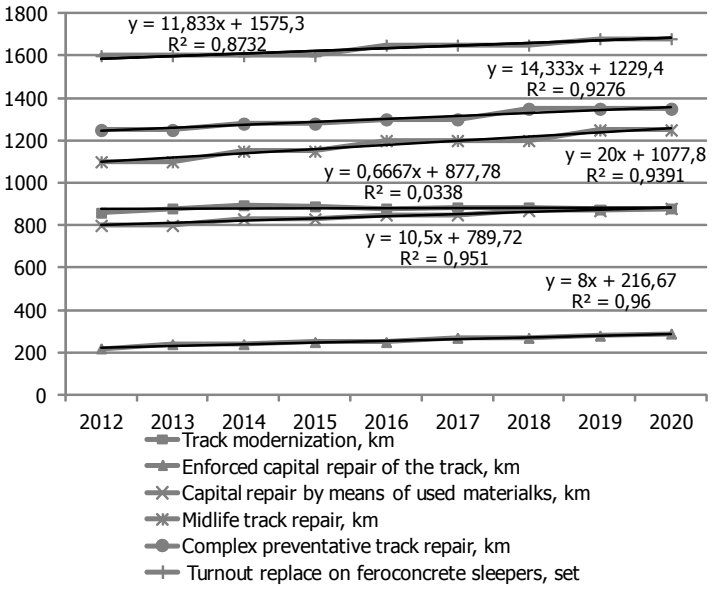

Fig. 3. Expected volumes of PPTRW of the track infrastructure enterprises to 2020 (Author's development)

The level of physical wear for vehicles of the track infrastructure enterprises is 89%, for machinery and equipment – 59%. The annual calculated need for specialized tools, equipment and machinery is about 70 million for the current period. (Fig. 4).

Effective functioning is provided by 66,01 people of the staff of «Ukrzaliznytsia» track infrastructure. The number of track infrastructure enterprises, which are the part of «Ukrzaliznytsia» is 194. They are combined into eight groups of track infrastructure enterprises.

The strategy development of the track infrastructure enterprises is based on providing the current and future need of transportation activity subjects in railway capacity, regardless of the number, complexity, and longevity of the track infrastructure facilities.

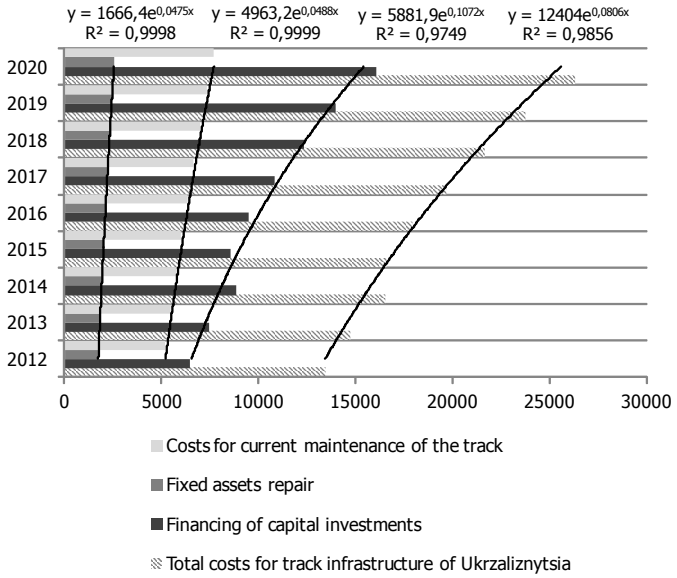

Fig. 4. The investment need of the track infrastructure enterprises to 2020 (Author's development)

However, during implementation of the complex strategy for the track infrastructure enterprise development there is not only the capital investments need to execute PPTRW.

Conclusions of the research

Thus, the general need of the track infrastructure enterprises to implement the development strategy of the track infrastructure to 2020 is 210 452 mln. grn.

The main directions of the disposition of these funds are: the capital construction; purchase of rolling stock, machinery and equipment; modernization of fixed assets (track modernization, replacement of turnouts); repair of fixed assets and cost for current maintenance of track infrastructure facilities [2].

Absorbtion of the total investment volume will provide the track infrastructure enterprises with necessary resources to ensure reliable, fail-safe, uninterrupted operation of track infrastructure facilities considering the

corresponding requirements of transportation activity subjects in the conditions of new economic management and implementation of their competition policy.

Prospects for further developments in this area

The current situation in the track industry offers the new opportunities to improve the track infrastructure efficiency. Transfer to the new technology for repair and current maintenance of the track, the introduction of the improved track diagnostic tools, the concentration of repair and service of maintenance vehicles in specialized enterprises have a real opportunity to reform the management structure of the track infrastructure of Ukrainian railway transport. However, the effective implementation of these measures requires a reasonable economic justification of the forecasting of investment need and the sources of coverage for the planned prospect.

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РАЗВИТИЕ ПУТЕВОГО ХОЗЯЙСТВА В ПРОЦЕССЕ РЕФОРМИРОВАНИЯ ЖЕЛЕЗНЫХ ДОРОГ

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Цель: статья посвящена планированию на перспективу объема средств, необходимых для нормального функционирования путевого хозяйства, с учетом необходимости реализации планово-предупредительных ремонтов и воспроизводственных мероприятий. *Обсуждение*: изучив текущее состояние путевого хозяйства, фактическое выполнение и сложившуюся острую потребность в реализации планово-предупредительных ремонтов, автор предлагает реализовать рациональный механизм распределения инвестиционных ресурсов на воспроизводственные мероприятия, который позволил бы достичь при минимуме потребных инвестиций значительных результатов по восстановлению пропускной способности железных дорог. *Результаты*: автором рассчитана потребность в инвестиционных ресурсах на воспроизводственные мероприятия путевого хозяйства до 2020 г. по видам деятельности. Это необходимо для разработки и реализации Концепции реформирования путевого хозяйства, достижения эффективности его функционирования, повышения конкурентоспособности всего железнодорожного транспорта в новых экономических условиях.

Ключевые слова: концепция реформирования, функционирование путевого хозяйства, воспроизводство.

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