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The importance of cohesion policy for the development of the railway system of the Republic of Croatia

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ABSTRACT

Cohesion policy is one of the European Union's policies, which provides Member States with the possibility of financial support under the European Structural and Investment Funds (ESI Funds) as well as with the Connecting Europe Facility (CEF), to reduce disparities and encourage the development of less developed Member States. By funding through Cohesion policy funds, the European Union seeks to accomplish a prosperous economy by achieving appropriate European standards in the individual Member States. Cohesion policy emphasizes the development of transport and mobility, and in particular, the investment in key transport links and sections of international importance through the revitalization of railway infrastructure in line with European Union standards. The railway system of the Republic of Croatia has been under-invested for many years, which is why it has not followed the requirements and needs of the development of the transport market. Membership in the European Union has provided the Republic of Croatia with co-financing for the development of the railway system. This paper will analyse the current investments in the railway system and the development potentials that are planned to be achieved in the next programming period. Therefore, the purpose of this paper is to analyse the importance of the Cohesion Policy of the European Union for the development of the railway system of the Republic of Croatia in the Programming period 2021-2027. The analysis aims to identify opportunities for further development of the railway system as the 'cleanest' transport industry, guided by the need to reduce harmful emissions following the European Green Deal by using funds from the European Structural and Investment Funds.

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1 Introduction

The railway system of the Republic of Croatia was for the first time connected to the European Transport Network in 1997 at the Third Pan-European Transport Conference in Helsinki joining the European transport system via Pan-European corridors, namely Corridor X and Branch Xa, Corridor V, Branches Vb and Vc and Corridor VII [7].

With the first version of the Transport Development Strategy, the determinants adopted for the development of railway transport in the territory of the Republic of Croatia were in line with the plans for the development of Pan-European corridors. Integration into the network

of Pan-European corridors was of great importance for the Republic of Croatia, and as stated, upon joining the European Union, it was established that it contains connections that have Trans-European importance [7].

The Trans-European Transport Network (TEN-T) aims to establish interconnected and interoperable transport networks in the EU, with an emphasis on removing bottlenecks and filling in missing connections. The EU provides significant financial funding for projects of common interest for the development and improvement of the transport network in the EU aimed at all Member States having transport connections that are relevant to the same.

With the accession of the Republic of Croatia to the European Union, it was necessary to initiate measures

to improve the railway system to adapt it to the standards and at the same time fit into the system of a single railway network. Given that rail transport is considered a transport industry that, compared to others, has a positive impact on the environment, or to a much lesser extent negatively affects it, the EU encourages its development through higher financial investments provided by the full range of funds.

Financial support from EU funds provided the opening of new opportunities in defining plans for the further development of railway transport in the Republic of Croatia, including those envisaged by the latest version of the Transport Development Strategy from 2017.

In 2017, by adopting a new Transport Development Strategy for the period until 2030, the Republic of Croatia gave significant importance to the development of railway transport, especially to the development of railway infrastructure as the most important link in the chain of inter-modal freight transport and integrated passenger transport [6].

Bringing the Croatian railway system to the EU level will be a long-term process that will take place through the implementation of many projects financed by EU support instruments to create a single network. The geo-transport location of the Republic of Croatia is extremely important for obtaining support from the EU in the form of improving transport infrastructure, given that all transport branches are significantly connected with the rest of Europe, thus creating opportunities for combined and intermodal transport strongly promoted by the EU [8].

2 Cohesion policy for the 2014–2020 programming period – 2020

Cohesion policy is one of the main investment policies of the European Union. It does its activities through funds provided by the Structural and Investment Funds,

collectively called ESI Funds. These funds have several main areas of activity and aim to achieve the principles of Cohesion policy by financing less developed regions and the Member States, encouraging sustainable development, developing, and growing employment and increasing competitiveness [8].

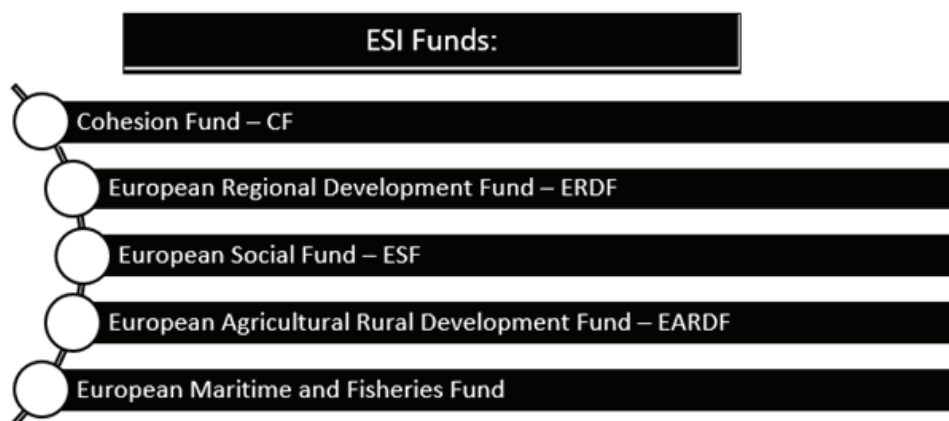
Scheme 1. shows the structure of European Structural and Investment Funds.

The transport sector is mostly financed by the Cohesion Fund and the European Regional Development Fund. The Cohesion Fund is focused on larger infrastructure projects, most often within the TEN-T network, which relates to the improvement of transport infrastructure but also projects in the field of environmental protection. Environmental projects are primarily focused on improving public and rail transport services, encouraging inter-modal transport, using renewable and alternative energy sources, and sustainable development as a whole [12].

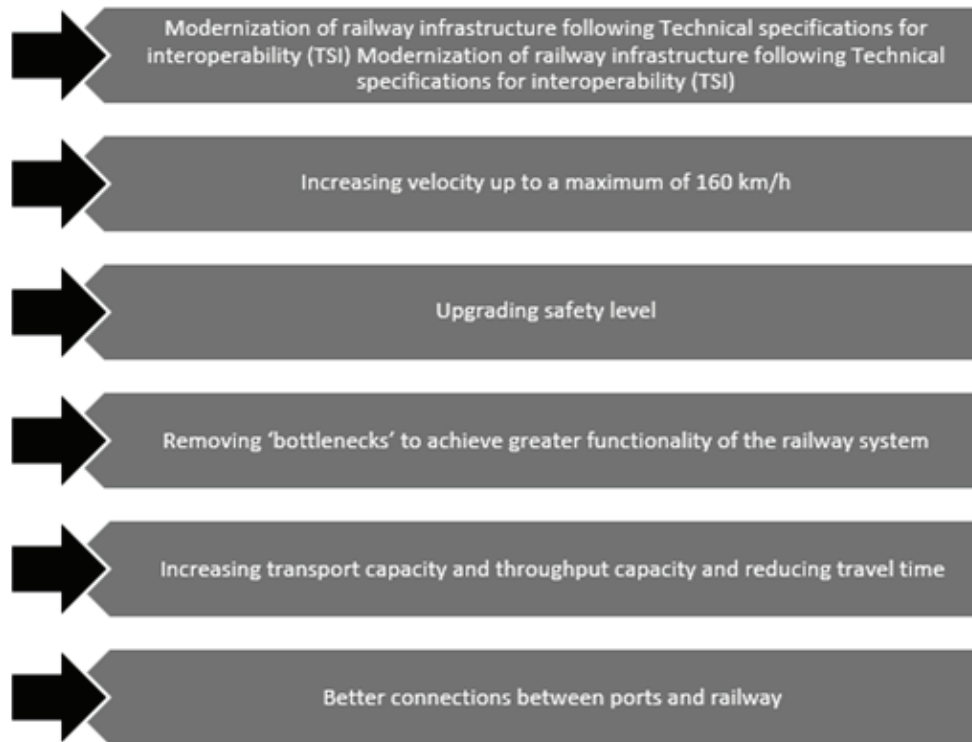
When investing in the TEN-T network, it is important to note that the focus is on projects that have priority European importance, which includes the financing instrument that was first established in the 2014–2020 Programming period under the title ‘Connecting Europe Facility’ (CEF) to develop transport and transport infrastructure and invest in energy and telecommunications.

In the Programming Period 2014–2020, special emphasis was on establishing sustainable development and improving transport and mobility. For the Republic of Croatia, such an initiative was extremely important, given that as a full member in the said Programming period it achieved the possibility of co-financing projects by the EU; many of them refer to projects aimed at improving transport infrastructure on the TEN-T network, especially rail infrastructure.

The role of cohesion policy is recognized as one of the EU’s main instruments for achieving harmonious development. The Multiannual Financial Framework (MFF) has



Scheme 1 European Structural and Investment Funds



Scheme 2 Specific objectives of HŽI's investments in the railway system of the Republic of Croatia

Source: Processed by the authors based on: *HŽ Infrastruktura (2020). "Railway for the Future" Program for the renewal and revitalization of railway infrastructure until 2030*

been adopted to implement Cohesion policy in the period 2014–2020; it amounted up to EUR 351.8 billion, or almost a third of the total budget of the European Union for the above-mentioned period.

The data presented in the Report on the utilization of funds from ESI funds in the Republic of Croatia, adopted at the 39th session of the Government of the Republic of Croatia, presented the value of projects contracted until 28th January 2020, which exceeded 13.4% of the maximum of the anticipated funds.

The Operational Program Competitiveness and Cohesion 2014–2020, as one of the four operational programs of the Republic of Croatia for the period from 2014–2020, which, among other things, co-finances individual projects in the railway sector, achieved the best percentage of contracted funds of 124.71% of the total available allocation, or 24.71% more than the maximum amount [11].

3 The influence of cohesion policy on the development of the railway system of the Republic of Croatia in the programming period 2014–2020.

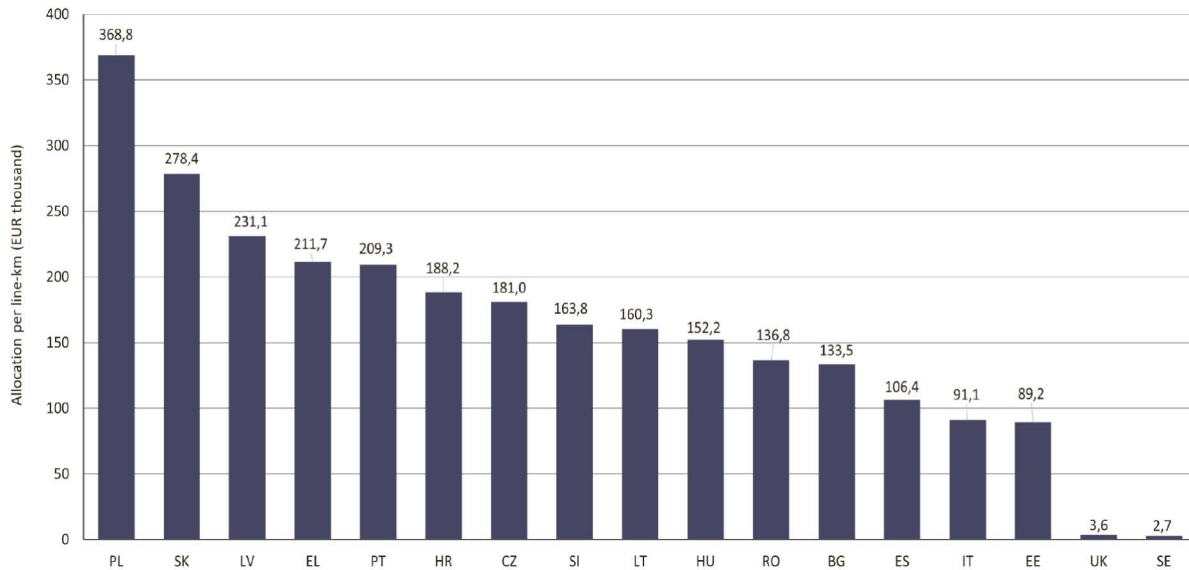
HŽ Infrastruktura d.o.o. is the holder of the largest infrastructure projects in the Republic of Croatia and the largest beneficiary of European Union grants in the trans-

port sector, intending to revitalize the entire railway network following European standards (increasing railroad capacity, traffic speed and safety level) [6].

Intending to improve the railway infrastructure of the Republic of Croatia to the level of EU standards, HŽI, with its Program for the Reconstruction and Modernization of Railway Infrastructure until 2030, defined the specific investment objectives shown in Scheme 2.

The fulfilment of the stated objectives will be achieved through the implementation of investment projects; currently, in the Republic of Croatia in the railway transport sector, nineteen such projects are being prepared and implemented. The projects are co-financed from ESI funds, i.e., in the field of transport and mobility from the Cohesion Fund and the European Regional Development Fund, and CEF [6].

According to the data published in the European Commission's Seventh monitoring report on the development of the rail market from May 2020, the Cohesion Fund and the European Regional Development Fund allocated around 188,000.00 EUR per line/km of railway to the Republic of Croatia. Considering that HŽ Infrastruktura manages the length of the railway of a total of 2617 km, the amount of allocation reached approximately 491,996,000 EUR within the programming period, as shown in Graph 1 [3].



Graph 1 Allocation of CF and ERDF funding per line-km (EUR thousand per line-km, May 2020)

Source: 7. European Commission’s Report on the development of the rail market

When analysing the graphs, it may be concluded that the Republic of Croatia is among the leading Member States in terms of allocated funds per line/km from the Cohesion Fund and European Regional Development Fund. Financial support from the funds is of key importance for solving the problem related to the construction of a double-track railway, which out of a total length of 2617 km, is only 274 km. This problem will be solved by implementing a series of projects in the period up to 2030. Significant progress is certainly expected by the end of 2023; this is the period by which the implementation of projects contracted in the 2014–2020 Programming Period is planned.

In addition to the financial means allocated from these funds, large financial support for the implementation of

projects in the railway sector was also provided by the CEF. The Republic of Croatia applied for funding from the mentioned instrument in an open call for funding under Objective 1. Objective 1 aims at bridging missing links, removing bottlenecks, enhancing rail interoperability, and improving cross-border sections [2].

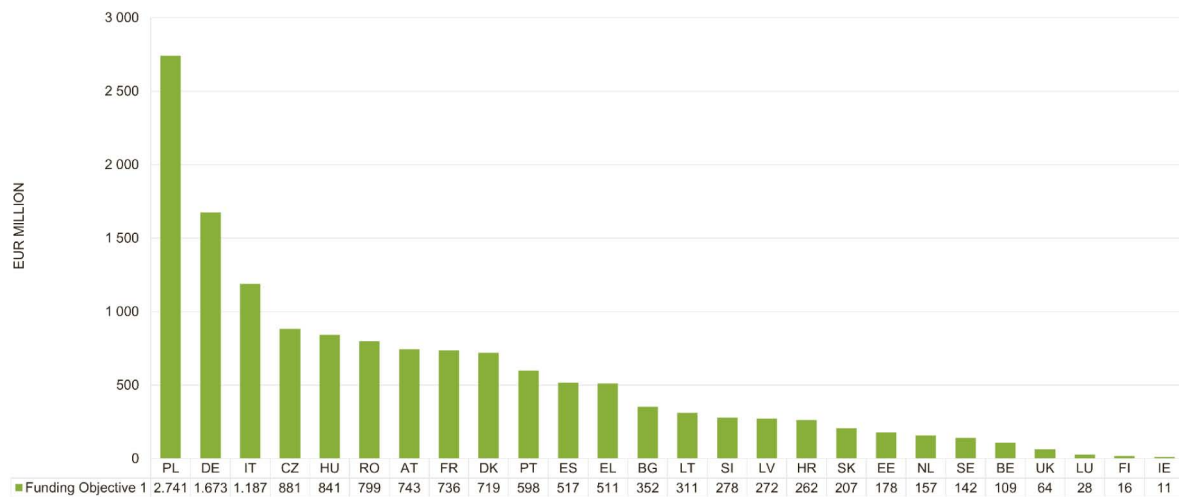
Priorities of financing Objective 1 are shown in the following schemes.

Within these priorities, funds provided by the CEF for the railway sector in the Republic of Croatia are aimed at projects to improve railway infrastructure within the basic TEN-T network, mostly the Croatian part of the Mediterranean Corridor, with emphasis on Rijeka’s busiest traffic route. With its projects, HŽ Infrastruktura provided

Objective 1 priorities:	Pre-identified projects on the corridors of the Core Network (railways, inland waterways, roads, maritime and inland ports)
	Pre-identified projects on other sections of the Core Network (railways, inland waterways, roads, maritime and inland ports)
	Rail interoperability
	European Rail Traffic Management Systems (ERTMS)

Scheme 3 Objective 1 priorities

Source: Processed by the authors based on: *European Commission (2014). Innovation and Networks Executive Agency; CEF Multiannual Call for Transport 2014: Funding Objective*



Graph 2 Allocation of CEF transport funds to rail actions per Member State and funding objective (April 2020):

Source: 7. European Commission's Report on the development of the rail market

almost 72% of the total allocated funds for the Republic of Croatia.

According to the data obtained by the European Commission's Seventh monitoring report on the development of the rail market from April 2020, the Republic of Croatia was allocated the amount of 262,000,000 mils. EUR to finance projects in the railway sector that meet the priorities of Objective 1, within the programming period 2014–2020, as shown in Graph 2 [2].

Allocated funds in the period 2014–2020, are focused on the implementation of 6 large infrastructure projects in the railway sector, but also on the education of relevant stakeholders about the time management and use of opportunities within CEF, through project preparation and implementation (*Technical Assistance Project*) and exchange of experiences with managers of railway infrastructure and other individual Member States of the European Union (*Twinning Project – Security Management*). With the funds provided from the European funds, a total of 19 projects are currently being implemented on the corridors RH1 (TEN-T core and comprehensive network – Pan-European Corridor X, Salzburg-Thessaloniki) and RH2 (TEN-T Mediterranean Corridor – Pan-European Corridor Vb, Budapest – Rijeka) [6].

For international freight traffic, corridor RH2 (*State border – Botovo – Koprivnica – Dugo Selo – Zagreb – Karlovac – Rijeka – Šapjane – State border*), and especially the part of the line M202 Zagreb Central Station – Karlovac – Rijeka, is extremely important as it represents the starting point, i.e., the destination of the Pan-European Corridor Vb Budapest – Rijeka, and now part of the Mediterranean TEN-T Corridor. This direction is necessary for connecting the central part of the Republic of Croatia

with Gorski Kotar and the northern Primorje, as well as for connecting European regional integrations such as the Alps – Adriatic, Mediterranean – Danube and the Central European Initiative. Apart from being part of the RH2 corridor and the Mediterranean TEN-T network corridor, it is also an integral part of the RFC6 International Freight Corridor [10].

Investment in the reconstruction and renewal of this route is of key importance for the final effectuation of the lowland railway designed a long time ago, i.e., high-efficiency railway, for which the possibility of realization in the coming period with the help of EU funds is finally visible.

The construction of the lowland railway will take place in phases, i.e., by individual sections, one of the most significant is the implementation of the project 'Reconstruction of the existing and construction of the second track on the section Hrvatski Leskovac – Karlovac', signed at the end of 2019. Traffic was observed on the section in question during 2017, and it was determined that the capacity of the line is 96 trains in one day. According to the planned timetable, the number of trains was 83, of which 27 were passengers, 17 official and 39 freight trains. When observing passenger traffic, it was found that the largest share refers to urban-suburban traffic of the city of Zagreb, which currently covers the section Duga Resa – Karlovac – GK, while as far as freight traffic is concerned, the largest share refers to transit traffic in Karlovac, where it comes to detention due to the manoeuvring actions [10].

The completion of the project envisages an increase in traffic, and it is estimated that by 2045, 141 trains will run daily on the section in question, of which there will be 78 passengers and 64 freight trains. In addition to infrastruc-

ture works, investing in the modernization of equipment will enable the increase of train speed to 160 km/h for passenger trains and 120 km/h for freight trains, which shorten the travel [10]. The value of the project is estimated at 366 mils. EUR. Three different public procurements have been announced for contracting works, namely for works on the construction and electricity railway infrastructure subsystem of the project, traffic management, and signal-safety railway infrastructure subsystem of the project and for supervision services of the project works. Many appeals against the published documentation as part of the public procurement procedures consequently postponed the deadlines set for the start of project implementation.

In addition to this section, the project 'Reconstruction of the existing and construction of the second track on the section Križevci – Koprivnica – state border', on which the ongoing works are planned to be completed by the end of 2023, has great importance in the achievement of the high-efficiency railway. Funds have also been provided for the preparation of study and project documentation on the section from Karlovac to Oštarije. Study documentation is being prepared and then the most complex section from Oštarije to Škrlevo will be defined, as well as designing the continuation of the railway to Rijeka to Jurdani is also being designed [10].

The accomplishment of a high-efficiency railway will not be significant only for railway traffic, but for the entire Rijeka traffic route, including the port of Rijeka and potential future infrastructure facilities that will greatly improve freight traffic. Apart from the mentioned investment in the construction of the lowland railway and the Rijeka traffic route of distinct national importance, it is also of great importance for the European Union as Kvarner is the fastest and shortest sea route between Europe and Far Eastern economic powers [5].

4 Programming period 2021–2027 – A look into the future

The new programming period brings significant changes for the EU and its members and covers the period from 2021 to 2027. In addition to the already established adoption of the Multiannual financial framework, for the period from 2021 to 2027, a special Instrument for Recovery and Resilience of the European Union, called 'Next Generation EU' (NG-EU), was established in response to the financial crisis caused by the coronavirus pandemic. The amount of the total budget is the largest so far and amounts to EUR 1.8 trillion, of which EUR 1,074 trillion is within the Multiannual financial framework and EUR 750 billion from the NE-EU [1].

The impact of the pandemic is also reflected in the formulation of cohesion policy for the said programming period by establishing additional funds. One of them is 'Recovery Assistance for Cohesion and the Territories

of Europe' (React-EU), which is a kind of continuation of the measures of recovery from the crisis from the previous period, which are: Coronavirus Response Investment Initiative (CRII) and Coronavirus Response Investment Initiative Plus (CRII +). React-EU will provide additional funding of EUR 47.5 trillion to previous period amounts under the ERDF, ESF and FEAD (Fund for European Aid to the Most Deprived). Funds will be allocated to the Member States considering the socio-economic impact of the crisis on individual areas [1].

The focus of EU Cohesion policy in the period 2021-2027 remains as the sustainable economic competitiveness through research and innovation, the digital transition, the objectives of the European Green Deal, and the promotion of the European Pillar of Social Rights.

Projects in the transport sector will continue to be largely funded by the Cohesion Fund and the European Regional Development Fund. Of the total available funds of these two funds of EUR 234 trillion (191 ERDF and 43 CF), for each region there will be a share allocated depending on the development potentials, needs and recommendations of the EU for the individual Member States. Through its activities, the Cohesion and European Regional Development Fund will also promote the objectives of the European Green Deal. From the ERDF, 30% of the allocated funds will be directed to environmental and climate protection measures, with the overarching objective of supporting the transition to a climate-neutral economy [1].

In terms of transport and mobility, Cohesion policy and in particular the ERDF will seek to support a successful transition to alternative fuels and so-called 'clean vehicles.' In addition to the CF and ERDF, the newly established Just Transition Fund (JTF), with a total budget of € 17.5 trillion, will be key to the successful implementation of the European Green Deal. The purpose of this fund is to mitigate the impact of the transition on a climate-neutral economy in the most affected areas. To be eligible for funding from this specific fund, each Member State is required to include in its national programs measures that will contribute to the transition to a climate-neutral economy and be in line with the objectives of the European Green Deal [1].

The European Green Deal was established as a solution to address the growing challenges in the field of climate and environment. It is a new growth strategy that seeks to transform the EU into a just and prosperous society with a modern, resource-efficient, and competitive economy in which there will be no net greenhouse gas emissions in 2050 and in which economic growth is not linked to the use of non-renewable resources. This strategy will launch many actions, and those in the transport sector are of key importance, given that it is responsible for as much as a quarter of greenhouse gas emissions in the EU.

In 2021, the European Commission has decided to launch the 'European Year of Rail' initiative, which aims

to highlight the advantages of using railways compared to other transport sectors. The share of greenhouse gas emissions in rail transport in the EU is 0.4%, which makes rail a logical choice for a sustainable and environmentally friendly transport sector. Therefore, this initiative plans to carry out a series of activities to popularize rail transport, given its important role in achieving climate neutrality. [1]

5 Obligations of the Republic of Croatia and opportunities for improvement of the railway system in the programming period 2021–2027

In the new programming period, Member States are required to adopt a series of strategic documents at the national level, which must be in line with the determinants and priorities set by the European Union for the period 2021–2027.

The starting point for accomplishing these duties for the Republic of Croatia was certainly the adoption of the National Development Strategy of the Republic of Croatia until 2030 at the session of the Croatian Parliament on 5th February. [14]

With this document, the Government of the Republic of Croatia sought to unite the potentials and objectives in 4 development directions: *Sustainable economy and society*; *Strengthening crisis resilience*; *Green and digital transition*; *Balanced regional development*. Their definition considers the objectives set within the European Green Deal and the European Territorial Agenda 2030, but also the consequences of the global crisis caused by the coronavirus pandemic [14].

Investment in transport and mobility is defined through two development directions: 'Sustainable Economy and Society' and 'Green and Digital Transition'. Given that the railway is recognized as the most sustainable form of transport, both in freight and passenger transport, which has a key role in achieving neutrality by 2050, this document provides investments for reducing the previous underinvestment compared to road transport, and in accordance thus regulating greenhouse gas emissions closely related to the same. The main emphasis is still on the development of the Rijeka traffic route, through the reconstruction of sections on the Rijeka-Budapest route, but also by investing in the Port of Rijeka due to its exceptional importance for international freight traffic. It will also be invested in smaller ports in the territory of the Republic of Croatia and to improve their connection with the railway and the road, thus strengthening the possibilities of intermodal transport. The continuation of the construction of Corridor Vc through neighbouring Bosnia and Herzegovina [14] fits into this orientation.

In addition to the already mentioned National Development Strategy of the Republic of Croatia until 2030, the Republic of Croatia is obliged to plan investment objectives in the new programming period, through

several other strategic documents. The implementation of the Strategy will therefore be based on the implementation of objectives through medium-term strategic planning acts and strategic documents related to programs from European Union funds. Following the above, it is necessary to compile national development plans, and based on them, the implementation programs of state administration bodies, as well as development plans and implementation programs of local and regional self-government units [14].

One of the most important documents of strategic planning is certainly the National Recovery and Resilience Plan 2021–2026, which was worked on throughout 2020 at the level of all relevant state departments. The drafting was preceded by consultations with the European Commission, which is based on strategic documents, programs, recommendations, and commitments and as such provides a clear and coherent framework for reforms, as well as development, social, environmental and all other objectives of the Government in the current decade [13].

The document is also in line with the EU guidelines, i.e., with the main priorities for the new programming period, which are mostly focused on the digital and green transition. The binding framework of this document is that a minimum of 20% of funds should be directed to digital transformation and a minimum of 37% of funds directed to green transition and the fight against climate change [13].

The National Recovery and Resilience Plan has 5 components: economies; public administration, judiciary, and state property; education, science, and research; labour and social protection markets, health and one initiative.

The focus is on the Economy component, for which 54% of the total anticipated funds are planned within the National Recovery and Resilience Plan. Funds under this component will be redistributed in the following areas: strengthening the competitiveness of the economy (12.5%), energy transition (10.2%), water management and waste management (13.4%) and the transport system (11.3%) [13].

In addition to the main components, the National Recovery and Resilience Plan describes in detail the planned reforms and investments within six subcomponents, of which 'Development of a competitive, energy sustainable and efficient transport system' contains an overview of investments in improving the entire transport system of the Republic of Croatia, and the significant part refers to the railway itself.

Following the above, a reform of the railway system is planned, and its implementation requires the development and adoption of several strategic documents. One of the most important is the Sector Policy Letter adopted on 1st July 2021 at the 65th session of the Government of the Republic of Croatia, officially entitled 'Modernization and restructuring of the railway sector'. With the aim of quality planning of the development of the railway sys-

tem, the strategic framework will be determined by drafting a long-term act – the Sectoral Strategy of the Railway System in the Republic of Croatia and two medium-term acts: The National Plan for the Development of Railway Infrastructure and the National Plan for the Management of Railway Infrastructure and Service Facilities and the Development of Railway Transport Services. A new multi-annual agreement on railway infrastructure management will also be established, which will clearly define the responsibility between the state and the railway infrastructure manager in the Republic of Croatia [9] [13].

The National Recovery and Resilience Plan defines several key investments in the railway sector. Emphasis was on investments that would remove ‘bottlenecks’ on railway infrastructure. Bottleneck interventions take place on sections, most of which are on the TEN-T network, while the rest are outside the TEN-T network [13].

Following the objectives of the European Green Deal and the main EU determinants for the new Programming period, the National Recovery and Resilience Plan, the planned investments in the railway sector are also oriented towards achieving a climate-neutral economy. This mostly refers to the modernization of the rolling stock, which would potentially be replaced by the introduction of battery trains for passenger transport, which would automatically reduce the harmful emissions. It is planned to purchase two prototypes of battery trains and to build stable energy connections for charging them. The project will create a framework for the assessment of the effectiveness of the replacement of the entire fleet over the coming period. To reduce the harmful effects on the environment, there are planned investments on freight trains, which will be oriented towards noise reduction, which has proven to be a significant problem in cities such as Rijeka where the railway is close to residential areas [13].

Given that the national objectives are harmonized with those at the EU level, the National Recovery and Resilience Plan defines investments in the direction of digitalization, which will include the improvement of online ticket sales system, the introduction of Wi-Fi in trains, modernization of sales channels – improvement of online sales system and modernization of sales devices in trains, upgrading passenger information system, modernization of the rolling stock by introducing GPS systems and harmonization with information and cyber security.

In addition to the previously described investments, the National Recovery and Resilience Plan envisages further investment in projects on Croatian railway sections that have key importance on the national and international levels.

6 Conclusion

Cohesion policy is aimed at the balanced growth and development of the Member States for overcoming regional disparities. With the accession of the Republic of Croatia to

the European Union, there has been provided financial support for investing in large infrastructure projects within the framework of Cohesion policy. The European Structural and Investment Funds are a kind of milestone and are of great importance for financing in the traffic and transport sector, especially within the railway system, which, in the Republic of Croatia has been significantly neglected for many years. The favourable geo-traffic position of the Republic of Croatia has contributed to the importance of the development of railway transport within the TEN-T network; its improvement is one of the priority goals for creating a quality, interconnected and interoperable transport network in the European Union. Railway transport is recognized as a sustainable transport branch, which is why the European Union, with the new Programming period, as well as with its reforms within the European Green Deal, encourages the development of this transport modality. The need for further development of railway transport through future projects in the railway sector for achieving climate neutrality is particularly emphasized. The investments made so far through the previous Programming period have resulted in a significant number of infrastructure projects on the railway network; their realization will improve the connections of the Republic of Croatia, as well as development potentials in strengthening multimodal transport, and thus competitiveness in the international market. In the Republic of Croatia, in the upcoming Programming period, with smart strategic planning of projects, the railway could achieve its full potential and reach the standards of the European Union.

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