

PRACTICAL RESPONSES OF TRANSPORT MANAGEMENT TO COVID-19 PANDEMIC WITHIN THE EUROPEAN UNION

Slobodan Aćimović¹, Veljko M. Mijušković¹ & Petar Ranković²

¹ University of Belgrade/Faculty of Economics and Business, Serbia

² Government of the Republic of Serbia/Ministry of Mining and Energy, Serbia

Abstract

Amidst the increase in the number of infected people all over the world during the first weeks of the outbreak of the COVID-19 pandemic, many countries have adopted measures to discourage the movement of their population, in order to ensure public health and control the health crisis. The closure of borders has limited the international transport of goods. However, very quickly there were practical responses that provided support to international transport and logistics services, with the aim of reducing delays in the delivery of materials and goods. The analysis within this paper considers different methods of acceleration in the transport of goods within the EU during the pandemic period. The results of the analysis based on the secondary data sources show threefold changes in the management of transport flows in the EU during that time period. First of all, "Green lanes" gave great support to road freight transport ensuring the continuous physical delivery of goods on the internal market of the EU. Secondly, the role of railways transport has increased, replacing road transport and achieving very good business results. Finally, overcoming the unfavorable situation in air transport has required the mobilization of available commercial passenger aircrafts and their redirection to transport of goods. These changes identified within the study indicate the necessity of flexible organization of international transport in the conditions of external risks in order to ensure the continuity of supply chains. The accumulated experience during the COVID-19 pandemic could serve as an example of good practice in overcoming challenges in transport management and supply chains of the future.

Key words: COVID-19 pandemic, transport management, European Union, green lanes.

1. INTRODUCTION

The COVID-19 pandemic has negatively affected the performance of many sectors in the globalized world economy. The reduction in volume and the complete suspension of transport flows between markets, caused by the adoption of new measures to protect public health and prevent the spread of the virus, have drawn the attention of the academic and business community to the special importance of transport management, which plays an intermediary role in international supply chains. In March 2020, 75 percent of global companies reported supply chain disruptions due to transportation restrictions, while 45 percent of logistics companies experienced significant delays in shipments, 86 percent of companies for China, 74 percent for Europe and 44 percent for North America (Tardivo & Zanuy, 2021). Transport management during the COVID-19 pandemic within the European Union presented a serious challenge that undermined the unity of the European market. The physical closure of internal and external borders and the introduction of new health protocols have drastically hampered the movement of people and goods, causing delivery delays and rising financial costs. New circumstances created the need for a different management of freight transport activities in the

European Union. Practical answers and support for road, air and rail freight transport in the European Union were soon created. The green lanes (corridors) established on the Trans-European Transport Network (TEN-T) made it possible to overcome interruptions and kilometer-long queues at border crossings in road transport. Civil air transport has almost completely directed all available capacities to the transport of goods, while freight rail transport has recorded growth and taken over a significant part of the activities of road and sea transport during the pandemic. The pandemic of the COVID-19 virus as an external environmental risk showed the necessity of the joint action of transport stakeholders in adopting emergency measures to ensure the continuous cross-border transport of goods.

2. THE COMPLEXITY OF GLOBAL TRANSPORT MANAGEMENT

Transport can be defined as the "function of planning, scheduling and controlling activities related to the method of work, suppliers and the movement of goods in and out of the organization" (APICS Dictionary, 2013). Transport management assumes planning with the aim of providing products to the right place, at the right time, as cheaply as possible. Lai believes that "transportation is an intermediary that facilitates the physical flow of goods from the point of origin to the final destination, and that the goal of specialized transportation intermediaries is to satisfy customers in the chain with greater efficiency and effectiveness than competitors" (Lai *et al.*, 2002). Transport is part of integrated logistics management and as such is of crucial importance. "A well-developed transport system ensures efficiency, reduction of operating costs and higher quality of logistics services. Today, transportation is considered a major component of distribution and logistics" (Topolšek *et al.*, 2018).

Managing the international transport of goods is the most important and complex logistics work in any company engaged in production, trade or logistics operations. Transport is the most important logistics activity since it accounts for about 50 percent of all logistics costs of the company. In systems of physical distribution, and more widely in the system of the economy as a whole, transport performs the function of "blood flow", transferring goods between spatially separated places of production and consumption (Aćimović & Mijušković, 2020). A good transportation system to the logistics system could provide better efficiency, reduce operating costs and promote service quality (Tseng *et al.*, 2005). Transport management is a key logistics activity since it ensures the movement of materials and goods from the place of origin to the place of consumption, or to the place of disposal. Transport plays an intermediary role in the supply chain because it enables the physical flow of goods from the supplier to the final destination. Transport companies carry out the physical distribution of products from one point to another (Coyle *et al.*, 1996). Transportation includes the mode selection of transporting goods (air, rail, maritime, road or pipeline), then routing the shipment and ensuring compliance with the regulations of the country to which the delivery is made (Lambert *et al.*, 1998). The goal of transport service providers is to satisfy the demands of customers (upstream and downstream) in the chain, with greater efficiency and effectiveness than competitors (Lai *et al.*, 2002).

Today's transportation networks of logistics service providers are extremely complex and tightly connected systems subject to many types of interference that lead to disruption of transportation flows. "Kwak pointed out that the most important risks in intercontinental goods flows are delays, natural disasters, lack of space, fluctuation of freight rates, misunderstandings, cargo damage, incorrect documents, strikes, etc." (Andrejić *et al.*, 2020).

Earlier research in the field of logistics neglected the importance of division of risk. Risks differ by origin since their source can be in the supply chain or in its environment. Therefore, sources of uncertainty should be separated into two different groups (Trkman& McCormack, 2009):

- Endogenous uncertainties. The source of risk is within the supply chain and can lead to changing relationships between the focal firm and suppliers. These uncertainties usually manifest themselves through market and technology turbulence.
- Exogenous uncertainties. The source of risk is outside the supply chain. These risks can be further classified into: discrete events (infectious diseases, terrorist attacks, labor strikes, etc.) and continuous risks (inflation rate, changes in the consumer price index, etc.)."

3. SPECIFIC RISKS OF INTERNATIONAL TRANSPORT MANAGEMENT

Risk management is becoming increasingly important in academic literature and practice in the field of transport logistics. It is about removing threats that could affect the success of supply chains (Coyle *et al.*, 2016). Transport disturbances can cause a number of negative consequences. In complex logistics systems, there is a high probability of their occurrence. Therefore, risk management should be an important part of the transport management strategy (Andrejić *et al.*, 2020). Risk-resilient transport systems must be flexible and anti-fragile. Transportation failures can potentially have major negative impacts on global supply chains and must be analyzed as such. Given that risks in global supply represent a great burden for all stakeholders, a discipline called Supply Chain Risk Management (SCRM) was created. Supply chain risk management involves "coordination and collaboration between supply chain partners to ensure profitability and continuity" (Yoon *et al.*, 2016). It is a business practice that aims to avoid costs, pursue to provide continuous customer service and maintain a market position. A study by IBM found that SCRM is the second biggest challenge for supply chain managers, more significant than growing customer demands and higher cost pressures (Kouvelis *et al.*, 2011).

The most important factors that affect risks in supply chains are: environmental, geopolitical, economic and technological. The main characteristics of these factors are (Manuj & Mentzer, 2008):

- Environmental factors have the highest probability of occurrence. These include natural disasters, extreme weather and pandemics.
- Geopolitical factors are highly likely to lead to interstate conflicts resulting in permanent trade restrictions.
- Economic factors refer to demand shocks that are often associated with sudden political and economic changes.
- Technological factors refer to breakdowns in the transport infrastructure which are quite rare. However, as supply chain management increasingly relies on information technology, any technological failure has serious consequences."

The mentioned factors are largely related to the risks in the management of international transport. Table 1 shows the impact of risks on the components of the logistics system. The biggest negative impacts on transport activities come from wrong and untimely information, operational risks and the environment, which includes health risks such as pandemics.

Table 1. Risks in different logistics management functions

Risks/Functions	Transportation management	Warehousing management	Material handling	Inventory management	Order management	Purchasing management	Customer service	Information management
Environment	*	*	*	*				*
Suppliers				*	*	*		*
Operational	*		*			*	*	*
Control		*		*	*			*
Planning				*	*	*	*	*
Customers					*		*	*
Information	*	*	*	*	*	*	*	*

Source: Wee and Blos (2012).

Transport risks arise when transport between locations is interrupted. Transport risks include all movements of cargo with the probability of impacting the performance of supply chains. They include delays, interruptions and stoppages of trade flows due to natural disasters and other hazards, as well as acts of terrorism or any other security incidents in traffic (Coyle *et al.*, 2016). APQC study found that nearly 83 percent of transportation participants experienced at least one supply chain disruption during the last 24 months of business. These disruptions create problems in physical flows within distribution channels, they also create delays and the need for additional activities. In the worst case, outages cause long-term damage to a company's image, profitability and stock price. The 2012 World Economic Forum study shows that significant supply chain disruptions reduce the share price of affected companies by an average of about 7 percent (Coyle *et al.*, 2016). Kwak pointed out that the most important risks in intercontinental goods flows are delays, natural disasters, lack of space, fluctuation of freight rates, misunderstandings, cargo damage, incorrect documents, strikes, etc. (Andrejić *et al.*, 2020). According to the results of many researches, traffic congestion is one of the most important transport risks. These are frequent occurrences that are not easy to predict and avoid. A delivery delay almost always causes customer dissatisfaction, and in some cases it can even lead to a halt in production. The essence of this problem lies in the impossibility of predicting events and quickly finding alternative solutions (Andrejić & Kilibarda, 2018).

Since 2006, the World Economic Forum has been dealing with the assessment of the perception of global risks. In its first report, the Forum warned of the risk of a pandemic outbreak by pointing out the potential impact of global health risks onto the whole world. That year, the report warned of a "deadly flu, the growth of which has been facilitated by global travel patterns in the absence of sufficient preventive protection mechanisms. The negative impacts of the pandemic would include, according to their forecast, a serious deterioration of travel, tourism and other service activities, as well as production and retail supply chains" (World Economic Forum, 2021). The COVID-19 pandemic has had a negative impact on international transport as it has caused disruptions in global supply chains, resulting in delays or complete suspension of the transport of goods. Since the beginning of 2020, more and more countries have closed their borders and restricted the movement of goods and the travel of people to contain the spread of the virus, thus creating barriers to international trade and transport. As a result of the pandemic, supply chains in the transport industry have been disrupted, albeit differently across air, road, rail and maritime transport (Statista, 2021). This led to problems that reflected onto logistics operations, primarily storage and transportation of goods, due to which the sector suffered serious losses. The COVID-19 pandemic revealed the

great weaknesses of this business model. First, the virus can directly affect employees engaged in the physical distribution of goods (truck drivers, seafarers, pilots). Second, international air travel was severely restricted. Third, social distancing measures as well as other health checks have created delays at borders, creating additional transaction costs. Fourth, many firms and governments faced shortages of goods and services as foreign suppliers favored their local customers. This discrimination was particularly evident in the procurement of pharmaceutical products and medical equipment (Strange, 2020).

4. METHODS OF ACCELERATING THE TRANSPORT OF GOODS WITHIN THE EU DURING THE COVID-19 PANDEMIC

4.1. Green lanes

At the beginning of the COVID-19 pandemic, the member states of the European Union decided to close their borders to the movement of people and goods in order to protect public health, which they mostly did in a fragmented and uncoordinated manner. The introduction of mandatory quarantine, social distance and special restrictive procedures, health and other controls at border crossings, caused major disruptions in the already non-unified European market as cargo trucks were stopped at border crossings, even within the Schengen area, while many planes and ships were left to rest in hangars and ports (Europska komisija, 2021a). "It was noted that on March 19, 2020, trucks formed long lines at border crossings between Germany and Poland for up to 50 kilometers, France and Germany more than 20 kilometers, Czech Republic and Germany 13 kilometers, Hungary and Romania 16 kilometers. The European Commission and the countries of the European Union had taken serious measures to put transport activities into operation, in the period of slowdown and complete stop of cross-border trade of goods. The measures supported a faster and continuous flow of goods throughout the European Union, both basic goods, food and medical materials, and other goods" (European Commission, 2021a). Thus, the Commission recognized the importance of the transport sector, which ensures economic continuity and the functioning of the single market.

The formation of Green lanes on the Trans-European Transport Network (TEN-T) served to overcome major delays in transport communications within the European Union. On March 16, 2020, the European Commission issued Guidelines for border management measures to protect health and the availability of goods and other services. They emphasized that the EU's internal borders should remain open for cargo and that the supply of basic products must be ensured. The free flow of goods, especially in crisis situations, meant that member states must fully comply with the guidelines at all border crossings within the EU (Europska komisija, 2020b). On March 23, 2020, the Commission published a communication on the establishment of Green Lanes which recorded permanently open border crossings and routes for all freight vehicles. Green lanes have been established throughout the Trans-European Transport Network (TEN-T) which consists of the most important arteries of road, rail and river traffic. There are numerous multimodal terminals, airports and ports on it. In order to ensure the continued functioning of European supply chains, Member States were required, without delay, to designate all relevant internal border crossings where such a system would operate. In these places, health and administrative checks were not allowed to last more than 15 minutes. This mechanism ensured freer and more efficient movement of goods within the European Union during the pandemic (European Commission, 2021a). Since the beginning of the COVID-19 pandemic, the Green lanes have strongly supported the smooth functioning of land supply chains that account for 75 percent of freight transport in the European Union (Europska komisija, 2020b). Their application is also registered in river and rail transport.

In the published communication, the commission made some other recommendations (Europska komisija, 2020b):

"• Member states should enable the free movement of any type of goods on the Green lanes, not just basic goods.

• Procedures at border crossings within the Green lanes should be reduced to a minimum and focused on strictly necessary procedures. States are urged not to require drivers, at border crossings, to show documents other than identification, as well as a letter from the employer.

• Health checks can be carried out before or after crossing the internal border to ensure continuous traffic. Member States should coordinate the performance of health checks only on one side of the border in order to avoid long waiting times.

• Health examinations and checks should be organized in such a way as to minimize delays, so it is recommended that drivers do not leave their vehicles;

• Other documentation and cargo checks should be kept to a minimum of time, not exceeding the usual limits, in order to avoid additional delays."

On October 22, 2020, the Council of the European Union adopted conclusions in which it gave the Commission clear guidelines and instructions containing a plan for an emergency situation in the freight transport sector in the following aspects (European Council, 2020):

"• Maintenance of cross-border freight transport operations along the Trans-European Transport Network (TEN-T) corridor and other essential cross-border connections, as well as the accompanying ancillary services that support the operation of that network;

• Ensuring the free movement of workers in transport, while protecting their health and safety;

• Preparing guidelines and best practice toolkits to strengthen sector resilience;

• Establishing a coherent regulatory framework regarding exemptions to be applied when similar pandemics or other major crisis situations occur."

On October 28, the European Commission proposed the expansion of the Green lanes principle from road to intermodal transport, which includes rail and air transport (European Commission, 2021a). In addition to internal borders, the Guidelines for Green Corridors included ensuring the smooth mobility of goods at the external borders of the European Union. Cooperation with other partners with whom the European Union has extensive economic cooperation, such as Switzerland and the United Kingdom, has been intensified. The green lanes were extended to the region of the Western Balkans, which ensured the smooth transit of goods in that region and the free movement of goods between the region and the European Union. At that time, it was established that almost 90 percent of the border crossings on the TEN-T network are in compliance with the Communication on Green lanes (European Commission, 2020a). The European Space Program Agency (EUSPA) has launched the Galileo Green Lane application to support transport companies in monitoring congestion at border crossings to ensure that Green lanes stay blocked no longer than 15 minutes (Galileo Green Lane, 2022).

However, the establishment of Green lanes did not mean the absence of restrictions on internal freight transport during the COVID-19 pandemic in the European Union. In February 2021, the IRU warned the European Union about new restrictions on road transport introduced by several member states. The new measures caused major delays on the key trade route at the Brenner Pass and the East-West Corridor. In its warning, IRU pointed out that the new border measures introduced by Germany at the border crossings with the Czech Republic and the Austrian province of Tyrol, in order to reduce the spread of mutations of the COVID-19 virus, could lead to new congestion. Although the borders remained open for transport traffic, according to the new measures drivers had to show a negative test, which abolished the meaning of the Green lanes. Tyrol and the Czech Republic have introduced the same measures for traffic

going to Germany. According to the data presented by IRU, this led to major traffic jams that at one point formed a 15-kilometer column. IRU has called on all parties to urgently introduce exemptions from the testing of professional drivers as they harm European supply chains. It was pointed out that the transit route between Germany and the Czech Republic is the main transport route of Central European transport logistics used by tens of thousands of trucks (The load star, 2021)

4.2. Use of passenger aircrafts for cargo operations

Aviation is a strategically important sector that employs almost five million people in the European Union. This sector makes a contribution of more than 300 billion euros and almost 2.1 percent of the GDP of the European Union. Air transport plays a leading role in tourism and enables exchange over long distances. Air carriers annually transport goods worth over 6.8 trillion US dollars worldwide, which represents 35 percent of world trade by value (IATA, 2021). For the European Union, continuous air freight services are of great importance, given that air transport plays a crucial role in the rapid delivery of basic goods, medicines, medical equipment, especially those that need to be delivered in a short period of time or those of great value (European Commission, 2020b). This has been particularly important during the COVID-19 pandemic, as airlines have made a major contribution to the transport of medical equipment and vaccines, both within the European Union and between Europe, East Asia and North America.

The COVID-19 pandemic had a major impact on air traffic in the European Union and throughout the world. During the first wave of the pandemic, most countries introduced bans that completely stopped internal flights within the European Union, then also those outside the EU. The crisis affected supply and demand disruptions. Eurocontrol announced that on March 31, 2020, there was a decrease in the number of flights by 86.1 percent. Overall, passenger air traffic dropped to zero while other flights were limited to cargo transport and repatriation (Eurocontrol, 2020). The International Air Transport Association (IATA) estimated that airlines worldwide lost 66 percent of passengers in 2020 and that the total revenue of the airline industry in 2020 was reduced by 357 billion euros. When it comes to air cargo internationally, IATA estimated that demand for air cargo fell by 27.7 percent in April 2020, then increased by 13.5 percent in July 2020. Demand in Europe fell even more, 33.7 percent in April (European Parliament, 2020). According to the association's expectations, airlines will not recover and reach the pre-pandemic level of activity and business by 2024 (Brennan, 2021). Some carriers have turned to the disturbing practice of organizing flights without passengers (Ghost flights) in order to manage to save predetermined slots. Under normal circumstances, carriers are required to use at least 80 percent of their allocated slots or risk being taken over by competitors (Bloomberg, 2020). In addition to providing no contribution, empty flights are problematic from the aspect of environmental protection and excessive consumption of fossil fuels. Compared to the passenger sector, air cargo has suffered less. Growth was even recorded in some periods, considering that cargo transportation became the main, and sometimes the only, source of revenue for airlines. According to estimates, worldwide freight revenues reached a record 110 billion US dollars in 2020, up from 102 billion recorded in 2019.

Air transport was greatly supported by regulatory authorities that issued certificates to airlines that they could use the space intended for passengers to transport cargo. The airline response to the crisis caused by the COVID-19 pandemic has shown three main lessons. First, the airline industry responded to the crisis very quickly and efficiently. Second, very good cooperation has been established between the airlines, the government and the civil sector in the management of resources related to the pandemic. Third, the activities of many governments

have encouraged economic stability and the support of public and private stakeholders (Bartle, *et al.*, 2021).

The need for urgent transportation of medical supplies led to the mobilization of commercial, dedicated cargo and military aircraft. The suspension of commercial flights led airlines to use commercial aircraft for the purpose of transporting cargo (Forbes, 2020). The Airbus company contributed to this, and for its A330 and A350 aircraft family, it developed a cargo pallet installation system that allows airlines to remove passenger seats in order to transport cargo in the passenger compartment of the aircraft. Cargo pallets enabled the continuous operation of many airlines throughout the European Union and the world during the pandemic of the COVID-19 virus, but also alleviated the global lack of air cargo capacity. This provided support to the industry to meet the demands of high demand for medical equipment and other large supplies (Airbus, 2020).

Given that air passenger and cargo transport suffered a major blow, the European Commission made a decision on April 1, 2020 to free airlines from certain obligations when using airport slots, which had an impact on safer planning of flight schedules. During February 2021, an amendment to the previous Regulation on slots was adopted, which stipulates that airlines can return up to half of the previously allocated slots with the aim of adapting to customer demands (European Commission, 2021). This reduced the pressure on carriers, so many had to organize empty flights with the aim of keeping them.

On March 26, 2020, the European Commission issued guidelines for the continuous support of air cargo operations (European Commission, 2020):

- Member States are invited to grant temporary traffic rights for additional cargo operations outside the EU.
- Temporary lifting of night curfews or slot restrictions at airports for essential cargo operations.
- Enabling the use of passenger aircraft for cargo operations."

4.3. The growth of the role of rail transport

According to data presented by International Union of Railways, the COVID-19 pandemic had a negative impact on the movement of goods and passengers in rail transport. National rail operators registered a decrease in the number of passengers by about 80 percent, while the volume of passengers in international rail services fell by almost 100 percent due to the physical closure of borders. When it comes to freight operations, the situation was different, so railway operators recorded an average decrease in goods volumes by about 15 percent (UIC, 2020). The Community of European Railway and Infrastructure Companies (CER) reported that the estimated revenue of the European Union's railway sector in 2020 fell by around 26 billion euros compared to the previous year. Their research showed that the crisis caused by the COVID-19 pandemic affects passenger and freight rail services differently. Travel operators were significantly more affected by the crisis, reporting a 42 percent drop in revenue, equivalent to a reduction in total sector revenue of approximately €24 billion. On the other hand, rail freight operators reported a drop in revenue of only 12 percent, equivalent to a loss of approximately 2 billion euros (International Railway Journal, 2020).

The COVID-19 virus pandemic has disrupted global supply chains between Europe and Asia, so rail transport has become the only channel for regular deliveries of goods between the European Union and China. The great crisis changed the traditional role of railway transport, which years ago was considered a supplement to maritime transport (Pluton Logistics, 2020). Despite the negative impact of the COVID-19 pandemic on international logistics, CER pointed

out that the crisis provided an opportunity for the railway sector to demonstrate its value to the European economy. During the pandemic, rail has proven to be an extremely efficient way to move large volumes of cargo, especially essential goods such as agricultural products, food and medical equipment. Rail transport is recognized as a potential backbone of future European economic development and recovery due to its resilience and ability to contribute to the fight against the pandemic (International Railway Journal, 2020).

During the COVID-19 pandemic, there was an increase in the costs of air and overseas transport, which affected the competitive position of railways. This has led to a growth in the rail freight market between China and Europe. Russian railways, which participate in the transport of goods between China and Europe, in the period from January to May 2020 achieved a growth of 35 percent compared to the previous year. For trade between the European Union and China, rail transport represents a compromise between air and sea transport, given that it is a much cheaper way of transporting goods (Coface, 2020). Only during the month of May 2020, the Chinese railway company China Railway Group received and dispatched 1.033 trains, while in 2017, a total of 3.700 trains traveled in both directions. Several factors have contributed to the increase in the amount of cargo delivered on this route. Rail transport has taken over large volumes of goods from air and sea transport. The COVID-19 pandemic has led to an increased demand for medical supplies transported on this route. At the same time, it worked on simplifying administrative procedures and improving infrastructure. Numerous cooperation agreements were signed with operators from Russia, Belarus, Poland, Germany, Kazakhstan and Mongolia. During the month of May, medicines, masks, health devices and equipment and other medical products were mostly transported to Europe (Pluton Logistics, 2020). Due to the problems that burdened long-distance air and sea transport, the railway has proven its adaptability and effectiveness in the delivery of goods between the European Union and China. In the future, additional investments will be needed in order to reduce the expected delivery time, given that the railway lags behind its competitors in this segment.

Even before the start of the COVID-19 pandemic, the European Union recognized the importance of the potential and role of the railway sector in the transport of goods, especially in the context of environmental protection and the European Green Deal, which should contribute to the growth of the market share of railway transport. The Green Deal envisages the improvement of the European cross-border railway network, as well as its connection with other international routes (Deutsche Welle, 2020). Rail transport has shown exceptional reliability and resilience during the COVID-19 virus pandemic, which is why many countries are considering financial investments in the renovation of existing as well as the construction of new railway connections. In the last few decades, there has been a marginalization of rail transport throughout the world, however, by marking 2021 as the European Year of Railways, the European Union has promoted the advantages of that mode of transport as a sustainable, smart and safe means of transport (UIC, 2021). The main challenge of the transport sector in the European Union is the development of rail freight transport. Since the 1970s, levels of rail freight transport have declined, resulting in a lack of investment in rail infrastructure (European Commission, 2008c). The European Commission has adopted a "sustainable and smart mobility strategy" and an "action plan" regarding the transformation of European transport. A goal has been set to double freight rail traffic by 2050, while high-speed rail traffic will double by 2030. This plan is in line with the Green Agenda, which aims to reduce carbon emissions by 90 percent by 2050 in order to create a smart, competitive and sustainable transport system in Europe (Rail Freight, 2020). In that process, intensive work will be done to reduce the role of road freight transport in favor of railways, which is in line with the European Green Deal.

5. CONCLUSION

Due to the spread of the COVID-19 pandemic, the member states of the European Union, as well as other countries in the world, closed border crossings and introduced new measures that disrupted transport traffic, causing delays and a complete interruption of cross-border transport in the European Union and beyond. In order to improve the effectiveness and efficiency of transport, there were practical solutions to accelerate the transport of goods in the European Union, which contributed to the facilitated physical flow of goods to their final destinations and the realization of the function of the single European market. Green lanes have given great support to road transport by ensuring continuous delivery, rail has replaced road transport and achieved good results, especially in transport between Europe and Asia. The use of civil aircraft for cargo transportation enabled more efficient intercontinental transport.

The COVID-19 pandemic as an external risk has indicated the necessary need to adapt the organization of international transport in order to ensure the continuity of supply chains. The Green lanes (first of all in road transport), the availability of airline planes for cargo transportation and the growth of the role and value of rail transport during the pandemic contributed significantly to this.

6. LITERATURE

1. Aćimović, S., Mijušković, V. (2020). *Međunarodna logistika*. Centar za izdavačku delatnost Ekonomskog fakulteta Univerziteta u Beogradu, Beograd.
2. Airbus (2020). Airbus develops solution for airlines to use their widebody aircraft for pure cargo operations during the COVID-19 pandemic, available at: <https://www.airbus.com/newsroom/press-releases/en/2020/04/airbus-develops-solution-for-airlines-to-use-their-widebody-aircraft-for-pure-cargo-operations-during-the-covid19-pandemic.html> (accessed July 8, 2022)
3. Andrejić, M., Kilibarda, M. (2018). Risk analysis of freight forwarders activities in organization of international commodity flows. *International Journal for Traffic and Transport Engineering*, 8(1), pp. 45-57.
4. Andrejić, M., Kilibarda, M., Pajić, V. (2020). Managing risks in logistics using FMEA-DEA approach, in *Methods in Logistics*, pp. 49.
5. APICS Dictionary. (2013), available at: <https://www.ascm.org/learning-development/certifications-credentials/dictionary/> (accessed July 10, 2022)
6. Bartle, J., Lutte, R., Leuenberger, D. (2021). Sustainability and Air Freight Transportation: Lessons from the Global Pandemic. *Sustainability*, 13(7), pp. 1-13.
7. Bloomberg (2020). Why are airlines flying empty „Ghost flights“, available at: <https://www.bloomberg.com/news/articles/2020-03-07/why-are-airlines-flying-empty-ghost-flights> (accessed July 12, 2022)
8. Brennan, E. (2020). Exchange of views with Eurocontrol, available at: https://www.europarl.europa.eu/cmsdata/211102/TRAN202020902_OJ_EUROCONTROL.pdf (accessed July 20, 2022)
9. Coface (2020). What does the future hold beyond COVID-19?, available at: <https://www.coface.com/News-Publications/News/Global-Transport-What-does-the-future-hold-beyond-COVID-19> (accessed August 1, 2022)

10. Coyle, J., J. Bardi., E. J., Langley, C. J. (1996). *Management of Business Logistics: A Supply Chain Perspective*. Western Publishing Company. Mason, Ohio.
11. Coyle, J., Novack, R., Gibson, B. (2016). *Transportation: A Global Supply Chain Perspective*. Cengage, Boston.
12. Deutsche Welle. (2020). U EU raste važnost železnice, available at: <https://www.dw.com/sr/u-eu-raste-važnost-železnice/a-52408963> (accessed August 3, 2022)
13. Eurocontrol (2020). Impact of State restrictions, uncoordinated approach and uncertainty over COVID-19, available at: <https://www.eurocontrol.int/sites/default/files/2020-09/eurocontrol-draft-traffic-scenarios-14092020.pdf> (accessed July 15, 2022)
14. European Commission (2021a). Ensuring the free flow of goods and services, available at: https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/transportation-during-pandemic_en (accessed July 20, 2022)
15. European Commission (2008c). Towards a European rail network for competitive freight, available at: <https://ec.europa.eu/transport/sites/default/files/2008-12-11-memo.pdf> , accessed onljeno (accessed August 1, 2022)
16. European Commission (2020a). Communication from the Commission, available at: https://ec.europa.eu/transport/sites/default/files/legislation/c20202010_en.pdf (accessed July 25, 2022)
17. European Commission (2020b). European Commission Guidelines: Facilitating Air Cargo Operations during COVID-19 outbreak, available at: [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020XC0327\(03\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020XC0327(03)&from=EN) (accessed July 28, 2022)
18. European Council (2020). Pandemic contingency plan for freight transport - Council adopts conclusions, available at: <https://www.consilium.europa.eu/en/press/press-releases/2020/10/23/pandemic-contingency-plan-for-freight-transport-council-adopts-conclusions/?fbclid=IwAR0PEsUkQVutTNvpoj-gqu3rDkcpOZ3DZ11h4MbcAzD2C34f7vqWwjo8Y24> , (accessed August 3, 2022)
19. European Parliament (2020). Air transport survival during the pandemic, available at: [https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/659326/EPRS_BRI\(2020\)659326_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2020/659326/EPRS_BRI(2020)659326_EN.pdf) (accessed August 3, 2022)
20. Europska komisija (2020b). Komunikacija komisije o uvođenju zelenih traka u okviru mjera upravljanja granicama radi zaštite zdravlja i dostupnosti robe i ostalih usluga, available at: [https://eur-lex.europa.eu/legal-content/HR/TXT/PDF/?uri=CELEX:52020XC0324\(01\)&from=EN](https://eur-lex.europa.eu/legal-content/HR/TXT/PDF/?uri=CELEX:52020XC0324(01)&from=EN) (accessed August 5, 2022)
21. Europska komisija (2021a). Komunikacija komisije Evropskom parlamentu i Evropskom vijeću: Poboljšanje zelenih prometnih traka radi održavanja gospodarske aktivnosti tijekom ponovnog širenja zaraze COVID-19, available at: https://eur-lex.europa.eu/resource.html?uri=cellar:30c69d1a-192c-11eb-b57e-01aa75ed71a1.0005.02/DOC_1&format=PDF (accessed July 28, 2022)
22. Forbes (2020). 7 Unusual Ways Aircraft Now Fly Cargo During Coronavirus Outbreak, available at: <https://www.forbes.com/sites/willhorton1/2020/04/01/7-unusual-ways-aircraft-now-fly-cargo-during-coronavirus-outbreak/?sh=223e983a35b1> (accessed August 12, 2022)

23. Galileo Green Line (2022), available at: <https://galileogreenlane.eu/> (accessed August 12, 2022)
24. IATA (2021). Action Cargo COVID-19, available at: <https://www.iata.org/en/programs/cargo/> (accessed August 12, 2022)
25. International Railway Journal (2020). European rail sector revenues fall €26bn in 2020, available at: <https://www.railjournal.com/financial/european-rail-sector-revenues-fall-e26bn-in-2020/> (accessed August 15, 2022)
26. Kouvelis, P., Dong, L., Boyabatli, O., Li, R. (2011). *Handbook of Integrated Risk Management in Global Supply Chains*. John Wiley & Sons, New Jersey.
27. Lai, K.-H., Ngai, E. W., T, Cheng, T. C. E. (2002). Measures for evaluating supply chain performance in transport logistics, Transportation Research Part. *Logistics and Transportation Review*. 38(6), pp. 439-456.
28. Lambert, D., Stock, J., Ellram, L. (1998). *Fundamentals of Logistics Management*. Irwin McGraw-Hill, New York, USA.
29. Manuj, I., Mentzer, J.T. (2008). Global supply chain risk management strategies. *International Journal of Physical Distribution & Logistics Management*, 38(3), pp. 192-223.
30. Pluton Logistics (2020). Alexey Grom, generalni direktor UTLC ERA – Predviđam velike mogućnosti za železničku industriju, available at: <https://plutonlogistics.com/zeleznicki-transport/alexey-grom-generalni-direktor-utlc-era/> (accessed August 12, 2022)
31. Pluton Logistics (2020). Rekord na železničkoj ruti Kina-Evropa – Tokom maja više od 1.000 vozova, available at: <https://plutonlogistics.com/zeleznicki-transport/rekord-na-zeleznickoj-ruti-kina-evropa-tokom-maja-vise-od-1-000-vozova/> (accessed August 27, 2022)
32. Rail Freight (2020). EU's mobility strategy: 'rail freight traffic will double by 2050', Retrieved from: <https://www.railfreight.com/railfreight/2020/12/11/rail-freight-transport-at-the-centre-of-europes-mobility-strategy/> (accessed August 17, 2022)
33. Statista (2021). Coronavirus: impact on the transportation and logistics industry worldwide - statistics & facts, available at: <https://www.statista.com/topics/6350/coronavirus-impact-on-the-transportation-and-logistics-industry-worldwide/> (accessed July 2, 2022)
34. Strange, R. (2020). The 2020 COVID-19 pandemic and global value chains. *Journal of Industrial and Business Economics*, Vol. 47(3), pp. 455-465.
35. Tardivo, A., Zanuy, A. (2021). COVID-19 Impact on Transport: A Paper from the Railways' Systems Research Perspective. *Transportation Research Record*. pp. 1-12.
36. The load star (2021). Covid border restrictions putting the brakes on pan-European road freight, available at: <https://theloadstar.com/covid-border-restrictions-putting-the-brakes-on-pan-european-road-freight/> (accessed August 12, 2022)
37. Topolšek, D., Kristina, C., Ojsteršek, T. (2018). Defining Transport Logistics: A Literature Review and Practitioner Opinion Based Approach. *Transport*. Vol. 33, pp. 1197-1203.
38. Trkman, P., Mc Cormack, K. (2009). Supply chain risk in turbulent environments-A conceptual model for managing supply chain network risk. *International Journal of Production Economics*, Vol. 119, pp. 247-258.

39. Tseng, Y., Yue, W., Taylor, M. (2005). The role of transportation in logistics chain. *Proceedings of the Eastern Asia Society for Transportation Studies*. Vol. 5, pp. 1657-1672.
40. UIC (2020). Management of COVID-19, available at: https://uic.org/IMG/pdf/economic_impact_v2.pdf (accessed August 15, 2022)
41. UIC (2021). European year of rail, available at: <https://uic.org/year-of-rail/>, (accessed July 18, 2022)
42. Wee H., Blos M. (2012). Risk Management in Logistics. In: Lu J., Jain L., Zhang G. (ed s.) *Handbook on Decision Making. Intelligent Systems Reference Library*, 33, pp. 285-305.
43. World Economic Forum. (2021). The Global Risk Report 2021, available at: http://www3.weforum.org/docs/WEF_The_Global_Risks_Report_2021.pdf (accessed August 15, 2022)
44. Yoon, J., Yildiy, H., and Tallury (2016). Risk Management Strategies in Transportation Capacity Decisions: An Analytical Approach. *Journal of Business Logistics*, 37(4), pp. 364-381.