Czech-Austrian Spring and Summer School

TRANSPORT POLICIES: NATIONAL AND EU POLICIES

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CONTENT

1. ABSTRACT

Transport is considered a key element in the European economy and society, as it has a cross-sectoral character it has to be handled with utmost focus and care. Transport is divided into different types based on the user and the transport medium. Each of the types has its unique conditions, requirements, and problems. To limit problems and possible damages, a set of rules and laws were introduced at the international level. The EU also has its goals and visions that are imposed on the member state by the legislation. Sometimes the national interest diverges from these goals, due to historical development or regional needs. The motivation for this paper is to identify the differences in goals and the reasons why they differ. This paper maps out the current situation of transport in the EU, the Czech Republic, and Austria. It briefly introduces the history of transport in both of the countries and then compares their situation and plans for the future. This is especially interesting because the countries are neighbours. Next EU legislation and its aim are discussed in detail. Mainly the major influences and contributing factors. Lastly, the paper introduces briefly the new technologies, which are expected to have a substantial impact on the whole industry. In summary, the paper is about EU transport with a closer look at Austria and the Czech Republic situation.

2. INTRODUCTION

Transportation has been an essential topic from the time of the first civilizations, as it is transversal to any economic activity and key to cultural development and communication. The first roads are dated to around 10 000 B.C. and the first paved roads a few millennia later. In Europe, the most famous ancient wide construction and usage of roads is attributed to the Roman Empire, which at its peak was connected by 29 main roads moving out from Rome and covering 78 000 km of the paved road. The main benefits of creating these roads were to increase trade and support military campaigns, which where a key factor to the expansion and power of the Empire. From that time on, humanity has kept improving the roads and means of transport till these days.[1]

Nowadays the transport sector yet again expects drastic changes due to the demand for lowering CO_2 emissions and pollution across all industries. This paper aims to provide a summary of these changes in the European Union as a whole and two member states: Austria and the Czech Republic.

The European Union, as political and economic union of 27 member states has a huge influence over the member states and their legislation. That is why this paper analyses first the overall situation of the EU as a whole. Then the different modes of transport are briefly described, as every mode of transport has its own set of laws and regulations and their combined use is one of the more important factors in the planning of the future transport systems.

Later main differences between Eastern and Western Europe are introduced, along with the main challenges that need to be solved. The differences between the East and the West are the result of the division of Europe in the second half of the 20th century, having some of these differences still an influence in the present situation.

The paper continues with a closer examination of the Czech Republic and Austria, which were chosen for this study as representative member states. The analysis of these two states is interesting, due to their closely linked development until the 20th century and similar geographies and size.

After analysing the two member states a comparison between them is established to find out which are current main differences and similarities. Also, the strategic plans of the countries from the public documents are researched and compared.

Lastly, the new technologies with possibly great influence on industry is reviewed. This step is done to further put the EU goals in the context, as some of the current objectives may turn out to be unreachable if these new technologies are not deployed to their full potential.

3. OVERVIEW & CONTEXT IN THE EUROPEAN FRAMEWORK

3.1. Overall situation in the EU

Contextualization and main challenges

Transport is considered a key factor for the European economy and society, as it is a basic requirement for maintaining competitiveness in the world economy and it plays an important role in improving the quality of life of citizens.

Europe's transport scheme is conditioned by the particularities and historical differences between the different countries and regions, which many times represent a burden to achieve a real integration of the economic and logistics activities. In particular, there are great differences between Eastern and Western Europe, being also the logistics networks between the two regions not fully developed.

At the same time, in recent years governments from the different European countries have implemented policies solely aimed to increase capacity, disregarding arising problems such as congestion of networks, security issues or pollution.

Therefore, reaching a greater homogeneity among regions and building a common efficient network that is able to meet future demands is the European Union's most important challenge for its near future.[2]

In this regard, there exists at the same time a dilemma in terms of how this growth should be addressed: either by improving the existing infrastructures or by building new ones. And also the choice between the different modes of transport and which priority should be given to rail/road transport remains to be decided.

Linked to this sustainable growth, some other challenges that need to be addressed to guarantee an appropriate development of the sector at the European level include: improving the internal market for transport, achieving oil independence, reducing environmental impact and integrating new technologies.

All the challenges mentioned need to be directly addressed by the European common strategy to ensure a sustainable growth of the European logistics network, as will be commented in the following section.

Transportation strategy and goals at the European level

In response to the challenges mentioned in the previous section, three main goals have been established at the European level, which aim to promote an efficient and sustainable common European transportation network.

The first goal refers to the growth of transport and mobility while reducing emissions by 60%. This would be possible through new transport patterns -e.g. multimodal logistic chains- and increased efficiency of vehicles and routes. New and more sustainable fuels and technologies, as well as information systems for management of transport are also key to achieve this greater efficiency.

The second goal further highlights the importance of a multimodal core network. An efficient network implies adapting the different modes of transport to the distance and particularities of the shipments, as well as an improved integration across modes.

Last but not least, the third goal aims to increase the competitiveness of long-distance and intercontinental transport, by an improved efficiency in the air and maritime networks and a more intelligent management of routes and infrastructure.

In accordance with these goals, a strategy based on four pillars is established: a single European transport area, innovating for the future, modern infrastructure and the external dimension.

Firstly, the need of creating a single European transport area is highlighted, as it would allow for a greater integration of the regions and a simplification of bureaucratic processes. This should go hand-in-hand with increased efforts to enhance the safety, quality and reliability of the services.

Innovation is at the same time seen as the best way to achieve oil independence and transition to a more sustainable and efficient transport system, with a clear focus on research and development of new and smart technologies.

Referring to the infrastructure, resources are to be invested in meeting the increased demand and reducing bottlenecks. At the same time, private investments in transport are to be favored through innovative financing instruments, reduced taxation and shortened assessments and administrative processes.

The fourth pillar, which refers to the external dimension, addresses the challenges linked to international logistics and transport. The areas of action of the European strategy include extending the European policy worldwide through participation in international organizations--with a particular focus on neighboring regions- and promoting free competition and sustainable transport solutions worldwide.

3.2. Types of transport

Transport is one of the biggest contributors to CO_2 emissions in the whole EU as shown in Figure 1. With the climatic crisis on the horizon and rising demand for a cleaner environment, the EU institutions aim to reduce the CO_2 emissions in the transport industry. However, due to the essentiality of the transport and risk of losing competitiveness with the rest of the world their approach has to be careful. To better tackle this issue of CO_2 it is necessary to divide the transport into categories. It could be either divided by user, the public, and business sectors. Where there are obvious differences between individual day-

to-day transportation of individuals and business transportation of the resources and personnel. The second way is to divide it by mode of transportation. Main modes of transportation include air, road, rail, maritime, and inland waterways. For this paper, the second more common approach was used, because with this approach it is possible to better describe the policies and their differences. [3–6]

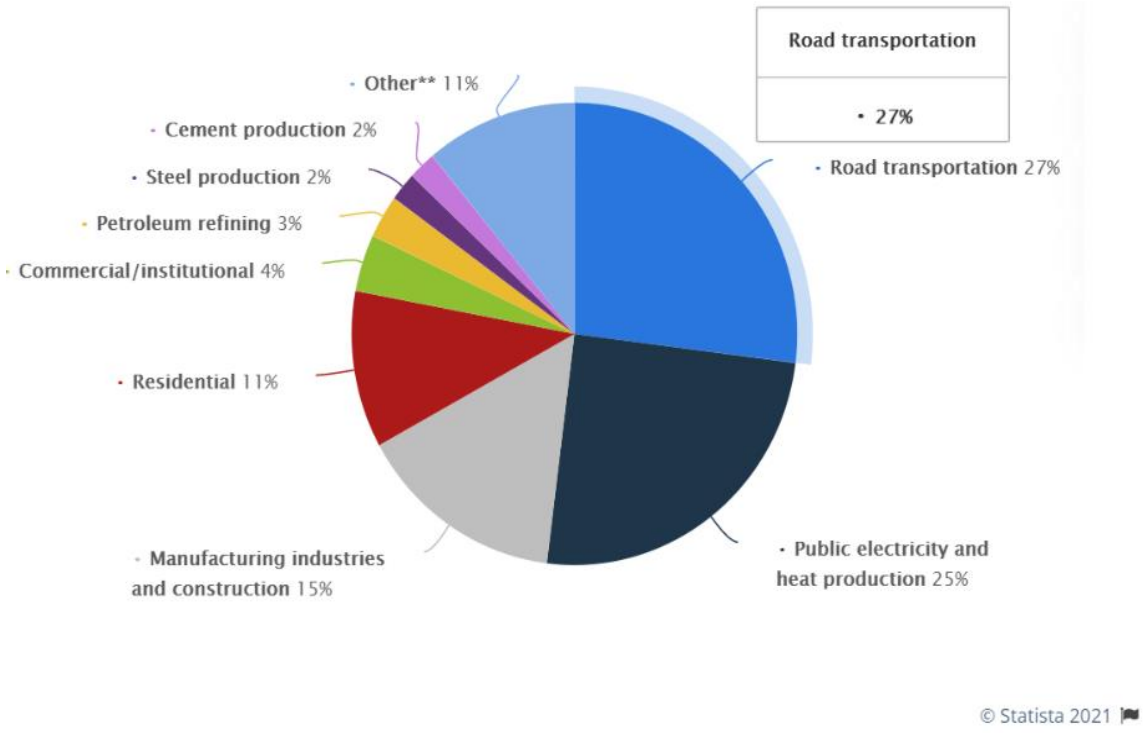

Figure 1: Distribution of carbon dioxide emissions in the European Union in 2019 [7]

Air transport

Air transport is the mode of transportation often used for long distances. It is mainly used for the transportation of people or high-value/weight things. It is rarely used for transportation of resources, due to the very high cost of transportation. The main advantage of air transport is the speed of transportation, which is the fastest among the classical modes of transportation.

Due to the recent covid pandemic air transport faces a crisis, because of the reduced demand for long-distance transportation. The transported volume and number of the flights dropped by a significant margin. Even though nowadays many companies in the industry face hard times it is expected that the sector will recover and years to come grow by 5 percent yearly. The industry generates over 2 percent of the EU GDP and employs over 5 million people. In the foreseeable future, the pressure to improve the efficiency of air vehicles is expected and tax advantages for aviation fuel might be cancelled.

EU market integration in the industry was addressed by three packages closely connected to the initiative for a Single European Sky (SES), launched in 2004. [3]

Road transport

Road transport is the main mode of transportation. It transports more passengers and freight than all other modes combined. It is essential for the EU's economy and citizen

transportation. It even employs over 10 million people and is one of the biggest job-providing sectors in the EU. Due to the volume and necessity of this transport mode, it is needed to identify ways and solutions to make transport more efficient, cleaner, and fairer. The transformation is already seen with the increasing number of electrical and hybrid vehicles, expansion of existing routes, and development of new ones. However, there is a huge challenge for the industry in the form of self-driving vehicles that might change the market. It is predicted there will be a huge improvement in efficiency, and a reduction in jobs is expected. [3]

Rail transport

Rail transport is considered a cleaner and more traditional mode of transportation. The EU's focus is to promote compatibility between national road systems and raise safety measures. The other objective is to develop and create new routes and their highspeed variants to improve capacity and long-distance traveling, possibly reducing CO_2-intensive air transport. Developing rail transport should also alleviate some pressure from other transport modes.

Maritime transport

Maritime transport is an important trade mode of transport that allows trade through Europe and countries all over the World. Close to 90% of the EU's external freight trade is seaborne. Maritime transport is used to import many necessary resources and commodities, any blockade of this mode of transport results in enormous economical losses. The EU's focus is to maintain the safety and efficiency of this type of transport mode against all possible threats and prevent possible scenarios such as the Suez Canal blockade in early 2021. [3]

Inland waterways

Inland waterways in the EU are about 37 000 kilometres long and 13 of the member states share some interconnection with their neighbours through inland waterways. Consumption of the resources needed to transport the cargo is one of the lowest in transport modes. However, the inland waterways are strongly dependent on geographical location and there are not many possibilities for expansions and creating new waterways. That is the reason why the EU mainly focuses on promoting inland waterway's competitiveness over development. Inland waterways mainly help to alleviate some pressure from train and road routes. [3]

4. THE TRANSPORTATION SECTOR IN AUSTRIA AND THE CZECH REPUBLIC

In the following subsections, a closer look into the Austrian and Czech Republic contexts will be taken, as well as into the specific goals and measures implemented in the transportation sector for each country. This will allow us to analyse to what extent the common European goals and strategies are reflected into the national policies, and also establish a comparison between the two countries.

4.1. Austria

Contextualization: geography, history and other conditioning factors

Austria is a small country (-84000 km2) located in Central Europe. Its having borders with eight different countries and occupying a strategic position linking the North Sea and the Black Sea through the Danube ports, and the Alps and the Adriatic Sea through railway connections makes it a key region for Intereuropean logistics, as well as an important bridge between Eastern and Western Europe.

The railway network in Austria is remarkably developed, being 37% of the total volume of shipments made by train -in comparison to an average of 18% in the European Union-. The Austrian railway network has links to all the bordering markets and counts six transshipment stations in different locations across the country. This is coherent to the high investments made in railway infrastructure, corresponding to 258 EUR per capita.[8]

The air logistics also play an important role in the Austrian logistics systems, as the Vienna International Airport has flights to 37 different destinations and represents an important link between Eastern and Western European countries. [8]

In a similar vein, transportation through waterways has also importance in the Austrian logistics network. Mainly the logistics network along the Danube -counting with four ports in the cities of Vienna, Linz, Krems and Enns- allows for its taking part in the Rhine-Main-Danube Canal, which is the most direct logistics route between the North and Black Seas. [8]

Regarding the historical development of the Austrian transport infrastructure, three key periods can be mentioned: the Post-War Period (1950-1970), the Post-Oil-Crisis Period (1970-1990) and the ‘’Austrian transport Master Plan'' period (1990-present). [9]

The Post-War Period was characterized by massive construction of motorways, partly as a measure to reduce high rates of unemployment. The development of the sector was greatly dependent on oil consumption, and public investments were mostly financed by fuel taxes.

After the Oil-Crisis, it was made evident that growth could not be sustained only based on fossil fuels. Other issues were at the same time given more importance: traffic safety, congestion and environmental issues. Some of the measures that were implemented in this period (1970-1990) include: speed limits, night drive prohibition, enhancement of public transport, etc. A first attempt to integrate multimodal supply chains was made.

In the most recent period (1990-present) the ‘’Austrian Transport Masterplan’’ was published. This document provides the objectives, measures and policies that are core to the current Austrian transport strategy. The focus in this period is to strengthen Austria as a business location, while addressing environmental issues and improving overall efficiency of the sector. -In the next section current policies are going to be explained in more detail-. [9]

Austrian Policies and Strategies

The Austrian Transport Masterplan (1991) first provided the objectives that currently still guide the development of the transport sector in the country. [9] The most recent version of the Masterplan(2017) is structured around four goals: social, security, environment and efficiency and its implementation is carried out through eight dimensions:[10]

- Modern infrastructure. E.g. the ‘’Zielnetz 2025+’’ initiative aims to the deployment and maintenance of infrastructure and logistic networks.
- Future of public transport. This dimension is focused on meeting the population’s needs and enhancing quality and coverage of the services provided.
- More security. E.g.: raise standards for transportation of dangerous products, revision of technical measures and supervision, reduction of number of accidents.
- Planning, systematization, networking. E.g. development of Inteligent Trafic Systems (IVS)
- Technology and Innovation. E.g.: development of technologies to retain particulates, optimization of routes, among others. Several programs like ‘’Mobilität der Zukunft’’ (Mobility of the Future) support specific innovation lines.
- Consideration of different necessities. In order to make transport available and accessible for everyone.
- Environmental protection and efficiency. E.g.: enhancing public transport, reducing road-traffic emissions, reducing levels of sulphur and lead, restricting transport to meet air quality and noise standards
- International dimension: E.g. through implementation of the Transeuropean Traffic Net (TEN-V)

At the same time, economic growth and positioning Austria as a key logistics location constitutes another important goal for Austrian transportation policies. To achieve this objective some measures/recommendations are provided, such as easing access to infrastructure for foreign companies, enhancing inter-modal transport and reorganizing the Austrian railway operator. [9]

Remarkably, Austrian strategy aligns with the European common programme. Namely the first and second goal of European strategy, which refer to growth of transport and mobility and the strengthening of multimodal supply chains, are directly addressed by the Austrian transport plan.

More specific policies and strategies regarding the rail network can be found in the Austrian National Implementation Plan (NIP), which fully embraces The European Rail Traffic Management System (ERTMS). Further deployment of the transport rail network has a great importance in the Austrian scheme, as environmentally friendly transport has a high political relevance in the country. [11]

In this regard, the Austrian masterplan contemplates a target of 85% electrification of railways by 2030 and a refurbishment of regional lines by 2032. [12] Control systems are also to be upgraded -e.g. Figure 2 shows the deployment plan for European Train Control System (ETCS) in Austria for 2032-.

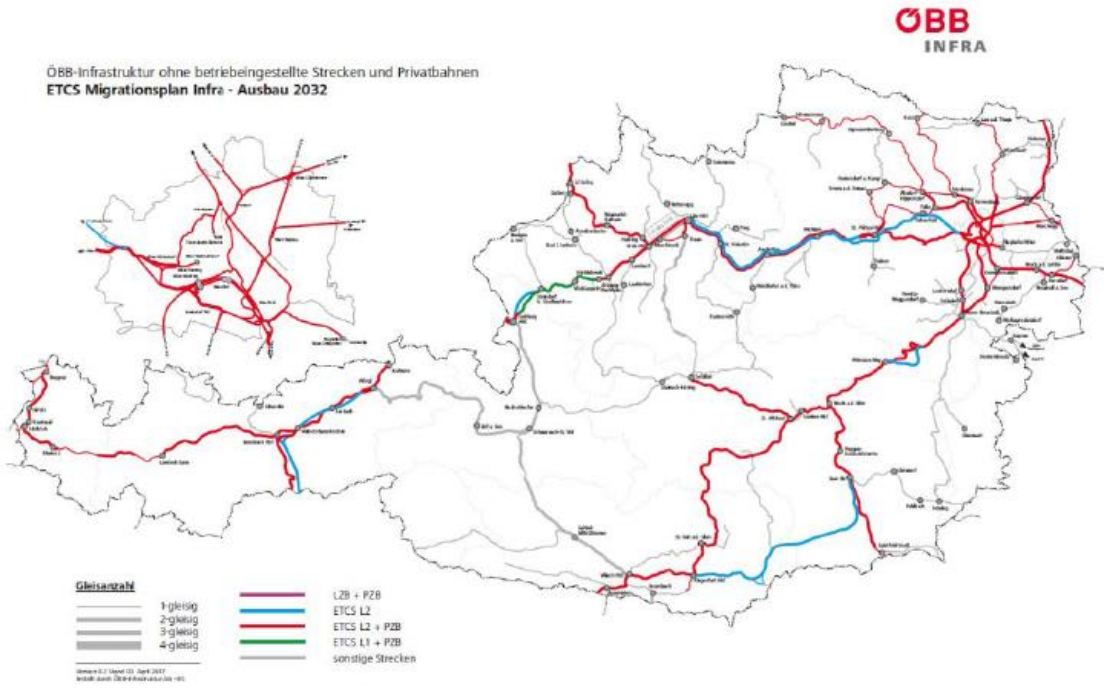

Figure 2: ETCS deployment plan Austria 2032

4.2. The Czech Republic

Contextualization: geography, history and other conditioning factors

The Czech Republic is one of the countries located in Central Europe with a size of 78 865 km^2. It has borders with four different countries and it is considered as a transportation hub between Eastern and Western Europe.

Most of the borders are defined by mountain regions that influence the shape of the transportation channels. The transportation network mainly consists of roads and railway stations, even though there are many rivers most of them do not have enough water to support water transport.

The Czech Republic is divided by a watershed into three main European river basins, the Elbe river basin drains the North Sea, the Danube river basin drains to the Black Sea and the Odra river basin drains to the Baltic Sea. Moreover, in the 20th century, the project Baťa Canal was finished, which at the time increased freight transport for Morava region. However due to lack of the water in the rivers, inland water transport is not as reliable and available. Currently there is a discussion about the new man-made canal Donau-Odra-Elbe that is criticized due to ecological and economical concerns.[13,14]

The road network in the Czech Republic -represented in Figure 2- consists of more than 55 790 km of the roads. However, there is still not a fully developed motorway network. Some of the key connections are still missing and due to slow construction speed and frequent maintenance works, it will take decades to finish. The Czech Republic as a transit country encountered many problems because of this reason, mainly trucks having to go through small villages and towns, long traffic and air pollution. [15]

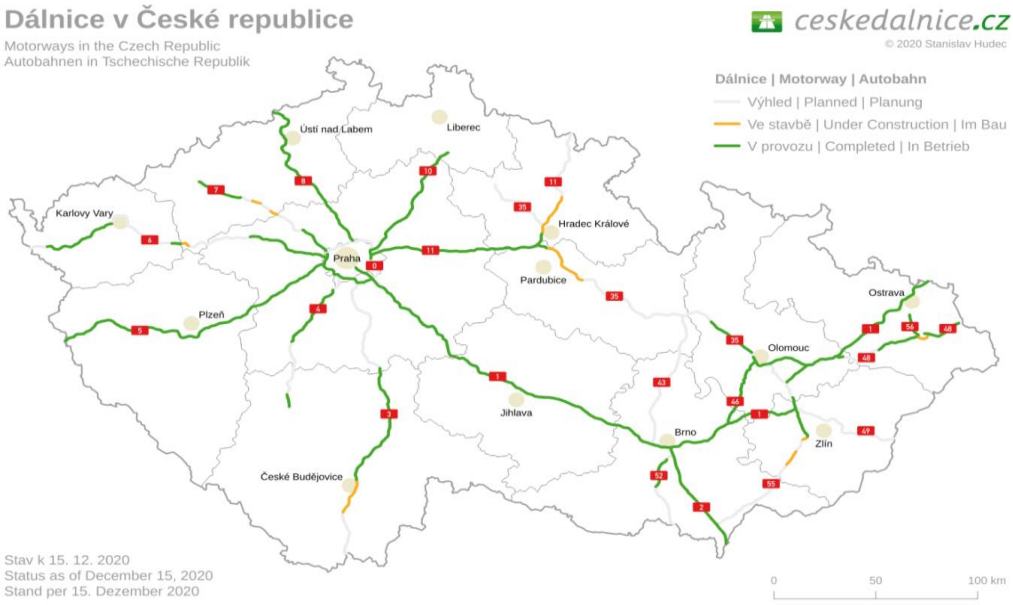

Figure 3: Map of the Czech Motorway Network[15]

Most of the air transport is carried out in the capital city by the airport Václava Havla, which provides its services to more than 12 million passengers yearly. In total there are 46 airports in the Czech Republic, but only six of them offer international flights. [16,17]

The Czech Republic has one of the densest railway networks with more than 9500 km. The main transport node is the Prague main railway station and the main transport firm is České Dráhy, which is the national company. Even though the network is dense and offers many connections it suffers from lack of the highspeed railways. There are many plans for the high speed railways, but they still have not been realized.[18]

Regarding the historical development of the Czech Republic transport infrastructure after World War 2, it can be divided into two parts.

The first one is the period from the end of World War 2 to the end of communism in the Czech Republic. During this period there was a high focus on railway transport, due to the limitation of personal cars. This had a large detrimental effect on the quality and development of the roads.

The second period is after communism, when Czech economy opened to the world and the transport modes had to shift to satisfy the demand. As a heritage from the first part, there is a big railway network that is costly to maintain. Moreover, it became necessary to complete the motorway network and connect it to neighbouring countries. In some cases, it is still a pending issue. In the railway network there are missing high speed tracks that would make railway transport more competitive for passengers. It is quite often the case that it is faster to take a bus compared to taking a train. The air transport booms more or less from the start of this period. On the other hand, the water transport stagnates or gets less importance. Recently the focus is on the continuous development and innovation in the transport industry, based on the EU priorities and national interest. [19]

Czech Republic Policies and Strategies

The Czech ministry of Transport is the main government body organizing and planning transport in the Czech Republic. It proposes new laws and changes to the current one in the transport department. The policies are mainly divided by the mode of transport. They feature all of the aspects connected to them and impose limits and restrictions for the users if necessary.

The ministry also creates plans for the future transport development. These plans are part of the strategic documents of the Czech Republic. Strategic documents have different levels based on the government body. The main document is always issued by the government and shows the vision and goals for the transport. Then there are regional and local documents and plans that try to fulfil regional and local needs and government goals.

Nowadays the Czech strategies and plans are strongly influenced by the EU, due to the grants and obligations. So the general trend of both the strategies and policies shifted more to an environmentally friendly direction. However, there is still great emphasis on the finishing transport network, developing high speed trains and overall raising of efficiency and safety.

More specifically, in the Transportation Policy of the Czech Republic for 2014-2020[20] aims the following priorities:

- The users: The transport system should have a social focus. This is achieved through measures aimed at pushing forward the competitiveness of the Czech Republic, achieving a better cohesion among regions, improving public transport and creating better conditions for the touristic sector.
- Operations and transport safety and security. E.g. by improving the quality of services, reducing traffic irregularities and enhancing inter-modality.
- Ensuring needed finance in the transport sector. Specific policies include ensuring funds by classical and alternative financing, internalizing external costs and distribution of funds.
- Ensuring a quality transport infrastructure. Important policies to address this goal include the acceleration of construction projects, completing the restructuring of the railway network.
- Research and innovation, reducing the impact on public health and environment and social issues

Taking a closer look at rail networks, the Czech National Implementation Plan was delivered in 2017, being fully aligned with the European Rail Traffic Management System (ERTMS). The main goal of this plan is to decommission Class B railways in three different stages, thus achieving a progressive modernization of the current rail network with a clear focus on safety. [21]

4.3. Comparison

Austria and Czech Republic have a similar conjuncture, as both countries have a similar size, geography and are to some extent transport hubs between Western and Eastern Europe. They also have dense railway networks and growing air transport. However, significant differences can be found in terms of the current state of their transport networks

and their strategy. Table 1 summarizes the most significant similarities and differences between the two countries.

Table 1: Comparison of goals, strategy and measures in the transportation sector for Austria and the Czech Republic

	Czech Republic	Austria
Documents and guidelines	The Transport Policy of the Czech Ministry of Transport for 2014-2020 (2013)[20], National Implementation Plan Czech Republic (2017)[21]	The Austrian Transport Masterplan (2012)[10], National Implementation Plan Austria(2017)[11], "Zielnetz 2025+" (2011)[22]
Alignment with EU goals and strategy	Aligned with EU goals	Aligned with EU goals
Main goal(s) of the country's logistics and transport plan	Focus on competitiveness: Deployment of the network to support the economic growth of the country and ensure basic levels of quality and security	Focus on efficiency and sustainability, in parallel with growth to meet increased demand
Environmental perspective	Lowering environmental impact, although mentioned in the guidelines, is not a priority in the Czech Agenda	Lowering environmental impact is key in the Austrian scheme, due to its high political relevance
Integration of national and European systems	Focus on strengthening interconnections with neighboring countries. Deployment of internal connections and cohesion among Czech regions	Integration into European networks and consolidation as logistics hub
Development and goals for rail networks through National Implementation Plans	Building of new infrastructure and refurbishment of old railways	Electrification of railways (85% electrification aimed by 2025).
Innovation	Nascent initiatives to promote innovation and research in transportation. Most projects are at a planning stage.	Pioneering innovation hubs of international relevance, especially in the fields of autonomous driving and Electric Vehicles

Regarding their current transport networks, Austria features much more developed and efficient railway transport, due to their high investments and historically more deployed networks. In this regard, it is noticeable that Austrian goals for its rail networks are focused on electrification and upgrades with an environmental perspective, whereas in the Czech Republic the main objective is to decommission and replace old rail networks to guarantee security. The Austrian road network is also more developed with higher quality roads and in air transport, Austria is also dominating in the number of passengers and cargo.

Concerning strategy and policies -even though both countries align with the European framework and have goals in common- the priorities are very different. Whereas in Austria environmental issues and innovation are in the spotlight; in the Czech Republic still more

urgent issues, such as guaranteeing security and basic quality standards, are given the priority.

There are few important reasons why the Czech Republic is behind. Some of them are, because of the geographical location and their different historical development during the communist regime, the other is due to the near distance between three capitals Wien-Bratislava-Budapest that motivated Austria to secure these important connections and establish itself as a strategic logistics centre.

Both countries are nowadays planning more projects for interconnections between themselves and take further steps to align with the European common framework, for example, through their National Implementation Plans (NIP), which align with the European Rail Traffic Management System (ERTMS), and with policies and strategies which aim to comply with the common European standards.

5. INNOVATION AND NEW TECHNOLOGIES

Many new technologies and innovative tendencies are currently revolutionizing the transportation and logistics sector: from electric and autonomous vehicles to new materials and design or intelligent routing systems. Anyhow, the European focus is to reach independence of carbon-sourced fuels in its transportation sector. Under the motto of 'Growing out of oil' the common European strategy intends to enhance the decarbonization of the sector, which would not only make the logistics network more sustainable and environmentally friendly, but also contribute to the energetic independence of the European Union from other regions.

The digital transformation of the logistics industry is key to comply with this decarbonization strategy at the European level. According to this digital transformation will be based on four main pillars: digitally enabled information services, new delivery capabilities (e.g. autonomous vehicles and drones), circular economy and shared logistics capabilities (in the line of intermodality). [23]

Taking a closer look at the national level, we can also analyze how the European common strategy also corresponds to the Austrian and Czech initiatives for the logistics and transportation sector.

In Austria main topics include: physical interconnectivity of the transport system (e.g intermodality), open information infrastructure (including digitalization, automatization, data sharing and security), modeling and simulation, and innovative concepts for urban mobility. [23]

The Austrian innovative and research efforts in the field of autonomous self-driving vehicles is particularly noteworthy. Thanks to programmes like the Austrian Mobility Labs, Austria has positioned itself as a pioneer in autonomous driving technology, offering a particularly favorable ecosystem for R&D activities in this field. [24,25]

Similar initiatives are promoted in the Czech Republic through the country's Mobility Innovation Hub. However, these initiatives are at a preparatory phase and have not still reached the level of deployment of Austrian centers. [26]

6. CONCLUSIONS

After having analyzed in detail the most important aspects of European transportation context, goals and strategies; and having taken a closer look at the national level for Austria and Czech Republic, some conclusions can be derived.

Firstly, it can be stated that there is a common approach at the European and national -Austrian and Czech- levels: transportation and logistics are perceived as key drivers of economy, and therefore efforts are to be made to grow the networks and meet increased demands. At the same time, these efforts are shaped by sustainability and efficiency requirements, in order to avoid environmental and security issues and guarantee an optimal functioning of the networks.

Despite this common objective, there are still deep differences between Czech Republic and Austria. Mainly due to their different political and economic contexts during the 20th century, the transportation networks in the Czech Republic are not as strong as Austrian trade lanes.

Regarding new technologies and innovations, these are particularly enhanced at the European level to comply with its sustainability and decarbonization goals and reach oil independence. The digital transformation of the sector is particularly contributing to this decarbonization goal, allowing for a more efficient management of networks and resources.

These initiatives are strongly promoted in Austria, where a strong ecosystem of research centers and institutions are pioneering in the digital transformation of logistics, especially regarding autonomous vehicle technology. In the Czech Republic, similar initiatives are also promoted, although they have not yet reached full development.

7. REFERENCES

1. Lay, M. G. *Ways of the World: A History of the World's Roads and of the Vehicles that Used Them*. (Rutgers University Press, 1992).
2. European transport policies. Available at: https://assembly.coe.int/nw/xml/XRef/X2H-Xref-ViewHTML.asp?FileID=7440&lang=EN. (Accessed: 24th June 2021)
3. Transport | European Commission. Available at: https://ec.europa.eu/info/policies/transport_en#related. (Accessed: 24th June 2021)
4. EU climate action and the European Green Deal | Climate Action. Available at: https://ec.europa.eu/clima/policies/eu-climate-action_en. (Accessed: 24th June 2021)
5. Infrastructure and Investment | Mobility and Transport. Available at: https://ec.europa.eu/transport/themes/infrastructure/. (Accessed: 24th June 2021)
6. *Roadmap to a Single European Transport Area*.
7. • EU: carbon dioxide emission sources 2019 | Statista. Available at: https://www.statista.com/statistics/999398/carbon-dioxide-emissions-sources-european-union-eu/. (Accessed: 24th June 2021)
8. Transport Infrastructure in Austria | ABA - Invest in Austria. Available at: https://investinaustria.at/en/sectors/logistics/infrastracture.php. (Accessed: 24th June 2021)
9. Emberger, G. National transport policy in Austria – from its beginning till today. *Eur. Transp. Res. Rev.* **9**, (2017).
10. Bundesministerium für Verkehr, I. und T. Gesamtverkehrsplan für Österreich. (2012).
11. Ministry, A. F. National Implementation Plan for ERTMS in Austria. **4**, (2017).
12. Corporate Power Purchase Agreements (PPAs): What are they? | Insights | DLA Piper Global Law Firm. Available at: https://www.dlapiper.com/en/austria/insights/publications/2019/11/what-are-corporate-power-purchase-agreements-ppa/. (Accessed: 28th November 2020)
13. Odborníci kritizují Zemanův kanál. Studie, která dokládá smysluplnost, je podle nich jen účelová | Domov | Lidovky.cz. Available at: https://www.lidovky.cz/domov/odbornici-kritizuji-zemanuv-kanal-studie-ktera-doklada-smysluplnost-je-podle-nich-jen-ucelova.A190817_155230_ln_domov_rkj. (Accessed: 24th June 2021)
14. Baťův kanál | unikátní vodní cesta. Available at: https://www.batacanal.cz/. (Accessed: 24th June 2021)
15. České dálnice | Dálniční síť v České republice. Available at: http://www.ceskedalnice.cz/dalnicni-sit/. (Accessed: 24th June 2021)
16. Letiště Václava Havla Praha | Letiště Václava Havla Praha, Ruzyně. Available at: https://www.prg.aero/#/. (Accessed: 24th June 2021)
17. Řízení letového provozu ČR, s.p. Available at: http://www.rlp.cz/Stranky/default.aspx. (Accessed: 24th June 2021)
18. Základní charakteristika železniční sítě - www.spravazeleznic.cz. Available at: https://www.spravazeleznic.cz/o-nas/vse-o-sprave-zeleznic/zeleznice-cr/zeleznicni-sit-v-cr. (Accessed: 24th June 2021)
19. Historický vývoj dopravy.
20. The Transport Policy of the Czech Ministry of Transport.

21. Czech Republic Ministry of Transport. National Implementation Plan Czech Republic. (2017).

22. Zielnetz 2025+ ÖBB-Infrastruktur AG. (2011).

23. (19) (PDF) Austrian research, technology and innovation (RTI) competences in the domain of „Physical Internet and transport logistics“. Available at: https://www.researchgate.net/publication/320498298_Austrian_research_technology_and_innovation_RTI_competences_in_the_domain_of_Physical_Internet_and_transport_logistics. (Accessed: 24th June 2021)

24. Mobility of the future: Austria is on the rise | Invest in Austria. Available at: https://investinaustria.at/en/blog/2019/06/future-mobility.php. (Accessed: 24th June 2021)

25. Austrian Mobility Labs - Future Mobility. Available at: https://mobilitaetderzukunft.at/en/articles/mobility-labs/. (Accessed: 24th June 2021)

26. Czech Republic launches new platform to promote innovation in mobility and transportation - Prague, Czech Republic. Available at: https://news.expats.cz/business-news/czech-republic-launches-new-platform-to-promote-innovation-in-mobility-and-transportation/. (Accessed: 24th June 2021)