

Diplomarbeit

Verbesserung der Konnektivität: Bewertung der Auswirkungen der transeuropäischen Netzwerk-Transportinfrastruktur im Kosovo

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Diploma Thesis

Enhancing Connectivity: Assessing the Impact of Trans-European Network Transport Infrastructure in Kosovo

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KURZFASSUNG / ABSTRACT

Integration ist der Prozess der Verschmelzung kleinerer Komponenten zu einem einzigen, zusammenhängenden System. Die wichtigste Art der Integration in diesem Jahrhundert ist die wirtschaftliche, die den Abbau von Handelsschranken zur Förderung der internationalen Zusammenarbeit beinhaltet. Städte, Regionen, Nationen und ihre Gemeinden profitieren alle in hohem Maße vom Ausbau der Verkehrsinfrastruktur. Die wirtschaftlichen Auswirkungen von Straßen und Autobahnen, einschließlich unmittelbarer und langfristiger Effekte, möglicher Nachteile und die Rolle des Verkehrssektors bei den Treibhausgasemissionen, sind die Hauptthemen dieser Arbeit.

Zu den westlichen Balkanländern, die noch einen langen Weg vor sich haben, bis ihre Wirtschaft ein zufriedenstellendes Niveau erreicht hat, gehören Albanien, Bosnien und Herzegowina, Kosovo, Nordmazedonien, Montenegro und Serbien. Um das Wirtschaftswachstum zu beschleunigen und die regionale Integration in die EU zu fördern, hat die Europäische Union in die Modernisierung der Verkehrsinfrastruktur in dieser Region investiert. Um die soziale und wirtschaftliche Integration der EU zu erleichtern und ihre Peripherie mit ihrem Kern zu verbinden, ist das Transeuropäische Verkehrsnetz (TEN-V) der Schlüssel zur Erreichung dieser Ziele, indem es die Verkehrswege in der EU zusammenführt, was in Wirklichkeit eines der größten Projekte der Europäischen Union ist.

Es gibt Methoden zur Bewertung der Vor- und Nachteile der TEN, aber politische Entscheidungen setzen sich häufig über diese Bewertungen hinweg, was sich langfristig nachteilig auswirkt. Die Region des westlichen Balkans wird von internationalen Finanzinstitutionen unterstützt, die eine nachhaltige wirtschaftliche und soziale Entwicklung, auch im Verkehrssektor, fördern. Der Kosovo verfolgt eine Verkehrspolitik, die den Ausbau des TEN-V-Netzes sowie die Instandhaltung und Verbesserung der bestehenden Infrastruktur, die Erhöhung der Sicherheitsvorkehrungen und die Verbesserung des Zugangs zu regionalen Märkten und darüber hinaus umfasst.

Die politische Führung und die Beamten im Kosovo haben vorgeschlagen, das transeuropäische Verkehrsnetz (TEN-V) im Kosovo auszubauen, um die Integration in die

Europäische Union nicht nur politisch, sondern auch wirtschaftlich zu fördern. Dies stellt jedoch eine große Herausforderung dar, da nicht nur die Europäische Union für die Finanzierung des Ausbaus zuständig ist, sondern auch der Kosovo einen Beitrag leisten muss. Ziel dieser Arbeit ist es zu untersuchen, wie sich diese Herausforderung auf den Haushalt des Kosovo auswirkt und ob eine solche Erweiterung zum jetzigen Zeitpunkt für den Kosovo von Vorteil ist oder nicht. Zu diesem Zweck wurde eine Fallstudie durchgeführt, in der Handelsdaten zwischen dem Kosovo, drei Ländern der Europäischen Union und Nachbarländern analysiert wurden. Die Ergebnisse zeigten einen deutlichen Anstieg der Importe in den Kosovo aus all diesen Ländern, was zu einem verstärkten Wettbewerb für lokale Unternehmen führt. Darüber hinaus untersuchte die Studie die internen Auswirkungen des Ausbaus und kam zu dem Ergebnis, dass die zentralen Knotenpunkte am meisten von der neuen Verkehrsinfrastruktur im Kosovo profitieren.

Integration is the process of merging smaller components into a single, cohesive system. The most important type of integration in this century is economic, which entails lowering trade barriers to foster international collaborations. Cities, regions, nations, and their communities all benefit greatly from the expansion of the transportation infrastructure. The economic effects of roads and highways, including immediate and long-term effects, prospective drawbacks, and the transportation sector's role in greenhouse gas emissions, are the main topics of this thesis.

In the Western Balkans, which still have ways to go before their economies are at a satisfactory level, are Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, Montenegro, and Serbia. To hasten economic growth and enhance regional integration into the EU, the European Union has made investments in modernizing the region's transportation infrastructure. In order to facilitate the social and economic integration of the EU and link its periphery with its core, the Trans-European Transport Network (TEN-T) is the key to achieve these goals by integrating the transportation routes in the EU which in reality is one of the biggest projects of the European Union.

There are methods for assessing the TEN-benefits and drawbacks, but political decisions frequently override these assessments, having detrimental long-term effects. The Western Balkans region is supported by international financial institutions, which encourage sustainable economic and social development, including that of the transportation sector. Kosovo has a transportation policy that includes expanding the TEN-T network as well as maintaining and improving the current infrastructure, enhancing safety precautions, and improving access to regional markets and beyond.

The political leaders and officials in Kosovo have proposed expanding the Trans-European Transport Network (TEN-T) within Kosovo to promote integration with the European Union not only politically but also economically. However, this presents a significant challenge as it is not solely the responsibility of the European Union to fund the expansion, but Kosovo must also contribute. The goal of this thesis is to examine the impact of this challenge on the Kosovo

budget and whether or not such an expansion will be beneficial to Kosovo at this time. To achieve this, a case study was conducted analyzing trade data between Kosovo, three central European Union countries, and neighboring countries. The results revealed a notable increase in imports to Kosovo from all these countries, leading to increased competition for local businesses. Additionally, the study examined the internal effects of the expansion, finding that central hubs benefit the most from the new transport infrastructure in Kosovo.

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Last but not least, I want to express my sincere thanks to my family, especially to my mother for her unwavering love, care, and support throughout this wonderful journey. Her sacrifice has been immense, and I am truly blessed to have her in my life.

ABBREVIATIONS

CBA – Cost Benefit Analysis
CEE – Central Eastern European Countries
CO2 - Carbon dioxide
EBRD - European Bank for Reconstruction and Development
EC – European Commission
ECSC - European Coal and Steel Community
EEA - European Environment Agency
EEC - European Economic Community's
EIB – European Investment Bank
EP – European Parliament
ESIF - European Structural and Investment Funds
EU – European Union
GDP - Gross Domestic Product
GAWB - Green Agenda for the Western Balkans
IFI - International Financial Institution
IPA – Instrument for Pre-Accession Assistance
KfW - the Kreditanstalt für Wiederaufbau
NATO - North Atlantic Treaty Organization
NWI - Net Worth Income
PPP – Public Private Partnership
SEETO - Southeast Europe Transport Observatory
TC - Transport Community
TEN – Trans European Network
TEN-T – Trans European Network Transport
USD – United States Dollar
WB – Western Balkans
WBIF - Western Balkans Investment Framework
WGB - World Bank Group

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1. INTEGRATION

Integration is the process of combining smaller components into a single system that functions as a whole. Integration is a word that is frequently used in politics and technology, but its effects go far beyond that. Integration in military and economic alliances, from wide organizations to the European Union, has influenced the diplomatic activities of numerous nations throughout modern European history.

Political integration essentially aims to establish a common set of values and practices, establish the same or similar technical, educational, medical, and other standards, secure a specific economic or even military zone, promote economic growth, or foster international understanding and comradery.

Integration is often used interchangeably with cooperation. However, the significance of integration gives it a different dimension rather cooperation.

Political integration is an admittance or acceptance by a higher instance, usually the country leaders or initiators of economic, political, and military alliances in Europe. It generally implies a commitment or signed agreement between two parties with the aim of fulfilling concrete goals or contractual obligations. Commonly, integrated parties are supposed to follow the same line of standards, values and policies as the institution or alliance that they pertain to. So, integration is a deeper cooperation with clear goals and involvement from both parties. Thus, integration and cooperation cannot be used interchangeably.

Furthermore, integration produces notable and evident results that reflect in the daily life of people. It revolves around certain goals and values that integrated institutions and parties align with. And whether those goals are economic, technological, or political, they are in place to create a common platform that simplifies the response to a complex problem or threat.

However, in this century, economic integration is the most significant integration. The term "economic integration" refers to the process of removing trade barriers between nations or opening up opportunities for economic collaboration. Free trade zones, shared markets, and

total economic union—the unification of monetary and fiscal policies—are examples of different levels of economic integration.[1]

Even in and of itself, the European Union is an economic union. An agreement for the establishment of the European Coal and Steel Community served as the foundation for the founding of the EU. Today, the majority of nations use a single currency, and the union has its own central bank. The union has its own budget, and the members are urged to adhere to the same financial principles. In terms of politics, the European Union has a single president and a top-down, coordinated foreign policy.

2. TRANSPORT INFRASTRUCTURE

The development of cities, regions, countries, and their communities depends heavily on the transportation infrastructure because it is essential for the economy and the welfare of the community. For this reason, it is commonly accepted that transportation infrastructure is a public benefit. As a result, in European Union countries, transportation infrastructure is largely supported by the public sector[2] rather than the private sector because of the poor rate of return on investment[3]. On the contrary, by enabling the exchange of commodities on the market, reducing travel times, and changing the economic geography, it indirectly contributes to the expansion of the private sector.

On the other hand, inadequate transportation infrastructure may have a negative impact on the environment, cause congestion and more accidents, and have an effect on climate change, particularly through raising CO2 emissions[4].

An extensive body of literature has been examined to analyse the effects of transportation infrastructure on the economy, trade, and health of people because this topic has gained a lot of attention recently.

By transportation infrastructure, is meant everything that facilitates the movement of people or goods, including roads, highways, railways, airports, bridges, waterways, canals, and terminals. However, for the sake of this thesis, the focus is only on the infrastructure of roads and highways.

The European Union with Commission Regulation of the No 851/2006 defines the mode categories and their subcategories. The mode categories are according European Commission are railways, inland waterways, short sea shipping routes, maritime and inland ports, airports, terminals, and roads.

Table 1: Definition of transport infrastructure for road and rail by European Union Commission

Category	Subcategory
Road	

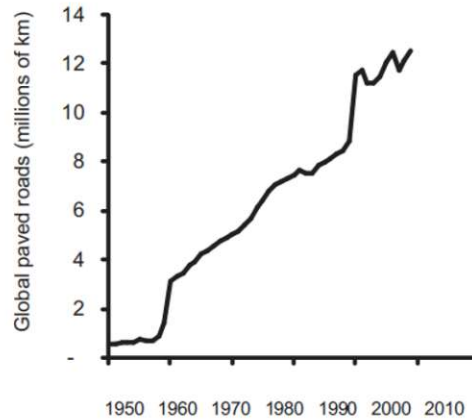
Land	The land used for road construction
Roadworks prior to paving	Earthworks, drainage, embankments
Pavement and ancillary works	Pavement courses, including waterproofing, verges, central reserve, gullies and other drainage facilities, hard shoulders and other emergency stopping areas, lay-bys and parking places on the open road (roads for access and parking and traffic signs), car parks in built-up areas on publicly owned land, planting and landscaping, safety installations, etc
Engineering structures	Bridges, culverts, overpasses, tunnels, structures for protection against avalanches and falling stones, snow screens, etc
Level crossings	All appliances to ensure the safety of road traffic
Traffic signs and signalling and telecommunications installations	All traffic equipment
Lighting installations	All lighting equipment
Toll collection installations, parking meters	All the equipment to collect the revenue for the use of the road
Buildings used by the infrastructure department	The facilities used for the management of the road
Rail	
Ground area	Land area used for rail
Track	Embankments, cuttings, drainage channels and trenches, masonry trenches, culverts, lining walls, planting for protecting side slopes etc
Platforms	Platforms for passengers and goods

Engineering structures	Bridges, culverts and other overpasses, tunnels, covered cuttings and other underpasses, retaining walls, and structures for protection against avalanches, falling stones, etc
Level crossings	All appliances to ensure the safety of road traffic
Superstructure, in particular	Rails, grooved rails and check rails, sleepers and longitudinal ties, small fittings for the permanent way, ballast including stone chippings and sand, points, crossings, etc
Lighting installations for traffic and safety purposes	All installations for the safety purposes
Buildings used by the infrastructure department, including a proportion in respect of installations for the collection of transport charges	The facilities used for the management of the rail transport

A nation's transportation infrastructure is typically evaluated based on its stock and capacity. Rietveld and Bruinsma assert that the density of the transportation infrastructure is a precise indicator of its capacity[5]. The population and area can be used to calculate the density. Consequently, the development of the economy is intimately related to a high-density transportation infrastructure[6].

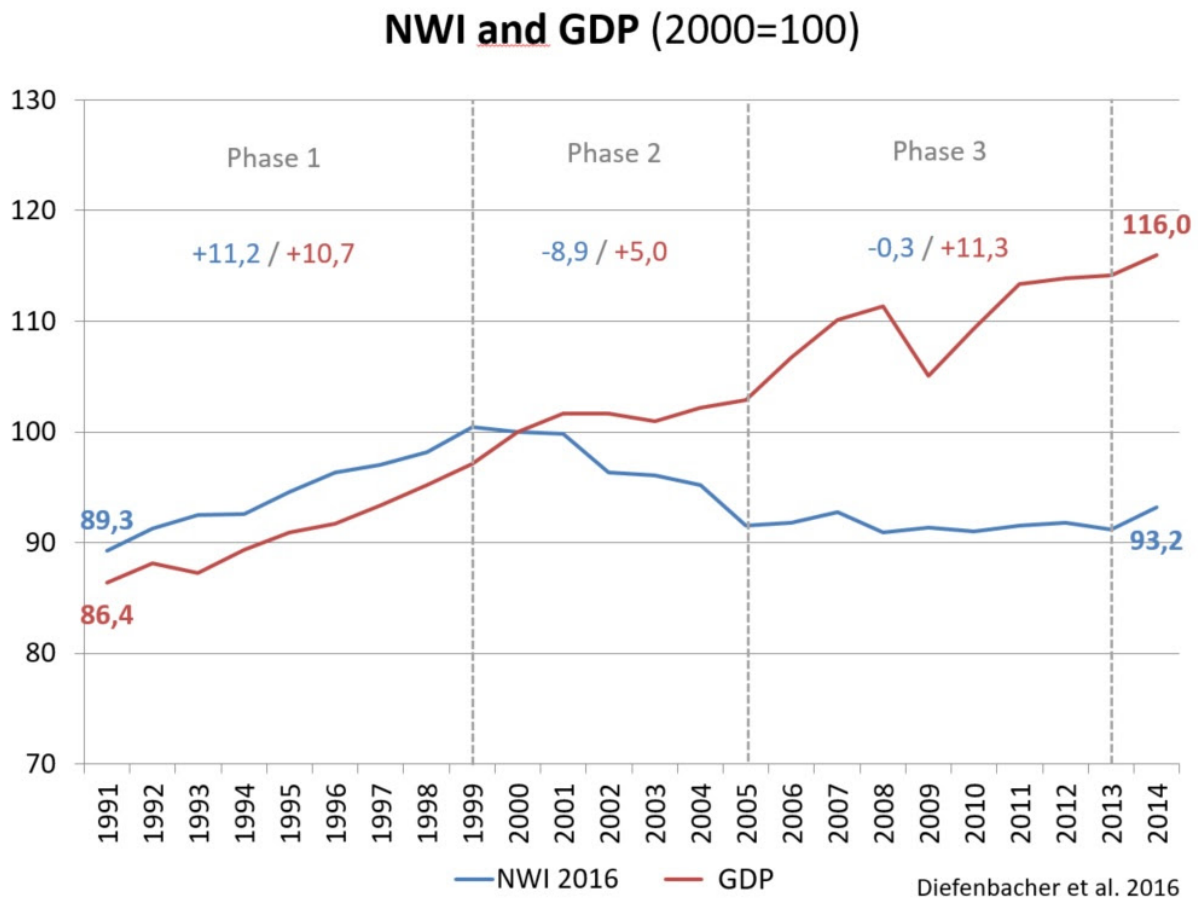
Germany which is one of the largest economies in European Union with (GDP per capita: 51.238 \$) has around 180 km of road per 100 sq. km. Whereas countries like Bulgaria which is one of the poorest economies (GDP per capita: 11.746 \$) within European Union has 37 km per 100 sq. km [7], [8]. This clearly shows the impact of transport infrastructure on the economy. However, it should be noted that it is not the only indicator and should not be considered the primary one. However, economic growth also affects the transportation infrastructure. As shown in the figure, infrastructure has expanded along with the economy. Nevertheless, high density alone does not necessarily reflect the qualities and characteristics of the infrastructure as a measure of transport infrastructure.

Figure 1: The transport infrastructure growth with economic growth [5]



However, GDP is not the only indicator that measures a country's economic performance. Another economic indicator which is more reliable to evaluate a country's economic performance is the Net Worth Income (NWI). The GDP of a country is a measure of the total value of goods and services generated within the country boundaries during a given period of time, usually a year. It is frequently used as the main metric for measuring the standard of living and economic development of a country. However, the income distribution within a country can be unequal and this is not taken into account by GDP.

Figure 2: The GDP vs the NWI[9]



On the other hand, the NWI, measures the sum of household income and in general attempts to provide a more accurate measure of economic wellbeing by addressing the impact of economic activity on the environment and other non-market factors. Long term trends in GDP and NWI might not always move in tandem. Although the GDP might rise as a result of increase production, technical break throughs or population growth, this does not imply that everyone in society is living better. On the other hand, NWI considers the external costs of economic activity in order to take into account the welfare of all members of society.

But how does the transportation infrastructure affect the economy?

It is difficult to overlook the fact that the development of the economy requires an appropriate infrastructure, regardless of the effectiveness or ineffectiveness of new transportation infrastructure.

The construction of new transportation infrastructure may have two different effects. In their book *Is transport infrastructure effective*, Rietveld & Bruinsma note that the effects can be either short-term or long-term impact[5].

What is the short-term impact?

The short-term impact of new infrastructure construction on the economy is immediate. As a result, the construction sector and other connected businesses will be able to add new jobs, which will stimulate the economy. This is widely accepted that a new project will stimulate the workforce in that part of the region where an infrastructure project is happening. This will have a slight economic impact on a small number of businesses and individuals and is directly related to the time of the completion of the construction works. Studies that have been conducted to illustrate the immediate effects of transportation infrastructure show positive effect in the short term on economy.

According to research by the American Association of State Highway and Transportation Officials, 1 billion \$ spent on highway construction can result in the creation of 27.800 jobs, while 1 billion \$ spent on transit construction can result in the creation of 19.800 jobs. Further study by the US Department of Transportation, which found that the Hiawatha Light Rail project in Minneapolis generated 1.9 billion \$ in economic activity and more than 20.000 jobs, supports this. According to research conducted in Europe by the European Commission, every 1 billion € invested in transportation infrastructure can generate almost 30.000 employment throughout the EU. The effects of transportation infrastructure on GDP, job growth, and economic activity but might differ slightly depending on the specific circumstances.

What is the long-term impact?

It is vital to categorize things in order to comprehend the significance of transportation.

Basic: The movement of people and things that is related to time, cost, and the potential for cross-correlation between entities

Operative: Enhancing the efficiency of the services in terms of time and safety in order to meet the requirements of users.

Geographical: The capacity to access further, more expansive markets.

The long-term effects will undoubtedly contribute to cutting business costs, which will lower the cost of manufacturing and enable enterprises to expand quickly and capture new markets farther from their base of operations. The Global Infrastructure Hub's study on the importance of infrastructure in economic growth and development further demonstrates the substantial correlation between infrastructure investment and economic growth. The return on investment for investments in public infrastructure is 1,5 times higher than for investments in other sectors. The drawback of this is that small firms will find it more difficult to compete with larger ones since the latter will harness the advantages of road infrastructure on a greater scale and eat the former. The economic effects of transportation infrastructure over the long term have been the subject of numerous studies. Depending on the type of infrastructure, the location, and the time period under consideration, the specific studies and their results may differ. However, the following studies serve as illustrations of the long-term effects of transportation infrastructure: according to a World Bank study, better transportation infrastructure can boost economic growth by lowering transportation costs, improving the effectiveness of supply chains, and luring in new businesses and investments. According to a National Bureau of Economic Research analysis, the development of the US Interstate Highway System in the 1950s and 1960s contributed significantly to long-term economic growth, including an increase in productivity and GDP per capita.

Better labour movement and modern infrastructure enable individuals to travel farther for work while paying less and taking less time, but on the other hand, this may result in a loss of labour to some less developed areas over time. The competition for labour may rise in some regions as a result of this, but it will also raise unemployment rates as new workers fill open

positions. However, improved infrastructure may also boost the need for fresh investment, which will certainly lead to the creation of new business opportunities and jobs.

As was already established, the long-term effects of infrastructure will definitely impact how regions are organized because as people move to interchanges, certain regions' residential growth and subsequent stagnation in economic development follow.

With the aforementioned factors taken into account, the long-term effect is related to GDP. Businesses will be more driven to generate more goods and services as a result, which will promote long-term economic growth.

Depending on scale and context, such as local and international, the economic impact of transportation infrastructure might vary. It is important to consider the level of study when examining the effects of transportation infrastructure on the economy, as these effects can vary between local and international economic structures.

On the other hand, urban sprawl, pollution, and traffic congestion are a few undesirable outcomes that it might bring about. Additionally, it may have adverse effects on nearby cities and cause community displacement.

Transport infrastructure may help the economy on an international scale by facilitating commerce and investment, enhancing connection between nations, and expanding access to international markets. However, it may also have unfavourable effects, including increased reliance on other nations, uneven development, and increased susceptibility to shocks from outside sources.

However, a decline in one of them may result in positive effects in the other one and vice versa. Examples include the construction of highways in the United States during the 1950s, 1960s, and 1970s, which encouraged residents of some cities to relocate to smaller towns outside of big cities, thereby boosting the local economies in those areas while simultaneously degrading the economies of the larger cities because of the reallocation of the population. But with small local economies, such as those in small communities where the highway passes through, the exact opposite occurs. The ability to transport commodities quickly, easily, and efficiently causes small economies to gradually contract until they collapse.

Additionally, Professor Knoflach highlights the importance of the balance between the economy and the environment. According to him, an important regulating factor between

environment and economy is the proportion of transportation expenses. Professor Knoflacher demonstrates that the five fundamental requirements for an eco-system — variety of the system, closed material cycles, maximum efficiency in handling resources and energy, self-regulation and regulation — can be satisfied and that this leads to an operating economy that is more in line with environment. The only way to minimize the actual system-related transport costs, which in a market-oriented economic system can only be accomplished by properly accounting for the actual costs of transport and their ecological consequences. But for this, a noticeable slowdown in traffic is required. He demonstrates how the growth in the econometric scale is caused by the speed of the transportation system. Ignoring the speed of the transportation network results in market concentration.

2.1. THE IMPACT TRANSPORT INFRASTRUCTURE IN POPULATION REDISTRIBUTION

The distribution of population can change with new transportation infrastructure. Despite the population boom in the country between 1950 and 1990, the construction of new highways resulted in a 17 percent reduction in population in central areas, according to Baum Snow research on the impact of new highway construction in the United States.

Another study by Levkovich, Rouwendal, and Ommeren demonstrates how the development of motorways in Netherlands throughout the 1960s and 1970s led to a decline in the population of the center areas and an increase in the population of the peripheral areas[10]. This is due to the development of new infrastructure, which has reduced travel expenses and lengthened travel times, allowing commuters to live farther from urban centers and to easily reach the market.

However, this has more negative than positive effects because, as Hermann Knoflacher notes in his book *Grundlagen der Verkehrs- und Siedlungsplanung*, the construction of new highways in Europe had a significant impact on traditional modes of transportation. He even goes so far as to claim that they altered family structures. The construction of new transportation infrastructure and a shift away from "traditional" which causes changes in other spheres of life, such as the closure of small local businesses because they can no longer compete with large corporations that benefit from the construction of new transportation infrastructure and use of its advantages.

2.2. ROAD INFRASTRUCTURE IMPACT IN THE ENVIRONMENT

Road infrastructure is essential to a nation's development, and while it has a bias in favour of the positive side of the economy over the bad, it has a greater negative influence on the environment.

The negative effects of roadside transportation on the ecosystem include species diversity risks, soil erosion, air pollution, and deterioration of plants and forests[11].

The air pollution caused by road infrastructure is one of its biggest and most detrimental effects on the environment. The need for travel and logistics transportation has expanded as a result of growing urbanization, as well as population concentration[12].

Another element causing future increases in air pollution is the fact that there are considerably more vehicles on the road than the transportation system can handle, and that number is growing more quickly.

Experts are divided on whether or not building more roads and other transportation infrastructure will improve the quality of the air. For instance, every government in Europe views the expansion of road infrastructure and investment in it as a means of reducing air pollution because the goal is to reduce traffic within populated areas and free up road traffic. However, a better road infrastructure encourages people to buy more cars, which certainly results in a rise in the number of vehicles on the road and an increase in air pollution. The significant capital investment may impede environmental protection efforts, ultimately degrading air quality[13].

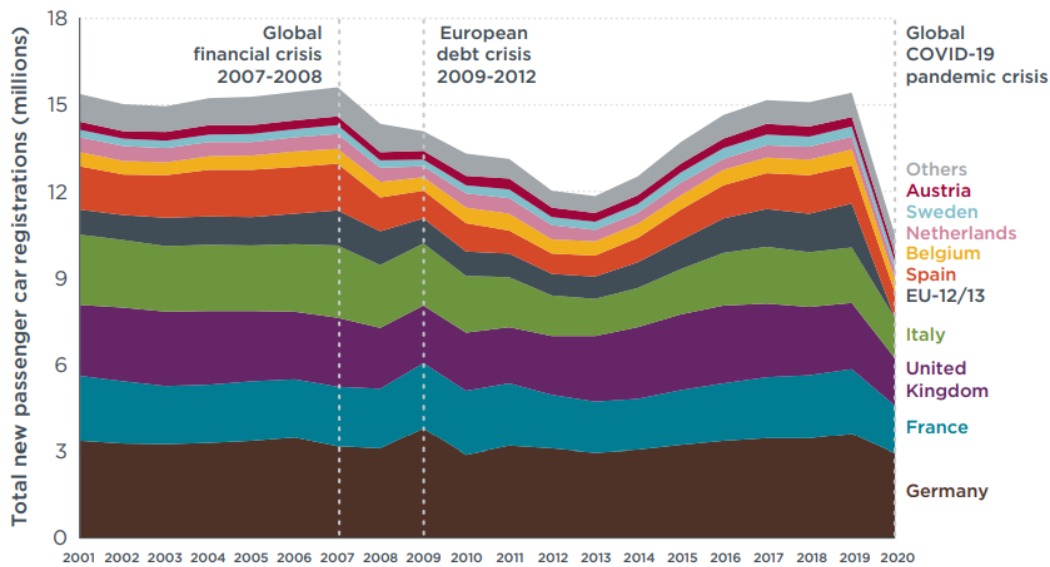
The European Union is attempting to restrict CO₂ emissions from passenger cars through the European Parliament with regulation 2019/631. With this rule, some objectives are set to support the EU's goal of reducing gas emissions and achieving the goals of the Paris Agreement on Climate Change while also enabling the operation of the internal market, one of the cornerstones of the European Union.

From 1 January 2020, this Regulation sets an EU fleet-wide target of 95 g CO₂ /km for the average emissions of new passenger cars and an EU fleet-wide target of 147 g CO₂ /km for the average emissions of new light commercial vehicles registered in the Union[14].

As part of the European Green Deal, the European Commission put up more challenging goals for 2030 on July 14, 2021. Average CO2 emissions from new passenger cars registered in 2025 and 2030 would have to drop by 15 % (no change) and 55 % (formerly 37.5 %), respectively, in comparison to the baseline year of 2021. The plan also indicates that, as a de facto phase-out of the internal combustion engine, new cars will be required to have zero emissions by 2035[15].

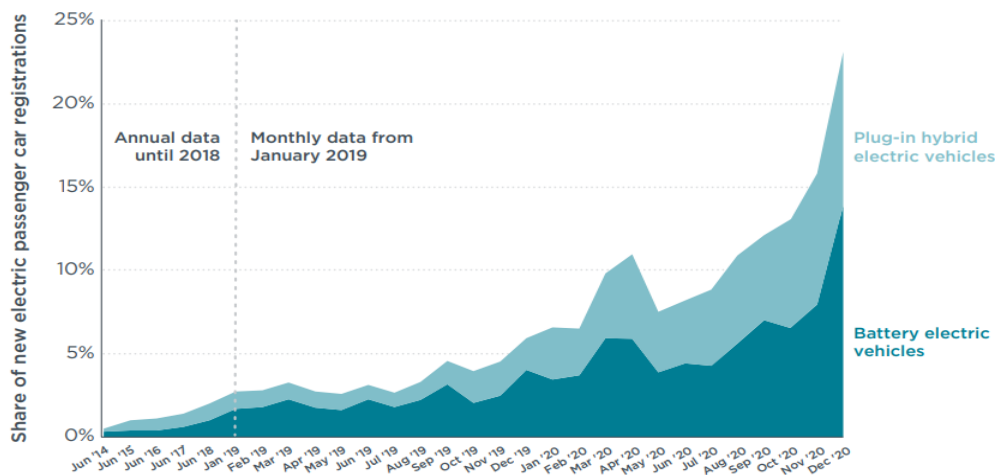
The vehicle registration process within the European Union hasn't changed significantly despite the introduction of the new legislation. As shown in the graph below, car registration increased the year that the CO2 regulation was introduced and then somewhat decreased the following year. COVID 19 is mostly responsible for this decline. In account of the statistics on new vehicle registrations below, it appears that the laws may not have a significant impact on the reduction of CO2 emissions after all.

Figure 3: New passenger car registration in Europe[15]



However, when we look at recent data on new electric vehicle registrations, we notice a significant growth, particularly from the year 2020 onward. This might be a sign that the objectives the European Union set with the aforementioned legislation would be met.

Figure 4: New electric passenger car registration in Europe[15]



According to a European Environment Agency (EEA) report titled "Transport and environment in the European Union — 2018," the transportation industry ranks second in the EU in terms of greenhouse gas emissions, contributing around 25% of the total. In addition, despite efforts to reduce emissions, the analysis found that between 1990 and 2016, emissions from the transportation sector grew by roughly 22%. This data supports research by the European Commission titled "Transport and Environment: State of Play and Next Steps," which emphasizes the contribution of the transportation sector to the EU's greenhouse gas emissions.

There are a number of reasons why EU nations can struggle to reach their transportation-related climate goals. One factor is the transportation industry's reliance on fossil fuels, which constitute a significant contributor to greenhouse gas emissions. The high rate of personal car ownership in several EU nations also contributes to a rise in roadside emissions. Another factor can be that the growth of alternate modes of transportation, like public transportation and electric vehicles, has lagged behind the rise in demand for transportation. In addition, there might not be enough political will or money to spend on legislation and infrastructure that would help the shift to more environmentally friendly modes of transportation.

Ground related risks to transport infrastructure!

The soil formation and vegetation are significantly impacted, by transportation infrastructure, and more specifically, by road infrastructure. By modifying the slope profile, removing vegetation, and creating steep slopes, the road construction will help cause erosions[16].

For instance, altering the natural hill-slope profiles, building roadcut and fill embankments, and creating impermeable roadbeds that concentrate runoff are all possible effects of road construction (Jordan and Martinez-Zavala, 2008). Roads concentrate runoff, which is essential for encouraging increased soil erosion and sediment formation on hill slopes, which subsequently degrades the quality of nearby open waterbodies (Forsyth et al., 2006; Lane and Sheridan, 2002; Ramos-Scharron and Macdonald, 2007; Sheridan and Noske, 2007). For instance, Lane and Sheridan (2002) found that the water quality has declined downstream of a road stream crossing, as seen by rising turbidity and total dissolved solids. Erosion on the road verge and the road fill slopes was the main source of sediment at the road stream crossing.

There are several ways to stop soil erosion, including bioengineering techniques like using vegetation, control blankets, geotextiles, etc., and engineering techniques like using lattice and diverting drains. Although these solutions for reducing soil erosion caused by roads are helpful, several of them fall short of their intended goals and some are even costly to employ, especially in areas with limited resources[16].

Habitat, the expansion of high-density roadways has impacted the habitat's mobility, reducing the likelihood of finding food, mating etc. There are often physical barriers on many roadways, especially those that pass over mountains, which prevent animals from moving about freely. Making infrastructure more permeable for wildlife through the use of fauna tunnels in conjunction with fencing and barriers directing the animals to the fauna passages can easily prevent this.

The fauna is impacted by more than just physical barriers; it is also at risk from hydrological changes, chemical pollution, noise and vibration, vibrations, changes in illumination, and visual disruptions.

3. EUROPEAN UNION

The European Union is the most effective and significant of the worldwide social and economic integration programs. The reason for this is that the European Union has its own market where people may move freely, commodities can be transferred inside the Union with little to no barriers, and services can be given in all of the countries that have made up this Union so far without any limitations[1].

Understanding the concept "social and economic integration" is crucial before moving on. Due to the lack of historical examples on the same size as the European Union where the integration of numerous nations and economies was made possible, it is exceedingly difficult to find such an example. However, the term "social and economic integration" started to take shape with the founding of the European Union. According to Ali El Agra, the term "social and economic integration" today refers to the process of combining various civilizations, economies, and cultures into one wider, unrestricted circle.

In Europe, there have been few attempts over the course of history to unite the several nations into one. The goal was to put an end to the brutal wars between the European countries while simultaneously advancing the economy. Nothing significant occurred until 1945, the year that World War II came to a close. Europe was worn out at the time, and quick action was required to revive the economy while simultaneously bringing together the countries that had been at war not long before. A kind of unification amongst the countries would stop a recurrence of the World War II scenario.

The British Prime Minister Winston Churchill gave the first indication in one of his speeches at the University of Zurich in 1946 *"It is to recreate the European Family, or as much of it as we can, and to provide it with a structure under which it can dwell in peace, in safety and in freedom. We must build a kind of United States of Europe. (...) The first step in the recreation of the European Family must be a partnership between France and Germany."* This idea of Winston Churchill would find support from the United States of America which saw the opportunity to encourage the unification of the west side against the Soviet Union (USSR).

Despite the need for a political and economic integration, it was only the economic integration that made it through during 50ties. In 1951 six countries in the composition of Germany, France, Italy, Belgium, Luxemburg, and Netherlands signed the Treaty of Paris, which included the establishment of the European Coal and Steel Community. This was crucial since it was obvious that a political integration would follow an economic integration. These six nations worked well together, and by the year 1957, they had signed two further agreements in Rome. The creation of an atomic energy community and the creation of a general common market were the two initiatives that were intended to bring these countries together specifically on these two topics, with plans to later expand into other areas of cooperation that would further the unification of Europe. The treaty of Rome would confirm that European countries especially Germany and France can really work together, and they were going toward as Jean Monnet the French politician was also cheering for, since 1914 *“Continue, continue, there is no future for the people of Europe other than in union.”*

Despite the fact that Winston Churchill is regarded as the founder of the European Union, Great Britain held a contrary view and refused to join the Union of the Six. In 1972, Great Britain decided to join the other six members of the European Economic Community, and with Denmark and Ireland getting on board, the Community of nine countries was founded, putting an end to its political opposition to the EU.

The European Economic Community's (EEC) continued existence would be threatened by the economic crisis of the 1970s and early 1980s. Although further integration appeared to be fading due to severe inflation and unemployment, Greece, which had been freed from the military dictatorship, still joined the Community in 1974. Portugal joined the European Economic Community in the same year, and Spain followed in 1975.

In 1987 the commitment of already 12 countries within the EEC to continue the development of it, it was further fulfilled with the Treaty of Single European Act. It was this act that made it a reality the common market among other objectives set out in this treaty which are the best explained by the president of the European Commission at that time Roy Jenkins *“The Single Act means, in a few words, the commitment of implementing simultaneously the great market*

without frontiers, more economic and social cohesion, an European research and technology policy, the strengthening of the European Monetary System, the beginning of an European social area and significant actions in environment."

By the time of the fall of communisms and the collapse of the USSR, the EEC was beginning to be recognized as a union with the ability to maintain political stability in Europe in addition to its influence on economic progress. As a result, the Maastricht Treaty, also known as the Treaty Establishing the European Union as we know it Today, entered into force in 1992. Even if there was no decision to adopt a common foreign policy, from this point on it was no longer just about the economic prosperity of each member state but also about how they would have to adapt their politics to the Union.

Sweden joined the European Union in 1995 despite its history of maintaining a policy of neutrality in order to take advantage of the potential economic benefits. In the same year, Finland and Austria joined the EU for the same reasons that Sweden did, despite the fact that both countries are neutral, with Finland being required to be so by a deal with the USSR in 1948 and Austria being required to be solely militarily neutral.

The Union's pursuit for social and economic cohesion among the many countries and regions of the community was established as one of the Union's aims by the Treaty of the Union. To do this, it was decided that the Cohesion Fund, established in 1994, would give less developed regions and countries financial aid targeted at areas like the environment or transportation infrastructure. The member states that met the convergence criteria and had GDP per capita below 90% of the average for the Union were eligible to receive this help. The most benefited country was Spain, followed by Greece, Portugal, and Ireland as the Cohesion countries.

In the 1990s, political upheavals in Europe, particularly in the Balkans, necessitated the development of a European foreign strategy. Despite the Treaty of Amsterdam's harsh criticism for failing to further political union, it was resolved to have a shared strategy in the member states' interactions with other countries.

With the Nice Treaty, the EU's member states opted to expand the union in 2001. Ten new countries joined the EU in 2004 as a result of the expansion strategy. The largest EU enlargement ever, with the majority of the new members being former Soviet Union republics, was completed by Poland, the Czech Republic, Slovakia, Hungary, Estonia, Lithuania, Letonia, Malta, and Cyprus. In 2007 another enlargement took place with Bulgaria and Romania joining the EU and the process of joining was concluded with Croatia as the last state to join the EU in 2013.

Numerous analyses were conducted to determine how these countries' economies might be impacted by their accession in 2004. According to a working paper by Marcin Grela et al., the GDP of the 11 central and eastern European countries that joined the EU in 2004 (CEE 11) increased on average twice as quickly as that of the EU-15 countries (already members of EU). Although countries with lower levels of development tend to converge more quickly than those with high levels, joining the EU had little effect on these nations' GDPs.

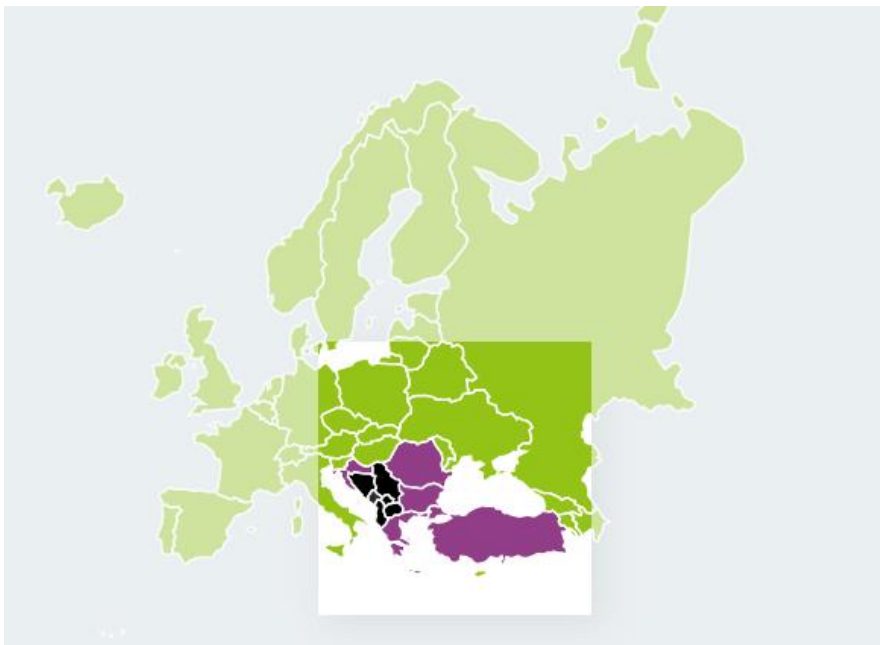
But yet again, joining the EU does not guarantee that new members will have more economic growth than current EU members. Rapacki et al state in their study "The EU enlargement and economic growth in CEE countries" the actual process of real convergence between individual Central and Eastern European Countries EEC-10 economies that joined the EU in 2004 and the EU-15 may take between 8 and 33 years[17].

However, the process of enlargement will continue because countries like Albania, Montenegro, North Macedonia, Serbia, and Turkey are already candidates and, on the path, to becoming members of the EU. Bosnia and Herzegovina and Kosovo are still only referred to as potential candidates to join the EU. Prior to joining the EU, these countries must increase their efforts and make improvements in areas like regional cooperation in the sense of good neighborliness, where transportation plays a crucial role, migration, the rule of law, and fundamental rights. Unfortunately, according to European Commission studies on the expansion, the majority of these countries need to improve on these grounds, hence their entry into the European Union currently seems unlikely.

4. WESTERN BALKAN

Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, Montenegro, and Serbia are the countries of the Balkans that are not members of the EU and some of them nor the North Atlantic Treaty Organization (NATO). These countries are collectively referred to as the Western Balkans (WB) by European and American politicians. These nations already share borders with other Balkan countries that are already EU members, including Croatia, Bulgaria, and Greece. The 218 750 km² Western Balkans are a region of the Balkan Peninsula. There are almost 20 million people living in WB.

Figure 5: Western Balkan countries



Because this region is composed up of a variety of different ethnic groups and has a broad range of cultures and religions, it was racked by conflicts for a long time, which stunted economic growth and, as a result, lagged behind European

Union members in the development of the transport sector.

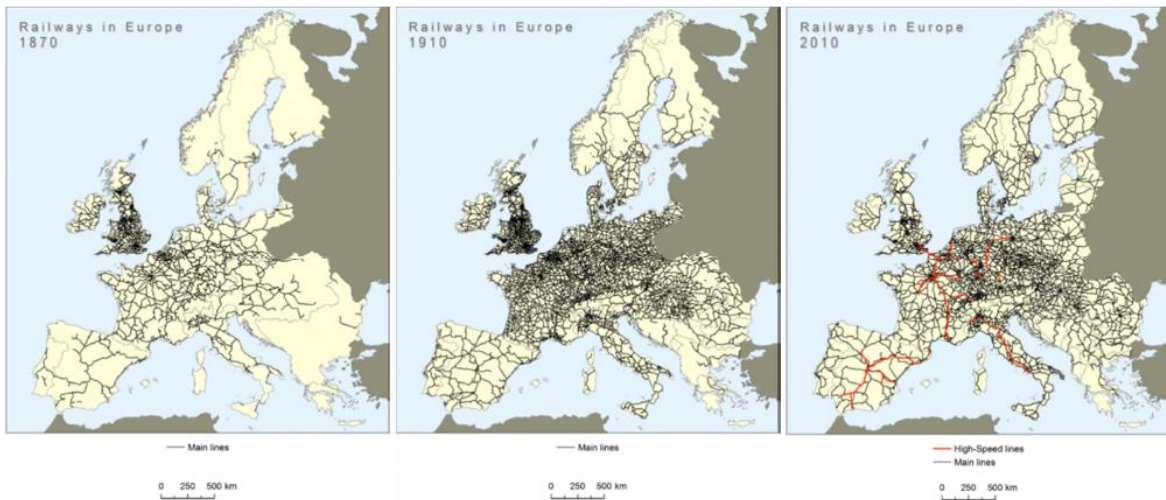
Beginning with the Ottoman era, the first and second World wars, as well as multiple Balkan Wars over the entire 20th century are some of the causes of the problems in WB, ending up with communism which lasted in some of the countris until the 90s of the last centry.

When the industrial revolution began in Great Britain and extended quickly throughout the entire west and central portion of Europe but not as quickly in the Balkans, these countries first lost their momentum.

Western Balkan countries took an additional 200 years to achieve the same level of GDP per capita as Great Britain or Austria, according to research from The Vienna Institute for International Economic Studies published in 2004. A comparison of the USD GDP per capita now still reveals a significant disparity, with the European Union having a GDP per capita of 34.173,5 \$ and the Balkans having an average GDP per capita of 6.160,3 \$ [18]. This makes it obvious that these countries still have a long way ahead to reach a satisfactory economic level.

In order to get a sense of how badly the Western Balkans' delayed development has damaged their transportation system, the development of rail infrastructure across all of Europe from the 19th century to 2010 is shown in the picture below.

Figure 6: Transport (rail and road network) network in Europe from 19th Century until 21st Century [19]



It is important to consider how these countries performed politically and economically after the fall of communism. Free elections and democracy itself are two aspects of politics that the Western Balkans countries lacked, at least until the 2000s, as evidenced by the fact that they were rated by Freedom House at a level twice weaker compared to the central European countries which were also under the communism. In contrast to center European countries, which were far more inclined toward democratic norms, the Western Balkan republics were more focused on state construction.

The challenge is that these countries are not particularly homogeneous within themselves, and since the political systems in the majority of these countries were so strongly nationalist in orientation, this led to several confrontations in the 1990s. The Balkan countries were getting drawn into wars that claimed a lot of lives and also had an impact on the economy, making it impossible to concentrate on liberalization and privatization while the central European countries were more focused on embracing the values of the European Union and adapting its policies.

The GDP gap widened even further than in the 1990s when simply comparing central European countries, ignoring other developed nations in Europe, demonstrating an unstable integration and regional cooperation of the Western Balkan countries[20].

The Western Balkan countries could emerge from the "dark era" and keep pace with transition. Even though democracy is still in its infancy, it is crucial to continue the transition while also pushing the market economy forward.

The region is significant to the EU in terms of security, stability, trade, and transit routes due to its geographic location. As a result, the EU should continue to place a high priority on the economic and political possibilities of the Western Balkan countries as well as their future in a European context.

The WB countries have been eligible to join the EU since 2000, and the major EU states have affirmed this possibility. These countries must first adhere to EU political, legal, and economic conditions in order to pursue membership in the EU. They have a framework for their interactions with the EU provided by the EU regulations, which have three major goals that these countries must achieve: contractual partnerships, regional cooperation, and trade relations. The final component also includes transportation, with free trade placing an emphasis on the movement of goods[21]. While Kosovo and Serbia are about to adopt such policies, Bosnia and Herzegovina and Albania have previously developed transport development strategies that take into account the environmental and social issues. In the upcoming years, North Macedonia and Montenegro promise to create similar plans.

A regional market would draw more investors, which would speed the development of these countries' economies and itself advance the region's integration into the Union. Nevertheless, Western Balkan countries initially need to increase their regional economic integration because the countries are not that big.

The European Union does not believe that building only roads is the best approach to promote transportation inside the Union or even in the Western Balkans due to the environmental impact. However, the Balkans' road system is, nevertheless, much more advanced than other modes like rail. Considering that many of the Western Balkans countries are deadlock countries, than road and rail modes are the most used ones for the transportation. Although the road network is the most developed one comparing to the other modes, still is not developed and maintained as in the Union. Road infrastructure, including road safety, needs to be upgraded immediately, and the Union has already begun investing in this area of Europe.

The construction of access to certain zones within the country itself was the guiding premise of rail network expansion. Because all of the Western Balkan countries, with the exception of Albania, were once a single state under the former Yugoslavia, there was an "accidental" or emerging regional rail connection. However, after the breakup of the former Yugoslavia, the connections were either not maintained or completely destroyed. There is hardly any rail infrastructure in the Western Balkans, and there is little inter-country rail travel. This is expected given that Kosovo has essentially no functioning rail infrastructure and that other countries likewise have highly outdated and inadequate rail networks.

Table 2: Transport network in Western Balkan[22]

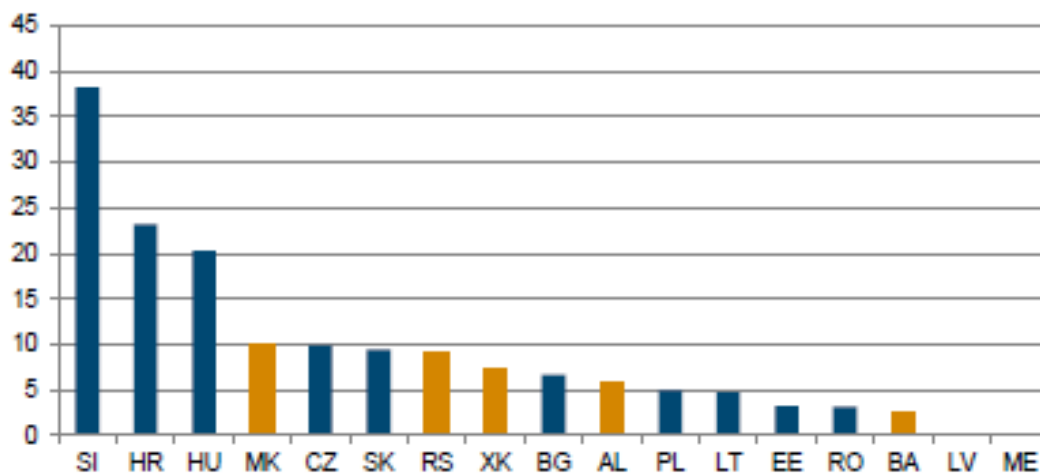
Country	Road [km]	Rail [km]	Waterways [km]	Ports	Airports
Kosovo	2012	300	0	0	1 active 1 inactive
North Macedonia	14 200	700	0	0	2
Albania	3945	700	41	70	1
Montenegro	7762	300	0	17	2
Serbia	44 248	3 700	587	0	2

Bosnia and Herzegovina	22 926	1000	990	0	3
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Geographically speaking, the Balkans, and specifically the Western Balkans, serve as a land bridge and the quickest route between the south and east of Europe and the center of Europe. The Balkans were taken into account in the Helsinki Corridors because of their significance. In five of ten the Pan European corridors, the Balkans are involved. Additionally, Corridor VIII, a 1.500 km route, exclusively passes through the Balkans. This famous corridor connects the Adriatic coast in Albania with the Black Sea in Bulgaria and runs from the west to the east of the Balkans. The railway route still has to be finished, but the road route has already been finished.

However, the density in 1000 km² land area of the motorway compared to the EU Members and Central European Countries is still low.

Figure 7: Density of roads in Europe km in 1000km²[23]



Air pollution and climate change are significant issues in WB. A rise of 1.7 Co to 4.0 Co is anticipated, and by the end of the century, this increase could exceed 5 Co. The Western Balkans are currently known as a hotspot for poor air quality.

Air pollution and climate change are significant issue in WB. A rise of 1.7 °C to 4.0 °C is anticipated, and by the end of the century, this increase could exceed 5 °C[24]. The Western Balkans are currently known as a hotspot for poor air quality.

The increase in road traffic, including both passenger and freight travel, is one of many factors contributing to the region's rising greenhouse gas emissions. According to a 2010 report from the European Environment Agency, passenger travel increased by 40% between the years 2000 and 2007 and continued to rise in the years that followed. With vehicles that are, on average, more than ten years old

Even though the Western Balkans lack adequate road infrastructure, this sector nonetheless makes a significant contribution, accounting for 90% of all greenhouse gas emissions. The energy sector and transportation together account for the majority of these emissions, with energy sector accounting for 16%[24].

However, the transport remains a very important sector in WB in terms of employment, as the sector engages more than 5% of the total workforce in WB.

Climate goals of Western Balkan

By endorsing the Green Agenda for the Western Balkans (GAWB) at the Summit in Sofia in 2020 and the GAWB Action Plan at the Brdo Summit in October 2021, the region has also committed to achieving carbon neutrality by 2050 and aligning with the key components of the European Green Deal, in line with the EU's ambition to become climate-neutral by that date.

This initiative of EU for Western Balkans has 5 pillars: decarbonization, circular economy, depollution, sustainable agriculture and protection of nature and biodiversity.

A number of transportation-related climate targets have been established for the Western Balkans region, including a decrease in greenhouse gas emissions and an increase in the usage of electric vehicles.

The most important thing to do in the Western Balkans is to immediately adapt climate policy, set transitional 2030 climate (and energy) targets that are in line with the increased EU ambitions, implement the EU Climate Law, align with the EU Strategy on Adaptation to Climate Change, increase deployment of natural and artificial carbon sinks, and make sure that all

economic sectors quickly transition to being more environmentally friendly, with a focus on those that are carbon-intensive. However, few particular objectives include the greenhouse gas emissions: Serbia with 30% by 2030, Albania, Montenegro, Kosovo and North Macedonia with 20% by 2030 and Bosnia and Herzegovina with 15% by 2030 are already set.

The Western Balkan economies should develop and adopt their long-term, low-greenhouse gas emissions development strategies (the long-term strategies) in accordance with the provisions of the EU Climate Law, Governance Regulation, and other elements of the EU climate policy framework, and adopt them without further delay and not later than by 2025. This is because it is necessary to chart a path towards carbon neutrality by 2050.

The goals to reduce greenhouse gas emissions from transportation could be positively or negatively impacted by new transportation projects in the Western Balkans region. On the one hand, by facilitating the movement of people and goods, new transportation projects like the construction of new motorways, railways, and airports can improve transportation efficiency and possibly lower emissions. This can be done by using public transit more frequently, and encouraging active mobility. On the other hand, if they result in increased car use, urban development, or a greater reliance on fossil fuels, new transportation projects will potentially have a negative impact on the targets for reducing greenhouse gas emissions from transportation. This might occur if the new developments aren't planned with sustainable transportation in mind, or if the right land-use planning regulations aren't in place alongside them. The new investments can hinder the environmental goals of WB countries, more specifically if new transportation projects prioritize private vehicle use over public transportation, walking, and cycling. The project which are poorly connected to existing transportation networks and do not offer opportunities for other modes of transportation might raise emissions.

5. PAN EUROPEAN NETWORKS

In Europe, it was apparent that most of the areas' connections were at a very poor stage during the 1980s and 1990s. As a result, the economy's competitiveness began to suffer.

Additionally, the severe traffic congestion had a negative impact on both the environment and people's health, this was caused by a lack of connectivity, consequently because of traffic jams on the roads, and a lack of infrastructure to link the various transportation modes together.

The summit in Prague in 1991, where the corridor concept was first introduced, marked the beginning of the Pan European Transport Network. The tenth corridor concept was completed at the conference in Helsinki, 1997, right after the conference in Crete, 1994, when the priority routes were determined, had drafted. Among other modes, the so-called Helsinki corridors are 25.000 km length on the rail network and 23.000 km length on the road network[25].

Figure 8: Pan European Corridors established in summit of Crete in 1994[26]



- I (North-South) Helsinki - Tallinn - Riga - Kaunas and Klaipėda - Warsaw and Gdańsk
 Branch A (Via Hanseatica/E264) - St. Petersburg to Riga to Kaliningrad to Gdańsk to Lübeck
 Branch B (Via Baltica/E67, Rail Baltica) - Helsinki to Warsaw.
- II (East-West) Berlin - Poznań - Warsaw - Brest - Minsk - Smolensk - Moscow - Nizhny Novgorod
- III Brussels - Aachen - Cologne - Dresden - Wrocław - Katowice - Kraków - Lviv - Kyiv
 Branch A - Berlin - Wrocław
- IV Dresden/Nuremberg - Prague - Vienna - Bratislava - Győr - Budapest - Arad - Bucharest - Constanța / Craiova - Sofia - Thessaloniki / Plovdiv - Istanbul.
- V (East-West) Venice - Trieste/Koper - Ljubljana - Maribor - Budapest - Uzhhorod - Lviv - Kyiv. 1,600 km (994 mi) long.
 Branch A - Bratislava - Žilina - Košice - Uzhhorod
 Branch B - Rijeka - Zagreb - Budapest
 Branch C - Ploče - Sarajevo - Osijek - Budapest
- VI (North-South) Gdańsk - Katowice - Žilina, with a western branch Katowice-Brno.
- VII (The Danube River) (Northwest-Southeast) - 2,300 km (1,429 mi) long.
- VIII Durrës - Elbasan - Skopje - Sofia - Plovdiv - Burgas - Varna. 1,500 km (932 mi) long.
- IX Helsinki - Vyborg - St. Petersburg - Pskov - Gomel - Kyiv - Liubashivka - Chişinău - Bucharest - Dimitrovgrad - Alexandroupolis. 3,400 km (2,113 mi) long.
 Major sub-alignment: St. Petersburg - Moscow - Kyiv.
 Branch A - Klaipėda - Vilnius - Minsk - Gomel
 Branch B - Kaliningrad - Vilnius - Minsk - Gomel
 Branch C - Liubashivka - Rozdilna - Odessa
- X Salzburg - Ljubljana - Zagreb - Beograd - Niš - Skopje - Veles - Thessaloniki. 2,300 km (1,429 mi) long.
 Branch A: Graz - Maribor - Zagreb
 Branch B: Budapest - Novi Sad - Belgrade
 Branch C: Niš - Sofia - Plovdiv - Dimitrovgrad - Istanbul via Corridor IV
 Branch D: Veles - Prilep - Bitola - Florina - Igoumenitsa

Even though the establishment of the Helsinki corridors is a unique from the Trans European transport network. The goal of PAN Corridors was to improve the transport network on the European Union and with the neighboring countries on the east and south of the Union. The Pan European Corridors covered the eastern part of Europe as an extension of the TEN on this side of continent. The infrastructure of the Pan European Network except the transport of the network on the territory of the Union includes the corridors in the central and eastern Europe, pan European transport areas and Euro-Asian links[25].

The corridors passed through countries like Czech Republic, Poland, Romania, Hungary, Estonia, Latvia, Lithuania, Slovenia, Bulgaria, and Croatia when they were first established. With last expansion of the Union in the central and east side of the continent, there was a need to incorporate these corridors into TEN-T. All the corridors which are going through the Union members are reviewed and are now part of the nine corridors of TEN-T.

In the meanwhile, the PAN Corridors that pass the Balkan are also included in the TEN T.

6. TRANS – EUROPEAN NETWORKS

Prior to delving further, it's crucial to clarify what the term “network” refers. Network is a framework of routes within a system of locations, identified as nodes. A route is a single link between two nodes that are part of a larger network which can refer to tangible routes such as roads and rail lines, or less tangible routes such as air and sea corridors. (Rodrigue et al, 2018).

The European Union has a long history of transforming and developing its transport system. Trans-European Networks were formed under the Maastricht Treaty with the goals of promoting social and economic unification within the Union and strengthening the internal market. The objective was to connect peripheral regions to the central regions of the European Union and to encourage the connectivity of national networks. In order to reach this the members were committed to establish specific guidelines which would in the future distinguish the necessary projects, development of technical standardization and uphold the financial efforts for the projects which would emerge from the specific guidelines[27]. Although the terms "Trans-European Network" encompass the sectors of transportation, energy, and telecommunications that collectively support the Union's internal market, this thesis will primarily focus on transportation in the sections that follow.

The free internal market, unrestricted passengers’ movement, and integration are all directly impacted by the Trans European Transport Network. It is inevitable that the union will not invest in transportation in order to achieve a competitive economy and reduce carbon dioxide release. The TEN-T initiatives promote social and territorial integration and a more even distribution of economic growth across the entire union.

Early in the 1990s, member states start to consider the idea of enhancing the transportation infrastructure. Only in 1996 did the union's member states publish the first set of rules and a master plan for the future development of transportation. Years later, in 1999, the rules were altered, and a specific fund was established for the expansion of the Trans European Transport

Network. The funding was evaluated multiple times [28] from that point until 2020, and additional funds were provided to finance the TEN-T.

The criteria that describe the technical requirements for the planification of the transport infrastructure and the network layout are established by the legal framework from 1996 Decision No. 1692/96/EC of the European Parliament and Council on Community[29]. Regulation (EU) No. 1315/2013, which outlines the technical standards for the infrastructure and defines the network layout[30], is the most recent and current version of the guidelines, having been changed throughout time and considering that Commission reviews these guidelines almost every ten years, then a new Regulation is expected in 2023[31]. It must be made clear that Member States are in charge of designing, constructing, and maintaining transportation infrastructure, but regional authorities frequently handle spatial planning and permit issuance.

By identifying the projects with a shared interest, the original decision's major goal was to create the fundamental principles for achieving the objectives and priorities in this field. All modes of transportation had to be included, the existing capacities had to be allowed and used, interoperability within modes had to be encouraged, and most importantly, the entire territory of the member states at the time had to be covered by the networks in order for them to be financially viable. Priorities included developing secondary infrastructure to access the network, establishing key links and interconnections to remove bottlenecks, integrating multiple modes of transportation, taking environmental concerns into account when designing networks, making the most of already-existing infrastructure, and enhancing safety.

The last revision of the guidelines and requirements were based on the white paper “Roadmap to a Single European Transport Area – Towards a competitive and resource efficient transport system”[32] with main objectives the safety and sustainability of the mobility of persons and goods, ensuring the connectivity for all regions of the union and neighboring countries.

The development of the EU's network of roads, rails, inland waterways, maritime shipping routes, ports, airports, and railroad terminals is the responsibility of TEN-T. The Trans European Transport Network itself is separated into two networks: the core network, which

includes the most crucial connections, and the comprehensive network, which includes connectivity for all of Europe. Core network completion is anticipated for 2030, while comprehensive network completion is anticipated for 2050.

Core network: This consists of the busiest and most significant transportation arteries in the EU, including the main roads, railroads, and canals. Certain technological specifications regarding capacity, speed, and compatibility must be met by the core network. For instance, the core network must have a minimum capacity of 80 million passengers annually for passenger transit and at least 2 million TEUs for freight transport.

Comprehensive network: This is made up of the remaining transport infrastructure in the EU. The comprehensive network must be of a specific standard and be able to connect to the core network, even though it does not need to fulfill the same technological standards as the core network.

The EU's transportation goals in the 90s were focused on removing barriers to free movement within the EU for people, goods, and services. The TEN-T was proposed as a means to achieve this by connecting EU regions and promoting the efficient flow of people and goods. However, as new challenges arose, the EU's objectives shifted towards digitalization, combating climate change through sustainable transportation, and reducing carbon emissions.

The EU has adjusted the TEN-T and its associated policies to better match them new objectives in response to these new challenges. For instance, the new TEN-T policy in 2013 places more of an emphasis on environmentally friendly transportation and the application of cutting-edge technology like smart mobility[30]. Additionally, the new TEN-T Regulation in 2023 will include new rules, new financing alternatives, and a new governance structure. The reviewed regulation will concentrate on a number of new topics, including financing, governance, and the incorporation of new forms of transportation like drones and autonomous cars[31].

Based on a very rich literature background it is easy to conclude that there are enough assessment methods for transport infrastructure. Each of them has their principals' advantages but also limits. Based on the own elaboration these assessments are divided on:

1. Socio economic assessment

2. Environmental assessment

1. Socio-economic assessment itself include:

Cost-benefit analysis: This assessment considers the social and private impacts in monetary values. This study can produce clear indication of the economic viability of a transport project.

Financial impact analysis: This assessment considers more the financial outcome for businesses and success of private of companies. This analysis ignores the social impacts.

Cost efficiency analysis: The assessment aims to prove an index of efficiency of the investment costs, however, the main problem with the analysis is the indication of the index of the efficiency.

Regional economic impact analysis: The assessment principle is the estimations of the impact on the regional development. However, there is no clear standardization for this assessment and depends on the comparability of the regions which in many cases can be limited considering that regions are in the same nature, economic development and structure.

2. Environmental assessments are:

Standard environmental analysis: Quantifies the environmental risks on people and nature in a wider range.

Environmental impact analysis: Assess the impact of the transport projects in narrow range by focusing on local impact. This can have bad results in a wider range of the impact as the analysis take into consideration the impacts of specific projects neglecting the outcomes of the projects which might be in the same area.

Climate impact analysis: The assessment focus on the gas emissions from the outcomes of a transport infrastructure.

All these analyses try to determine which projects within TEN-T should be implemented, to assess their advantages and disadvantages and their technical and financial requirements. However, the final decision on the implementation will likely remain a political one. If the political decision makers focus on the short-term impact, they will mostly ignore the above-

mentioned analysis, leaving the projects with negative impact as in financial also environmental aspect in the long term.

At the present, planning takes independently on the national level, with minimum international cooperation. As the consequence the decisions are in national level, leaving the EU with minimum influence on them. Different national evaluation approaches leave at the end with different strategies. An entire network analysis is not easy due to hardly comparable inputs from different countries.

The impact of these network in the socio-economic development of Europe.

Numerous studies, particularly those relating to the TEN-T network, have examined the advantages of funding transportation infrastructure.

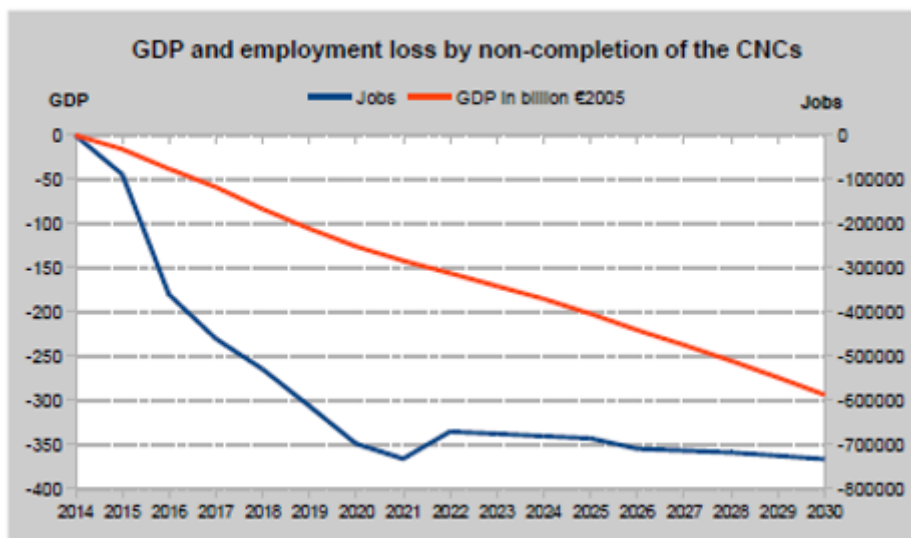
For instance, according to research by the European Commission, every euro spent on TEN-T infrastructure can provide 2,5 € in additional economic advantages, including increased commerce, increased productivity, and the creation of jobs. According to different research by the European Commission, lowering traffic on TEN-T highways could shorten travel times by up to 20 %, providing an annual economic benefit of 20 billion €. According to the European Investment Bank (EIB), by 2030, TEN-T investments might generate up to 1,7 million new employments.

Transport investment can lead to job creation in a variety of ways. For example, building new infrastructure such as highways, airports, and public transportation systems can create jobs for construction workers, engineers, and other professionals. Additionally, improving transportation options can make an area more attractive to businesses, which can lead to job growth in the region. Furthermore, investment in transportation can also lead to the growth of logistics and supply chain industries.

A study by the Fraunhofer Institute for System and Innovation Research has shown the significance of the TEN-T network for the future of Europe, highlighting the consequences and costs of non-completion. The GDP of the EU would be 1.8 % lower in 2030 as a result of the TEN-failure to be completed by that date. The second more general economic effect has to do

with employment. Without the core TEN-T, approximately 730.000 employments would not be produced in 2030. If these job losses were to continue from 2015 through 2030, the core TEN-T would have produced an additional loss of 10 million jobs in the EU. This indicates that close to 20.000 jobs would be created for every billion € invested in the core TEN-T. They also discovered that the more vulnerable low skilled employee groups would have profited excessively from the introduction of the core TEN-T.[33]

Figure 9: Loss of GDP and jobs between 2015 and 2030 by non-completion of TEN-T Core Network[33]



They discovered that failing to complete the cross-border projects along the nine core network would result in a 43 billion € reduction in investment. The EU GDP would decline by 86 billion € in 2030. Between 2015 and 2030, the cumulative GDP loss would be 725 billion €. In 2030, fewer jobs would be created, and from 2015 to 2030, the number of jobs lost as a result of not finishing the cross-border projects would be close to 1,9 million.

The consequences of not completing innovative technologies along the nine-core network are comparable in magnitude. In 2030, there would be a 41 billion € decline in investments, which would result in an 89 billion € decline in GDP. In 2030, there would be over 200.000 unfilled positions. The total loss of GDP is 723 billion €, and between 2015 and 2030, 1.9 million jobs are not expected to be generated.

Their estimates show that putting in place the core TEN-T network by 2030 will give the European economy a significant boost, boosting GDP and employment. Additionally, they

contend that the employment that would result will disproportionately benefit less skilled employees and other weaker groups[33].

One of the main goals of the TEN-T is to reduce bottlenecks and improve the efficiency of cross-border transportation, which is crucial for the smooth functioning of the EU's single market. Single market defines an area where the trade borders have been removed and there are free movement of goods, services and people[34].

The TEN-T focuses on eliminating physical, administrative, and technical barriers that impede the free flow of goods, people, and services across the EU. This includes improving the infrastructure and equipment at border crossing points, as well as streamlining customs procedures and other administrative formalities. The TEN-T also aims to promote the interoperability and compatibility of different transportation systems across the EU, such as trains and roads, to ensure that vehicles and cargo can move seamlessly between different countries.

The experience in EU nations reveals that there is a lack of coordination between the member states' projects and strategies. The policy, which beside the EU states also includes the countries of the Western Balkans, are not subject to any obligations[30]. These states are not required to submit their transportation strategies and plans to the Commission. This resulted in a significant misalignment of the countries. Furthermore, the Commission lacks the legal authority to force the member states to carry out any of the corridor projects.

The funding of these networks has an effect on the obligation's lack of force as well.

Combining the data provided by Panagopoulos and cited in CE et al. (2012), national financing contributes in TEN-T projects with 73 % and EU co-financing with 27 %. The latter consists of co-financing from the EIB (14 %) as well as the TEN-T Fund (2 %), Structural and Cohesion Fund (ERDF/CF), and 11 %.

The EU allocates funds for the Trans-European Transport Network (TEN-T) through two financial instruments, including the Connecting Europe Facility (CEF) and the European Structural and Investment Funds (ESIF). The allocation of funds is determined by a set of

standards and priorities established at the EU level. The European Commission, the European Parliament, and the EU member states consult with each other and negotiate these standards and priorities.

The TEN-T guidelines, which are routinely updated to reflect changes in EU policy and strategic aims, outline the financing priorities. The guidelines outline the top priorities for funding the transportation system, such as creating transnational corridors, finishing off remaining links, modernizing existing infrastructure, and using cutting-edge technology and alternative fuels[35], [36].

However, TEN-T funding criteria employed by the European Union (EU) may have several shortcomings or restrictions. The EU's selection criteria may contain some aspects that are open to interpretation and judgment. The EU's selection criteria may focus on particular features of a project's proposed, such as its financial impact or environmental sustainability. This could result in some projects being given higher priority than others, even if they have additional advantages or disadvantages that are not considered in the selection criteria.

Whether intentionally or unconsciously, bias has the power to influence the selection process. Several things, including interpersonal connections, political considerations, or lobbying efforts, may have an impact on this.

The projects, especially the ones in Western Balkan are very much depended on the political decisions. An example of this is the construction route 6 in Kosovo which connects the Kosovo with North Macedonia, and which is part of TEN-T. Kosovo has already completed the construction of the highway 6 years ago, while North Macedonia is only now at the beginning of the procurement to begin with construction of their part.

Even though research on socioeconomic and environmental issues are scarce, those that do exist rarely take these factors into account when evaluating a project. Politicians and those who advocate for these initiatives frequently fail to take into account the Cost-Benefit Analysis (CBA) when making decisions. This was the case, for instance, for a section of high-speed rail

in France that received EU co-funding despite the CBA's recommendation that the project's socio-economic costs would likely outweigh its benefits.

Before allocating EU co-funding to these TEN-T, the Commission does not have any models or specific data gathering procedures in place to independently assess the potential for passenger and freight traffic using these projects[37]. However, the major emphasis should not be on the number of kilometers of motorways, rail, or tunnels built, but rather on broader issues like how passengers use the infrastructure, how to optimize passenger traffic flow, or how to reduce travel time.

According to the academic standard for passenger high-speed rail, these lines need to carry 9 million passengers who live within a 60-minute commute each year in order to be financially viable. The instances for two TEN-T projects are shown below with this indication[38].

TEN-T Project: Rail Baltica	Promoters CBA analysis	Other analysis
Section 1: Baltic states	2017 CBA: 4,6 million passangers	European Court of Auditors: 3,8 million of passangers
Section 2: up to Warsaw	CBA: 8,3 million passangers	--
TEN-T Project: Fehmarn Belt	Promoters CBA analysis	Other analysis
Section: Copenhagen and Hamburg	CBA: 7,7 million passager	--

Source: Eurostat, European Court of Auditors

The European Court of Auditors, who have access to these CBAs, claim that TEN-T projects lack high-level analysis, which means that not all national and regional stakeholders are taken into account. This may result in expenses and benefits from a particular project not being distributed completely among the regions and countries impacted.

The European Court of Auditors frequently examines the TEN-T projects because some of the funding is coming directly from the EU. Even though they frequently criticize shortcomings in all dimensions, they typically place more emphasis on the short-term financial aspects of shortcomings while ignoring the longer-term socioeconomic shortcomings. According to their results in their most recent audit report from 2021, which focused on eight key TEN-T projects,

ongoing delays drive up the starting price by 47 %. Such delays have detrimental effects on not only the financial situation but also on other areas, particularly on road projects where they cause congestion, bottlenecks, and decreased road safety on neighboring highways. Highway development has its own effects on the environment; over the course of 50 years, 1,6 km of new highway will result in an increase in CO2 emissions of more than 100.000 tons[39]. The Court of Auditors, however, frequently overlooks environmental considerations.

The entire European Union and neighboring countries are meant to be connected by the TEN-T network, however the center regions typically receive the most investment, which stunts growth in the periphery.

A master thesis from TU student Victor Weber on Integration effects of the Trans-European Traffic networks on central areas and periphery shows that the TEN-T have more desirable effect on the central areas rather than peripherals areas. But before we need to define what is exactly a peripheral area. For many authors peripherality can be defined in geographical terms resulting mainly from the lack of accessibility and/or economic and political importance when compared to the central area.

The thesis examen the impact of TEN-T on the process of European integration, with a particular emphasis on the 2001–2011-time frame. The study takes take a comprehensive approach by analyzing Europe as a whole, as well as delving into the specifics of Austria and Portugal showing the differences in the economic growth. His findings show that the GDP growths in higher levels compare to the ones in the peripherals areas such as Portugal which have low and slow GDP growth.

These findings follow the question: will these differences between the central and peripheral areas growing with the Trans European Transport networks? The tendency shows that the current plans for the TEN -Ts that the difference will increase having in mind only the nodes of the network. The TEN-T nodes are key points or locations within these networks that serve as important hubs for transportation. These nodes connect various regions and cities within the EU and help to promote economic growth, reduce isolation, and enhance the overall functioning of the EU's single market. Examples of TEN nodes include major airports, seaports, and intermodal transportation centers[40].

The highest number of the most important nodes are located in the central areas of EU creating an even stronger central pattern. Countries with more developed transportation infrastructure and economies will see more benefits from the TEN-T, as they have more resources to invest in and make use of the improved infrastructure. Central European countries, such as Germany, France, and the Netherlands, are likely to benefit the most, as they are major transportation hubs in Europe, and the TEN-T program aims to connect these hubs to other parts of the EU. Additionally, the TEN-T program also focuses on areas that are less developed, but with potential for growth and development, these areas are expected to benefit the most.

6.1. TEN-T AND WESTERN BALKAN

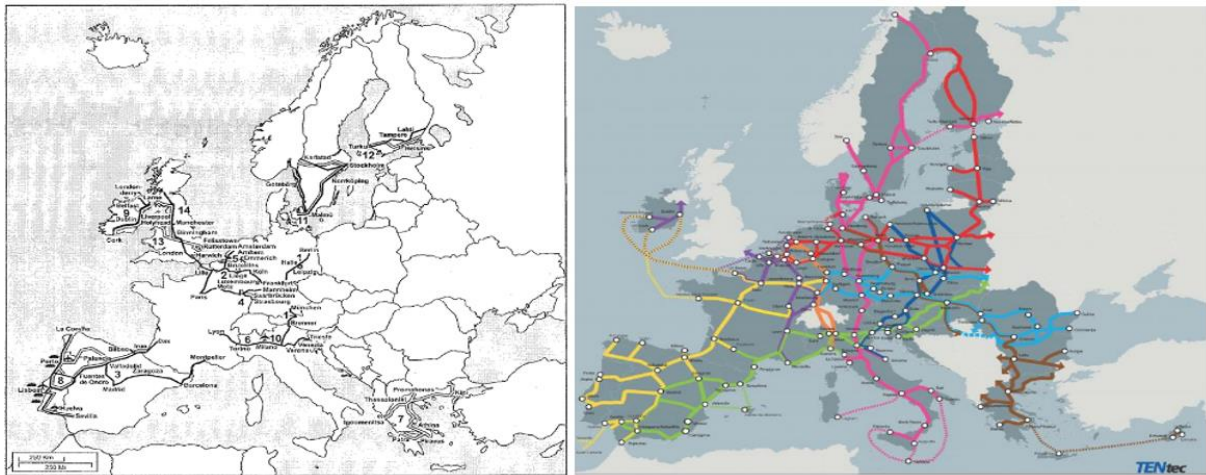
Transport is a crucial industry in WB, not only because it employs 5 % of the region's workforce but also because it provides a link to the rest of the European Union, which in turn helps WB countries' economies and promotes citizens' freedom of movement.

The six Western Balkan countries, including Croatia, established an organization to focus solely on developing the regional transport network in order to develop the transportation infrastructure. The governments of Albania, Bosnia and Herzegovina, Croatia, North Macedonia, Serbia, Montenegro, and the United Nations Mission in Kosovo formed "The South East Europe Transport Observatory" (SEETO) in June 2004. This organization's goals included extending the TEN-T network to the Western Balkans and harmonizing regional regulations and standards. The successor of SEETO is "The Transport Community," which has the same goal but a different name. The European Council decision EU 2019/392, which founded the Transport Community in 2017, set up its primary objective as integrating Western Balkan transportation into the EU. This organization's goals include raising standards, enhancing infrastructure, enhancing connectivity between the Western Balkans and the EU, and improving people's and businesses' quality of life. The intention is to boost the region's competitiveness and employment levels through this. This organization includes not only the six WB nations, but also the other EU members who assist the WB nations in adopting and implementing UE transportation laws as well as capital investment policies that are connected

to the WB nations' membership to the EU. The oversight of the implementation of projects related to the Trans European Network - Transport is one of the organization's many duties.

There are currently 30 priority projects[30], which are a component of the Core Network Corridors, and they were added as the EU expanded over the years. There are now nine TEN T Core Network Corridors (Baltic – Adriatic, North Sea – Baltic, Mediterranean, Orient – East Med, Scandinavian – Mediterranean, Rhine – Alpine, Atlantic, North Sea – Mediterranean, Rhine – Danube). The Core Network Corridors' top priorities are to improve cross-border connectivity, remove any potential barriers to free movement, integrate several means of transportation, and improve technical compatibility[41]. 34.401 km of the TEN T's total transport corridors are made up of roads[14].

Figure 10: TEN T Corridors in 1996 and TEN T Corridors in 2022[14]



The EU aims to create an integrated transportation system because it will help to strengthen the single market and make the EU more competitive on a global basis. Since the Balkans are the EU's nearest neighbor and the future of the region lies within the EU, as stated by all European and Balkan political leaders, the TEN T must also be expanded in this area. The Union's commitment to this region is communicated through a number of initiatives in addition to being highlighted at the highest political level.

Indicative extension of 5.284 km of TEN T roads (3.540 km Core Network) and 3.857 km railroads (2.602 km Core Network), are planned with Regulation 1315/2013. There are plans to extend inland waterways, seaports, waterways ports, and airports in addition to highways and railroads[15].

Figure 11: Indicative extension of TEN T in Western Balkans[16]



The road Core and Comprehensive Network consists of:

Corridor/ Route	Country	Network	Length [km]
Corridor Vc	Bosnia and Herzegovina	Core and Comprehensive	Core – 400 Comprehensive - 400
Corridor VIII	Albania, North Macedonia	Core and Comprehensive	Core – 546 Comprehensive – 657
Corridor X	North Macedonia, Serbia	Core and Comprehensive	Core – 726 Comprehensive – 726
Corridor Xb	Serbia	Core and Comprehensive	Core – 185 Comprehensive - 185
Corridor Xc	Serbia	Core and Comprehensive	Core – 110 Comprehensive – 110
Corridor Xd	North Macedonia	Comprehensive	Comprehensive – 110
Route 1	Bosnia and Herzegovina, Montenegro	Core and Comprehensive	Core – 147 Comprehensive – 126
Route 2a	Bosnia and Herzegovina	Core and Comprehensive	Core – 228 Comprehensive – 228
Route 2b	Albania, Bosnia and Herzegovina, Montenegro	Core and Comprehensive	Core – 53 Comprehensive – 395

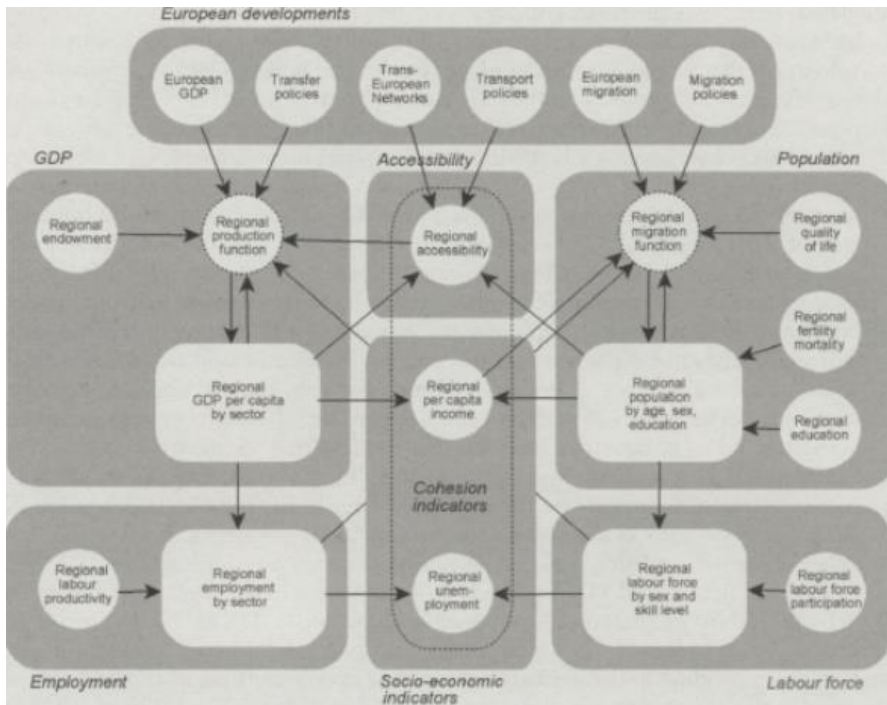
Route 2c	Albania	Core and Comprehensive	Core – 125 Comprehensive – 125
Route 3	Bosnia and Herzegovina, Serbia	Comprehensive	Comprehensive – 185
Route 4	Montenegro, Serbia	Core and Comprehensive	Core – 601 Comprehensive – 601
Route 5	Serbia	Comprehensive	Comprehensive – 213
Route 6a	Nort Macedonia, Kosovo, Montenegro, Serbia	Core and Comprehensive	Core – 259 Comprehensive – 84
Route 6b	Kosovo, Montenegro	Comprehensive	Comprehensive – 205
Route 7	Albania, Kosovo, Serbia	Core and Comprehensive	Core – 314 Comprehensive – 314
Route 8	North Macedonia	Comprehensive	Comprehensive – 78
Route 9a	Bosnia and Herzegovina, Serbia	Comprehensive	Comprehensive – 228

The European Commission report in 2020 on the Core and Comprehensive Network in Western Balkans points out that only 45 % of the Core Network (for all modes) and 51 % of the Comprehensive Network (for all modes) is compliant with the criteria set out by the Regulation 1315/2013 on the TEN T. Therefore, a very challenging goals to be completed are ahead of this region and the only way to reach these goals and comply with the regulation on TEN T, a powerful support from EU toward WB countries including here financial backup is required.

However, the socio-economic development of these Western Balkans countries is not increased so much from the investment on this transport infrastructure as much as the entering the European Union itself.

Klaus Spiekermann and Michael Wegner using SASI model which is a simulation model of the socio-economic development of regions in Europe foresee the development of the accessibility, GDP per capita and employment in these countries.

Figure 12: SASI Model[42]



Simulating three scenarios: 1. How the development would take place if there was no EU enlargement in these countries but only investment in transport infrastructure. 2. Enlargement of EU, without the transport in narrow sense of the scenario. 3. Except the TEN-T priority projects, the projects in transport in these countries are considered.

In terms of accessibility the enlargement of EU in this region shows the main impact and with investment in transport increases the impact but in lower effect. However, compared this to the already EU regions, the impact of the infrastructure with enlargement combined has a very strong effect[42]. Just like the accessibility effects the socio-economic effect of enlargement is much larger than those of transport infrastructure. However, it must be remembered that the Western Balkans are not spherically comparable as the Portugal or Spain region.

As we can see, the enlargement would cause these nations' regulations to harmonize, which would make it simpler for organizations and people to comply with regulations and traverse borders more quickly. Due to the ease of member state cooperation in managing the flow of people and goods, the operation of the customs itself would be more effective. The management of borders would be another factor that might result in the adoption of the EU Schengen border management, which would help to enhance management and security.

Spending money on transportation infrastructure alone is not a reliable sign of increased socio-economic growth. This is expressed in light of the fact that, despite funding from the EU, the countries themselves are mostly responsible for establishing the TEN-T networks.

However, it's important to keep in mind that putting massive infrastructure projects into action may be complicated and tough, and that there might be certain challenges and disadvantages related to TEN-T investments. For instance, certain EU member states may find it difficult to afford the pricey and considerable financing required for TEN-T initiatives. Coordination problems with investments between nations and regions may also exist, which can cause delays and cost overruns. Additionally, local populations and environmental organizations might oppose TEN-T developments. The fact that the TEN-T initiative is not distributed uniformly across the EU and that some regions are less likely to gain from it is another one of its drawbacks. Furthermore, it might not address the accessibility and connectivity issues in some outlying and distant areas.

According to research conducted by the European Environment Agency (EEA), the development of TEN-T infrastructure may have detrimental effects on the environment, including climate change, biodiversity loss, and air and water pollution. The implementation of TEN-T projects has been hampered by delays and cost overruns, which have raised the overall cost of TEN-T projects, according to the European Court of Auditors.

While studies and reports to date indicate that TEN-T investments can have a positive impact, it's crucial to remember that the precise advantages will depend on the individual projects and the environment in which they are carried out. Additionally, depending on the condition

of their transportation infrastructure, their economic status, and their political environment, TEN-T investments may have varying effects in various countries and regions.

7. INVESTMENT IN WESTERN BALKAN

After the conflicts in the Western Balkans came to an end, the European Union and other international financial organizations encouraged the development of the transport, energy, and other essential sectors that were related to the economic development of the region.

Only for the development of the region's transportation and energy infrastructure more than 11 billion € in total were granted and loaned from EU and other financial institutions since the 1990s.

International Financial Institutions (IFIs) have a significant impact on the development of the countries which prior need to be members of these organizations. These organization infuse money mostly in developing countries to raise the social and economic aspects. Their position comprises providing finance, guidance, and assistance with project implementation in such countries.

By providing loans, credits, and grants to developing countries, the hope is to decrease poverty, raise living standards, and promote regional cooperation and integration on a sustainable economic and social basis.

Despite their independence, the states who founded these international organizations still have a role in the decisions made, based on the voting strength of each member state. In many circumstances, this calls into question the institutions' independence, although each institution is ultimately accountable for its own decisions. As a result, these institutions are held largely accountable for their work, with the member states being held second in line. The rationale behind this is that these organizations have the authority to act in ways that member states acting alone are not permitted to[43].

Additionally, the organizations integrate financial activities that, by their very nature, may be hard to discern from private financial institutions. In addition to their effects on the economy and society, these organizations' operations have a big impact on the environment since they influence how the member states apply environmental protection and climate change regulations.

The most noteworthy financial institutions which also operate in Western Balkans are:

- World Bank Group;
- European Bank for Reconstruction and Development (EBRD);
- European Investment Bank (EIB);
- the Kreditanstalt für Wiederaufbau (KfW).

Except for the fact that these organizations give all required support, with the condition that their rules and regulations need to be followed, the projects that are funded by these institutions are carried out by the borrowing countries themselves. The project life cycle is the same regardless of which institutions are involved. A feasibility study, design, planning, implementation, completion, and evaluation are all steps in the process.

The borrowing nations must take the initiative; they must choose a project and submit a funding request. It is advisable to first carry a feasibility assessment before moving forward with the project.

The funding and implementation of the project must be negotiated between the borrower and the relevant institution. The funding agreement, which specifies how the money will be distributed, is signed as soon as an agreement has been reached and the institution's board has given its approval for the project.

The borrower bears the responsibility for executing the project, with International Financial Institutions (IFIs) playing a relatively limited role. IFIs primarily participate in the procurement process, which they opted to oversee in light of corruption concerns in the Balkans.

The project's evaluation, which is typically carried out by the IFI itself, concludes the process and gives IFIs a greater understanding of the country for potential future investments.

Typically, the governments that borrow money from these institutions do so for large-scale projects. Borrowers, especially those in the Western Balkans, lack the internal resources necessary to carry out such huge projects. As a result, consultants might be hired through an international competitive bid process for phases like feasibility, design, preparation, or supervision. The same is applicable to businesses that provide goods, services, equipment,

and other non-consulting services. The borrowing country can hire consulting or non-consulting firms, but these contracts must be made in accordance with the rules of funding institution for hiring consultants as well as the rules for hiring goods and services. Each institution has its own set of procurement policies, but there are few significant differences between them.

Table 3: IFI Funding in Western Balkan

World Bank (data until 2019)		KfW (data until 2021)		EBRD (data until 2022)		EIB (data until 2021)	
Albania	€ 814.700.000,00	Albania	€ 941.000.000,00	Albania		Albania	
Kosovo	€ 391.400.000,00	Kosovo	€ 286.000.000,00	Kosovo		Kosovo	
North Macedonia	€ 382.100.000,00	North Macedonia	€ 295.000.000,00	North Macedonia		North Macedonia	
Serbia	€ 2.100.000.000,00	Serbia	€ 1.588.000.000,00	Serbia		Serbia	
Montenegro	€ 86.800.000,00	Montenegro	€ 477.000.000,00	Montenegro		Montenegro	
Bosnia and Herzegovina	€ 398.200.000,00	Bosnia and Herzegovina	€ 549.000.000,00	Bosnia and Herzegovina		Bosnia and Herzegovina	
Total	€ 4.173.200.000,00	Total	€ 4.136.000.000,00	Total	€ 15.000.000.000,00	Total	€ 8.900.000.000,00

Source: World Bank, KfW, EBRD, EIB

There are some donors which help WB for the projects in WB. Those are: The Austrian Government, the Danish International Development Agency, the Global Environment Facility, and the Swedish International Development Agency continue to be important partners in the SEE.

In addition to the aforementioned international financial organizations, the European Union has been funding initiatives in the Western Balkans as part of pre-accession assistance since 2007. The transition support and institution building, cross-border cooperation, regional development, human resources development, and rural development are the main areas of concentration for EU financing in WB[44].

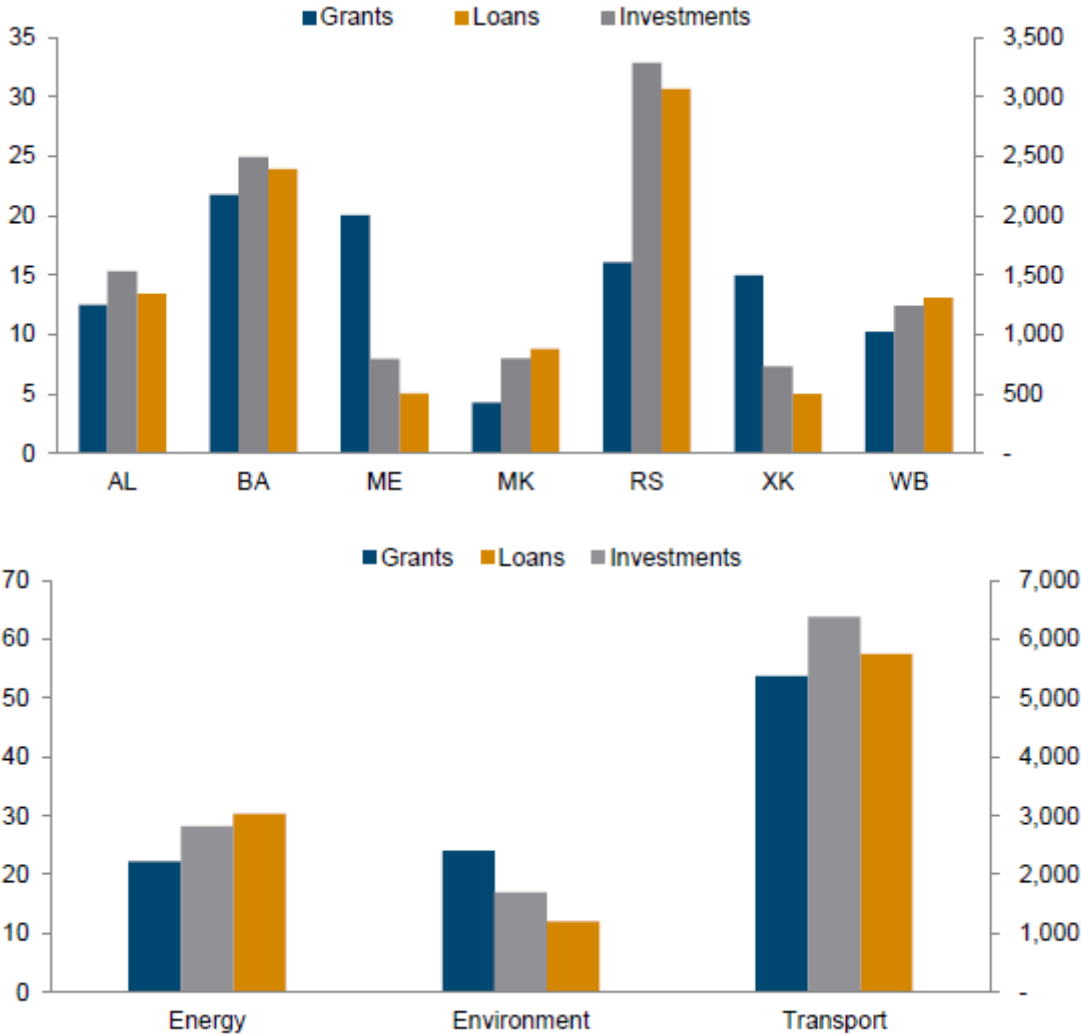
A total of approximately 37 billion € has been assigned to support the integration of Western Balkan countries, distributed among IPA I, IPA II, and IPA III. IPA I was allocated 1.1 billion € between 2007 and 2013, while IPA II also received 1.1 billion €. IPA III, on the other hand, was assigned 14,162 million € [45][46][47].

The Western Balkans Investment Framework (WBIF), which was established in 2009 by the EU and other financial organizations and donors, contains funds from the IPA allocated to the Western Balkans as well as funds from other partner organizations like the EBRD, EIB, KfW,

CEB, World Bank. Only in the public sector infrastructure are grants and loans totaling over 23 billion € planned for the WB. Austria, Sweden, and Norway are the top three contributors to the investment framework, together with the EU and other international financial institutions.

The image below illustrates that the WBIF solely focused on infrastructure investments from 2009 to 2017. The total investment value, grants, and loans shares are presented in percentages. Although the WBIF also carries out investments in the energy and environmental sectors, the transport infrastructure receives the highest amount of investment.

Figure 13: Grants, Loans and Investment of WBIF in Western Balkan[48]



However, the IFI loans are the main contributor on the improvement of the transport infrastructure, where most of the WB countries have the main source to fund the

transport project. Except Kosovo and Albania which use their national budget as the main source. This also originates from the construction of the "Rruga e Kombit" motorway, which was used by the politicians of the day in both nations to advance their respective cross-border national agendas[23].

8. KOSOVO

The recent history of the Balkans is described with wars, starting from the world wars and Balkan wars. Yugoslavia, which incorporated most of the western Balkan nations we are familiar with today, was the most powerful country in the Balkans during the 20th century. Kosovo was also a part of this federation, although with very little rights, including here the economic and social rights. The Yugoslav Communist Party at the time severely restricted Albanians' ethnic rights in Kosovo, which is now and historically home to a majority of Albanians[49].

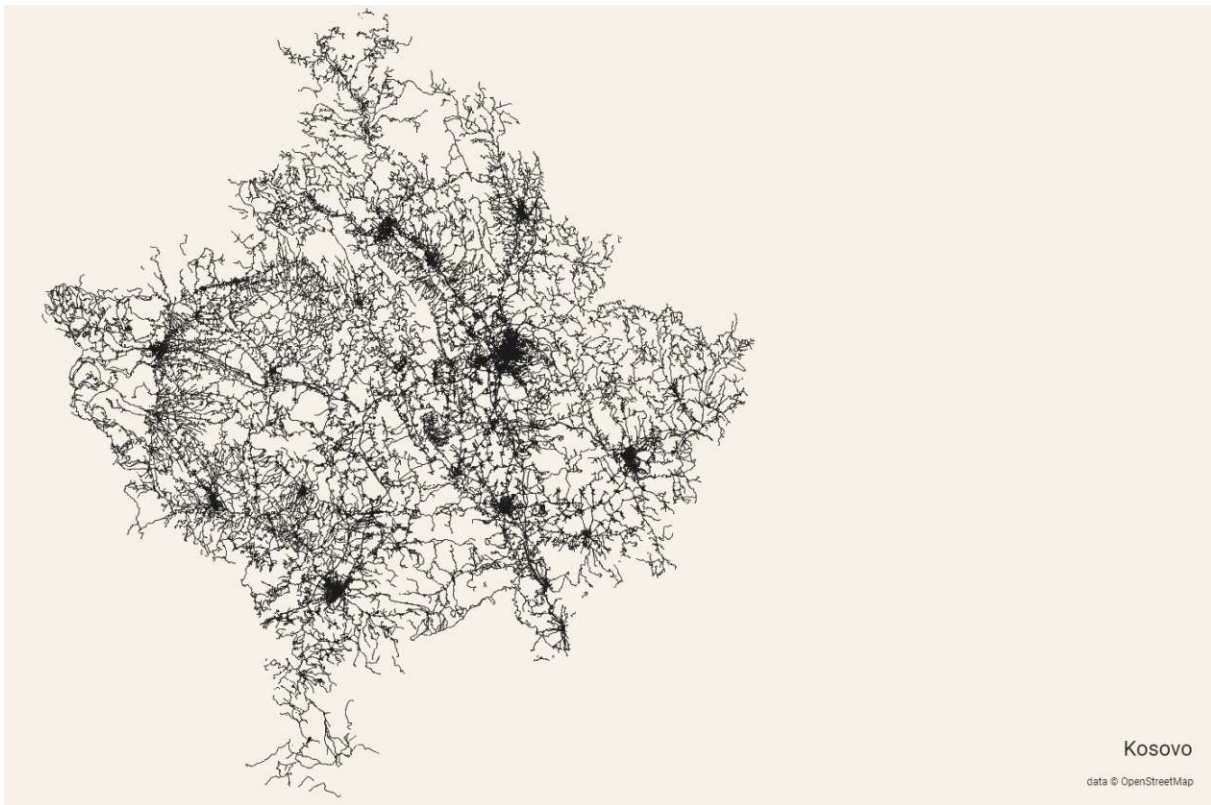
Due to the federation's uneven rights and Serbia's ongoing oppression—which was also the possessor of the so-called province of Kosovo—protests against the then-regime in Kosovo started and culminated in conflict in 1997–1999. After the conflict, the UN established the Interim Administration Mission in Kosovo, which governed the country up until 2008, when the Kosovo people declared their independence as a nation and took over governance on their own without any outside interference.

EU partnerships with Kosovo were formally established in 2002. Kosovo signed the Stabilization and Association Agreement with the EU in 2016, making Kosovo a prospective member of the EU.

The size of Kosovo is 10.905,25 km². It shares borders with Serbia to the north-east, Montenegro to the north-west, North Macedonia to the south, and Albania to the southwest. 28 % of Kosovo's 1,78 million residents, or its entire population, are under the age of 14[50].

Roads, railroads, and aviation are the three main transportation modes in Kosovo. Since the rail infrastructure in Kosovo is in terrible shape, 95 % of all transportation is done by vehicle[51].

Figure 14: Road network in Kosovo



The majority of Kosovo's roads were constructed in the 1960s, but because of the war, a sizable portion of the network had to be rebuilt or constructed from scratch from the beginning of 2000. As a result, the network is generally in decent condition when compared to other countries in the region.

The 137 km-long motorways, the 750 km-long national road, and the 1.495 km-long regional road make up Kosovo's roads. Local roads make up the final category; they contain both urban and rural roads, bringing the total length of Kosovo's road network to 8.500 km[50]. For a period of ten years, it is predicted that maintaining and improving Kosovo's current main and regional road network will cost 48 million € annually[52].

The rail infrastructure consists of 330 km of rail which connects the main cities of Kosovo and Kosovo with North Macedonia. The rail track from Kosovo to Serbia are not operative at the moment. Only 40 % of the network is operational since the condition of the rail infrastructure is deplorable. Low maintenance and poor safety on the cross rails result in numerous fatal accidents every year.

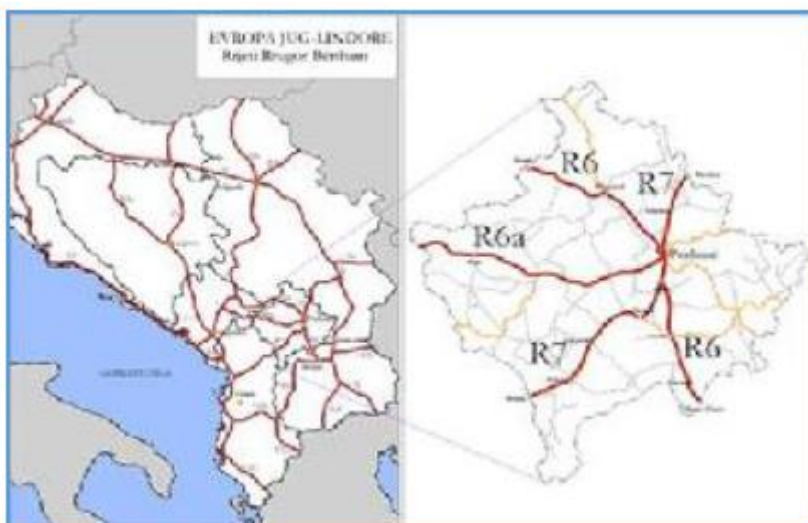
The first rail, which connects Mitrovica to Thessalonika via Skopje, was constructed in 1874, very early in the industrial revolution. A new rail route linking Pristina, Fushe Kosova, and continuing to Peja was constructed in 1934. While the rail line connecting Pristina to Nis in Serbia via Podujava was constructed in 1947, it is no longer in use as a result of the Kosovo War. From Prizren to Peja, the last rail route was constructed in 1963[49].

Kosovo owns two airports, although only one of them is currently in operation. One of the busiest airports in the region is located near to Pristina, the capital city.

With the expansion of TEN T into the Western Balkans, it is expected that Kosovo will have better access to EU markets as well as regional markets, enhancing the economic stability of the youngest nation in Europe. Part of the Core and Comprehensive network of the TEN T are also two roads in Kosovo, route 6 and route 7.

When the Pan Euro Corridors were setup in the conference of Crete in 1994, Kosovo was not an independent country and was under the Yugoslavia federation with unequal rights compared to other member states. Because of this, Kosovo, was left out of all 10 corridors even though it is located in the middle of the Balkans and Corridors would have a far better connection. However, Kosovo was able to construct the route 6 and route [40] which are a link of Kosovo to Corridors 8 and 10.

Figure 15: Route 6 and Route 7 in Kosovo which are part of TEN T[40]



For the years 2015 to 2025, Kosovo has created a transport strategy and action plan. A number of important goals have been outlined in the action plan, including maintaining the current infrastructure that is linked to pan-European corridors, enhancing safety measures, improving transportation quality, including multimodal enhancement, upgrading road services like maintenance and construction, and boosting public transportation. Moreover, the initiative seeks to enhance rail services and build a rail connection to Albania. Since there is no port or maritime transportation, the policy seeks to improve connectivity to surrounding ports in other countries. In order to enhance both general traffic safety and road safety particularly, Kosovo also adopted a separate road safety strategy and action plan in 2015. The transport strategy also plans to become a member of numerous international transportation organizations.

Most of Kosovo's goals from the list of above ones have not been met until now. In Kosovo, for instance, the statistical office reports a continuous decline in the number of people using public transportation, particularly rail transportation. In the meantime, the number of cars is rising while the number of kilometers of roads remains the same. The number of fatalities on the roads is still shockingly high when compared to EU members. For instance, in 2010, there were 100 fatalities per 1 million inhabitants, compared to 63 in the EU, and more recently, in 2018, there were 74, with 50 fatalities when compared to the EU[53]. The expansion of the railway with Albania, where a feasibility study has already been started, is one goal that Kosovo is still working toward because it would enable a connection with the port of Durrës.

From 2007 onward, Kosovo has received financial support totaling more than 1.7 billion € as a result of signing the Association and Stabilization Agreement with the European Union, which is a necessary condition for entering the Union. Since 2009, 180 million € have been provided as a grant to Kosovo only for transportation under the WBIF. The EU intends to finance the building of a further 23 km of highway and the rehabilitation of a 213 km railway line through grants and loans from 2022 until 2030[54].

Over 400 million € have been lent or granted to Kosovo by the World Bank through the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA) since 2014. Must emphasize that none of these money were used in the transport sector.

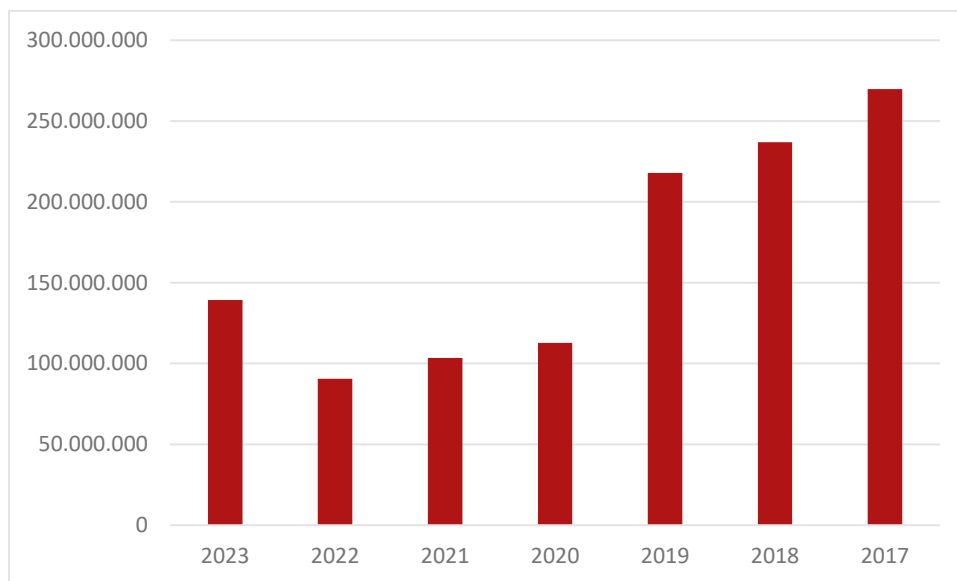
The EBRD and other significant financial organizations have so far invested through loans 636 million€ in Kosovo. Only 172 million € were spent on transportation (road and rail), with 71 million € going toward Route 6's Highway Kijeve-Zahaq segment[55].

Over 300 million € worth of projects were sponsored by the European Investment Bank in Kosovo, some of which were through the WBIB (12 million €). 122 million € were spent exclusively on transportation, the road part of Route 6 Kijeve -Peje[56].

Over 280 million € have been spent in Kosovo by KfW, primarily in the energy sector. KfW does not invest mainly in the transportation industry[57].

On the other hand, Kosovo's own budget allocated for transport has decreased during the past five years. From the budget allocation it appears that Kosovo's focus is in transportation development more than in other sectors.

Figure 16: The national budget of Kosovo for transport in the last 7 years



9. IMPACT OF TEN-T NETWORK EXPANSION ON KOSOVO

9.1. TEN-T IN KOSOVO

The goal of the European Union is to have its surrounding countries, in this instance the countries located in Western Balkans, which also share the aspiration for joining the EU in the future to have the same degree of development as the members of EU. One way to reach this objective, the Transport Community has decided to expand and to include this region in the TEN-T. To address the need for high-quality infrastructure in the regions and to close development gaps, the EU committed to an unprecedented financial stimulus in this area.

The responsibility for financing a TEN-T extension in the Western Balkans does not fall solely on the European Union, but also on the participating countries who have pledged their own national funds. It's estimated that the overall cost of expanding the TEN-T network in Kosovo will be approximately 2.2 billion €.

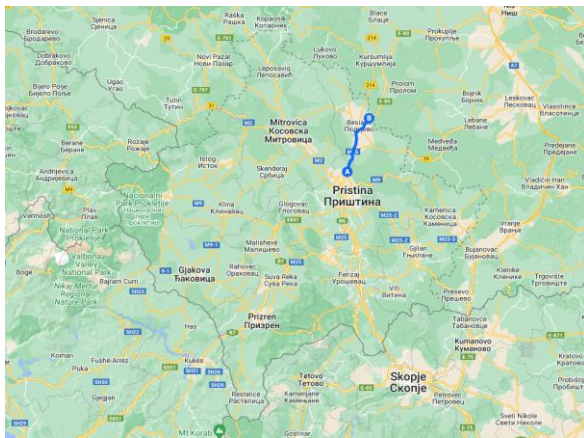
Since gaining independence in 2008, Kosovo's annual budget, which is particularly small for a developing country[1], has averaged roughly 2.1 billion € [59]. Since the first highway, Route 7 Section 1's construction, began, the expected cost of completing Kosovo's TEN-T network, at 2.2 billion €, has averaged roughly 122 million € per year, placing a substantial load on the nation's budget. In comparison to Kosovo's average economic growth rate of 4.2%[60] over the same time, this equals an average annual expenditure of 7% of the national budget. Only 8% of the investment in this extension in Kosovo has come from EU grants, with the rest coming directly from national funds or loans that Kosovo will have to repay.

Table 4: The load of TEN-T projects in national budget of Kosovo

Year	Total Budget	Average investment per year in TEN-T		Economic growth
2008	€ 1.200.567.340,00	€ 122.222.222,22	10%	3,0%
2009	€ 1.201.259.610,00	€ 122.222.222,22	10%	5,0%
2010	€ 1.236.250.170,00	€ 122.222.222,22	10%	4,9%
2011	€ 1.414.927.737,00	€ 122.222.222,22	9%	4,3%
2012	€ 1.512.647.064,00	€ 122.222.222,22	8%	1,7%
2013	€ 1.591.512.602,00	€ 122.222.222,22	8%	5,3%
2014	€ 1.613.199.726,00	€ 122.222.222,22	8%	3,3%
2015	€ 1.634.886.850,00	€ 122.222.222,22	7%	5,9%
2016	€ 1.678.709.487,00	€ 122.222.222,22	7%	5,9%
2017	€ 2.001.020.477,00	€ 122.222.222,22	6%	4,8%
2018	€ 2.080.480.837,00	€ 122.222.222,22	6%	3,4%
2019	€ 2.378.231.797,00	€ 122.222.222,22	5%	4,8%
2020	€ 2.620.368.600,00	€ 122.222.222,22	5%	-5,3%
2021	€ 2.454.209.105,00	€ 122.222.222,22	5%	10,7%
2022	€ 2.735.749.600,00	€ 122.222.222,22	4%	4,2%
2023	€ 3.211.603.100,00	€ 122.222.222,22	4%	3,3%
2024	€ 3.532.763.410,00	€ 122.222.222,22	3%	4,5%
2025	€ 3.886.039.751,00	€ 122.222.222,22	3%	5,2%

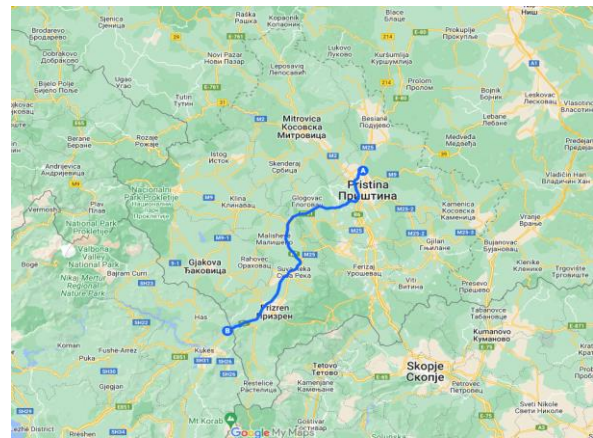
Years 2024 and 2025 are just an assumption with an increase of 10% per year.

TEN-T Roads



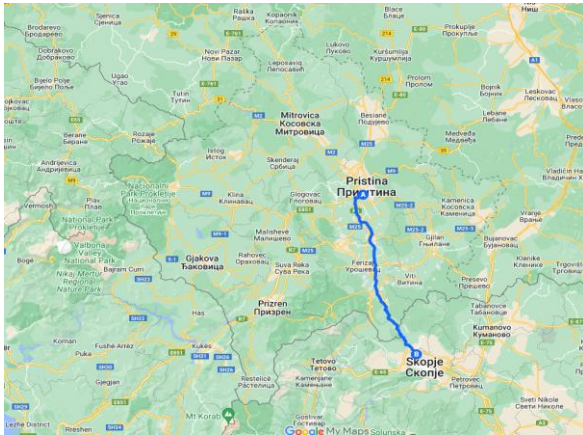
Route 7 – Section 2: Prsitine – Merdare

Total investment: 208m €
National budget: 7.5m €
Loans: 116m € [61]
Grant: 84m € [61]



Route 7 – Section 1: Pristine – Morine

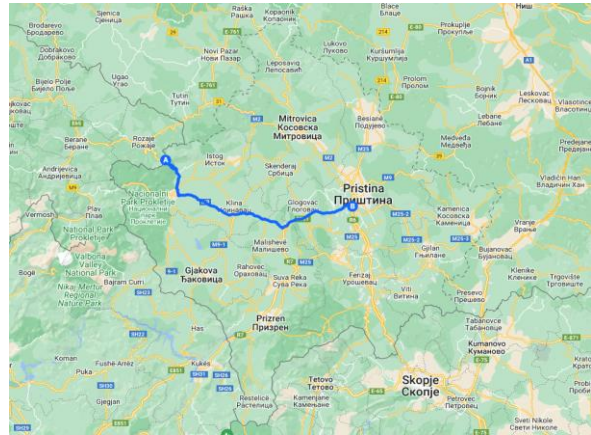
Total investment: 830m € [62]
National budget: 830m € [62]



Route 6 – Section 1: Pristina – Hani I Elez

Total investment: 650m € [62]

National budget: 650m €



Route 6 – Section 2: Pristina – Peje

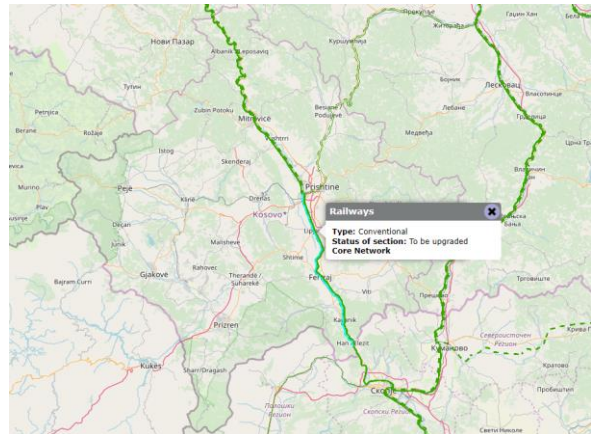
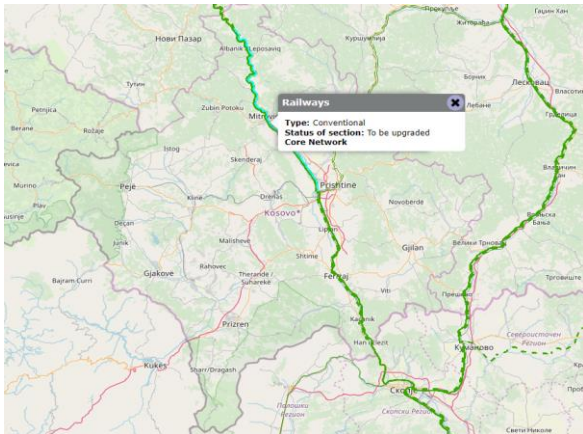
Total investment: 200m € [62] (Only for the section Peje – Zahac)

National budget: 49m € [62]

Loans: 151m € [63]

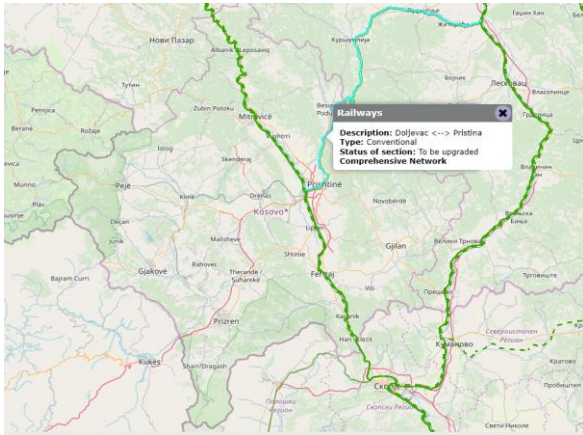
Part 3: **Pristina-Mitrova** 20km of **route 6** is another road project included in the TEN-T projects. It is anticipated to cost roughly 60 million € and be finished in 2023[64].

TEN-T Railway



Railway rehabilitation and modernization Route 10. Section 1 and Section 2

Total Investment: 245 million € [65]



**Rehabilitation of the Eastern Railway line
(Border with Serbia – Podujevo – Fushe
Kosove)**

Total Investment: 67m € [66]

The airport in Pristina is also a part of the TEN-T. The airport was recently upgraded, but in 2021 also received further investment of about 30 million € for the expansion of the airfield apron by 500 meters. Although Kosovo is a landlocked nation, the expansion of TEN-T into the western Balkans means that no inland waterway or maritime projects are anticipated[65].

Given that both Route 6 and Route 7 converge in Pristina's central region, we can divide them into four distinct roads. Route 6 is made up of Section 1, which connects Pristina to Hani I Elezit, and Section 2, which connects Pristina to Peje. Section 1 of Road 7 connects Pristina to Morine. These three sections all connect Kosovo to Corridor VIII, making it easier to connect with other regions and place Kosovo within a larger European framework. Inversely, the second part of Route 7 connects Kosovo with Corridor X from Pristina to Merdare, bringing Kosovo nearer to the center of Europe.

After the war, Kosovo constructed two of the nation's largest and most major roadways. Kosovo has concentrated its capital expenditure on constructing these two motorways. The first one is Section of route 7 (Merdare - Morina), which runs from the Serbian border in the northeast of Kosovo to the Albanian border in the southwest. The second one was Section I of route 6 (Pristina - Hani I Elezit), which links North Macedonia's capital city Pristina.

Section I of route 6's construction began in 2014 and was finished in 2019. It is a 65-kilometer-long highway. In contrast, section I of route 7's construction began in 2008 and was completed in November 2013.

Despite the fact that, contrary to what the politicians at the time claimed, section I of route 7 does not actually connect Kosovo with any of the PAN Corridors, it is nonetheless significant since it links Kosovo with Albania.

At the time of construction of these two highways, Kosovo was still not experienced in Public Private Partnership, therefore only the public funds were used, not like the other Southeast Europe countries such as Hungary or Croatia, which used in maximum and in excellent way the PPP funding[2]. With section I of route 7 costing 830 million € and section I of route 6 costing 650 million €, the budget of Kosovo was significantly influenced[3].

According to a 2008 study by Doll and Essen on the expenses of building a motorway in several European countries, Austria has the highest rate at 13 million € per kilometer. Kosovo, on the other hand, spent 11 million € per kilometer, placing it after Austria in terms of costs in second place. The expense of creating Route 7 (Section I) was astronomical, though, given that Kosovo has a GDP per capita of 4 400 USD[4] and Austria has a GDP per capita of 53 285 USD[5].

Around 3000 local people were employed during construction for each route, according to the Riinvest Institute. According to their calculations, the engaged workforce costs up to 30 million € each route, or 3.5% for route 7 (section I) and 4.6% for route 6 (section II).

Furthermore, the local road companies were affected because they had to work with Bechtel & Enka, who was the main contractor on building these two highways, in order to survive because the government concentrated all of its investment in these two roads while decreasing it on local and other roads in Kosovo.

A feasibility study was not conducted for Part I of route 7, but one was available in Part II that was largely concerned with cost-benefit analysis. When expropriation fees, taxes, and contingencies are taken into account, the estimated total construction cost for Part II of route 7, which connects Pristina to Merdare and connects with Serbia, is 175 m€, with an average cost per km of 6.48 m€[71]. However, these expenses were anticipated during the feasibility study completed in 2016. The European Commission's 2020 report on the extension of TEN-T in the Western Balkans stated that the investment amount has increased to 260 million €.

The current route M25 already provides a vital connection between Nis (Serbia) and Pristina. The feasibility study conducted for the proposed highway revealed that the road currently sees 9,691 vehicles per day. It is important to keep in mind that these measurements were made in April and given how many people from Kosovo's diaspora generally travel through Serbia to Kosovo in the summer, this number is probably going to increase to almost 20,000 vehicles per day during that time. This would result in a situation where there is too much traffic on the road.

As was already noted, it is essential to carry out both a socio-economic assessment and an environmental assessment before to investing in any transportation project. The socio-economic assessment is more important for a large-scale project in a developing economy like Kosovo. Also, a benefit-cost analysis is utilized as a systematic approach of evaluating the economic benefits and drawbacks of the investment because this project was granted by EU and a loan from the EIB. This analysis' major goal is to convert the investment's impacts into monetary terms and to account for the fact that benefits often accrue over a lengthy period of time while capital expenditures are primarily incurred in the first few years.

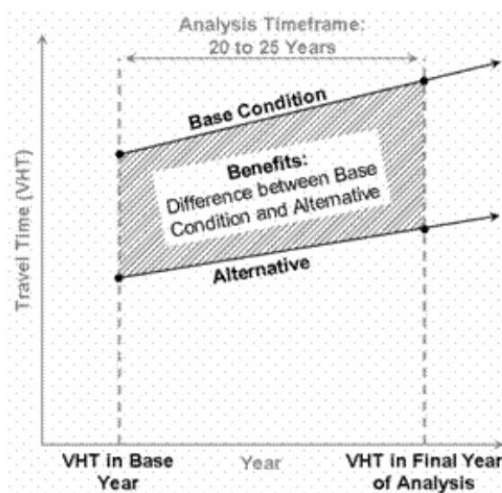
Table 5: Cost – benefit analysis of the highway[71]

Year	Costs		Benefits						Economic flows
	Investment	M & O Cost	VoT Savings	VoC Savings	Residual value	Accidents Savings	External Cost Savings	Consumer surplus	
2020		0.4 m €	7 m €	7 m €		0.05 m €	2.5 m €	1.3 m €	18 m €
2030		1.4 m €	7 m €	4 m €		-0.005 m €	0.6 m €	2.6 m €	13 m €
2040		1.4 m €	21 m €	12 m €		0.07 m €	1.5 m €	3.8 m €	37 m €
2045		0.4 m €	31 m €	14 m €	32 m €	0.09 m €	1.7 m €	5.5 m €	85 m €
Total from 2020 until 2045	111 m €	13 m €	353 m €	254 m €	32 m €	1 m €	37 m €	77 m €	630 m €
ENVP	90 m €	4 m €	94 m €	85 m €	4 m €	0.3 m €	14 m €	22 m €	125 m €
EIRR									16.3%
B/C									2.3

M & O – Maintenance and Operation; VoT – Value of Time; VoC – Vehicle Operation Cost; ENVP - ENPV Economic Net Present Value; EIRR - Economic Internal Rate of Return; B/C – Benefits/Costs

The most significant benefit found by the Pristina-Merdare highway feasibility study was the reduction in journey time. This was determined by evaluating the amount of time required to travel on the present route and the proposed alternative. Traffic demand forecasting models were used to predict travel times for both the existing road and the proposed alternative for the years 2020, 2030, 2040, and 2045. The value of time according to the feasibility study was based on the average gross wage for Kosovo as well as the amount of vehicle occupancy.

Figure 17: Feasibility study calculation methodology[72]



Nevertheless, it is important to note that the feasibility study's results regarding the benefits of the new highway may be more favorable due to the parameters used in the study.

However, the average time spent on mobility in one day is constant over time and between different groups of people and is also independent of the travel mode. As Knoflacher confirms, the time of mobility is nearly constant and since the time for mobility is always constant, the sum of time savings is always 0. Even though the average travel time remains constant, the space covered during this time can vary significantly. For example, one hour of travel in Berlin can cover way more kilometers than one hour of travel in a village in Africa (assuming the same travel mode). As Knoflacher explains, if the speed of a certain transportation system changes, then the system transportation borders also have to change. Therefore, an increase in speed does not affect the average time spent on mobility, however, it imposes an increase in the distance covered. So, the transportation system expands as the distance covered at the same time increases.

The value of time savings may be the greatest amount of benefit in monetary value in the early years, which is a significant argument in favor of investing in such an infrastructure project, particularly for politicians. However, in the long run, it has negative effects.

Although being a useful technique for assessing transportation projects, benefit-cost analysis mainly considers the most fundamentally monetizable aspects of transportation, such as travel time costs, vehicle operating costs, safety costs, and maintenance costs, but as costs, they are not gains or benefits in the system. Some crucial components of the impacts that such investments may have on the area where the road is built are not taken into account, especially in terms of socioeconomic elements like local competitiveness and productivity. According to the feasibility study's findings, the motorway had to be operational by 2020. The outcomes are unlikely to differ considerably, even with delays. It's important to note that expropriation and other charges were not factored into the total investment amount in the economic study.

A key determinant of how spatially interdependent two locations are the amount of trade that flows between them. The structure of each regional economy's productivity, its levels of production, and its competitiveness all play a significant role in determining the direction of these flows. More benefits from enhanced transportation infrastructure will accrue to regions with comparative advantages in production and a productive structure that fosters efficiency, uniform product quality, and increased productivity. On the other hand, regions with a weak productivity base, low productivity, and relative low competitiveness will either have fewer benefits or may even experience losses compared to stronger and more productive regions[73].

Linking regional economies with expertise in distinct or complementary productive sectors might increase total productivity. This is due to the fact that the transportation development will boost trade between the regions, leading to increased specialization and efficiency. The more competitive or productive region may increase its comparative advantage in terms of productivity or competitiveness as a result of connecting regions with competing economies. Conversely, a lower rate of productivity could result in fewer business interactions in the

location with higher manufacturing costs. This view is supported by scholars such as Button (1998) and Beyzatla et al. (2014).

Considering previous major road constructions from Bechtel-Enka (an international construction consortium) in Kosovo, such as Kosovo highway section I of route 6, approximately 43 workers are needed to build one kilometer of a road in Kosovo[74]. Based on this estimate, Pristina-Merdare highway section would employ approximately a 1200-person workforce. It is a common practice from international companies and consortiums contracted to finish motorways and highways to subcontract local companies and freelancers for different aspects of the job. Many workers will also be trained with skills that can be used in future projects in Kosovo. However, this is only a short term impact, as after the completion these skilled workers will have to find other solutions outside Kosovo, since Kosovo is such a small market for a high number of skilled workers in a particular sector.

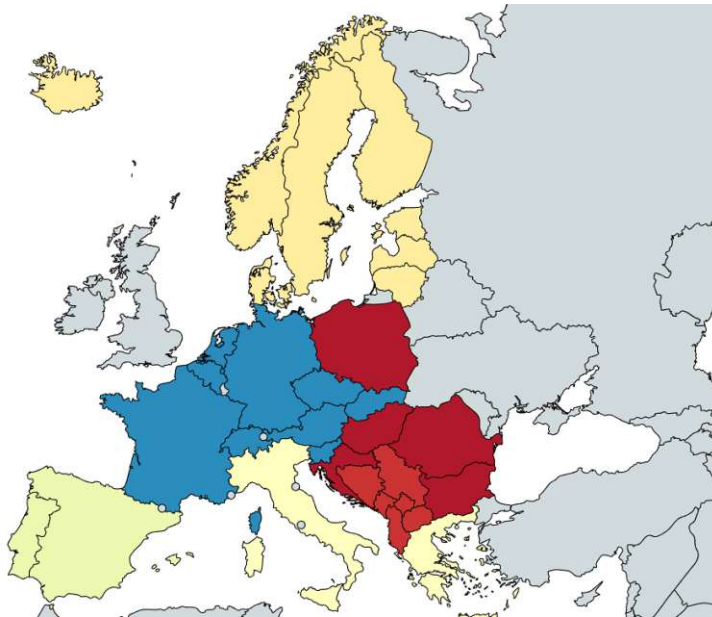
The construction of the highway will take up to 10 years, meaning that the residents nearby will experience 10 years of noise pollution. Carbon emissions in the area will rise together with the general land pollution. The environment costs will also include the wildlife in the area, as this land pollution inflicts a domino effect on the ecosystem within the area as whole. As the wildlife adjusts to the new intense changes, the food chain also adjusts and many species might disappear from the ecosystem in a short time. Other species might become endangered.

9.2. THE CENTRAL EFFECT AND THE GRAVITY ON LARGER SCALE FOR KOSOVO

The expansion of the TEN-T network is anticipated to enhance the enormous impact that central areas have on peripheral places. Notwithstanding the fact that a region's exact definition is ambiguous, for the purpose of this study, a region can be thought of as a place that has been formally declared as such.

As Fürst notes, regions are made through social norms or political decisions, and the purposes they fulfill determine their boundaries and size. In other words, the political, social, and economic characteristics that give a region its coherence and identity can differ depending on the location in question. Understanding the role of regions in economic and social development is therefore essential to designing effective policies and initiatives to support their growth and well-being.

Figure 18: The regions of Europe

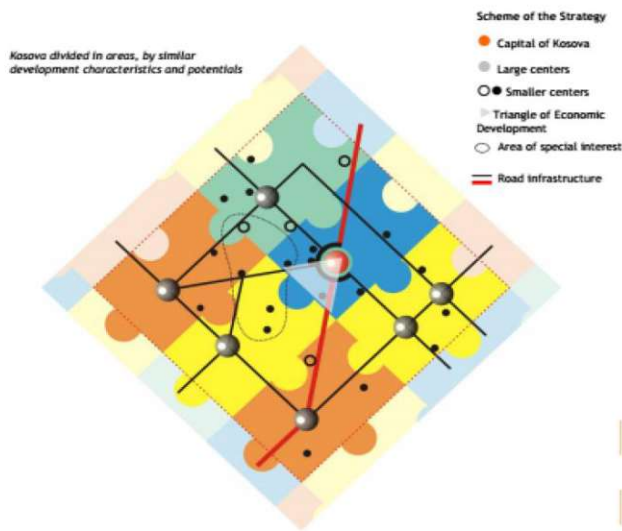


In comparison to the center European regions, the Western Balkans are frequently seen as a peripheral area. This impression is the result of historical, economic, and political circumstances that have influenced the growth of the area. The location of the Western Balkans is one of the main causes for this classification. Because of its location on the edge of Europe, the area frequently serves as a link between that continent of Europe and the Middle East. It is more prone to political unrest, armed conflict, and economic underdevelopment

because of its position. A complex geopolitical landscape has resulted from the region being caught between opposing interests and influences from the East and the West. Economic underdevelopment in the Western Balkans has further exacerbated the region's periphery. The region has a high unemployment rate, a low amount of foreign investment, and a comparatively low GDP per capita. A brain drain has resulted from the underdevelopment of the economy, as many young people have moved to areas with stronger economies in quest of better prospects.

The central parts of Europe, such as Germany, France, and the UK, on the other hand, have been successful in creating robust economies, stable governments, and high standards of life. These areas have been successful in luring international investment, educated labor, and visitors, all of which have boosted their economies.

Figure 19: Spatial spread of Kosovo[71]

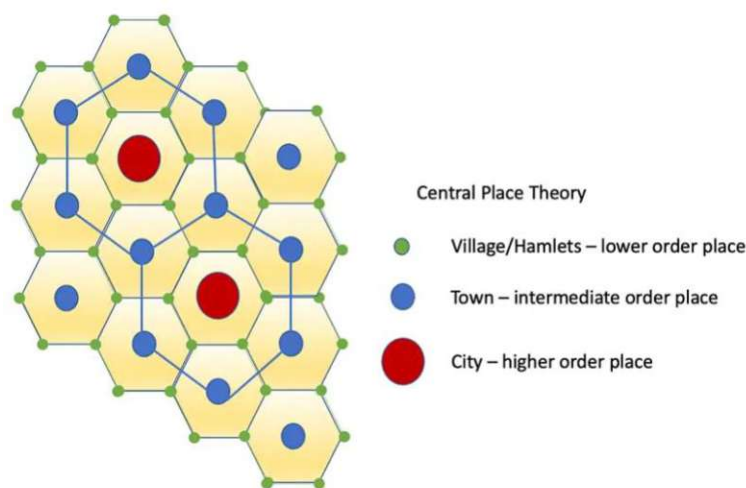


A variety of intricate elements have in fact influenced the spatial evolution of Kosovo. The four designated zones of Kosovo, each with its own distinct characteristics and identity, reflect the ethnic and cultural variety of the country. Pristina, the country's capital, is located in the "Hub" of Kosovo, which is symbolized by the blue area. It serves as the nation's administrative, service, and commercial hub. Kosovo's economic situation has also had a big impact on how the country's landscape has evolved. The service and tourist industries make major contributions to Kosovo's economy, and the agriculture which is the biggest contributor on

the economy of Kosovo. As a result, many of the country's cities are centered around agricultural production and related industries, while the tourism industry has spurred development in areas such as infrastructure, transportation, and hospitality. Kosovo's political climate has also had an impact on the development of its physical environment, particularly with regard to infrastructure and transportation. The Hub of Kosovo is where the country's road and rail networks intersect, which has helped to facilitate economic activity and development in the region. While some areas have seen more investment and development than others due to political causes

Walter Christaller, a German geographer, attempted to employ concepts of economic and social behavior to explain the distribution and size of urban centers in a region. His hypothesis holds that the central locations are placed in a hierarchy, with smaller settlements encircling the bigger ones. Economic factors like competitiveness and the effectiveness of transportation dictate the size of the central locations. The concept of "hexagonal hinterlands," or the territories served by a specific central location, is also included in Christaller's theory. These areas are divided into hexagons to ensure that no area is left without services and that the hexagons surrounding each major location do not cross over too much.

Figure 20: The hexagon pattern[75]



Accessibility

TEN-T is a policy instrument that promotes regional prosperity and reduce regional inequality. This approach is predicated on the idea that better mobility results in increased accessibility, which in turn encourages commerce and economic expansion.

In the context of transportation, accessibility refers to the ease with which individuals or groups of people can reach a particular location. It is a measure of the likelihood that a person will have the chance to engage in a particular activity. It can be quite advantageous for the overall development of transportation strategies to use accessibility as an approach.

When considering accessibility, it should be taken into account both the spatial proximity of opportunities as well as their relative potential. This reflects the fact that people or goods are more likely to travel to destinations that closer or more attractive all else being equal. Also, the cost factor plays a key role in the accessibility, as it reflects the cost of transportation or other barrier to movement between locations.

The planning implications of the accessibility measures can be used to identify regions with high or low accessibility and to prioritize transportation infrastructure investments to increase accessibility. The focus is in connecting places with high accessibility to other places with high accessibility as this leads to the largest gains in accessibility.

Yet, it is important to consider whether countries who are already economically developed or countries that are still in the process of developing can profit more from these TEN-T chances.

TEN-Ts are designed with the concept that they can aid in securing the spatial freedoms seen to be crucial for the market, particularly the unimpeded mobility of people and products. This should lower route resistance and lead to either direct or indirect cost savings, which is advantageous for both customers and businesses.

As a result, there are more options available to households and businesses in terms of consumption and employment prospects. This expanded potential also applies to businesses,

which are now able to source labor, raw materials, finished parts, and other mobile production variables from new suppliers. This can result in a market expansion. Also, because of the two-way effects of this better accessibility, there is more rivalry for families and businesses to provide and obtain goods and services.

Furthermore, improved transportation accessibility through TEN-Ts is essential for promoting trade between countries. As a result, commerce may become more appealing and competitive.

However, the question raises, which countries, though, stand to gain the most from improved transportation infrastructure? Is it the more developed and centrally located countries or the developing countries? While improved transport accessibility can lead to increased international trade and expansion into new markets for companies, the distribution of these benefits is not necessarily equal between countries.

Table 6: The trade data with central EU countries

Year	Trade	Germany		Austria		Belgium	
		Monetary value	Percentage value	Monetary value	Percentage value	Monetary value	Percentage value
2011	Export	€ 24.144.000,00	7,6	€ 5.711.000,00	1,8	€ 5.085.000,00	1,6
	Import	€ 293.441.000,00	11,8	€ 38.669.000,00	€ 1,60	€ 8.656.000,00	0,3
2012	Export	€ 14.995.000,00	5,4	€ 4.425.000,00	1,6	€ 473.000,00	0,2
	Import	€ 304.195.000,00	12,1	€ 34.073.000,00	€ 1,40	€ 8.869.000,00	0,4
2013	Export	€ 10.985.000,00	3,7	€ 6.327.000,00	2,2	€ 807.000,00	0,3
	Import	€ 252.594.000,00	10,3	€ 36.858.000,00	€ 1,50	€ 9.290.000,00	0,4
2014	Export	€ 11.340.000,00	3,5	€ 6.416.000,00	2,0	€ 716.000,00	0,2
	Import	€ 272.973.000,00	10,8	€ 36.742.000,00	€ 1,40	€ 6.677.000,00	0,3
2015	Export	€ 11.693.000,00	3,6	€ 12.316.000,00	3,8	€ 2.400.000,00	7,5
	Import	€ 290.948.000,00	11,0	€ 43.705.000,00	€ 1,70	€ 9.383.000,00	0,4
2016	Export	€ 13.830.000,00	4,5	€ 6.667.000,00	2,2	€ 2.261.000,00	0,7
	Import	€ 342.890.000,00	12,3	€ 43.368.000,00	€ 1,70	€ 9.353.000,00	0,3
2017	Export	€ 20.194.000,00	5,3	€ 10.548.000,00	2,8	€ 1.076.000,00	0,3
	Import	€ 378.515.000,00	12,4	€ 50.570.000,00	€ 1,70	€ 10.751.000,00	0,4
2018	Export	€ 24.872.000,00	6,8	€ 8.303.000,00	2,3	€ 2.719.000,00	0,7
	Import	€ 394.143.000,00	11,8	€ 52.545.000,00	€ 1,60	€ 14.406.000,00	0,4
2019	Export	€ 30.907.000,00	8,1	€ 8.498.000,00	2,2	€ 4.572.000,00	1,2
	Import	€ 447.645.000,00	12,8	€ 64.049.000,00	€ 1,80	€ 16.196.000,00	0,5
2020	Export	€ 43.980.000,00	9,3	€ 7.066.000,00	1,5	€ 7.884.000,00	1,7
	Import	€ 427.065.000,00	13,0	€ 68.955.000,00	€ 2,10	€ 18.754.000,00	0,6
2021	Export	€ 61.769.000,00	8,2	€ 10.553.000,00	1,4	€ 10.509.000,00	1,4
	Import	€ 611.365.000,00	13,1	€ 72.033.000,00	€ 1,50	€ 23.822.000,00	0,5
2022	Export	€ 88.228.000,00	9,6	€ 16.439.000,00	1,7	€ 15.723.000,00	1,7
	Import	€ 611.805.000,00	12,5	€ 84.234.000,00	€ 1,47	€ 43.278.000,00	0,8

Since the railway network in Kosovo is poor and there is no direct connection to a port, the main means of bringing in and taking out goods and people is via road. The relatively small size of the country, steep terrain, recent history of violence, and political instability of Kosovo all contribute to the lack of a well-developed rail network. Road transportation has consequently taken over as the main form of transportation in Kosovo. The country's road system links it to its neighbors, providing essential commerce connections to regional and global markets.

To determine the effect of these motorways in Kosovo, a significant amount of data from the Kosovo Statistical Agency was extracted and examined.

Figure 21: Trade data between Kosovo and Germany

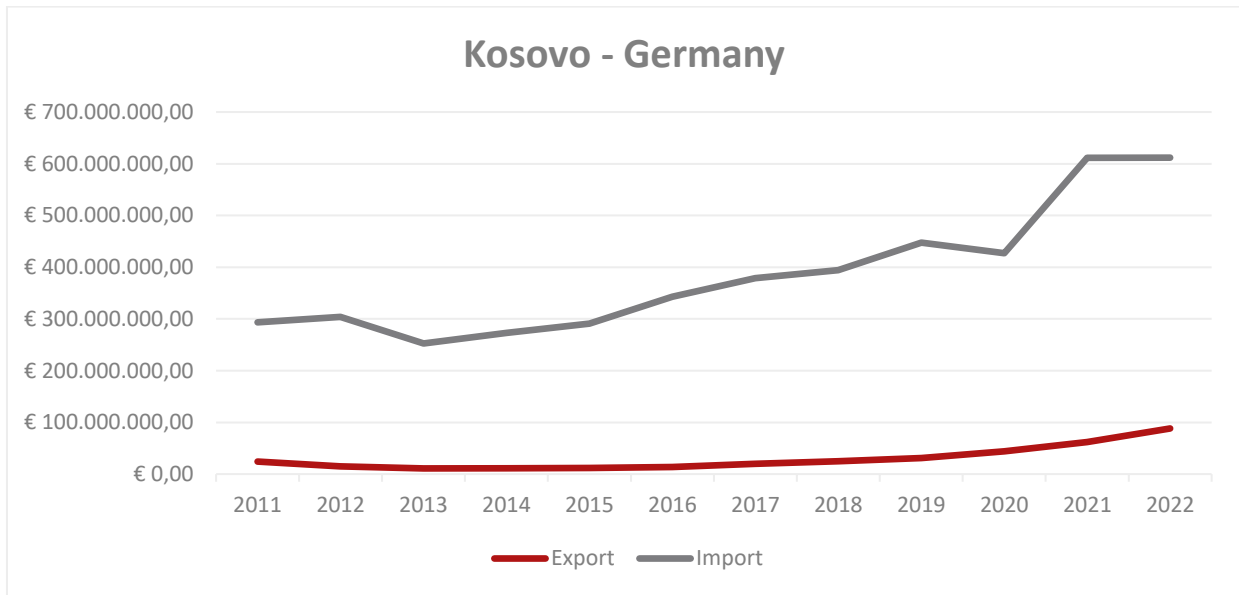


Figure 22: Trade data between Kosovo and Austria

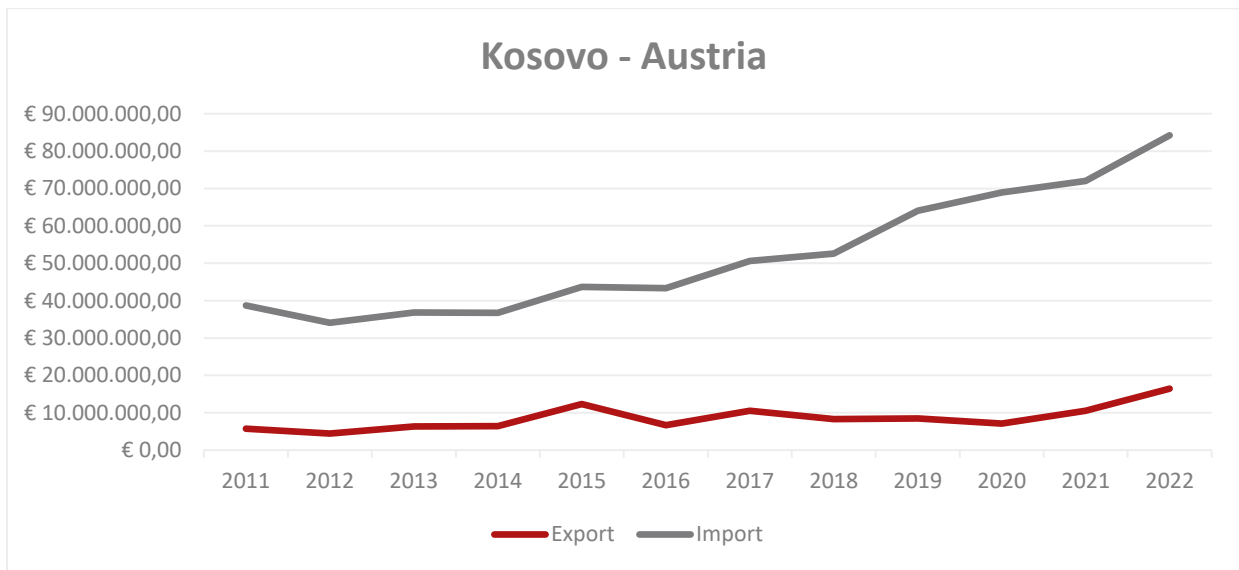
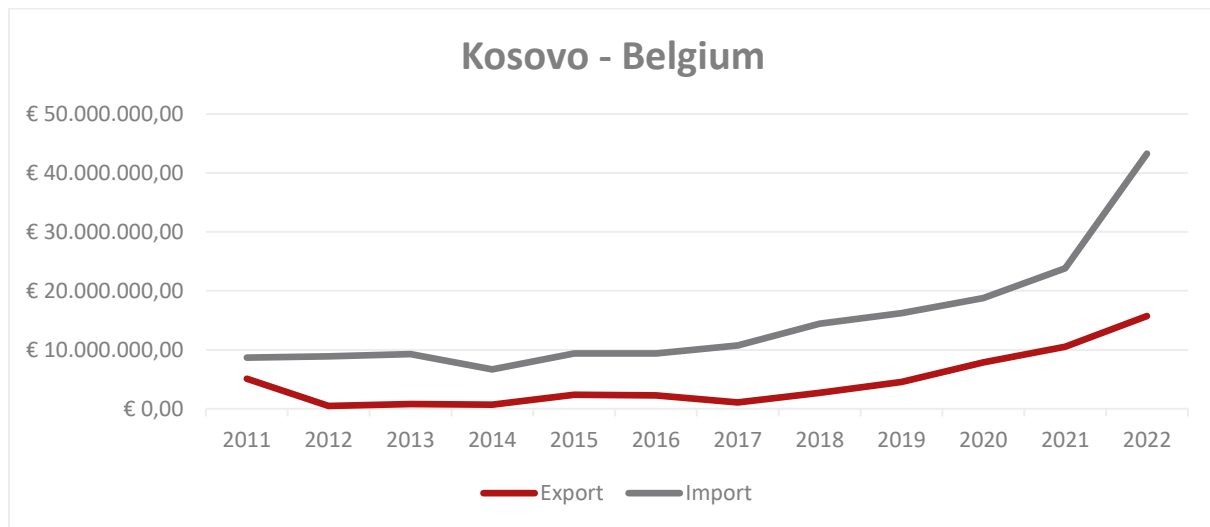


Figure 23: Trade data between Kosovo and Belgium



The increase in competition is a potential drawback of improved transport accessibility for developing countries. A more accessible transportation network may make it simpler for goods from developed countries to reach developing countries, increasing rivalry for local businesses. Local businesses may find it more challenging to compete with bigger, more established corporations from industrialized countries as a result. Increased transport accessibility may lead to a greater reliance on industrialized countries for the supply of some goods and services, leaving domestic markets for those items underdeveloped.

Large-scale investment by Kosovo in TEN-T has a detrimental effect on its budget, causing it to shrink by an average of 7% annually. This is a result of the nation's trade figures with several of the EU's more central countries, specifically Germany, Austria, and Belgium. As part of its overall international trade with nations, Kosovo sells roughly 3.3% of its goods to these 3 countries and imports 4.6% of their products annually.

While such infrastructure can bring significant benefits in terms of connectivity. The trading data that was examined spans the time from the end of 2011 to 2022, when Kosovo launched the first TEN-T core network. When these data are analyzed, it becomes clear that Kosovo has been predominantly increasing its imports from the three central European Union countries under examination. In the example of Germany, Kosovo has boosted exports there by 34% but increased imports by 63% over time. Similar to Austria, Kosovo has seen a 52% increase in

export throughout the years but a 62% increase in import. Kosovo's exports to Belgium have climbed by 29%, while its imports have increased by 35%.

A common trend of all three figures above is the linear shape of the curve representing the Kosovo export to the three countries and the more exponential looking curves representing the import of the three countries to Kosovo. Furthermore, the export-import ratio between Kosovo and these three countries shows that central EU countries are significant trade gainers, and this trading trend seems to be very promising for the central EU countries in the future as per figures above. For instance, the Kosovo-Germany import-export ratio of the last year is 6 to 1, with Kosovo importing 600 million € worth of goods from Germany and only exporting 100 million. Similarly, the Kosovo-Austria import-export ratio of 2022 was 5 to 1 with Kosovo importing about 84 million € and exporting only 18 million €. The Kosovo-Belgium import-export ratio was 3 to 1 in 2022, with Kosovo importing 43 million € worth of goods and exporting a little more than 15 million €.

The monetary benefit is not the only way that central EU countries benefit from the Western Balkans. For decades now, it has been a common trend that hundreds of thousands of Balkan workers migrate to West Europe (particularly in more central countries such as Germany, Austria, Switzerland, and Belgium) every year. From construction workers to engineers and doctors, Kosovo has also been affected by this trend. A study conducted by the European Policy Institute of Kosovo shows that in a 10-year period (from 2008-2018), about 203,000 Kosovo citizens have left Kosovo and filed asylum applications in the European Union countries. Aside from the legal migration, about 141,000 Kosovo citizens are staying illegally in Europe[76].

The Institute for Employment Research in Germany found that there are approximately 1.74 million vacant jobs in Germany. It is clear that Germany and other Central European countries are in desperate need of skilled workers from third-world countries, especially from the Balkans[77].

The German Chambers of Commerce and Industry also stated that more than half of German companies are facing serious struggles to fill all the positions in their companies due to the

lack of skilled workers. In order not to move production abroad, an optimal solution is to attract workers from abroad to Central Europe[78].

A quarter of all the economic migrants in 2018 in Germany come from the Western Balkans, showing the need of Germany for workers from the Balkans and Kosovo particularly[79].

However, this situation may be beneficial to both parties, Kosovo citizens and European countries. It is beneficial to Kosovo citizens in the sense that when they migrate, they become part of a larger market and economy, where they get secure jobs, contracts, insurance, job benefits, and significantly better working conditions. Kosovan citizens working in Europe also bring back to Kosovo a good fraction of the money that they win abroad. Only in 2020, personal remittances comprised 18.6% of the total GDP of Kosovo[80].

The data study also reveals that the TEN-T investment has not necessarily resulted in better trading outcomes with the nearby countries that these highways directly connect, such as Albania and North Macedonia, in addition to the negative impact on Kosovo's budget and trade balance. Despite the improved connectivity, imports from these countries have significantly expanded in Kosovo, but export growth has only been slight.

Table 7: The trade data with neighboring countries

Year	Albania		North Macedonia	
	Monetary value	Percentage value	Monetary value	Percentage value
2011	€ 34.566.000,00	10,8	€ 30.949.000,00	9,7
	€ 94.400.000,00	3,9	€ 365.961.000,00	14,7
2012	€ 40.180.000,00	14,6	€ 26.376.000,00	9,6
	€ 110.528.000,00	4,4	€ 287.739.000,00	11,5
2013	€ 43.774.000,00	14,9	€ 26.139.000,00	8,9
	€ 110.597.000,00	4,5	€ 185.020.000,00	7,6
2014	€ 44.011.000,00	13,6	€ 35.960.000,00	11,1
	€ 133.702.000,00	5,3	€ 139.668.000,00	5,5
2015	€ 40.254.000,00	12,4	€ 33.355.000,00	10,3
	€ 151.897.000,00	5,8	€ 143.846.000,00	5,5
2016	€ 42.053.000,00	13,6	€ 38.578.000,00	12,5
	€ 115.791.000,00	4,2	€ 156.727.000,00	5,6
2017	€ 60.257.000,00	15,9	€ 45.850.000,00	12,1
	€ 151.815.000,00	5,0	€ 156.498.000,00	5,1
2018	€ 68.252.000,00	18,6	€ 43.737.000,00	11,9
	€ 206.492.000,00	6,2	€ 172.176.000,00	5,1
2019	€ 67.378.000,00	17,6	€ 44.125.000,00	11,5
	€ 223.899.000,00	6,4	€ 240.641.000,00	6,9
2020	€ 110.231.000,00	23,2	€ 44.082.000,00	9,3
	€ 190.980.000,00	5,8	€ 188.589.000,00	5,7
2021	€ 111.329.000,00	14,7	€ 86.984.000,00	11,5
	€ 266.858.000,00	5,7	€ 242.785.000,00	5,2
2022	€ 103.204.000,00	11,2	€ 118.907.000,00	13,0
	€ 257.947.240,00	4,6	€ 269.284.600,00	5,0

Figure 24: Trade data between Kosovo and Albania

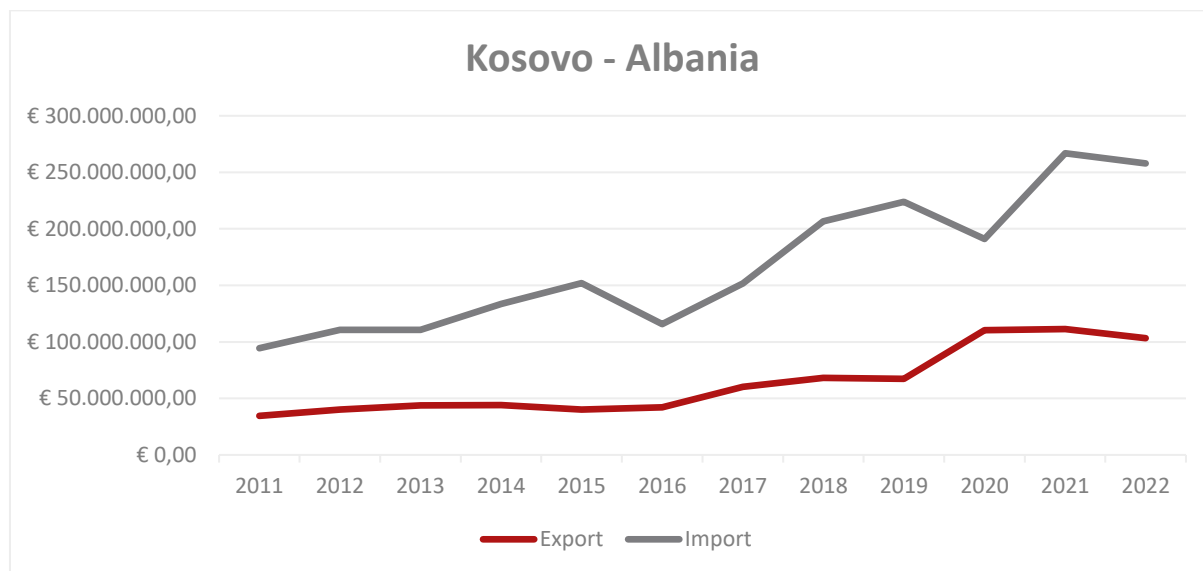
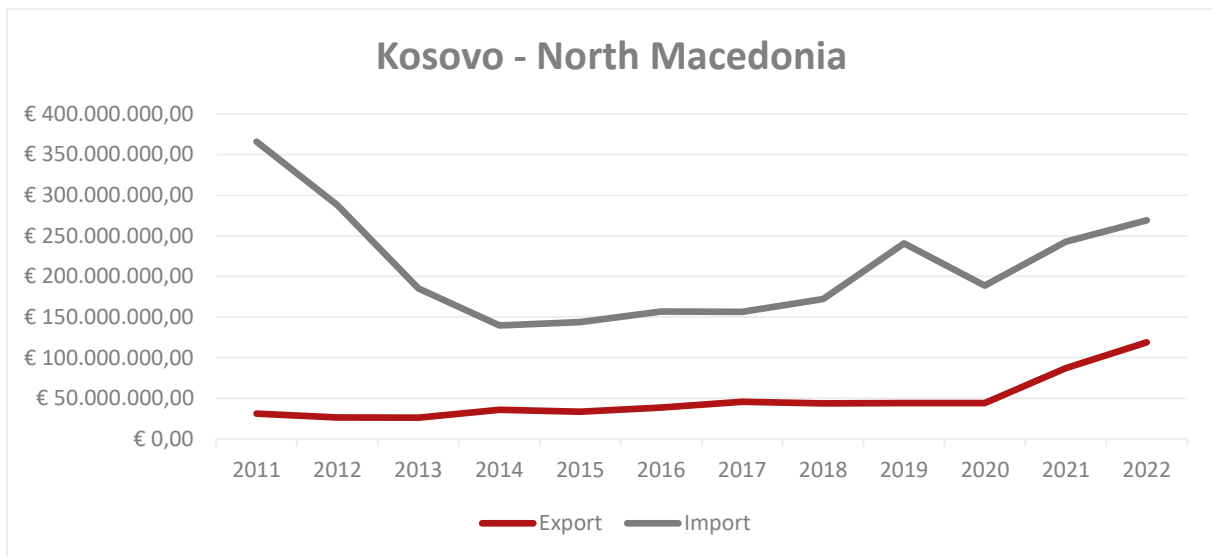


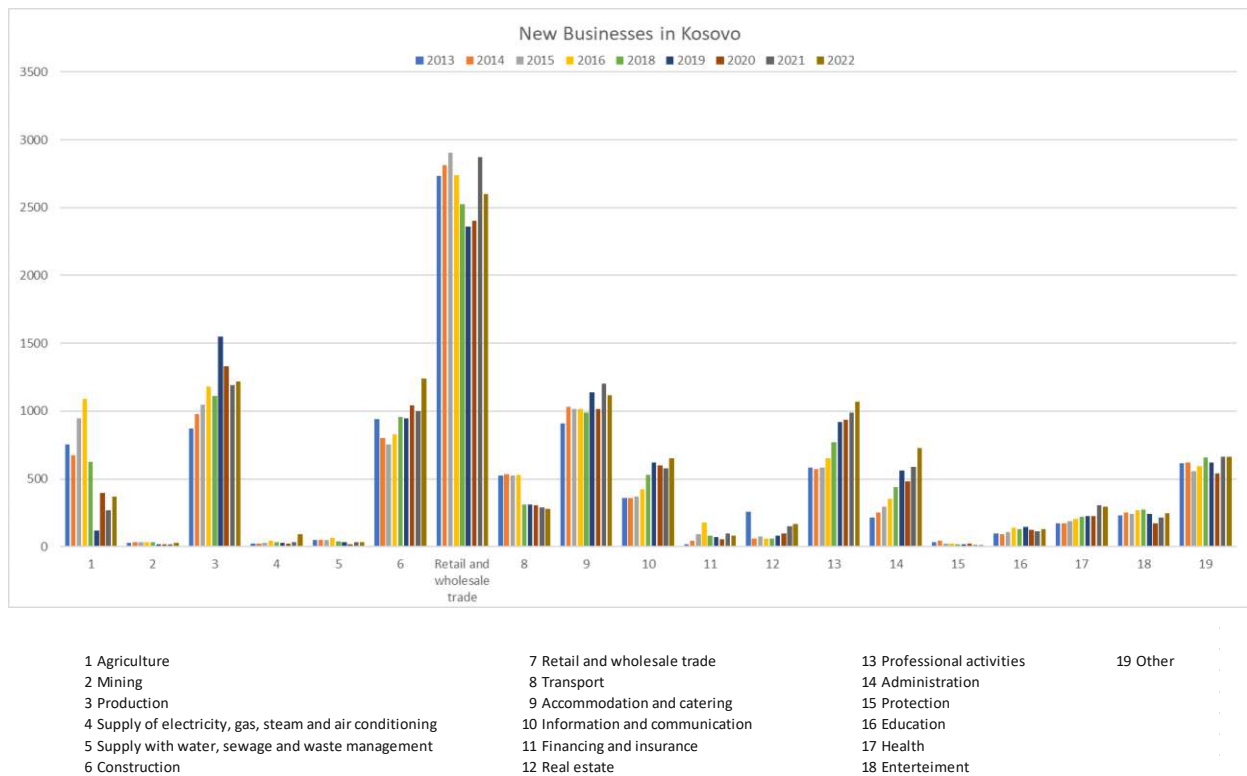
Figure 25: Trade data between Kosovo and North Macedonia



Over time, Kosovo's imports from Albania climbed by 65% while its exports to Albania increased by 62%. The same is held for Kosovo's imports from North Macedonia, which have climbed by 79% despite a 40% increase in exports to that country. It is significant that the import from North Macedonia, which had been declining since 2011, began to rise once more immediately after Section I of route 6 was finished. These findings suggest that new transport infrastructure does not guarantee better trading outcomes, and further measures may be needed to support a more balanced trade relationship between the connected countries.

In the scenario presented, Kosovo's new TEN-T transportation system would instead increase the country's dependence on imports rather than boost domestic productivity. In order to accomplish demand maximization, a corporation normally aims to reduce expenditures, such as transportation, land, and labor costs, while choosing a location. Yet, Kosovo's lack of domestic manufacturing implies that it must rely largely on imports to satisfy market demands. New transportation infrastructure may therefore serve merely to increase this dependency on imports and decrease domestic output.

Figure 26: Type of new Businesses in Kosovo during years 2013 - 2022



The data, which shows a decline in Kosovo's overall productivity and an increase in imports, clearly illustrate this pattern. Particularly, compared to other business sectors, the number of new retail and wholesale trade companies in Kosovo has significantly increased after the improvement of transport infrastructure in 2013. Every year, the number of new trade businesses has increased by 85% on average compared to other types of businesses. This shows that the new infrastructure is promoting a rise in trade businesses and import reliance, which may not be sustainable over the long term, rather than enhancing productivity and local production.

The central effect and the gravity within Kosovo

The development of routes 6 and 7 through Pristina, the capital city of Kosovo, emphasizes the importance of the city for the social, cultural, and economic advancement of the country. Pristina was already a major hub that offered a wide range of goods and services to the surrounding areas before the development of these routes. Yet as the highways are built, Pristina's significance could grow even more, and the disparity between it and the other parts of Kosovo could become more obvious. This is due to the fact that people are willing to travel

shorter distances to obtain a particular good or service. Therefore, the improved transport infrastructure provided by the highways may incentivize individuals and businesses to concentrate in Pristina, leading to increased economic activity and development in the city. Regional disparities could result from the fact that other parts of Kosovo could not experience the same level of economic development and progress.

Figure 27: Route 6 and Route 7[62]

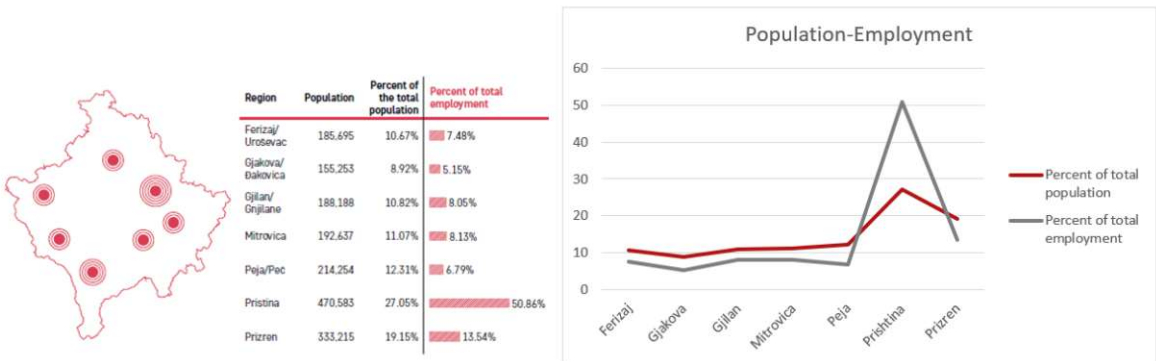


Seven administrative regions, each with a different number of municipalities, make up Kosovo. More than a quarter of Kosovo's population lives in Pristina, the largest of these regions. Prizren, which accounts for almost 19% of the total population, is the second-largest region. Importantly, the majority of Kosovo's employed work force resides in Pristina and Prizren. About half of the country's officially employed labor force, or 51% of it, is working in Pristina alone. An additional 14% of people work in Prizren, showing that these two areas account for a sizable share of Kosovo's employed population.

The transformation of society is significantly influenced by transportation infrastructure, particularly large-scale transportation infrastructure like TEN-T. It may be simpler to access

markets and customers in a place that is well connected to major highways or transportation hubs, which may contribute to an increase in economic activity and population. Victor Weber's thesis and Christaller's theory both demonstrate that larger settlements offer a wider range of goods and services while smaller communities offer a more constrained selection. A decrease in economic activity, particularly the production and availability of products and services, points to a population drop.

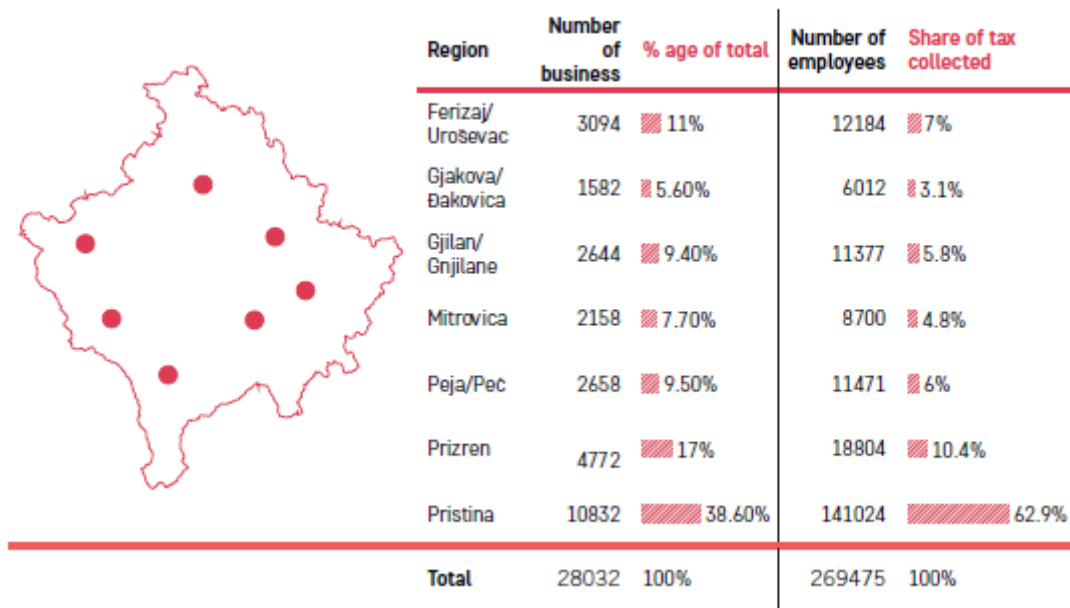
Figure 28: Population and employment by region[81]



It is obvious that Pristina the hub where intersect both major highways of the country route 6 and route 7 has clearly cemented its place as the most active economic region in Kosovo. The data above shows that the interconnectedness that the transportation provides Pristina with, obviously enabled Pristina to remain the most active region in Kosovo. The more investment which are directed to connecting Pristina with other regions only contributes more to the disparities between population and employment, which should not be the goal of regional planning.

Moreover, increasing transport accessibility may result in employment displacement in some industries, particularly those that are made less competitive by higher imports from industrialized regions.

Figure 29: Active companies and employment by region[81]



In the lack of statistics on economic performance at the individual level, tax revenue activity is used as a stand-in for regional development trends. The expectation for regional economic growth reveals that the Pristina region's capital city is home to a significant amount of economic activity. Data on active companies and the number of employees demonstrate how the region around Pristina, which is home to 38.6% of operating companies and the majority of workers who actively pay taxes, is the center of business activity.

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