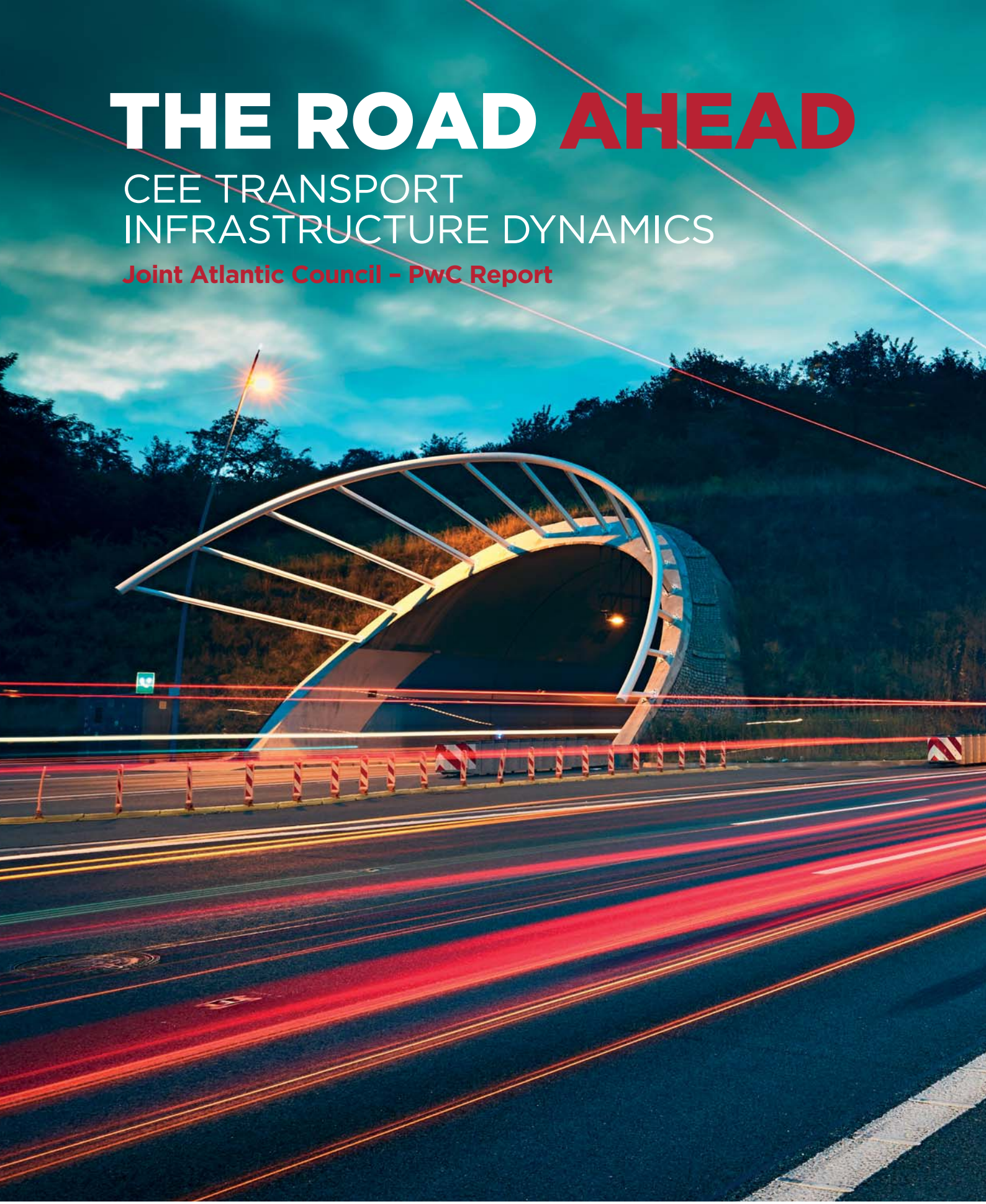
THE ROAD AHEAD

CEE TRANSPORT INFRASTRUCTURE DYNAMICS

Joint Atlantic Council – PwC Report



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Atlantic Council

“Central Europe can realize its enormous market access potential through the advancement of the favourable geostrategic position of Croatian ports, bridging the development gap between East and West of Europe while ensuring accessibility, connectivity and cohesion of the entire EU”.

The President of Croatia **Kolinda Grabar-Kitarović**

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DID YOU KNOW...?

1. The Three Seas region accounts for 28% of the EU's territory and 22% of its population, but only 10% of its GDP.

2. Central and Eastern Europe (CEE) has made unprecedented progress after decades of underinvestment: approx. 5,600 kilometres of new motorways have been built over the last 20 years. But the gap is still significant – a citizen of the "old EU" has on average twice as many kilometres of motorways to drive on his/her counterpart in CEE.

3. Business leaders still believe that inadequate transport infrastructure is a substantial barrier to business growth in CEE – in the WEF Global Competitiveness Report, CEE ranks significantly lower in the infrastructure index than Western Europe and Northern America.

4. Almost EUR 210 billion has been spent on transport infrastructure in CEE EU member states over the past 20 years, which equals to over EUR 100 spent per capita each year.

5. The EU has played an unprecedented role in helping CEE build its transport infrastructure – over EUR 150 billion has been spent from EU Structural Funds, with additional money made available from the Connecting Europe Facility and the European Investment Bank.

6. Five key TEN-T corridors play a paramount role for the Three Seas region (North Sea-Baltic, Baltic-Adriatic, Rhine Danube, Orient / East-Med and Mediterranean) – more than EUR 384 billion across over 2,000 projects is still needed to complete them.

7. Financial needs for further transport infrastructure development in broadly defined CEE (including Balkans and CIS) have been estimated at EUR 615 billion through 2025, which equals to just below EUR 170 to be spent per capita in CEE each year.

8. CEE is expected to outpace Western Europe over the next five years with construction market growth of 3.1% per annum, creating good opportunities for domestic and international companies and investors.

9. Some of the global top 10 construction companies as VINCI, Skanska, Hochtief and Bouygues and the largest infrastructure funds have invested billions of euros in key transport projects in Poland, Slovakia, Hungary and Croatia – there is lots of liquidity in the market and they are interested in investing more in well prepared projects with a balanced risk-reward profile.

10. 75% of the infrastructure that will exist in 2050 does not exist today – new technologies will impact not only the way transport infrastructure will be designed, built and operated, but also the demand for transport services.

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FOREWORD BY THE ATLANTIC COUNCIL

Twenty-eight years after the fall of the Berlin Wall, much progress has been made toward fulfilling the vision of a Europe whole, free, and at peace. The accession of Central Europe's countries to NATO and the European Union has contributed to the security, stability, and prosperity of the entire continent, and the transatlantic alliance.

Yet the task is far from finished. Europe's economic and social woes, as well as new security challenges, add to the urgency of completing and consolidating the European integration project, and reinforcing the resilience of the European Union as a whole.

A major challenge is to overcome the legacy of the past in infrastructure development. For more than half a century, infrastructure interconnections focused on the development of the East–West axis. During the Cold War, a pipeline infrastructure that delivered Soviet oil and gas to Central and Eastern Europe also served as a tool of submission and control. After the fall of the Wall, the region's governments understandably focused on integrating their economies into the advanced Western markets, to a large extent neglecting intraregional infrastructure development along the north-south axis.

In 2015, Croatia and Poland launched an effort to accelerate the construction of cross-border energy, transport, and telecommunications infrastructure across Central Europe. The so-called Three Seas Initiative aims to deepen and modernise economic linkages among the nations situated between the Baltic, Black, and Adriatic Seas.

The Three Seas Initiative was the subject of the 2014 report Completing Europe – From the North-South Corridor to Energy, Transportation, and Telecommunications Union, which we had the privilege to co-direct. Published by the Atlantic Council and Central Europe Energy Partners (CEEP), and co-chaired by General James L. Jones, Jr., former US National Security Advisor to President Obama, and Mr Paweł Olechnowicz, Chairman of the Board of Directors of Central Europe Energy Partners, the report presents a roadmap to address the missing infrastructure links in Central and Eastern Europe. It calls for accelerated construction of a "North-South Corridor" of energy, transport and communications links.

Through this infrastructure investment, the Three Seas Initiative will yield a more prosperous and economically resilient Central and Eastern Europe, growth across the European continent and a Europe economically more capable of partnering with the United States in addressing the global economic and security challenges and opportunities now defining this century.

We were proud to partner with PwC to prepare this follow-up report, taking stock of developments in the critically important transport sector. PwC has done a tremendous job in mapping out the remaining infrastructural bottlenecks, analysing policy, regulatory and financial hurdles, and outlining a series of recommendations to speed up development.

This report intends to inform the third Three Seas Summit, convening heads of state from Central and Eastern Europe in Warsaw on July 6-7, 2017, and to be also attended by the President of the United States.

Indeed, Washington's engagement and leadership can provide an important impetus to the Three Seas Initiative. By integrating this initiative as a pillar of its engagement with Europe, the U.S. can contribute to the building of a European Union that is more resilient and active on the world stage. The Initiative also offers the prospect of bolstering economic and commercial ties to Central Europe and Europe as a whole, to complement our strong political links.

David Koranyi

Director, Energy Diplomacy Initiative,
Global Energy Center
Atlantic Council

Ian Brzezinski

Resident Senior Fellow
Brent Scowcroft Center on International Security
Atlantic Council

INTRODUCTION

The Three Seas Initiative was established to create a platform for Central and Eastern Europe's integration with the European Union as a whole: strengthening political ties, facilitating cross-border cooperation and enabling large, pan-regional projects that will stimulate sustainable economic growth.

The initiative includes 12 European Union member states between the Baltic, Adriatic and Black Seas: Austria, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. The Three Seas region accounts for 28% of the EU's territory and 22% of its population, but only 10% of its GDP. Nominal GDP per capita of the 12 countries is EUR 14,750, about 51% of the average for the entire EU.[1] There are large differences in economic development between these 12 countries, with Austria at one end of the economic spectrum and Romania and Bulgaria at the other.

Stronger cooperation among CEE countries is crucial to enhance their economic growth and close the gap in GDP between the Western and the Eastern parts of the EU over the coming decades. One of the major objectives for the Three Seas alliance is the strengthening of previously neglected north-south transport infrastructure links, which are key to economic growth throughout the region.

In today's increasingly competitive global economy, the prosperity and wellbeing of a united Europe depend upon how quickly and effectively it can adapt to a fast changing and ever more competitive world. Delivering a connected, safe, affordable and sustainable transport system is critical to that process of adaptation. An integrated and efficient transport network is not just essential to business success and quality of life; it is also a driver of jobs and growth in its own right.

"In the course of the last decades the completion of the North-South corridor did not keep pace with the development of West-East infrastructure. However, increasing connectivity in the CEE region would directly strengthen our competitiveness and the economic ties of our countries, which would further drive the growth and competitiveness of Europe as a whole. This initiative will be a priority area for the Hungarian Presidency of the Visegrad Group, starting in July 2017".

Krisztina Varju, Ministerial Commissioner for the Hungarian Presidency of the Visegrad Group (V4) 2017-2018

[1] Visegrad Plus online, December 2016, http://visegradplus.org/the-baltic-adriatic-black-seas-region [accessed 30.05.17]

In this report, we consider the question "Can we afford not to further develop transport infrastructure in CEE, and in particular in the Three Seas region?" We will take a look at what has already been done to achieve the Connected Europe paradigm, what more should be happening, and how we can proceed.

In such a competitive and diverse environment, how can we best deliver a comprehensive transport infrastructure system along the key CEE transport corridors over the next decade and beyond? And what key steps need to be taken right now in order to realise the Three Seas transport vision within CEE? This report is our contribution to the ongoing exploration of what it will take to deliver future transport infrastructure for CEE. It addresses the following key themes:

- What is it about transport infrastructure that it is so vital to economic growth in CEE?
- What has been done to date?
- Can Europe afford to forgo further infrastructure investments in CEE? Challenges and opportunities from the Single Market, economic and social aspects
- Continuity of Connected Europe beyond the EU to the markets of Asia and globally
- How can we finance the future of transport infrastructure in the CEE region and beyond?
- The impact and potential of technology: how do we build for a digital future?

PLAYING CATCH-UP AFTER YEARS OF UNDERINVESTMENT

Infrastructure as the key factor for competitive growth in CEE

For CEE, having transport infrastructure as efficient as that of Western Europe would mean a quantum leap in its ability to continue its competitive growth. Distance matters less when efficient, fast and safe connections facilitate business operations.

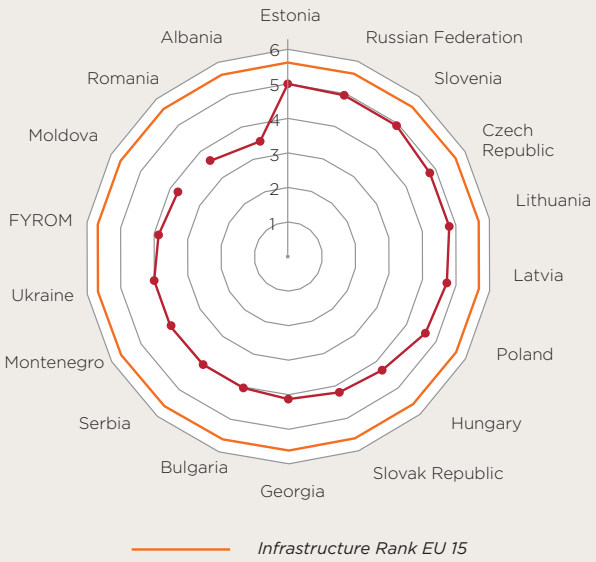
Infrastructure is key to any appraisal of a country or region's competitiveness. The World Economic Forum (WEF) Global Competitiveness Report 2016-2017[2] assesses the competitiveness landscape of 138 economies, providing insight into the drivers of their productivity and prosperity through the Global Competitiveness Index (GCI). This measure correlates positively with a country's global infrastructure rank. Enhancements to a country's infrastructure are directly connected with its competitiveness, by increasing its investment attractiveness and ease of doing business.

There is significant variation in GCI scores and infrastructure rank across Europe, and even within CEE itself. The EU15 has an average infrastructure rank of 5.65. No CEE country exceeds 5, while the average for the region is 4.02, and some countries, such as Albania, Romania and Moldova, score as low as 3.5.

In the WEF Executive Opinion Survey, business leaders noted that inadequate infrastructure is a substantial barrier to business growth in CEE. It is ranked as one of the most significant barriers in all CEE countries (e.g. 4th in Bulgaria, 7th in Poland and Romania).

Better infrastructure could help all CEE countries improve their competitiveness, including those that already score relatively high. For example, Poland ranks high in global competitiveness at 36, yet its infrastructure rank is only 53, with a score of 4.34.

CEE Region Infrastructure ranking



Source: PwC Analysis based on WEF Global competitiveness Index 2016-2017 http://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017_FINAL.pdf [accessed 28.05.2017]

[2] World Economic Forum, Global Competitiveness Report 2016-2017, http://www3.weforum.org/docs/GCR2016-2017/05FullReport/TheGlobalCompetitivenessReport2016-2017_FINAL.pdf [accessed 30.05.17]

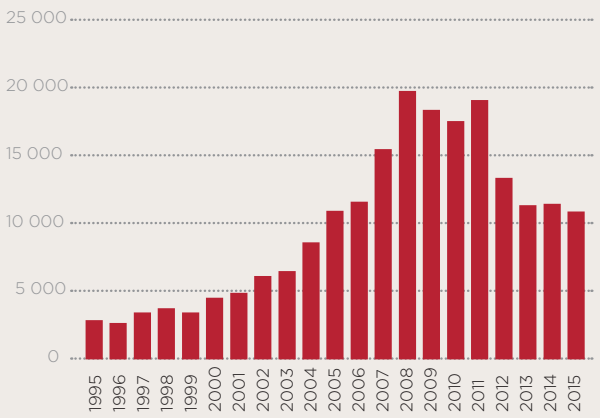
CEE Infrastructure – significant progress to date

Prior to EU accession, transport infrastructure investment throughout the region was historically low, resulting in a considerable disparity between CEE and the EU15.

Throughout 1995-2015, we observed progress in the trend of CEE transport infrastructure investments. They began to grow rapidly after 2001, totalling almost EUR 210 billion over 20 years.

Thanks to these investments, the EU members in CEE managed to catch up on their infrastructure backlog from previous years. The road network, in particular, has seen substantial improvements, with more than 5,600 kilometres of new motorways built throughout CEE since 1995.[3] As illustrated in the chart below, in some countries this expansion has been quite dramatic, and the growth rate of 202% in total is almost five times the pace in the EU15.

Infrastructure Investments in EU11 (EUR milion)



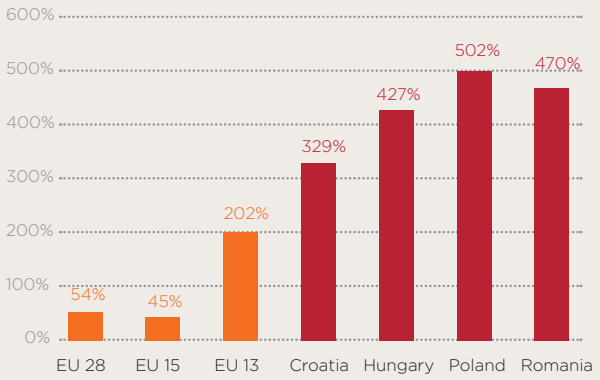
Source: OECD (2017), Infrastructure investment (indicator). doi: 10.1787/b06ce3ad-en [Accessed on 22 June 2017]
EU11 (Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia)

CEE Infrastructure – there is still ground to cover

Despite such positive developments, CEE transport infrastructure remains less mature than that of Western Europe. For example, despite the 202% increase in length of motorways over the last 20 years, the total number of kilometres per million inhabitants in the EU13 remains less than half the figure in the EU15 (81 km versus 165 km).

Also, there is still considerable disparity in both availability and quality of road, rail, air and port infrastructure across CEE; gaps within and between the networks cause bottlenecks in the movement of both people and goods, particularly across borders. Countries in the Three Seas region remain noticeably below average in terms of their transport infrastructure quality rating, across all modes of transport.

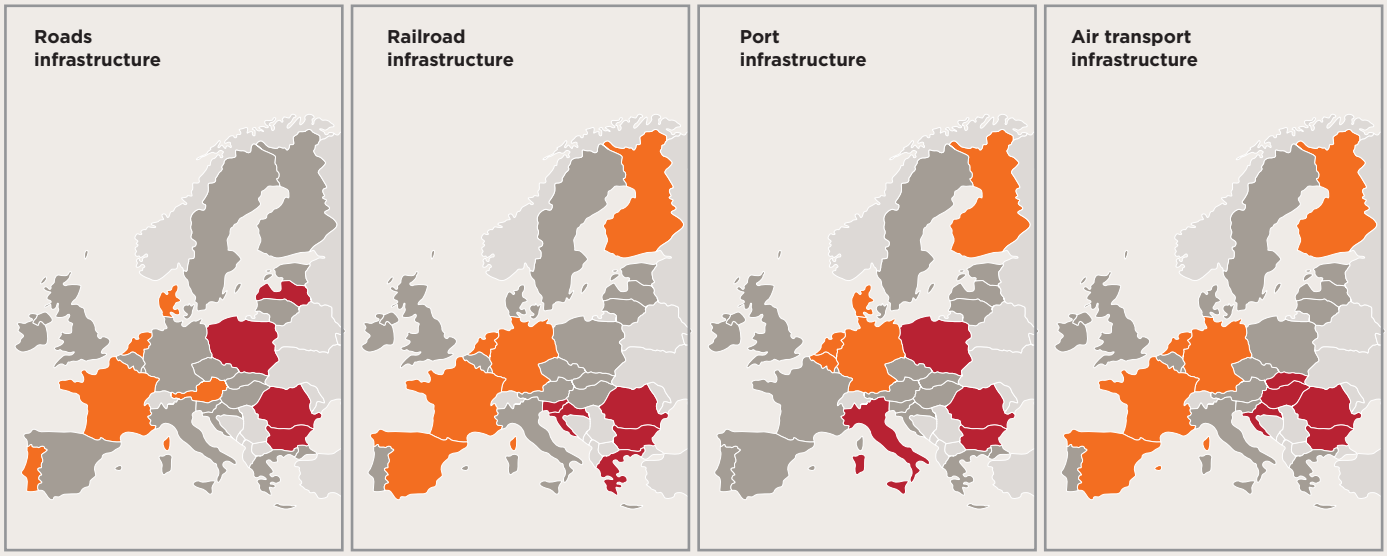
Increase in total motorway length, 1995-2013



Source: PwC analysis based on European Commission data https://ec.europa.eu/transport/facts-fundings/statistics/pocketbook-2016_en [accessed 25.04.2017]

[3] PwC analysis based on European Commission data https://ec.europa.eu/transport/facts-fundings/statistics/pocketbook-2016_en [accessed 25.04.2017]

Quality of transport infrastructure



Rating based on a survey by the World Economic Forum, using a scale from 1 (extremely underdeveloped) to 7 (extensive and efficient).
Source: https://ec.europa.eu/transport/facts-fundings/scoreboard/compare/investments-infrastructure/quality-roads_en [accessed 7.05.2017]

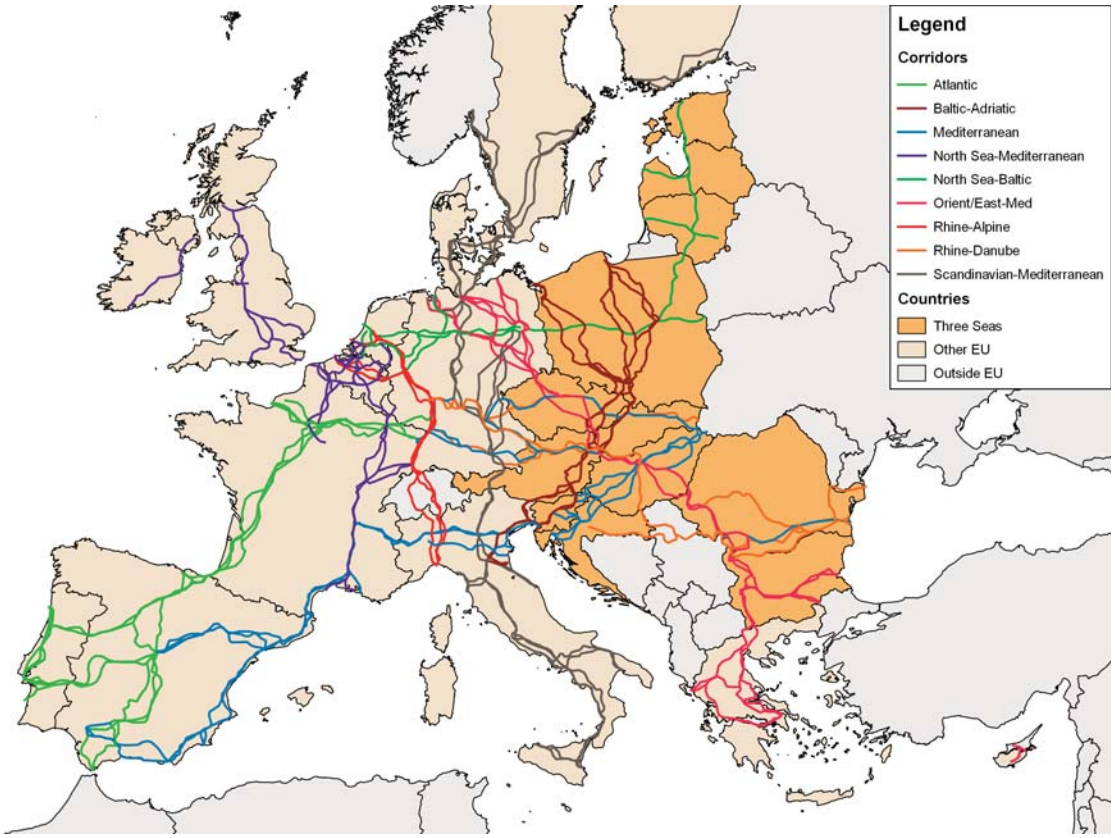
In summary, CEE needs further investments to reach the EU15's level of competitiveness. After decades of under-investment, ploughing money into new routes and modernising and maintaining the existing transport system across the region remains crucial for achieving sustainable economic growth and maximising the region's competitive potential.

CONNECTING CEE

Connecting Europe

The EU is the largest single economy in the world: a single market predicated on the belief that free movement of goods, capital, services, and people drives prosperity. As a concrete step toward realising the potential of the single market, in 1994 the EU initiated its trans-European transport network policy (TEN-T). In 2013, the European Commission established a network of nine core transport corridors that links all EU member states. Its objective is to close the gaps between countries' transport networks, remove bottlenecks that impede the smooth functioning of the internal market and overcome technical barriers such as incompatible standards for rail traffic. Its specific focus is on modal integration (developing all transport modes and connections between them, as well as traffic and information management systems), interoperability and coordinated infrastructure development.[4] Plans for the second generation of TEN-T corridor works were approved in December 2016, laying the foundation for completion of the network by 2030.

TEN-T Corridors



Source: PwC graphic based on European Commission information https://ec.europa.eu/transport/themes/infrastructure_en accessed [30.05.2017]

[4] European Commission, https://ec.europa.eu/transport/sites/transport/files/tent-coordinators-2nd-workplan-nsb.pdf [accessed 25.04.2017]

> "In my opinion, Three Seas Initiative successfully supports the development of pan-European transport corridors. If you look at the map, it is clear that the pan-European transport corridors don't have sufficient direct connections in the North-South direction".
>
> **Mārtiņš Lazdovskis,** Member of the board, Latvian State Roads

The TEN-T network corridors that are most critical for CEE and the Three Seas initiative are:

- **North Sea-Baltic**
- **Baltic-Adriatic**
- **Rhine-Danube**
- **Orient / East-Med**
- **Mediterranean**

Together, these five corridors and the Motorways of the Sea unite the eastern countries of the EU from north to south and from west to east. They traverse major European transport axes, providing much-needed links to economically important regions. From the emerging economies of Eastern Europe to the established centres of Western European commerce, these corridors open up significant potential for sustainable economic growth in Europe, which means opportunities throughout old and new EU member states and the development of trade and business relationships with Asian countries and globally.

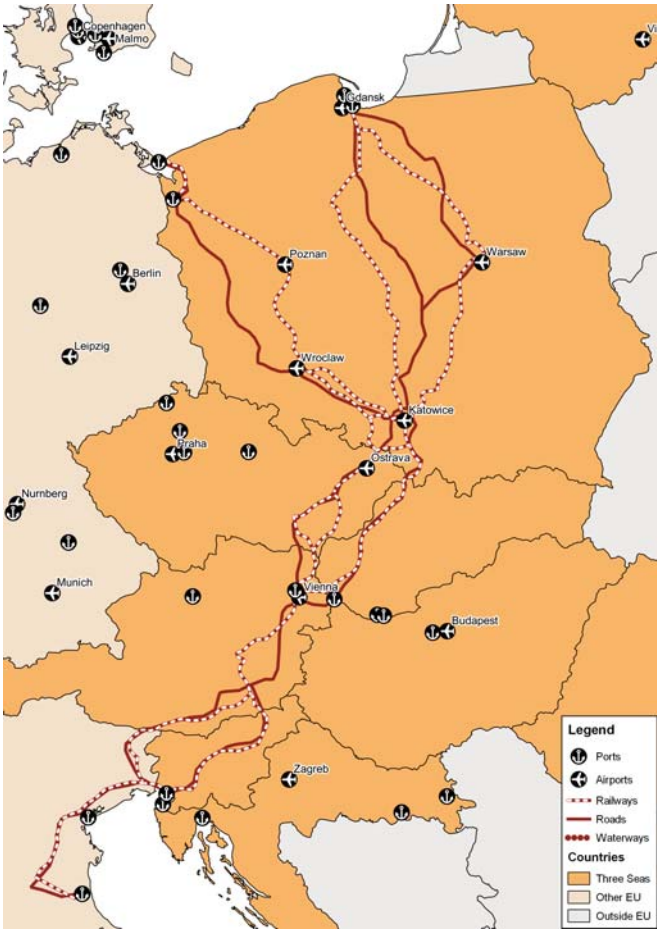
The Baltic-Adriatic Corridor

The Baltic-Adriatic Corridor is one of the most important trans-European road and railway axes, connecting the Baltic ports in Poland with the Adriatic Sea. The Corridor links the major intersections (urban nodes, ports, airports and other transport terminals) through rail, road, maritime and air transport connections from north to south, i.e. from Poland through the Czech Republic, Slovakia and Austria, to Slovenia and Italy.

It includes priority railway projects, such as new cross-border sections and the Gdansk-Ravenna rail freight project. At 2,400 km and carrying more than 24 million tonnes of freight a year,[5] this initiative provides better access to both Baltic and Adriatic seaports for economic centres across CEE. Such a network significantly strengthens the efficiency, safety and quality of the infrastructure base through multimodal transport chains for freight and passengers.

Territories	Austria, Czech Republic, Italy, Poland, Slovakia, Slovenia
Cost	**EUR 69.5 billion**
Rail	4,285 km
Road	3,600 km
Core Urban Nodes	13
Core Airports	13
Ports (inland & maritime)	10
Road Rail Terminals	24
Ongoing & planned projects, including:	**477**
Road	80
Rail	97
Maritime ports	102
Airports	84
Urban nodes	73

Source: Baltic Adriatic, Second Workplan of the Coordinator, December 2016, https://ec.europa.eu/transport/sites/transport/files/tent-coordinators-2nd-workplan-bac.pdf [accessed 25.04.2017]



Source: PwC graphic based on European Commission Information http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html [accessed 25.05.2017]

[5] European Commission, Baltic-Adriatic Core Network Corridor, https://ec.europa.eu/transport/themes/infrastructure/ten-t-guidelines/corridors/bal-adr_en [accessed 25.04.2017]

The key objectives of the Baltic-Adriatic corridor, if achieved, will have a significant positive impact on transport in the Three Seas region, including:[6]

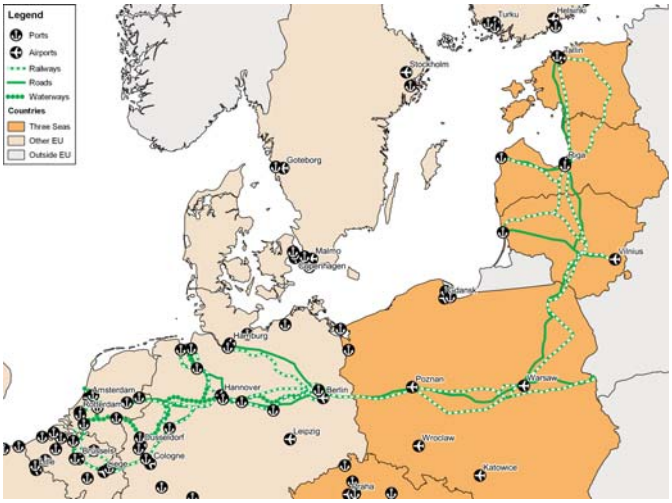
- Enabling technical compliance of the railway network with the EU's TEN-T regulations to allow standardisation of modal networks: along the corridor, the noncompliance rates for axle load, speed and train length standards are 8%, 29% and 71% respectively, with the largest needs in Poland and Slovenia.
- Enabling technical compliance of the road network with the EU's TEN-T requirements: in Poland, the Czech Republic and Slovakia, the noncompliance rates for road infrastructure along the corridor are 28%, 21% and 17% respectively.
- Eliminating the main rail and road bottlenecks, to encourage the development of long-distance international traffic flows along the Corridor, in particular by:
  - upgrading railway cross-border sections between Poland – the Czech Republic / Slovakia, Slovakia – Austria, Austria – Slovenia and Slovenia – Italy
  - improving the national networks in Poland and Slovenia, including junctions and nodes
  - increase infrastructure capacity for the most critical nodes around urban agglomerations (Warsaw and Katowice in Poland, Brno in the Czech Republic, Bratislava in Slovakia, Vienna in Austria and Ljubljana in Slovenia)
- Last-mile connections to ports, to accommodate the heavy traffic generated by the ports and streamline onward rail connections for both freight and passengers, in particular at some Polish and all Adriatic ports.
- Full deployment of the European Rail Traffic Management System (ERTMS) to enable interoperability of national transport networks.

[6] Baltic-Adriatic, Second Workplan of the Coordinator, December 2016, https://ec.europa.eu/transport/sites/transport/files/tent-coordinators-2nd-workplan-bac.pdf [accessed 25.04.2017]

The North Sea-Baltic Corridor

This is the northernmost corridor in TEN-T. Not only does it play a critical role in creating improved connections between Central, Northern and Eastern Europe; it also links some of the most important ports in Europe. This corridor is therefore crucial for the region's integration into global transport routes. The Baltic States serve as a vital commercial hub for connections to the eastern and northern markets of Russia, China and the rest of Asia, while the North Sea ports provide maritime access to global trading routes, including to the Americas.

The objective of the corridor is to link ports by all available modes to enable multimodal transport – including rail, roads, inland waterways and air and providing state-of-the-art traffic and information management systems.



Source: PwC graphic based on European Commission information http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal /map/maps.html [accessed 25.05.2017]

Territories	Belgium, Estonia, Finland, Germany, Latvia, Lithuania, Netherlands, Poland
Cost	**EUR 80 billion**
Rail	5,986 km
Road	4,092 km
Core Urban Nodes	17
Core Airports	16
Ports (inland / maritime)	32
Road Rail Terminals	17
Ongoing & planned projects, including:	**402**
Road	117
Rail	110
Maritime ports	78
Airports	43
Inland Ports & IWW	22
Multimodal	17

Source: North Sea-Baltic: Second Workplan of the European Coordinator, December 2016, https://ec.europa.eu/transport/sites/transport/files /tent-coordinators-2nd-workplan-nsb.pdf [accessed 25.04.2017]

Current capacity issues along the corridor are a direct result of chronic under-investment across all modes of transport. The corridor, once completed, will provide efficient road and rail transport connections for passengers and freight for the three Baltic countries of Estonia, Latvia and Lithuania, with Poland, Germany, the Netherlands and Belgium. The corridor also includes inland waterways between the Odra River and German, Dutch and Flemish ports.[7]

Some of the key objectives for the North Sea-Baltic Corridor[8] are particularly relevant for the Three Seas initiative:

- Increasing capacities and bridging missing links in the rail network – given a fragmented and outdated rail network along the corridor, rail projects account for the highest share of planned investments. More than EUR 30 billion are assigned to develop new rail lines and eliminate bottlenecks, with a significant percentage going to projects in Three Seas countries such as Rail Baltica (EUR 5.9 billion), electrification of lines in the Baltic States (approx. 1 billion in Latvia and Lithuania), as well as new and upgraded lines in Poland (EUR 8 billion).

- Enabling technical compliance and railway capacity improvement projects (mostly modernisation) in Poland and the Baltic States

- Promoting multimodal transport – the corridor is creating multi-modal transport links, not only by sea, but via rail, roads, inland waterways and air, to many of the most important ports in Europe.

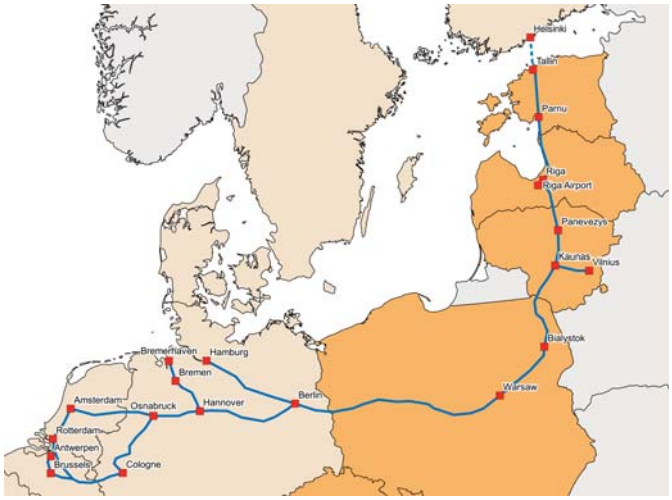
- Enabling technical compliance of the road network with the EU's TEN-T requirements (roads have to be either an express road or a motorway by 2030): In 2014, compliance rates for road infrastructure on the corridor in Poland, Lithuania, Latvia and Estonia were only 56%, 55%, 8% and 7% respectively.

- Improving the most critical nodes around urban agglomerations to eliminate congestion (especially Warsaw, Poznań, Vilnius and Riga)

[7] European Commission, https://ec.europa.eu/transport/themes/infrastructure /ten-t-guidelines/corridors_en [accessed 03.06.17]

[8] North Sea-Baltic: Second Workplan of the European Coordinator, December 2016, https://ec.europa.eu/transport/sites/transport/files /tent-coordinators-2nd-workplan-nsb.pdf [accessed 25.04.2017]

Rail Baltica



Source: PwC graphic based on European Commission information http://www.railbaltica.org/wp-content/uploads/2017/04/rb-north.jpg [accessed 27.04.2017]

Rail Baltica is the largest railroad infrastructure project ever undertaken in the Baltic nations. It will connect the Baltic States and Poland with the rest of Europe, from Tallinn to Warsaw via Riga and Kaunas, thereby linking the new EU member states of Estonia, Latvia, Lithuania and Poland with a faster, interoperable, direct rail line for both freight and passengers, and offering an alternative to the predominant traffic flows with Russia and Belarus. It will encompass three multimodal freight terminals and three airport connections.

The first phase of the project (Rail Baltica I), from the Polish border to the Lithuanian city of Kaunas, was completed in October 2015. The second phase (Rail Baltica II) will complete the project, connecting Kaunas, Riga and Tallinn with an electrified double-track line. Construction of this phase is scheduled for 2018-2025.

Key facts about the Rail Baltica project:

- 10-year construction period
- 728 km of track from Tallinn to the Polish border
- 5 million passengers a year by 2030
- 16 million tonnes of freight a year by 2030
- EUR 5.9 billion investment over 10-15 years
- Powered by electricity – less noise and vibration, more environmentally friendly

Key outcomes for passengers of the Rail Baltica project:[9]

- fast, comfortable and affordable rail transport
- regular trains every two hours
- far quicker journey times (travel time from Tallinn to Riga will be 2 hours, i.e. half the time by car)
- capacity for more than 3,000 passengers per day per section
- net socio-economic benefits from passenger travel, freight shipping, railway operating profit, employment and environmental impact will exceed EUR 16 billion.[10]

[9] North Sea Baltic: Second Workplan of the European Coordinator, December 2016, https://ec.europa.eu/transport/sites/transport/files/tent-coordinators-2nd-workplan-nsb.pdf [accessed 25.04.2017]

[10] Presentation "Project of the century" (Baiba Rubesa, CEO RB Rail AS, April 2017) http://www.railbaltica.org/wpcontent/uploads/2017/04/Rubesa_presentation-1.ppsx [accessed 27.04.2017]

"Development of Rail Baltica infrastructure is a priority for the EU. It is co-financed by EU funds. However, the development of the infrastructure around the line is challenging and might require private financing. For that purpose, as well as for financing of Rail Baltica after 2020, PPP should be considered".

Kaspars Rokens, Member of the Board, RB Rail AS

Project management

RB Rail, collectively owned by the three Baltic member states, was set up in November 2014 to provide project management and governance. During 2016, RB Rail agreed common procurement standards for Rail Baltica II, completed feasibility studies and achieved closer cooperation with Poland and Finland.

In January 2017, the prime ministers of all three Baltic States signed an agreement on the implementation of the Rail Baltica standard-gauge link.[11] The agreement determines the technical parameters, route and construction schedule.

The next steps include establishing a common procurement procedure and design guidelines, as well as stakeholder management, including land acquisitions, compensation and resolution of potential disputes.

Main issues and challenges

The key issue for the project is stakeholder management, including addressing citizens who will be impacted or displaced by the new line. For example, in Lithuania, a large part of 2018 and 2019 will be devoted to land acquisition, landowner compensation and potential disputes; in Estonia, citizens are not yet convinced of the need for the project.[12]

[11] http://www.railjournal.com/index.php/high-speed/trilateral-rail-baltica-agreement-signed.html [accessed 25.04.2017]

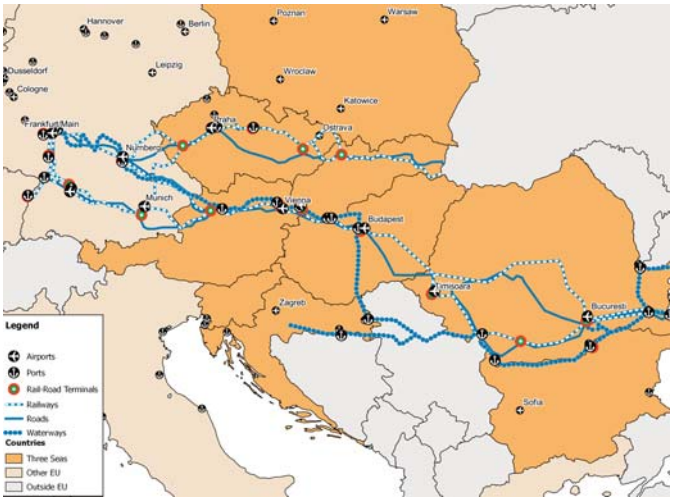
[12] Baltic Times, April 2017, http://www.baltictimes.com/rail_baltica_railway__good_for_all__but_unsettled_issues_abound/ [accessed 04.06.17]

Rhine-Danube Corridor

The Rhine-Danube Corridor is the transport backbone of the EU, connecting the entry ports at the Black Sea with southern Germany along the Rhine and Danube. The other branch links the Ukrainian-Slovakian border to the Rhine ports and central European regions.

The Rhine-Danube Corridor covers a significant part of the Three Seas region and includes all modes of transport. The Corridor is the main east-west link between European countries, connecting France, Germany, Austria, the Czech Republic, Slovakia, Hungary, Croatia, Romania and Bulgaria along the Rhine, Main and Danube rivers to the Black Sea. It also touches four non-EU States: Serbia, Bosnia and Herzegovina, Moldova and Ukraine.

The Corridor focuses to a great extent on rail and inland waterway interconnections. The main inland connection between the Rhine, Main and the Danube represents the backbone of inland navigation between the north-western European basins and the south-eastern Black Sea. The Corridor covers 3,656 km of inland waterway network in the EU, as well as related inland waterway sections and ports in Serbia, Bosnia and Herzegovina, Moldova and Ukraine. To remove major bottlenecks and allow smooth inland waterway transport along the entire Corridor the navigability of the Danube and Sava Rivers, in particular, must be improved. These improvements will raise standards for metrics including draught, permissible height under bridges and in particular targeted depth. In 2015, only 42% of the inland waterway sections met the targeted fairway depth. 59 IWW and 96 port projects to be completed have been identified along the Corridor, with Romania ranking highest – more than half of Romania's 101 projects are port-related.[13]



Source: PwC graphic based on European Commission information http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html [accessed 25.05.2017]

Territories	Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, France, Germany, Hungary, Moldova, Romania, Serbia, Slovakia, Ukraine
Cost	**EUR 69.9 billion**
Rail	5,715 km
Road	4,870 km
IWW	3,656 km
Core Airports	11
Ports (inland / maritime)	21
Road Rail Terminals	27
Ongoing & planned projects, including:	**429**
Road	84
Rail	119
Maritime ports	96
Airports	20
Inland Ports & IWW	59
Multimodal	25

Source: Rhine-Danube, Second Workplan of the Coordinator, December 2016, https://ec.europa.eu/transport/sites/transport/files/tent-coordinators-2nd-workplan-rhd.pdf [accessed 23.06.2017]

[13] Rhine Danube, Second Workplan of the Coordinator, December 2016, https://ec.europa.eu/transport/sites/transport/files/tent-coordinators-2nd-workplan-rhd.pdf [accessed 23.06.2017]

> "Improvement of inland waterways has significant positive externalities, including decarbonisation of transport and improving internal connectivity, especially in the context of the Three Seas initiative. This is likely to require significant public intervention, as infrastructure would have to be built or upgraded and cross-country coordination required given the nature of waterway infrastructure".
>
> **Sue Barrett,** Director for Transport, EBRD

Some of the goals for the Rhine-Danube Corridor are particularly relevant to the Three Seas Initiative:

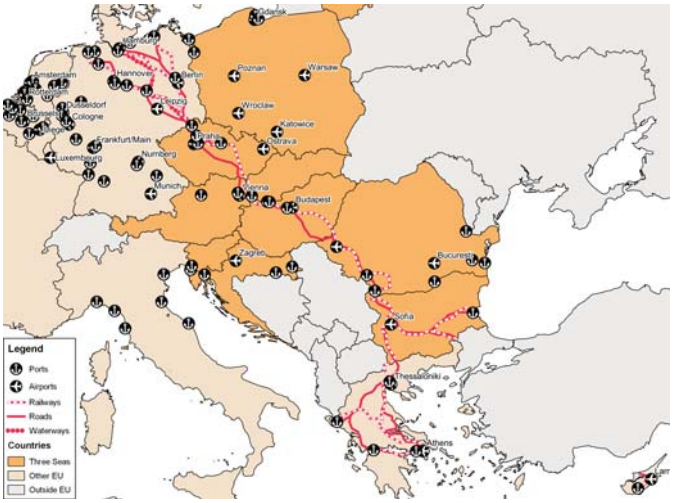
- Addressing the main missing links and bottlenecks in the railway system, in particular cross-border connections. Key rail projects to be completed in the Three Seas area include the Domazlice German-Czech border crossing and the Arad-Craiova and Craiova-Bucharest sections of the TEN-T core route in southern Romania.
- Improving intermodal facilities in the Corridor's key ports in Hungary, Croatia and Romania.
- Harmonisation of administrative procedures and interoperability of tolling systems in ports, to avoid delays and remove burdens on hauliers and freight forwarders.
- Addressing technical standards / missing links at road borders, particularly the Czech-Slovakian and Hungarian-Slovakian borders.
- Addressing key missing motorway / express road links in the Czech Republic, Slovakia and Romania, along with refurbishment of ageing infrastructure.
- Interoperability of toll collecting systems and real-time traffic information along the Corridor.
- Addressing capacity issues in the key nodes – in particular in Hungary and Romania.

The Orient / East-Med Corridor

The Orient / East-Med Corridor connects the maritime interfaces of the North, Baltic, Black and Mediterranean Seas. It links the German ports of Bremen, Hamburg and Rostock to the Czech Republic and Slovakia, with a branch through Austria, extending further through Hungary and Romania towards Sofia, with links to the port of Burgas and to Turkey, then to the Greek ports with a 'Motorway of the Sea' link from Greece to Cyprus.

Certain goals and development needs for the Orient / East-Med Corridor are particularly relevant for the Three Seas initiative, including[14]:

- Road networks: Capacity bottlenecks occur along several corridor sections, with a total length of about 500 km, some of which are saturated motorways in Germany, the Czech Republic, Austria and Hungary. These are to be addressed by projects for completion of ring roads (Prague, Vienna, Budapest and Sofia) and upgrading or construction of new motorway sections in the Czech Republic (D1), Austria (A5), Hungary (M15) and Bulgaria (A3 Struma).
- Filling in the numerous missing links along the corridor. In particular, multi-modal connections between Hungary, Bulgaria, Romania and Greece either do not exist or need substantial upgrading.
- Cross-border traffic management systems for both rail and inland waterways are still to be implemented on many sections.
- Increase rail cross-border capacity: three critical cross-border sections are experiencing severe capacity constraints and major bottlenecks: Dresden-Prague, Békéscsaba-Thessaloniki and Prague-Česká Třebová.
- Port capacity and inland waterways bottlenecks are being addressed by expansions or construction of new facilities to accommodate increasing demand.



Source: PwC graphic based on European Commission information http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html [accessed 25.05.2017]

Territories	Austria, Bulgaria, Cyprus, Czech Republic, Germany, Greece, Hungary, Romania, Slovakia
Cost	**EUR 60 billion**
Rail	5,800 km
Road	5,400 km
IWW	1,700 km
Core Urban Nodes	15
Core Airports	15
Ports (inland / maritime)	22
Road Rail Terminals	25
Ongoing & planned projects, including:	**429**
Road	73
Rail	121
Maritime ports	77
Airports	29
Inland Ports & IWW	21

Source: Orient / East-Med, Second Workplan of the European Coordinator, December 2016, https://ec.europa.eu/transport/sites/transport/files/tent-coordinators-2nd-workplan-oem.pdf [accessed 25.04.2017]

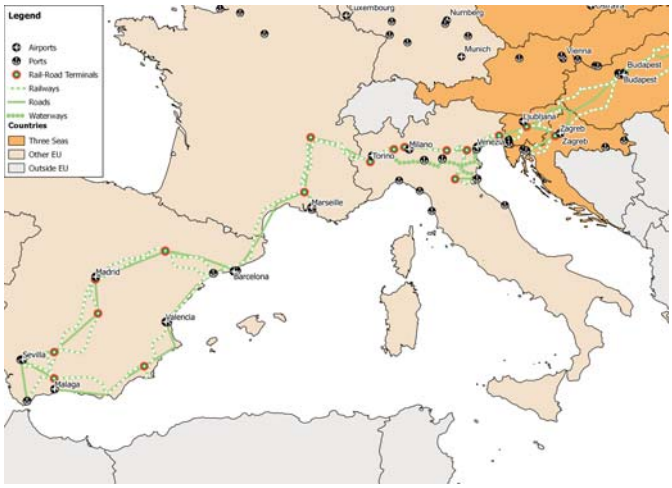
[14] Orient / East-Med, Second Workplan of the European Coordinator, December 2016, https://ec.europa.eu/transport/sites/transport/files/tent-coordinators-2nd-workplan-oem.pdf [accessed 25.04.2017]

Mediterranean Corridor

The Mediterranean Corridor links the ports in the south-western Mediterranean region to the centre of the EU, following the coastlines of Spain and France, and crossing the Alps towards the east. Only the easternmost part of the Corridor crosses the Three Seas region, through Slovenia, Croatia and Hungary up to the Ukrainian border. It will facilitate connections with non-EU countries (in particular the Balkan countries and Ukraine).

Some of the key objectives for the Mediterranean Corridor[15] are particularly relevant to the Three Seas initiative:

- Addressing the main cross-border missing links and bottlenecks, in particular:
  - cross-border rail connections: Italy-Slovenia (Trieste-Divaca – total cost ca. EUR 102 million) and Croatia-Hungary (Križevci-Koprivnica and Dombóvár-Gyékényes; total cost ca. EUR 471 million).
  - cross-border road connections: Hungary-Ukraine (M34 and M3 – total cost ca. EUR 566 million) and Slovenia-Hungary (M70 – total cost ca. EUR 60 million).
- Addressing key missing capacities, including: new railway line in central Slovenia, missing railway and ring road in the Budapest node and upgrade of the Divaca-Koper railway connection, enhancing last mile connections to Rijeka Port and Zagreb Airport.
- Interoperability of toll systems, traffic management and real-time traffic information along the Corridor.
- Harmonising national procedures for authorisation and certification of rolling stock.
- Addressing capacity issues in the key nodes – in particular Ljubljana, Zagreb and Budapest.



Source: PwC graphic based on European Commission information http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html [accessed 25.05.2017]

Territories	Croatia, France, Hungary, Italy, Slovenia, Spain
Cost	**EUR 104 billion**
Rail	7,887 km
Road	5,503 km
Core Urban Nodes	13
Core Airports	17
Ports (inland / maritime)	21
Road Rail Terminals	19
Ongoing & planned projects	**407**
Road	71
Rail	96
Maritime ports	81
Airports	41
Inland Ports & IWW	31
Multimodal	42

Source: Mediterranean, Second Workplan of the Coordinator, December 2016, https://ec.europa.eu/transport/sites/transport/files/tent-coordinators-2nd-workplan-med.pdf [accessed 23.06.2017], https://www.railfreightcorridor6.eu/RFC6/Public/RFC6_CID_Book5_2015-16_12-01-2016.pdf [[accessed 23.06.2017]

[15] Mediterranean, Second Workplan of the Coordinator, December 2016, https://ec.europa.eu/transport/sites/transport/files/tent-coordinators-2nd-workplan-med.pdf [accessed 23.06.2017]

Motorways of the Sea (MoS)

The Motorways of the Sea (MoS) initiative was incorporated into the TEN-T programme in 2004. It was developed specifically to create new inter-modal maritime-based logistics chains throughout Europe, improving access to markets throughout the continent; reduce freight costs by creating a competitive alternative to the over-stretched road system; and better integrate European transport chains.

The EU remains the most important exporter globally and the second largest importer, meaning maritime transport and all related shipping services are essential to helping European companies compete worldwide. The Three Seas initiative may build on maritime connections, both creating an alternative to the dominance of road freight across the region, and helping to connect the region globally.

MoS aims to increase the amount of cargo carried by ships, by developing efficient ports and better port-to-hinterland infrastructure. This will help mitigate congestion and deficiencies in land transport links within the Three Seas region, which are detrimental to cohesion and a dynamic internal market, as well as to the rest of Europe, the world's largest trading bloc.

Source: PwC graphic based on European Commission information http://ec.europa.eu/transport/infrastructure/tentec/tentec-portal/map/maps.html [accessed 25.05.2017]

MoS are being developed around four sea corridors:[16]

1. ***Motorway of the Baltic Sea*** (linking the Baltic Sea member states with those in Central and Western Europe, including the route through the North Sea/Baltic Sea canal)

2. ***Motorway of the Sea of western Europe*** (leading from Portugal and Spain via the Atlantic Arc to the North Sea and the Irish Sea

3. ***Motorway of the Sea of south-east Europe*** (connecting the Adriatic Sea to the Ionian Sea and the eastern Mediterranean, including Cyprus)

4. ***Motorway of the Sea of south-west Europe*** (western Mediterranean, connecting Spain, France, Italy and including Malta, joining up with the Motorway of the Sea of south-east Europe, and including links to the Black Sea).

MoS projects are focused on developing maritime links between ports of strategic importance to the European Union and their hinterlands, as well as port facilities and underlying infrastructure.

The development of Motorways of the Sea will provide a framework for the deployment of high-level standards for efficient, safe and environmentally friendly maritime transport operations.

[16] European Commission, Motorways of the Sea, https://ec.europa.eu/transport/modes/maritime/motorways_sea_en [accessed 25.04.2017]

Western-Balkans Investment Framework (WBIF)

In 2015, the TEN-T programme was extended to the Western Balkans in order to integrate this region with the rest of the EU. In this respect, the Western-Balkans Investment Framework (WBIF) was established as a joint blending facility of the European Commission, participating Financial Institutions (FIs), bilateral donors, and Western Balkan countries to deliver funding for strategic investment projects in beneficiary countries.[17]

The priority projects have been identified and positioned as first in line, with benefits to include better transport networks across the Three Seas region. The European Union, through the WBIF, has been instrumental in identifying investment needs as well as financing the technical documentation required for construction work.

The largest priority project in WBIF is Corridor X – a key Pan-European route running through Austria, Slovenia, Croatia, Serbia, FYROM, and Greece. It forms a part of the south-eastern axis of extensions of the TEN-T network, serving international and local traffic, as well as reducing bottlenecks.

The project has found financial and operational support from various grantors, including the EIB, EBRD and World Bank, as well as the WBIF grant to finance project management activities and special studies.

Project	Description	EUR million
Section 1	E75	970
Section 2	E80	600
Overall	Total Cost	1 570
Included in the estimate	Project preparation, management of construction and supervision (both sections)	30

Source: https://www.wbif.eu/wbif-projects/details?code=PRJ-SRB-TRA-005&ogtitle=Corridor X Serbia (Road)&ogdescription=PRJ-SRB-TRA-005&ogimage=Sites/website/projects/PRJ-SRB-TRA-005/WB1-SER-TRA-01.jpg

[17] European Commission, 2016, Connectivity Agenda: Co-Financing Investment Projects in the Western Balkans, https://www.wbif.eu/content/stream//Sites/website/library/2016-Paris-Summit-Package [accessed 22.05.2017]

Lessons learnt

We have reviewed several projects within the TEN-T network that are relevant to the Three Seas Initiative, underpinning the improvement of connectivity and smooth movement of people, goods and services between the Baltic, Adriatic and Black Seas.

During our review and discussion with key stakeholders, we identified several common issues that the projects face, mainly connected with:

- political agendas
- technical challenges
- social and environmental impact
- administrative/procedural delays
- financing issues

Political agendas

Political changes on the governmental level may make it difficult to move forward with projects despite earlier agreements, and have proved to be significant impediments to timely project delivery. This issue is even more critical for pan-regional projects. It is therefore worth considering whether such vast initiatives should perhaps be administered and coordinated at the international level to mitigate such risk. The coordinated approach to the Rail Baltica project may serve as a positive example.

Technical challenges

We observed that some projects risk significant delays due to prolonged discussion on technical solutions and redrafting of feasibility studies. Some projects that are vital for connectivity need to pass through difficult landscapes which may impact the process on both the national and the regional level.

Social and environmental impact

Residents are often reluctant to support projects. Such heavy infrastructure changes must proceed with caution, and address local communities' concerns. It is the task of government to explain the needs that underlie infrastructure decisions, and to make every effort, from the national/regional as well as local perspective, to explain the opportunities such investments bring. When deciding on locations, governments should also pay special attention to minimising the social costs of:

- environmental impact: be open to "green" options, not allowing unnecessary impact on local biodiversity zones,
- business to business impact: location decisions should also incorporate local infrastructure already in place, so as not to disturb existing businesses,
- promote countries' unique specialisations, supporting their local development and export potential to bring profit at both the local and national levels.

In this context, inland waterways, as a safe and environmentally friendly mode of transport, should be further discussed within the Three Seas region. Rivers such as the Danube, the Vistula, the Sava, the Dnipro and the Odra have a lot to offer in terms of intermodal transport, especially in the context of congested road and rail infrastructure. However, rivers in the Three Seas region today are not used to their full capacity, and play an insignificant role.

Administrative/procedural delays

The vast administrative inefficiencies and barriers across the Three Seas region and beyond may have a significant impact on the projects:

- different procurement procedures for national parts of the project, including tightening of procedures in response to corruption concerns, resulting in delays
- lack of interest or progress in one of the countries involved can delay the entire process
- complexity of work due to various environmental, administrative and social factors
- different legal requirements, e.g. building permits
- different technical requirements, e.g. for feasibility studies.

Financial issues

Despite significant progress to date, some key projects have not yet secured financing. The major reasons may include:

- affordability issues, especially in the case of large multinational projects to be sponsored by relatively smaller economies
- concerns about bankability of the projects
- delays in procedures that precede financing, e.g. feasibility studies, environmental procedures
- some projects are not financially attractive to private investors, and too large for a single government to deal with.

Financing is a particularly critical issue for the parts of the network crossing non-EU countries, which do not enjoy the same benefits of EU funding as the EU13. We discuss financing later in this report.

"Currently, Romania has on-going cross-border rail projects with 4 out of its 5 neighbours: Hungary, Bulgaria, Ukraine, and Republic of Moldova. While the cooperation with the two EU neighbours benefits from the inclusion of both borders in the two Core Network Corridors crossing Romania, the cooperation with Ukraine and Moldova lacks the necessary public interest and funding".

Marius Chiper, General Manager CNCF CFR SA (Romanian National Railway Company)

An open window to the East – and the globe

In addition to the TEN-T network, other initiatives may significantly impact the transport network in the Three Seas region. These are projects that expand the EU's trade routes far beyond its boundaries, connecting the CEE member states – and, by extension, the EU as a whole – with global trade networks, particularly with Asian markets. Such projects include:

- Pan-European transport corridors
- Belt & Road (B&R) Initiative
- Trans-Caspian International Transport Route (TITR)

Building transport infrastructure in Europe just to connect its member states would be short-sighted in the era of globalisation. We need to think beyond our own backyard, and take measures to tap into the opportunities provided by global projects that could open European markets and help develop trade and business relationships with Asia and globally, by connecting markets, increasing the speed of transport and serving as a logistics centre for European trade. Thus, initiatives such as Pan-European transport corridors, B&R and TITR might further impact transport connectivity for the Three Seas countries.

Source: PwC graphic based on http://ec.europa.eu/ten/transport /documentation/doc/2005_11_24/2005_report_paneurostar_en.pdf

Pan-European transport corridors

The Pan-European transport corridors are distinct from the EU's TEN-T, however, they are seen as complementary to EU transport networks, especially after most of the countries involved in the Pan-European corridors eventually joined the EU. Similarly to TEN-T, the corridors cover road, rail and waterway infrastructure.

Beskyd tunnel, south-west Ukraine – an example of Pan-European transport corridors improving connectivity in the Three Seas region, and more broadly in Europe

The current 1.7 km single-track Beskyd tunnel was built in 1886, when the region was part of the Austro-Hungarian Empire. The tunnel, part of the Pan-European network (Corridor V), handles 60% of rail traffic going to Ukraine's western border, and is a major bottleneck:

- it is the only single-track section of the line between Kiev and the EU border,
- the tunnel is operating under emergency restrictions due to water penetration,
- operational disruptions can limit speed to 15 km/h.

The new double-track tunnel:

- will remove the bottleneck by almost quadrupling capacity from the current 12 trains per day to 46,
- supports the EU connectivity agenda and will significantly reduce journey times between Western Ukraine and the borders with Hungary and Slovakia,
- is expected to be fully operational by early 2018.

The tunnel is being financed with loans from two international institutions: the EIB is providing EUR 55 million, and the EBRD USD 40 million.

The Belt & Road Initiative: creating a modern-day 'Silk Road'

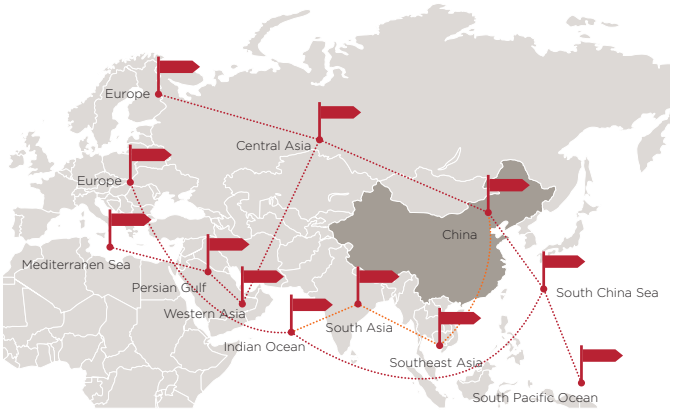
Belt & Road (B&R) is a development programme to promote Eurasian trade and integration that will have an impact not just on CEE and the rest of Europe, but on the entire world. Its two main components are the land-based 'Silk Road Economic Belt', and the 'Maritime Silk Road', which will create a vast infrastructure network connecting China to Europe via South and Central Asia and the Middle East.[18] The routes will run through more than 60 countries, which today represent 65% of the world's population, 30% of global GDP and more than 35% of the world's trade.[19]

B&R could have significant implications for CEE. All of the Three Seas countries except Austria are being considered for Belt & Road projects, as are several other countries in the region, including Albania, Bosnia and Herzegovina, FYROM, Moldova, Serbia, Ukraine and Eurasia.

Of the six economic corridors outlined in the B&R initiative, the most relevant for CEE and the rest of Europe is the New Eurasian Land Bridge, which connects China to Europe via Central Asia, past Russia and through to the Netherlands. China plans to strengthen connectivity and speed up freight transport along this route.

The initiative offers new opportunities to broaden and deepen trade and investment cooperation between China and CEE. Moving from being export destinations to becoming investment partners in production, technology, finance and infrastructure development, the CEE countries are likely to see new trade patterns emerge with China.

Proposed routes of the Belt and Road initiative



Source: PwC

[18] PwC, https://www.pwccn.com/en/consulting/br-watch-infrastructure.pdf [accessed 26.04.2017]

[19] The Guardian, May 2017, https://www.theguardian.com/world/2017/may/12/the-900bn-question-what-is-the-belt-and-road-initiative [accessed 25.04.2017]

The Trans-Caspian International Transport Route (TITR)

TITR is a 4,766-km multimodal freight route that is expected to offer annual capacity of 27.5 million tonnes of containerized cargo and up to 300,000 TEU by 2020. It is poised to invigorate cargo transport between China and Europe via Central Asia and the South Caucasus.

Today, Asia-Europe trade is carried out predominantly via ocean routes (and partly via the Trans-Siberian and Trans-Kazakhstan railways). Though ocean shipments are cheaper than rail or road, freight transported by rail through the TITR will deliver goods between Asia and Europe significantly faster than by sea. Thus, countries in the TITR region have the potential to become significant transit countries for the growing trade between Asia and Europe.

The creation of an efficient transport corridor is particularly vital for landlocked countries in Central Asia to obtain secure, cost-effective access to the major markets, and to overcome the trade bottlenecks. Located between Asia and Europe, the TITR has every prospect of becoming one of the shortest and most competitive routes for trade between the rising economies of Asia and the more developed European economies.

Source: PwC graphic based on: http://mtu.gov.ua/news/25244.html [accessed 20.05.2017]

As the EU's easternmost members, Three Seas countries are in a unique geographical position to take advantage of both of the major infrastructure development initiatives that are influencing the region from west and east. It would enhance not only national transport connectivity but also regional links, opening up trade and investment possibilities outside the region and tapping into the Asian and global markets.

HOW CAN INFRASTRUCTURE BE FINANCED?

Across the EU, the development of the TEN-T Core Network Corridors requires significant investment between now and 2030.

The medium-term investment needs of EUR 2.4 trillion, with a gap of EUR 700 billion, relate to transport infrastructure in the entire EU, including both EU13 and EU15. The investment needs of the five key TEN-T corridors most relevant to the Three Seas region (North Sea-Baltic, Baltic-Adriatic, Rhine Danube, Orient / East-Med and Mediterranean) amount to EUR 384 billion, although obviously only part of these costs relate to the Three Seas region.

If we look at CEE more broadly than the EU13, and include non-EU countries in the Balkans and the CIS, the financing needs for transport infrastructure have been estimated at EUR 615 billion through 2025.[20]

Irrespective of the source of the estimate, investment needs are clearly much higher than the available funding, and this is also true of the Three Seas region. This is too large a task for governments alone, so multilateral financial institutions and private investors have a critical role to play.

This chapter reviews key financing and funding sources that may be used to implement ambitious transport infrastructure programmes across the CEE region, including both public and private sources.

Future investment need in EU Transport

	Short-term 2014-2020 (7y)	Medium-term 2014-2030 (17y)
Care network corridors	€ 250bn	€ 740bn[3]
Other Transport investment needs	€ 800bn	€ 1,700bn
Total needs	**€ 1,050bn**[1]	**€ 2,440bn**[4]
Gap vs current trends[2]	€ 300bn	€ 700bn

[1] Based on extrapolation of OECD/Eurostat data (total transport infrastructure investment in the EU-28 amounted to EUR 730 billion for 2000-2006 and EUR 820 billion for 2007-2013)

[2] Current trend of around € 100bn spending per year versus estimated need

[3] TEN-T Corridors studies

[4] Need estimated based on 1% of GDP spent on transport infrastructure

Source: Violeta Bulc, European Commissioner for Transport, Regional Transport Investment Conference, Sofia, Bulgaria, March 2017

[20] PwC analysis based on data prepared for PwC by Oxford Economics https://www.pwc.com/gx/en/industries/capital-projects-infrastructure/publications/cpi-spending-outlook.html

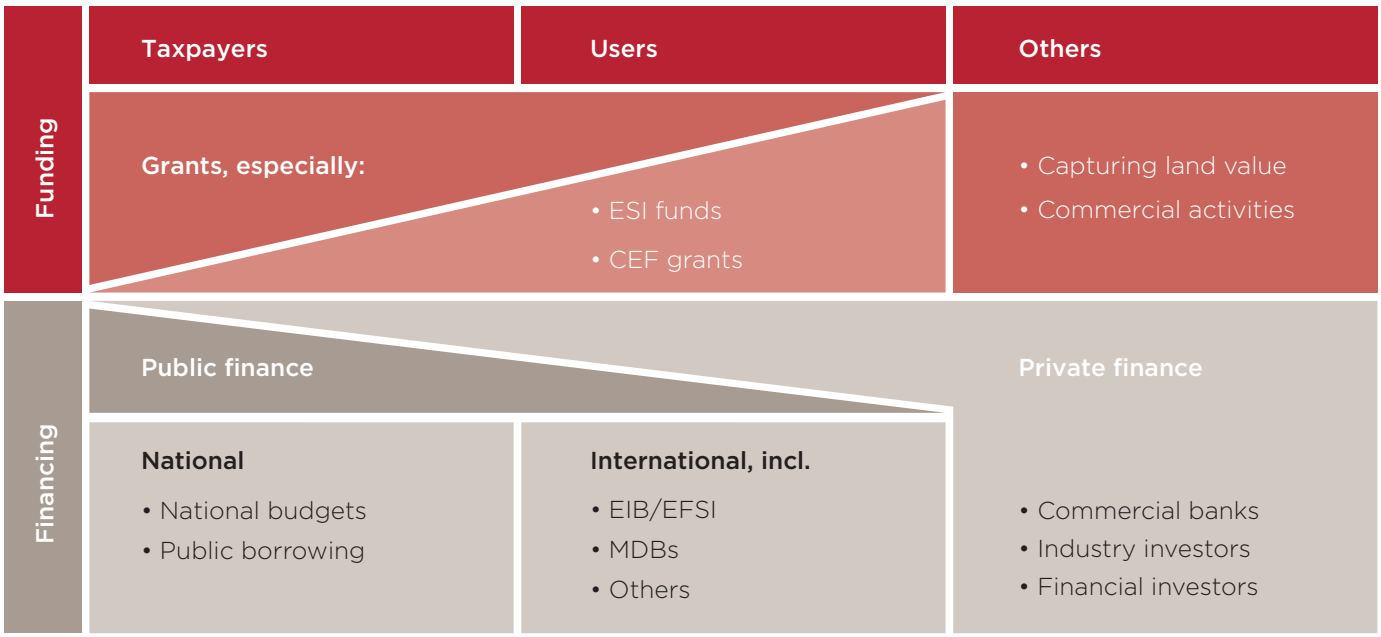
Financing and funding

Private investment can help bridge the financing gap. Yet there is confusion about the key differences between "financing" and "funding". So, what is the difference?

- Financing a project means who, at the outset, raises the cash to build it. This could be the public sector or the private sector, which raises debt and equity to build public-sector assets.
- But funding a project is a question of who ultimately pays for it over the long term; is it the user or the taxpayer? While the private sector may be financing infrastructure, it wants a return on that investment and repayment of that finance, which is ultimately funded by the taxpayer or the users.[21]

Decision makers need to realise that private investors will mostly be able to help with project financing, and only to a limited extent with funding (e.g. by helping capture land value or increased revenues from commercial activities). Hence, the decision on the affordability of a project in relation to its potential sources of funding, and prioritisation of projects given restricted funding sources, remains with the public sector.

The illustration below shows the sources of financing and funding for transport projects in the EU countries:



Source: PwC

[21] PwC, Funding or financing? Untangling a policy confusion, August 2016 [accessed 25.04.2017]

Public financing – Key instruments and institutions

EU funding and financing

EU funds have been by far the most important source for the funding of transport needs across CEE, including the Three Seas initiative. The following table outlines the EU instruments and the type of available financing / funding through 2020:

EU Instrument	Type of financing / funding	Available funds from EU budget (2014-2020)
European Structural Investment Funds (ESIF)	Grants (plus financial instruments)	**EUR 70 billion**
Connecting Europe Facility (CEF)	Grants (plus CEF debt instrument)	**EUR 24 billion**
Horizon 2020	Grants (plus InnovFin – EU Finance for Innovators)	**EUR 6.3 billion**

Source: Violeta Bulc, European Commissioner for Transport, Regional Transport Investment Conference, Sofia, Bulgaria, March 2017

European Structural and Investment Funds

European Structural and Investment Funds (ESIF) provide a source of funding for transport infrastructure projects of national and regional importance. The funds are jointly managed by the European Commission and the EU member states.

The European Structural and Investment Funds most relevant to transport are:

- Cohesion Fund (CF) – funds transport and environmental projects in countries where the gross national income (GNI) per inhabitant is less than 90% of the EU average. In 2014-2020, all CEE EU Member States fall into this category.
- European Regional Development Fund (ERDF) – promotes balanced development in the various regions of the EU, including funding transport projects of regional importance.

In 2007-2013, EUR 82 billion of ESIF resources were invested in the transport sector, which amounts to about 25% of total available resources. The largest share of the allocations has been for road and railway projects (respectively EUR 41 billion, or 50%, and EUR 24 billion, or 30%, of the total allocation). Other areas of focus were urban and multimodal transport projects, ports, airports, and inland waterways. Of particular importance were investments in support of the TEN-T corridors, which represented EUR 38 billion.

All Three Seas countries benefited from ESIF, with Poland accounting for 31%, the Czech Republic for 9.5%, Hungary for 8.1% and Romania for 6.6% of funding allocated for transport.

For the 2014-2020 period, the ESIF estimates investment of approximately EUR 71 billion in transport.

Connecting Europe Facility (CEF)

The Connecting Europe Facility (CEF) for Transport is the funding instrument to carry out European transport infrastructure policy. It aims at supporting investments in new infrastructure or upgrading existing facilities. This is a centrally managed EU fund.

CEF Transport focuses on cross-border projects, and projects aiming at removing bottlenecks or bridging missing links in the EU network and traffic management systems. It also supports innovation in the transport system to improve the use of infrastructure, reduce the environmental impact of transport, enhance energy efficiency and increase safety.

The total budget for CEF Transport is EUR 24 billion for 2014-2020. Through February 2017, EUR 19 billion has been allocated to 452 signed grant agreements, of which EUR 17 billion went to building cross-border infrastructure and EUR 2 billion to combining transport modes and IT.[22]

While CEF has played an important role in financing projects of regional importance and environmentally friendly transport modes in the Three Seas region, the funds will be almost entirely allocated by the end of 2017.

European Investment Bank (EIB)

The EIB has been an important source of financing for transport projects in the Three Seas region. In 2007-2017, the EIB provided transport-related lending in the amount of EUR 29.7 billion for new member states in the CEE region.[23]

10 flagship EIB transport-related projects in CEE

Project name	New CEE EU Member States involved	EIB contribution (EUR million)	Signing date
S&CF Transport Framework Facility	Czech Republic	1,319	Dec 2007
A2 Toll Motorway 2nd Segment – TEN-T	Poland	1,000	Jun 2009
S7 and S8 Expressways – TEN-T	Poland	900	Dec 2012
Bucharest Metro Line 5 (Section I & II)	Romania	860	Nov 2011
Poland Motorways II	Poland	800	Jun 2011
Transit Roads V	Bulgaria	380	Aug 2007
Slovakia Transport Framework Facility 2014-2020	Slovakia	350	Nov 2015
Railway Infrastructure Rehabilitation	Hungary	250	Dec 2013
Highways IX	Slovenia	145	Jun 2015
Zadar New Port	Croatia	100	Sep 2007

Source: PwC analysis based on: http://www.eib.org/projects/loan/list/index.htm [accessed 27.04.2017]

[22] https://ec.europa.eu/inea/sites/inea/files/2017_cef_transport_stat_web_final.pdf;

[23] Source: http://www.eib.org/projects/loan/list/index.htm [accessed 25.04.2017]

European Fund for Strategic Investment – EFSI (Juncker Plan)

The European Fund for Strategic Investments (EFSI) is an initiative launched jointly by the EIB Group and the European Commission to help overcome the investment gap in the EU by mobilising private financing for strategic investments. It is a guarantee programme that addresses financing rather than funding gaps; in other words, the underlying projects must be financially sound to ensure repayment.

With a European Commission guarantee and the EIB's own funds, EFSI allows authorities to take on riskier operations, including some in the transport sector. The objective of EFSI is to mobilise EUR 315 billion in investments throughout Europe. Given that generally the EU13 economies are perceived as riskier than most EU15 member states, especially when it comes to greenfield transport projects, EFSI may continue playing an important role in financing key revenue-generating transport projects and mobilising private investments in the Three Seas region.

Major EFSI transport projects in CEE

Project name	Country	EFSI financing (EUR million)	Total investment related to EFSI (EUR million)	Approval date
SIGNED				
D4/R7 Slovakia PPP	Slovakia	427	639	Oct 2015
Krakow By-Pass – Łagiewnicka Route	Poland	93	198	Dec 2016
Przewozy Regional Rolling Stock Modernisation	Poland	45	106	Jul 2016
Tallinn Airport Upgrade	Estonia	30	48	Oct 2016
APPROVED				
Riga Transport Company	Latvia	75	175	Oct 2016
A14 Vilnius – Utena Highway PPP	Lithuania	40	88	Sep 2016
Lithuanian Airports	Lithuania	30	44	Jun 2016
Lower Silesia Regional Roads PPP	Poland	Not disclosed	Not disclosed	Jan 2016

Source: PwC analysis based on: http://www.eib.org/efsi/efsi-projects/index.htm [accessed 28.04.2017]

Other sources of public / multilateral financing European Bank for Reconstruction and Development (EBRD)

According to the EBRD's Strategic and Capital Framework 2016-2020, the core competencies of the bank include structuring market-based, commercially oriented and predominantly private-sector investment solutions. For transport infrastructure, this comprises the development of efficient transport systems and municipal infrastructure services through commercialisation, privatisation or a mix of public and private involvement, including PPPs.

The EBRD has played a significant role in financing key transport projects throughout CEE, with EUR 8.63 billion of financing between 2007-2016.[24]

Others:

Transport infrastructure needs in the broadly defined CEE / CIS region may also be financed from other sources of international development / multilateral financing, including:

- World Bank / IFC
- Asian Infrastructure Investment Bank
- Asian Development Bank
- Multi-donor facilities.

10 examples of EBRD transport-related projects in CEE

Project name	Country	EBRD contribution (EUR million)	Signing date
Pan-European Corridors	Ukraine	450	Nov 2010
R1 Motorway	Slovakia	399	Aug 2009
Corridor Vc	Bosnia and Herzegovina	205	Oct 2008
Banja Luka to Doboj Road	Bosnia and Herzegovina	185	Apr 2012
Moldova Roads Rehabilitation IV	Moldova	150	Jun 2013
K10 Road	Serbia	150	Sep 2009
D4/R7 Highway PPP	Slovakia	148	Jun 2016
Rail Corridor VIII – Second Phase	FYROM	145	Dec 2014
PKP Cargo Rail	Poland	100	Dec 2015
Corridor X	FYROM	91	Sep 2011

Source: PwC analysis based on:
http://www.ebrd.com/cs/Satellite?c=Content&cid=1395250404279&d=&pagename=EBRD%2FContent%2FDownloadDocument
[accessed 28.04.2017]

[24] EBRD, http://www.ebrd.com/cs/Satellite?c=Content&cid=1395250404279&d=&pagename=EBRD%2FContent%2FDownloadDocument [accessed 22.05.2017]

Private financing

In addition to public financing sources, countries in the Three Seas region must also work to attract private sector financing, both domestic and international, if they are to develop the infrastructure they need. Such financing comes from both industry investors engaged in concessions, and financial investors focusing on infrastructure projects. Due to increasing pressure on public debt, including in the Three Seas countries, the region needs to look for project finance models with private investment for revenue-generating projects that minimise the impact of future liabilities on public budgets.

But that raises a crucial question:
Is the CEE region an attractive market for private investors? What is the balance of risk and reward?

Thanks to forecasts for continued economic growth across the region, combined with the need for greater unity and economic participation within the EU and global economic structures, CEE may be seen as an attractive market for infrastructure investors. CEE is expected to outperform Western Europe over the next five years, with an average annualised construction market growth of 3.1% compared with 2.3% in Western Europe, according to BMI Research.

This creates an attractive story for private investors. However, as an emerging region, one of the major barriers to financing the necessary infrastructure across CEE is its perception as relatively risky, particularly compared with North America, Western Europe and Asia. BMI publishes the Infrastructure Risk-Reward Index, which offers valuable conclusions for CEE and the Three Seas region.

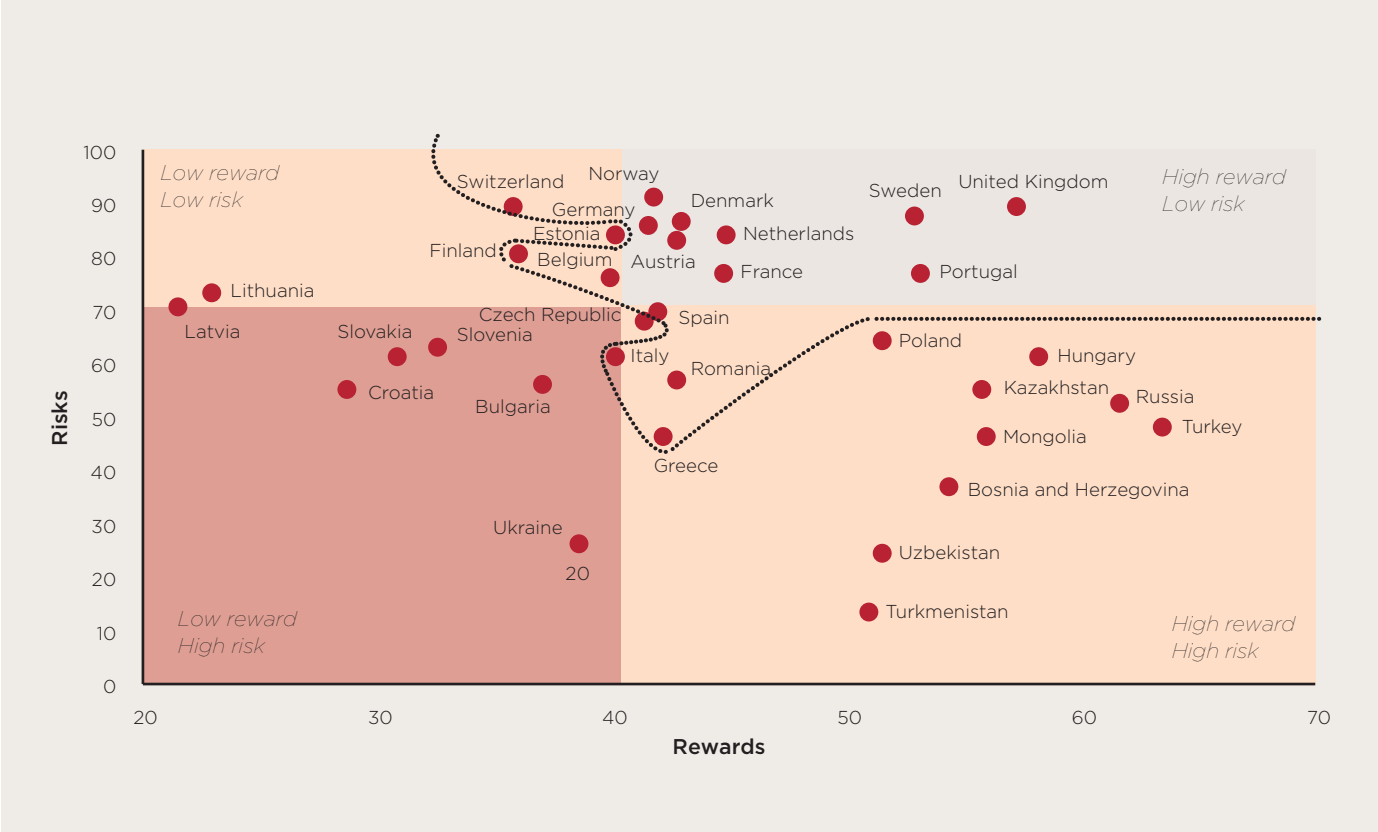
If we assume that a Reward Index exceeding 40 means high rewards, and a Risk Index over 70 means low risk, of the CEE countries only Estonia just barely makes it into investors' "sweet spot" of high reward and low risk. There are countries in the Three Seas region where risks are ranked at about 50-60, which is comparable to some EU15 countries such as Greece or Italy, but rewards are perceived as relatively low (e.g. Lithuania, Latvia, Croatia, Slovakia, Slovenia). These are smaller countries, which might still be able to use private financing provided they are able to demonstrate a sound pipeline of feasible projects. Slovakia has proved this assumption correct by successfully using private financing for its transport infrastructure.

Source: EUROPE INFRASTRUCTURE REPORT, Q1 2017, BMI Research http://www.bmiresearch.com [accessed 20.03.2017]

On the other side of the spectrum are countries with higher reward perceptions but potentially unacceptable risk scores – this is particularly true of Eurasian countries, which might need to use risk mitigating measures, particularly the support of multilateral institutions, to attract private investors.

This chart makes it clear that Three Seas countries will have to compete with Western European economies, which are generally perceived as more attractive. Still, the scarcity of "ready-to-finance" infrastructure projects globally and the enormous liquidity awaiting investment opportunities might play in favour of CEE, provided there is a pipeline of well-prepared projects, and risks are mitigated.

Infrastructure Risk-Reward Index



Scores out of 100. Higher Scores = Lower Risk.
Source: PwC Analysis based on BMI Risk–Reward Index http://www.bmiresearch.com/ [accessed 6.05.2017]

Some risks are pervasive in all countries, and must be addressed if governments are seriously contemplating the use of private financing for their infrastructure projects on a larger scale:

- Lack of political support
- Opaque regulatory regimes and complexity of the procurement process for private finance (e.g. PPPs and concessions)
- Shortage of well-developed projects that can leverage the market's appetite – very long lead times for project development
- Recurring project failures, resulting in a loss of trust in private financing
- Insufficient capacity and skills in the public sector to adopt private infrastructure financing schemes.

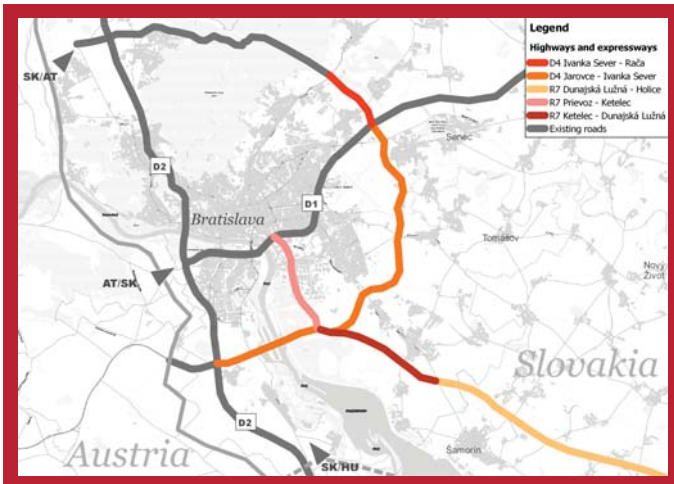
Use of private financing for transport projects in the Three Seas region to date

Thus far, the countries in the Three Seas region have had some experience in attracting private investors to their key transport projects. However, private investment has not been a significant source of financing, and many countries have a history of false starts when it comes to PPPs and concessions.

Examples of transport projects successfully attracting private investment in CEE

Project	Capex (EUR million)	Project description	Equity investors (at FC)	Main Lenders	Signing date
D4/R7 PPP, Slovakia	998	30-year availability based DBFOM 27 km new sections of Bratislava ring road, and 32 km of the R7 expressway, which links the country's east and west	Ferrovial Macquarie Capital PORR	EIB, KBC, EBRD, UniCredit, Credit Agricole CIB, ICO, SIH, SMBC	Jun 2016
Zagreb Airport, Croatia	324	Concession for existing facilities and design, construction and financing of a new terminal and runway for 30 years	Aéroports de Paris, Bouygues, IFC, Marguerite, TAV Airports, Viadukt	IFC, EIB, Deutsche Bank, UniCredit, Zagrebacka Banka	Dec 2013
R1 Motorway (Nitra and Tekovské Nemce), Slovakia	900	30-year DBFOM for construction and operation of a 52km 2x2 lane motorway, bypassing the city of Banská Bystrica	Meridiam, Vinci	EBRD, Banco Bilbao, BNP Paribas, Credit Agricole CIB, Erste, UniCredit	Aug 2009
A1 Motorway – 2 sections, Poland	1340	PPP contract till 2039 for two phases: 90 km new road from Gdansk to Torun in Northern Poland	Skanska, John Laing, NDI, Intertoll	EIB, NIB, SEK	Jul 2005/ Dec 2008
A 2 Motorway – 2 sections, Poland	640	40-year DBFOM for two stretches of A2: 1. Konin to Nowy Tomysl Tomysl (149 km)	Kulczyk Holding, Strabag, EGIS, others	EIB, Credit Lyonnais, Commerzbank	Oct 2000
	1310	2. Nowy Tomyśl-Świecko (106 km)	Meridiam, Strabag, Kulczyk Holding, KWM Investment	EIB, Banco Bilbao, Caja de Ahorros, Deutsche Bank, Calyon, Espirito Santo, IPEX-BANK, PKO BP, Societé General, WestLB	Jul 2009
M5 Motorway, Hungary	1300	A 173 km route connecting Budapest, with south-eastern Hungary and Serbian border	Bouygues Group	AIB, Banca Infrastrutture, BOI, Commerzbank, Depfa Bank, Dexia, EBRD, Erste, Groupe Caisse d'Epargne, Haitong, Helaba Landesbank, HUF, IKB, NG, Intesa Sanpaolo, Islandsbanki, KBC, KfW, Mizuho, Natixis, OTP, RBS, SMBC, UniCredit	Jun 1998, Dec 2005, Mar 2006
M6 Motorway, Hungary	1968	Motorway linking Budapest area with the Dunaujvaros M6-M8 Junction in south Hungary, implemented in 3 phases, (58 km, 86 km, 65 km)	Bilfinger, Bouygues Group, Egis, Intertoll, John Laing, Porr, Strabag	Bankia, Bayern LB, BNP Paribas Fortis, CIB, Commerzbank, Deka, EBRD, Fortis, HSBC, KfW, Lloyds, MNB	Dec 2004, Nov 2007, Jul 2008

Source: PwC analysis based on publicly available data



Source: http://www.obchvatbratislavy.sk/en/galeria/mapy [accessed 20.03.2017]

D4/R7 Motorway PPP – use of innovativefinancial structure with private and multilateral financing

Slovakia's Ministry of Transport, Construction and Regional Development used competitive procurement to contract two sections of the D4 highway, representing 27 km of Bratislava bypass and three sections of the R7 dual expressway with a length of 33 km. The total CAPEX value is EUR 998 million.

The winning private partner, Obchvat Nula (SPV of Cintra, PORR and Macquarie), selected from among four shortlisted bidders, is to design, construct, finance, operate and maintain all stretches of the roads under a PPP contract, which covers four years of construction and 30 years of operations. The private partner will bear the construction and availability risk; demand risk will be borne by the public sector. The payment mechanism is based on availability of the road and performance of the private partner to agreed standards.

The project has a very innovative financial structure, including multilaterals such as EIB/EFSI, EBRD as well as competitive private financing. This is the first transaction in Slovakia benefitting from a guarantee under the Juncker Plan (EFSI). The project also benefited from support from the EU structural funds: Slovak Investment Holding, established by the Slovak government as an investment tool to support long-term investments from EU structural funds, has provided mezzanine financing at favourable terms to the project.

This structure has proven successful, and development of a bankable off-balance-sheet concession contract and project documentation allowed the parties to reach financial close of the project less than 18 months from the procurement notice. During the entire procurement process, no complaints were filed and no legal action taken. A robust competitive dialogue and efficient procurement process supported market appetite: the tender was very competitive, and pricing in final offers was significantly lower than pre-tender estimates.

The investor landscape in the CEE region continues to develop. In addition to the private investors already present in transport infrastructure for the past few decades, there are potential entrants seeking new markets outside their traditional territories, for example:

- Private investors who are already active and experienced in private financing of infrastructure, but thus far have focused on their home markets or very narrowly defined markets (e.g. Turkey)
- Those with limited experience in private financing of projects in CEE but with an interest in infrastructure projects (e.g. China, South Korea)

To summarise, we believe that given the region's experience to date as well as forecasted market growth, private investors will be able to offer competitive financing for projects in the Three Sea region that:

- are not too large to raise affordability concerns, unless there is significant financial backup in place
- adopt proven, bankable commercial terms and risk transfer – in particular, do not fully pass traffic/demand risk on to the private sector (with the potential exception of airports)
- adopt, to the extent possible, internationally recognised documentation and follow internationally recognised procurement processes
- enjoy political stability, including a reasonable macroeconomic stance supporting affordability and repayment of private investors' money
- enjoy some level of political and other risk insurance, especially for countries with lower credit ratings.

How to approach financing – key recommendations

There are two major categories of projects, which require different approaches to financing:

1. Commercially attractive, revenue-generating projects, with a sound financial rationale. Such projects include:

- infrastructure of critical importance to the European transport network,
- brownfield projects – upgrade / enhancement of infrastructure capacity and performance, with proven traffic / revenue generation potential
- investment with relatively smaller CAPEX component in relation to commercially attractive service provision (e.g. terminals, toll roads with attractive traffic forecast).

These projects are likely to find sources of financing, including conventional lending from public and private banks, financial instruments and equity financing from private investors, including PPPs and concessions, provided that the risk profile is acceptable.

Despite their financial viability, these projects may still benefit from public support to address imbalances in cash flows during the construction and ramp-up phase, until a sustainable cash flow is secured. Challenges may also result from project-specific risks and the inability of commercial markets to lend long term, in line with the project life cycle. This is where they can benefit from credit enhancing instruments and guarantees – in particular the EFSI (the Juncker Plan).

2. Projects of key economic impact with lower financial returns. Such projects include:

- large greenfield projects with unproven traffic and revenue generating potential
- several cross-border connections (esp. railways) which are necessary as the relieve key bottlenecks in networks
- inland waterway navigability improvements which typically require significant financial investment, including significant environmental works
- some large-scale projects developed by smaller or poorer countries – e.g. Rail Baltica (Baltic States with project value of EUR 5.9 billion) or the Gdansk-Odessa Motorway (Ukrainian section).

These projects might require substantial public support through public funding, including national budgets and EU funds. They may, if properly structured, also benefit from innovative private financing, with public funding structured as EU grants, fiscal incentives or availability payments backed by the sovereign.

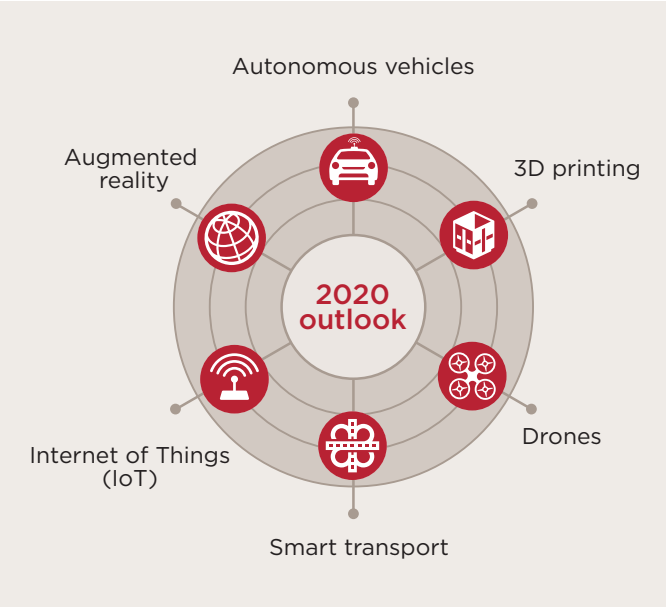
Given the significant financing gap for transport infrastructure in general and CEE in particular, both governments and regional institutions and initiatives such as Three Seas should promote a portfolio approach to the projects, to ensure the maximum effect on connectivity and interoperability of the transport network as a whole.

Key questions for decision makers in the CEE region about how to prioritise and finance project portfolio

Project prioritisation	Funding and financing the project in the portfolio
• Are we prioritising the right projects? Do we take into account the key objectives, such as: – Removal of key bottlenecks and missing links to improve the international network – Optimal interconnection of national transport networks, including alignment of technical standards – Improved interconnection of transport modes – Promotion of sustainable transport – Promotion of socio-economic impact of transport projects • In particular, how do we ensure that projects of key economic impact but lower financial returns, including cross-border projects and those addressing key bottlenecks, find financing? • Which projects should we continue? Which ones could we abandon or delay?	• How can we better balance project types to ensure funding streams within the portfolio? • How can we extract maximum value from existing projects in the portfolio? • How can we optimise CAPEX and OPEX costs? • What financial structures are available, and how can we best utilise them for a particular project? In particular, projects with sound revenue generation capacity should look first for private investors. • What is the optimal model for public and private sector collaboration on a particular project?

THE IMPACT OF TECHNOLOGY AND A DIGITAL FUTURE ON TRANSPORT INFRASTRUCTURE

Developing, building, operating and maintaining transport infrastructure has historically been fairly straightforward. Though still complex, it has been essentially engineering-driven, extremely labour -intensive, costly and long-term. Yet a wide array of breakthrough technologies has been rapidly transforming the ways we build and manage infrastructure, reshaping how the transport sector operates and impacting every participant along the transport value and supply chains. Here are the six technologies that have the potential for the greatest impact in the not-so-distant future.



Source: PwC

"It is estimated that 75% of the infrastructure that will exist in 2050 does not exist today. Given rapid developments in technologies, we expect future infrastructure to benefit from opportunities that we could not have imagined even a decade ago. These changes need to be taken into account when planning new infrastructure, including the potential impact on demand for transport as well as estimating capital expenditure and long-term operational and maintenance costs".

Agnieszka Gajewska, PwC, CEE Capital Projects and Infrastructure Leader

Drones

Use of drone technology is growing, and growth is expected to accelerate, especially in areas such as:

- Real-time monitoring of project progress
- Managing asset maintenance
- Handling tasks in hazardous areas
- Conducting asset inventories.

This may significantly increase the quality of project management during the development and completion phases of transport projects, thus mitigating the risk of delays and cost overruns. Once projects are complete, drone technology should reduce operating and maintenance costs.

3D printing

With its application in infrastructure increasing, for projects ranging from 3D construction of buildings to the printing of replacement parts on-site, 3D printing has the potential to dramatically impact the transport sector, both positively and negatively. Transport assets such as bridges and railroads are likely to benefit from faster, lower-cost construction, maintenance and repairs. On the other hand, shipping and logistics will likely see a negative impact, as the need to ship parts, products and raw materials will be reduced as remote production is replaced by facilities closer to the customer. The defining moment for 3D printing in transport infrastructure may still be many years away. But we should take 3D printing into account now, as such infrastructure often takes decades to plan and build.

Augmented reality

Augmented reality (AR) involves the overlaying of text or visuals on an individual's view of the physical world through a digitally connected device. Unlike virtual reality (VR) – which creates a completely artificial environment for the user – augmented reality digitally superimposes new information on top of the existing environment. This "augmentation" of the real world has huge potential for transport infrastructure projects. From the initial planning stages, where planners are better enabled to "see" how people might navigate through transport hubs such as railway stations or airports, to the construction stage, where workers are equipped with context-specific, actionable information in real time via smart glasses (e.g. blueprints overlaid on an actual building site), AR has the potential to vastly improve the speed and quality of information-sharing on the job, and therefore to mitigate the risk of sub-optimal planning and scoping of transport assets.

"Smart" transport

New technology is having a significant impact on navigation systems and real-time travel information, and may enable more efficient use of existing infrastructure, minimising congestion through enhanced traffic management and information. The challenge is to develop infrastructure with smart technology at its core, while keeping it flexible enough to adapt to the rapidly changing technology landscape.

Autonomous vehicles

Driverless cars have the power to dramatically transform mobility, which has huge implications for how we design our future transport infrastructure. As people become accustomed to thinking about buying mobility-as-a-service, the greater convenience of driverless vehicles combines benefits such as freeing up time and attention while on the move, as well as enabling greater density of traffic flow and thus more efficient use of infrastructure.

The Internet of Things (IoT)

IoT is the rapidly expanding network of digitally-connected objects – hand-held and wearable devices, vehicles, buildings and more – that have sensors and intelligent computing capabilities embedded. These objects open the door to a future of vast collection of data, and analytics-driven insight. The opportunities presented by these new capabilities range from the build-out of the underlying communications infrastructure to buildings and transport hubs that integrate connectivity, intelligence and insight, again enabling more efficient use of existing infrastructure.

These technologies are or have the potential to become instrumental to transport infrastructure projects. They may help at various stages of projects, from the design phase through post-implementation project monitoring, and significantly impact the requirements for new-built transport infrastructure, its costs of operation as well as the way it is operated in the future.

RECOMMENDATIONS

> "The challenge of reconciling short-term affordability constraints with long-term planning and delivery requires vision, innovation and commitment from everyone involved. This is of critical importance to funding-constrained countries in CEE".
>
> **Richard Abadie,** PwC, Global Capital Projects and Infrastructure Leader

Despite the progress across CEE and Three Seas countries, in particular over the past decade, the need for further investment in transport infrastructure remains substantial. Insufficient quality and availability of transport infrastructure is a key factor inhibiting the further development and competitiveness of economies throughout CEE, and the Three Seas region in particular. These needs far exceed the ability of the individual governments to pay for them; thus, multilateral intervention and investment from the private sector will be required if the region is to fulfil its potential as a cohesive, competitive and connected participant in the European Union.

The overall challenge is therefore to make the key CEE investments in critical transport fundable – regardless of their risks, financing structures and revenue potential.

The Three Seas Initiative, as part of European vision, is a positive step for driving the economic and social benefits of investment in transport throughout the CEE region, by delivering a discussion platform and potentially more holistic approach that can provide more certainty for raising essential financing. Based on our own project experience in CEE and discussions we have had with stakeholders, we make six recommendations for delivering the transport infrastructure required to achieve the Three Seas region's growth ambitions:

1. Political consensus

The unpredictable nature of the political landscape means there is often reluctance across CEE countries to make long-term commitments to the delivery of planned projects. There is an increasing need for consensus on key transport infrastructure in the Three Seas region that will be able to outlast political turmoil and changes in national governments. A more coordinated vision and a common purpose is particularly critical for multinational and cross-border projects that require alignment beyond national interests.

2. Coordination on a regional level

The Three Seas Initiative has been a positive step in collaboration between neighbouring countries. But many of the existing projects face administrative and procedural difficulties, primarily due to the fragmented approach to financing, planning and delivery that arises from differing national requirements, especially with regard to procurement laws and other legislation on administrative procedures.

Well-structured, coordinated new legislation at the national and regional levels (to the extent possible) is needed in order to cope with the increasingly complex and multidimensional nature of transport infrastructure projects in the region.

3. Prioritisation of projects

Ongoing strains on public funding inevitably mean hard choices: a balancing act between short-term affordability and commercial viability, against the long-term need to overcome the transport gaps that are inhibiting sustainable economic growth. Prioritisation thus builds a stable project pipeline that facilitates investment. Special attention should be given to the wider network and multinational projects, of which Rail Baltica is a prime example. The countries directly impacted by this project are relatively small, and would not be able to cope with the financial burden by themselves. Yet as this is the major connector from the North and Baltic regions of CEE to Western Europe, the economic and social costs of failure are higher than the necessary long-term investment.

4. Mobilising the private sector to overcome financing constraints

Private sector finance, with its innovative structures that complement public sector resources, will be essential to achieving CEE's transport infrastructure ambitions. The Three Seas countries have not historically been at the forefront of developing advanced infrastructure financing instruments and may require support in capacity building and project preparation to bring to the market feasible, well-structured and bankable projects.

5. Increasing the efficiency of existing projects

Improvement and standardisation of processes and procedures, including compliance with technical requirements, limiting administrative barriers and procedures and with underlying digital solutions, especially at border crossings and ports, is essential to increasing the effectiveness of existing infrastructure in order to streamline the flow of goods and passengers.

6. Monitoring of lessons learnt

There are similarities in the challenges facing the planning and implementation of large network transport projects across EU and the Three Seas region in particular, given the markets' similar maturity levels. Conclusions from the key lessons learnt, especially on coordination of multiple authorities, preparation of feasibility studies (including environmental assessments) and stakeholder consultation procedures, should be adopted to improve project preparation and delivery practices and speed up investments across the Three Seas region.

ACRONYMS AND ABBREVIATIONS

AIIB Asian Infrastructure Investment Bank

AR Augmented Reality

B&R Belt & Road

BMI Business Monitor International

CAPEX Capital Expenditure

CEE Central and Eastern Europe, defined broadly in this report as: Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, FYROM, Moldova, Mongolia, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Turkmenistan, Ukraine, Uzbekistan

CEF Connecting Europe Facility

CF Cohesion Fund

CIS Commonwealth of Independent States

DBFOM Design, Build, Finance, Operate and Maintain contract

EBRD European Bank for Reconstruction and Development

EC European Commission

EFSI European Fund for Strategic Investments

EIB European Investment Bank

ERDF European Regional Development Fund

ERTMS European Rail Traffic Management System

ESIF European Structural and Investment Funds

EU European Union

EU13 Bulgaria, Croatia, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia

EU15 Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom

FC Financial Close

FYROM the former Yugoslav Republic of Macedonia

GCI Global Competitiveness Index

GNI gross national income

ICT information and communication technologies

IMF International Monetary Fund

INEA Innovation and Networks Executive Agency

IoT Internet of Things

IWW Inland Water Ways

MDBs Multilateral Development Banks

MoS Motorways of the Sea

OECD Organisation for Economic Cooperation and Development

OPEX Operating Expenditure

PPP Public-Private Partnership

RB Rail Baltica

TEN-T Trans-European Transport Network

THREE SEAS COUNTRIES – Austria, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia

TITR Trans-Caspian International Transport Route

VR Virtual Reality

WEF World Economic Forum

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