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Interoperability and Military Mobility

An Assessment of the Functionality of Europe's Logistical Infrastructure

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This paper was drawn up by Ikram Aboutaous, Gabriele Ghio, Isabella Stuerzer under the supervision and guidance of Mr Mario Blokken, Director of the Permanent Secretariat.

This Food for Thought paper is a document that gives an initial reflection on the theme. The content is not reflecting the positions of the member states but consists of elements that can initiate and feed the discussions and analyses in the domain of the theme. All our studies are available on www.finabel.org

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ABSTRACT

Following the Russian annexation of Crimea and ensuing concerns for the territorial integrity of European Union members and partners, the functionality of Europe's logistical infrastructure for fast transport of considerable volumes of military equipment and personnel has been questioned. Therefore, the following study will analyse the current state of Europe's transport infrastructure regarding military readiness and interoperability capability, identify shortcomings, and develop recommendations for improvement. Specific ar-

reas of interest include an investment backlog since the global financial crisis of 2008/09, delayed standardisation and maintenance across Europe, and potential for modernisation, including consideration of digitisation trends. Recommendations will consider the potential for infrastructure development that addresses military and economic security needs, such as focusing on improvements with a dual-use function instead of remnants of separate infrastructures for military and economic purposes from the Cold War era.

Keywords: Military Mobility, Interoperability, Readiness Initiative, Logistical Infrastructure, Military Transport, NATO, EU.

INTRODUCTION

Background of the Problem

NATO defines military mobility as the “quality or capability of military forces which permits them to move from place to place while retaining the ability to fulfil their primary mission”¹ - a definition from the 1997 Logistics Handbook that still holds today. Unfortunately, military planning concerning logistics and mobility has been neglected by NATO and the European Union since, as evidenced by the fact that said Logistics Handbook has not been reviewed and updated since 1997.

Once the Warsaw Pact and the Soviet Union had collapsed, military mobility and interoperability investments were not prioritised, as the main threat seemed gone. Similarly, other infrastructure projects and investments in military transport have received less funding or have been shelved altogether after decades of steadily increasing military defence investments and necessary infrastructure. The growing European Union and European partners of the Transatlantic Alliance profited from the peace dividend. Still, they failed to invest sufficient means in infrastructure construc-

1. NATO Logistics Handbook, “Mobility”, NATO, 1997 [online]. Available at: <https://www.nato.int/docu/loge-en/1997/defini.htm> [Accessed May 21, 2021]

tion and maintenance that would also serve military needs. Consequently, the 2014 annexation of Crimea by Russian troops and hence the violation of the territorial integrity of Ukraine, a European Union priority partner, demonstrated both a change in the military security environment and a concerningly ill-functioning transport infrastructure required for bringing land forces from different parts of Europe to its Eastern flank in case of another Russian attack.

Military Mobility: A Constant Asset in an Evolving Strategic Context

From the Spartans at the Thermopylae to the English longbowmen of the 13th to 15th century to the Wehrmacht of World War Two, the ability of an army to move both rapidly and in sync has been a paramount asset which throughout history has enabled a force to prevail over either a less interoperable, or more cumbersome enemy many times its size. Since then, the players, the balance of power, and the very nature of warfare have profoundly changed. Military mobility still represents the backbone of a consistent defence that ensures security and fosters deeper integration and more comprehensive coordination between countries. Such a perspective is particularly noteworthy if applied within EU borders, whose several bodies are called to deal with new, hybrid threats which can be more effectively tackled through member states' cooperation in one of the key fields of military mobility: transportation infrastructures. In this dimension, politics and the military apparatus should interact deeply with each other, building up a complex as

resilient as possible in which harmonisation of procedures, joint exercises and standardisation of interfaces are top priorities to be addressed both at EU and NATO levels. In short, in a fast-evolving strategic context, reaction speed is increasingly important as countries must be able to respond to multiple challenges from different actors as well as regions at short notice. As Clausewitz wrote in his essay *Principles of War* (1812): "The first and most important rule to observe [...] is to use our entire forces with the utmost energy. The second rule is to concentrate our power as much as possible against that section where the chief blows are to be delivered [...] so that our chances of success may increase at the decisive point. The third rule is never waste time [...] it is necessary to set work at once". An integrated infrastructure capacity plays a crucial role in accomplishing these aims.

Purpose of the FFT and Key Findings

The following study will analyse the status of Europe's transport infrastructure regarding military readiness and interoperability capability, identify shortcomings, and develop recommendations for improvement. Overall, the top priorities for policymakers should be modernising and standardising infrastructure and bureaucratic procedures across Europe to facilitate interoperability and improve functionality and military readiness.

In the event of a crisis that requires the rapid movement of military forces and goods in Europe, several obstacles have been identified as threats to effective coordination and deployment of forces crossing multiple countries where rules, regulations, and procedures dif-

fer, as well as the quality of an effective infrastructure network. There is an urgent need to provide Europe with a solid and state-of-the-art transportation infrastructure and promote standardisation of procedures, funding processes, and enhancing civil-military cooperation at all levels. However, the European military mobility project faces several obstacles: Given the current difficult sanitary situation and recent political developments, the EU and transatlantic security environments are confronted with a series of various threats that could jeopardise the realisation of such an ambitious and innovative defence project². These threats include the rise of China and Russia, their instigation of and involvement in regional conflicts, and their recent suspicious rapprochement and ever-closer ties in key areas of defence technology cooperation. Consequently, the US is gradually transferring its “strategic centre of gravity to the Indo-Pacific region” and therefore cutting its spending on deterrence and defence in Europe³. This could potentially have devastating consequences on the military mobility project as the US has been the biggest investor in NATO civil and military budgets.

Military Needs and Infrastructure Assessment

The current mismatch between the status quo of transport infrastructure across European regions and military needs results from three issue areas: Delayed standardisation, a significant investment backlog since

the 2008/09 financial crisis, and insufficient digitalisation. The European Union Military Staff calls for improvements in infrastructure, regulatory and procedural issues, and addressing shortcomings in the military domain⁴.

Infrastructure needs to transport military equipment of the current and future generations quickly and securely – equipment that is often higher, wider, and heavier than previous generations. Therefore, tunnel height, load capacity of bridges, and railway gauge width need to be expanded, or alternatives need to be constructed.

Currently, any military transport across Europe is heavily inhibited by regulatory and procedural issues: Upon entering and exiting states, lengthy and complex procedures for cross-border and movement in national territory, including customs formalities related to military operations, need to be completed; moreover, custom procedures and diplomatic clearances must be conducted. Additionally, diverging national rules on the transport of dangerous goods in the military domain make cross-border movement of military assets even more difficult, as does the fact that there are no standardised procedures, and often pertaining forms and paperwork has to be completed manually rather than digitally.

Finally, there are shortcomings within the military domain that the EUMS considers crucial to address. The EUMS identifies a lack of coordination structures, limited or no movement plans, and rare joint training and exercises as key challenges⁵.

Further, military mobility needs risk man-

2. Brauss et al., “The CEPA Military Mobility Project”, p. 28. Available at: <https://cepa.org/the-cepa-military-mobility-project-moving-mountains-for-europes-defense/> [Accessed May 20, 2021].

3. Ibid.

4. European Commission, “Defending Europe: Improving Military Mobility within and beyond the European Union,” European Union External Action Service [online]. Available at: https://ec.europa.eu/sites/default/files/2018_military_mobility_factsheet_0.pdf [Accessed May 21, 2021].

5. Ibid.

agement tools and cooperation to ensure the security of transiting forces. Not only transport infrastructure, but also logistic hubs are lacking. Also, relevant authority and control are scattered and in different hands across nations. National points of contact need to be established, or existing contact points need to cooperate more efficiently with military hubs and NATO points of contact.

Delayed Standardisation of Regulatory and Procedural Measures

For cross-border movement, a combination of the provisions of the NATO Standardization Agreement, AMovP6, and national rules are the basis for transportation of military assets across borders and within countries⁶ – and for each country, a different set of rules and regulations apply. Similar provisions apply for standard custom procedures. Right now, both an EU Form 302 and a NATO Form 302, documents used for exemption from customs checks related to the import and export of military equipment, need to be completed and submitted to different authorities.⁷

Similar to the lengthy duration of transportation efforts, permission for crossing a national border takes up to five working days to obtain – NATO, however, plans operation with a time span of three calendar days, a glaring discrepancy that military planners liked to see addressed.

A 2014 war game study conducted by the RAND Corporation found even grimmer

challenges: Should Russia decide to invade the Baltic States, NATO would not be able to defend the territory and population of its members and staunch supporters, especially because land forces were expected to arrive with a significant delay in every scenario that was war-gamed⁸.

Evidence to these findings is an anecdote from 2017 that US Army Colonel Patrick Ellis shared: Col. Ellis commanded a squadron of the Army's 2nd Cavalry Regiment that participated in a variety of multinational exercises, setting out from Germany for a journey through Hungary, Romania, and Bulgaria and eventually across the Black Sea to Georgia. DefenseOne quotes Ellis "we sat in our Strykers for an hour and a half in the sun just waiting for guys to manually stamp some paperwork"⁹, describing a delay of 90 minutes at the Rumanian-Bulgarian border, thus pointing to two further challenges: a lack of standardisation in bureaucratic procedures and a lack of digitalisation.

Delayed Modernisation of Transport Infrastructure

Since the end of the Cold War, the NATO Military Load Classification (MLC) of bridges and roads has been significantly downscaled or halted altogether. For instance, in Eastern Germany – where key routes for transportation from France to the Baltic States are located – none of such classification exists, given special provisions of the Two-plus-Four Trea-

6. Heinrich Brauss, Ben Hodges, Julian Lindley-French, "Moving Mountains for Europe's Defense," Center for European Policy Analysis, March 2021 [online]. Available at: <https://cepa.org/the-cepa-military-mobility-project-moving-mountains-for-europes-defense/> [Accessed May 21, 2021].

7. Ibid.

8. David A. Shlapak, Michael Johnson, "Reinforcing Deterrence on NATO's Eastern Flank," RAND Corporation, 2016 [online]. Available at: <https://doi.org/10.7249/RR1253> [Accessed May 21, 2021].

9. Caroline Houck, "If War with Russia Breaks Out, Borders and Bureaucracy Could Slow the West's Response," DefenseOne, October 12, 2017 [online]. Available at: <https://www.defenseone.com/policy/2017/10/if-war-russia-breaks-out-borders-and-bureaucracy-could-slow-west-response/141753/> [Accessed May 21, 2021].

ty regulating German reunification in 1990.¹⁰ Further, a review of the classification was discontinued and instead, a national classification system was introduced. While most bridges along main transportation routes can support the weight of current and even next-generation equipment, bridges in more rural areas cannot be included in military planning or transportation activities in military exercis-

es, given their overall construction or age.¹¹ It is also noteworthy that military planners and NATO fully expect that truck, trailer, and the heavy tank will have a combined weight of more than 120 tons in the future, a weight that is hardly transportable by aircraft, meaning that roads, rails, and bridges will gain a (newfound) importance in military logistics.¹²



NATO Military Load Classification Signs in Storage (Germany, 2013)

Hence, allied nations should improve their infrastructure and capabilities based on a joint assessment and expansion plan and use new digital technologies to monitor infrastructure and plan logistics. This is a key military concern given experiences such as recurring problems when transporting the US Army's

Bradley fighting vehicle across Poland, which has many bridges on the way, most of which are still from the Soviet era. These bridges can only support up to 50-60 tons, making them uncrossable for the Challenger or the Leopard – and resulting in the US Army still operating Bradleys developed in the 1980s.¹³

10. Antonia Kleitkamp, "Kalter Krieg: Warum die Panzerschilder der Nato verschwinden," *Die Welt*, November 26, 2013 [online]. Available at: <https://www.welt.de/geschichte/artikel/22263139/Warum-die-Panzerschilder-der-Nato-verschwinden.html> [Accessed May 21, 2021].

11. Daniel Friedrich Sturm, "Als ich Soldat wurde, hatte die Bundeswehr 2000 Panzer. Heute sind es rund 200," *Die Welt*, May 15, 2019, [online]. Available at <https://www.welt.de/politik/ausland/plus194398953/Nato-General-Als-ich-Soldat-wurde-hatte-die-Bundeswehr-2000-Panzer-Heute-sind-es-rund-200.html> [Accessed May 21, 2021].

12. Brauss et al., "Moving Mountains for Europe's Defense."

13. Sydney J. Freedberg, Jr., "The Army's Polish Bridge Problem," *Breaking Defense*, February 06, 2020 [online]. Available at: <https://breakingdefense.com/2020/02/omfy-the-armys-polish-bridge-problem/> [Accessed May 21, 2021].

Manfred Nielsen, Deputy Supreme Allied Commander Transformation, expressed concern that transportation of tanks by train across the Federal Republic of Germany required a preparatory period of 36 days – the alliance aims to be able to transport tanks by train five days after giving notice.¹⁴ In June 2017, a NATO report already highlighted this issue and expressed further concern regarding the functionality of European allies' infrastructures for military transport, such as the fact that bridges, railways, and roads, might not be able to support the weight of today's military heavy equipment given that infrastructure construction and maintenance was neglected since the end of the Cold War.¹⁵ For instance, a German Leopard 2A7 battle tank weighs 62.52 tons, seven tons more per vehicle than the previous generation of the tank.¹⁶ The forthcoming new British tank Challenger 3 shall be in operation until 2040 and is replacing a tank model that was first introduced in 1994.¹⁷ Challenger 2 weighs 64 tons¹⁸, whereas Challenger 3 is expected to weigh more.¹⁹ Similarly, the current series of the French tank Leclerc was first introduced in 1992 with a weight of around 56 tons; at one point, the French Army mobilised more than 400 Leclerc tanks, whereas as of 2016, this number is down to 200.²⁰ It received a significant update in 2006 - to include digital fire control and operation systems



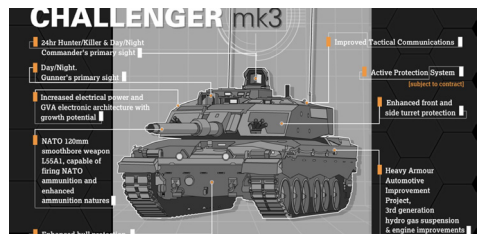
Leclerc Tanks Participating in a Parade on the Champs-Élysées (undated)

Source: <https://www.defense.gouv.fr/terre/equipements/vehicules/scorpion/char-leclerc>. © Armée de Terre



A Leopard 2 Tank During a Military Exercise (undated)

Source: <https://www.bundeswehr.de/de/struktur-technik/bundeswehr/landsysteme/bundeswehr/leopard2>. © Bundeswehr/Ralph Zwilling



Presentation of the Challenger 3 Tank (2021)

Source: <https://www.army.mod.uk/news-and-extras/news/2021/05/64h/challenger-3-upgrade/>. © Ministry of Defence

14. Sturm, "Als ich Soldat wurde, hatte die Bundeswehr 2000 Panzer. Heute sind es rund 200."

15. Matthias Gebauer et al., "NATO Grapples with Serious Organizational Shortcomings," Der Spiegel, October 20, 2017 [online]. Available at: <https://www.spiegel.de/international/world/nato-faces-serious-shortcomings-in-command-rcvamp-a-11273937.html> [Accessed May 21, 2021].

16. Frank Lobitz, Kampfpanzer Leopard 2. Entwicklung und Einsatz in der Bundeswehr (Erlangen: Verlag Jochen Vollert, 2009), 147-186.

17. UK Army, "Challenger 3 – the British Army's New Main Battle Tank Is Coming," Army MOD, May 07, 2021 [online]. Available at: <https://www.army.mod.uk/news-and-events/news/2021/05/challenger-3-upgrade/> [Accessed May 21, 2021].

18. Dick Taylor, Challenger 2 Main Battle Tank Owners' Workshop Manual: 1998 to Present (Sparkford: J H Haynes & Co Ltd, 2018), 181.

19. Tom Sables, "Challenger 3: What Will The Army's Next Main Battle Tank Be Like?" Forces, May 07, 2021 [online]. Available at: <https://www.forces.net/news/challenger-3-what-will-armys-upgrade-main-battle-tank-be> [Accessed May 21, 2021].

20. Ministère des Armées, "Char Leclerc," June 27, 2019 [online]. Available at: <https://www.defense.gouv.fr/terre/equipements/vehicules/scorpion/char-leclerc> [Accessed May 21, 2021].

- and will remain in operation until 2040.²¹ The arsenal overhaul is evidence for a new understanding of battlefields, emphasising digital technologies such as automated target detection²² and an integrated real-time information sharing system, and understanding the continued importance of strong, modern ground defence capabilities. Arms and equipment as heavy as the current and next-generation tanks are hardly transportable via aircraft. Therefore, an intact, capable, and resilient transport infrastructure, is needed to ensure quick transportability in times of crisis, and allow for flexible response.

Military needs have been absent from the planning and budgeting process for infrastructure maintenance and expansion since the 1990s, when the immediate Soviet threat was a relic of the past, and an upcoming Russian threat not sufficiently considered. New infrastructure projects did not consider their functionality to transport military equipment and troops and domestic military logistics were neglected. Instead, solely civilian purposes of infrastructure were discussed, and the debate surrounding military readiness shifted to capabilities for a flexible response out of the area. As infrastructure development stagnated, the development of new or the modernisation of current military arms systems was also neglected, as was the priority of exercises reflecting logistic procedures – for instance. NATO ceased to update its

handbook on logistics in 1997²³, as previously cited in the introduction. The fact that much equipment was produced in the 1990s or is based on models from the 1990s adds to the fact that there is only limited potential for utilising modern-day digital technologies to support military missions and enhance interoperability.

Delayed Standardisation of Transport Infrastructure and Regulatory Procedures

The underdevelopment of transport capabilities is only one significant issue that should be addressed when modernising European infrastructure and preparing it for military mobility. The load capacity of roads and bridges, the height of tunnels or the gauge width of highway tracks are central indicators for the functionality of Europe's transport infrastructure for military purposes.²⁴ The same is true for transparent regulations for the transport of dangerous goods and customs formalities at borders. Another challenge is a lack of standardisation of norms for military equipment and transport infrastructure as well as administrative procedures regarding regulatory and procedural issues across Europe²⁵. For instance, the standard railway gauge width in Europe is 1,435 mm, whereas in Ukraine, Moldova and the Baltic States, traditionally Russian standard gauge with a width of 1,520 mm applies.²⁶

21. Army Technology, "Leclerc Main Battle Tank" [online]. Available at: <https://www.army-technology.com/projects/leclerc/> [Accessed May 21, 2021].

22. Simon Newton, "Challenger 3: Army Getting Europe's 'Most Lethal Tank' In £800m Contract," Forces, May 07, 2021 [online]. Available at: <https://www.forces.net/news/challenger-3-army-getting-europes-most-lethal-tank-ps800m-contract> [Accessed May 21, 2021].

23. Gebauer et al., "NATO Grapples with Serious Organizational Shortcomings."

24. European Commission, "Defending Europe: Improving Military Mobility within and beyond the European Union."

25. European Commission, High Representative of the Union for Foreign Affairs and Security Policy, "Joint Communication to the European Parliament and the Council on the Action Plan on Military Mobility," EURLEX, March 28, 2018 [online]. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018J0005&from=EN> [Accessed May 21, 2021].

26. Brauss et al., "Moving Mountains for Europe's Defense."

Consequently, the endeavour to transport land forces from Central Europe to the Baltic States or Ukraine to respond to foreign aggression needs to include time and logistics for loading equipment from a train running on a standard railway gauge to another one running on Russian standard gauges. However, this would not be the only challenge land forces would see themselves confronted with. To reach Estonia or the Black Sea, multiple state borders need to be crossed, each requiring different paperwork to be completed – often manually – both when entering and leaving the respective country.

Investment Backlog

Another key concern is the availability of funds and investment decisions: the Connecting Europe Facility (CEF; since April 2021 housed in the European Climate, Infrastructure and Environment Executive Agency) includes a Military Mobility Fund which was established to support military mobility through contracting transport infrastructure projects, with a special focus on projects to be completed in two or more member states. However, neither have member states made optimal use of the fund, which is worth almost €1.7 billion, nor has the European Parliament prioritised investments in infrastructure. Further, the 2021-2027 fund contains

almost €5 billion less in funds as the European Union needed to budget with a 16% budget cut after the United Kingdom left the union and hence ceased to contribute funding.²⁷ The European Investment Bank reports an investment backlog that dates as far back as the global financial crisis of 2008/09, when many investments in transport infrastructure projects were halted or shelved because one or all parties could not contribute their share of funding.²⁸ In 2016, The European Investment Bank alerted policymakers that investments in transport infrastructure projects need to increase by 50% compared to the investment level of two years ago to meet policy goals set for transport infrastructure modernisation.²⁹

While the EIB recommends a renewed investment effort in transport infrastructure to support the internal European market – also as a means to overcome continued repercussions from the 2008/09 crisis – military leaders call for a consideration of military needs as well. Experts from the EIB suggest the European Fund for Strategic Investment (EFSI) as a source for funding, while CEPA experts recommend EU Recovery and Resilience Facility (RFF) funds. Another challenge is the decrease in defence spending and availability of funds for new equipment and training; NATO exercises have decreased in scope and number compared to the Cold War Era.³⁰

27. Ibid.

28. Debora Revoltella et al., "Infrastructure Investment in Europe and International Competitiveness," European Investment Bank, January 2016 [online]. Available at: https://www.eib.org/attachments/efs/economics_working_paper_2016_01_en.pdf [Accessed May 21, 2021].

29. Ibid.

30. Elisabeth Braw, "Russia Has 100K Troops On the Move. Here's Why NATO Can't Do the Same," DefenseOne, September 05, 2017 [online]. Available at: <https://www.defenseone.com/ideas/2017/09/nato-russia-military-mobilization-zapad/140747/> [Accessed May 21, 2021].

PESCO and the EU Action Plan on Military Mobility

During the superpower's confrontation, Europe was one of the hotspots. Major exercises designed to test military mobility (Able Archer, Lionheart, Big Lift) were so recurrent that across Western Europe, there were signs on thousands of road bridges bearing the image of a tank and a number, standing for the weight and gauge any given bridge could bear in the event of a major exercise or an emergency. However, since the end of the Cold War, much of the rail infrastructures across Europe has been privatised, underlining the shift to a corporate culture with its emphasis on commercial costs and profit, which in turn has entailed main logistical assets to be constructed with no heed for their potential military use³¹. Moreover, despite the significant interweaving of logistic and procedural aspects in military mobility, while the latter has been subject of several provisions and adjustments following NATO's enlargement eastward from the mid-90s, the former has been largely neglected after the collapse of the Soviet Union. This notwithstanding, the Russian annexation of Crimea in 2014 marked a major turning point, leading EU officials to focus more on joint efforts to secure their borders through a collective security approach based on the swift deployment of military

personnel and equipment.

In his 2017 State of the Union address, then-EU Commission President Juncker stressed the imperative of creating a “fully fledged European Defence Union by 2025”³², a commitment renewed by one of von der Leyen's goals to “unite and strengthen Europe”³³. Although a European infrastructure that enables connectivity and ensures a rapid response is a top requirement for these visions, existing regulatory, administrative, and infrastructure inconsistencies across EU territory have significantly hampered military activities. To address these challenges, several political initiatives have been promoted in the last years—two of which are of particular relevance:

- The Permanent Structured Cooperation (PESCO) in the area of defence policy and security, established on a European Council decision in December 2017. It aims - with the support of the European Defence Agency (EDA)- at enhancing the operational readiness and contribution of the 25 EU member states' armed forces as well as developing through concerted investments shared capability projects, among which military mobility figures as one of the more binding commitments³⁴;
- The EU Action plan on Military Mobility was presented in March 2018 by Mogherini, at the time High Represent-

31. Heinrich Brauss, Ben Hodges, Julian Lindley-French, “The CEPA Military Mobility Project: Moving Mountains for Europe's Defense”, Report by the Center for European Policy Analysis Task Group, March 2021, p. 15

32. European Commission, State of the Union Address, (EC, 2017). Available at: http://europa.eu/rapid/press-release_SPEECH-17-3165_en.htm

33. European Parliament, Military Mobility: Infrastructures for the Defence of Europe, (EP Briefing, 2020). Available at: [http://www.europarl.europa.eu/RegData/etudes/BRIE/2020/646188/EPRS_BRI\(2020\)646188_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/BRIE/2020/646188/EPRS_BRI(2020)646188_EN.pdf)

34. Council of the European Union, Establishing Permanent Structured Cooperation (PESCO), (Council Decision 2017/2315, 2017). Available at: <http://data.europa.eu/eli/dec/2017/2315/oj>

tative of the EU for Foreign Affairs and Security Policy and Bulc, former EU Commissioner for Transport. Its purposes are manifold, as it represents a concrete step to upgrade and make better use of the EU transport network, ensuring that military needs are accounted for when infrastructure projects are planned; it highlights the greater vulnerability of a mobility system hampered by physical weaknesses and political barriers that prevent the rapid deployment of forces across national borders; it finally recognises the necessity to identify and agree on- at a European level- military requirements which reflect national needs in terms of, for instance, the availability of compatible logistical assets (civilian/military hubs), accessibility and security of infrastructures, and information exchange between the military and civilian sectors³⁵.

Infrastructure Development Potential through Public-Private Synergies

PESCO and the EU Action plan are going to be implemented in full accordance with the sovereign rights of the EU member states over their national territory and national decision-making processes regarding military movements, working in synergy with civilian players and in coordination not only with EU bodies and agencies but also with NATO. Moreover, both these initiatives are

parts of a major project composed of complementary programmes- e.g., Roadmap on Military Transportation, Multimodal Transportation Hub, Diplomatic Clearance Technical Agreement- carried out by several public and private entities to “simplify and standardise cross-border military transport in Europe”³⁶.

The idea to overcome bottlenecks through policy coordination within and between EU and NATO in the security field has received broad consensus, particularly from the latter military officials, who have recurrently called for creating a “military Schengen zone”³⁷. To provide an example, in 2017, Lieutenant General Ben Hodges- back then in charge of the US military in Europe- and Major General Steven Shapiro- chief officer of the 21st Theatre Sustainment Command in Germany, with responsibility for logistics and military deployment throughout the European and African theatres- stressed the potentially harmful delays caused by “listing each one of the vehicles by serial number on a document and repeat the same process afterwards on a different document in a different language”³⁸ before crossing another border, underlining the necessity for more homogenous checking procedures across the continent. As military mobility is emerging as a key topic on the European agenda given the rise of new, hybrid threats, the above-mentioned proposals made by European institutions intend to relieve these burdens and respond to the EU’s ambition to become a stronger, global actor.

35. European Commission, Joint Communication to the EU Parliament and the Council on the Action Plan on Military Mobility, (JOIN/5 Final, 2018). Available at: <https://ec.europa.eu/transport/sites/transport/files/2018-military-mobility-action-plan.pdf>

36. Council of the EU, PESCO, 2017

37. Jen Judson, Outgoing US Army Europe Commander Pushes for Military Schengen Zone, (Defense News, 2017). Available at: <https://www.defensenews.com/smr/european-balance-of-power/2017/07/28/outgoing-us-army-europe-commander-pushes-for-military-schengen-zone/>

38. B.Hodges, M. Shapiro q.i. Adrian Blasquez, “Securing Europe in Insecure Times: How Military Mobility and Deepened European Integration are Vital to Europe’s Security”, EU Monitor, November 2019, p.3

In short, the co-dependency between strategy and logistics- where the former decides where and how to act, while the latter ensures the practical ability to do so- was notably made by Baron de Jomini, one of Napoleon's most renowned generals. Such a deep connection not only is far from being outdated but, by contrast, is also gaining increasing importance: nowadays, it revolves around the concept of military mobility, which works as *trait d'union* between the political and the military environments (as shown, for instance, by the EU-NATO Structured Dialogue launched in 2018) and it has to be implemented through a solid, integrated infrastructure network that can bear both defence and civil needs.

Harmonisation within the European Regulatory and Logistic Framework between Existing Barriers, Challenges and Opportunities

The Declaration of Rome - adopted on 25 March 2017, on the occasion of the 60th anniversary of the EU's founding Treaty - emphasises Brussels' commitment to take greater responsibility to create a more competitive and integrated defence environment³⁹, strengthening common security and resilience and thus involving more efficient military mobility. However, military mobility is legally bound by multiple national regulations and European standards that must authorise cross-border movement of personnel and goods, making it difficult to carry out adequately rapid military interventions. It is, therefore, necessary to envisage a series

of measures aimed at improving it, ensuring a more interconnected infrastructure system with harmonised procedures to facilitate more efficient logistical interoperability for military purposes. It is worth emphasising that the relevance of military mobility goes well beyond its operational functions in a risk contingency, as it is also a major indicator of a system's effectiveness, resilience, consistency, and credibility from a security perspective, thus ensuring long term goals such as deterrence against potential threats. An effective deterrence must be built on a strong foundation of speed, particularly "speed of assembly to gather the elements of combat power in place to stop an adversary or, if deterrence fails, to respond forcefully"⁴⁰, and the mobility of land forces can only be credible if the infrastructures that enable it are sufficiently robust, the network is endowed with sound coordination and standardisation and, finally, if the necessary permissions are in place.

In short, a credible deterrence can only be achieved when conditions are set for a successful collective defence, of which military mobility is an essential pillar, representing one of the most important Western security's centres of gravity. The EU Action Plan and, more specifically, the EDA's Roadmap on Cross-Border Military Transportation identify three thematic areas:

- Regulatory, which involves ensuring that states have the necessary administration to allow the armed forces of partner countries to cross their borders more quickly;
- Legal, which refers to the status of military forces in a foreign country, data

39. Council of the European Union, The Rome Declaration, (Statements and Remarks, 14/9/17, 2017). Available at: [The Rome Declaration \(europa.eu\)](https://ec.europa.eu/cepa/)

40. Brauss et al., "The CEPA Military Mobility Project", p. 12

protection and transport of dangerous goods;

- Logistical, through the development of upgraded transportation infrastructures, including localising roads and bridges that can support the weight of military equipment or increasing capacity at key ports.

Since the November 2017 Joint Communication to EU Parliament and Council on Improving Military Mobility in the European Union⁴¹, EU Commission, EDA and other EU agencies are working in collaboration with NATO and the member States to assess the current state of the infrastructure, and to find concerted solutions to these existing barriers.

As far as the first two categories are concerned, all European countries must establish a harmonised cross-border approval process for all military movements across Europe by applying streamlined customs procedures and standardised regulations for transporting military goods. Overcoming border bureaucratic bottlenecks is a major challenge as these regulations rely on national decision-making processes. This notwithstanding, military mobility represents a key factor in bolstering dialogue and cooperation between transatlantic allies to strengthen defence capabilities, aiming to establish a common legal ground to ensure smooth transit along defined intermodal (railways, highways, ports, inland waterways) movement corridors. For instance, NATO

has implemented a legal framework through Technical Arrangements (TAs), while EDA is implementing the “Optimising Cross-Border Movement Permission Procedures in Europe” programme to facilitate member states’ capabilities for operations, exercises, and joint command and control activities⁴². More concretely, NATO’s allies and partners have adopted Form 302 with the EU moving in the same direction by developing a similar template to ease the movement of military goods under the Common Security and Defence Policy⁴³. Additionally, another requirement which the EU is aiming to simplify and harmonise are the value-added tax (VAT) regulations in force to those supply efforts demanded by military personnel deployed abroad, with the EU Commission proposing in April 2019 these goods to be VAT exempt and be treated in the same way as under the NATO framework to enhance military cooperation.

Regarding the logistical category, it is worth emphasising that the transportation infrastructure in Europe has been primarily designed for civilian transport. Nonetheless, given the rising concerns for the potential military threat posed by Russia, it was agreed at NATO’s Warsaw Summit in 2016 that allies should provide for “heavier, more high-end forces and capabilities and more forces at higher readiness”⁴⁴. Adjustments in these terms involve a network of main supply routes (MSRs) capable of carrying the weight of heavy armour and large mechanised for-

41. European Commission, Joint Communication to the EU Parliament and the Council on Improving Military Mobility in the European Union, (JOIN/41 Final, 2017). Available at: [join2017/04/13-improving-military-mobility.pdf](https://ec.europa.eu/press/communications/2017/04/13-improving-military-mobility.pdf) [europa.eu]

42. European Defence Agency, 23 Member States Sign New Military Mobility Programme, (EDA, 2019). Available at: [23-Member-States-sign-new-military-mobility-programme](https://eda.europa.eu/23-member-states-sign-new-military-mobility-programme) [europa.eu]

43. European Commission, Guidance Document on Customs Formalities in the EU for Military Goods to be Moved or Used in the Context of Military Activities (Use of the Form 302), (Directorate General Taxation and Customs Union, 2021). Available at: https://ec.europa.eu/taxation_customs/sites/taxation/files/guidance_document_on_customs_formalities_in_the_eu_for_military_goods.pdf

44. NATO, Warsaw Summit Communique, (Press Release, 2016). Available at: https://www.nato.int/cps/en/natohq/official_texts_133169.htm

mations, which need a significant upgrade. In Europe, 90% of highways, 75% of national roads and 40% of bridges can carry vehicles with a maximum Military Load Classification (MLC) of 50 tons for a tracked vehicle. Critically, these vehicles can thus only weigh up to 45.4 tons on bridges, while a maximum weight of 52.6 tons is permitted for wheeled ones⁴⁵. Considering that the combination of trucks, trailers and heavy tanks could go beyond 120 tons, response operations tend to favour the use of river or rail routes.

Nonetheless, even the “rail lift” requires standardisation of its gauges and weight capacity, since railway lines in several European countries have different track gauges, presenting a real challenge for the rapid movement of forces on NATO’s eastern flank in particular. Western allies must devote greater attention to filling logistical gaps by improving existing infrastructures: the first move towards this direction is to take more into account additional infrastructure requirements to enable military traffic through, for instance, the reinforcement of bridging capabilities and addressing the shortages in the capacity of tunnels, roadways, and harbours for the transport of heavy military vehicles; the second one is identifying and start submitting proposals for priority dual-use (civilian and military) infrastructure projects that could be co-funded by the EU Commission through the military mobility envelope of the Connecting Europe Facility⁴⁶. Such projects will be particularly relevant along both the MSRs and intermodal transport corridors and covered by the Euro-

pean Commission’s Trans-European Transport Network (TEN-T) policy.

A Closer Look at TEN-T and the North Sea-Baltic Corridor

As highlighted above, interoperability of armed forces on the field is essential. Still, it must be backed up by well-established logistical organisation and horizontal regulatory coordination to avoid delays that could be detrimental to national and transnational security in the case of a crisis. Concretely, it means, for instance, loading German tanks onto a Dutch cargo ship, which will be controlled in the port of destination by Estonian officials and brought into the area of operations using Lithuanian and Polish road and rail carriers, all supervised by joint US-EU command and control units. These sorts of activities representing the background for many training military exercises in Europe occur in a bureaucratic context of rules and regulations that differ from country to country, and by using facilities which are not always suitable for military purposes.

In this sense, the TEN-T is an illustrative case to show EU efforts towards a much more integrated approach and modernisation of the existing infrastructure complex. TEN-T networks are a set of linear (railways, highways and waterways) and fixed (urban nodes, freight, airports) infrastructure assets strategically relevant at the European level and regulated by the EU Regulation 1315/2013⁴⁷. The overall project- to be completed by 2050-

45. Brauss et al., “The CEPA Military Mobility Project”, p. 33

46. European Commission, Connecting Europe Facility/Transport, (Innovation and Networks Executive Agency, 2020). Available at: [Connecting Europe Facility | Innovation and Networks Executive Agency \(europa.eu\)](#)

47. Under the Article 42.1 of the Regulation, the core network corridors are “an instrument to facilitate the coordinated implementation of the core network. In order to lead to resource efficient multimodal, contributing to cohesion through improved territorial cooperation, core network corridors shall be focused on: modal integration; interoperability; coordinated development of infrastructures, in particular cross-border sections and bottlenecks”. Cfr. <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=lexdex%3A32013R1315>

aims to ensure accessibility to all EU regions, and its Core Network- to be completed by 2030- consists of nine main multimodal corridor⁴⁸.

The priority is to ensure the efficiency of these main movement corridors, providing missing links, interconnecting the different transport modes, and eliminating existing bottlenecks and incompatibilities. To achieve these aims, a “gap analysis” was undertaken to establish

a relationship between military and civilian infrastructure requirements addressed by the TEN-T policy. The analysis identified a significant 93% overlap between the infrastructure targeted as relevant, both for military purposes and the scope of the TEN-T⁴⁹. Given the necessary upgrades to meet civilian and military needs and due to the different quality of the infrastructure in the European countries as well as the disparity of criteria when approaching the construction of new projects,



Source: Adapted from [https://www.europarl.europa.eu/RegData/enudes/BRIF/2020/646188/EPRS_BRI\(2020\)646188_EN.pdf](https://www.europarl.europa.eu/RegData/enudes/BRIF/2020/646188/EPRS_BRI(2020)646188_EN.pdf)

The Trans-European Transport Network Corridors (European Commission, 2020)

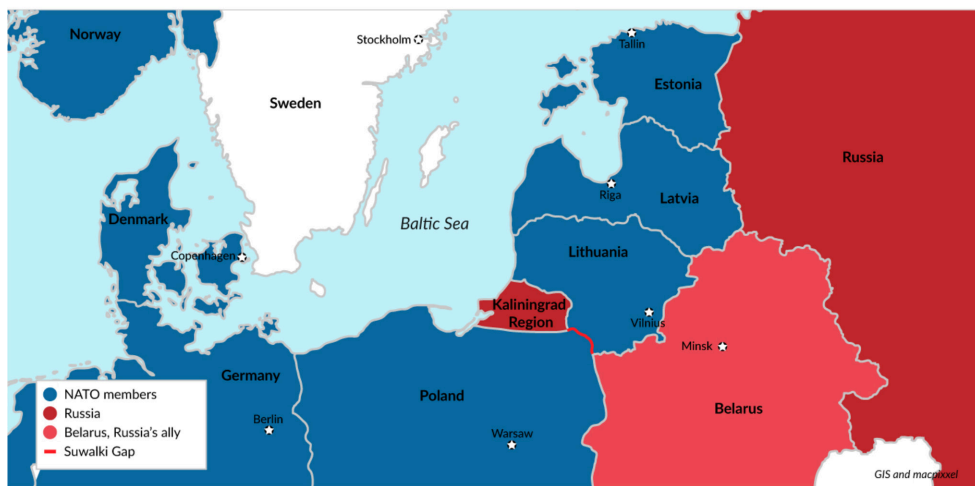
48. EP, Military Mobility: Infrastructures for the Defence of Europe. Available at: [http://www.europarl.europa.eu/RegData/enudes/BRIF/2020/646188/EPRS_BRI\(2020\)646188_EN.pdf](http://www.europarl.europa.eu/RegData/enudes/BRIF/2020/646188/EPRS_BRI(2020)646188_EN.pdf)

49. Ibidem

the TEN-T policy is imperative to set uniformed standards and technical requirements for the infrastructure system. To provide an example, Lithuania, Latvia, and Estonia- despite being both EU and NATO members- operate Russian gauge railroad tracks as previously mentioned. Until the Second World War, the Baltic States were connected to Europe with 1435mm rails, but since the second half of the 20th century, they operate the Russian gauge 1520mm rails, hindering the connection of the Baltic countries with the rest of Europe⁵⁰. This is particularly important considering that one of the principal objectives of the TEN-T policy is connecting East with West, improving not only the freight interchanges and accessibility of the eastern EU member states to western members' markets and vice versa, but also reinforcing the East-

ern flank- one of the most sensitive areas from a security perspective. For instance, given the increasingly tense geopolitical confrontation with Moscow, in the case of an emergency in the Baltic states, allied forces would need to cross the Suwalki gap- a strip of land about 60 km wide and stretching for about 100 km along the Lithuanian-Polish border between pro-Russian Belarus and the Russian enclave of Kaliningrad. The Corridor could become a choke point for Western forces and cut across NATO's land supply axis to the Baltics. Such a critical physical weakness is exacerbated by the lack of infrastructure around the area: only two roads and one railway line through the Suwalki gap would enable NATO land forces to reinforce the region. To deal with these challenges, the Estonian EU presidency initiated in 2017 a pilot analysis for the

The Suwalki Gap



Suwalki Gap (National Interest, 2019)

50. Blasquez, "Securing Europe in Insecure Times: How Military Mobility and Deepened European Integration are Vital to Europe's Security", EU Monitor, p.3- note 12

Source: <https://nationalinterest.org/blog/buzz/whats-russia-and-nato-should-start-worried-about-new-land-tri50117>

countries of the North Sea-Baltic Corridor (NSB), which, among the nine core TEN-T Corridors, has the potential to become one of the most economically diverse in the EU⁵¹, linking the Baltic Sea region with the main ports of the North Sea.

The pilot analysis involved the defence and transport representatives of the countries composing the NSB Corridor- Finland, Estonia, Latvia, Lithuania, Poland, Germany, Belgium, and the Netherlands- and identified barriers in their transport networks for military purposes: in several EU member states' road networks, for example, "the maximum height clearance of road bridges as well as the weight tolerance of certain bridges is not sufficient for oversized or overweight military vehicles; equally, regarding transport by rail, in certain cases, there is insufficient loading capacity to move oversized military equipment"⁵². Despite the initiative recognising that there are major opportunities for dual-use civilian-military infrastructure, the 3200km long NSB Corridor suffers from some consistent infrastructure discrepancies and incompatibilities. While there is strong traffic in the western end of the Corridor from the four largest ports in Europe (Rotterdam, Amsterdam, Hamburg, and Antwerp) to the hinterland of the Netherlands and Germany up to Berlin, the flow then lessens from Berlin to Warsaw and, as far as rails are concerned, the connection northward from Poland to the Baltics is underdeveloped. More specifically, the Corridor lacks a 1435mm

rail connection between Sestokai- 22km inside the Lithuanian border with Poland- and Tallinn (the railway between the Polish border and Sestokai has a parallel tracking of 1520 and 1435mm, recently extended to Kaunas). Such a "break of gauge" is not only a missing link but also creates a bottleneck where the two gauges meet as passengers and goods (including military equipment) have to change trains from the 1435 mm gauge used in Belgium, Netherlands, Germany, and Poland to the 1520 mm gauge used in the Baltic states. These deficiencies are undermining, *inter alia*, the positive development of economic cohesion in the Baltic States, which are less connected to the European transport flows than the other countries along the Corridor⁵³. This fundamental imbalance of transport infrastructure and service constitutes the foremost challenge of the Corridor. A current project, Rail Baltica, aims to solve this infrastructural discrepancy by linking these states with an interoperable faster direct rail line, offering an alternative to the predominant traffic flows with Russia and Belarus- thus representing a strong strategic component in the NSB Corridor⁵⁴.

Besides gauge incompatibilities, railway capacity for cross-border traffic is also hampered by two other main technical barriers throughout the Corridor: lack of the European Rail Traffic Management System (ERTMS) and lack of harmonisation regarding train length, axle load, and thus line speed.

The ERTMS is a system for managing, con-

51. European Commission, North Sea-Baltic: Core Network Corridor Study, (Final Report, 2014). Available at: https://ec.europa.eu/transport/sites/transport/files/north_sea_baltic_study_0.pdf

52. EC, Joint Communication to the EU Parliament and the Council on the Action Plan on Military Mobility. Available at: https://ec.europa.eu/transport/sites/transport/files/2018:military_mobility_action_plan.pdf

53. EC, North Sea-Baltic: Core Network Corridor Study. Available at: https://ec.europa.eu/transport/sites/transport/files/north_sea_baltic_study_0.pdf

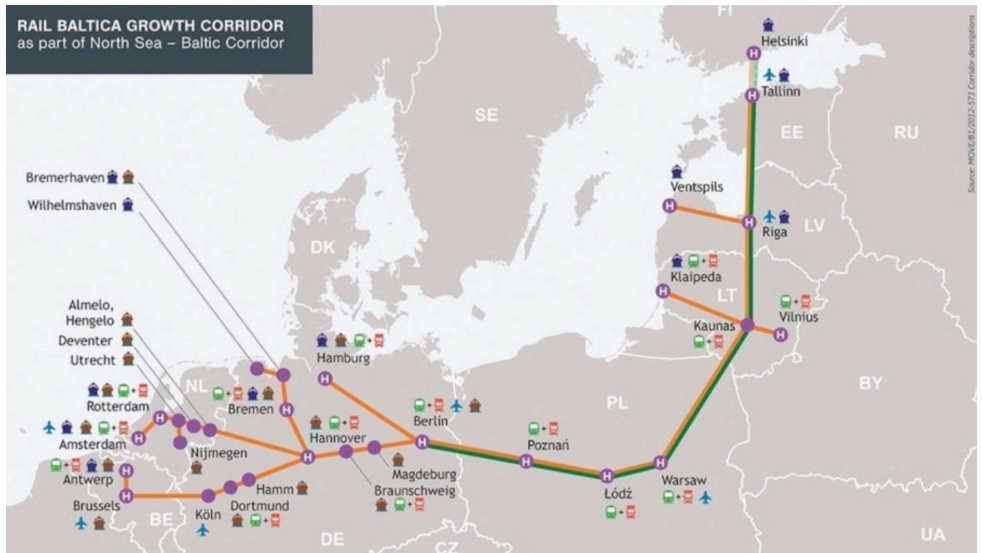
54. Catherine Trautmann, "North Sea Baltic: Fourth Work Plan of the European Coordinator", Report conducted under European Commission Directorate General for Mobility and Transport, June 2020, p. 15. Available at: https://ec.europa.eu/transport/sites/transport/files/4th_nsb_wp.pdf

trolling, and protecting railway traffic and on-board signalling, designed to replace the multiple and mutually incompatible traffic and safety systems of the various national European railways to foster interoperability of railway systems high-speed networks. Although the design and construction of new 1435mm gauge, Rail Baltica foresees the deployment of the ERTMS on the entire line. Currently, the management and control system is in operation on only 8% of the total length of the rail tracks (which is 6.189km, including the ramifications of the railway lines to reach the periphery areas of the Corridor), with no sections planned to be deployed in Finland and the Baltic states by 2023⁵⁵.

The majority of the Corridor is made to hold

the minimum train length of 740m as required under the TEN-T Regulation. However, in Belgium and Germany, the whole network is not complying with the requirement due to existing train length restrictions of 650m during peak hours. Together with the dual gauge 1435/1520mm track from the Polish border to Kaunas, trains' length and weight impact their speed, which can be severely restricted. For example, between Białystok and Olecko (Poland), the speed limits are between 80-120km/h. In contrast, between Olecko and the Lithuanian border, the speed is completely inadequate at a maximum of 60km/h⁵⁶.

The NSB Corridor connects the capitals of all the EU member states through which it



Suwalki Gap (National Interest, 2019)

55. Matthias Ruete, "ERTMS: First Work Plan of the European Coordinator", Report conducted under European Commission Directorate General for Mobility and Transport, May 2020, p. 42. Available at: https://ec.europa.eu/transport/sites/transport/files/work_plan_ertms_2020.pdf; See also https://projects.interreg-baltic.eu/fileadmin/user_upload/Library/Outputs/NSB_CoRe_Policy_Paper.pdf, p. 16

56. Catherine Trautmann, "North Sea Baltic: Second Work Plan of the European Coordinator", Report conducted under European Commission Directorate General for Mobility and Transport, December 2016, p. 13. Available at: https://ec.europa.eu/transport/sites/transport/files/2nd_workplan_nsb_1.pdf

Source: <https://nationalinterest.com/blog/buzz/where-russia-and-antioch-claim-territory-and-what-it-means-for-the-baltic-sea/>

passes- Helsinki, Tallinn, Riga, Vilnius, Warsaw, Berlin, Brussels, Amsterdam- and has 16 core network airports, 12 maritime ports, 20 inland ports and 17 railroad terminals⁵⁷. Given both its assets and alignment, a vital objective of the Corridor is to develop transport interconnectivity between its key urban nodes and hubs, favouring multimodality, particularly in the most critical “last miles”⁵⁸. To provide an example, the Corridor has an effective inland waterways (IWWs) network stretching from the North Sea ports to Berlin, including several of the leading logistics hotspots in Europe. This notwithstanding, due also to geography and morphological characteristics, the network is not homogenous, with the long segment from Warsaw to Tallinn marked by insufficient transport infrastructure, lack of international railway services, and overdependence on road transport, resulting in congestion. The Via Baltica highway, for instance, is the main artery for traffic between Poland and the Baltics, and almost its full length throughout Lithuania, Latvia, and Estonia has only two lanes. Road cargo currently holds 50% of the modal share of the ports’ connections, but by 2030, the goal is to decrease it, shifting road transports to rail, IWWs and short-sea shipping⁵⁹. Considering these assumptions and since the NSB Corridor has a significant concentration of ports and IWWs, plans foresee them playing an increased role, recognising efficient port hinterland connections, particularly by rail and IWWs a major priority

on the NSB Corridor.

Moreover, as highlighted by Izabela Kaczmarzyk- project coordinator for Poland under the EU study about the current status, future compliance and potential of the Corridor- TEN-T is currently taking into account projected extensions (e.g., connecting the Freeport of Riga directly into the TEN-T network via the Riga Northern Transport corridor) which will enhance ports’ strategic relevance as “frontrunners of economic development [with the capacity of] reducing noise and pollution”⁶⁰. In the light of the environmental requirements from International and EU regulations as well as targeting zero-emission transportations, growing flows in maritime and IWWs are needed. In this regard, however, problems relate both to ports’ terminal capacity and some IWWs’ navigability shortages, resulting in limited hinterland connections, which, in turn, hinder capacity. On the eastern side of the Corridor, freeway access to the ports needs to be improved by dredging activities. An adequate ice-breaking capacity is necessary to accommodate terminals’ increasing freight and passenger capacities. On the western side, although all IWWs sections on the Corridor are in the Conference Européenne des Ministres des Transports (CEMT)- classes IV to VIc⁶¹, many canals in Germany meet only the minimum requirements and should be upgraded to match the expected increase in freight demand (e.g., the minimum bridge height of 5.25m is not cur-

57. Ivi, p.11

58. Last mile is a term used in supply chain management and transportation planning to describe the last leg of a journey comprising the movement of people and goods from a transportation hub to a final destination.

59. Trautmann, “North Sea Baltic: Second Work Plan of the European Coordinator”, p. 17

60. Majorie van Leijen, €44 Billion of Railway Projects on the North Sea-Baltic Corridor, (RailFreight, 2020). Available at: <https://www.railfreight.com/railfreight/2020/06/09/44-billion-of-railway-projects-on-the-north-sea-baltic-corridor/?gclid=ce>

61. European Conference of Ministers of Transport, Résolution 92/2 relative à la Nouvelle Classification des Voies Navigables, (CEMT, 1992). Available at: <https://web.archive.org/web/20110623140403/http://internationaltransportforum.org/IntOrg/acquis/svat19922f.pdf>

rently met on several canals⁶²).

What is paramount is to ensure efficiency through an integrated approach that sees a smooth interchange between transport modes throughout the whole extension of the Corridor. Therefore, it is necessary to concentrate efforts on its most critical sectors. In this perspective, the Recovery and Resilience Facility (RRF) is the key instrument at the heart of NextGeneration, the EU's plan for emerging stronger from the COVID-19 pandemic. It will provide up to €672.5 billion to support investment projects and reforms, specifically targeted by each member state via the submission of national recovery and resilience plans. The EU Commission has received 17 of these plans, 5 of which from countries involved in the NSB Corridor (Belgium, Germany, Latvia, Lithuania, and Poland), outlining as a common feature sustainable transport and

infrastructure development to sustain mobility⁶³.

To conclude, social, economic, environmental, and defence issues are deeply intertwined, and their common denominator within the mobility field is to have a sound infrastructure. In addition to good and efficient freight connections, comfortable international passengers transit across the whole Continent, and more robust military movement corridors, dual civil-military infrastructures are important for enhancing identity among European citizens: in fact, an integrated and well-functioning network entails dialogue, projects sharing, and investments. Working as further elements of unity and cohesion among Western allies, harmonisation of procedures also plays a primary role in enhancing a common political front, reinforcing military capacities and thus ensuring more security.

RECOMMENDATIONS FOR IMPROVEMENT

The dynamic of European cooperation on military mobility has taken on a new twist since the illegal annexation of Crimea in 2014, therefore forcing both EU and NATO to improve and facilitate interoperability and military readiness across the European territory. The highlight of the cooperation comes with the realisation of a next-level partnership through the 2016 and 2018 EU-NATO Joint Declarations, which suggest “swift and

demonstrable progress” in military mobility. The new defined defence and security cooperation comes with close coordination on foreign policy issues, joint training and exercises, ranging from hybrid warfare, 5G, and cyber defence, to military mobility⁶⁴.

Military mobility is built on the cooperation of multiple actors: EU, NATO, civil society, as well as close coordination between governments and national military bodies. The coop-

62. Trautmann, “North Sea Baltic: Second Work Plan of the European Coordinator”, p. 8

63. European Commission, Recovery and Resilience Facility: Croatia and Lithuania Submit Official Recovery and Resilience Plans, (EC, 2021). Available at: https://ec.europa.eu/commission/presscorner/detail/en/IP_21_2501

64. Latici Tania, “Understanding EU-NATO cooperation. Theory and practice”. European Parliamentary Research Service (EPRS), 2020 [online]. Available at: [https://www.europarl.europa.eu/RegData/etudes/BRIF/2020/659269/EPRS_BRIF\(2020\)659269_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIF/2020/659269/EPRS_BRIF(2020)659269_EN.pdf)

eration between multiple actors comes with a number of challenges and opportunities. Yet, as there has often been no clear and effective coordination on an adequate and up-to-date strategy on military mobility, such innovative cooperation is mainly hindered by the lack of common mechanisms in infrastructure modernisation and transportation funding.

Therefore, based on key findings from previous chapters of this paper as well as specialised literature, such as recommendations put forth by subject matter experts involved with the Military Mobility Project of the Center for European Policy Analysis CEPA, this section will highlight a series of requirements and recommendations for improvement of common challenges which have been identified as possible actions to take to enhance interoperability and military readiness across and within the European territory.

Enhance EU-NATO cooperation on military mobility

1. *Envisage the creation of a common secretariat.* To avoid any duplication and to improve the transmission of the information at all levels, a common secretariat or a joint designated task group should therefore be created to ensure swift communication between multiple actors involved in cross-border military movement⁶⁵. The creation of a common platform would also allow to foster relations between non-EU (The US, Canada, Norway, Turkey, Montenegro, Albania,

or North Macedonia) and non-NATO countries (Austria, Sweden, Finland, or Ireland) and promote a common sense of cooperation and resilience.

2. *Reinforce the Structured Dialogue on Military Mobility* launched in 2018 between EU and NATO staffs, where discussions have mainly been held on cross border legislative and procedural issues. In this sense, the number of staff meetings at all levels should be increased to facilitate information sharing and identify potential actions or backlogs in the decision-making process and technical issues.
3. *Harmonise cross-border movement permission procedures* in Europe to establish compatible regulations and procedures for all modes of transport through Technical Arrangements (TAs), providing EU and NATO staff with a framework for sharing and developing best practices for military forces. Two Technical Arrangements have already been completed by the European Defence Agency (EDA) in 2019 within its “Optimising Cross-Border Movement Permission Procedures in Europe” programme, where twenty-five EU member states have already joined the venture aimed at fostering their defence capacities for “operations, exercises and daily activities”⁶⁶. Non-EU partners should also be incorporated in such programmes to ensure and optimise cross-border movement across and within the European territory.

65. Drent et al., “Military Mobility and the EU-NATO Conundrum”, Clingendael Netherlands Institute of International Relations, 2019 [online], Available at: https://www.clingendael.org/sites/default/files/2019-07/Military_Mobility_and_the_EU_NATO_Conundrum.pdf

66. Brauss et al., “The CPA Military Mobility Project”, p.30

4. *Simplify diplomatic clearances and customs procedures.* The Action Plan vows to reduce and eventually overcome bureaucratic border procedures by harmonising cross-border movement permission. Simplifying diplomatic clearances might be, in this case, a major challenge to tackle, as it relies on national governments to standardise customs procedures. However, it is for the sake of national and European security, ensuring that all NATO and EU countries apply the same set of customs procedures for military transport across the continent, as it entails a rapid movement of forces in the event of a major crisis. In this context, standardisation of NATO and EU Form 302 is designed to ensure uniform treatment of import, export, and transit of military goods, in the context of CSDP and NATO activities. It has been made clear that the EDA is to come up with a digital format of Form 302 by 2024 to be used by EU and non-EU partners to apply the same set of procedures for all military movements across Europe. In this regard, special attention must be addressed to the training of customs officers, providing them with the necessary tools to apply the new harmonised set of rules and procedures⁶⁷.
5. *Harmonise procedures for the transport of dangerous goods.* Besides the already initiated process for standardisation of customs procedures, it should also be noted that within the framework of military mobility, the question of transport of dangerous goods has been a major chal-

lenge for EU and national institutions. In this regard, the CPA has recently called for the implementation of a common legal framework for the transport of dangerous goods at EU level to establish a common set of approved dangerous military goods to be transported across EU and partner countries, and therefore reduce bureaucratic backlogs⁶⁸.

6. *Enhance EU-NATO joint training and exercises.* Military movements in Europe require close coordination between multiple stakeholders ranging from military to civil personnel. In this sense, it is of primordial importance to regularly organise training and simulation exercises to test the actual effectiveness of military infrastructure, evaluate the coordination between all stakeholders, and draft recommendations for improvement. It is also an excellent opportunity to foster civil-military relations, guarantee a high level of interoperability, and detect risks and challenges that might impact the realisation of smooth military mobility coordination at EU-NATO level.

Promote Dual-Use Functions of Infrastructure Projects and Civil-Military Cooperation

7. Identify dual-use infrastructure projects. In 2019, the European Council agreed on a dual-use transport infrastructure budget, as it was identified that the transportation infrastructure in Europe

67. *Ibid.*, p.37

68. *Ibid.*

is mainly designed for civilian purposes. Therefore, the European Commission – in line with the military mobility requirements – decided to identify dual-use infrastructure projects as part of the TEN-T programme that would carry heavy military vehicles and eligible for co-funding⁶⁹. The next call for proposals for dual-use projects is set up in 2021. The stated goal is to identify existing rail and road networks that need to be urgently upgraded to NATO and EU standards and determine infrastructure projects covered by TEN-T corridors. It is, therefore, crucial to harmonise infrastructure projects by upgrading dual-use civil-military transport systems as it would highly participate in closing the gaps at a national level and allow a rapid movement of forces and goods in case of a crisis.

8. Adopt a common EU-NATO budget for infrastructure modernisation. As detailed in the first recommendation, the EU-NATO cooperation should equip itself with a joint secretariat. In the same vein, the two organisations should work on a common budget for military mobility and, more precisely, on civil-military infrastructure and cooperation. Non-EU NATO countries like Turkey already have access to both EU and NATO funding in the scope of IPA (Instrument for Pre-Accession Assistance), which funds the Transport Operational Programme meant to finance the connection of the

Turkish rail transport network to TEN-T⁷⁰. However, regarding such innovative and ambitious cross-border projects, it is crucial to harmonise the budget mostly out of transparency for civilian and military stakeholders.

Integrate New Digital Technologies in Infrastructure Modernisation

9. Develop an innovative system aimed at gathering people for a common purpose. While it is crucial to modernise transport infrastructures to facilitate military mobility and interoperability, it should be noted that developing and integrating new digital technologies cannot solely be focused on upgrading military equipment, but also to foster a cyber culture within the people who are involved in the process whether them being from the civil society or military bodies. In this sense, it is important to give civil-military innovators an effective and transparent working environment, where they can provide high-tech solutions for military infrastructures, and the people using those technologies by educating them in working together on military mobility projects that require less rigid bureaucratic rules and more flexibility regarding growing hybrid threats⁷¹.
10. Make full use of technology-driven trends impacting logistical infrastructure. Technology experts from National

69. Ibid., p.33

70. Drent et al., "Military Mobility and the EU-NATO Conundrum", Clingendael Netherlands Institute of International Relations, 2019 [online]. Available at: https://www.clingendael.org/sites/default/files/2019-07/Military_Mobility_and_the_EU_NATO_Conundrum.pdf

71. Jason M. Brown, "Why the Military Needs a Technology Revolution," The National Interest, May 31, 2017 [online]. Available at: <https://nationalinterest.org/feature/why-the-military-needs-technology-revolution-20933> [Accessed May 21, 2021].

Defense demonstrated how big technology-driven trends could have a significant impact on logistical infrastructures⁷². Based on their results and the potential of the European military mobility project, the 3D printing technology can be the next-generation system to be widely

used in ground combat operations. It allows to reduce production and storage requirements. This technology could therefore be a great asset to EU-NATO forces, as it could unburden supply lines and facilitate logistics missions.⁷³

CONCLUDING REMARKS AND WAY AHEAD

Military mobility and Europe's logistical infrastructure have often been described as a major challenge in European defence and security. They entail the combination of multiple civil, industrial, and military stakeholders. However, and regarding recent political developments, gathering mismatched defence industries to work closely on harmonising cross-border movements through the modernisation of the existing transportation network has become the flagship of EU-NATO cooperation. During a high-level conference on Military Mobility organised in May 2021 by the EDA, it has been highlighted by Portugal, which holds the Presidency of the Council of the EU until June 2021, that the relevance of Military Mobility shouldn't be overlooked as it goes beyond just military considerations: "We see a lot of technical work going on [between EU and NATO], but the result of this technical work will be a political result because, at the end of the day, it is a politi-

cal project. I hope that Military Mobility will open the door to deeper cooperation between the EU and NATO in various areas. I hope that in 2035, we can look back and say: the Military Mobility project was the pioneer project" (João Gomes Cravinho, Minister of National Defence of Portugal)⁷⁴. In the context of widespread budget cuts in defence and security since the start of the Covid-19 pandemic, as well as continuing insufficient investments by EU countries in fostering their military capabilities and interoperability, it appears that the EU-NATO joint venture is a godsend, enabling both organisations to share their burden and create an optimum working environment for the realisation of the military mobility project⁷⁵.

While this ambitious association between the two international organisations is encouraging, there is still room for improvement, and further systematic efforts will have to be

72. Gulu Gambhir, "The Digital Age Is Transforming Military Logistics", National Defense, March 1st, 2018 [online]. Available at: <https://www.nationaldefensemagazine.org/articles/2018/3/1/the-digital-age-is-transforming-military-logistics>. [Accessed May 21, 2021].

73. Jason M. Brown, "Why the Military Needs a Technology Revolution," The National Interest, May 31, 2017 [online]. Available at: <https://nationalinterest.org/feature/why-the-military-needs-technology-revolution-20933> [Accessed May 21, 2021].

74. European Defence Agency (EDA), "High-level Military Mobility Symposium discussed way ahead", May 7th, 2021 [online]. Available at: <https://eda.europa.eu/news-and-events/news/2021/05/07/high-level-military-mobility-symposium-discussed-way-ahead>

75. Brauss et al., "The CPA Military Mobility Project", p.28.

made to ensure the realisation of this prominent project. Examples such as the one of railway gauge width precisely illustrate the main challenges land forces interoperability in Europe faces today and serve as a reminder of a changing geostrategic environment on the European continent. The political and military domains must work together to enhance interoperability through improved mobility while also strengthening the European alliance in military cooperation and defence matters. In addition to reflecting on military needs, not only infrastructure expansion, regulatory standardisation - such as in the form of a “military Schengen Zone”⁷⁶ -, and regular maintenance, but also regular exercises and reviews of practices and regulations with a focus on improving interoperability and advancing

harmonisation of standards and procedures are necessary. This process needs to include government, military, and industry stakeholders as the promotion of dual-use functions of expanded or newly constructed infrastructure and its potential for public-private synergies should be considered in investment decisions. Further, the involvement of industrial R&D experts ensures that new infrastructure and equipment are on par with current technological capabilities, including digitalisation trends. As the deviation of rail gauge width in the Baltic States and in Ukraine additionally underscores, it is important to involve members of the European Union and include allies such as Partnership for Peace (PfP) countries in the standardisation process.

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⁷⁶ Judson, “Outgoing US Army Europe Commander Pushes for Military Schengen Zone.”

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Created in 1953, the Finabel committee is the oldest military organisation for cooperation between European Armies: it was conceived as a forum for reflections, exchange studies, and proposals on common interest topics for the future of its members. Finabel, the only organisation at this level, strives at:

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Finabel contributes to reinforce interoperability among its member states in the framework of the North Atlantic Treaty Organisation (NATO), the EU, and *ad hoc* coalition; Finabel neither competes nor duplicates NATO or EU military structures but contributes to these organisations in its unique way. Initially focused on cooperation in armament's programmes, Finabel quickly shifted to the harmonisation of land doctrines. Consequently, before hoping to reach a shared capability approach and common equipment, a shared vision of force-engagement on the terrain should be obtained.

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