

ISSUE BRIEF

NATO deterrence and defense:

Military priorities for the Vilnius Summit

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At the North Atlantic Treaty Organization's July summit in Vilnius, the focus will necessarily be on support to Ukraine. But as NATO's Strategic Concept makes clear, the Alliance also needs to respond to a broader set of challenges, with those arising from Russia particularly acute. This issue brief focuses on the conventional military threat from Russia, and sets forth six priority actions that NATO should undertake to enhance its deterrent and defense posture.

In summary, the report recommends:

- enhancing NATO's mobility capability to meet the force-posture goals established at the Madrid summit through a combination of prepositioning; regular division, brigade, and air-wing forward training and exercises; establishment of new training areas; and increased host-nation support;
- establishing a sustainment initiative so that NATO maintains stocks sufficient to fight an extended-duration conflict, and that the defense industry has the capability to replenish such stocks in a timely manner;
- establishing effective relationships with key private-sector companies that will engage in operational activities during a conflict, initially focused on cybersecurity for critical infrastructure, ensuring the continuity of information technology and communications networks and the utilization of private-sector space capabilities;

- establishing, through the Defense Planning Process requirements for low-cost unmanned air and maritime vehicles, including with artificial-intelligence (AI) capabilities, and reviewing the potential role of mines as a deterrent capability;
- revising NATO's command-and-control structures at Joint Forces Command Brunssum and Joint Forces Command Naples to be regional commands capable of directing high-intensity warfare and focused on the east/north and the south, respectively; and utilizing currently available commercial technology to establish the capability for prompt command and control of multidomain operations; and
- establishing the requisite funding to achieve the foregoing, including a pledge by NATO nations of 2.5 percent of gross domestic product (GDP) as a floor for defense spending and supporting the European Union (EU) creation of an EU security and defense budget focused on mobility, sustainment, and critical-infrastructure resilience.

I. THE RUSSIAN CONVENTIONAL THREAT

NATO's Strategic Concept is clear as to the nature of the threat that Russia poses.

The Russian Federation is the most significant and direct threat to Allies' security and to peace and stability in the Euro-Atlantic area. It seeks to establish spheres of influence and direct control through coercion, subversion, aggression and annexation. It uses conventional, cyber and hybrid means against us and our partners. Its coercive military posture, rhetoric and proven willingness to use force to pursue its political goals undermine the rules-based international order...In the High North, its capability to disrupt Allied reinforcements and freedom of navigation across the North Atlantic is a strategic challenge to the Alliance. Moscow's military build-up, including in the Baltic, Black and Mediterranean Sea regions, along with its military integration with Belarus, challenge our security and interests.¹

The nature of the conventional threat that the Alliance faces is, of course, affected by Russia's engagement in its war against Ukraine. On the one hand, the threat might turn real in the near term. While Russia has not attacked into NATO territory, Russian President Vladimir Putin has been clear that Russia views the ongoing conflict as one in which NATO is involved.

During an interview aired on the state-owned *Rossia-1* channel to commemorate the one-year anniversary of Russia's invasion of Ukraine, Putin claimed that by "sending tens of billions of dollars in weapons to Ukraine" the North Atlantic Alliance was taking part in the war. He further accused the West of having "one goal: to disband the former Soviet Union and its fundamental part...the Russian Federation."²

Whether any such escalation would occur—and how—is not knowable, including what Russia might do if Ukraine becomes more successful in retaking its territory.

A limiting factor, of course, is that the Russian military being heavily engaged in the fight against Ukraine reduces not only its current capability against NATO, but also its capabilities for the future, as noted in the recent Annual Threat Assessment of the US Intelligence Community.

Moscow's military forces have suffered losses during the Ukraine conflict that will require years of rebuilding and leave them less capable of posing a conventional military threat to European security...Heavy losses to its ground forces and the large-scale expenditures of precision-guided munitions during the conflict have degraded Moscow's ground and air-based conventional capabilities.³

Nonetheless, Russia could determine that a direct attack into NATO territory is necessary to disrupt NATO's support to Ukraine, particularly if Russia's position in the war deteriorates. Moreover, as demonstrated by Russia's proposed "treaties" presented prior to its attack against Ukraine, Russia seeks to dominate the security of NATO's eastern members.⁴ Under a calculus similar to that which led to the attack on Ukraine, Russia could, for example, attack the Baltic states or Poland.

1 "Strategic Concept," North Atlantic Treaty Organization, 2022, 4, <https://www.nato.int/strategic-concept>.

2 Aitor Hernández-Morales, "Putin Accuses NATO of Participating in Ukraine Conflict," *Politico*, February 26, 2023, <https://www.politico.eu/article/vladimir-putin-accuse-nato-participate-ukraine-conflict-war-russia>.

3 "Annual Threat Assessment of the U.S. Intelligence Community," US Office of the Director of National Intelligence, February 6, 2023, 14, <https://www.dni.gov/files/ODNI/documents/assessments/ATA-2023-Unclassified-Report.pdf>.

4 Steven Pifer, "Russia's Draft Agreements with NATO and the United States: Intended for Rejection?" Brookings, December 21, 2021, <https://www.brookings.edu/blog/order-from-chaos/2021/12/21/russias-draft-agreements-with-nato-and-the-united-states-intended-for-rejection>.

While Russia's conventional capabilities have been degraded, they can be reconstituted over time. Additionally, Russia has other nonconventional capabilities, which it might conclude enhance its prospects if it did decide to attack NATO territory.

- As part of such an attack, critical infrastructure would likely be targeted. As the US Intelligence Community has stated, "Russia is particularly focused on improving its ability to target critical infrastructure, including underwater cables and industrial control systems, in the United States as well as in allied and partner countries, because compromising such infrastructure improves and demonstrates its ability to damage infrastructure during a crisis."⁵
- Russia has recently announced that it will place tactical nuclear weapons in Belarus, and might use the threat of such weapons to constrain a NATO response to an attack.⁶

To sum up, Russia is a near-, medium-, and longer-term threat. Its willingness to go to war against Ukraine underscores that it might act on its stated concerns regarding NATO. Accordingly, the recommendations below are intended to enhance NATO's deterrent and defense posture, both to reduce the probability of a conflict with Russia and to ensure a successful outcome if such a conflict occurs.

II. NATO PRIORITIES

In conjunction with the issuance of NATO's new Strategic Concept at the June 2022 Madrid summit, NATO agreed to a "New NATO Force Model." While only in outline form, the new force-model presentation states that NATO will be able to provide "well over 100,000 Tier 1 forces" in "up to 10 days" and "around 200,000 Tier 2 forces" in "around 10-30 days."⁷ The discussion below sets forth six priority actions necessary to accomplish the goals of the new force model.

5 "Annual Threat Assessment of the U.S. Intelligence Community," 15.

6 James Gregory, "Putin: Russia to Station Nuclear Weapons in Belarus," BBC News, March 26, 2023, <https://www.bbc.com/news/world-europe-65077687>. Another uncertainty is whether the declared China-Russia "no limits" agreement would translate into significant support from China in the context of a Russian attack against NATO. Chinese actions could include weapons supply, cyberattacks, disinformation, and restrictions on trade, including key minerals and/or components. However, multiple commentators have noted that China has not offered "no limits" support to Russia in the Russia-Ukraine war. See: Andrew S. Erickson, "Friends with 'No Limits?' A Year into War in Ukraine, History Still Constrains Sino-Russian Relations," Fairbank Center for Chinese Studies, February 21, 2023, <https://fairbank.fas.harvard.edu/research/blog/sino-russian-relations>. The Vilnius summit should ask the Supreme Allied Commander Transformation, as part of that command's foresight analysis, to evaluate the potential for, and possible nature of, China's involvement in a Russian attack against NATO.

7 "New NATO Force Model," North Atlantic Treaty Organization, 2022, https://www.nato.int/nato_static_fl2014/assets/pdf/2022/6/pdf/220629-infographic-new-nato-force-model.pdf.

8 "Defense Transportation: The Army Should Take Action to Better Ensure Adequate Rail Support to Combatant Commanders," US Government Accountability Office, August 2021, 1, <https://www.gao.gov/assets/720/716278.pdf>.

A. Mobility

NATO has not currently provided a breakdown of the composition of either Tier 1 or Tier 2 forces. However, NATO's military authorities, led by the Supreme Allied Commander for Europe (SACEUR), are presumably doing a detailed mobility analysis as part of effectuating those force goal requirements. Such a review should be utilized to develop the requirements for transportation (e.g., rail cars required, bridges that need to be reinforced), logistical coordination (e.g., time-phased rail and road movements), and finances (costs associated with achieving mobility requirements). The specifics can then be broken down and passed to nations via the Defense Planning Process, and to the European Union through the existing coordination mechanisms supporting military mobility.

In addition to the specifics from such a review, three operational considerations provide a basis for NATO actions to enhance mobility that should be approved at Vilnius.

First, prepositioning equipment forward significantly reduces mobility requirements, which can be quite substantial—particularly for heavy forces. By way of example, an armored brigade combat team moving in the United States can require on the order of six hundred rail cars.⁸ While other NATO heavy brigades are generally smaller, they would likewise require significant movement and other logistical support including, for example, sufficient rail cars and heavy-equipment transporters, as well as theater-wide coordination of movements.

The NATO military authorities developing the force model can reduce the logistical burden, and speed the availability of forward forces, by including the establishment of substantial amounts of prepositioned materiel in the eastern portion of the Alliance as a key element in planning. In particular, while the United States already has six prepositioned sets of equipment in Europe, France, Germany, and the United Kingdom should each undertake prepositioning in the east,

which will enhance their ability to have their forces ready for combat in accordance with the requirements of the new force model.⁹ By way of example, the United Kingdom's recent Integrated Review Refresh provides for only one brigade to be sent forward in the event of a conflict with Russia, but appropriate prepositioning would allow for at least one more to be quickly available.¹⁰

Second, forces that are already forward deployed for training would obviously have a positive impact on mobility requirements in the event of a conflict. Some useful steps have been taken—including the establishment of enhanced forward brigades now present in eight countries—but the actual number of forces forward deployed by European countries is still relatively modest.¹¹

- The United Kingdom, “[i]mmediately after Russia attacked Ukraine...very rapidly deploy[ed]...three Army battlegroups across Europe: tanks to Scandinavia, infantry and cavalry to Estonia and Poland, and battlefield helicopters and paratroops to the Balkans.”¹² However, a “typical Battlegroup...could contain about 600 men,” so the deployment is far from what would be needed in a conflict.¹³
- France has an approximately five-hundred person force in Romania as part of its leadership of the newly established multinational enhanced forward brigade of approximately eight hundred in that country, and has also deployed additional forces of about six hundred in exercises with the brigade.¹⁴ This is an entirely worthwhile effort, but insufficient for the requirements of a conflict.

NATO should consistently increase the number of forces in the east by establishing regularized regional training schedules of

larger force components—both land and air—for non-eastern countries, by having eastern countries establish useful training ranges, and providing effective host-nation support to facilitate such activities.

While the United States maintains substantial permanent and rotational forces in eastern Europe,¹⁵ increasing the capacity of other NATO members to be able to likewise maintain larger forward forces will require both restructuring of militaries to add to active duty forces, and additional resources to support such forces as well as their forward deployment.

At present—and for the foreseeable future—the British Army is unable to maintain a continuous rotational presence of an entire armoured brigade outside the UK without announcing mobilisation. Its 3rd Division, intended for operations in the European theatre, will only complete the process of restructuring and modernisation by 2030, and will consist of two armoured and one reconnaissance & artillery brigade combat teams. That is why London is unable to assign a specific brigade to Estonia, but can only offer individual subunits.¹⁶

It is not only the United Kingdom facing such limitations.

The German Army will not have one fully equipped brigade available until 2023, when it will be on duty with NATO's Very High Readiness Joint Task Force (VJTF). The Bundeswehr will only have one fully modernised division available by 2027, and a further two by 2031. It would thus only be able to permanently deploy one brigade in Lithuania on a rotational basis by around 2026. Canada also has the problem of deploying an entire brigade without prior mobilisation, as its peacetime armed forces consist of only three mechanised brigades.¹⁷

9 Christopher Gardner, “USACE Supports Readiness in Europe by Modernizing Army's Prepositioned Stock Facilities,” US Army, September 7, 2022, https://www.army.mil/article/259992/usace_supports_readiness_in_europe_by_modernizing_armys_prepositioned_stock_facilities.

10 “Integrated Review Refresh 2023,” HM Government, March 2023, 40, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1145586/11857435_NS_IR_Refresh_2023_Supply_AllPages_Revision_7_WEB_PDF.pdf.

11 “NATO's Military Presence in the East of the Alliance,” North Atlantic Treaty Organization, last updated December 21, 2022, https://www.nato.int/cps/en/natohq/topics_136388.htm.

12 Ben Barry, “Can the British Army Still March to the Sound of the Guns?” International Institute for Strategic Studies, February 6, 2023, <https://www.iiss.org/blogs/analysis/2023/02/can-the-british-army-still-march-to-the-sound-of-the-guns>.

13 “Formations,” British Army, last visited March 20, 2023, <http://www.armedforces.co.uk/army/listings/10014.html>.

14 Luiza Ilie and John Irish, “With Troops in Romania, France Seeks to Capitalise on Military Ties,” Reuters, January 27, 2023, <https://www.reuters.com/world/europe/with-troops-romania-france-seeks-capitalise-military-ties-2023-01-27/>; “US, French Troops in Romania Hold NATO Military Drills,” Associated Press, February 9, 2023, <https://apnews.com/article/nato-politics-romania-government-e2d0466e727284f8b89f0d1e44eebc3d>.

15 “Fact Sheet: U.S. Defense Contributions to Europe,” US Department of Defense, June 29, 2022, <https://www.defense.gov/News/Releases/Release/Article/3078056/fact-sheet-us-defense-contributions-to-europe>.

16 Jacek Tarociński and Justyna Gotkowska, “Expectations Versus Reality: NATO Brigades in the Baltic States?” OSW Centre for Eastern Studies, December 6, 2022, <https://www.osw.waw.pl/en/publikacje/analyses/2022-12-06/expectations-versus-reality-nato-brigades-baltic-states>.

17 Ibid.

To support expanded forward training, the issue of infrastructure for training also needs prompt, high-level attention. While substantial upgrades to infrastructure, including a facility for prepositioned stocks, are taking place in Poland, and there are ongoing enhancements to airfields in Romania, much of the existing infrastructure in the east cannot support brigade-level activities and remediation plans are insufficient.¹⁸ NATO needs to determine what is required in the southeast and especially in the Baltics, which could be the initial locus of a conflict but where host-nation support is currently insufficient.

An earlier Atlantic Council report identified a need for the Baltic countries to improve rail lines “connecting with key military bases and likely staging areas” and to enhance the “ability of roads and bridges...to accommodate heavy vehicles.”¹⁹ The same study noted the limited capacity of Baltic nation training areas to conduct brigade-level training, as well as live-fire exercises.²⁰

None of the Baltic states is in a position to provide the infrastructure necessary to station such [brigade] forces in the near future. The training grounds and barracks infrastructure is insufficient and needs to be significantly developed. Lithuania has declared that it will complete the relevant investments by 2026. Estonia, as agreed with London, will develop its military infrastructure so that it can accommodate an entire brigade. In Latvia too, the NATO battlegroup is making full use of the military installations there; Latvia has taken steps to expand them. The problems of inadequate housing for soldiers and the too small military training grounds in the Baltic states are not new. The military infrastructure has been undergoing a process of modernisation for years there, but the scale of requirements remains very high.²¹

NATO should continue to utilize its own common-funded Security Investment Programme budget to support such efforts.²² That budget was recently increased to one billion euros, but further increases are warranted.²³ Likewise, national funding comparable to the US European Deterrence Initiative (which is planned at \$3.6 billion for fiscal year (FY) 2024) should similarly be directed by other non-eastern NATO members.²⁴ Moreover, as more fully discussed below, the European Union should establish a security and defense budget, with one key component being increased funding for NATO mobility requirements.

B. Sustainment

The duration of the Russia-Ukraine war has brought home the necessity for NATO to have the capability to engage in an extended conventional conflict. While the current focus has understandably been on ensuring Ukraine’s ability to continue fighting, an effective deterrent and defense posture for NATO is also dependent on a sufficient capability to engage in conflict over an extended period.²⁵ However, NATO nations have long suffered from significant underinvestment, and munitions stocks and other materiel are at entirely insufficient levels. A study by the European Union highlighted that “years of defence underspending...has led to an accumulation of gaps and shortfalls in the collective military inventories as well as reduced industrial production capacity.”²⁶

At Vilnius, NATO needs to take three steps to acquire the necessary sustainment capabilities.

First, NATO needs to establish a mandatory sustainment target for nations. A reasonable goal would be to have sufficient stocks of key weapons and associated logistical support on hand to be able to undertake an effective defense for a one-

18 Christopher Gardner, “U.S. Army Corps of Engineers Construction Project in Poland Will Further Enhance NATO Readiness in Region,” US Army, April 20, 2022, https://www.army.mil/article/255841/u_s_army_corps_of_engineers_construction_project_in_poland_will_further_enhance_nato_readiness_in_region; “Allied Air Forces Work Together to Improve Romanian Air Base,” North Atlantic Treaty Organization, January 3, 2023, https://ac.nato.int/archive/2023/NATO_Infra_eAP_ROU.

19 Kathleen J. McInnis and Connor McPartland, *Falling in: The Deterrent Value of Host Nation Support in the Baltic Sea Region*, Atlantic Council, May 2021, 16–18, https://www.atlanticcouncil.org/wp-content/uploads/2021/05/Falling-In_Deterrent-Value-of-HNS-in-the-Baltic.pdf.

20 Ibid.

21 Tarociński and Gotkowska, “Expectations Versus Reality.”

22 “Funding NATO,” North Atlantic Treaty Organization, March 22, 2023, https://www.nato.int/cps/en/natohq/topics_67655.htm.

23 “NATO Agrees 2023 Budgets, Reflecting Higher Ambitions for the New Security Reality,” North Atlantic Treaty Organization, December 14, 2022, https://www.nato.int/cps/en/natohq/news_210091.htm.

24 “Department of Defense Releases the President’s Fiscal Year 2024 Defense Budget,” Department of Defense, press release, March 13, 2023, <https://www.defense.gov/News/Releases/Release/Article/3326875/department-of-defense-releases-the-presidents-fiscal-year-2024-defense-budget>.

25 Seth G. Jones, “Empty Bins in a Wartime Environment,” Center for Strategic and International Studies, January 2023, https://csis-website-prod.s3.amazonaws.com/s3fs-public/2023-01/230119_Jones_Empty_Bins.pdf.

26 “Joint Communication to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions on the Defence Investment Gaps Analysis and Way Forward,” European Commission and High Representative of the Union for Foreign Affairs and Security Policy, May 18, 2022, https://eur-lex.europa.eu/resource.html?uri=cellar:c0a8dcda-d7bf-11ec-a95f-01aa75ed71a1.0001.02/DOC_1&format=PDF.

year period. The NATO military authorities, led by SACEUR, can establish goals based on analytic reviews and wargaming of such matters as rates of fire, expected losses, and required maintenance. Given that NATO nations are currently so substantially lacking in terms of sustainment, it will be important to set priorities with a focus on the most critical requirements. Not everything will be able to be acquired as promptly as would be desirable. Once overall prioritized goals are established, national goals can then be transmitted to individual nations through the Defense Planning Process.

Second, NATO needs to take steps to increase defense industry capabilities. Certain useful actions to that end are already being undertaken, including in the context of supporting Ukraine. Among other efforts, the European Union through the European Defence Agency has agreed on joint funding for expanded ammunition production:

Eighteen states sign[ed]...the European Defence Agency (EDA) project arrangement for the collaborative procurement of ammunition to aid Ukraine and replenish Member States' national stockpiles. The project opens the way for EU Member States and Norway to proceed along two paths: a two-year, fast-track procedure for 155mm [millimeter] artillery rounds and a seven-year project to acquire multiple ammunition types.²⁷

As the seven-year effort to acquire multiple ammunition types suggests, multiyear procurements are crucial for industry to be able to undertake the investments necessary to support NATO's enhanced requirements for sustainment.

The US Congress has similarly authorized multiyear procurements by the Defense Department (DoD), which the DoD has

utilized in establishing its acquisition plans to be funded by the proposed FY2024 budget.

This budget leverages unprecedented use of multi-year procurement (MYP) authorities provided by Congress to deliver critical munitions affordably, while bolstering our inventories and providing a more predictable demand signal to the industry. This strategy will facilitate industrial production efficiencies because the industry would be incentivized to organize in a more cost-effective manner.²⁸

Other nations, such as France and Germany, which are undertaking major defense-spending increases, should likewise utilize multiyear procurements.²⁹

Third, multinational consortiums should be organized to combine spending on key equipment and materiel that the NATO military authorities designate as areas of highest priority. NATO already organizes a number of common efforts, ranging from acquiring high-end capabilities to establishing key logistical efforts, such as multinational ammunition warehousing.³⁰ Future such activities should be undertaken, as much as is practicable, in coordination with the European Union, which, as noted above, has undertaken similar efforts through the European Defence Agency.³¹

C. Engaging the Private Sector During Conflict

In the context of the Russia-Ukraine war, private-sector companies have been instrumental in coordinating with the Ukraine government to provide operational cybersecurity capabilities and help maintain Ukraine's access to the Internet.³² The resultant continuity of operations has occurred despite significant Russian cyber and kinetic attacks.³³

27 "EDA Brings Together 24 Countries for Common Procurement of Ammunition," European Defence Agency, March 20, 2023, <https://eda.europa.eu/news-and-events/news/2023/03/20/eda-brings-together-18-countries-for-common-procurement-of-ammunition>.

28 "Department of Defense Releases the President's Fiscal Year 2024 Defense Budget." MYPs in the FY2024 budget request include: Naval Strike Missile, RIM-174 Standard Missile, Advanced Medium-Range Air-to-Air Missile, Long-Range Anti-Ship Missile, and Joint Air-to-Surface Standoff Missile—Extended Range.

29 Clea Caulcutt, "Macron Proposes Major Boost to French Defense Spending amid Ukraine War," *Politico*, January 20, 2023, <https://www.politico.eu/article/emmanuel-macron-ukraine-war-volodymyr-zelenskyy-major-boost-to-french-defense-spending>; German Defence Minister Pushes for 10 Bln Euro Budget Increase—Spiegel," Reuters, February 10, 2023, <https://www.reuters.com/markets/europe/german-defence-minister-pushes-10-bln-euro-budget-increase-spiegel-2023-02-10>.

30 "Multinational Capability Cooperation," North Atlantic Treaty Organization, February 20, 2023, https://www.nato.int/cps/en/natohq/topics_163289.htm; "Multinational Projects," North Atlantic Treaty Organization, last visited March 28, 2023, https://www.nato.int/nato_static/assets/pdf/pdf_2013_06/20130604_130604-mb-multinational-projects.pdf; "NATO, More Allies Join NATO's Multinational Ammunition Warehousing Initiative," North Atlantic Treaty Organization, November 17, 2022, https://www.nato.int/cps/en/natohq/news_209075.htm.

31 "All Activities," European Defence Agency, last visited March 28, 2023, <https://eda.europa.eu/what-we-do/all-activities>.

32 Irene Sanchez Cozar and Jose Ignacio Torreblanca, "Ukraine One Year on: When Tech Companies Go to War," European Council on Foreign Relations, March 7, 2023, <https://ecfr.eu/article/ukraine-one-year-on-when-tech-companies-go-to-war>.

33 David Cattler and Daniel Black, "The Myth of the Missing Cyberwar," *Foreign Affairs*, April 6, 2022, <https://www.foreignaffairs.com/articles/ukraine/2022-04-06/myth-missing-cyberwar>.

Those operational and coordinated activities by the private sector demonstrate that there is a “sixth domain” in warfare—in addition to the five recognized domains of land, maritime, air, cyber, and space.³⁴ Specifically, the private sector’s “sphere of activities” in wartime is itself a sixth domain, and it needs to be included as part of warfighting constructs, plans, preparations, and actions if NATO and its nations are to prevail in future conflicts.³⁵

NATO needs to take the following actions to establish effective coordination with the private sector.

First, contrary to the expectations of many, cyber defense has proven quite effective for Ukraine in the context of the Russia-Ukraine war. That has largely been true because capable private-sector companies have been engaged with the Ukraine government in effectuating the cyber defense effort.³⁶ NATO needs to ensure that its member nations have likewise organized highly capable cybersecurity support from the private sector for those critical infrastructure necessary for effective military operations—which will generally involve the electric grid, pipelines, air, rail, and ports, as well as the information and communications networks themselves. NATO does not have the regulatory authority to require such actions, but the obligations can be included as part of the Defense Planning Process—and can then be harmonized with European Union and national cybersecurity regulations, including the European Union’s recent network and information security (NIS2) directive which nations are required to comply with by October 2024.³⁷

Second, a focused effort needs to be undertaken with respect to undersea cables. Transatlantic cables are instrumental to connectivity between North America and Europe, and undersea cables also support connectivity between the United Kingdom and Europe, as well as across the Baltic Sea.³⁸ As noted above, “Russia is particularly focused on improving its ability to target critical infrastructure, including underwater cables.” In a conflict, undersea cables would be expected targets, both through cyberattacks and physical attacks, including at onshore cable landing points. Justin Sherman and John Arquilla have each set forth a variety of recommendations to enhance undersea cable resilience.³⁹ At the Vilnius summit, NATO’s Joint Task Force—Norfolk, which has responsibility for maritime operations should be tasked to work with Allied Command Transformation—and key nations including the United States, France, and the United Kingdom that have significant undersea capabilities—to develop the necessary plans to enhance the resilience of undersea cables.

Third, plans for the use of private-sector space assets need to be established. In the Ukraine conflict, the use of Starlink terminals has proved indispensable.⁴⁰ A variety of possible technical arrangements, particularly those focused on low-Earth-orbit satellites, can be utilized to support wartime activities, and NATO planning needs to evaluate and then organize those of important value. This includes both establishing contractual arrangements and, as appropriate, enacting legislation that ensures the availability of the necessary assets. In the United States, the Defense Production Act, which covers the provision of services, may provide the nec-

34 “Multi-Domains Operations Conference—What We Are Learning,” North Atlantic Treaty Organization, April 8, 2022, <https://www.act.nato.int/articles/multi-domains-operations-lessons-learned>.

35 Christine H. Fox and Emelia S. Probasco, “Big Tech Goes to War,” *Foreign Affairs*, October 19, 2022, <https://www.foreignaffairs.com/ukraine/big-tech-goes-war>. The role of the private sector is also discussed in: Emma Schroeder and Sean Dack, *A Parallel Terrain: Public-Private Defense of the Ukrainian Information Environment*, *Atlantic Council*, 2023, <https://www.atlanticcouncil.org/in-depth-research-reports/report/a-parallel-terrain-public-private-defense-of-the-ukrainian-information-environment>.

36 See, e.g.: Schroeder and Dack, *A Parallel Terrain*, 14.

37 DIRECTIVE (EU) 2022/2555 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 14 December 2022 on measures for a high common level of cybersecurity across the Union, <https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32022L2555&qid=1672747885309&from=EN>

38 Stanley Reed, “A Widening Web of Undersea Cables Connects Britain to Green Energy,” *New York Times*, January 4, 2022, <https://www.nytimes.com/2022/01/04/business/britain-electricity-norway-cables.html>; Lukas Trakimavičius, “The Hidden Threat to Baltic Undersea Power Cables,” NATO Energy Security Centre of Excellence, December 2021, <https://www.enseccoe.org/data/public/uploads/2021/12/the-hidden-threat-to-baltic-undersea-power-cables-final.pdf>.

39 Justin Sherman, *Cyber Defense Across the Ocean Floor*, *Atlantic Council*, September 2021, <https://www.atlanticcouncil.org/wp-content/uploads/2021/09/Cyber-defense-across-the-ocean-floor-The-geopolitics-of-submarine-cable-security.pdf>; John Arquilla, “Securing the Undersea Cable Network,” Hoover, 2023, https://www.hoover.org/sites/default/files/research/docs/Arquilla_SecuringUnderseaCable_FINAL_0.pdf.

40 Sam Skove, “How Elon Musk’s Starlink Is Still Helping Ukraine’s Defenders,” *Defense One*, March 2023, <https://www.defenseone.com/technology/2023/03/black-swan-starlinks-unexpected-boon-ukraines-defenders/383514>.

essary legislative framework, but NATO and member nations should undertake a comprehensive review to determine what may be required.⁴¹

Fourth, plans and exercises need to be developed and undertaken with the private sector. While ad hoc arrangements—such as those put in place in Ukraine—can obviously be useful, an organized planning and exercising effort will be far superior.

Fifth, NATO needs to determine what role capabilities such as those provided by US Cyber Command’s “hunt forward” will play in achieving the resilience of critical infrastructure.⁴² The United States through Cyber Command—as well as other nations with significant cyber capabilities such as the United Kingdom, France, and Estonia—need to work with SACEUR to determine how offensive operations should be integrated with defensive actions to achieve the requisite degree of resilience designed to protect key critical infrastructure operated by the private sector.

D. Low-Cost Defense Planning—Unmanned Vehicles and Land Mines

As noted above, NATO military capabilities have suffered from years of underinvestment by nations. While budgets have been increased, resource constraints are still significant. Accordingly, NATO and its nations should look carefully at low-cost capabilities that can substantially enhance deterrence and defense. Unmanned vehicles and land mines both offer promise.

1. Unmanned Vehicles

The use of unmanned vehicles—both air and maritime—in the Russia-Ukraine war has highlighted their value for intelligence, surveillance, and reconnaissance (ISR); for targeting; and for attack.⁴³ Unlike high-end and costly capabilities—exemplified by US unmanned air systems including the Gray Eagle (\$127 million per copy), Reaper (\$28 million per copy), and Global Hawk (\$141 million per copy)—the unmanned vehicles utilized in Ukraine have been less sophisticated and cheaper.⁴⁴ However, as the conduct of the war and the discussion below elaborate, inexpensive unmanned vehicles based on available commercial technology can deliver a high degree of capability for both surveillance and attack.⁴⁵ As is already the case for Ukraine, low-cost unmanned vehicles should become an important element of NATO’s deterrent and defense strategy.

A useful starting point to illustrate the value of low-cost unmanned vehicles based on commercial technology comes from two task forces established by US Central Command.

The Air Force’s Task Force 99 was “established in October at al-Udeid air base in Qatar, [and] aims to test commercially-available small, high-altitude drones linked by [a] mesh network.”⁴⁶

[It] looks for new ways to deploy robotic platforms for intelligence, surveillance and reconnaissance (ISR) and other missions...“not just tracking objects in the air, but... finding things that could be on the ground...and how those could be a threat.”⁴⁷

41 The Defense Production Act in the United States covers the provision of services, and can be used as one basis for ensuring continuity of private-sector satellite support in the event of a conflict. “Defense Production Act (DPA),” US Federal Emergency Management Agency, 2018, https://www.fema.gov/sites/default/files/2020-03/Defense_Production_Act_2018.pdf. DPA Section 101(a) provides: “The President is authorized...(2) to allocate materials, services, and facilities in such manner, upon such conditions, and to such extent as he shall deem necessary or appropriate to promote the national defense.” (Emphasis added.)

42 Suzanne Smalley, “Nakasone Says Cyber Command Did Nine ‘Hunt Forward’ Ops Last Year, Including in Ukraine,” Cyberscoop, May 4, 2022, <https://cyberscoop.com/nakasone-persistent-engagement-hunt-forward-nine-teams-ukraine>.

43 T.X. Hammes, “Game-changers: Implications of the Russo-Ukraine War for the Future of Ground Warfare,” Atlantic Council (April 2023), 7, 9-10, 11- 14, <https://www.atlanticcouncil.org/wp-content/uploads/2023/04/Game-Changers-or-Little-Change-Lessons-for-Land-War-in-Ukraine-.pdf>

44 John R. Hoehn and Paul K. Kerr, “Unmanned Aircraft Systems: Current and Potential Programs,” Congressional Research Service, July 28, 2022, 6, 7, 11, <https://sgp.fas.org/crs/weapons/R47067.pdf>.

45 “Ukraine Is Betting on Drones to Strike Deep into Russia,” Economist, March 20, 2023, <https://www.economist.com/europe/2023/03/20/ukraine-is-betting-on-drones-to-strike-deep-into-russia>.

46 Jared Szuba, “US Top Middle East Commander Tests New Model of Deterring Iran,” Al-Monitor, January 3, 2023, <https://www.al-monitor.com/originals/2022/12/us-top-middle-east-commander-tests-new-model-deterring-iran>.

47 John Harper, “US Central Command’s New Task Force 99 Begins Drone Operations in Middle East,” Defensescoop, February 13, 2023, <https://defensescoop.com/2023/02/13/us-central-commands-new-task-force-99-begins-drone-operations-in-middle-east>.

The unit “recently concluded its first operational experiment, a successful test of using small drones for intelligence, surveillance, and reconnaissance roles.”⁴⁸

Central Command’s Task Force 59 has accomplished similar achievements in the maritime arena.

The Navy stood up TF 59 in September 2021...[in a] turn to the private sector [and]...[w]ithin a month, the new unit had begun deploying unmanned, unarmed, camera-laden sea drones linked by artificial intelligence into the Persian Gulf...

TF 59 has since conducted exercises with Bahrain, Jordan, Kuwait, Qatar, Saudi Arabia and Israel, and has deployed some two dozen drones—among them [private-sector] Sairdrones, MARTAC Mantas T12s, T38 Devil Rays—with the goal that regional navies will contribute 80 such devices by the end of 2023.⁴⁹

As these efforts demonstrate, currently available commercial technologies cannot only provide highly useful ISR, but such activities can be effectively integrated among nations—avoiding many of the issues that often face coordination of activities involving classified systems.

As useful as the ongoing efforts are, the potential for use of unmanned vehicles is much greater, as Thomas Hamilton and David Ochmanek have described.

[An] approach...to employ large numbers of relatively low-cost, attritable—low-cost, reusable, and ultimately expendable—unmanned aerial vehicles (UAVs) to perform a variety of tasks in support of joint force defensive campaigns...[S]uch an approach...could allow land-based forces to generate and sustain airpower without relying on fixed base infrastructure, such as runways and maintenance facilities.⁵⁰

The Hamilton and Ochmanek analysis is built around unmanned aerial vehicles (UAVs) being “employ[ed] in contested zones to create a targeting mesh—a net of UAVs that work together.”⁵¹ Their analysis focused on how such a network could be utilized to stop an attack by the People’s Republic of China (PRC) across the Taiwan Strait, but the approach is equally applicable to an attack by Russia against NATO nations, as the “object of a targeting mesh is to be able to guide a missile on to a specific [target],” which, of course, applies as much to Russian military assets as to those of the PRC.⁵²

While Hamilton and Ochmanek’s conclusions are analytic, ongoing developments such as those with Task Forces 99 and 59 underscore that the capabilities they describe are well within the reach of a commercially based effort. For example, the UAVs for the targeting mesh would have “comparatively simple sensors based on commercial technology,” and “[c]ommunication within the mesh...is provided by millimeter-wave (MMW) radio, a technology already widely used for 5G communications.”⁵³ T.X. Hammes has likewise described the ability of commercial drones to provide “affordable intelligence, surveillance, and reconnaissance (ISR) and attack” including the potential for the commercial sector to “appl[y] advanced manufacturing techniques” that could lead to an “exponential drop in the cost of precision-guidance technologies.”⁵⁴

Undertaking an effort—for example, by a consortium led by the United States and working closely with the commercial sector—to build effective yet inexpensive unmanned vehicles such as for a targeting mesh and precision-strike drones as critical capabilities for NATO should be an agreed outcome of the Vilnius summit.

2. Landmines

NATO needs to evaluate whether landmines would be an important capability to be utilized in the context of a high-intensity conflict with Russia—and also an important element of deterrence.

48 Chris Gordon, “Air Force’s Task Force 99 Conducts First Successful Drone Tests,” *Air & Space Forces Magazine*, February 27, 2023, <https://www.airandspaceforces.com/air-forces-task-force-99-conducts-first-successful-drone-tests>.

49 Jared Szuba, “US Top Middle East Commander Tests New Model of Deterring Iran.”

50 Thomas Hamilton and David A. Ochmanek, “Operating Low-Cost, Reusable Unmanned Aerial Vehicles in Contested Environments,” RAND, 2020, iii, https://www.rand.org/pubs/research_reports/RR4407.html.

51 Ibid.

52 David Hambling, “Low-Tech, Unkillable ‘Mesh’ of Targeting Drones Could Help Destroy a Chinese Fleet Invading Taiwan,” *Forbes*, September 21, 2021, <https://www.forbes.com/sites/davidhambling/2021/09/21/low-tech-targeting-mesh-drones-could-tip-the-odds-against-a-chinese-fleet-invading-taiwan/?sh=2cf199084b45>.

53 Ibid.

54 T.X. Hammes, “Game-changers: Implications of the Russo-Ukraine War for the Future of Ground Warfare,” Atlantic Council (April 2023), 9, 13, 16, <https://www.atlanticcouncil.org/wp-content/uploads/2023/04/Game-Changers-or-Little-Change-Lessons-for-Land-War-in-Ukraine-.pdf>

Landmines have proven valuable as part of the Ukrainian military's combined-arms approach. One example involved a "three-week fight in the town of Vuhledar in southern Ukraine."⁵⁵

[The Ukraine military] had prepared a kill zone farther along a dirt road that the [Russian] tanks were rumbling down...

Anti-tank teams hi[d] in tree lines along the fields... armed with American infrared-guided Javelins and Ukrainian laser-guided Stugna-P missiles...Farther away, artillery batteries were ready. The dirt road had been left free of mines, while the fields all about were seeded with them, so as to entice the Russians to advance while preventing tanks from turning around once the trap was sprung.

The column of tanks becomes most vulnerable...after the shooting starts and drivers panic and try to turn around—by driving onto the mine-laden shoulder of the road. Blown-up vehicles then act as impediments, slowing or stalling the column. At that point, Ukrainian artillery opens fire, blowing up more armor and killing soldiers who clamber out of disabled machines.⁵⁶

Landmines can also have deterrent value. Colonel John B. Barranco has described how Ukraine could use landmines as a "planned border wall" if Russian forces were expelled, either as a "continuous mine barrier along the entire border, or one focused on crucial terrain that channels potential invading forces onto the ground of Ukraine's choosing."⁵⁷

For NATO, there could be substantial deterrent value in a border wall for the Baltic countries and Poland (and Finland now that it is a member) that utilizes mine barriers. South Korea utilizes just such mine barriers as an important element of combined deterrence and defense with the United States on the Korean peninsula.⁵⁸

A decision to utilize landmines as part of NATO deterrence and defense would raise significant geopolitical issues. Currently, all NATO nations other than the United States are parties to the landmine treaty, which bars the use of such mines.

The launcher of such a mine must have direct visual contact with the location upon triggering it, [while]...mines banned by [the treaty] involve explosives set off by the proximity of—or contact with—the target.⁵⁹

Moreover, the United States, because of a policy decision by the Joseph Biden administration, has limited its involvement in landmine use to only Korea.⁶⁰

There is no doubt that indiscriminate use of landmines can be devastating to civilian populations; precisely that problem has arisen in Ukraine as a result of their use by Russia.⁶¹ However, a Russian attack against NATO nations would undoubtedly cause enormous harm to civilians, as Russian attacks on Ukrainian cities have demonstrated—and the placement of landmines at the border might well be a valuable deterrent factor.

The nature of the security environment in Europe has significantly changed since the broad adoption of the landmines treaty. At Vilnius, NATO should generate a review of whether or not—and under what conditions—landmines should become part of its defense.

E. Command and Control

NATO's existing command-and-control arrangements have not been organized for a high-intensity conflict against Russia. At the Vilnius summit, NATO military authorities will present regional plans that include responding to such a contingency. As part of implementing those plans, NATO should revise the command structures at JFC Brunssum and JFC Naples to enhance the Alliance's operational capabilities for high-intensity conflict with Russia; and promote nations' adoption of commercially available technology that can provide for effective multidomain tactical operations.

55 Andrew Kramer, "In an Epic Battle of Tanks, Russia Was Routed, Repeating Earlier Mistakes," *New York Times*, March 1, 2023, <https://www.nytimes.com/2023/03/01/world/europe/ukraine-russia-tanks.html>.

56 Ibid.

57 John B. Barranco, *Safe Distance: Why Ukraine Should Embrace the US Position and Deploy Land Mines Responsibly*, Atlantic Council, May 17, 2022, <https://www.atlanticcouncil.org/blogs/new-atlanticist/safe-distance-why-ukraine-should-embrace-land-mines>.

58 "U.S. Military Reinstates Its Landmine Ban—Except for Korea," Associated Press, June 21, 2022, <https://www.npr.org/2022/06/21/1106367928/us-landmine-ban-trump-korea-ukraine-russia-ottawa-treaty>.

59 Jussi Rosendahl, "Finland Developing Horrifying Jumping Land Mine to Deter Russian or Other Land Invasions," Reuters, March 8, 2018, <https://www.businessinsider.com/finland-develops-horrifying-jumping-land-mine-to-deter-russia-invasions-2018-3>.

60 "U.S. Military Reinstates Its Landmine Ban—Except for Korea."

61 Rich Wordsworth, "Russia Has Turned Eastern Ukraine into a Giant Minefield," *Wired*, December 21, 2022, <https://www.wired.com/story/russian-landmines-ukraine-psychological-warfare>.

1. Revised Command Structures

In the years since Russia's illegal seizure of Crimea, NATO has undertaken a series of initiatives to upgrade its warfighting capabilities, including increasing the size of the NATO Response Force, establishing a NATO Readiness Initiative, and developing Graduated Response Plans.⁶² However, none of those efforts involved the development of a fully articulated war plan for high-intensity conflict including the required command and control. To support the regional plans that will be presented at Vilnius and the force requirements of the New NATO Force Model, NATO military authorities need to review the command-and-control capabilities of the joint-force commands, and determine how operational control below the SACEUR should best be effectuated.

Key issues include the appropriate division of labor among the JFCs; whether there should be a new "Northern Command" as Finland became a NATO member before Vilnius, and Sweden might as well; what should be the relationship between JFC Norfolk and the two European-based commands; and whether the JFCs need internal restructuring or strengthening to accomplish the goals of the new force model.

The principle of unity of command suggests several answers to those issues.

- First, in a conflict with Russia, there will be continuous interactive operations among and between the nations and militaries in and around the Baltic Sea. Maintaining unity of command suggests, therefore, that JFC Brunssum be organized to have responsibility for both sides of the Baltic Sea, as well as its waters. Or, to describe it in another way, JFC Brunssum would have both an eastern and northern focus.
- Second, JFC Naples would have responsibility for wartime activities in and around the Mediterranean Sea, including those on land or in the air from Portugal through Turkey. Moreover, given its maritime and geographical focus, JFC Naples should have responsibility for naval activities in the Black Sea, though Romania, and probably Bulgaria, should fall within JFC Brunssum's land-based area of responsibility (AOR). National forces

moving from JFC Naples' AOR to JFC Brunssum's AOR would transfer to command under JFC Brunssum.

- Third, JFC Norfolk should maintain maritime command in the Atlantic, but forces once on land or in the Baltic or Mediterranean Seas should fall under the command of JFC Brunssum or JFC Naples, respectively.
- Fourth, NATO military authorities should be tasked to recommend any required restructuring and/or strengthening of JFC Brunssum, JFC Naples, and JFC Norfolk. Concomitantly, there should be a review of existing NATO command capabilities below the JFCs. For example, there are currently nine deployable NATO headquarters, but the manpower and financial resources for at least most of those headquarters would be better focused on the requirements for deterring and defending against Russia.⁶³

2. Commercially Based ISR and Targeting for Multidomain Tactical Operations

NATO's Strategic Concept underscores multidomain operations as a centerpiece of high-intensity warfare.

We will individually and collectively deliver the full range of forces, capabilities, plans, resources, assets and infrastructure needed for deterrence and defence, including for high-intensity, multi-domain warfighting...⁶⁴

To accomplish effective multidomain operations, NATO needs "to exponentially improve the quality and speed of shared awareness, decision-making, and action," as a recent report by retired Major General Gordon Davis states.⁶⁵ Nations have understood the need for such improvements, and are accordingly engaged in developing the requisite capabilities including, for example, the effort by the United States focused on Joint All-Domain Command and Control.⁶⁶

NATO and nations could, however, substantially—and promptly—advance capabilities in this arena by the utilization of commercially available technology. The possibilities are exemplified by two systems—GIS Arta and the Delta Situational Awareness System—developed by Ukraine in the context of

62 "Readiness Action Plan," North Atlantic Treaty Organization, September 1, 2022, https://www.nato.int/cps/en/natohq/topics_119353.htm.

63 "Rapidly Deployable Corps," North Atlantic Treaty Organization, June 22, 2022, https://www.nato.int/cps/en/natohq/topics_50088.htm.

64 "Strategic Concept," North Atlantic Treaty Organization, 2022, 6, <https://www.nato.int/strategic-concept>.

65 Gordon B. "Skip" Davis Jr., *The Future of NATO ISR*, *Atlantic Council*, March 2023, 5, 26, <https://www.atlanticcouncil.org/wp-content/uploads/2023/03/The-future-of-NATO-C4ISR-Assessment-and-recommendations-after-Madrid.pdf>.

66 "Summary of the Joint All-Domain Command and Control (JADC2) Strategy," US Department of Defense, March 2022, <https://media.defense.gov/2022/Mar/17/2002958406/-1/-1/1/SUMMARY-OF-THE-JOINT-ALL-DOMAIN-COMMAND-AND-CONTROL-STRATEGY.PDF>.

the Russia-Ukraine war. The systems integrate information from multiple ISR sources, increasing battlespace awareness, and allow for prompt targeting by weapons networked with the ISR information. They are discussed below partly to show their own value but, much more importantly, to demonstrate what is possible using commercially available technology.

The Delta Situational Awareness Systems “provides a comprehensive picture of the current battle space displayed and summarised on a user-friendly digital map by collecting data from sensors and open and secret sources.”⁶⁷ It “integrates real-time intelligence data from multiple sources and provides real-time monitoring of the battlefield for commanders of different levels.”⁶⁸

A key aspect of Delta is that it utilizes available commercial technology to provide the information to users as the “system...is ready to use on laptops, tablets or mobile phones.”⁶⁹

The result is illustrated on an interactive map which locates enemy forces and gives troops on the ground a crucial advantage. The system is, simply put, a real-time command-and-control centre that brings Ukrainian forces cutting-edge capability in the network-centric environment of modern warfare.⁷⁰

GIS Arta is another Ukrainian system, also based on commercial technology, that allows for coordinated targeting.

Forward observers, unmanned aerial systems, or other scout elements can share their observations of an enemy target’s location in real time over an encrypted network. These networks are multiband, and can utilize satellite, internet, and radio protocols across a number of devices readily available to all [Ukrainian] echelons.⁷¹

GIS Arta “allows for immediate verification of a target, and a kill decision can be made in record time at a command team’s

[tactical operations center]” to provide targeting orders to multiple components and systems.

The request for fire goes out to whatever element is the most available. The ubiquity of GIS Arta’s interfaces, being scalable down to an individual smartphone, means that the targeting assignment can be given to everything from the most sophisticated Multiple Rocket Launcher System to the lowest-tech ambush crews on Ukraine’s Territorial Defense Force...Simultaneous fires from multiple vectors can be placed if deemed necessary, providing a joint-strike capability.⁷²

Each of Delta and GIS Arta appears capable of effectuating important aspects of multidomain warfare. They appear to be the kind of systems that would fit as part of a “federated architecture [that] would retain local connectivity through mobile, ad hoc networks composed of nodes sharing data in multiple directions over short ranges.”⁷³ However, the point is not necessarily to acquire those systems—that needs expert evaluation. Rather, at the Vilnius summit, NATO military authorities should be tasked with establishing a consortium to develop and make available such commercially based systems—including, but not limited to, a review of the value of Delta and GIS Arta—for utilization by nations on the high-intensity battlefield.

F. Resources

Acquiring the capabilities necessary for success in high-intensity warfare will require sustained higher levels of spending than NATO nations have undertaken since the end of the Cold War. To accomplish that objective, three initiatives should be agreed upon at the Vilnius summit.

First, NATO should agree that nations should spend at least 2.5 percent of GDP on defense instead of the 2-percent goal previously agreed. The United Kingdom has established such an aspiration, and Estonia has recommended such a requirement

67 Oscar Rosengren, “Network-Centric Warfare in Ukraine: The Delta System,” Grey Dynamics, February 3, 2023, <https://greydynamics.com/network-centric-warfare-in-ukraine-the-delta-system>.

68 “Ukraine to Implement Delta Situation Awareness System in Defense Forces,” EuroMaidan Press, February 4, 2023, <https://euromaidanpress.com/2023/02/04/ukraine-to-implement-delta-situation-awareness-system-in-defense-forces>.

69 Rosengren, “Network-Centric Warfare in Ukraine.”

70 Ibid.

71 Mark Bruno, “‘Uber For Artillery’—What Is Ukraine’s GIS Arta System?” Moloch, August 24, 2022, <https://themoloch.com/conflict/uber-for-artillery-what-is-ukraines-gis-arta-system>.

72 Ibid. While there are some differences in open reporting about the time for execution and the degree of accuracy of GIS Arta, it appears that from the receipt of information to the firing of weapons takes no more than about two minutes, and may take as little as one minute—and that accuracy appears to be within about five-six meters, and perhaps as little as two meters.

73 Chris Dougherty, “Confronting Chaos: A New Concept for Information Advantage,” War on the Rocks, September 9, 2021, <https://warontherocks.com/2021/09/confronting-chaos-a-new-concept-for-information-advantage>.

for all allies.⁷⁴ While only the United States, Poland, and Greece currently meet the 2.5-percent target, a number of nations—including France, Germany, and the United Kingdom, which have larger militaries—have increased, or set plans to increase, budgets.⁷⁵ It will be important for those additional budgetary amounts to be utilized to meet the requirements necessary to achieve the objectives of the New NATO Force Model.

Second, as discussed above, NATO should help develop—and nations should undertake to acquire—lower-cost, but still highly effective, systems based on commercial technologies. Exquisite and more costly systems will certainly continue to have consequential value, but they will be out of the reach of many nations. Those nations, however, can still provide effective capabilities utilizing lower-cost systems built around commercial capabilities. NATO should include the utilization of such lower-cost technologies as a focus of its implementation efforts.

Third, the EU could accomplish a great deal through the creation of a regularized EU security and defense budget focused on mobility, sustainment, and critical-infrastructure resilience. The EU has already taken steps that set a basis for establishing such a budget. It recently added 616 million euros to its spending on military mobility.⁷⁶ Through its European Peace Facility, it has provided 3.6 billion euros in funding for Ukraine, including to support contributions of military materiel by EU member nations.⁷⁷ Moreover, as noted above, it has established a funding mechanism for the acquisition of ammunition by EU members.

While each of these are valuable actions, regularizing such expenditures at significantly higher levels through an EU

security and defense budget is called for, in light of the threat posed by Russia. The need is clear enough.

- “In the context of the original mobility plan, the European Commission proposed a budget of approximately 6.5 billion euros. However, that proposal was reduced to 1.69 billion euros in the enacted budget, far from what would have been necessary prior to Russia’s invasion of Ukraine and even less so now.”⁷⁸ The planned 616 million euros hardly remedy this substantial deficiency.
- In terms of sustainment, in addition to the plans for ammunition, the EU should provide budgetary support for key weapons systems needed for high-intensity conflict, including “anti-armor capabilities and man-portable and medium-range air defenses, unmanned aerial vehicles for both sensing and attack, long-range fires, and precision-guided munitions.”⁷⁹
- The EU recently issued “important directives requiring that nations enhance the resilience of their critical infrastructure...[b]ut implementing the directives will require significant fiscal expenditures.”⁸⁰ The EU is currently developing the Cyber Solidarity Act whose “purpose is to establish a ‘cyber reserve’ made of private trusted providers that would qualify with certification and would support responses to significant cyber-attacks.”⁸¹ If the legislation is enacted, that would establish a “budget that provides complementary fiscal support for following the new directives, rather than leaving those responsibilities solely to nations.”⁸²

74 “Integrated Review Refresh 2023,” 3; “Estonia’s New Coalition Wants NATO Allies to Spend 2.5% GDP on Defense,” EER News, March 10, 2023, <https://news.err.ee/1608911333/estonia-s-new-coalition-wants-nato-allies-to-spend-2-5-gdp-on-defense>.

75 “Defence Spending Pledges by NATO Members Since Russia Invaded Ukraine,” UK Parliament, August 11, 2022, <https://commonslibrary.parliament.uk/defence-spending-pledges-by-nato-members-since-russia-invaded-ukraine>.

76 “EU Transport Infrastructure: Speeding-Up Investment in Military Mobility,” European Commission, December 21, 2022, https://transport.ec.europa.eu/news/eu-transport-infrastructure-speeding-investment-military-mobility-2022-12-21_en.

77 “Ukraine: Council Agrees on Further Military Support under the European Peace Facility,” Council of the European Union, press release, February 2, 2023, <https://www.consilium.europa.eu/en/press/press-releases/2023/02/02/ukraine-council-agrees-on-further-military-support-under-the-european-peace-facility>.

78 Franklin D. Kramer, *Sweden Has a Chance to Transform European Security—Even Before It Officially Joins NATO*, Atlantic Council, January 30, 2023, <https://www.atlanticcouncil.org/blogs/new-atlanticist/sweden-has-a-chance-to-transform-european-security-even-before-it-officially-joins-nato>.

79 Franklin D. Kramer and Barry Pavel, *NATO Priorities: Initial Lessons from the Russia-Ukraine War*, Atlantic Council, June 13, 2022, <https://www.atlanticcouncil.org/in-depth-research-reports/issue-brief/nato-priorities-initial-lessons-from-the-russia-ukraine-war>.

80 Kramer, *Sweden Has a Chance to Transform European Security—Even Before It Officially Joins NATO*.

81 Luca Bertuzzi, What to expect from the EU’s Cyber Solidarity Act, EURACTIV.com (March 7, 2023), <https://www.euractiv.com/section/cybersecurity/news/what-to-expect-from-the-eus-cyber-solidarity-act/>

82 Franklin D. Kramer and Barry Pavel, *NATO Priorities*.

III. CONCLUSION

At the Vilnius summit, NATO should take steps to enhance its deterrence and defense capabilities to meet the challenges presented by the Russian conventional military threat. Key areas include mobility, sustainment, private-sector interaction, unmanned vehicles, artificial intelligence, mines, command and control, and ensuring adequate resources. Undertaking the required actions will reduce the probability of conflict, but ensure that NATO will prevail if conflict does arise.

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