Journal on Baltic Security, 2025; 11(1): 58-87

Research Article

Open Access
https://doi.org/10.57767/jobs_2025_004

Illimar Ploom, Zdzisław Śliwa, and Michelle Haas*

Lessons Identified from Ukraine: The Bid for the Estonian Total Defence Concept

Received: 8 April 2025
Accepted: 8 June 2025

Abstract: This article analyses Estonia's strategic response to Russia's full-scale invasion of Ukraine, emphasising the revival of the total defence concept. The authors argue that it is a shift in Estonia's deterrence posture – from deterrence by punishment to deterrence by denial that has been pushing this revival. Since the 2010s, Estonia transitioned away from a total defence posture towards a comprehensive defence strategy. This deterrence shift results in bringing back total defence. However, it merges the two defence concepts. Reemerging total defence efforts can be seen in the expansion of Estonia's conventional defence capabilities, increased military spending, and investments in long-range precision weapons. This conventional focus has brought along a strong push in matters concerning resilience, such as societal preparedness at large and public education. These latter elements are shared among notions of both comprehensive and total defence.

Keywords: Russian aggression against Ukraine, Estonia, lessons identified, total defence, comprehensive defence

* **Corresponding author:** Illimar Ploom, Dr. e-mail: illimar.ploom@baltdefcol.org, Baltic Defence College. **Authors:** Zdzisław Śliwa, Dr.(*hab*). University of Wroclaw, and Baltic Defence College, and Michelle Haas, Ghent University, Egmont Institute, and Baltic Defence College

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That is a proclivity for an approach that
can be labelled as "appeasement".
With this approach, one unwittingly becomes
an accomplice of imperialist forces in Russia
who believe that they can solve
their country's immense problems
by outward expansion
and by threatening their neighbours.
- H.E. Lennart Meri,
(Office of the President
of the Republic of Estonia, 1994)

Introduction

Historically, Estonia has suffered due to Russian imperial and regional power ambitions, resulting in the country losing its independence for decades in the 20th century. This period was marked by repression and the deportation of thousands of citizens, many of whom never saw Estonia again. Understandably, this historical experience led to a culturally significant notion that 'nothing good can be expected from the east' (Berg, 2020). Therefore, Russian aggression against Ukraine has been under close observation in an effort to understand the evolving nature of Russian warfare practices and expansionist policies. Such lessons learned are progressively implemented to prepare for the unknown. As 'Russia is gearing up for a prolonged confrontation with NATO, which implies bolstering its western border with additional military units over the medium to long term', the threat to Estonian sovereignty could actualise in the coming years (Estonian Foreign Intelligence Service, 2024, p.37). Estonia promotes this interpretation and understanding amongst its allies and partners, especially those in NATO and the European Union. The Estonian leadership recognises that Moscow's imperialistic ambitions are a continuation of its long past, including that of the Soviet

Union (AFP, 2025). It has been prominently presented by Yevgeny Primakov, Prime Minister of Russia from 1998 to 1999, highlighting Russia's 'primacy in the post-Soviet space' (Rumer, 2019, pp.1-9). This is particularly relevant to the Baltic countries as 'Putin still openly believes the Baltic belong back in Russia's sphere of influence' (Adler, 2025).

Russia was, is, and will remain a major security threat to Estonia. This is accentuated by Russia denying recognition of Estonia's land border determined by the Tartu Peace Treaty and objecting to the delimitation of national borders. However, it was in 2007 when the 'Bronze Soldier' debacle brought Estonia-Russia relations to a new low in the post-Soviet era. Kadri Liik estimates that 'it was in those early years that the question of the legal nature of Estonia's statehood emerged as the mother of all arguments between the two countries' (Liik, 2007, p.71). The level of urgency surrounding the Russian threat has risen significantly since the full-scale invasion of Ukraine. A commonly used concept in strategic studies defines threat as the combination of intent and capability, both of which are clearly present when assessing Russia from Estonia's perspective (Singer, 1958, pp. 90-105). A third factor, opportunity, further refines this concept and helps explain the nuances of current threat assessments. According to the Estonian Foreign Intelligence Service's 2025 report, the probability of a direct military attack on Estonia remains 'unlikely' for 2025, primarily due to Russia's ongoing war in Ukraine and the significant resources it demands (Estonian Foreign Intelligence Service, 2024, pp.37-39). However, this assessment is dynamic; as the conflict progresses and Russia adapts its posture, the potential for escalation in the Baltic region could grow in the coming years.

Despite mental preparedness, Russian aggression against Ukraine has significantly altered Estonian preparations to defend their country, reinvigorating the concept of total defence. Russian aggression has compelled the nation to observe the war and the evolution of warfare in order to observe and learn lessons regarding all aspects of life that the war affects. Estonia's revision of its national defence capabilities is nevertheless based on the understanding that not all the 'lessons identified' could be implemented as 'lessons learned'. As Estonia is a small nation, its leadership must carefully

decide what is suitable and what can be financed within limited resources. This article discusses Estonian security aspects and threat perception leading to the revitalisation of the total defence approach and its merge with comprehensive approach. It explores the implications of lessons learned in areas crucial for confronting both overt conventional attacks as well as hybrid attacks against the nation using the instruments of power concept.

Shifts in Threat Perception and Deterrence Posture Bring a Resurgence of a Total Defence Strategy

This section briefly outlines the more abstract logic underlying this article. In short, our argument is that Estonia has made a major shift from deterrence by punishment to deterrence by denial which has led to a revival of the total defence concept in national defence and national security. However, total defence has not brushed aside the previous comprehensive defence concept but rather integrated it. Estonia also utilises a third concept of territorial defence which can be seen as a sub-section of the total defence concept in this case. In short, for Estonia the concentration is back on the conventional military vector, supported by a staunch civilian effort. This increased attention also revitalises the civilian aspect stemming from the comprehensive approach. At its flanks, this new vector also includes vital whole-of-government aspects of comprehensive defence. Likewise, the extension of the voluntary Estonian Defence League as a territorial defence organisation illustrates the centrality of the civilian support for the military.

The question 'Is Narva Next?' gained notoriety in 2014. At the time, it was briefly discussed, but almost unanimously deemed irrelevant largely due to Estonia's NATO membership (Berman, 2014; Goble, 2015). However, following the events of 2022 the possibility of conventional Russian aggression towards Estonia, and by implication other Baltic States, can no longer be entirely dismissed (Herem, 2023). This shift did not occur overnight, but the notion of potential Russian invasion has become increasingly evident among both the Estonian elite and the general population. Moreover, although

perceptions amongst the public have evolved over the years of the war, the percentage of Estonian population considering Russia a significant threat has remained consistently high since 2022 (Stenbock House, 2024). This threat perception, of Russia as a possible territorial threat in the near future, has inevitably impacted Estonia's defence policy. Since Russia's full-scale invasion of Ukraine in 2022, Estonia has significantly accelerated preparations for a Russian attack.

This fundamental change has been reflected in Estonia's general defence objective: deterrence and defence concepts (Ploom and Murumets, 2023). In 2022, then-Chief of Defence General Herem expressed his scepticism about deterrence, a sentiment echoed by then-Prime Minister Kaja Kallas (Turovski, 2022). Citing Estonia's small size and the atrocities in Bucha and Irpin, Kallas argued that Estonia could not withstand to be conquered and occupied for 180 days before NATO troops could intervene (Milne, 2022). Consequently, Estonia was among the first to advocate for deterrence by denial to replace deterrence by punishment within NATO (Vasli, 2022).

This article argues that the above-mentioned shift in deterrence could and should be translated into the vocabulary of total and comprehensive defence. For it is the dynamic of these two concepts that are strongly affected. There exists also in Estonia a concept of territorial defence which, by involving mainly the efforts of a voluntary military organisation of the Estonian Defence League can be considered a subsidiary of total defence. Our main argument is that total defence has gained primary importance over comprehensive defence, yet not pushing it aside, but rather embracing it. Thus, in addition to the concepts of comprehensive and territorial defence, Estonia's national security policy is once again including the concept of total defence (Veebel et al., 2020). Total defence was already exercised during the interwar period and methodically improved since 1991 (Veebel, 2025), membership in the European Union and NATO only bolstering it (Veebel, Ploom, and Sazonov, 2021). Total defence is emphasised in the National Defence Development Plan for 2017-2026, highlighting the requirement to develop capabilities for both initial self-defence, but also the infrastructure for hosting collective defence with reinforcements from allied forces (Ministry of Defence, 2017).

In short, total defence involves both full social and governmental efforts from all levels of national administration, along with the orchestrated utilisation of military and non-military capabilities.

Total defence reflects the need for both, reliable collective and robust independent defence. Only the combination of the two could bring the much-needed shift in deterrence. For Estonia, independently achieving deterrence by denial is unfeasible. As far as collective defence is concerned, if deterrence by punishment meant relying on NATO's delayed reaction, deterrence by denial means the deployment of bigger residing allied forces and their expedient reinforcement. This shift towards a novel collective defence strategy led to new NATO regional plans and commitments, most notably the transition from a concept of forward presence to forward defence (Monaghan et al., 2024). The implementation of these new plans remains somewhat uncertain, as it requires long-term commitments of resources, funding, and political will (Kepe, 2024). While Estonia, alongside other nations with a heightened threat perception, will persist in exerting diplomatic pressure on NATO and its allies to implement these plans, their implementation ultimately lies beyond Estonia's direct control. This raises a critical question: beyond NATO's strategic planning, what lessons can Estonia draw from the war in Ukraine, and how can these be translated into its own national capabilities and defence planning?

The answer lies within robust individual defence. Here the concept of total defence acquires its full meaning as a small nation like Estonia needs to harness both its military as well as its civilian support of the former. Therefore, the biggest immediate change still concerns the individual defence level where it is vital for a nation to be immediately ready for an intensive conflict. The most visible changes in this regard can be perceived in a conventional direction. Both new capabilities (in sufficient capacities) and a new strategic posture can be seen to converge here. A lesson identified from Ukraine informs that responses to Russian aggression should not avoid targeting its territory (Samost, 2024). This is emphasised by the lack of strategic depth in the Baltics.

Estonia cannot allow the war to come into its territory by any significant degree. Vice versa, as a new normal for Estonian military leadership, at the very least, Estonia needs to be ready to threaten deep within Russian borders in order to impact command posts, logistical nods, and ammunition stores (Samost, 2024).

To be able to explain these changes, total defence allows the most inclusive yet flexible framework. On the individual defence level, the civilian effort is at least as vital as the military. This crux between civilian and military is where we see the most visible revival of the total defence concept. Namely, following Ukrainian experience, a rise into a bigger prominence of civilian support, direct and indirect, to the conventional war effort. This is noticeable in the attempt to widen remarkably the personnel base of the Estonian Defence League, a voluntary military organisation (Tooming, 2022). A more united military and community support concept is also critical in terms of building resilience, especially in terms of a wider support ground around conflict areas.

Estonia's former total defence concept signified a situation where the military with the all-out civilian support was ready to push back conventional conflicts, such conflicts being relatively clearly defined phenomena in time and space. However, with the appearance of hybrid risks and conflicts, the comprehensive approach emerged, stressing non-military aspects of defence (Buzan, 1991). The reason is that hybrid conflicts are not as clearly discernible in time and space as conventional conflicts.

To put it in a historical perspective, Estonia saw a move from total defence to comprehensive defence in 2010. While the old total defence concept had prepared the nation for an all-out conventional war centred around the military proper, the comprehensive approach stressed the non-military spheres of government and society, getting ready for a hybrid response (Veebel and Ploom, 2018). Although the comprehensive defence concept saw an important role for the civilian effort, it somewhat downplayed the involvement of civilians in conventional defence.

To bring this to bear within the comprehensive defence terminology, in the Estonian case the whole-of-society aspect lost its centrality to the whole-of-

government aspect. Now, when witnessing the switch to deterrence by denial, the authors put forth that this also brings back aspects central to the total defence concept, particularly the conventional conflict and readiness, as well as the civilian effort to support primarily the conventional military effort. However, this does not mean that comprehensive defence in the sense of the readiness to respond to hybrid actions is pushed aside. Vitally, the whole-of-government aspect is retained and moreover, while losing somewhat in relative terms, can be even seen to gain importance in absolute terms. Namely, the budget allocations for the whole-of-government capabilities have seen a significant increase. Now, areas like cyber, energy, and infrastructure can be considered as part of the renewed effort.

National Defence: Increased Spending and Strategic Choices

The most noticeable shift within the deterrence and defence concept can be witnessed in the change of strategic posture, the acquirements of capabilities to target deep within Russian territory, and the required budgetary changes.

In terms of national defence, this fundamental change in threat perception has necessitated a strong emphasis on building new capabilities, which has led to a significant increase in defence expenditures. Before 2022, Estonia's defence expenditure was consistently over 2% of G.D.P. This has risen to 3.3% in 2025, which means approximately an additional 2.2 billion euros for defence; the national budget is projected to reach 42 billion euro in 2025. An important decision was made to further increase the expenditure to a minimum of 5% of the G.D.P. by 2026; a position reinforced by the Estonian Prime Minister after the 2024 Trump election and the concomitant pressure on European allies (Väino and Turovski, 2025). It is noteworthy that these decisions have been made during a period of significant economic downturn, with Estonia's economy contracting since 2022 (BMI, 2024). Albeit there are signs that the economy may see recovery, this economic context makes the political decision even more remarkable. Especially as, since 2022, successive Estonian government coalitions have made several decisions to allocate additional funds

to the defence sector, particularly to meet the needs for equipment and ammunition. Estonia has also been a leading nation in donating nearly 2.6% of its G.D.P. to Ukraine, maintaining its position as a per capita leader in contributions (Ukraine Support Tracker, 2024). This effort is viewed as part of national defence efforts. In short, defence expenditure has significantly increased since Russia's full-scale invasion of Ukraine, but the war has proven that national defence efforts will not be sufficient for a small nation like Estonia to defend itself. In this sense, Estonia is dependent on the national defence efforts of NATO allies.

However, budget is not everything. A closer look at procurement choices, as well as their diplomatic impact, further illustrates the significant shift in Estonia's threat perception and therefore its national defence efforts. The most illustrative example is the decision to acquire new long-range precision weapons, showing the need to possess capabilities to attack the enemy's deep area and logistics (Hindre, 2025a). Since Spring 2024, this topic has been intensely debated among political and military elites, and even within society. It is driven by NATO requirements and Estonia's decision to shift potential battles from its own territory back into Russia (Hõbemägi, 2024). This effort has primarily focused on building new missile reserves, particularly ATACMS for use with HIMARS launchers. However, this will not be implemented as a straightforward purchase. While the minimum sum of 1.6 billion euros, as declared by both previous and current Chiefs of Defence and the former permanent secretary of the Ministry of Defence, was half of the desired 3.2 billion euros, the new coalition has deemed it feasible to allocate this sum over a five-year period (Lind, 2025). As Defence Minister Pevkur explained, procuring too many missiles at once would mean that Estonia could miss some developments in this field, due to the rapid development of military technologies (Lass, 2024).

Estonia's strategic decision to significantly invest in long-range weapon systems and stockpiles is, in fact, directly linked to a diplomatic shift. The broader transition from deterrence by punishment to deterrence by denial has not only led to an increased defence budget but also prompted changes in Estonia's diplomatic posture and procurement decisions. Such a substantial

investment in long-range weapon systems would have been politically unthinkable before Russia's full-scale invasion of Ukraine. The common political assumption in Estonia is that Ukraine is not only fighting for itself, but by diminishing Russian combat power, it is giving time for the Western nations to rebuild their military capabilities. Estonian security reports recognise that if Ukraine were subordinated to Russia, it would only encourage Moscow to continue aggression. In other words, the element of 'opportunity' in Estonia's assessment of the Russian threat depends on the outcome of the war. In terms of 'intent', it is clear that Moscow sees NATO as a military threat (Office of the President of the Russian Federation, 2021). This chain reaction means supporting Ukraine is key to a deterrence strategy. As a result, Estonia has already donated numerous combat platforms, such as howitzers, military vehicles, Javelin missiles, personal protection equipment, and military field hospitals. The Russian-origin equipment allowed immediate employment in combat, which was very important during the first year of war, limiting the need for any training. Moreover, the education and training of Ukrainian soldiers have been intensified over time at all levels of war.

This significant effort of military support for Ukraine also leads to lessons identified for the Estonian Defence Forces (E.D.F.) to procure combat systems verified in combat. Meeting NATO standards, to enhance interoperability with NATO troops already present in Estonia or planned to be deployed, is always the main goal. However, the war in Ukraine showed that this interoperability of Western material, let alone units, remains a considerable challenge. These lessons highlight the importance of combat readiness, reduced notice to move, and improved mobilisation system. Exercises conducted between the E.D.F. and Defence League (D.L.) presented a significant number of reservists to report to units in a short time. This aspect is under improvement as the number of exercises and reservists continues to grow. Additionally, a number of major international exercises are conducted in an effort to increase the readiness of allies to be able to deploy in the Baltics. A prime example is 'Defender Europe' which attempted to

validate the ability to deploy the US armed forces to Europe; it included the use of Estonian seaports and airfields (Ploom, Sliwa, and Veebel, 2020). This is, however, part of the challenge, as war preparations comprise detailed preparations of defence infrastructure, reliable logistics, heightened ammunition production capabilities, evacuation and medical systems, along with detailed social arrangements.

Investments in the Military Instrument of Power

This section brings out the biggest changes in building Estonian military capabilities as the main vector of its total defence concept. Estonia has learnt that the intensity of the conflict requires significant additional investments into old capabilities in terms of capacity (e.g. ammunition) and in new capabilities (e.g. drones).

A vital component of the total defence concept are national armed forces, operating closely with territorial defence forces, creating a deterrent effect during peacetime and being ready to fight at any cost. Despite the increased defence spending facilitating military capabilities enhancement, as aggression would likely come swiftly, the delivery of these combat platforms is in question as fabrication takes years – not days. Estonia is planning the procurement of the anti-ship missile 'Blue Spear' to integrate those capabilities with the Finnish anti-ship missile M.T.O. 85M (Saab R.B.S. 15) to block the Gulf of Finland. When merged with the Latvian Naval Strike Missile (N.S.M.) and new naval mines, the Russian Baltic Fleet's freedom of manoeuvre will be limited. As proved by lessons identified on the Black Sea, land-based systems merged with naval drones were effective in pushing the Russian navy off the Ukrainian coastline. It inflicted losses like sinking the cruiser 'Moskva' and many other ships, limiting Russia's ability to attack Ukraine with sea-based long-range missiles such as the 'Kalibr'. The Russian Baltic Fleet possesses amphibious capabilities, which should not be underestimated. However, an amphibious assault will be a huge risk for the Russian Navy due to the combined anti-ship capabilities of the allied nations around the Baltic Sea. Moreover, there is joint procurement among Baltic countries, enhancing military cooperation.

Three medium-range air defence IRIS-T batteries are procured jointly with Latvia to integrate airspace security to defend military units and protect critical infrastructure.[1] It is a vital procurement as civilian critical infrastructure like power stations and energy grids are under constant attacks in Ukraine, especially during wintertime, to weaken the national will to fight and impact the resilience of both the military and the people. This is undoubtedly a critical lesson learned from Ukraine for Estonia regarding the risk for critical civilian infrastructure, energy production, airfields, ports, military command centres, and rail system. These elements of critical infrastructure will be targeted in the case of Russian aggression in an effort to impair Estonian military capabilities, deny ally deployment, and degrade societal resilience and will to defend. In 2025, Estonian government initiated the procurement of a long-range missile defence system to counter Russian missile threats (Hindre, 2025b). The 1 billion Euro project considers three possible procurement options: the US-made 'Patriot', Israel's 'David Sling', and the Franco-Italian SAMP/T; all of them with capabilities to engage ballistic missiles. Air defence systems are a critical asset due to the proximity of Russia. This fact is significantly limiting pre-warning and reaction times to counter ballistic missile attacks. The new air surveillance radars will support airspace protection along with the Air Policing mission operating from a modernised Ämari Air Base.

Other aspects enhancing defence capabilities are joint regional military planning, trans-border exercises, and an increased exchange of information. These mentioned advantages are vital as Estonia lacks strategic and even operational depth compared to Ukraine. It is most probable that, during a conflict the whole territory of the Baltic states will be under attack. Therefore, such initiatives as lifting various legal barriers for cross-border movement will facilitate the smooth deployment of other NATO units to Estonia. There are many observations of battlefield evolution in the Russia-Ukraine war. The biggest change is brought by the ubiquity of all kinds of drones, making the battlefield unusually transparent. Once positions have been fortified, it creates

[1] IRIS-T - infrared imaging system tail/thrust vector-controlled air defence system.

a death zone of 10km to 20km wide along the frontline. This makes mechanisation both more vulnerable but also more decisive should there appear a window of opportunity. In this sense, manoeuvrability remains a crucial factor. A positive factor for Estonia is the mechanisation of existing brigades, which is almost completed in the case of the 1st Brigade located at the Tapa base. The 2nd Infantry Brigade is in the process of being upgraded, and armoured combat vehicles will reinforce the unit, enhancing its mobility, firepower, and protection of forces (Tambur, 2023).

One of the elements of enhancing manoeuvrability is the procurement of 230 armoured vehicles from the Turkish companies Nurol Makina and Otokar; in parallel, facilitating cooperation between both nations' defence industries (Tambur, 2023). The technical requirements were based on experiences from Ukraine, along with fast delivery options. The critical importance of mobility and firepower has been recognized. It has issued in the acquisition of HIMARS launchers and missiles. There is also a continuity in supplying K9 self-propelled howitzers and CAESAR.[2] To underpin specific capabilities, the six HIMARS multiple launch rocket systems arrived in Estonia already in April 2025, marking one of the largest arms procurements. This is an important factor as those long-range artillery systems could attack enemy targets located some 300 kilometres away and they are interoperable with NATO and allied systems. As Latvia and Lithuania also plan to use them, this makes cross-border cooperation not only essential, but also valuable. Estonia already included HIMARS in the largest military drill, Exercise Hedgehog 2025, with the participation of 16,000 Estonian and allied troops (Joint Headquarters of the Estonian Defence Forces, 2025). Ukrainian experiences highlight the importance of long-range capabilities to attack enemy rear areas like logistics nodes, lines of communication, and military industry. In general, NATO Article 3 is well perceived and funded by Estonia, showing readiness to fight arm-in-arm with other NATO nations. Nevertheless, the relatively low G.D.P. of a small country limits investment. It is of critical importance as needs are growing in non-combat spheres.

[2] 'CAESAR' is s a French elf-propelled 155 mm howitzer installed on a 6x6 truck chassis.

A fundamental issue is the preparation of the national medical system; the Russian lack of respect for the law of armed conflict and combat tactic of targeting not only military units, but of civilian sites, results in mass casualties. These lessons learned require investment in the public health system, which is already facing problems such as staffing and financial resources. The review of the system is ongoing, including the decision to purchase mobile field hospitals, enhance first aid, and improve rehabilitation and recovery services. The medical support for wounded Ukrainian soldiers provides sour but highly valuable experiences for medical personnel. This is a rather urgent aspect as the Estonian population is small, so every soldier matters. What is more, the working system will need to support allies fighting on Estonian territory.

The war in Ukraine has proved the importance of mission command principles at all levels of war. This is visible by way of addressing the effect of electronic warfare (E.W.) capabilities on battlefield communication. Electromagnetic domain's capabilities (i.e. E.W. systems such as radio jammers and G.P.S. transmission jammers) negatively impact communication on the battlefield. Communication among units will therefore be limited, causing the units to fight independently following courses of action approved by upper echelon. Despite Russian electromagnetic domain capabilities being infamous for their innovation, this remains a problem faced by both Ukrainian and Russian units, allowing both sides to jam communication and to detect and attack headquarters.

Another factor is communication discipline; Russia lost a series of command posts as a result of military members using mobile phones and unencrypted radios. Estonia understands the role of the electromagnetic spectrum, causing investments to protect 'friendly sensing and communications systems while denying access to the electromagnetic spectrum by enemy troops' (Clark, 2022). Headquarters must follow strict regulations related to the communication safety and implementation of active countermeasure assets, jammers, and false stations. As the modern battlefield is transparent in being observed from above by satellites, reconnaissance assets, and drones,

command posts must be more mobile than before. For those posts 'cannot survive against the pace and precision of an adversary who possesses sensor-based technologies, electronic warfare, and unmanned aerial systems or has access to satellite imagery' (Crombe and Nagl, 2023, p.24). The process of organising Estonian division-level headquarters is ongoing in an effort to enhance the interoperability with Allied and friendly forces and contribute to the NATO Force Structure. The challenge is the requirement to invest in division-level combat service and combat service support capabilities; it is very costly to allocate funding, and it will take time to create a fully operational division.

A division headquarters will support the unity of Estonian and NATO defence plans underpinned by joint staff exercises to clarify the chain of command and to develop staff officers' skills. An issue is the growing demand for officers educated at the operational level; most Estonian senior officers are educated at the Baltic Defence College. There is also a need to create, separately or with other Baltic countries, a course to teach at a high tactical level (i.e. division, corps); this discussion is ongoing. Regional cooperation is essential as the Baltics are seen as a joint operations area, requesting coordination of operations across borders. Concerning Estonia, lessons identified recommend destroying the Russian chain of command, and therefore the protection of Estonian and NATO system must be protected.

The war in Ukraine is a moment of marked evolution in drone warfare, which caused significant casualties among Russian manpower and significant annihilation of equipment, including long-range strikes. Drones 'combine intelligence, surveillance and reconnaissance (I.S.R.), communication nodes, and data transfer capabilities, as well as strike functionality' (Goldstein and Waechter, 2023). The long-range assets allow attacking military installations and destroying valuable assets such as aircraft and helicopters within Russian territory. The annihilation of Russian strategic bombers located more than 4,000 kilometres from Ukraine is evidence of drone capabilities, along with the skills of Ukrainian special forces. Due to the success of implementing drone capabilities, parallel drone countering systems are in development. Among them, countermeasures provided by the West have allowed denying

numerous Russian drone attacks via G.P.S. jamming and other electronic disruption measures. Ukrainian-created Unmanned Systems Forces is a separate branch of the Armed Forces and units composed of drone operators proved to be highly effective.

The Estonian decision to procure advanced long-range loitering munitions from Israel Aerospace Industries reflects the implementation of lessons identified and understanding of the reality of the changing battlefield (Hankewitz, 2023). The choice between technologies such as F.P.V. drones or loitering munitions is not an easy one. For Estonia, it is a matter of the availability of potential pilots, of a weapon system's effectiveness and efficiency, of maturity of technology, and several more aspects. Loitering munitions, though more expensive, require fewer pilots and are more effective, thus, all in all, their agglomerated efficiency is comparable to F.P.V. drones. The process of preparing for drone warfare has been supplemented by the creation of drone operators' units, even at a platoon level in both E.D.F. and E.D.L., where curiously the latter has been given a considerably bigger role. The decision to give the main responsibility to the voluntary E.D.L. can also be interpreted from the innovation perspective. Whereas E.D.F. is tied to slow bureaucratic processes, the E.D.L. is not and can thus be more flexible in experimenting and making procurement choices. The Estonian Defence Industry Cluster Initiative in February 2025 introduced the 'Baltic Drone Wall' concept as an example of efficient use of the technology. It will reinforce the Estonian and NATO border surveillance during peacetime and could create a range of experts and fighting capabilities in the event of war. From a more distant vantage point, the role of drones in conflicts requires continuous attention from tactical and operational levels up to the strategic level. There is also a psychological effect which the contemporary battlefield, saturated with drones, creates. In the years to come, air, land, and sea-based drones as well as drone swarms will be more sophisticated. It could be an advantage for the Estonian digitalised society as traditional combat methods are unlikely to be

enough to stop Russia's standard method of mass mobilisation of combatants, weapons, and ammunition in the event of aggression.

Infrastructure plays a crucial role, especially during the mobilisation of allied troops to Estonia as they must cross the Suwalki Corridor and two other NATO members. This distance could be complicated during a crisis and much more so during the war as airports, roads, railways, and seaports would be within range of Russian artillery and long-range systems. When integrated with 'Via Carpathia' and 'Trans-European Transport Network', in the event of war, the volume of military and civilian traffic can drastically increase. The projects, 'Rail Baltica' and 'Via Baltica', are vital and must be coordinated with military experts to meet civilian and military needs. As mentioned, Estonia promotes the European Union Permanent Structured Cooperation or PESCO's 'Military Mobility' and 'Military Schengen Zone', this is a way in which the E.U. initiatives in 'logistics deterrence' could contribute to the defence of 'every inch' of NATO territory. Another factor is Estonia's obligation, as a NATO Host Nation, to invest in infrastructure to create conditions to accommodate an extended number of troops and equipment. Also, to offer quality training grounds. The United Kingdom is considering the deployment of an enhanced Forward Land Forces (F.L.F.) brigade from 2025 to the Tapa garrison. The enhancement of the military training area in Nursipalu will support the growing requirements for military exercises.

Another lesson from the war in Ukraine proves that ammunition must be amassed ahead of conflict, as supplies procurement during a war are slow and at a delay. The lesson is that artillery still plays a significant role, but to be effective, an extensive number of shells are needed. As a result, approximately one quarter of Estonia's defence budget is dedicated to building up ammunition supplies. However, Estonia still needs investment into ammunition storage and reliable distribution systems as logistics is, and will be, a decisive factor, as proved in Ukraine.

Both sides in the ongoing war have been actively constructing defensive fortifications, including lines of bunkers, obstacles, and minefields. These fortifications aim to impede potential adversary advances and strengthen defensive capabilities. This lesson can be seen as not only identified but learnt

by Estonia. Recognising the importance of terrain, reinforced with military infrastructure, 600 squad-level bunkers are planned along the border with Russia to delay the enemy's advance, and thereby facilitating mobilisation and deployment of Estonia's armed forces. Bunkers will be reinforced to withstand direct fire and be camouflaged as civilian structures. These bunker structures are tested to ensure the desired protection level. This concept is valid for all nations bordering Russia; similar preparations are implemented by Ukraine on the front line and along the border with Belarus to deter an attack from the north. The Baltic defence zone, along with similar bunkers in Latvia and Lithuania, will contribute to deterrence and defence at borders, limiting enemy offensive tempo. All initiatives concerning fortifications can be seen as an expression of the 2022 'NATO Strategic Concept', emphasising Deterrence and Defence 'to defend every inch of Allied territory' (NATO, 2022, p. 6). To note on a heavily debated fortification method, Estonia entered the 1997 Ottawa Convention in 2004. In June 2025 Riigikogu adopted the law to withdraw from the anti-personnel mines convention. In Ukraine, Russia developed the so-called 'Surovikin line' reinforced by intense minefields, which slowed the Ukrainian counter-offensive. Similarly, Ukraine is using mines in defensive operations. A discussion about reintroducing anti-personnel mines has been initiated in Estonia, although the topic is fraught, and has stalled for now. However, leaving the Ottawa Convention allows for Estonia to implement the lesson learnt from Ukraine as an option in the event of Russian aggression.

Building Multidimensional National Resilience as Part of Total Defence

There are multiple diverse initiatives in Estonia which could be subsumed under the banner of resilience. The war in Ukraine demonstrates the need to build a resilient society, for both national survival and as part of the total defence strategy. Some initiatives target civil preparedness to the effects of

bombardments of infrastructure; other initiatives aim to mitigate Russian propaganda stemming from media channels and the Orthodox Church.

Russian attacks on Ukrainian citizens and civilian infrastructure highlighted the need to prepare the Estonian population for crises which would be similar in the event of Russian invasion. The government developed an educational emergency preparedness booklet, *Code of Conduct for Crisis Situations*, a complex document covering a variety of crises (Ministry of the Interior and the Government of Estonia, 2018). An additional method of societal preparedness was the decision was to present Ukraine's fight on television. Military experts as well as E.D.F. and E.D.L. officers have been presenting the situation to the public to enhance situational awareness. The war in Ukraine proved its population's relative readiness to face hybrid attacks.

A challenge for Estonia is that it is a small country with a population consisting of some 1.3 million citizens, including approximately 285,819 Russians (or 20.9% of the population at large) (Statistics Estonia, 2025). Steps were taken to better integrate this large Russian minority population with Estonia and to limit Russian propaganda and information operations. Some of these steps included closing Russian media platforms, limiting Russian-language education, expulsion of pro-Russian persons and agents of influence, denying permits for firearm ownership, and removing monuments related to Russian occupation.

For Ukraine, control of social media platforms, TV, and radio by Ukrainian authorities is an important factor as 'media resilience' is a key tool in the development of population resilience. For the digitalised Estonian society, this aspect is also of crucial importance. Albeit there is a dilemma in balancing a free media space and state minimisation of propaganda requiring a switch to some level of state-controlled media.

Another operations security (OPSEC) factor is denying Russian services the opportunity to gather data. Espionage is a challenge in Ukraine. In an effort to learn from the Ukrainian challenges, Estonian services are observing potential persons who could work for, or on behalf of, Russia. Recently, after initial warnings, the head of the Estonian Orthodox Church of the Moscow

Patriarchate was refused the extension of his residence permit on the basis of supporting Russian aggression. The lesson from Ukraine shows that the negative impact of the Moscow Patriarchate on society matters.

One of the lessons learned from Ukraine is to promote security matters and to emphasise defence-related education to underpin mental resilience against Russian information operations. As an outcome, the support for E.D.F. and NATO presence in Estonia has significantly increased. Such an approach supports enhancing the number of trained reserves and ranks of the E.D.F. and E.D.L. As the Ukrainian Territorial Defence Forces proved successful in combatting Russian aggression, the Estonian government has enhanced defence preparations of society. As a NATO member, Estonia will not fight alone, but geography could isolate Estonia for some time if attacked abruptly. Despite the efficacy of the NATO warning system, Russia will likely attempt a surprise attack. Consequently, the lesson from the war in Ukraine is that every citizen matters. Civilian help is predominantly linked with military service, but support of law enforcement agencies such as police or civil defence units as well as fire departments and medical services is also critical. Equally essential is the willingness to stay and fight for the country. One of the promotional projects is the initiation 'Reservists' Week in 2024 'to recognise and raise public awareness of the importance of reservists' (Ministry of Defence, 2024). The week included military exhibitions and other social events. There are some 90,000 trained reserve troops in Estonia and maintaining their motivation, training, and readiness is of great importance as the shortage of soldiers has been a critical issue for Ukraine. Recognising that Russia consistently targets the civilian population in Ukraine, the Estonian Rescue Board revised and marked shelters in an effort to increase options for civilian protection in the case of aggression. Additionally, to increase warning systems, Estonia purchased civil defence sirens to install in selected locations. The Russian aggression, brutal treatment of civilians, and attacks on critical infrastructure were an impetus to invest in civil defence, a lesson taken seriously.

Supporting Total Defence: Comprehensive Defence Retains its Importance

Another cause for concern is that Ukraine has been under increasing Russian hybrid attacks since at least 2014; and there are already examples of similar incidents in Estonia, such as damaging the Balticconnector natural gas pipeline in the Gulf of Finland or the Estonian-Finnish undersea power cable Estlink 2. These peacetime incidents cause for warning. Although Estonia, Latvia, and Lithuania unplugged from the Russian-controlled BRELL electricity grid to merge with the European continental power grid, the hybrid attacks danger remains. If critical energy infrastructure is attacked it could cause a shortage of energy, gas, and electricity supplies during the war. An attack on critical energy infrastructure is a challenge even in peacetime due to the growing applicability of cyber-attacks. Energy independence is both a political and security issue. Based on the Russian strategy to 'freeze' and blackout Ukraine, Estonia has made significant steps to end the dependence on Russian supplies. Estonia's connection with European gas and electric grids makes it vulnerable to enemy direct attack or sabotage. Alternative solutions are in place, including Nordic suppliers, but the 'accidental' Estlink 2 shutdown proves that Russia could impact supplies even during peace or crisis. There is a strong investment in solar and wind renewable energy sources, along with creating oil shale strategic production capacity, plus nationwide campaigns to reduce energy consumption. Among other sectors, the importance lies in the utilisation of L.N.G. supplies via Klaipeda and Inkoo L.N.G. shipping terminals. There is an ongoing discussion about a small modular nuclear reactor as a source of energy; as for now, a working group has identified suitable locations and a storage site for spent nuclear fuel (see Lepmets 2023, pp. 11-13). However, the war in Ukraine demonstrates that Russia could engage all major energy-related facilities. Therefore, in addition to capacity, another aspect is energy-related facilities protection against air attacks and sabotage. It could cause a strategic dilemma to be forced to decide between protecting military sites and units or protecting critical energy infrastructure. Even now, Russian hybrid attacks disrupt G.P.S. signal and mobile communication in Eastern Europe,

impacting sectors such as air traffic in Estonia as has been the case several times with Tartu airport.

Estonia has been under constant and continuous cyberattacks for many years. Compared to 2022 (2672 incidents), the number of cyber incidents increased in 2023 by 22% (3314 Incidents), comprising phishing, fraud, targeting social services, user credentials, and banking Information Systems Authority, 2024, p. 12). The Estonian government has recognised the importance of educating users to enhance cyber resilience of Estonian society along with 5G, supply chain, and cloud services security.[3] The amended 'Cybersecurity Act' has been one of the major legal frameworks to prevent and resolve cyber incidents (Ministry of Justice, 2022). Investment in the NATO Cooperative Cyber Defence Centre of Excellence is a respected Estonian contribution to the Alliance, especially expressed by the 'Locked Shields' exercise series, facilitating a collective response to the Russian cyber threat. Ukrainian experiences and the presence of Ukrainian experts make those exercises more realistic. To assist Ukraine, the 'Tallinn Mechanism', established in December 2023, not only serves as aid but also as lessons parallel platform as the sources of threats are Russia-sponsored institutions and hackers (Information Systems Authority, 2024, p. 16). The new information security standard will force agencies and companies to conduct audits of security systems every three years, enhancing network resilience. Both energy security and cyber domains could affect society, leading to unpleasant political decisions at local and government levels, not excluding E.U. institutions as of e-voting. Russia is practising such destructive attacks to diminish the population's trust in the government and armed forces' capabilities and to reduce the will to defend.

A lesson from Ukraine presents the importance of domestic production capacity of defence-related or dual-use technologies. This is specifically important for Estonia due to its geographic location and possible isolation.

[3] For example, only Estonian operators Elisa Eesti, Tele2 Eesti, and Telia Eesti were competitors in introducing 5G technology, with an option to cooperate with Finnish Nokia or Swedish Ericsson.

Therefore, the Estonian Defence and Aerospace Industry Association cooperating with the Estonian Centre for Defence Investments has established a Defence Estonia Cluster in 2024 merging 21 members to promote innovation in the defence and security industry. It aims to utilise the domestic defence industry potential supported by creating a defence industry fund worth 50 million Euros, to increase if successful (Government Communication Unit, 2024). One of the key projects, based on critical shortages of ammunition by the Ukrainian Defence Forces, is the establishment of a complex for 'local production of small, medium, and large calibres of ammunition' and explosives (Rojoef, 2024). Location in Estonia will shorten the supply chain and could be an export opportunity because of shortages of ammunition by the Allies. Legally the Weapons Act and the Explosives Act will create a competitive environment by reducing bureaucracy and will enable foreign direct investments (ERR News, 2024a). The latter is rather important because of relatively limited military-related spending. Finally, it is important to underline that Estonian robotics and autonomous systems developer Milrem Robotics and the Ukrainian Defence Industry have started cooperation and exchange of experiences based on real lessons from the battlefield. Those lessons will be implemented in the national projects.

Conclusion

Estonia's strategic recalibration in response to Russia's full-scale invasion of Ukraine marks a decisive evolution in its national defence posture. The lessons identified from Ukraine's battlefield experiences have catalysed a comprehensive transformation of Estonia's security architecture, rooted in the revival of the Total Defence concept. This approach, which integrates military, civil, economic, and psychological resilience, reflects Estonia's recognition that modern threats are multidimensional and require a whole-of-society response.

A central theme in this transformation is the shift from deterrence by punishment to deterrence by denial. Estonia's leadership has acknowledged that the traditional assumption of delayed NATO intervention is no longer tenable. Instead, the focus has turned to ensuring that Estonia can resist and

repel aggression from the outset. This has led to significant investments in long-range precision strike capabilities, air and missile defence systems, and the mechanisation of ground forces. The procurement of HIMARS, Blue Spear anti-ship missiles, and loitering munitions demonstrates Estonia's intent to hold adversaries at risk before they can establish a foothold.

Beyond kinetic capabilities, Estonia has prioritised resilience in the electromagnetic, cyber, and information domains. The integration of electronic warfare countermeasures, cyber defence initiatives, and public education campaigns reflects a nuanced understanding of hybrid threats. The establishment of drone units and the Baltic Drone Wall initiative further illustrate Estonia's commitment to innovation and adaptation in the face of evolving warfare.

Crucially, Estonia's approach is not limited to military preparedness. The reinforcement of civil defence infrastructure, energy independence, and societal cohesion underscores the holistic nature of Total Defence. Initiatives such as the Reservists' Week, the revision of shelter networks, and the promotion of national identity among Russian-speaking citizens aim to foster a resilient and unified population capable of withstanding both physical and psychological pressures.

Estonia's strategic outlook is also shaped by regional dynamics. The accession of Finland and Sweden to NATO has enhanced the Baltic region's strategic depth, enabling more effective joint defence planning and logistics. Estonia's advocacy for forward defence within NATO, and its alignment with Article 3 obligations, signal its proactive role in shaping the Alliance's eastern posture.

Ultimately, Estonia's experience offers a compelling model for small states navigating systemic threats. By internalising the lessons of Ukraine and translating them into actionable reforms, Estonia has demonstrated that deterrence is not solely a function of size or firepower, but of readiness, resolve, and integration. The Total Defence concept, revitalised and adapted to contemporary realities, positions Estonia not only as a resilient frontline

state but also as a contributor to broader Euro-Atlantic security. As the geopolitical environment remains volatile, Estonia's strategic foresight and commitment to national resilience will be critical in deterring aggression and preserving sovereignty.

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