



U.S. Arms Transfers to Ukraine

Impact Assessment

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ABOUT THE PROJECT

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Executive Summary

- U.S. deliveries of *HIMARS* were decisive for summer offensives (especially the training), despite their reduced range.
- Advanced weaponry was a popular signal, but older systems proved just as valuable, while the diversity of NATO-supplied systems is increasingly problematic.
- WWII weaponry is losing significance, while modern technology (ranging from drones to long-range artillery) is overcoming Russia's historical manpower advantage.
- Maintenance and spare parts remain the biggest challenge, both logistically (outside Ukraine) and training Ukrainians to do it.
- Gradual vertical U.S. escalation by supplying more and more sophisticated weaponry has been successful so far in avoiding a major Russian lashing out (e.g., the feared nuclear response and/or direct attacks against NATO member states).
- No arms diversions have been detected yet, but concerns are mounting about the post-/frozen-conflict spread of weapons (especially small arms).
- U.S. public support for providing weapons to Ukraine is gradually falling and is increasingly conditional on parallel diplomatic efforts.
- Most experts consider training and intelligence to be more significant than weapons' deliveries – these aspects of U.S. military assistance are discussed in two forthcoming reports for this project.

Introduction

Arms transfers to Ukraine are perhaps the most extensively covered form of military assistance. There has been no shortage of sources¹ offering quality documentation of the types of equipment being transferred by various countries — with the United States leading the list early, and still by a large margin. Historically, arms transfers have also been the most usual form of aiding a proxy in conflict, with literature concerning proxy use² mainly focusing on the anticipated and unintended consequences of this type of assistance.

The focus and contribution of this study is tracing the key U.S. arms transfers through different phases of the war in Ukraine and comparing their anticipated and perceived impact. While touching briefly on U.S. assistance to Ukraine after Russia's 2014 incursion into Crimea, its primary focus is on trends in assistance since Russia launched a conventional war against Ukraine in February 2022. The study traces U.S. arms assistance through five temporal phases of the war (plus pre-invasion): (1) initial battles countering Russia's invasion over February and March; (2) Ukraine's sustained resistance and the arrival of more Western aid over March and April; (3) the summer of attrition; (4) the Ukrainian counteroffensive beginning in August; and (5) Russia's escalation since October.

This temporal tracing of arms transfers is followed by a discussion of public perceptions of Western aid to Ukraine and concerns about weapons diversion.

This study focuses on U.S. arms transfers, but it is important to recognize the significance of the concerted effort that includes other types of U.S. military and non-military assistance, as well as assistance provided by other NATO and global allies, and Ukraine's own technical capabilities and ingenuity.

The study is based on public sources, opinion polls, and elicitations from American, Polish, and Lithuanian experts. The ten experts interviewed specifically for this effort included high level officials, who have recently left the intelligence and military service, some of whom had first-hand experience in Ukraine in 2022, as well as diplomats, and heads of prominent security-focused think-tanks. In addition, in analyzing the different phases of the 2022 war, where available, the corresponding Russian narratives, reactions, and maneuvers are also identified, providing situational snapshots from multiple vantage points.

¹ See, e.g., *Forum on Arms Trade*, <https://www.forumarmstrade.org/ukrainearms.html>; Gedeon, J. (March 22, 2022). *The weapons and military aid the world is giving Ukraine*. Politico. <https://www.politico.com/news/2022/03/22/ukraine-weapons-military-aid-00019104>; Antezza, A., Frank, A., Frank, P., Franz, L., Kharitonov, I., Kumar, B., Rebinskaya, E., and Trebesch, C. (Aug 2022). *Ukraine Support Tracker*. Kiel Working Paper No.2218. https://www.ifw-kiel.de/fileadmin/Dateiverwaltung/IfW-Publications/-ifw/Kiel_Working_Paper/2022/KWP_2218_Which_countries_help_Ukraine_and_how_/KWP_2218_Version5.pdf

² See, e.g., Mumford, A. (2013). *Proxy Warfare*. Polity; Ladwig, W. C. (2017). *The Forgotten Front: Patron-Client Relationships in Counterinsurgency*. Cambridge University Press; Rondeaux, C. and Serman, D. (Feb 20, 2019). *Twenty-First Century Proxy Warfare: Confronting Strategic Innovation in a Multipolar World*. New America. <https://www.newamerica.org/international-security/reports/twenty-first-century-proxy-warfare-confronting-strategic-innovation-multipolar-world/>

This paper is part of the broader research effort to assess several tools short of war that the U.S. has used to help Ukraine – other papers forthcoming in this series analyze the impact of Western training, intelligence sharing, and the use of U.S. naval assets in this conflict over the course of 2022. This effort bridges the coverage gap between classified tactical-level military briefs and media commentary, drawing on top-level regional expertise. These practical reflections offer a systematic integrated perspective and capture timely perspectives to be built upon as more insights become available over time.

Assistance Since 2014

While the United States had established and maintained military ties and joint training programs with Ukraine since the 1990s, following Russia's incursion into Crimea in 2014, Ukraine had consistently requested assistance in the form of advanced weapons systems. However, the U.S. attitude has been shifting with successive administrations, as well as with the escalation of the conflict from gray zone to conventional warfare. President Obama's approach has been to provide training instead of any lethal aid (seemingly to the dismay of Ukrainians), while under Trump's presidency, Ukraine received *Javelin* anti-tank missiles in 2018, as well as *Stinger* MANPAD systems in 2019.³ The Biden administration has been increasingly forthcoming with arms transfers, as will be detailed in this study, although concerns about Russia's escalatory responses to the types of aid provided have always been at the forefront. Notably, it appears that Ukraine may have prioritized the political signals that receiving the newest weapons' systems from various NATO allies sends – looking to boost the information campaign with these practical expressions commitment and level of support. However, this emphasis may have led to underappreciation of the operational implications, applications, and especially the scalability and maintenance aspects of the mix of systems that it gradually ended up with.

2022 Trends

Various analysts have separated the war of 2022 into three to five different phases, based on their perceived shifts to the extent of Russia's territorial conquest ambitions,⁴ and changes in tactical dynamics on both sides.⁵ For the purpose of the broader research effort that this paper is a part of, we have identified five phases in the 2022 war effort, starting the discussion with an antecedent phase to the war

³ Yaffa, J. (Oct 17, 2022). *Inside the U.S. Effort to Arm Ukraine*. New Yorker. <https://www.newyorker.com/magazine/2022/10/24/inside-the-us-effort-to-arm-ukraine>.

⁴ Kofman, M. and Evans, R. (Dec 9, 2022). *Winter and Beyond: An Inflection Point in the War Over Ukraine*. War on the Rocks. <https://warontherocks.com/2022/12/winter-and-beyond-an-inflection-point-in-the-war-over-ukraine/>; Freedman, L. (July/Aug 2022). *Why War Fails: Russia's Invasion of Ukraine and the Limits of Military Power*. Foreign Affairs; Psaropoulos, J. (Aug 24, 2022). *Timeline: Six months of Russia's war in Ukraine*. Al-Jazeera. <https://www.aljazeera.com/news/2022/8/24/timeline-six-months-of-russias-war-in-ukraine>; Bloomberg. *A Visual Guide to the Russian Invasion of Ukraine*. <https://www.bloomberg.com/graphics/2022-ukraine-russia-us-nato-conflict/?leadSource=verify%20wall>.

⁵ (Nov 3, 2022). *Jacek Bartosiak, John R. Deni (US Army War College) on the observation from the battlefield in Ukraine*. <https://www.youtube.com/watch?v=BmnwMjlUEzQ>; Yaffa, J. (Oct 17, 2022). *Inside the U.S. Effort to Arm Ukraine*. New Yorker. <https://www.newyorker.com/magazine/2022/10/24/inside-the-us-effort-to-arm-ukraine>.

(and U.S. assistance in Ukraine's preparations for it) as running from January 1 to February 23. The first phase (February-March) covers the initial scramble to counter the Russian invasion, with relatively limited foreign assistance available. The second phase (April-May) shows a serious boost in military assistance, inspired largely by the unexpected Ukrainian resilience and ingenuity.⁶ The third phase (June-July) is termed variously a stalemate, incremental advances, or attrition, and reflects a period of relatively little territory changing hands – the big signifier of the start of this phase is the arrival of *HIMARS* systems into the battlefield, while the end is ambiguous. The start of the fourth phase, identified by different sources at different dates in August (and by some in September), is marked by a major Ukrainian counter-offensive campaign that changed the stalemate dynamic and succeeded in giving Ukraine the battlefield advantage. We mark the start of the fifth phase with Ukraine's bombing of the Kerch bridge: while it was part of the speeding counter-offensive, Russia responded to this particular move by launching a massive bombing campaign against civilian infrastructure.

Phase 0: January 1 to February 23 — Antecedent

In early 2022, U.S. intelligence was increasingly confident about Russia's impending plans to launch a conventional war in Ukraine, while Ukraine's capacity to resist was assessed as minimal. In contrast, most experts interviewed for this effort, among others,⁷ recalled Ukraine's highly optimistic self-assessments of the ability to counter Russian maneuvers (partially due to them being anticipated under the threshold of a conventional invasion). Overall, there was considerable initial reluctance to respond to Ukraine's increasingly pressing requests for arms transfers, partially due to the fears that such transfers might hasten Russia's attack and partially fearing that they would soon fall into Russia's hands.⁸

Interestingly, Russian media narratives at the time were regularly hinting that Ukraine was about to convince the West to engage in nuclear arms transfers to Ukrainian territory,⁹ and nuclear fear mongering seems to have gradually escalated throughout the campaign.

Phase 1: February 24 to March 30 — Full Invasion

The arms transfers during the first stage of the war are perhaps best documented, and their impact most extensively analyzed¹⁰ — given the natural availability of temporal perspective and increasingly good-quality data. However, ongoing intelligence sharing¹¹ and previous Western arms transfers and training

⁶ Some analysts merge these two phases into one; among those that do not, one of the central shifts is Russia's refocusing of war goals away from conquering the entire Ukraine in late March.

⁷ Weiss, M. (April 19, 2022). *The Lessons of Ukraine So Far*. Deep State Radio. <https://thedsrnetwork.com/lessons-of-ukraine/>.

⁸ See, e.g., Lawrence Freedman, L. (July/Aug 2022). *Why War Fails: Russia's Invasion of Ukraine and the Limits of Military Power*. Foreign Affairs. <https://www.foreignaffairs.com/articles/russian-federation/2022-06-14/ukraine-war-russia-why-fails>.

⁹ For summary, see *Russian Media Analysis* (Feb 25, 2022). Center for Naval Analyses.

<https://www.cna.org/Newsletters/Russian%20Media%20Analysis/Russian-Media-Analysis-Report-Issue-10.pdf>.

¹⁰ The key ones are summarized in Table 1, p.13.

¹¹ The intelligence sharing and training aspects of U.S. military assistance are discussed in great detail in two separate interim reports for this ATAC project (forthcoming in 2023).

provided since 2014 have arguably played a more significant role in these early successes – international military assistance was still in the process of getting mobilized.

The initial narratives focused on Ukraine achieving tremendous efficacy using very limited and somewhat basic weaponry. For instance, the abovementioned transfers of *Javelin* and *Stinger* systems, ongoing since 2018, became one of the early game-changers, especially as their availability gradually increased.¹² They were seen as playing a crucial role in Ukraine’s countering of Russian frontline tanks advancing during this stage.¹³ Furthermore, Ukraine’s effective use of Western MANPAD systems, including *Stinger*, was key to ensuring the protection of the frontline airspace from Russian helicopters — those raids had ceased by April due to high casualty rates.¹⁴ The *Javelins* were also assessed as highly effective in this respect — albeit their scarcity was forcing the defenders to prioritize, largely directing the *Javelins* against Russian tanks.¹⁵

Outside experts and observers assessed that Ukrainian stocks of armaments would only last a couple of weeks. Nevertheless, several experts interviewed for this effort, who were directly familiar with the battlefield situation, have shared that Ukraine was able to sustain its defenses almost entirely from the stocks it had for the first two months. The initial international assistance efforts largely focused on globally sourcing and transferring the older model 152mm ammunition — compatible with the artillery Ukrainian armed forces were using at the time.

NATO’s standard 155mm shells were not compatible with Ukrainian artillery, but the initial Western reluctance to transfer the more modern heavy weaponry gave immediate rise to narrative clashes and speculation in the international public information space. Western intelligence did not assess Ukraine as capable of long-term resistance, as noted above, thus reasoning for transfers of older equipment as a short-term stop gap, immediately usable on the battlefield. It is worth noting that global availability of 152mm artillery and shells was increasingly limited (reportedly dwindling to nearly zero by October 2022), and sources familiar with the efforts to arrange these transfers to Ukraine described them as a struggle,¹⁶ — rather

Moreover, all the experts interviewed for this effort assessed the older equipment as being just as effective, especially combined with quality intelligence support from the West.

¹² Debusmann, B. (Apr 21, 2022). What weapons has the US given Ukraine — and how much do they help? BBC. <https://www.bbc.com/news/world-us-canada-60774098>; Demirjian, K. (June 2, 2022). *Private groups work to bring specialized combat gear to Ukraine*. Washington Post. <https://www.washingtonpost.com/national-security/2022/06/02/ukraine-special-operations-combat-gear/>.

¹³ See, e.g., Ryng, J. and Hartwell, L. (Nov 4, 2022). *The Russia-Ukraine conflict: what is next?* New Eastern Europe. <https://neweasterneurope.eu/2022/11/04/the-russia-ukraine-conflict-what-is-next/>.

¹⁴ Bronk, J., with Reynolds, N. and Watling, J. (Nov 7, 2022). *The Russian Air War and Ukrainian Requirements for Air Defence*. RUSI. <https://static.rusi.org/SR-Russian-Air-War-Ukraine-web-final.pdf>.

¹⁵ Bronk, J., with Reynolds, N. and Watling, J. (Nov 7, 2022). *The Russian Air War and Ukrainian Requirements for Air Defence*. RUSI. <https://static.rusi.org/SR-Russian-Air-War-Ukraine-web-final.pdf>.

¹⁶ Yaffa, J. (Oct 17, 2022). *Inside the U.S. Effort to Arm Ukraine*. New Yorker. <https://www.newyorker.com/magazine/2022/10/24/inside-the-us-effort-to-arm-ukraine>; Detsch, J. (Oct 26, 2022). *Ukraine Says It Needs More Guns, Shells, and Firepower*. Foreign Policy. <https://foreignpolicy.com/2022/10/26/ukraine-weapons-request-firepower-russia-war/>.

than being the easier way out. Moreover, all the experts interviewed for this effort assessed the older equipment as being just as effective, especially combined with quality intelligence support from the West. It was seen as easy to integrate due to familiarity, and easier for Ukrainians to maintain, compared to the complex and somewhat less robust Western systems supplied subsequently.

Meanwhile, Russia — and the more hawkish advocates for the Ukrainian cause — interpreted these initial transfers as an empty gesture, dumping old weapons stock as an indication of the lack of Western resolve to support Ukraine,¹⁷ leveraging this aspect of the narrative in their information campaigns, as noted above. It is worth noting that several experts interviewed for this effort did not discount the rationale of getting the older NATO stocks out so as to be able to approach local policy makers for newer replacements — but still considered it a win-win for Ukraine and the West. Interestingly, while Russian commentators recognized the general technical efficacy of the abovementioned *Stinger* systems, the prevailing narrative was Western reluctance in handing them over — too few to make a difference.¹⁸

Perhaps the most notable role, in terms of arms transfers during the first stage of this war, has been played by drones sold or donated to Ukraine. Since 2019, Ukraine has purchased 30 *Bayraktar* drones from Turkey (to Russia's expressed dismay).¹⁹ Their role in destroying Russian military assets during the early days has been so notable, that NGOs and influencers in Lithuania, Latvia, Poland, Norway, and Canada initiated crowdfunding campaigns to supply Ukraine with additional *Bayraktars*.²⁰ The United States has also included *Switchblade* drones in the military assistance package for Ukraine in mid-March,²¹ amplifying its signal of commitment, although the drones themselves, and the requisite training, have

¹⁷ For summary, see *Russian Media Analysis* (March 11, 2022). Center for Naval Analyses. <https://russiamil.wordpress.com/2022/03/11/russian-media-analysis-issue-11-march-11-2022/>; and *Russian Media Analysis* (March 25, 2022). Center for Naval Analyses. <https://www.cna.org/our-media/newsletters/russian-media-analysis/issue-12>.

¹⁸ See, e.g., Sokirko, V. (March 10, 2022). *NATO will supply Ukraine with weapons from the German Democratic Republic that is over a half century old*. *Gazeta.ru*. <https://www.gazeta.ru/army/2022/03/10/14617015.shtml>.

¹⁹ Hacaoglu, S. and Champion, M. (Dec 3, 2021). *Ukraine Angers Russia by Buying Turkish Drones and Wants To Get Its Hands On More*. *Bloomberg*. <https://www.bloomberg.com/news/articles/2021-12-03/ukraine-buys-more-armed-drones-from-turkey-than-disclosed-and-angers-russia>; Mittal, V. (June 23, 2022). *The Ukrainian Military Is Changing Its Tactics With Bayraktar TB2 Drones*. *Forbes*. <https://www.forbes.com/sites/vikrammittal/2022/06/23/ukrainian-military-is-changing-its-tactics-with-the-bayraktar-tb2-drones/?sh=48b378b61ec0>.

²⁰ LRT.lt. (Aug 16, 2022). *Following Lithuania, Latvia starts raising funds to buy Bayraktar drone for Ukraine*. <https://www.lrt.lt/en/news-in-english/19/1760542/following-lithuania-latvia-starts-raising-funds-to-buy-bayraktar-drone-for-ukraine>; Ciobanu, C. (July 15, 2022). *Poles Raise Money to buy Bayraktar Drone for Ukraine*. *Balkan Insight*. <https://balkaninsight.com/2022/07/15/pires-raise-money-to-buy-bayraktar-drone-for-ukraine/>; Daily Sabah. (July 15, 2022). *Norway, Canada start fundraising to buy Bayraktar TB2s for Ukraine*. <https://www.dailysabah.com/business/defense/norway-canada-start-fundraising-to-buy-bayraktar-tb2s-for-ukraine>.

²¹ Defense Brief Editorial (Mar 16, 2022). *Latest US aid package for Ukraine will include Switchblade kamikaze drones*. <https://defbrief.com/2022/03/16/latest-us-aid-package-for-ukraine-will-include-switchblade-kamikaze-drones/>.

reached Ukraine in April,²² with the first videos of their battlefield use emerging in late May.²³ Ret. U.S. Admiral Stavridis has subsequently named the *Switchblade* drones among the decisive technology on the battlefield for having significantly aided Ukrainian ground campaigns.²⁴ Meanwhile, Russian commentators discounted the videos of *Bayraktars* in action as fake,²⁵ and were convinced the *Switchblade* shipments would be destroyed en route by Russia and never reach the battlefield²⁶ — echoing their narratives about *Stingers*.

As the war wore on, drones have come to play an important role: civilian drones (used by Ukrainian armed forces and civilian volunteers) allowed for a new level of target reconnaissance, while military strike drones (including the modern ones eventually developed by Ukrainian manufacturers) extended Ukraine's reach.

As the war wore on, drones have come to play an important role: civilian drones (used by Ukrainian armed forces and civilian volunteers) allowed for a new level of target reconnaissance, while military strike drones (including the modern ones eventually developed by Ukrainian manufacturers) extended Ukraine's reach. Thus, it is worth marking their significant, especially the symbolic and information campaign, value since the start of the conflict.

Phase 2: April 1 to May 11 — Western Boost

Ukraine's successful resistance efforts and the considerable impact of even the initially limited U.S. military assistance were seen by many as key to generating the political will to step up the arms transfers.²⁷ By mid-April the United States has pledged 90 M777 155mm howitzers to Ukraine — an unprecedented transfer of heavy artillery to this country — half of which were delivered by the end of the month.²⁸ Ukraine's minister of defense has described this step as a crossing of a certain Rubicon.²⁹ Some experts were assessing the type of military aid being sent at this time as still largely focused on

²² Stewart, P. and Idrees Ali, I. (Apr 6, 2022). *U.S. training small number of Ukrainians on Switchblade drones -defense official*. Reuters. <https://www.reuters.com/world/us/us-training-small-number-ukrainians-switchblade-drones-defense-official-2022-04-06/>.

²³ D'Urso, S. (May 25, 2022). *Evidence Of US-supplied Switchblade Loitering Munitions Targeting Russian Troops In Ukraine Emerges*. The Aviationist. <https://theaviationist.com/2022/05/25/switchblade-ukraine/>.

²⁴ Stavridis, J. (Sep 14, 2022). *How Ukraine Turned the Tide Against Russia*. Time. <https://time.com/6213007/ukraine-offensive-against-russia/>.

²⁵ Preobrazhensky, N. (March 17, 2022). *Bayraktar's Marketing Fail*. Nezavisimaya Gazeta. https://nvo.ng.ru/armament/2022-03-17/6_1181_marketing.html.

²⁶ See, e.g., Alshaeva, I. (March 18, 2022). *The American kamikaze drone will not help Ukraine*. Gazeta.ru. <https://www.gazeta.ru/army/2022/03/18/14644813.shtml>.

²⁷ Yaffa, J. (Oct 17, 2022). *Inside the U.S. Effort to Arm Ukraine*. New Yorker. <https://www.newyorker.com/magazine/2022/10/24/inside-the-us-effort-to-arm-ukraine>; Volker, K. (Sep 26, 2022). *A Western Strategy for Ukraine: Part 2*. CEPA. <https://cepa.org/article/a-western-strategy-for-ukraine-part-2/>.

²⁸ Doornbos, C. (Apr 28, 2022). *More than half of the 90 US howitzers bound for Ukraine now delivered*. Stars and Stripes. <https://www.legion.org/news/255649/more-half-90-us-howitzers-bound-ukraine-now-delivered>.

²⁹ Yaffa, J. (Oct 17, 2022). *Inside the U.S. Effort to Arm Ukraine*. New Yorker. <https://www.newyorker.com/magazine/2022/10/24/inside-the-us-effort-to-arm-ukraine>.

achieving the immediate effects on the battlefield (i.e., preventing Russia from overrunning more of Ukrainian territory).³⁰ In addition to providing Ukraine with NATO-compatible artillery, and greater capacity to counter Russian artillery, these deliveries took on further significance in offering resupply, as Ukraine's own stocks were described as running critically low.³¹ Notably, Gen. Hodges (among others) has identified the unusually high rate of ammunition use already in April, pointing to potential challenges of resupply and production,³² to come forth fully in the fall.

Following the prominent role of drones (as opposed to manned aircraft) in this war, in late April the United States also committed to sending 121 Phoenix Ghost drones to Ukraine. It is particularly worth noting that, while these drones had been in production prior 2022, they had since been tailored to the conflict environment in Ukraine,³³ providing perhaps the earliest example of experimental or adaptive arms transfers in this war.

On April 26, the first meeting of the international Ukraine support group took place at the Ramstein Air Base in Germany. Attended by representatives of 40 countries, the meeting was seen by many³⁴ as the turning point and international signal of willingness to support Ukraine and provide heavy weaponry — particularly on the part of Germany.³⁵

Interestingly, a few experts interviewed for this effort have noted the morale-boosting effects produced not only by the much-publicized transfers of heavy and modern equipment, but also of the basic type of assistance that signaled the care for the wellbeing of individual soldiers (e.g., bullet proof vests, Humvees) in contrast to Russia's approach towards its own soldiers.

Phase 3: June 1 to July 31 — Attrition/Stalemate

In July, the U.S. *HIMARS* and *MLRS* systems started to reach Ukraine (see Table 1, p.13), increasing the shooting range and precision. The United States had modified the rocket launchers to reduce their range

³⁰ Watling, J. (Apr 12, 2022). *Supporting Ukraine for the Long War*. War on the Rocks. <https://warontherocks.com/2022/04/supporting-ukraine-for-the-long-war-2/>.

³¹ Seligman, L. (July 8, 2022). *Biden to Send New Precision-Guided Artillery Rounds to Ukraine*. Politico. <https://www.politico.com/news/2022/07/08/biden-artillery-ukraine-kyiv-russia-00044735>.

³² (April 26, 2022). Jacek Bartosiak talks to Gen. (ret.) Ben Hodges on war in Ukraine as of 26 April 2022. <https://www.youtube.com/watch?v=IUyRclxae0M>.

³³ Johnson, K. (July 25, 2022). *U.S. Sending 580 Phoenix Ghost Drones to Ukraine*. Flying. <https://www.flyingmag.com/u-s-sending-580-phoenix-ghost-drones-to-ukraine/>; Atlamazoglou, S. (Sep 9, 2022). *The US has sent hundreds of Phoenix Ghosts to Ukraine, but there have been few glimpses of the 'kamikaze' drones in action*. Business Insider. <https://www.businessinsider.com/us-has-sent-hundreds-of-phoenix-ghost-drones-to-ukraine-2022-9>.

³⁴ Hrudka, O. (Apr 29, 2022). *Breakthrough at Ramstein: NATO unites to help Ukraine defeat Russia*. Euromaidan Press. <https://euromaidanpress.com/2022/04/29/ramstein-meeting-marks-a-radical-change-in-ensuring-ukraine-and-global-security/>.

³⁵ Morris, L. (Apr 26, 2022). *After hesitancy, Germany greenlights some heavy arms for Ukraine*. Washington Post. <https://www.washingtonpost.com/world/2022/04/26/germany-heavy-weapons-ukraine/>.

as a precaution against them being fired into Russia, carefully avoiding potential escalation.³⁶ Still, these systems were described by most as a tectonic shift in battlefield dynamics,³⁷ enabling Ukrainian attacks on Russian command-and-control posts, ammunition depots, and logistical operation nodes. Their battlefield impact has been described as an immediate³⁸ force multiplier,³⁹ destroying large portions of Russian logistical rearguard and forcing their retreat. Ukrainian troops have reported that this has allowed them to shift from holding positions to gradually pushing Russian forces out of occupied territories, with the second-order effect of being the ability to protect more civilians from the offensives.⁴⁰

Furthermore, the *HIMARS* precision strike capability has helped Ukraine overcome the numerical advantages of Russian artillery.⁴¹ Aside from the immediate relevance to the conflict in Ukraine, this was a notable strategic marker, given Russia's historical tendency to attempt to overwhelm opponents with its sheer number of troops and equipment on the battlefield, thus compensating for training or technical inferiorities. Moreover, in addition to the battlefield role and political signal of growing Western commitment, the arrival of new game-changing artillery was described as a significant boost to Ukrainian fighter morale.⁴²

Meanwhile, Russia's military response to the introduction of *HIMARS* into the battlefield has been to renew missile strikes against major Ukrainian cities, such as Kyiv as well as to threaten strikes against the Western supply convoys (threats that were ultimately never carried out). In addition, Russian commentators have kept up the narrative that United States and NATO were not sharing the newest

³⁶ Gordon, M. R. and Lubold, G. (Dec 5, 2022). *U.S. Altered Himars Rocket Launchers to Keep Ukraine From Firing Missiles Into Russia*. Wall Street Journal. <https://www.wsj.com/articles/u-s-altered-himars-rocket-launchers-to-keep-ukraine-from-firing-missiles-into-russia-11670214338>.

³⁷ Stavridis, J. (Sep 14, 2022). *How Ukraine Turned the Tide Against Russia*. Time. <https://time.com/6213007/ukraine-offensive-against-russia/>; Detsch, J. (July 13, 2022). *Ukraine Is Bringing a Big Gun to a Knife Fight*. Foreign Policy. <https://foreignpolicy.com/2022/07/13/ukraine-himars-ammunition-russia-us>; Coles, I. and Gershkovich, E. (July 13, 2022). *Ukraine Strike on Russian Air-Defense Unit Shows Impact of New Weapons from West*. Wall Street Journal. <https://www.wsj.com/articles/ukraine-strike-on-russian-air-defense-unit-shows-impact-of-new-weapons-from-west-11657708988>; Ayad, P. (July 14, 2022). *Can US-supplied HIMARS be a game changer for Ukraine?* France 24. <https://www.france24.com/en/europe/20220714-can-us-supplied-himars-be-a-game-changer-for-ukraine>; Ponomarenko, I. (July 8, 2022). *Ukraine Targets Russia's Ammunition Depots, Undermining Its Artillery Advantage*. Kyiv Independent. <https://kyivindependent.com/national/1234>.

³⁸ Davydenko, D., Khvostova M., and Lymar, O. (July 5, 2022). *Immediate impact: How Western heavy weapons are already helping Ukraine halt Russia*. European Council of Foreign Relations. <https://ecfr.eu/article/immediate-impact-how-western-heavy-weapons-are-already-helping-ukraine-halt-russia/>.

³⁹ Cranny-Evans, S. (Nov 8, 2022). *What weapons are significant for current and future warfare? Lessons learned from recent conflicts*. SIPRI Conference.

⁴⁰ Avdeedva, M. (Oct 19, 2022). *Russia-Ukraine Dialogues: battlefield updates*. LSE. <https://www.youtube.com/watch?v=Qow33e-IQFM>.

⁴¹ Binnendijk, H. (Aug 2022). *Six Months Twenty-Three Lessons: What the world has learned from Russia's war in Ukraine*. Atlantic Council. <https://www.atlanticcouncil.org/blogs/new-atlanticist/six-months-twenty-three-lessons-what-the-world-has-learned-from-russias-war-in-ukraine/>.

⁴² Yaffa, J. (Sep 23, 2022). *Putin's Escalation in Ukraine Is a Losing Strategy*. New Yorker. <https://www.newyorker.com/news/news-desk/putins-escalation-in-ukraine-is-a-losing-strategy>.

technology with Ukraine as late as June, pointing to the older equipment and its limited capabilities as a sign of lacking Western resolve.⁴³

As the conflict progressed, ensuring proper maintenance and repairs of a growing number of different Western armaments' systems was becoming difficult for the Ukrainian armed forces.⁴⁴ One of the challenges included the high rate of munitions use and considerable wear and tear of equipment used in Ukraine — much more than was typical when such technology has been used by Western armies.⁴⁵ Most experts interviewed for this effort have suggested that the significantly shortened trainings on the new weapons systems had failed to instill a culture of using them in a careful and economical manner — resulting in a trigger-happy approach — while others attributed the unusually high rate of wear and tear to the inherently intensive nature of this particular war. Subsequently, getting the systems out of Ukraine for repairs in neighboring Poland, Lithuania, and the Czech and Slovak republics created additional operational challenges — reportedly, one-third of the howitzers were out of commission being serviced at any given time.⁴⁶ In addition, misgivings about a potentially trigger-happy Ukrainian approach to ammunition were translating into a declining willingness to provide it and calls for greater oversight.⁴⁷ Another increasingly pressing issue was the scarcity of spare parts and logistical difficulties in getting them ordered and delivered,⁴⁸ as well as juggling a multitude of spare parts from international suppliers that tended to be visually similar yet not interchangeable.⁴⁹

Phase 4: August 1 to October 7 — Ukrainian Counteroffensive

The cumulative effects of increasingly sophisticated arms deliveries and training trickling in thus far have facilitated Ukraine's ability to launch increasingly successful counteroffensive operations and take back territories. However, while the narratives about battlefield advancements abounded, accompanied by political will to continue to provide arms, the actual arms transfers seemed to be slowing down due to production issues (see Table 1, p.13). Whereas previous deliveries had been coming from ready-to-use

⁴³ See, e.g., Khramchikhin, A. (June 10, 2022). *Western tanks will not save Ukraine*. Nezavisimaya Gazeta. https://nvo-ng.ru.translate.google/realty/2022-10-06/3_1209_tanks.html?_x_tr_sl=ru&_x_tr_tl=en&_x_tr_hl=en&_x_tr_pto=wapp.

⁴⁴ Bowen, A. S. (Sep 14, 2022). *Russia's War in Ukraine: Military and Intelligence Aspects*. Congressional Research Service, Report R47068. <https://crsreports.congress.gov/product/pdf/R/R47068>.

⁴⁵ Tucker, P. (Sep 18, 2022). *US Soldiers Provide Telemaintenance as Ukrainians MacGyver Their Weapons*. Defense One. <https://www.defenseone.com/technology/2022/09/us-soldiers-provide-telemaintenance-ukrainians-macgyver-their-weapons/377306/>.

⁴⁶ Ismay, J. and Gibbons-Neff, T. (Nov 25, 2022). *Artillery Is Breaking in Ukraine. It's Becoming a Problem for the Pentagon*. New York Times. <https://www.nytimes.com/2022/11/25/us/ukraine-artillery-breakdown.html?searchResultPosition=66>.

⁴⁷ Detsch, J. (Dec 9, 2022). *U.S. Plans for a Hypothetical War Limit Aid to a Real One*. *Foreign Policy*. https://foreignpolicy.com/2022/12/09/military-aid-ukraine-russia-munition-stockpile-shortages/?utm_source=PostUp&utm_medium=email&utm_campaign=FP%20This%20Week&utm_term=61321&tpcc=FP%20This%20Week.

⁴⁸ Tucker, P. (Sep 18, 2022). *US Soldiers Provide Telemaintenance as Ukrainians MacGyver Their Weapons*. Defense One. <https://www.defenseone.com/technology/2022/09/us-soldiers-provide-telemaintenance-ukrainians-macgyver-their-weapons/377306/>.

⁴⁹ Telegraph (Sep 5, 2022). *How the West is racing to stop Ukraine's guns falling silent*. Ukraine: The Latest Podcast. <https://www.youtube.com/watch?v=9CXdUHG3TAE>.

stockpiles, additional ones would take time to source or manufacture — and given the high precision technology involved, ramping up production was not a straightforward effort.⁵⁰ For instance, Ukraine was estimated to be using *Javelin* missiles at the rate of 500 per day, and requesting replenishments, whereas the annual production capacity for these missiles had been at around 2,000 prior to 2022.⁵¹ Indeed, by September, the United States had transferred about one-third of all its *Javelin* and *Stinger* inventory to Ukraine, and stocks of a number of other arms systems were assessed as running low.⁵² Overall, the high use-up rate of military technology in Ukraine has highlighted the capability gaps in the military industrial complex that had opened up since 1990s⁵³ — also pointing to the potential limits of Western deterrence capabilities in light of conventional weapons shortages.

In light of production bottlenecks, new or experimental weapons and platforms were attracting growing attention — and potential funding — as a way to sustain the military assistance to Ukraine in the short- to medium-term.⁵⁴ For instance, as one of the medium-term solutions to Ukraine's air defense problem the United States has offered to transfer the *VAMPIRE* anti-drone system, which has only been unveiled in May (the commitment to Ukraine was made in August, with deliveries due in mid-2023).⁵⁵ Another example is Boeing's Ground-Launched Small Diameter Bomb (GLSDB): this 150km range munition has been in development since 2019 and has emerged as a relatively cheap booster to Ukraine to be manufactured from readily available components (with deliveries anticipated in spring 2023).⁵⁶

Curiously, in addition to ramping up production and accelerating the introduction of new weapons' systems into the market, the mounting pressure of weapons shortages in Ukraine have given rise to the

⁵⁰ Telegraph (Sep 5, 2022). *How the West is racing to stop Ukraine's guns falling silent*. Ukraine: The Latest Podcast. <https://www.youtube.com/watch?v=9CXdUHG3TAE>.

⁵¹ Yaffa, J. (Oct 17, 2022). *Inside the U.S. Effort to Arm Ukraine*. New Yorker. <https://www.newyorker.com/magazine/2022/10/24/inside-the-us-effort-to-arm-ukraine>.

⁵² Cancian, M. F. (Sep 16, 2022). *Is the United States Running out of Weapons to Send to Ukraine?* CSIS. <https://www.csis.org/analysis/united-states-running-out-weapons-send-ukraine>.

⁵³ See, e.g., Cranny-Evans, S. (Nov 8, 2022). What weapons are significant for current and future warfare? Lessons learned from recent conflicts. SIPRI Conference; Kofman, M. (Oct 19, 2022). Russia-Ukraine Dialogues: battlefield updates. London School of Economics. <https://www.youtube.com/watch?v=Qow33e-lQFMI>; McConville, J. C. (Nov 16, 2022). Politico Defense Summit. <https://www.politico.com/live-events/1997/07/21/at-a-crossroads-americas-defense-strategy-00001398>.

⁵⁴ Cancian, M. F. (Sep 16, 2022). *Is the United States Running out of Weapons to Send to Ukraine?* CSIS. <https://www.csis.org/analysis/united-states-running-out-weapons-send-ukraine>; Cancian, M. F. (Oct 17, 2022). Can the United States Do More for Ukrainian Air Defense? CSIS. <https://www.csis.org/analysis/can-united-states-do-more-ukrainian-air-defense>.

⁵⁵ Gould, J. (Nov 1, 2022). *Drone-killing Vampires due in Ukraine next year, Pentagon says*. Defense News. <https://www.defensenews.com/pentagon/2022/11/01/drone-killing-vampires-due-in-ukraine-next-year-pentagon-says/>; L3Harris Unveils Vehicle-Agnostic Modular Palletized ISR Rocket Equipment (*VAMPIRE*). (May 10, 2022). Military Leak. <https://militaryleak.com/2022/05/10/l3harris-unveils-vehicle-agnostic-modular-palletized-isr-rocket-equipment-vampire/>.

⁵⁶ Stone, M. (Nov 28, 2022). *Exclusive: U.S. weighs sending 100-mile strike weapon to Ukraine*. Reuters. https://www.reuters.com/business/aerospace-defense/100-mile-strike-weapon-weighed-ukraine-arms-makers-wrestle-with-demand-sources-2022-11-28/?utm_source=Sailthru&utm_medium=newsletter&utm_campaign=daily-briefing&utm_term=11-28-2022.

prospects of re-opening Soviet-era 152mm munitions manufacturing lines in Czech Republic, Slovakia, and Bulgaria.⁵⁷ It is worth noting that as of October 2022, only around one-third of Ukrainian artillery was of NATO 155mm standard.⁵⁸

In addition, the growing pressure to balance Ukraine's immediate needs with short-to-medium term manufacturing capabilities brought forth strategic discussions about U.S. willingness to shift the arms and assets it was deploying globally for long-term contingency planning. Indeed, some experts had pointed out the parallels with tensions that the U.S. political leaders had faced when signing the Lend Lease agreement during World War II: those historical transfers had spread the American arsenals thin, potentially challenging the U.S. capability to defend its territory.⁵⁹ In contrast, other experts were pushing the United States to revise its contingency planning vis-à-vis Russia, including the stockpile requirements (thus freeing up more of it for Ukraine), citing the need to downgrade Russia's capability assessments in the face of this war.⁶⁰ Although the present day strategic transfers' balance concerns the defense of U.S. allies and interests abroad, rather than the United States itself, the gradual escalation of the war brought new urgency to these considerations.

In addition, the growing pressure to balance Ukraine's immediate needs with short-to-medium term manufacturing capabilities brought forth strategic discussions about U.S. willingness to shift the arms and assets it was deploying globally for long-term contingency planning

Phase 5: October 8 to December — Russia's Escalation

The Ukrainian bombing of the Kerch bridge on October 8 was met with an onslaught of brutal Russian strikes on civilian infrastructure and systematic destruction of critical energy and water infrastructure nodes. Interestingly, some experts have assessed these infrastructure attacks as inevitable ahead of winter, being included in Russian planning from the start.⁶¹

This new phase of the war has opened the conversation in the West about providing Ukraine with air defenses, which had been initially considered off limits but was now part of urgent arms-transfer discussions at an emergency G-7 meeting.

⁵⁷ Erlanger, S. and Jakes, L. (Nov 26, 2022). *U.S. and NATO Scramble to Arm Ukraine and Refill Their Own Arsenals*. New York Times. <https://www.nytimes.com/2022/11/26/world/europe/nato-weapons-shortage-ukraine.html?searchResultPosition=35>.

⁵⁸ Detsch, J. (Oct 26, 2022). *Ukraine Says It Needs More Guns, Shells, and Firepower*. Foreign Policy. <https://foreignpolicy.com/2022/10/26/ukraine-weapons-request-firepower-russia-war/>.

⁵⁹ See, e.g., Johnson, D.E. (June 28, 2022). *What Better Way to Use the Arsenal of Democracy?* RAND. <https://www.rand.org/blog/2022/06/what-better-way-to-use-the-arsenal-of-democracy.html>.

⁶⁰ Detsch, J. (Dec 9, 2022). *U.S. Plans for a Hypothetical War Limit Aid to a Real One*. Foreign Policy. https://foreignpolicy.com/2022/12/09/military-aid-ukraine-russia-munition-stockpile-shortages/?utm_source=PostUp&utm_medium=email&utm_campaign=FP%20This%20Week&utm_term=61321&tpcc=FP%20This%20Week.

⁶¹ Avdeeva, M. (Oct 19, 2022). *Russia-Ukraine Dialogues: battlefield updates*. LSE. <https://www.youtube.com/watch?v=Qow33e-IQFM>.

Ukraine has mainly been relying on the Soviet S-300 surface-to-air systems, including internationally transferred units, and had started using its aviation force to shoot down drones in an attempt to conserve its missile supply.⁶² In October, the United States had committed to providing Ukraine with eight additional NASAM systems by 2025, but only the two available in stock could be delivered in November (see Table 1, p.13).⁶³ In addition, in December, efforts were launched to shift several NASAM systems to Ukraine from the Middle East over the next three to six months.⁶⁴ The HAWK systems, retired from NATO and U.S. active use a few decades ago, were another part of the aid package, deemed sufficiently effective against Russian attacks, and available quite widely in the West.⁶⁵ Indeed, a mid-November assessment by the Institute for the Study of War noted a marked increase in the effectiveness of Ukrainian air defenses specifically due to these Western-provided systems.⁶⁶ With the winter setting in and an anticipated pause in active battlefield engagements as of December 2022, Gen. McConville identified air defense capabilities as taking on a particular importance in securing and maintaining Ukrainian positions.⁶⁷

Until mid-December 2022, Ukraine's requests for the modern NATO-standard *Patriot* system were being denied, due both to the lengthy and complex operator training requirements, and to push back from U.S. commanders in other theaters against giving up their stocks.⁶⁸ However, with intensifying Russian strikes against the energy infrastructure, the United States has announced a change to this policy during President Zelensky's visit to Washington, D.C. While one *Patriot* battery was to be transferred from

⁶² Khurshudyan, I. (Oct 20, 2022). *Ukraine improvises with aging air defenses to counter Russian missiles*. Washington Post. <https://www.washingtonpost.com/world/2022/10/20/air-defenses-ukraine-missiles-russia/>; Erlanger, S., Schmitt, E., Schwartz, M., and Nagourney, E. (Oct. 11, 2022). *Pressure Grows on the West to Speed Air-Defense Systems to Ukraine*. New York Times. <https://www.nytimes.com/2022/10/11/world/europe/ukraine-g7-air-defense.html>.

⁶³ Gould, J. (Oct 25, 2022). *Ukraine-bound NASAMS are in US hands now: Raytheon*. Defense News. <https://www.defensenews.com/pentagon/2022/10/25/ukraine-bound-nasams-are-in-us-hands-now-raytheon/>; Cancian, M. F. (Oct 17, 2022). *Can the United States Do More for Ukrainian Air Defense?* CSIS. <https://www.csis.org/analysis/can-united-states-do-more-ukrainian-air-defense>; Reuters (Nov 7, 2022). *Ukraine receives first delivery of NASAMS air defence systems*. <https://www.reuters.com/business/aerospace-defense/ukraine-receives-first-delivery-nasams-air-defence-systems-minister-2022-11-07/>.

⁶⁴ Hudson, L. (Dec 1, 2022). *U.S. looks to shift air defense systems from Middle East to Ukraine, Raytheon chief says*. Politico. <https://www.politico.com/news/2022/12/01/raytheon-air-defense-ukraine-middle-east-00071687>.

⁶⁵ Stone, M. (Oct 25, 2022). *Exclusive: U.S. considers HAWK air defense equipment for Ukraine*. Reuters. <https://www.reuters.com/world/europe/exclusive-us-considers-hawk-air-defense-equipment-ukraine-say-us-officials-2022-10-25/>.

⁶⁶ Institute for the Study of War (Nov 15, 2022). *Russian Offensive Campaign Assessment*. <https://www.understandingwar.org/backgroundunder/russian-offensive-campaign-assessment-november-15>

⁶⁷ McConville, J. C. (Nov 16, 2022). *Politico Defense Summit*. <https://www.politico.com/live-events/1997/07/21/at-a-crossroads-americas-defense-strategy-00001398>.

⁶⁸ Erlanger, S., Schmitt, E., Schwartz, M., and Nagourney, E. (Oct. 11, 2022). *Pressure Grows on the West to Speed Air-Defense Systems to Ukraine*. New York Times. <https://www.nytimes.com/2022/10/11/world/europe/ukraine-g7-air-defense.html>; Cancian, M. F. (Oct 17, 2022). *Can the United States Do More for Ukrainian Air Defense?* CSIS. <https://www.csis.org/analysis/can-united-states-do-more-ukrainian-air-defense>.

Poland to Ukraine,⁶⁹ around 90 soldiers are needed to operate it, and the required operator training takes around six months⁷⁰ - meaning the battlefield impact will be far from immediate. Furthermore, Retired Lt. Gen. Mark Hertling, former commander of U.S. Army in Europe was among many experts cautioning against inflated expectations of the difference the single system can have on the ground,⁷¹ even though the transfer has certainly generated the political signal of U.S. support that Ukraine has sought.

The longer-range ATACMS for HIMARS were also seen by Ukraine as key to protecting the civilian infrastructure increasingly pummeled by Russia. But fears of escalation, in case such missiles were used against Russian territories, have thus far stayed the Western hand.⁷²

In addition, citing the high level of wear and tear of Western-provided howitzers and the limited prospects of ammunition resupply, Ukraine has also asked the United States to provide cluster munitions,⁷³ raising significant ethical and legal dilemmas (as of early December 2022, the U.S. administration has not taken a position regarding these requests).

Table 1. Monthly U.S. Deliveries of Key Arms to Ukraine.⁷⁴

	March	Apr	May	June	July	Aug	Sept	Oct	Nov	Total
Javelin	2000				6500					8500
Stinger	800				1400					2200
M777 (155mm)		108		18				16		142
NASAM					2				2	4
Switchblade		700								700
Phoenix Ghost		121			580					701
HIMARS				4	12		18	4		38

⁶⁹ Britzky, H. (Dec 21, 2022). *Patriot missile systems will help Ukraine's defense but experts caution they may have limited effect*. CNN. <https://edition.cnn.com/2022/12/21/politics/patriot-missiles-ukraine/index.html>.

⁷⁰ Kronfield, M. and Javaid, M. (Dec 21, 2022). *Here's everything you need to know about Patriot missiles*. Washington Post. <https://www.washingtonpost.com/nation/2022/12/21/what-patriot-missile-system-why-does-ukraine-need/>.

⁷¹ Britzky, H. (Dec 21, 2022). *Patriot missile systems will help Ukraine's defense but experts caution they may have limited effect*. CNN. <https://edition.cnn.com/2022/12/21/politics/patriot-missiles-ukraine/index.html>.

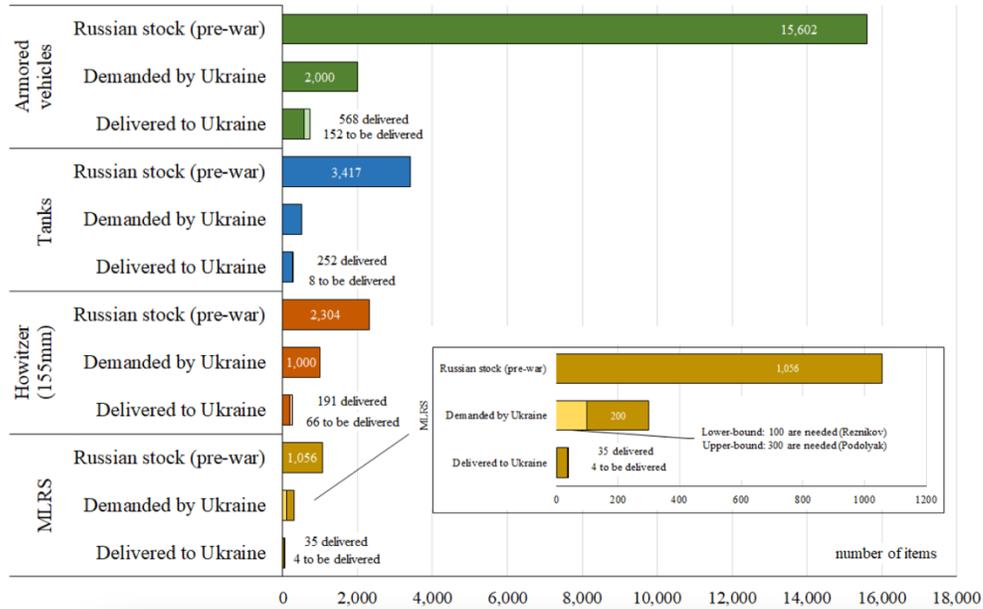
⁷² See, e.g., Ryng, J. and Hartwell, L. (Nov 4, 2022). *The Russia-Ukraine conflict: what is next?* New Eastern Europe. <https://neweasterneurope.eu/2022/11/04/the-russia-ukraine-conflict-what-is-next/>.

⁷³ Detsch, J. (Oct 26, 2022). *Ukraine Says It Needs More Guns, Shells, and Firepower*. Foreign Policy. <https://foreignpolicy.com/2022/10/26/ukraine-weapons-request-firepower-russia-war/>; Seligman, L. and Ward, A. (Dec 9, 2022). *Biden administration has 'concerns' about providing Ukraine cluster munitions*. Politico. <https://www.politico.com/news/2022/12/09/biden-administration-ukraine-cluster-munitions-00073316>.

⁷⁴ Data sources pooled from: Forum on the Arms Trade. <https://www.forumarmstrade.org/ukrainearms.html>, and Kiel Working Paper. https://www.ifw-kiel.de/fileadmin/Dateiverwaltung/IfW-Publications/-ifw/Kiel_Working_Paper/2022/KWP_2218_Which_countries_help_Ukraine_and_how_/Kiel_Working_Paper_2218_v3.pdf; U.S. Department of Defense. <https://www.defense.gov/News/News-Stories/Article/Article/3103655/more-himars-phoenix-ghost-drones-bound-for-ukraine/>.

Figure 1. Arms Assistance: Deliveries vs. Ukrainian Requests⁷⁵

Disclosed bilateral commitments and deliveries between January 24 and August 3, 2022



As illustrated in Figure 1, Ukraine remained at a disadvantage to Russia in terms of traditional military equipment (as well as manpower). Transfers of arms from the U.S. (summarized in Table 1 above), as well as other NATO member states, while making a big difference, did not close that gap – nor were they meant to. Leveraging its training and innovation and emerging new systems of intelligence sharing (discussed in forthcoming papers in this research series), as well as other battlefield adaptations, Ukraine was able to not only mount sustained opposition to Russia, but also launch successful counter-offensive campaigns, reclaiming some of the territories lost in 2022.

Public Perceptions

U.S. pollsters have been carefully tracking the level of public support for providing military assistance to Ukraine throughout 2022. While in their questions some have differentiated between sending U.S. troops into Ukraine versus providing arms, none of the public polls has asked more detailed questions about the specific types of military assistance (e.g., provision of training, intelligence sharing, or the movement of American assets in the theater outside Ukraine). The phrasing of the questions also tended to vary from assessing the support to the current level of military assistance or for providing more military assistance, to making military assistance conditional to diplomatic efforts, or to providing all the military assistance that Ukraine is requesting.

⁷⁵ Source: Kiel Working Paper. https://www.ifw-kiel.de/fileadmin/Dateiverwaltung/IfW-Publications/-ifw/Kiel_Working_Paper/2022/KWP_2218_Which_countries_help_Ukraine_and_how_/Kiel_Working_Paper_2218_v3.pdf

As can be seen in Figure 2, the start of the war was when the greatest number of Americans seemed to favor sending more arms, as aid provision negotiations were just getting under way. With HIMARS and other systems increasingly reaching Ukraine during the summer of attrition, more respondents seemed to find the administration's efforts sufficient or even excessive, although the support ticked up again with punitive Russian strikes against civilian infrastructure. As the conflict progressed, concerns over U.S.-Russia direct conflict escalation and economic hardships emanating from the war seemed to chip at the public support towards economic, rather than military, aid to Ukraine — even though the pro-diplomacy camp was growing.

Figure 2: Level of U.S. Public Support to Providing Military Assistance to Ukraine⁷⁶



⁷⁶ Data sources pooled from: Telhami, S. (March 31, 2022). What do Americans think of the Russia-Ukraine war and of the US response? Brookings. <https://www.brookings.edu/blog/order-from-chaos/2022/03/31/what-do-americans-think-of-the-russia-ukraine-war-and-of-the-us-response/>; Durkee, A. (March 8, 2022). *More Support Military Intervention in Ukraine than Oppose it Poll Says*. Forbes. <https://www.forbes.com/sites/alisondurkee/2022/03/08/more-support-military-intervention-in-ukraine-than-oppose-it-poll-says---but-financial-aid-still-preferable/?sh=3ecb3d951c80>; Rose, J. (March 24, 2022). *Most Americans don't like Biden's Ukraine response and worry about inflation*. NPR. <https://www.npr.org/2022/03/24/1088568802/russia-ukraine-biden-approval-rating-poll-numbers-inflation>; Watson, M. (May 26, 2022). *Polls show US support for Ukraine waning as Biden administration steps up aid*. ASPI Strategist. <https://www.aspistrategist.org.au/polls-show-us-support-for-ukraine-waning-as-biden-administration-steps-up-aid/>; AMP Research Lab. (Aug 8, 2022). *Poll: Amid Russia Ukraine War, Americans Divided over Biden's Influence on Military Aid*. <https://www.apmresearchlab.org/motn/poll-ukraine-military-aid>; Sparks, S. (May 2, 2022). *Majorities favor support for Ukraine despite broad concerns about impacts: POLL*. ABC News. <https://abcnews.go.com/Politics/majorities-favor-support-ukraine-broad-concerns-impacts-poll/story?id=84405185>; Feldscher, J. (Aug 23, 2022). *7 in 10 Americans Want To Send More Weapons To Ukraine, Poll Finds*. <https://www.defenseone.com/policy/2022/08/7-10-americans-want-send-more-weapons-ukraine-poll-finds/376224/>; Smeltz, D. and Sullivan, E. (Aug 18, 2022). *Americans Support Ukraine "As Long As It Takes"*. The Chicago Council on Global Affairs. <https://www.thechicagocouncil.org/research/public-opinion-survey/americans-support-ukraine-long-it-takes>; Haltiwanger, J. (Sep 27, 2022). *New poll signals Americans are growing tired of support for Ukraine without diplomacy as the war against Russia drags on*. Business Insider. <https://www.businessinsider.com/new-poll-signals-americans-are-growing-tired-of-supporting-ukraine-2022-9>; Zengerle, P. (Oct 6, 2022). *Three in four Americans say U.S. should support Ukraine despite Russian threats: Reuters/Ipsos poll*. Reuters. <https://www.reuters.com/article/ukraine-crisis-usa-poll-idAFKBN2R0277>; Jackson, C., Azevedo Lohr, A., and Duran, J. (Oct 10, 2022). *Most Americans agree the U.S. should continue to support Ukraine despite threat of nuclear weapons use by Russia*. Ipsos. <https://www.ipsos.com/en-us/news-polls/americans-agree-us-continue-support-ukraine-despite-russia-threatening-use-nuclear>.

At the start of the war, two polls conducted 10 days apart in March found that 67 percent⁷⁷ and 83 percent⁷⁸ of Americans, respectively, supported the provision of weapons to Ukrainian armed forces. Interestingly, when asked specifically about matching the support to Ukrainian requests, over 60 percent favored fulfilling “some” of these requests, while less than 20 percent favored complying with all of them, citing escalation concerns.⁷⁹ This is consistent with the U.S. – and other NATO member states – consistently providing less equipment than Ukraine was requesting (see Figure 1, p.13). Similarly, in late April, an Ipsos poll found 73 percent of Americans in favor of “continued” provision of arms to Ukraine.⁸⁰ By May, as the bulk of Western (not just American) arms were getting delivered, the support seemed to dwindle. In the Mood of the Nation poll, 45 percent of Americans surveyed in late May assessed the United States as “providing the right amount of support,” while 31 percent found it excessive.⁸¹ In a Pew poll, 12 percent of respondents found the military aid excessive.⁸² Meanwhile, two separate polls found 55 percent of Americans favored further increasing military support to Ukraine.⁸³ Polls conducted in July and August, as attrition was settling into the battlefields, consistently found 72 percent of respondents in favor of sending “more weapons and military supplies to Ukraine,”⁸⁴ and 51 percent supporting “continued provision” of arms.⁸⁵

⁷⁷ Durkee, A. (March 8, 2022). *More Support Military Intervention in Ukraine than Oppose it Poll Says*. Forbes. <https://www.forbes.com/sites/alisondurkee/2022/03/08/more-support-military-intervention-in-ukraine-than-oppose-it-poll-says---but-financial-aid-still-preferable/?sh=3ecb3d951c80>.

⁷⁸ Telhami, S. (March 31, 2022). *What do Americans think of the Russia-Ukraine war and of the US response?* Brookings. <https://www.brookings.edu/blog/order-from-chaos/2022/03/31/what-do-americans-think-of-the-russia-ukraine-war-and-of-the-us-response/>.

⁷⁹ Rose, J. (March 24, 2022). *Most Americans don't like Biden's Ukraine response and worry about inflation*. NPR. <https://www.npr.org/2022/03/24/1088568802/russia-ukraine-biden-approval-rating-poll-numbers-inflation>.

⁸⁰ Jackson, C., Azevedo Lohr, A., and Duran, J. (Oct 10, 2022). *Most Americans agree the U.S. should continue to support Ukraine despite threat of nuclear weapons use by Russia*. Ipsos. <https://www.ipsos.com/en-us/news-polls/americans-agree-us-continue-support-ukraine-despite-russia-threatening-use-nuclear>.

⁸¹ AMP Research Lab. (Aug 8, 2022). *Poll: Amid Russia Ukraine War, Americans Divided over Biden's Influence on Military Aid*. <https://www.apmresearchlab.org/motn/poll-ukraine-military-aid>.

⁸² Watson, M. (May 26, 2022). *Polls show US support for Ukraine waning as Biden administration steps up aid*. ASPI Strategist. <https://www.aspistrategist.org.au/polls-show-us-support-for-ukraine-waning-as-biden-administration-steps-up-aid/>.

⁸³ Sparks, S. (May 2, 2022). *Majorities favor support for Ukraine despite broad concerns about impacts: POLL*. ABC News. <https://abcnews.go.com/Politics/majorities-favor-support-ukraine-broad-concerns-impacts-poll/story?id=84405185>; AMP Research Lab. (Aug 8, 2022). *Poll: Amid Russia Ukraine War, Americans Divided over Biden's Influence on Military Aid*. <https://www.apmresearchlab.org/motn/poll-ukraine-military-aid>.

⁸⁴ Feldscher, J. (Aug 23, 2022). *7 in 10 Americans Want To Send More Weapons To Ukraine, Poll Finds*. Defense One. <https://www.defenseone.com/policy/2022/08/7-10-americans-want-send-more-weapons-ukraine-poll-finds/376224/>; Smeltz, D. and Sullivan, E. (Aug 18, 2022). *Americans Support Ukraine "As Long As It Takes"*. The Chicago Council on Global Affairs. <https://www.thechicagocouncil.org/research/public-opinion-survey/americans-support-ukraine-long-it-takes>.

⁸⁵ Zengerle, P. (Oct 6, 2022). *Three in four Americans say U.S. should support Ukraine despite Russian threats: Reuters/Ipsos poll*. Reuters. <https://www.reuters.com/article/ukraine-crisis-usa-poll-idAFKBN2R0277>.

As the Ukrainian counteroffensive was slowly but surely gaining ground and concerns were mounting over weapons' maintenance and manufacturing capacity, a September poll found that 47 percent of Americans were only willing to support continued military assistance if a parallel diplomatic effort was underway (41 percent were willing to provide support regardless).⁸⁶ In October, shortly after the Kerch bridge explosion and the ensuing Russian escalation, 66 percent of U.S. respondents were in favor of continued military support for Ukraine.⁸⁷ In early November, around 30 percent of U.S. respondents felt that the U.S. was giving Ukraine too much aid,⁸⁸ although there was a desire to cut back on economic assistance while sustaining the military aid.⁸⁹ By early December, 40 percent of surveyed Americans supported sustaining the current level of assistance to Ukraine indefinitely, while 47 percent favored pressuring Kyiv towards a negotiated settlement.⁹⁰

Indeed, as the war wound into winter, despite considerable Ukrainian battlefield advances and advantages as of December 2022, political pressure from the West was gradually mounting for Ukraine to consider some form of a negotiated settlement.

Indeed, as the war wound into winter, despite considerable Ukrainian battlefield advances and advantages as of December 2022, political pressure from the West was gradually mounting for Ukraine to consider some form of a negotiated settlement. The Biden administration has been explicit and careful about waiting for Ukraine to define the terms of victory. However, a decisive battlefield resolution to this war by either side was considered unlikely, in addition to potentially being escalatory, and there was a growing desire to see the conflict concluded sooner rather than later.

Second Order Effects: Concerns and Realities

Escalation and U.S. Goals

Although Russia's red lines were never explicitly communicated, U.S. intelligence estimated them to be drawn at the direct intervention of NATO forces in Ukraine, Russian military defeat in Ukraine, or threat to Putin's regime.⁹¹ While there seemed to be no public or expert appetite for committing U.S. or NATO troops to Ukraine, the United States seemed to be particularly mindful of the second red line:

⁸⁶ Haltiwanger, J. (Sep 27, 2022). *New poll signals Americans are growing tired of support for Ukraine without diplomacy as the war against Russia drags on*. Business Insider. <https://www.businessinsider.com/new-poll-signals-americans-are-growing-tired-of-supporting-ukraine-2022-9>.

⁸⁷ Zengerle, P. (Oct 6, 2022). *Three in four Americans say U.S. should support Ukraine despite Russian threats: Reuters/Ipsos poll*. Reuters. <https://www.reuters.com/article/ukraine-crisis-usa-poll-idAFKBN2R0277>.

⁸⁸ Salama, V. (Nov. 3, 2022). *Republican Opposition to Helping Ukraine Grows, WSJ Poll Finds*. Wall Street Journal. <https://www.wsj.com/articles/republican-opposition-to-helping-ukraine-grows-wsj-poll-finds-11667467802>.

⁸⁹ Rogin, J. (Nov 10, 2022). *Opinion The next Congress could cause Ukraine to lose the war*. Washington Post. <https://www.washingtonpost.com/opinions/2022/11/10/republican-congress-us-aid-ukraine/>.

⁹⁰ Parker, C. (Dec 5, 2022). *Support slipping for indefinite U.S. aid to Ukraine, poll finds*. Washington Post. <https://www.washingtonpost.com/world/2022/12/05/american-support-ukraine-poll/>.

⁹¹ Yaffa, J. (Oct 17, 2022). *Inside the U.S. Effort to Arm Ukraine*. New Yorker. <https://www.newyorker.com/magazine/2022/10/24/inside-the-us-effort-to-arm-ukraine>.

military defeat. Since the start of the war, the Biden administration seemed to be carefully calibrating the amount of military assistance to prevent an outright Russian military defeat while ensuring Ukraine's survival.⁹² The U.S. rhetoric notably shifted in late April, with Lloyd Austin's famous statement about weakening Russia militarily to prevent its future adventurism,⁹³ echoed by the U.S. Ambassador to NATO as seeking "a strategic defeat of Russia."⁹⁴ This rhetoric came as the boost phase in Western military assistance was unfolding, and it is worth noting the absence of any identifiable Russian reaction, in official statements or tactical battlefield decisions, to this iteration of more expansive U.S. goals. Nevertheless, President Biden's phrasing at the end of June that this war "will not end with a Russian defeat of Ukraine"⁹⁵ seemed, again, to signal more modest U.S. goals, as the conflict reached a summer stalemate.

Indeed, many have suggested that the slow pace and limited scope of U.S. weapons' assistance provided to Ukraine was indicative of the ultimate acceptability of a stalemate in this war. One of the dominant arguments for limiting the supply of particular types and quantities of weapons to Ukraine has been the fear that their potential for reaching into Russia's territory may provoke Russian escalation.⁹⁶ At the same time, it was believed that Russia was not willing to get into World War III.⁹⁷ For instance, Gen. Hodges assessed the United States as overestimating Russia's willingness to widen the conflict and engage NATO member states,⁹⁸ and by December 2022 many experts believed that Russia was not willing to escalate the conflict any further.⁹⁹ Meanwhile, Russian officials consistently reiterated that Western arms provided to Ukraine were making this a proxy war that could potentially escalate to World War III level.¹⁰⁰

⁹² See, e.g., Volker, K. (Sep 26, 2022). *A Western Strategy for Ukraine: Part 2*. CEPA. <https://cepa.org/article/a-western-strategy-for-ukraine-part-2/>.

⁹³ See, e.g., Borger, J. (Apr 25, 2022). *Pentagon chief's Russia remarks show shift in US's declared aims in Ukraine*. The Guardian. <https://www.theguardian.com/world/2022/apr/25/russia-weakedend-lloyd-austin-ukraine>.

⁹⁴ See, e.g., Gijs, C. and Roberts, H. (May 20, 2022). *Western allies ramp up rhetoric against Russia, want 'defeat' of Moscow*. Politico. <https://www.politico.eu/article/western-allies-nato-us-uk-eu-against-russia-want-to-see-defeat-moscow/>.

⁹⁵ Forgey, Q. (June 30, 2022). *Biden: War 'will not end with a Russian defeat of Ukraine in Ukraine'*. Politico. <https://www.politico.com/news/2022/06/30/biden-war-russia-ukraine-00043449>.

⁹⁶ See, e.g., Baron, K. (May 11, 2022). *Does the West Want Ukraine to Win or Not?* Defense One. <https://www.defenseone.com/ideas/2022/05/does-west-want-ukraine-win-or-not/366820/>.

⁹⁷ Yaffa, J. (Oct 17, 2022). *Inside the U.S. Effort to Arm Ukraine*. New Yorker. <https://www.newyorker.com/magazine/2022/10/24/inside-the-us-effort-to-arm-ukraine>.

⁹⁸ Ryng, J. and Hartwell, L. (Nov 4, 2022). *The Russia-Ukraine conflict: what is next?* New Eastern Europe. <https://neweasterneurope.eu/2022/11/04/the-russia-ukraine-conflict-what-is-next/>.

⁹⁹ Kramer, A. E. (Dec 6, 2022). *Ukraine Strikes More Boldly, Seeing Little Room for Russia to Escalate*. New York Times. <https://www.nytimes.com/2022/12/06/world/europe/ukraine-drone-strikes-russian-bases.html?searchResultPosition=15>.

¹⁰⁰ Maynes, C. (Apr 29, 2022). *Russia sharpens warnings as the U.S. and Europe send more weapons to Ukraine*. NPR. <https://www.npr.org/2022/04/29/1095458518/russia-ukraine-us-military-aid>.

Though Russia threatened to target Western arms convoys/shipments,¹⁰¹ it never did so throughout 2022. As noted above, at the start of the war, Russian commentators were also convinced the U.S. *Switchblade* drone shipments would be destroyed by Russia en route, thus discounting their potential battlefield significance.¹⁰² Although Russia did launch several strikes against railways in Ukraine in an attempt to limit such supply,¹⁰³ road mobile convoys travelling inside Ukraine or any convoys on the way to Ukraine from NATO member states have not been struck. Experts interviewed for this effort have offered several plausible explanations, many of which had to do with limited Russian intelligence and limited technical capabilities to strike such small moving targets, as well as excellent operational security and masking capabilities on the part of Ukraine. Another, related, aspect was the cost-benefit calculus, making it hardly worthwhile for the Russians to expend valuable missiles in an uncertain attempt to take out 2-3 relatively lower-value targets. In addition, some of the interviewed experts ascribed this to Russian fears of escalating the conflict, especially given the chance of munitions straying into territories outside Ukraine. Nevertheless, one ought not discount the possibility that some convoys or smaller distribution centers have actually been hit, with Ukraine choosing not to release such information.

Notably, the decision to provide lethal aid overtly has been a departure from more recent U.S. proxy support tactics. While not historically unprecedented, *overt* provisions of armaments is not the typical route for the United States to support its allies. A relatively recent instance of this type of assistance was seen in the El Salvador's civil war, and previous examples include the WWII Lend-lease as well as the Arab-Israeli war. While the ability to maintain a thin veil of plausible deniability has traditionally been seen as a way to avoid escalation,¹⁰⁴ other experts saw that as a factor limiting the sponsor's control — and thus increasing escalation risks.¹⁰⁵ Dropping the secrecy in Ukraine has enabled the United States to make arrangements allowing to deliver the military assistance faster and in larger quantities than in previous operations, while also using the optics as an additional signal of commitment.¹⁰⁶

Another emerging argument — just as often made by Russian officials and commentators — has been that the very increase in the supply of arms to Ukraine, regardless of their range, was fueling this conflict,¹⁰⁷ prolonging it, and escalating its intensity. Indeed, Western experts also recognized the gradual

¹⁰¹ See, e.g., Radio Free Europe. (March 12, 2022). *Russia Says It Could Target Western Arms Supplies To Ukraine*. <https://www.rferl.org/a/russia-western-military-aid-ukraine-target/31749659.html>.

¹⁰² See, e.g., Alshaeva, I. (March 18, 2022). *The American kamikaze drone will not help Ukraine*. *Gazeta.ru*. <https://www.gazeta.ru/army/2022/03/18/14644813.shtml>.

¹⁰³ Hunder, M. (Apr 25, 2022). *Ukraine says Russia is targeting railways to cut arms supply routes*. *Reuters*. <https://www.reuters.com/world/europe/ukraine-says-russia-is-targeting-railways-cut-arms-supply-routes-2022-04-25/>.

¹⁰⁴ Vaynman, J. and Volpe, T. (March 11, 2022). *Making Coercion Work Against Russia*. *War on the Rocks*. <https://warontherocks.com/2022/03/making-coercion-work-against-russia/>.

¹⁰⁵ Freedman, L. (Nov 2014). *Ukraine and the Art of Limited War*. *Survival*, 56(6), 15–17. DOI:10.1080/00396338.2014.985432.

¹⁰⁶ Vaynman, J. and Volpe, T. (March 11, 2022). *Making Coercion Work Against Russia*. *War on the Rocks*. <https://warontherocks.com/2022/03/making-coercion-work-against-russia/>.

¹⁰⁷ See, e.g., Foulconbridge, G. (Apr 25, 2022). *Russia warns United States against sending more arms to Ukraine*. *Reuters*. <https://www.reuters.com/world/europe/russia-warned-united-states-against-sending-more-arms-ukraine-2022-04-25/>;

introduction of more and more weaponry into the battlefield, including their increasingly advanced types, as an example of a classic conflict escalation spiral.¹⁰⁸ Moreover, some have described this U.S. approach as “boiling the frog,” i.e., ratcheting up the pressure on Russia so gradually as to — successfully — avoid a major lashing out.¹⁰⁹ Regardless of these provisions and escalation dynamic, overall a collapse or defeat on the battlefield of either Russia or Ukraine were assessed as unlikely.¹¹⁰

Diversions Concerns

A significant concern among both supporters of increasing arms transfers to Ukraine and those skeptical of upping that effort, has been the potential for the military assistance to be diverted for nefarious purposes. The first part of this concern had to do with the global trend for simmering, or recently concluded, conflicts to fuel the weapons’ black market, particularly for small arms and ammunition. The second part related to Ukraine’s territory and organized crime elements featuring prominently in international trafficking (including arms, as well as nuclear and radiological materials) even before the 2014 Russian incursion — with the country being increasingly less able to counter these activities as the conflict intensified.¹¹¹ The third part built on Ukraine’ poor record of keeping tabs on the light weapons received through international assistance since 2014. For instance, over the period of 2013-2015, around 300,000 light weapons have gone missing, with only around 4,000 subsequently retrieved.¹¹² As the conflict progressed, over 2019-2020, cases surfaced of attempted theft and re-sales of dozens of RGD-5 grenades, as well as RPG rockets and a launcher.¹¹³

Against this backdrop, it is hardly surprising that calls for oversight and diversion concerns have been voiced since March 2022. However, many in Ukraine flatly denied such narratives as Russian

Maynes, C. (Apr 29, 2022). *Russia sharpens warnings as the U.S. and Europe send more weapons to Ukraine*. NPR. <https://www.npr.org/2022/04/29/1095458518/russia-ukraine-us-military-aid>; Alshaeva, I. (March 11, 2022). *Targets for Russian Missiles*. Nezavisimaya Gazeta. https://nvo.ng.ru/nvo/2022-03-10/1_1180_conflict.html.

¹⁰⁸ Charap, S. and Shapiro, J. (Aug 1, 2022). *Could U.S. Weapons Assistance to Ukraine Lead to Russian Escalation?* RAND. <https://www.rand.org/blog/2022/08/could-us-weapons-assistance-to-ukraine-lead-to-russian.html>; Speri, A. (Sep 10, 2022). *U.S. Military Aid to Ukraine Grows to Historic Proportions — Along with the Risks*. The Intercept. <https://theintercept.com/2022/09/10/ukraine-military-aid-weapons-oversight/>.

¹⁰⁹ Kendall-Taylor, A. (Oct 14, 2022). *Monterey Conversations: The Biden Administration Policy on Ukraine*. <https://www.youtube.com/watch?v=-e-dfy17uKc>.

¹¹⁰ Wasielewski, P. (April 8, 2022). *Appraising the War in Ukraine and Likely Outcomes*. FPRI. https://www.fpri.org/article/2022/04/appraising-the-war-in-ukraine-and-likely-outcomes/?utm_source=FPRI+E-Mails&utm_campaign=ed1dced958-Email-insights-2022-april-11&utm_medium=email&utm_term=0_e8d0f13be2-ed1dced958-179134869.

¹¹¹ See, e.g., Murauskaite, E. E. (2016). *Nuclear Smuggling and Threats to Lithuanian Security*. Lithuanian Annual Strategic Review 2015-2016. pp. 153-68; Clunan, A.L. and Trinkunas, H.A. (2010). *Ungoverned Spaces: Alternatives to State Authority in an Era of Softened Sovereignty* (Stanford University Press); Galeotti, M. (May 1, 2014). *Ukraine’s Mob War*. Foreign Policy. <https://foreignpolicy.com/2014/05/01/ukraines-mob-war/>.

¹¹² (May 17, 2022). *Experts warn arms for Ukraine could end up in wrong hands*. France24. <https://www.france24.com/en/live-news/20220517-experts-warn-arms-for-ukraine-could-end-up-in-wrong-hands>.

¹¹³ Giorno, T. (March 7, 2022). *Risk of weapons vanishing as over 20 countries send arms to Ukraine*. Quincy Institute for Responsible Statecraft. <https://responsiblestatecraft.org/2022/03/07/big-risk-of-weapons-vanishing-as-over-20-countries-send-arms-to-ukraine/>.

propaganda.¹¹⁴ In April, Europol investigators noted that Ukraine was no longer maintaining a register of arms handed out to civilians, and raised concerns that organized crime elements were already moving small arms from Ukraine into the European black markets.¹¹⁵ Further concerns were raised by operatives on the ground in Ukraine that during the first two months of the war only about a third of the international arms transfers were successfully making it to the front lines.¹¹⁶ For instance, ret. Col. Millburn, founder of the Mozart Group,¹¹⁷ has emphasized the problem of arms and equipment being stuck at the larger distribution centers, e.g., in Lviv, and not making it to the front lines.¹¹⁸ Logistical challenges were often at fault, and a portion of any arms and equipment were lost earlier in the war as Russian forces pushed out Ukrainian defenders.¹¹⁹

By July, Ukrainian and international oversight committees were set up to address potential concerns. The U.S. armed forces were said to be closely tracking the key armament systems provided (e.g., *Javelins*, howitzers etc.). However, other types of equipment, such as armored vehicles or counter-IED equipment, were not part of the purview and remained at potential risk of diversion.¹²⁰ In November, the United States sent additional unarmed military inspectors to Ukraine, and thus far there were no indications of weaponry being diverted to the black market.¹²¹ Although pressure was gradually growing for greater U.S. oversight, increasing inspector presence in Ukraine, especially closer to the end-points of the distribution chain near the front lines, remained unfeasible without considerable additional risks of conflict escalation by involving armed U.S. personnel.¹²² This has prompted the exploration of innovative technological

¹¹⁴ See, e.g., Homenko, S. (July 15, 2022). *Олексій Резніков: Закінчити війну до кінця року абсолютно можливо*. BBC. https://www.bbc.com/ukrainian/features-62176090?at_custom4=BEC5357C-0427-11ED-A76B-8F2B0EDC252D&at_medium=custom7&at_custom3=BBC+News+Ukraine&at_custom2=facebook_page&at_custom1=%5Bpost+type%5D&at_campaign=64&fbclid=IwAR1vJrwCle_QXleWZ30p8ynlTsQqmRqWZORipgFT9poy-j7FX2dHjXX1fCA.

¹¹⁵ Foy, H., Fleming S., and Olearchyk, R. (July 12, 2022). *Nato and EU sound alarm over risk of Ukraine weapons smuggling*. Financial Times. <https://www.ft.com/content/bce78c78-b899-4dd2-b3a0-69d789b8aee8>.

¹¹⁶ Yamaguchi, A. and Pena, A. (Aug 7, 2022). *Why military aid in Ukraine may not always get to the front lines*. CBS News. <https://www.cbsnews.com/news/ukraine-military-aid-weapons-front-lines/>.

¹¹⁷ Discussed in greater detail in the forthcoming project report on training, the Mozart Group is an independent initiative set up by retired veterans of the U.S. armed forces to train Ukrainian fighters in Ukraine and assist with delivering arms' supplies from the main logistical nodes, such as Lviv, to the front lines.

¹¹⁸ Milburn, A. (May 9, 2022). *Petraeus on Ukraine: A Conversation Between Gen. David Petraeus and Col. Andy Milburn*. <https://www.youtube.com/watch?v=I2rYpl8klNA>.

¹¹⁹ Kube, C. and McCausland, P. (Nov, 2022). *U.S. military inspectors in Ukraine to keep further track of weapons and equipment*. NBC News. <https://www.nbcnews.com/news/us-news/us-military-inspectors-ukraine-keep-track-weapons-equipment-rcna54891>.

¹²⁰ Cohen, J. (March 1, 2022). *Sending Weapons to Ukraine Could Have Unintended Consequences*. CATO Institute. <https://www.cato.org/commentary/sending-weapons-ukraine-could-have-unintended-consequences#>.

¹²¹ Kube, C. and McCausland, P. (Nov, 2022). *U.S. military inspectors in Ukraine to keep further track of weapons and equipment*. NBC News. <https://www.nbcnews.com/news/us-news/us-military-inspectors-ukraine-keep-track-weapons-equipment-rcna54891>; Freedman, L. (Oct 19, 2022). *Russia-Ukraine Dialogues: battlefield updates*. LSE. <https://www.youtube.com/watch?v=Qow33e-IQFM>.

¹²² Demirjian, K. (Nov 27, 2022). *Pressure builds to step up weapons tracking in Ukraine*. Washington Post. <https://www.washingtonpost.com/national-security/2022/11/27/biden-ukraine-weapons/>.

approaches to tracing the weapons distributed (e.g., apps and blockchain),¹²³ the effectiveness of which is to be seen in the coming years.

Overall, the expert consensus seemed to be that any major arms trafficking incidents were most likely to emerge if or when the war would either conclude or reach a more stable stalemate, with the fighting dying down, rather than featuring in the currently active conflict environment.¹²⁴ Nevertheless, concerns have been consistently expressed about the onwards spread of weapons supplied to Ukraine in the post-conflict environment.¹²⁵

Conclusion

This study has traced the key U.S. arms transfers through different phases of the war in Ukraine in 2022, assessing their perceived impact from a multitude of vantage points — public and expert, U.S., European, and Russian.

Overall, the emerging wisdom seems to be that intelligence and training have been the key factors deciding the impact of a particular weapons' technology in this conflict. Drones and HIMARS played a huge role, generating some of the critical inflection points during the war, but the associated training, wargaming, and intelligence sharing were key force multipliers enabling those effects. Transfers of older armaments and limited capability systems, while appearing somewhat poorly from an information campaign and signaling point of view, turned out to be just as valuable on the battlefield.

However, the diversity of incompatible Western systems comprising Ukraine's arsenal has become a major challenge, amplifying the training and logistical issues associated with arranging maintenance and procuring spare parts in a conflict environment. Many of these challenges were further amplified by the remote-only support options, as the risks for more direct U.S. presence on the ground are still deemed too steep. Moreover, the unusually high use rate of weapons and ammunition have highlighted significant gaps in Western (not just U.S. or Ukrainian) defense planning in terms of procurements, initiating global strategic posture conversations and raising practical questions about deterrence capabilities and effectiveness.

Finally, while fears of provoking Russian escalation plagued every step, the gradual U.S. vertical escalation approach has successfully avoided it thus far, while enabling Ukraine with increasingly sophisticated weaponry.

¹²³ Toosi, N. and Bender, B. (Dec 14, 2022). *U.S. cable warns of major barriers to tracking Ukraine aid*. Politico. <https://www.politico.com/news/2022/12/14/us-ukraine-aid-cable-00073803>.

¹²⁴ (Aug 9, 2022). *A Case for More Oversight of Military Aid to Ukraine*. Arms Control, Vol. 14 No. 6. <https://www.armscontrol.org/issue-briefs/2022-08/case-more-oversight-military-aid-ukraine>; Willsher, K. (June 2, 2022). *Arms sent to Ukraine will end up in criminal hands, says Interpol chief*. The Guardian. <https://www.theguardian.com/world/2022/jun/02/ukraine-weapons-end-up-criminal-hands-says-interpol-chief-jurgenstock>.

¹²⁵ Vaynman, J. and Volpe, T. (March 11, 2022). *Making Coercion Work Against Russia*. War on the Rocks. <https://warontherocks.com/2022/03/making-coercion-work-against-russia/>.



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