

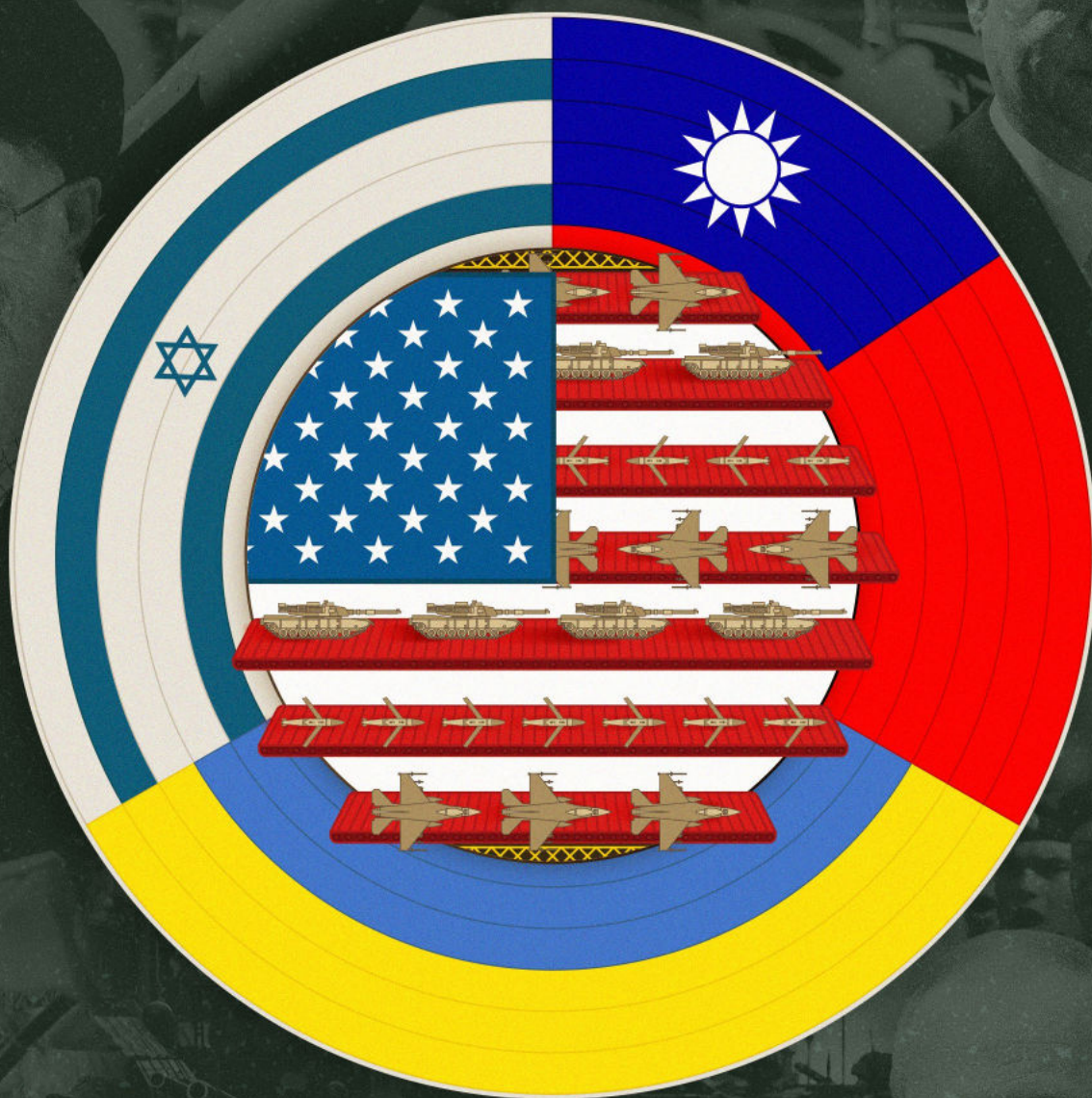


Arsenal of Democracy

Arming Taiwan, Ukraine, and Israel While Strengthening the U.S. Industrial Base

Ryan Brobst and Bradley Bowman

April 2025



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FDD PRESS

A division of the
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Washington, DC

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Introduction

China, Russia, Iran, and North Korea are sprinting to strengthen their military capabilities and are increasingly working together to threaten the United States and its interests. Thankfully, Americans have valuable partners in Taiwan, Ukraine, and Israel who are willing to fight to defend themselves and the interests they share with the United States. But to be successful, Taipei, Kyiv, and Jerusalem need American weapons. By transferring these arms, Washington can defend its interests without sending American troops to the battlefield.

But can the United States simultaneously arm Taiwan, Ukraine, and Israel? Or must Washington choose between them? And can the United States arm its partners while also producing the weapons the U.S. military needs? How healthy is the American defense industrial base (DIB) when it comes to building the weapons beleaguered democracies need? And how can the American arsenal of democracy be strengthened?

To answer these questions, this paper examines in detail 25 weapon systems that the United States provides or may provide to Ukraine and Taiwan, or to Ukraine, Taiwan, and Israel. The evidence shows there has not been a material delay in the delivery of the examined weapon systems to Taiwan or Israel because of American efforts to support Ukraine. But this does not mean America's DIB is in good health. Without prudent reforms and substantial new investments, the DIB may not be capable of sustaining America's role as the arsenal of democracy.

America's Interests in the Defense of Taiwan, Ukraine, and Israel

The United States is in intense global competition with the Chinese Communist Party (CCP), and that competition is most acute in the Taiwan Strait.¹ If China initiates a naval blockade or invasion of Taiwan, the United States could be forced to make a difficult choice: 1) go to war against China and potentially see thousands of American service members lose their lives; or 2) take no military action — abandoning a democratic partner, empowering the CCP, and dealing a serious blow to American security, credibility, and prosperity that will reverberate widely for years to come.²

However, the United States may never have to face that choice if it provides Taiwan with the military capabilities necessary to convince Beijing that aggression against Taipei would fail or not be worth the high costs. Reinforcing deterrence is far less costly than confronting aggression. That is surely a lesson that Russia's 2022 invasion of Ukraine has underscored.

The people of Ukraine are defending themselves against that unprovoked invasion, in what constitutes the largest war in Europe since World War II. Sending arms to help Ukraine defend itself is a wise and sustainable investment for the United States, as it degrades Russian combat capabilities, decreases Russia's ability to launch further aggression, and reduces the chances that Moscow will attack NATO member states.³ Supporting Ukraine not only serves core U.S. national security interests in Europe but also sends a valuable deterrent

1. U.S. Department of Defense, Report to Congress, "Military and Security Developments Involving the People's Republic of China," October 19, 2023. (<https://media.defense.gov/2023/Oct/19/2003323409/-1/-1/1/2023-MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA.PDF>); "US Navy sends first warship through Taiwan Strait post-election," *Reuters*, January 24, 2024. (<https://www.reuters.com/world/us-navy-says-uss-john-finn-conducted-transit-taiwan-strait-2024-01-24>)

2. Mark F. Cancian, Matthew Cancian, and Eric Heginbotham, "The First Battle of the Next War: Wargaming a Chinese Invasion of Taiwan," *Center for Strategic and International Studies*, January 2023. (https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/230109_Cancian_FirstBattle_NextWar.pdf?VersionId=WdEUwJYWlySMPIr3ivhFolxC_gZQuSOQ); David Sacks, "Why Is Taiwan Important to the United States?" *Council on Foreign Relations*, June 20, 2023. (<https://www.cfr.org/blog/why-taiwan-important-united-states>)

3. @Brad_L_Bowman, X, November 1, 2024. (https://x.com/Brad_L_Bowman/status/1852423177571578292); Luke Coffey, "The North Atlantic Treaty Organization at 75: Reflecting on Past Successes and Planning for the Future," *Testimony before the Senate Foreign Relations Subcommittee on Europe and Regional Security Cooperation*, January 29, 2024. (https://www.foreign.senate.gov/imo/media/doc/5ce607f1-c805-d98c-d58f-143a4fe4dfe4/013124_Coffey_Testimony.pdf); Jim Garamone, "Paparo Says Ukraine Aid Will Help Deter China in Indo-Pacific," *DOD News*, February 1, 2024. (<https://www.defense.gov/News/News-Stories/Article/Article/3664135/paparo-says-ukraine-aid-will-help-deter-china-in-indo-pacific>)

message to other adversaries contemplating aggression against American allies and partners.⁴

Deterrence is based on the adversary's perception of both U.S. military capabilities and Washington's political will to use those capabilities. Thus, a failure to support Ukraine after publicly committing to do so would have consequences far outside the region, which is perhaps why Taiwan has supported American assistance to Kyiv.⁵ Not a single U.S. service member is fighting in Ukraine, and the U.S. security assistance committed to Ukraine is equivalent to less than 3 percent of what the United States spent on the Pentagon since the 2022 Russian invasion.⁶ If Americans nevertheless abandon Kyiv or pressure it to accept terms favorable to Moscow, Beijing will likely conclude that the United States will not send American forces to fight in the Taiwan Strait.⁷ This would render aggression toward Taiwan and a costly war in the Pacific more likely.⁸

Finally, the Islamic Republic of Iran — which views the United States as its archenemy — is undertaking a methodical campaign against the State of Israel, America's most reliable and capable partner in the Middle East.⁹ Since 1979, and especially in the past year, Israel has proven it has no equal among America's partners in countering Iran and its terrorist network, which includes terrorist groups such as Hamas and Hezbollah.¹⁰

The American military is more capable because of its intelligence sharing and security cooperation with Israel. In addition, the U.S. and Israeli governments, along with companies from both countries, regularly cooperate on cutting-edge systems that have improved the safety and capability of U.S. troops.¹¹ Helping Israel deter, degrade, and defeat terrorist organizations such as Hamas and Hezbollah, which have attacked and killed hundreds of U.S. citizens and service members, strengthens U.S. national security.¹²

4. Bradley Bowman and H.R. McMaster, "Supporting Ukraine and Israel Will Help Deter Aggression Around the World," *Newsweek*, February 21, 2024. (<https://www.newsweek.com/supporting-ukraine-israel-will-deter-aggression-around-world-opinion-1870864>)

5. Elbridge A. Colby, *The Strategy of Denial: American Defense in an Age of Great Power Conflict* (New Haven: Yale University Press, 2021), page 55.; Phelim Kine, "Taiwan's leadership 'extremely worried' US could abandon Ukraine," *Politico*, February 23, 2024. (<https://www.politico.com/news/2024/02/23/taiwan-leadership-u-s-ukraine-00143047>)

6. @Brad_L_Bowman, X, November 1, 2024. (https://x.com/Brad_L_Bowman/status/1852423177571578292)

7. Bradley Bowman, "What Happens in Kyiv Doesn't Stay in Kyiv," *The Wall Street Journal*, January 17, 2025. (<https://www.wsj.com/opinion/what-happens-in-kyiv-doesnt-stay-in-kyiv-8e93b23b?st=fjy1qZ>)

8. Bradley Bowman, Mark Montgomery, and Richard Thornton, "Beijing Is Listening as Americans Threaten Taiwan," *The Wall Street Journal*, September 12, 2024. (<https://www.wsj.com/opinion/china-taiwan-invasion-defense-elbridge-colby-e6db62a8?st=zX4GbD>); Bradley Bowman and H.R. McMaster, "Supporting Ukraine and Israel Will Help Deter Aggression Around the World," *Newsweek*, February 21, 2024. (<https://www.newsweek.com/supporting-ukraine-israel-will-deter-aggression-around-world-opinion-1870864>)

9. Following decades of supporting terror proxies targeting Israel, the Islamic Republic of Iran attacked Israel directly twice, once on April 13, 2024, and again on October 1, 2024.

10. Bradley Bowman, "How America benefits from its security partnership with Israel," *The Washington Times*, October 29, 2024. (<https://www.washingtontimes.com/news/2024/oct/29/america-benefits-security-partnership-israel>)

11. The White House, Press Release, "FACT SHEET: U.S.-Israel Strategic High-Level Dialogue on Technology," September 30, 2022. (<https://il.usembassy.gov/fact-sheet-u-s-israel-strategic-high-level-dialogue-on-technology>); Bradley Bowman, "The U.S.-Israel Operations-Technology Working Group Gets Busy," *Foundation for Defense of Democracies*, December 20, 2022. (<https://www.fdd.org/analysis/2022/12/20/the-u-s-israel-operations-technology-working-group-gets-busy>)

12. Sammy Westfall, "Nearly two-dozen Americans have been killed in Israel-Gaza war, U.S. says," *The Washington Post*, January 23, 2024. (<https://www.washingtonpost.com/national-security/2024/01/23/americans-killed-israel-gaza-war>); Antony J. Blinken, U.S. Department of State, "40th Anniversary of the Beirut Marine Corps Barracks Bombing," October 23, 2023. (<https://2021-2025.state.gov/40th-anniversary-of-the-beirut-marine-corps-barracks-bombing>); On July 30, 2024, Israel killed Fuad Shukr, a top Hezbollah commander whom the United States government says played a "key role" in the 1983 Beirut Marine barracks bombing that resulted in the deaths of 241 U.S. military personnel.; U.S. Department of State, Embassy in Egypt, "Rewards for Justice – Reward Offer for Information on Hizballah Key Leaders Talal Hamiyah and Fu'ad Shukr," October 10, 2017. (<https://2017-2021.state.gov/rewards-for-justice-reward-offer-for-information-on-hizballah-key-leaders-talal-hamiyah-and-fuad-shukr>)

Arming Taiwan, Ukraine, and Israel

U.S. interests in providing Taiwan, Ukraine, and Israel with the weapons they need are clear, but does the United States have the ability to arm these three partners simultaneously?¹³ The essential strategic impulse behind this question is sound. Resources, after all, are not infinite. Leaders must establish priorities and make tough decisions. That is the essence of strategy — the coordination of ends and means.

Some suggest the United States cannot support all three beleaguered democracies, citing alleged delays in deliveries to Taiwan purportedly caused by aid to Ukraine or the depletion of U.S. stockpiles.¹⁴ But is it true that U.S. support for Ukraine has materially slowed U.S. weapons deliveries to Taiwan? What role has U.S. support for Israel played? Some express opinions on these questions without supporting evidence.¹⁵ Until now, there has not been a sufficiently systematic investigation of the relationship between support for Ukraine and weapons deliveries to Taiwan — or, for that matter, deliveries to Israel. The evidence shows the falsehood of claims that the United States cannot arm Taiwan, Ukraine, and Israel simultaneously.

This report consists of four sections. They detail the study's methodology and provide an overview of the mechanisms the U.S. government uses to transfer arms to foreign partners; present the report's main findings; provide the foundation for this analysis, scrutinizing 25 specific weapon systems and munitions with actual or

possible overlap between Taiwan, Ukraine, and Israel; and provide 18 recommendations for strengthening the U.S. defense industrial base, addressing the needs of allies and partners, and ensuring sufficient defense spending.

Of the 25 weapon systems examined, none experienced a material delay in delivery to Taiwan or Israel due to the commitment of that system to Ukraine. As detailed in this report, a material delay is defined as more than one year for an existing (signed) order.

“The evidence shows claims that the United States cannot arm Taiwan, Ukraine, and Israel simultaneously do not withstand scrutiny.”

However, the absence of delays does not necessarily mean that the DIBs (supply chains and production capacity/capability) associated with the production of those 25 systems are healthy or sufficient. In many cases, they are not. For the 25 weapon systems considered, seven of their DIBs were assessed as strong, 14 require attention, and four are weak.

In the second Trump administration, many priorities will compete for attention. It is difficult to imagine a higher priority than taking steps to better secure the United States and bolster deterrence. That will require the administration to spend more on defense, supercharge the U.S. defense industrial base, bolster U.S. military readiness, reform the Foreign Military Sales (FMS) process, and expand security assistance to Taiwan, Ukraine, and Israel.

13. Bradley Bowman and Mark Montgomery, “Supporting America’s Allies Puts America First,” *National Review*, February 23, 2024. (<https://www.nationalreview.com/2024/02/supporting-americas-allies-puts-america-first>)

14. @ElbridgeColby, X, October 3, 2024. (<https://x.com/ElbridgeColby/status/1841874646028681651>); @ElbridgeColby, X, June 25, 2024. (<https://x.com/ElbridgeColby/status/180555524374556983>)

15. Alex Velez-Green, “Prioritizing Ukraine Aid Threatens Deterrence by Denial in the Pacific,” *The Heritage Foundation*, July 26, 2023. (<https://www.heritage.org/global-politics/commentary/prioritizing-ukraine-aid-threatens-deterrence-denial-the-pacific>); Alex Velez-Green, “Managing Trade-offs Between Military Aid for Taiwan and Ukraine,” *The Heritage Foundation*, August 31, 2023. (<https://www.heritage.org/defense/report/managing-trade-offs-between-military-aid-taiwan-and-ukraine>); Bradley Bowman, Russell Hsiao, Michael Mazza, Yuki Tatsumi, and Alexander Velez-Green, “November 30: Implications of Global Conflicts for Taiwan Strait Security,” *Panel at Global Taiwan Institute*, November 30, 2023. (<https://globaltaiwan.org/events/november-30-implications-of-global-conflicts-for-taiwan-strait-security>)

Methodology and Background

This project initially sought to examine the effects of military support for Ukraine on the delivery of weapons to Taiwan. Following the October 7, 2023, attack on Israel by Hamas, the scope of the project expanded to include the effects of support for Ukraine on deliveries to Israel.

To identify systems that Taipei purchased, the FDD research team cataloged all potential FMS to Taiwan notified to Congress by the Pentagon's Defense Security Cooperation Agency (DSCA) between January 1, 2015, and September 30, 2024.¹⁶ The authors separated the sales into two categories. The first category [listed in Figure 3] consists of sales that include major weapon systems.¹⁷ The second category [listed in Figure 4] consists of sales that primarily include spare parts, contractor support, localized communication equipment, maintenance, or upgrades. There is frequently no official delivery date for items in the second category since they generally constitute ongoing support for the buyer's existing systems. In the absence of a delivery date, one cannot quantify a delay. Additionally, items in the second category are less likely to strain the DIB.

To identify weapons that were ordered by Taiwan that have been or might be committed to Ukraine, this report compares FMS to Taiwan in the first category with the list of weapon systems and munitions committed to Ukraine that the U.S. Department of State released on September 27, 2024.¹⁸

The United States has provided, or committed to provide, a large quantity and variety of major

weapon systems to Israel since that date.¹⁹ The Biden administration did not release a fact sheet detailing aid to Israel, but the research team identified many systems through open sources.

This report examines 13 weapon systems for actual or possible overlap between Ukraine and Taiwan and examines an additional 12 weapon systems for actual or possible overlap between all three partners, for a total of 25. For each system, researchers examined data regarding quantities ordered, delivery timelines, contract details, production capacity, and other relevant information. (See the Weapon Systems section for profiles of individual systems.)

Transfer Mechanisms

There are four major mechanisms the United States uses to transfer weapon systems to allies and partners: Foreign Military Sales (FMS), Direct Commercial Sales (DCS), Excess Defense Articles (EDA), and Presidential Drawdown Authority (PDA). These four mechanisms each have different characteristics, some of which impact the delivery timeline and contracting process.

FMS is a mechanism in which a foreign government places an order for a system or services, but the U.S. Department of Defense (DOD) contracts with industry on behalf of the foreign government to procure the system. Most large systems, such as aircraft, ships, and tanks, go through the FMS process. The U.S. government generally considers advanced systems such as fighter aircraft, various ground-based air defenses, air-to-air missiles, standoff weapons, unmanned aerial systems, and others only available for export through

16. Not all FMS notified to Congress result in delivered capabilities, and the number of delivered systems may differ from the number notified. An overview of the U.S. Arms Sales process, including the difference between FMS/USAI, DCS, EDA, and PDA can be found in Appendix A.; Paul K. Kerr, "Arms Sales: Congressional Review Process," *Congressional Research Service*, August 13, 2024. (<https://crsreports.congress.gov/product/pdf/RL/RL31675>); "Major Arms Sales," *Defense Security Cooperation Agency*, accessed October 18, 2024. (<https://www.dscs.mil/press-media/major-arms-sales>)

17. For the purposes of this report, "major weapon systems" includes major military weapon systems from anti-tank weapons to fighter jets but does not include unguided munitions 105 mm or smaller in caliber.

18. U.S. Department of State, Press Release, "U.S. Security Cooperation with Ukraine," September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>)

19. Bradley Bowman and Richard Goldberg, "How to Ensure Israel Has the Weapons It Needs," *Foundation for Defense of Democracies*, March 14, 2024. (<https://www.fdd.org/analysis/2024/03/14/how-to-ensure-israel-has-the-weapons-it-needs>)

FMS.²⁰ As part of the process, the United States has provided weapons to Kyiv via the Ukraine Security Assistance Initiative (USAI).²¹

DCS is a second mechanism by which U.S. defense companies sell directly to foreign buyers, although the export licenses are approved by the U.S. government and the potential sales are submitted to Congress if they are above a designated dollar threshold.²²

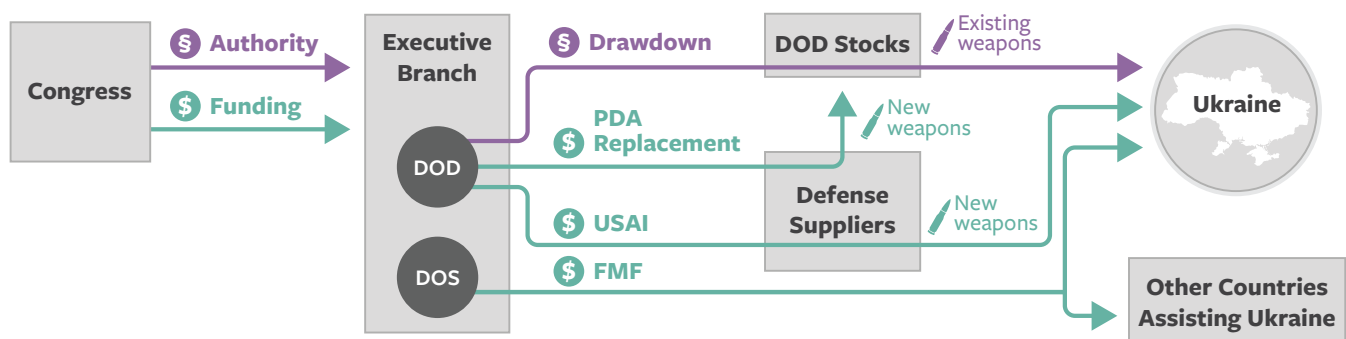
The EDA mechanism is used for cases in which defense articles deemed excess to U.S. needs “can be offered to foreign governments or international organizations in support of U.S. national security and foreign policy objectives,” according to the Defense Security Cooperation Agency.²³ The value of systems transferred

as EDA is a fraction of the value associated with conventional FMS and DCS.²⁴

The PDA mechanism enables the DOD to transfer systems to foreign governments from existing U.S. stockpiles. This is mostly used as an emergency response to a contingency, such as the 2022 Russian invasion, although the United States is starting to use PDA to deliver systems to Taiwan to deter a potential contingency.²⁵

For a more detailed description of the mechanisms through which the United States transfers arms to other countries, see Appendix A. For a discussion of the report’s scope, see Appendix B.

Figure 1: Ukraine-Related Funding and Authorities: Selected Funding and Authorities Used to Aid Ukraine and Replenish U.S. Stocks



Source: Congressional Research Service²⁶

20. U.S. Department of Defense, Defense Security Cooperation Agency, “Security Cooperation Management — Chapter 15: A Comparison of Foreign Military Sales and Direct Commercial Sales,” September 2023. (<https://www.dscu.edu/sites/default/files/2024-04/15-chapter.pdf>)

21. Christina L. Arabia, Andrew S. Bowen, Jennifer DiMascio, Daniel M. Gettinger, Brendan W. McGarry, and Luke A. Nicastro, “Defense Production for Ukraine: Background Issues for Congress,” *Congressional Research Service*, September 16, 2024. (<https://crsreports.congress.gov/product/pdf/R/R48182>)

22. Paul K. Kerr, “Arms Sales: Congressional Review Process,” *Congressional Research Service*, August 13, 2024. (<https://crsreports.congress.gov/product/pdf/RL/RL31675>)

23. “Excess Defense Articles (EDA),” U.S. Department of Defense, Defense Security Cooperation Agency, accessed October 18, 2024. (<https://www.dsca.mil/programs/excess-defense-articles-eda>)

24. U.S. Department of Defense, Department of the Navy, “Excess Defense Articles (EDA),” accessed October 18, 2024. (<https://www.secnav.navy.mil/nipo/Pages/About/Security%20Assistance/Excess-Defense-Articles.aspx>)

25. U.S. Department of Defense, Office of the Inspector General, “(U) Evaluation of the DoD’s Tracking and Accountability of Presidential Drawdown Equipment Provided to Taiwan,” September 11, 2024. (https://media.defense.gov/2024/Sep/12/2003542471/-1/-1/1/DODIG-2024-130_REDACTED%20SECURE.PDF)

26. Christina L. Arabia, Andrew S. Bowen, Jennifer DiMascio, Daniel M. Gettinger, Brendan W. McGarry, and Luke A. Nicastro, “Defense Production for Ukraine: Background Issues for Congress,” *Congressional Research Service*, September 16, 2024. (<https://crsreports.congress.gov/product/pdf/R/R48182>)

Classification of Ukraine Impact and Defense Industrial Base Health

For each of the 25 systems with actual or potential overlap, the authors investigated two key issues: 1) the duration of any delays to orders placed by Taiwan or Israel resulting or likely resulting from the United States providing the systems to Ukraine; and 2) the overall health of the defense industrial base supporting the manufacturing and production of each system. Depending on the length of any delay, each of the 25 systems was placed in one of three classifications reflecting the level of **“Ukraine Impact.”**

- **“No Material Delay”** designates systems provided or potentially provided to Ukraine that delayed delivery of existing (signed) orders for that system to Taiwan or Israel by less than one year.²⁷
- **“Manageable Delay”** designates systems provided or potentially provided to Ukraine that delayed delivery of that system to Taiwan or Israel by more than one year but less than two years.
- **“Significant Delay”** designates systems provided or potentially provided to Ukraine that delayed delivery of that system to Taiwan or Israel by more than two years.

Each of the 25 systems was also placed in one of three classifications under **“Defense Industrial Base”** based on the overall health of U.S.-based production of that system.²⁸ In some cases, delivery of a system to Ukraine may not have delayed delivery to Taiwan or Israel, but the system’s DIB may nonetheless require attention. If a given system is no longer in production due to replacement by newer systems, this classification only indicates the health of the stockpile. If the system is not yet in production because it is still under development, the status of the development program is assessed instead.

- **“Strong”** designates systems that are stockpiled in large numbers and are produced in quantities sufficient to meet reasonable future needs.²⁹
- **“Requires Attention”** designates systems that are either stockpiled in limited numbers or require increases in production that can be achieved within two years to meet reasonable future needs.
- **“Weak”** designates systems that either have very limited stockpiles or need large increases in production that cannot be achieved within two years absent extraordinary measures.

The information regarding timelines and production capacity in this report is based on unclassified information available as of September 30, 2024, and some of the information may have changed since then.

27. It is possible that Taiwan or Israel could need more or different types of aid in the future and sign additional orders. This report offers a snapshot during the designated time frame, not a prediction of future orders. For a discussion of the designated time frames, see Appendix C.

28. Whether existing domestic defense production capacity is sufficient depends on several variables and assumptions, many of which are difficult to predict and are beyond the control of the United States. Decision-makers should examine these variables and assumptions, including any related to access to critical components and resources, as well as the likelihood of the United States confronting in the future simultaneous major wars against great power adversaries. There is further discussion of these challenges and what to do about them in the analysis and recommendation sections.

29. “Reasonable future needs” refers here to the continued provision of weapons to Taiwan, Ukraine, and Israel, as well as the replenishment of depleted U.S. stockpiles to roughly pre-February 2022 levels. The term is not intended to include what is needed for a great power war, much less simultaneous wars against two great power adversaries. Countries entering great power conflicts almost never have pre-war stockpiles sufficient to last the entirety of the war.

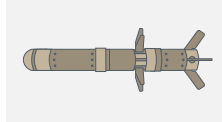
Actual or Potential Weapon Systems Overlap by Partner*



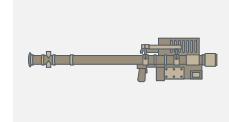
Ukraine



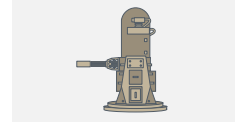
Taiwan



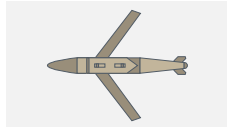
FGM-148
Javelin Advanced
Anti-Tank Weapon
System-Medium



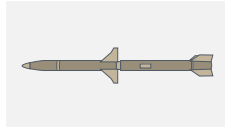
FIM-92 Stinger
Missile System



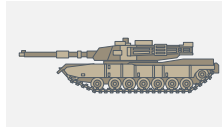
**Phalanx Close-In
Weapons System
(CIWS)**



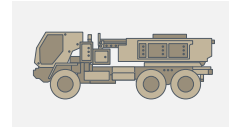
AGM-154C
Joint Standoff
Weapon (JSOW)



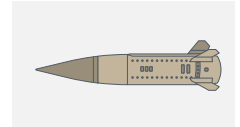
AGM-88 High-Speed
Anti-Radiation
Missile (HARM)



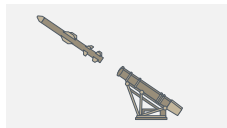
M1
Abrams Tank



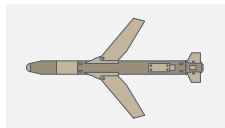
M142 High Mobility
Artillery Rocket
System (HIMARS)



Army Tactical Missile
System (ATACMS)



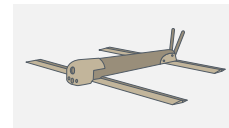
Harpoon Coastal
Defense System
(HCDS) and Harpoon
Block II Missile



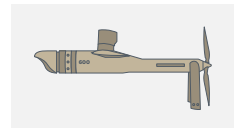
AGM-84 Standoff
Land Attack Missile –
Expanded Response
(SLAM-ER)



M109
Paladin Self-Propelled
Howitzer



Switchblade 300
Anti-Personnel and
Anti-Armor Loitering
Missile System



ALTIUS-600M



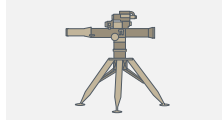
Ukraine



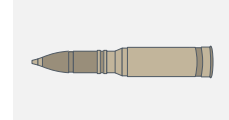
Taiwan



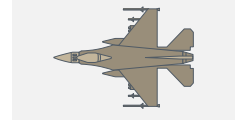
Israel



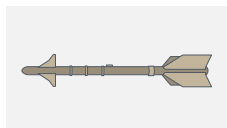
BGM-71 Series TOW
Missile System



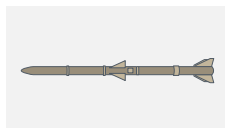
120 mm
Tank Ammunition



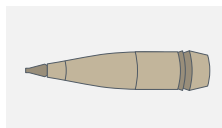
F-16 Fighting Falcon
Multirole Fighter
Aircraft



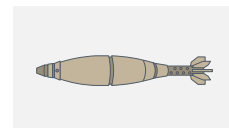
AIM-9
Sidewinder Missile



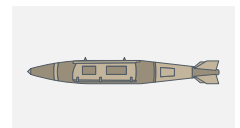
AIM-120 Advanced
Medium Range
Air-to-Air Missile
(AMRAAM)



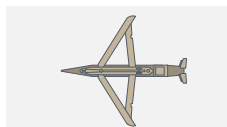
155 mm
Artillery Ammunition



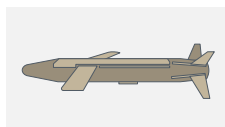
120 mm
Mortar Ammunition



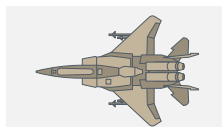
Joint Direct Attack
Munition (JDAM)



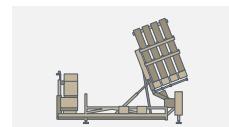
GBU-39B
Small Diameter Bomb
(SDB)



SPICE
Guidance Kit



F-15 Eagle Multirole
Fighter Aircraft



Iron
Dome

*Some systems not yet committed to each partner, but could be in the future.

Defense Industrial Base Health

STRONG



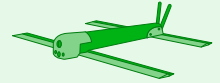
Phalanx Close-in Weapons System (CIWS)



AGM-88 High-Speed Anti-Radiation Missile (HARM)



M1 Abrams Tank



Switchblade 300 Anti-Personnel and Anti-Armor Loitering Missile System



BGM-71 Series TOW Missile System



Joint Direct Attack Munition (JDAM)



GBU-39B Small Diameter Bomb (SDB)

REQUIRES ATTENTION



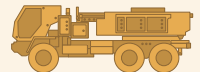
FGM-148 Javelin Advanced Anti-Tank Weapon System-Medium



FIM-92 Stinger Missile System



AGM-154C Joint Standoff Weapon (JSOW)



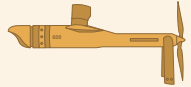
M142 High Mobility Artillery Rocket System (HIMARS)



Army Tactical Missile System (ATACMS)



M109 Paladin Self-Propelled Howitzer



ALTIUS-600M



120 mm Tank Ammunition



F-16 Fighting Falcon Multirole Fighter Aircraft



AIM-9 Sidewinder Missile



120 mm Mortar Ammunition



SPICE Guidance Kit

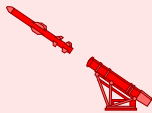


F-15 Eagle Multirole Fighter Aircraft

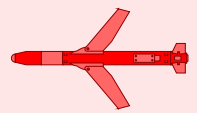


Iron Dome

WEAK



Harpoon Coastal Defense System (HCDS) and Harpoon Block II Missile



AGM-84 Standoff Land Attack Missile – Expanded Response (SLAM-ER)



AIM-120 Advanced Medium Range Air-to-Air Missile (AMRAAM)



155 mm Artillery Ammunition

Analysis

This study demonstrates that the provision or potential provision of the 25 examined weapon systems to Ukraine did not materially delay their provision to Taiwan or Israel. There are at least four reasons why that is the case.

First, the three partners have somewhat different needs due to variability in their geography, the capabilities of their adversaries, and the nature of the conflict in which they are or might be engaged. As a result, the number of major systems or munitions needed in significant quantities by two or more of these partners is relatively limited. For example, Israel had almost no need for large anti-ship weapons in its conflict with Hamas and Hezbollah, whereas Taiwan urgently needs large numbers of Harpoon anti-ship missiles.

Second, where there is overlap in the needs of Taiwan, Ukraine, and Israel, the respective production lines are often healthy and/or expanding. This is the case with the High Mobility Artillery Rocket System (HIMARS). Taiwan is set to receive more HIMARS, and on an accelerated timeline, than it did before the 2022 Russian invasion, due to production increases.

Third, in several cases — but not all — the United States possesses a large inventory or stockpile of the relevant system that enables, or potentially enables, its provision to partners from U.S. inventories via Presidential Drawdown Authority. This is the case with the Joint Direct Attack Munition (JDAM), which the Pentagon stockpiles in large numbers, produces thousands of each year, and for which the United States retains significant spare production capacity.

Fourth, most of the weapons Taipei and Jerusalem seek from Washington are being acquired through contracts for new systems rather than the transfer of older systems already in the U.S. military's inventory. In contrast, many of the systems and munitions sent to Ukraine were existing systems already in the U.S. military's inventory and sent to Kyiv using PDA. Critics of U.S. security

assistance to Ukraine, therefore, cannot credibly argue that providing Kyiv with older weapons from the U.S. military's existing inventory has slowed the production of new capabilities by industry. An example of this dynamic is the Advanced Medium-Range Air-to-Air Missile (AMRAAM). Taipei and Jerusalem ordered an advanced, yet-to-be-fully fielded model, whereas Kyiv has received older variants.

However, the limited tension between the needs of Taiwan, Ukraine, and Israel does not necessarily mean that the DIBs associated with the production of the systems are healthy or sufficient. For the 25 weapon systems considered, seven, or 28 percent, of the respective DIBs were assessed as strong. Meanwhile, 14 require attention, and four are weak, putting 72 percent in those two categories.

“Critics of U.S. security assistance to Ukraine, therefore, cannot credibly argue that providing Kyiv with older weapons from the U.S. military's existing inventory has slowed the production of new capabilities by industry.”

For systems or munitions assessed to have a DIB that is weak or that requires attention, there were three primary reasons. First, in some instances, production of a particular system or munition had ceased, such as the Stinger missile. Second, a system or munition may have experienced large swings in procurement quantities over time, reducing the incentive for industry to invest in production or maintain sufficient production capacity. Third, a system or munition may have recently entered service, not giving production capacity a chance to expand yet.

To be clear, these problems are not the result of U.S. security assistance to Ukraine. Rather, they are the result of misguided decisions that contributed to systemic problems associated with the DIB, defense contracting, and the FMS process. Indeed, these problems did not emerge overnight but over decades.³⁰

30. Seth Jones, “Empty Bins in a Wartime Environment,” *Center for Strategic and International Studies, International Security Program*, January 2023. (https://csis-website-prod.s3.amazonaws.com/s3fs-public/2023-01/230119_Jones_Empty_Bins.pdf?VersionId=mW3OOngwul8V2nR2EHKBYxkpiOzMis88)

The Consequences of Insufficient Defense Spending

Following the end of the Cold War, leaders of both political parties fell prey to a mistake that the United States has often made after major wars: an excessive reduction in defense spending. That decision damaged the U.S. DIB and hurt military capacity. At the infamous so-called “last supper” in 1993, then Deputy Secretary of Defense William Perry told the executives of major U.S. defense firms that they should consolidate into a small number of large firms, as defense budget cuts would endanger the existence of many of their companies.³¹ Perry reportedly stated, “We expect defense companies to go out of business. We will stand by and watch it happen.”³²

And go out of business they did. The reduction in defense investment in the 1990s resulted in the number of major U.S. aerospace prime contractors falling from more than 50 to five by the early 2000s.³³ That, in turn, reduced competition and the DIB’s production capacity. Many production lines closed completely, and the capacity of others declined significantly.³⁴ According to the Congressional Research Service (CRS), the

production output of the commercial DIB decreased by approximately 35 percent during the 1990s.³⁵

The issue with restarting shuttered production lines is not generally a lack of raw materials, as the civilian economy consumes far more of most resources, such as metals and electronics, than defense production does. The difficulty in setting up or expanding defense production is typically in building the facilities and creating the tooling to make components or munitions that are only used in military, not commercial production.³⁶ For example, scaling up 155 mm artillery rounds eventually required “literally building new factories and putting advanced machine tools in them,” according to Doug Bush, the former assistant secretary of the Army for acquisition, logistics, and technology.³⁷ Or, in the case of Stinger, a component in the missile’s seeker had to be redesigned from scratch before full-scale production could restart.³⁸

More recently, the Budget Control Act of 2011, and the associated implementation of sequestration, put additional downward pressure on the defense budget.³⁹ In 2011, spending on the Department of Defense constituted 4.4 percent of U.S. gross domestic product

31. John Mintz, “How a Dinner Led to a Feeding Frenzy,” *The Washington Post*, July 3, 1997. (<https://www.washingtonpost.com/archive/business/1997/07/04/how-a-dinner-led-to-a-feeding-frenzy/13961ba2-5908-4992-8335-c3c087cdebc6/>)

32. John Tirpak, “The Distillation of the Defense Industry,” *Air & Space Forces Magazine*, July 1998. ([https://www.airandspaceforces.com/PDF/MagazineArchive/Documents/1998/July 1998/0798industry.pdf](https://www.airandspaceforces.com/PDF/MagazineArchive/Documents/1998/July%201998/0798industry.pdf))

33. U.S. National Aeronautics and Space Administration, “FINAL REPORT of the Commission on the Future of the United States Aerospace Industry,” November 2002. (<https://www.nasa.gov/wp-content/uploads/2024/01/aerocommissionfinalreport.pdf>)

34. U.S. Department of Defense, Office of the Under Secretary of Defense for Acquisition and Sustainment, “State of Competition within the Defense Industrial Base,” February 2022. (<https://media.defense.gov/2022/Feb/15/2002939087/-1/-1/1/STATE-OF-COMPETITION-WITHIN-THE-DEFENSE-INDUSTRIAL-BASE.PDF>)

35. Luke A. Nicastro, “The U.S. Defense Industrial Base: Background and Issues for Congress,” *Congressional Research Service*, September 23, 2024. (<https://crsreports.congress.gov/product/pdf/R/R47751>)

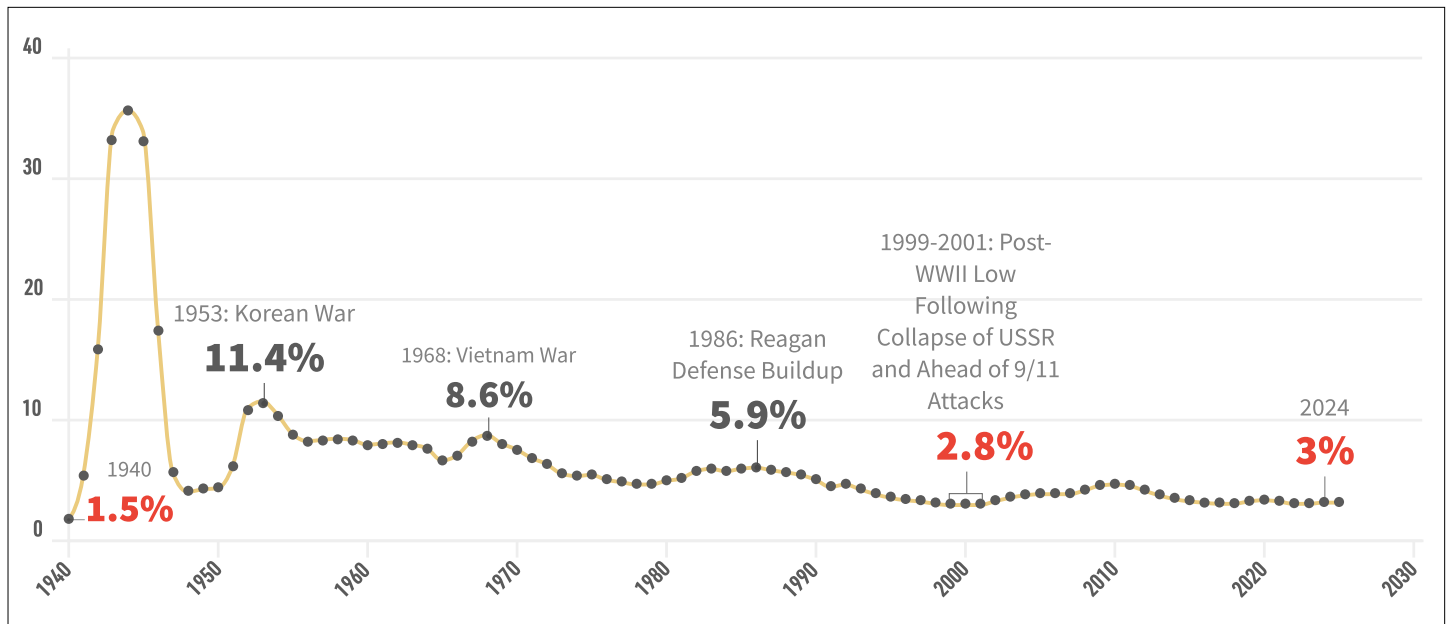
36. Cynthia Cook, “Reviving the Arsenal of Democracy: Steps for Surging Defense Industrial Capacity,” *Center for Strategic and International Studies*, March 14, 2023. (<https://www.csis.org/analysis/reviving-arsenal-democracy-steps-surging-defense-industrial-capacity>)

37. Jen Judson, “US Army eyes sixfold production boost of 155mm shells used in Ukraine,” *Defense News*, March 28, 2023. (<https://www.defensenews.com/digital-show-dailies/2023/03/28/us-army-eyes-six-fold-production-boost-of-155mm-shells-used-in-ukraine>)

38. Marc Selinger, “Stinger missile production to rise 50% by 2025, US Army says,” *Janes*, January 25, 2023. (<https://www.janes.com/osint-insights/defence-news/industry/stinger-missile-production-to-rise-50-by-2025-us-army-says>)

39. Brendan W. McGarry, “The Defense Budget and the Budget Control Act: Frequently Asked Questions,” *Congressional Research Service*, September 30, 2019. (<https://sgp.fas.org/crs/natsec/R44039.pdf>); U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller)/Chief Financial Officer, “United States Department of Defense Fiscal year 2023 Budget Request,” March 2022, page 4. (https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2023/FY2023_Budget_Request.pdf); Budget Control Act of 2011, Pub. L. 112-25, 125 Stat. 240, codified as amended at 2 U.S.C. § 901. (<https://www.congress.gov/bill/112th-congress/senate-bill/365>)

Figure 2: U.S. Defense Spending as Percentage of GDP



Source: Department of Defense National Defense Budget Estimates for FY 2025, April 2024. Table 7-7. Notes: War and supplemental funding is included prior to FY 2008, and from FY 2021 onward. DOD, not National Defense, percentages used. Based on DOD outlays not budget authority. Dates associated with conflicts demonstrate the peak spending during that conflict, not the duration of the conflict. The 2025 percentage is projected.

(GDP) or 18.8 percent of federal spending that year. By 2022, the year Putin launched his massive reinvasion of Ukraine, defense spending had dropped to 2.9 percent of GDP and 11.6 percent of federal spending, according to the Pentagon. Both numbers were near post-World War II lows.⁴⁰

In its July 2024 report, the bipartisan National Defense Strategy (NDS) Commission cited “insufficient defense budgets” as a leading cause for weakness in the DIB.⁴¹ The logic is simple: If the Pentagon reduces its demand for systems and munitions, the DIB’s ability to produce those tools of national defense dwindles and will be insufficient when the next war starts. That can cost American lives in the early weeks and months of a new war.

A Broken Process for Defense Appropriations

Exacerbating these insufficient defense budgets, Congress has habitually failed to pass new defense appropriations before the start of the fiscal year on October 1. Instead, legislators have relied on continuing resolutions (CRs), a practice in which Congress essentially copies and pastes the previous year’s appropriation into the new fiscal year, ignoring new threats and new requirements, creating inefficiencies and uncertainties for contractors, wasting billions of dollars, and delaying the start of vital new programs.⁴²

This reliance on CRs has become more the norm than an anomaly. “In the 14 fiscal years since fiscal

⁴⁰ U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller), “National Defense Budget Estimates For FY 2025,” April 2024. (https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2025/fy25_Green_Book.pdf)

⁴¹ Rep. Jane Harman, Amb. Eric Edelman, Gen. John Keane, Thomas Mahnken, Mara Rudman, Mariah Sixkiller, Alissa Starzak, and Roger Zakheim, “Commission on the National Defense Strategy,” RAND Corporation, July 2024. (https://www.armed-services.senate.gov/imo/media/doc/nds_commission_final_report.pdf)

⁴² Ibid.

year 2011, the DOD has had only one, on-time, full appropriation,” the Pentagon noted in February 2024. “For 13 of those years, the department operated — at least part of the time — under a CR.”⁴³

Over time, Washington’s inability to provide the Department of Defense with timely, sufficient, and predictable funding damaged the American DIB, pushing many defense contractors to downsize, go out of business, or stop working with the Pentagon.⁴⁴ That eroded the American arsenal of democracy and made the Pentagon more reliant on sole-source suppliers and foreign suppliers.⁴⁵

When the military services and the Office of the Secretary of Defense confronted insufficient budget topline, they were forced to make tough choices, prioritizing urgent requirements related to current conflicts and taking risks when it came to needs for potential conflicts against near-peer or peer adversaries. That often meant ending programs or reducing quantities requested to the minimum required to barely sustain the production line. This helps explain why the United States found its munitions DIB lacking in 2022.⁴⁶ Insufficient purchases reduced the U.S. stockpiles available to either equip U.S. forces or send to allies and partners. Worse still, procuring systems and munitions at the minimum sustainment rate reduces production capacity and weakens supplier networks. Consequently, once a crisis strikes, the necessary surge production capacity

is limited or nonexistent — and restoring it costs more and takes longer.

The most valuable commodity once a major war begins is time. “For almost twenty years we had all of the time and almost none of the money; today we have all of the money and no time,” then Army Chief of Staff General George Marshall wrote on July 22, 1940, little more than a year before the Pearl Harbor attack and America’s entry into World War II.⁴⁷ America can belatedly throw money at a problem and move more quickly when finally motivated to do so, but it would be far better for American national security interests — and the service members who do the fighting and make the sacrifices — if Americans can make the necessary defense inventory and production capacity investments long before, not after, crises start.

Meanwhile, as the National Defense Strategy Commission noted, several other dynamics further weakened the U.S. DIB. These included relative declines in defense research and development (R&D) spending; defense industry consolidation and an associated reduction in competition; reliance on sole-source suppliers; policy, regulatory, and cultural barriers to new entrants; challenges associated with harnessing commercial innovation; erosion of the broader U.S. manufacturing base; shortages of skilled workers; and insufficient access to strategic and critical minerals.⁴⁸ In short, as the commission noted, “Consolidation and

43. C. Todd Lopez, “DOD Continues Work With Congress to Get Appropriation,” *DOD News*, February 27, 2024. (<https://www.defense.gov/News/News-Stories/Article/Article/3688740/dod-continues-work-with-congress-to-get-appropriation>)

44. An example of this is the Stinger missile, which went out of production approximately two decades ago and is now being restarted at considerable expense and delay.

45. Mackenzie Eaglen, “The ‘Arsenal of Democracy’ Does Not Sustain Itself,” *American Enterprise Institute*, October 23, 2023. (<https://www.aei.org/foreign-and-defense-policy/the-arsenal-of-democracy-does-not-sustain-itself>); U.S. Department of Defense, “Securing Defense-Critical Supply Chains,” February 2022. (<https://media.defense.gov/2022/Feb/24/2002944158/-1/-1/1/DOD-EO-14017-REPORT-SECURING-DEFENSE-CRITICAL-SUPPLY-CHAINS.PDF>)

46. Joe Gould, “Pentagon, industry wrestle with how to boost weapons production for Ukraine,” *Defense News*, April 18, 2022. (<https://www.defensenews.com/industry/2022/04/18/pentagon-industry-wrestle-with-how-to-boost-weapons-production-for-ukraine>)

47. “Marshall and the Invasion of Poland,” *The George C. Marshall Foundation*, August 30, 2023. (<https://www.marshallfoundation.org/articles-and-features/marshall-invasion-poland>)

48. Jane Harman, Amb. Eric Edelman, Gen. John Keane, Thomas Mahnken, Mara Rudman, Mariah Sixkiller, Alissa Starzak, and Roger Zakheim, “Commission on the National Defense Strategy,” *RAND Corporation*, July 2024. (https://www.armed-services.senate.gov/imo/media/doc/nds_commission_final_report.pdf)

underinvestment have led to too few companies, gaps in the workforce, insufficient production infrastructure, and fragile supply chains.”⁴⁹ A November 2024 House Select Committee on Strategic Competition between the United States and the Chinese Communist Party simulation of a Chinese invasion of Taiwan underscored these challenges, including “too few solid rocket motors, processor assemblies, castings, ball bearings and forgings,” according to analysis by the Center for Strategic and International Studies.⁵⁰

“The silver lining of Putin’s invasion of Ukraine is that it served as a wakeup call for Americans and Europeans that such aggression is not a relic of the 20th century.”

In response to some of these problems, Congress expanded the use of multiyear procurement for munitions, appropriating funds for the multiyear procurement of the Naval Strike Missile (NSM), Guided Multiple Launch Rocket System (GMLRS), Patriot Advanced Capability-3 Missile Segment Enhancement (PAC-3 MSE), Long Range Anti-Ship Missile (LRASM), Joint Air-to-Surface Standoff

Missile (JASSM), and Advanced Medium-Range Air-to-Air Missile (AMRAAM) in fiscal year (FY) 2024.⁵¹ When matched with the necessary appropriations, these multiyear procurements can incentivize industry investment in the DIB workforce, R&D, and infrastructure. However, congressional appropriators have sometimes balked at funding these procurements, claiming the savings are limited. Savings matter, but the urgency of certain threats requires decision-makers to prioritize speed at the expense of savings. That acceleration may ultimately protect the lives of U.S. service members and their partners by equipping them at what sometimes is called “the speed of relevance.”⁵²

An insufficient U.S. DIB is particularly problematic at a time when U.S. adversaries are cooperating more closely and China is conducting a military buildup of a magnitude not seen since World War II.⁵³ The silver lining of Putin’s invasion of Ukraine is that it served as a wake-up call for Americans and Europeans that such aggression is not a relic of the 20th century. Such invasions still occur, and Western capitals — including Washington — as well as allies in Asia, must make sure their defense spending levels, industrial bases, and inventories reflect that reality.⁵⁴

49. Ibid.

50. Seth Jones, “The U.S. Is Losing the Ability to Deter War With China,” *The Wall Street Journal*, November 26, 2024. (<https://www.wsj.com/opinion/the-u-s-is-losing-the-ability-to-deter-war-with-china-defense-industrial-base-2da8b83a>)

51. Further Consolidated Appropriations Act, 2024, Pub. L. 118-47, 138 Stat. 460, codified as amended. (<https://www.congress.gov/bill/118th-congress/house-bill/2882/text>); Ronald O’Rourke, “Multiyear Procurement (MYP) and Block Buy Contracting in Defense Acquisition: Background and Issues for Congress,” *Congressional Research Service*, December 19, 2024. (<https://crsreports.congress.gov/product/pdf/R/R41909>)

52. Jim Garamone, “DoD Restructures Acquisition, Technology Office to Improve Military Lethality, Speed,” *DOD News*, August 2, 2017. (<https://www.defense.gov/News/News-Stories/Article/Article/1265231/dod-restructures-acquisition-technology-office-to-improve-military-lethality-sp>)

53. Adm. John Aquilino, U.S. Navy Commander, U.S. Indo-Pacific Command, “U.S. Indo-Pacific Command Posture,” *Testimony before Senate Committee on Armed Services*, March 20, 2024. (<https://www.congress.gov/118/meeting/house/116960/witnesses/HHRG-118-AS00-Wstate-AquilinoJ-20240320.pdf>)

54. Bradley Bowman and Rear Adm. (Ret.) Mark Montgomery, “Trump Can – and Should – Fully Fund our Military,” *National Review*, November 29, 2024. (<https://www.nationalreview.com/2024/11/trump-can-and-should-fully-fund-our-military>)

Bureaucratic Hurdles to Arming America's Allies and Partners

A major source of delay is the slow and cumbersome DOD contracting process.⁵⁵ Take, for example, the Harpoon missile. It took the DOD almost two and a half years to award a Harpoon missile contract for Taiwan despite the missile already being in production and having a similarly sized order placed just months earlier.⁵⁶ That means it took the Pentagon nearly the amount of time that elapsed between Pearl Harbor and D-Day to simply award a contract.⁵⁷ This incident, and ones like it, suggests that the Pentagon's contracting procedures and culture do not reflect the urgency of the threats to the United States and its partners.

Also, the Pentagon frequently waits until multiple foreign orders have been placed for a system before awarding contracts.⁵⁸ While this "bundling" practice may be designed to lower the unit cost by taking advantage of economies of scale, it is partially responsible for years of delays and likely makes sustaining production lines more difficult by depriving companies of regular, consistent orders.⁵⁹

The United States also has generally avoided using PDA to fulfill a country's orders unless a conflict

is about to start or has already started. The main advantage of PDA transfers is the speed with which the system can be delivered compared to relying on contracts for new systems, although PDA transfers from U.S. military inventories will ultimately have to be backfilled by the procurement of new systems from the DIB.

The United States has largely resisted changing the order of the foreign queue for systems, even when a particular buyer faces an urgent need. It seems obvious that the delivery queues for key munitions and weapon systems should be periodically examined and reordered to align with the U.S. National Security Strategy and National Defense Strategy.⁶⁰ More specifically, the burden of proof should be on anyone arguing that a system should be delivered to another partner before Taiwan, Ukraine, and Israel as they contend with dire threats.

That said, the U.S. government is right to prioritize orders for the American military over foreign military sales.⁶¹ But in some instances, it may better serve U.S. interests to send a system or munition to a security partner first before an entire DOD order is fulfilled if doing so would allow an ally or partner to degrade a common adversary with whom the United States is not

55. Roger Wicker, "Restoring Freedom's Forge: American Innovation Unleashed," *Defense Management Institute*, December 19, 2024. (<https://www.dmi-ida.org/knowledge-base-detail/Restoring-Freedoms-Forge-American-Innovation-Unleashed>)

56. Bradley Bowman and Rear Adm. (Ret.) Mark Montgomery, "Taiwan Needs Our Help Now," *The Dispatch*, April 17, 2023. (<https://thedispatch.com/article/taiwan-needs-our-help-now>); "Boeing awarded contract by US Navy to supply Harpoon Block II missiles to Saudi Arabia," *Global Defense News, Army Recognition Group*, May 15, 2019. (<https://www.armyrecognition.com/news/navy-news/2019/boeing-awarded-contract-by-us-navy-to-supply-harpoon-block-ii-missiles-to-saudi-arabia>)

57. Bradley Bowman and Rear Adm. (Ret.) Mark Montgomery, "Taiwan Needs Our Help Now," *The Dispatch*, April 17, 2023. (<https://thedispatch.com/article/taiwan-needs-our-help-now>)

58. Additionally, contractors sometimes impose a minimum order quantity before agreeing to accept a contract.

59. U.S. Department of Defense, "Securing Defense-Critical Supply Chains," February 2022. (<https://media.defense.gov/2022/Feb/24/2002944158/-1/-1/1/DOD-EO-14017-REPORT-SECURING-DEFENSE-CRITICAL-SUPPLY-CHAINS.PDF>); U.S. Department of Defense, Department of the Army, Office of the Assistant Secretary of the Army (Acquisitions, Logistics, and Technology), "Surge Capacity in the Defense Munitions Industrial Base," September 14, 2023. ([https://asb.army.mil/Portals/105/Reports/2020s/ASB%20FY%2023%20DMIB%20Report%20\(E\).pdf?ver=jZRw9v2VxCiQIvsBFsDG4g%3d%3d](https://asb.army.mil/Portals/105/Reports/2020s/ASB%20FY%2023%20DMIB%20Report%20(E).pdf?ver=jZRw9v2VxCiQIvsBFsDG4g%3d%3d))

60. Bradley Bowman and Rear Adm. (Ret.) Mark Montgomery, "Expedite arms deliveries to beleaguered democracies," *Defense News*, June 14, 2022. (<https://www.defensenews.com/opinion/commentary/2022/06/14/expedite-arms-deliveries-to-beleaguered-democracies>)

61. Rep. Mike Waltz, Rep. Seth Moulton, Rep. French Hill, Rep. Mike Garcia, Rep. Rich McCormick, Rep. Young Kim, and Rep. Jason Crow, "Foreign Military Sales TIGER Task Force: Report," *House Foreign Affairs Committee*, February 7, 2024. (<https://foreignaffairs.house.gov/wp-content/uploads/2024/02/2.7.24-FMS-TIGER-Task-Force-Report.pdf>)

at war.⁶² Similarly, if the goal is to deter new aggression, decision-makers should ask whether the system will have a greater deterrent effect in the Pentagon's arsenal or in the arsenal of a beleaguered democracy confronting actual or potential aggression.

Cause for Cautious Optimism

Despite the myriad problems and challenges, there is significant progress being made in producing certain key systems. Take HIMARS, for instance. Due to large orders from Poland and others, the manufacturer was on track to double production by the end of 2024. Production of 155 mm artillery rounds has followed a similar path, with a new plant opened in Mesquite, Texas, in May 2024.⁶³ The Stinger missile will re-enter high-rate production in 2026 after a component in its seeker is redesigned, and Javelin production is expected to roughly double in the next few years. This additional production capacity will prove useful in meeting U.S. military and partner demand in the coming years.

Counterintuitively, arming America's allies contributes to this progress rather than limiting

U.S. capabilities since allied needs serve as a demand signal for the DIB, resulting in new investment that ultimately yields greater capacity. For example, 80 years ago, Lend-Lease aid to Britain prepared U.S. industry for World War II prior to U.S. entry.⁶⁴ Far from depleting the United States, the demand for arms production primed industry to produce the enormous amounts of materiel needed to win.⁶⁵ Likewise, Putin's invasion of Ukraine served as a wake-up call for Americans, exposing the DIB's shortcomings. The U.S. government has responded by investing in its defense industry and by placing large orders of munitions that give companies a strong demand signal.⁶⁶

Indeed, a large portion of U.S. security assistance for beleaguered democratic partners is actually spent in the United States. One American Enterprise Institute study estimated in February 2024 that "\$73 billion, or 77 percent, of the supplemental funding [for Taiwan, Ukraine, and Israel] is domestically invested, with \$59 billion going directly to U.S. defense companies—and their workers."⁶⁷ That employs Americans, boosts the U.S. economy, and strengthens the DIB.

62. Bradley Bowman and Rear Adm. (Ret.) Mark Montgomery, "Supporting America's Allies Puts America First," *National Review*, February 23, 2024. (<https://www.nationalreview.com/2024/02/supporting-americas-allies-puts-america-first>)

63. Bradley Bowman and Gen. Randy George, "Adversaries and the Army: A Conversation with the U.S. Army Chief of Staff," *FDD's Foreign Policy*, August 30, 2024. (<https://www.fdd.org/podcasts/2024/08/30/adversaries-and-the-army-a-conversation-with-the-u-s-army-chief-of-staff>); Mike Stone, "US Army opens new 155mm artillery munitions plant in Texas," *Reuters*, May 29, 2024. (<https://www.reuters.com/business/aerospace-defense/us-army-opens-new-155mm-artillery-munitions-plant-texas-2024-05-29>); Lockheed Martin, "Ramping Up: Lockheed Martin Steadily Increasing Production of High-Demand Systems," February 15, 2024. (<https://www.lockheedmartin.com/en-us/news/features/2024/ramping-up--lockheed-martin-steadily-increasing-production-o.html>)

64. Thomas Morgan, "The Industrial Mobilization of World War II: America Goes to War," *Army History*, April 1995. (<https://www.jstor.org/stable/26304207?seq=1>); Alan Gropman, *Mobilizing U.S. Industry in World War II: Myth and Reality* (Washington, DC: Institute for National Strategic Studies, National Defense University, 1996). (<https://apps.dtic.mil/sti/tr/pdf/ADA316780.pdf>)

65. Dean Allard, Edward Marolda, Thomas Hone, Maj. Charles Kirkpatrick, and Gary Weir, "Gearing Up for Victory: American Military and Industrial Mobilization in World War II," *Colloquium on Contemporary History*, June 25, 1991. (<https://www.history.navy.mil/research/library/online-reading-room/title-list-alphabetically/g/gearing-up-victory.html>)

66. Jerry McGinn, "America needs to grow its capacity to produce weapons. Here's four steps to do it," *Breaking Defense*, March 17, 2023. (<https://breakingdefense.com/2023/03/america-needs-to-grow-its-capacity-to-produces-weapons-heres-four-steps-to-do-it>); Sam Skove, "Army aims to double 155mm shell production by October," *Defense One*, February 5, 2024. (<https://www.defenseone.com/policy/2024/02/army-aims-double-155mm-shell-production-october/393943>); Michael Marrow, "Raytheon to max out AMRAAM production for 'foreseeable future,' exec says," *Breaking Defense*, September 6, 2023. (<https://breakingdefense.com/2023/09/raytheon-to-max-out-amraam-production-for-foreseeable-future-exec-says>); Northrop Grumman, Press Release, "Northrop Grumman Expanding Capacity to Meet Global Security Demands," March 25, 2024. (<https://news.northropgrumman.com/news/releases/northrop-grumman-expanding-capacity-to-meet-global-security-demands>)

67. National Security Supplemental Appropriations Act, 2024, Division A, Pub. L. 118-50, 138 Stat. 896. ([https://www.appropriations.senate.gov/imo/media/doc/national_security_act_sxs.pdf#page=](https://www.appropriations.senate.gov/imo/media/doc/national_security_act_sxs.pdf#page=;)); Mackenzie Eaglen, "Most of the Money in the 'Foreign Aid' Bill would Stay in the U.S.," *The Dispatch*, February 16, 2024. (<https://www.aei.org/op-cds/most-of-the-money-in-the-foreign-aid-bill-would-stay-in-the-u-s>)



Shells produced at the Scranton Army Ammunition Plant (U.S. Army photo by Henry Villarama)

When considering the U.S. DIB and its reform, it is important to understand the value of both stockpiles and defense production capacity. Sufficient stockpiles at the onset of a conflict are vital to block adversary efforts to accomplish a quick *fait accompli* and to ensure U.S. service members do not run out of munitions in the early days and weeks of the war. If that happens, U.S. casualties will go up, and the chances the aggressor will be successful increase.

But in a war against a peer adversary, planners must assume that even a large stockpile will eventually be depleted. When that happens, the size of existing defense production capacity will matter, and the time required to create additional capacity may be measured in American lives.

Those who focus on stockpiles to the exclusion of production capacity should consider World War I. France was firing artillery rounds at a monthly rate exceeding 90 percent of its entire pre-war stockpiles by 1916. Germany, which had the largest pre-war stockpile, would have exhausted that stockpile in two and a half months at its 1918 rate of fire.⁶⁸ That is why, in addition to large stockpiles, it is so important to have a DIB with open production lines, significant existing production capacity, and ready-to-implement plans to expand production capacity quickly in a crisis.

In sum, the provision of weapons to Ukraine has not materially delayed the provision of weapons to Taiwan or Israel in the 25 cases examined. However, there remain serious problems in the DIB as well as in the FMS process. Yet neither weaknesses in the DIB nor a dysfunctional FMS process resulted from U.S. security assistance to Ukraine. Rather, they significantly preceded that conflict. In fact, sending weapons to Ukraine has not only supported vital American security interests but has actually strengthened the ability of the U.S. DIB to arm American troops and beleaguered democracies.

Weapon Systems

Utilizing the methodology detailed in this report, this section examines 13 weapon systems for actual or possible overlap between Ukraine and Taiwan and an additional 12 weapon systems for actual or possible overlap between all three partners, for a total of 25. For each system, data regarding quantities ordered, delivery timelines, contract details, production capacity, and other relevant information are examined where possible. This analysis demonstrates whether the provision of each system to Ukraine delayed its provision to Taiwan or Israel and offers some insights into the health of each respective DIB.

68. David Zabecki, *Steel Wind: Colonel Georg Bruchmuller and the Birth of Modern Artillery* (Westport, CT: Praeger, 1994), page 8.

Weapon Systems With Actual or Possible Overlap Between Ukraine and Taiwan

The following 13 weapon systems have both an FMS to Taiwan announced between January 1, 2015, and September 30, 2024, and are committed or likely will be committed to Ukraine.



FGM-148 JAVELIN ADVANCED ANTI-TANK WEAPON SYSTEM-MEDIUM

What: The Javelin is a medium-range anti-tank weapon with fire-and-forget targeting capability.⁶⁹

Why: The Javelin missile can target armored vehicles, potentially low- and slow-flying helicopters, as well as amphibious forces attempting to land or reinforce a beachhead.⁷⁰

69. "Javelin Portable Anti-Tank Missile, US," *Army Technology*, June 2, 2023. (<https://www.army-technology.com/projects/javelin-portable-anti-tank-missile/?cf-view>)

70. In this report, the term "armored vehicles" refers to a wide variety of military vehicles, including tanks; Joseph Trevithick, Oliver Parken, and Tyler Rogoway, "The Use Of Anti-Tank Guided Missiles Against Helicopters Didn't Start In Ukraine," *The War Zone*, April 7, 2022. (<https://www.twz.com/45084/the-use-of-anti-tank-guided-missiles-against-helicopters-didnt-start-in-ukraine>)

Details: DSCA announced a Foreign Military Sale to Taiwan of 208 Javelin missiles in December 2015 to augment Taiwan's existing arsenal of Javelins.⁷¹ The United States committed 10,000-plus Javelin missiles to Ukraine primarily through Presidential Drawdown Authority from existing U.S. stockpiles.⁷² There are no DCS for Javelin missiles. According to the Stockholm International Peace Research Institute (SIPRI), Taiwan received 542 Javelin missiles from the United States between 1990 and 2015. Contracts for Taiwan's Javelin missiles were awarded in August 2017 and July 2018, and full delivery is expected within the next 12 months.⁷³ Taiwan's 2015 Javelin order was unfulfilled for over six years prior to the 2022 Russian invasion, and most of the Javelins provided to Ukraine came from the U.S. military inventory rather than new procurement from industry. Therefore, Javelins sent to Ukraine from U.S. military stocks did not delay the delivery of new Javelins being produced for Taiwan. U.S. production of Javelins is set to roughly double over the next few years.⁷⁴ The Javelin Joint Venture production rate already reached 2,400 per year in February 2024 and is expected to reach 3,960 per year by late 2026.⁷⁵ The U.S. Army awarded a three-year contract for Javelin production worth up to \$7.2 billion in May 2023.⁷⁶ Polish and American companies signed a memorandum of understanding in September 2024 to jointly produce Javelins in Poland, which will further expand production.⁷⁷ At the current production rate, it will take approximately one month to produce the quantity needed to meet Taiwan's existing orders. Additionally, PDA for Taiwan could enable the United States to send Javelins from existing stocks as an interim solution until the new Javelins arrive.

Ukraine Impact: No Material Delay — The United States is expected to provide Taiwan with all requested Javelins within the next 12 months despite the provision of Javelins to Ukraine.

Defense Industrial Base: Requires Attention — The United States reportedly transferred approximately one-third of domestic Javelin stockpiles to Ukraine, and while the Javelin Joint Venture partnership is significantly increasing production capacity, it will take time to replenish U.S. inventories.⁷⁸

71. U.S. Department of Defense, Defense Security Cooperation Organization, Press Release, "Taipei Economic and Cultural Representative Office in the United States – Javelin Missile," December 16, 2015. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-3>); Shirley A. Kan, "Taiwan: Major U.S. Arms Sales Since 1990," *Congressional Research Service*, August 29, 2014. (<https://sgp.fas.org/crs/weapons/RL30957.pdf>)

72. "Committed" means that the United States announced plans to deliver the system to Ukraine. When PDA is used, the systems usually arrive quickly. Accordingly, when the term "committed" is used in the context of PDA transfer, the reader can generally assume the system has arrived unless otherwise specified; U.S. Department of State, Bureau of Political Affairs, "U.S. Security Cooperation with Ukraine – Fact Sheet," September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>)

73. "SIPRI Arms Transfer Database," *Stockholm International Peace Research Institute*, March 11, 2024. (<https://www.sipri.org/databases/armstransfers>); U.S. Department of Defense, "Contracts For Aug. 15, 2017," August 15, 2017. (<https://www.defense.gov/News/Contracts/Contract/Article/1279412>); U.S. Department of Defense, "Contracts For July 24, 2018," July 24, 2018. (<https://www.defense.gov/News/Contracts/Contract/Article/1583211>)

74. Thomas Newdick, "Production Of In-Demand Javelin Missiles Set To Almost Double," *The War Zone*, May 9, 2022. (<https://www.twz.com/production-of-in-demand-javelin-missiles-set-to-almost-double>)

75. "Lockheed Martin on track to increase production of weapons systems," *Reuters*, February 15, 2024. (<https://www.reuters.com/business/aerospace-defense/lockheed-martin-track-increase-production-weapons-systems-2024-02-15>)

76. Ashley Roque, "Army and Javelin Joint Venture ink 3-year deal valued over \$7 billion," *Breaking Defense*, May 4, 2023. (<https://breakingdefense.com/2023/05/army-and-javelin-joint-venture-ink-3-year-deal-valued-over-7-billion>)

77. Jaroslaw Adamowski, "US manufacturers eye Javelin anti-tank missile production in Poland," *Defense News*, September 7, 2023. (<https://www.defensenews.com/global/europe/2023/09/07/us-manufacturers-eye-javelin-anti-tank-missile-production-in-poland>)

78. Mark Cancian, "Is the United States Running out of Weapons to Send to Ukraine?" *Center for Strategic and International Studies*, September 16, 2022. (<https://www.csis.org/analysis/united-states-running-out-weapons-send-ukraine>)



FIM-92 STINGER MISSILE SYSTEM

What: The Stinger missile is a man-portable air defense system.⁷⁹

Why: The Stinger missile can target low-flying jets, helicopters, and unmanned aerial vehicles.

Details: DSCA announced an FMS to Taiwan of 250 Stinger missiles in December 2015 and an additional 250 Stinger missiles in July 2019.⁸⁰ The United States committed 2,000-plus Stinger missiles to Ukraine mostly through PDA.⁸¹ There are no DCS for Stinger missiles. According to SIPRI, Taiwan had already received 2,223 Stinger missiles

79. “Stinger Man-Portable Air Defence System (MANPADS),” *Army Technology*, July 14, 2014. (<https://www.army-technology.com/projects/stinger-man-portable-air-defence-system-manpads>)

80. U.S. Department of Defense, Defense Security Cooperation Organization, Press Release, “Taipei Economic and Cultural Representative Office in the United States (TECRO) – Block I-92 MANPAD Stinger Missiles and Related Equipment and Support,” December 16, 2015. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-tecro-united-states>); U.S. Department of Defense, Defense Security Cooperation Organization, Press Release, “Taipei Economic and Cultural Representative Office (TECRO) in the United States -Stinger Missiles and Related Equipment and Support,” July 8, 2019. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-10>)

81. U.S. Department of State, Bureau of Political Affairs, “U.S. Security Cooperation with Ukraine – Fact Sheet,” September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>)

from the United States between 1990 and 2015.⁸² The U.S. Army plans to increase the rate of Stinger refurbishment to 60 per month by 2025, a 50 percent increase compared to levels in 2023.⁸³ The refurbishment of old systems had previously ended in 2020.⁸⁴ The production line for manufacturing new missiles largely closed approximately 20 years ago, with the line intermittently producing small numbers of systems for foreign customers.⁸⁵ Consequently, a component in the missile's seeker went out of production and now has to be redesigned and produced before large-scale deliveries of new missiles can occur, which is estimated to begin in 2026.⁸⁶ Availability of that component will generate additional production capacity, which will be useful should Taiwan decide to purchase additional systems or if Stingers are provided to Taiwan through PDA.⁸⁷ The partial closure of the production line explains the delay in deliveries to Taiwan, including why the initial order went unfulfilled for over six years prior to the 2022 invasion of Ukraine. Regardless, Taiwan is expected to receive its order of Stinger missiles in 2025, and the provision of existing Stingers to Ukraine from the U.S. arsenal did not delay the production of new Stingers for Taiwan.

Ukraine Impact: No Material Delay — The United States expects to provide Taiwan with all ordered Stinger missiles by the end of 2025 despite the provision of Stinger missiles to Ukraine, which had no impact on Taiwan's delivery timeline.

Defense Industrial Base: Requires Attention — A component of the Stinger missile is being redesigned with large-scale production becoming possible in 2026.

82. "SIPRI Arms Transfer Database," *Stockholm International Peace Research Institute*, March 11, 2024. (<https://www.sipri.org/databases/armstransfers>)

83. Marc Selinger, "Stinger missile production to rise 50% by 2025, US Army says," *Janes*, January 25, 2023. (<https://www.janes.com/osint-insights/defence-news/industry/stinger-missile-production-to-rise-50-by-2025-us-army-says>)

84. Mike Stone, "U.S. buys more Stingers after missiles' success in Ukraine," *Reuters*, May 27, 2022. (<https://www.reuters.com/business/aerospace-defense/exclusive-us-army-replenishes-stinger-missiles-after-ukraine-shipments-2022-05-27>)

85. Marcus Weisgerber, "Raytheon Calls in Retirees to Help Restart Stinger Missile Production," *Defense One*, June 28, 2023. (<https://www.defenseone.com/business/2023/06/raytheon-calls-retirees-help-restart-stinger-missile-production/388067>)

86. Marc Selinger, "Stinger missile production to rise 50% by 2025, US Army says," *Janes*, January 25, 2023. (<https://www.janes.com/osint-insights/defence-news/industry/stinger-missile-production-to-rise-50-by-2025-us-army-says>)

87. Kelvin Chen, "Taiwan to purchase additional Stinger missiles to bolster deterrence," *Taiwan News* (Taiwan), September 1, 2024. (<https://taiwannews.com.tw/news/5928608>); Nomaan Merchant, Ellen Knickmeyer, Zeke Miller, and Tara Copp, "US announces \$345 million military aid package for Taiwan," *Associated Press*, July 29, 2023. (<https://apnews.com/article/taiwan-military-aid-china-support-06e61a0e0ed787ea120f839ef59885fa>)



PHALANX CLOSE-IN WEAPONS SYSTEM (CIWS)

What: Phalanx CIWS is a point defense, radar-guided, 20 mm gun system.⁸⁸

Why: Phalanx CIWS can protect ships and, potentially, installations from incoming cruise missiles, drones, low-flying aircraft, small high-speed surface craft, and surface mines.

Details: DSCA announced an FMS of 13 Phalanx Block 1B CIWS to Taiwan in December 2015.⁸⁹ There are no DCS for CIWS. Eleven of the 13 systems had reportedly been delivered to Taiwan as of April 2023, with the last two systems reportedly delivered by March 2024.⁹⁰ According to SIPRI, Taiwan already received 13 Phalanxes between

88. U.S. Department of Defense, Department of the Navy, "MK 15 - Phalanx Close-In Weapon System (CIWS)," September 20, 2021. (<https://www.navy.mil/Resources/Fact-Files/Display-FactFiles/Article/2167831>)

89. U.S. Department of Defense, U.S. Defense Security Cooperation Agency, Press Release, "Taipei Economic and Cultural Representative Office in the United States – MK 15 Phalanx Block 1B Baseline 2 CIWS Guns, Upgrade Kits, Ammunition, and Support," December 16, 2015. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-mk-15>)

90. "U.S. Already Delivered 11 Mk 15 Phalanx Block 1B CIWS Guns to Taiwan," *Army Recognition Group*, April 3, 2023. (<https://www.armyrecognition.com/news/navy-news/2023/us-already-delivered-11-mk-15-phalanx-block-1b-ciws-guns-to-taiwan>); Matthew Strong, "Taiwan Navy has received 11 of 13 MK15 Block 1B gun systems ordered," *Taiwan News* (Taiwan), March 31, 2023. (<https://www.taiwannews.com.tw/news/4852295>); "Taiwan Navy Strengthens Air Defense with New Phalanx Block 1B Systems," *Army Recognition Group*, August 22, 2024. (<https://armyrecognition.com/news/navy-news/2024/taiwan-navy-strengthens-air-defense-with-new-phalanx-block-1b-systems>)

1990 and 2015.⁹¹ Phalanx CIWS has not been committed to Ukraine, although if Ukraine receives the land-based version of CIWS — Counter-Rocket, Artillery, and Mortar (C-RAM) — it could be used to defend high-value targets from Russian drones.⁹²

Ukraine Impact: No Material Delay — The Phalanx cannot be cited as an example in which security assistance for Ukraine impeded efforts to arm Taiwan as the system has not been committed to Ukraine.

Defense Industrial Base: Strong — There are no reported delays in CIWS deliveries, and the system is not required in large numbers.

91. “SIPRI Arms Transfers Database,” *Stockholm International Peace Research Institute*, March 11, 2024. (<https://www.sipri.org/databases/armstransfers>)

92. Rear Adm. (Ret.) Montgomery and Bradley Bowman, “Send Ukraine C-RAMs and VAMPIREs to help defeat Iranian drones,” *C4ISRNET*, November 4, 2022. (<https://www.c4isrnet.com/thought-leadership/2022/11/04/send-ukraine-c-rams-and-vampires-to-help-defeat-iranian-drones>)



AGM-154C JOINT STANDOFF WEAPON (JSOW)

What: The AGM-154C JSOW is an air-to-surface glide bomb with an imaging infrared seeker for use against hardened targets.⁹³

Why: The JSOW can target facilities, bases, ships in port, and air defense systems.

Details: DSCA announced an FMS of 56 JSOWs to Taiwan in June 2017.⁹⁴ Former President Joe Biden agreed to provide Ukraine with JSOWs in September 2024.⁹⁵ There are no DCS for JSOWs. According to SIPRI, Taiwan has

93. U.S. Department of Defense, Department of the Navy, "AGM-154 Joint Standoff Weapon (JSOW)," September 27, 2021. (<https://www.navy.mil/Resources/Fact-Files/Display-FactFiles/Article/2166748>)

94. U.S. Department of Defense, Defense Security Cooperation Organization, Press Release, "Taipei Economic and Cultural Representative Office (TECRO) in the United States – AGM-154C Joint Standoff Weapon (JSOW) Missiles," June 29, 2017. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-tecro-united-1>)

95. C. Todd Lopez, "Latest Security Assistance for Ukraine Announced, White House Directs DOD to Allocate Remaining Appropriations," *DOD News*, September 26, 2024. (<https://www.defense.gov/News/News-Stories/Article/Article/3918679/latest-security-assistance-for-ukraine-announced-white-house-directs-dod-to-all>)

yet to receive any JSOWs.⁹⁶ DOD procurement of JSOW ended around 2017, with low demand from other sources keeping the production line barely open.⁹⁷ The DOD has a significant remaining inventory of JSOW, so the provision to Ukraine via PDA should not impact the provision of JSOWs to Taiwan, even if the transfer to Taipei occurs through PDA.⁹⁸ However, the seven-year gap between DSCA announcement and contract award, as well as the expected 2027 completion date, raises questions related to an insufficient sense of urgency.⁹⁹ It is worth noting that the United States already transferred to Ukraine the Joint Direct Attack Munition-Extended Range (JDAM-ER) and Small Diameter Bomb (SDB), both of which offer similar effects in terms of the gliding capability of JSOW and are produced in much larger numbers at lower cost.¹⁰⁰

Ukraine Impact: No Material Delay — If both Ukraine and Taiwan’s JSOWs come from existing U.S. stocks, the provision of JSOWs to Ukraine should have little to no impact on Taiwan’s order. This is especially likely to be true due to Ukraine’s limited ability to employ the glide bombs it already has as well as Taiwan’s small order size. However, this could change in the unlikely event that large numbers of JSOWs are committed to Ukraine. If Taiwan’s order is fulfilled from new production models, PDA transfers to Ukraine will have no effect on the delivery timeline.

Defense Industrial Base: Requires Attention — The JSOW is in low-rate production, but thousands were procured prior to production diminishing. Additionally, weapons like the JDAM-ER and the Small Diameter Bomb are produced in large numbers and could likely fulfill Taiwan’s requirements to some extent.

96. “SIPRI Arms Transfer Database,” *Stockholm International Peace Research Institute*, March 11, 2024. (<https://www.sipri.org/databases/armstransfers>)

97. U.S. Department of Defense, Department of the Navy, “AGM-154 Joint Standoff Weapon (JSOW),” September 27, 2021. (<https://www.navy.mil/Resources/Fact-Files/Display-FactFiles/Article/2166748>)

98. “How Many AGM-154 JSOW Does the U.S. Have for Conversion into Cruise Missiles?” *Defense Express* (Ukraine), September 27, 2024. (https://en.defence-ua.com/news/how_many_agm_154_jsow_does_the_u_s_have_for_conversion_into_cruise_missile-11992.html)

99. U.S. Department of Defense, “Contracts For Feb. 2, 2024,” February 2, 2024. (<https://www.defense.gov/News/Contracts/Contract/Article/3665263>)

100. Thomas Newdick, “Ukraine’s Su-27s Are Launching JDAM-ER Winged Bombs Too,” *The War Zone*, August 24, 2024. (<https://www.twz.com/ukraines-su-27s-are-launching-jdam-er-winged-bombs-too>); “GBU-39B Small Diameter Bomb Weapon System,” *U.S. Air Force*, accessed December 9, 2024. (<https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104573/gbu-39b-small-diameter-bomb-weapon-system>); Brian P. Kelly, Brett Stevens, and Sean D. Hayes, “Cost Effective Analysis Comparing the Small Diameter Bomb and the Joint Standoff Weapon (A+ Variant),” *Naval Postgraduate School*, December 2004. (<https://apps.dtic.mil/sti/pdfs/ADA429334.pdf>)



AGM-88 HIGH-SPEED ANTI-RADIATION MISSILE (HARM)

What: The HARM is a supersonic air-to-surface missile that homes in on and destroys enemy radar systems.¹⁰¹

Why: The HARM can target and suppress air defense radars and systems.

Details: DSCA announced an FMS to Taiwan of 50 HARMs in June 2017 and 100 HARMs in March 2023.¹⁰² The United States committed an unknown number of HARMs to Ukraine, which was confirmed by U.S. defense

¹⁰¹ "AGM-88 HARM," *U.S. Air Force*, accessed December 9, 2024. (<https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104574/agm-88-harm>)

¹⁰² U.S. Department of Defense, Defense Security Cooperation Organization, Press Release, "Taipei Economic and Cultural Representative Office (TECRO) in the United States – AGM-88B High-Speed Anti-Radiation Missiles (HARM)," June 29, 2017. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-tecro-united-0>); U.S. Department of Defense, Defense Security Cooperation Organization, Press Release, "Taipei Economic and Cultural Representative Office in the United States – F-16 Munitions," March 1, 2023. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-f-16>)

officials in August 2022.¹⁰³ There are no DCS for HARMs. HARMs were committed to Ukraine through PDA and USAI. According to SIPRI,¹⁰⁴ Taiwan did not receive any HARM missiles between 1990 and 2015. Taiwan reportedly received at least some of the HARMs from the 2017 order in 2022, when the delivery was originally scheduled for 2023.¹⁰⁵ The delivery of the HARMs to Taiwan a year earlier than expected occurred even though the United States started to deliver HARMs to Ukraine the same year. Therefore, it is unlikely that aid to Ukraine had a material impact on the availability of missiles to fulfill Taiwan's 2017 order of HARMs. Delivery is expected in the 2025-2026 time frame.

Ukraine Impact: No Material Delay — There was likely no material delay in delivering Taiwan's 2017 order of HARMs due to their provision to Ukraine, and delivery of Taiwan's 2023 order is expected in 2025-2026. There are no reported production issues or shortages of HARMs, so the provision of HARMs to Ukraine is unlikely to significantly impede HARM delivery to Taiwan in the future.

Defense Industrial Base: Strong — The United States continues to procure the long-range HARM upgrade — the Advanced Anti-Radiation Guided Missile Extended Range (AARGM-ER) — 285 of which are requested in the FY 2025 president's budget.¹⁰⁶

103. U.S. Department of State, Bureau of Political Affairs, "U.S. Security Cooperation with Ukraine – Fact Sheet," September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>); "HARM Missiles: from Desert Storm to Donetsk," *Airforce Technology*, November 30, 2022. (<https://www.airforce-technology.com/analyst-comment/harm-missiles-donetsk>)

104. "SIPRI Arms Transfer Database," *Stockholm International Peace Research Institute*, March 11, 2024. (<https://www.sipri.org/databases/armstransfers>)

105. Roy Choo, "Taiwan receives AGM-88 missiles to take on Chinese air defences," *Shephard Media*, January 5, 2023. (<https://www.shephardmedia.com/news/air-warfare/taiwan-receives-agm-88-anti-radiation-missiles>)

106. U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller)/Chief Financial Officer, "Program Acquisition Cost by Weapon System," March 2024. (https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2025/FY2025_Weapons.pdf)



M1 ABRAMS TANK

What: The Abrams tank is a main battle tank.¹⁰⁷

Why: The Abrams tank can target infantry, armored vehicles, and positions.

Details: DSCA announced an FMS of 108 M1A2T Abrams tanks to Taiwan in July 2019.¹⁰⁸ In January 2023, the Biden administration committed to sending 31 M1A2 Abrams Tanks to Ukraine.¹⁰⁹ In March 2023, the Biden

¹⁰⁷. “Abrams M1A2 SEPv3 Main Battle Tank, US,” *Army Technology*, June 14, 2024. (<https://www.army-technology.com/projects/abrams-m1a2-sepv3-main-battle-tank>)

¹⁰⁸. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, “Taipei Economic and Cultural Representative Office in the United States (TECRO) - M1A2T Abrams Tanks and Related Equipment and Support,” July 8, 2019. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-9>)

¹⁰⁹. David Vergun, “Biden Announces Abrams Tanks to be Delivered to Ukraine,” *DOD News*, January 25, 2023. (<https://www.defense.gov/News/News-Stories/Article/article/3277910/biden-announces-abrams-tanks-to-be-delivered-to-ukraine>); C. Todd Lopez, “Ukrainians to Get U.S. Tanks by Fall,” *DOD News*, March 21, 2023. (<https://www.defense.gov/News/News-Stories/Article/article/3336826/ukrainians-to-get-us-tanks-by-fall>); U.S. Department of State, Bureau of Political Affairs, “U.S. Security Cooperation with Ukraine – Fact Sheet,” September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>)

administration decided not to send newer M1A2 tanks to Ukraine but instead sent 31 refurbished M1A1 tanks through PDA, which arrived in Ukraine in August 2023.¹¹⁰ There are no DCS for the Abrams. According to the International Institute for Strategic Studies (IISS) Military Balance 2024, Taiwan has roughly 650 main battle tanks — 200 M60A3s and 450 CM-11s.¹¹¹ The Joint Systems Manufacturing Center-Lima (JSMC) has a production capacity (which, in this case, refers to updating existing hulls to modern standards) of approximately 15 Abrams tanks per month.¹¹² The 31 tanks sent to Ukraine underwent an armor refurbishment at JSMC, and General Dynamics Land Systems Customer Support Operations at Ft. Cavazos, Texas, refurbished the remainder of the tanks' systems in preparation for shipment. In order to prioritize Ukraine's urgent need for tanks, the armor refurbishment at JSMC for 116 M1A1 tanks for Poland was paused. Therefore, completing refurbishment for Ukraine took two-to-three-months' worth of production. Additionally, Taiwanese personnel received maintenance training on the Abrams in 2024, accelerating the timeline for fielding the system once delivery is fulfilled. Taiwan was reportedly expecting to receive 38 Abrams tanks by the end of 2024, and full delivery is expected by October 2025.¹¹³

Ukraine Impact: No Material Delay — The provision of refurbished Abrams tanks to Ukraine caused at most a three-month delay in the production and delivery of tanks to Taiwan, and Taiwanese personnel have already been training in maintenance of the system.

Defense Industrial Base: Strong — The United States has thousands of Abrams tank hulls in storage that can be refurbished and upgraded and can produce around 15 per month.

110. Lolita Baldor, "US speeds up Abrams tank delivery to Ukraine war zone," *Associated Press*, March 21, 2023. (<https://apnews.com/article/ukraine-russia-war-abrams-tanks-94294a9c1e1acc50098afa440bcb4d40>); Carla Babb, "All 31 Abrams Tanks in Ukraine, US Military Confirms to VOA," *Voice of America*, October 16, 2023. (<https://www.voanews.com/a/all-31-abrams-tanks-in-ukraine-us-military-confirms-to-voa/7313918.html>)

111. "The Military Balance 2024," *International Institute for Strategic Studies*, February 13, 2024. (archived version available at <https://web.archive.org/web/20241203005245/https://www.iiiss.org/publications/the-military-balance>); "M60A3 – Main Battle Tank (M60)," *Army Technology*, May 22, 2020. (<https://www.army-technology.com/projects/m60a3-main-battle-tank>)

112. Dan Parsons, "U.S. Army Could Use New Lend-Lease Act To Speed M1 Abrams Tanks to Poland," *The Warzone*, May 18, 2022. (<https://www.twz.com/u-s-army-could-use-new-lend-lease-act-to-speed-m1-abrams-tanks-to-poland>)

113. Lo Tien-pin and Jake Chung, "First batch of Abrams tanks might be delayed," *Taipei Times* (Taiwan), April 6, 2024. (<https://www.taipeitimes.com/News/taiwan/archives/2024/04/06/2003816025>); After the assessed period of this report ended on September 30, 2024, Taiwan received 38 Abrams tanks in December 2024; see: "Taiwan gets US Abrams tanks, hardening final defenses in an invasion," *Defense News*, December 20, 2024. (<https://www.defensenews.com/global/asia-pacific/2024/12/20/taiwan-gets-us-abrams-tanks-hardening-final-defenses-in-an-invasion>)



M142 HIGH MOBILITY ARTILLERY ROCKET SYSTEM (HIMARS)

What: HIMARS is a Multiple Launch Rocket System on a wheeled chassis capable of firing six Guided Multiple Launch Rocket System (GMLRS) rockets, one Advanced Tactical Missile System (ATACMS), or two Precision Strike Missiles (PrSM).¹¹⁴

Why: HIMARS can target infantry, vehicles, positions, bases, and ships, depending on the munition used.¹¹⁵

Details: DSCA announced an FMS to Taiwan of 11 HIMARS in October 2020.¹¹⁶ Taiwan ordered an additional 18 systems in 2022 after abandoning plans to purchase M109 Paladin self-propelled howitzers.¹¹⁷ The United States

¹¹⁴. "HIMARS - High-Mobility Artillery Rocket System, USA," *Army Technology*, July 7, 2023. (<https://www.army-technology.com/projects/himars>)

¹¹⁵. Current munitions can target stationary ships. Future munitions, such as the maritime strike variant of the Precision Strike Missile, will be able to target moving ships.

¹¹⁶. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Taipei Economic and Cultural Representative Office in the United States (TECRO) - HIMARS, Support, and Equipment," October 21, 2020. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-15>)

¹¹⁷. Ministry of National Defense of the People's Republic of China, "The Ministry of National Defense issues a press release explaining the 'increased purchase of the Long-range Precision Fire Strike System (Project Thunder Storm)' by the Army," May 10, 2023. (<https://www.mnd.gov.tw/english/Publish.aspx?title=News%20Channel&SelectStyle=Defense%20News%20&p=81476>)

committed 40-plus HIMARS to Ukraine: at least 21 through PDA, at least 18 through USAI, and three through an emergency FMS funded by Germany.¹¹⁸ There are no DCS for HIMARS. Despite increased demand for HIMARS, reports indicate that Taiwan expects to receive the first order of 11 systems in late 2024 or early 2025.¹¹⁹ The additional 18 systems are expected to be delivered in 2026, a year ahead of the original schedule.¹²⁰ Production of HIMARS has already increased from 48 per year to 60 per year and is expected to double to a capacity of 96 per year by the end of 2024.¹²¹ It is possible that the HIMARS being produced for Ukraine could be in the production queue ahead of those being produced for Taiwan. It is important to note, however, that Taiwan is set to receive more HIMARS, and on an accelerated timeline, than it did before the 2022 Russian invasion, due to production increases. Taiwan could use the 300-kilometer range of ATACMS launched from HIMARS to target People's Liberation Army (PLA) facilities, bases, and ships in port before they cross the Taiwan Strait. If armed with the forthcoming maritime strike variant of the Precision Strike Missile, HIMARS could also target People's Liberation Army Navy (PLAN) ships at sea. Taiwan could use the 70-kilometer range of the GMLRS fired by HIMARS to strike PLA forces that make it ashore. Over 50,000 GMLRS were produced by 2021, and production will increase to 14,000 per year in 2025 from its previous rate of 6,000 per year.¹²² However, current demand for GMLRS exceeds production capacity, and it will likely take several years to replenish U.S. stocks.

Ukraine Impact: No Material Delay — There may be slight tension between the provision of HIMARS to Ukraine through USAI (although not from those already transferred through PDA) and the second FMS of HIMARS to Taiwan. However, delays in delivery to Taiwan because of deliveries to Ukraine will be less than one year due to increased production rates. Taiwan is expected to receive the first 11 HIMARS by the first quarter of 2025 and an additional 18 by 2026.

Defense Industrial Base: Requires Attention — HIMARS production is increasing at a rapid pace, as is the production of GMLRS, although demand continues to exceed production capacity for GMLRS.

118. U.S. Department of State, “U.S. Security Cooperation with Ukraine – Fact Sheet,” September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>); Joe Gould, “New Ukraine aid will buy 18 HIMARS and weapons to ‘disrupt’ drones,” *Defense News*, September 28, 2022. (<https://www.defensenews.com/pentagon/2022/09/28/new-ukraine-aid-will-buy-18-himars-and-weapons-to-disrupt-drones>); U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, “Ukraine - High Mobility Artillery Rocket Systems,” May 10, 2024. (<https://www.dsca.mil/press-media/major-arms-sales/ukraine-high-mobility-artillery-rocket-systems>)

119. Matthew Strong, “Taiwan to receive early delivery of 18 extra HIMARS systems in 2026,” *Taiwan News* (Taiwan), May 5, 2023. (<https://www.taiwannews.com.tw/news/4883328>); After the assessed period of this report ended on September 30, 2024, Taiwan reportedly received HIMARS and ATACMS in November 2024. (<https://www.janes.com/osint-insights/defence-news/industry/taiwan-receives-initial-himars-and-atacms>)

120. Matthew Strong, “Taiwan to receive early delivery of 18 extra HIMARS systems in 2026,” *Taiwan News* (Taiwan), May 5, 2023. (<https://www.taiwannews.com.tw/news/4883328>)

121. Valerie Insinna, “Lockheed making moves to increase HIMARS production to 96 per year,” *Breaking Defense*, October 18, 2022. (<https://breakingdefense.com/2022/10/lockheed-making-moves-to-increase-himars-production-to-96-per-year>); “Lockheed Martin on track to increase production of weapons systems,” *Reuters*, February 15, 2024. (<https://www.reuters.com/business/aerospace-defense/lockheed-martin-track-increase-production-weapons-systems-2024-02-15>)

122. Kinsey Lindstrom, “Army celebrates production of 50,000th GMLRS rocket and its continued evolution,” *Defense Visual Information Distribution Service*, January 12, 2021. (<https://www.dvidshub.net/news/386831/army-celebrates-production-50000th-gmlrs-rocket-and-its-continued-evolution>); Sam Skove, “Why It’s Hard to Double GMLRS Production,” *Defense One*, March 30, 2023. (<https://www.defenseone.com/business/2023/03/why-its-hard-double-gmlrs-production/384646>); Jen Judson, “Did Ukraine funding spare the US Army from budget cuts?” *Defense News*, March 27, 2023. (<https://www.defensenews.com/land/2023/03/27/did-ukraine-funding-spare-the-us-army-from-budget-cuts>); Lockheed Martin, “Ramping Up: Lockheed Martin Steadily Increasing Production of High-Demand Systems,” February 15, 2024. (<https://www.lockheedmartin.com/en-us/news/features/2024/ramping-up--lockheed-martin-steadily-increasing-production-o.html>)



ARMY TACTICAL MISSILE SYSTEM (ATACMS)

What: ATACMS is a short-range, surface-to-surface ballistic missile that can be fired from HIMARS or Multiple Launch Rocket Systems.¹²³

Why: ATACMS can strike a wide variety of targets at significant ranges depending on the variant, including facilities, bases, and ships in port.

Details: DSCA announced an FMS of 64 M57 ATACMS to Taiwan as part of a purchase of 11 HIMARS in October 2020.¹²⁴ Taiwan later increased this purchase to 84 missiles.¹²⁵ The United States has committed an unknown number of ATACMS to Ukraine (likely in the low hundreds).¹²⁶ Ukraine has received 165-km and 300-km variants of ATACMS, some of which employ submunition payloads and some of which have unitary warheads.¹²⁷ There are no DCS for ATACMS. Sixty-four of Taiwan's ATACMS have already been produced, although production of additional missiles may be delayed due to an apparent DOD decision not to order any additional ATACMS, which will cause contracting

¹²³. "MGM-140 Army Tactical Missile System (ATACMS)," *Missile Threat*, Center for Strategic and International Studies, November 30, 2016, last modified April 23, 2024. (<https://missilethreat.csis.org/missile/atacms>)

¹²⁴. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Taipei Economic and Cultural Representative Office in the United States (TECRO) – HIMARS, Support, and Equipment," October 21, 2020. (<https://www.dscamilitary.com/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-15>)

¹²⁵. "Purchase of 18 additional HIMARS multiple launch rocket systems Military: Delivered to Taiwan in 2026," *Liberty Times Net* (Taiwan), May 5, 2023. (<https://def.ltn.com.tw/article/breakingnews/4292058>)

¹²⁶. Eric Schmitt, "U.S. Secretly Shipped New Long-Range Missiles to Ukraine," *The New York Times*, April 24, 2024. (<https://www.nytimes.com/2024/04/24/us/us-ukraine-russia-missiles.html>)

¹²⁷. Natasha Bertrand and Oren Liebermann, "US has provided Ukraine long-range ATACMS missiles, sources say," *CNN*, October 18, 2023. (<https://www.cnn.com/2023/10/17/politics/us-ukraine-long-range-atacm-missiles/index.html>); "U.S. Confirms It Sent Missiles With 300-Kilometer Range To Ukraine," *Radio Free Europe/Radio Liberty*, April 24, 2024. (<https://www.rferl.org/a/ukraine-us-confirms-acatms-300-kilometer-russia-range-military-aid-russia/32919389.html>)

delays.¹²⁸ The ATACMS production line is still open and reportedly has a capacity of 500 missiles per year.¹²⁹ Since June 2022, the State Department has approved the FMS of at least 311 M57 ATACMS to seven countries (Estonia,¹³⁰ Lithuania,¹³¹ Poland,¹³² the Netherlands,¹³³ Morocco,¹³⁴ Latvia,¹³⁵ and Norway).¹³⁶ A contract to produce many of these ATACMS FMS cases was awarded on July 2, 2024.¹³⁷ Even if the limited U.S. arsenal of ATACMS would make it difficult to provide additional missiles to both Ukraine and Taiwan via PDA, it is worth noting that the Army began accepting deliveries of ATACMS's replacement, the Precision Strike Missile (PrSM), in December 2023.¹³⁸ Doug Bush, the former assistant secretary of the Army for acquisition, logistics, and technology, stated in September 2023 that PrSM entering service would make providing ATACMS to Ukraine "less risky."¹³⁹ The additional range and future maritime strike capability of PrSM make it better suited to Taiwan's needs, and increased production and procurement of PrSM could help compensate for any shortfall in ATACMS production or stockpiles.¹⁴⁰

Ukraine Impact: No Material Delay — The provision of ATACMS to Ukraine is unlikely to have a material impact on providing ATACMS to Taiwan. The initial provision of the aging 165-km-ranged ATACMS variants did not affect Taiwan's order, which was for the 300-km M57 variant. Producing Taiwan's order of 84 M57 missiles will take approximately two months at the current rate, and 64 of Taiwan's ATACMS have already been produced.

Defense Industrial Base: Requires Attention — The production line for ATACMS is still open and can produce missiles in substantial quantities, but U.S. stockpiles are not large. However, the introduction of PrSM could provide additional U.S. capacity to meet the ground-launched strike capacity and capability requirements of partners in the coming years. Congress and the administration should ensure that ATACMS delivery queues are aligned with the National Security Strategy and the National Defense Strategy and should consider approving the export of PrSM to Taiwan.

128. After the assessed period of this report ended on September 30, 2024, Taiwan reportedly received HIMARS and ATACMS in November 2024. See: Sohini Mandal, "Taiwan received initial HIMARS and ATACMS," *Janes*, November 12, 2024. (<https://www.janes.com/osint-insights/defence-news/industry/taiwan-receives-initial-himars-and-atacms>)

129. Karen DeYoung and John Hudson, "U.S. will send Ukraine long-range missiles, after delay," *The Washington Post*, September 22, 2023. (<https://www.washingtonpost.com/national-security/2023/09/22/atacms-ukraine-cluster-munitions/>)

130. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Estonia – M142 High Mobility Artillery Rocket System (HIMARS)," July 15, 2022. (<https://www.dsca.mil/press-media/major-arms-sales/estonia-m142-high-mobility-artillery-rocket-system-himars>)

131. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Lithuania – M142 High Mobility Artillery Rocket System (HIMARS)," November 9, 2022. (<https://www.dsca.mil/press-media/major-arms-sales/lithuania-m142-high-mobility-artillery-rocket-system-himars>)

132. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Poland – High Mobility Artillery Rocket System (HIMARS)," February 7, 2023. (<https://www.dsca.mil/press-media/major-arms-sales/poland-high-mobility-artillery-rocket-system-himars-0>)

133. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "The Netherlands – M142 High Mobility Artillery Rocket System (HIMARS)," February 16, 2023. (<https://www.dsca.mil/press-media/major-arms-sales/netherlands-m142-high-mobility-artillery-rocket-system-himars>)

134. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Morocco – High Mobility Artillery Rocket Systems (HIMARS)," April 11, 2023. (<https://www.dsca.mil/press-media/major-arms-sales/morocco-high-mobility-artillery-rocket-systems-himars>)

135. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Latvia – M142 High Mobility Artillery Rocket Systems," October 24, 2023. (<https://www.dsca.mil/press-media/major-arms-sales/latvia-m142-high-mobility-artillery-rocket-systems>)

136. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Norway – M142 High Mobility Artillery Rocket Systems," August 9, 2024. (<https://www.dsca.mil/press-media/major-arms-sales/norway-m142-high-mobility-artillery-rocket-systems>)

137. U.S. Department of Defense, "Contracts for July 2, 2024," July 2, 2024. (<https://www.defense.gov/News/Contracts/Contract/Article/3825673>)

138. Ashley Roque, "Lockheed begins delivering long-range PrSM Increment 1 to Army," *Breaking Defense*, December 8, 2023. (<https://breakingdefense.com/2023/12/lockheed-begins-delivering-prsm-inc-1-to-army/>); Bradley Bowman and Ryan Brobst, "Deploy the Precision Strike Missile to the Middle East," *Breaking Defense*, November 30, 2023. (<https://breakingdefense.com/2023/11/deploy-the-precision-strike-missile-to-the-middle-east/>)

139. Joseph Trevithick and Howard Altman, "Decision To Give ATACMS To Ukraine Is About To Become Easier," *The Warzone*, September 19, 2023. (<https://www.twz.com/one-argument-against-giving-atacms-to-ukraine-is-about-to-erode>)

140. Ashley Roque, "Army taps teams to build new Precision Strike Missile for targets beyond 1,000km," *Breaking Defense*, March 27, 2023. (<https://breakingdefense.com/2023/03/army-taps-teams-to-build-new-precision-strike-missile-for-targets-beyond-1000-km>)



HARPOON COASTAL DEFENSE SYSTEM (HCDS) AND HARPOON BLOCK II MISSILE

What: The HCDS is a mobile, land-based, anti-ship missile battery mounted on trucks. HCDS fires the Harpoon anti-ship missile, which is capable of sinking or damaging warships and other vessels.

Why: Harpoon missiles can target ships. HCDS's mobility makes the systems more difficult to detect and improves their survivability.¹⁴¹

Details: DSCA announced an FMS to Taiwan of up to 100 Harpoon Coastal Defense Systems along with up to 400 RGM-84L-4 (surface-launched) Harpoon Block II missiles in October 2020 and 60 AGM-84L-1 (air-launched) Harpoon Block II missiles in September 2022.¹⁴² There are no DCS for Harpoon. According to SIPRI, Taiwan received 335 Harpoon missiles of various types between 1990 and 2015.¹⁴³ The United States committed two Harpoon missile

¹⁴¹. U.S. Department of Defense, Naval Air Systems Command, "Harpoon," *NAVAIR*, accessed December 9, 2024. (<https://www.navair.navy.mil/product/Harpoon>)

¹⁴². U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Taipei Economic and Cultural Representative Office in the United States (TECRO) – RGM-84L-4 Harpoon Surface Launched Block II Missiles," October 26, 2020. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-17>); U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Taipei Economic and Cultural Representative Office in the United States (TECRO) – RGM-84L-4 Harpoon Surface Launched Block II Missiles," October 26, 2020. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-17>); U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Taipei Economic and Cultural Representative Office in the United States – AGM-84L-1 Harpoon Block II Missiles," September 2, 2022. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-agm>)

¹⁴³. "SIPRI Arms Transfer Database," *Stockholm International Peace Research Institute*, March 11, 2024. (<https://www.sipri.org/databases/armstransfers>)

launchers to Ukraine, which also received two additional launchers from U.S. international partners.¹⁴⁴ Despite the fact sheet on aid to Ukraine stating that Washington provided “two Harpoon coastal defense systems” to Kyiv, Ukraine did not receive the same system that Taipei ordered.¹⁴⁵ The system sent to Ukraine was constructed by retrofitting ship-based launchers and older, ship-launched missiles onto trucks and then pairing them with a power source on another truck.¹⁴⁶ All four units used third-party transfer missiles from countries such as the Netherlands, with Denmark also providing launchers.¹⁴⁷ As confirmed in a press briefing by a U.S. senior defense official, the United States did not provide Ukraine with any of the missiles.¹⁴⁸ The HCDS that Taiwan ordered is a purpose-built system for which the launcher production contract was only awarded in March 2022. Additionally, the missile production contract to accompany the HCDS was awarded in April 2023 — approximately two and a half years after the sale was initially announced — despite the United States having awarded a contract for the production of Harpoon missiles five months earlier.¹⁴⁹ However, a similar retrofitting could be used as an interim solution for Taiwan, as full delivery is not expected until 2029.¹⁵⁰ There was an option to advance the full delivery date by two years, but the DOD decided not to exercise that option, and the opportunity has passed. The DOD could also conduct a policy change to permit older Harpoon variants to be contracted and sent to Taiwan on a faster timeline but has not done so. However, the first HCDS has been built and tested, and missile deliveries are expected to start in 2025. The manufacturer’s maximum annual production capacity for Harpoon missiles and Standoff Land Attack Missiles (SLAM) — a Harpoon derivative — is approximately 600 per year.

Ukraine Impact: No Material Delay — The provision of Harpoon launchers to Ukraine did not impede the delivery of HCDS because the Ukrainian system was retrofitted using existing components, while the system for Taiwan is new procurement from industry. The United States did not provide Harpoon missiles to Ukraine, so any delay in the delivery of the missiles to Taiwan cannot be attributed to security assistance to Kyiv.

Defense Industrial Base: Weak — Under current plans, it is expected to take approximately nine years to go from DSCA announcement to full delivery of HCDS to Taiwan. That delay could prove costly. The Pentagon took multiple years to award a contract for the missiles despite having recently awarded another contract for Harpoon production, and the DOD did not take all available steps to expedite the full delivery of HCDS. The expected maximum production capacity of Harpoon/SLAM will be sufficient to meet reasonable future needs once reached.

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- 144.** U.S. Department of State, Bureau of Political-Military Affairs, “U.S. Security Cooperation with Ukraine – Fact Sheet,” September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>); Sam Lagrone, “Denmark Sending Ukraine Anti-Ship Harpoon Missiles To Take on Russian Ships in Black Sea,” *USNI News*, May 23, 2022. (<https://news.usni.org/2022/05/23/denmark-sending-ukraine-anti-ship-harpoon-missiles-to-take-on-russian-ships-in-black-sea>)
- 145.** U.S. Department of State, Bureau of Political-Military Affairs, “U.S. Security Cooperation with Ukraine – Fact Sheet,” September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>)
- 146.** Howard Altman, “How The U.S. Rushed Harpoon Anti-Ship Missiles To Ukraine (Updated),” *The Warzone*, September 7, 2022. (<https://www.twz.com/how-the-u-s-rushed-harpoon-anti-ship-missiles-to-ukraine>)
- 147.** David Axe, “Ukraine’s F-16s With Harpoon Anti-Ship Missiles Is One Small Electronic Box,” *Forbes*, September 1, 2023. (<https://www.forbes.com/sites/davidaxe/2023/09/01/all-it-takes-to-arm-ukraines-f-16s-with-harpoon-anti-ship-missiles-is-one-small-electronic-box>); “Netherlands to give Ukraine anti-ship rockets,” *NL Times* (The Netherlands), June 16, 2022. (<https://nltimes.nl/2022/06/16/netherlands-give-ukraine-anti-ship-rockets>); Joseph Trevithick and Tyler Rogoway, “Harpoon Anti-Ship Missiles Headed To Ukraine From Denmark,” *The Warzone*, May 23, 2022. (<https://www.twz.com/harpoon-anti-ship-missiles-headed-to-ukraine-from-denmark>)
- 148.** U.S. Department of Defense, “Senior Defense Officials Hold a Background Briefing,” June 15, 2022. (<https://www.defense.gov/News/Transcripts/Transcript/Article/3064802/senior-defense-officials-hold-a-background-briefing-june-15-2022>)
- 149.** U.S. Department of Defense, “Contracts For March 2, 2022,” March 2, 2022. (<https://www.defense.gov/News/Contracts/Contract/Article/2952403>); U.S. Department of Defense, “Contracts For April 7, 2023,” April 7, 2023. (<https://www.defense.gov/News/Contracts/Contract/Article/3356129>); U.S. Department of Defense, “Contracts for May 13, 2020,” May 13, 2020. (<https://www.defense.gov/News/Contracts/Contract/Article/2185990>)
- 150.** Bradley Bowman and Rear Adm. (Ret.) Mark Montgomery, “Taiwan Needs Our Help Now,” *The Dispatch*, April 17, 2023. (<https://thedispatch.com/article/taiwan-needs-our-help-now>)



AGM-84 STANDOFF LAND ATTACK MISSILE- EXPANDED RESPONSE (SLAM-ER)

What: SLAM-ER is an air-launched cruise missile.¹⁵¹

Why: F-16s and other aircraft can employ SLAM-ER to target facilities, bases, and ships.

Details: DSCA announced an FMS of 135 SLAM-ERs to Taiwan in October 2020.¹⁵² SLAM-ER is a Harpoon derivative with significant overlap in the production lines.¹⁵³ There are no DCS for SLAM-ER. According to SIPRI, Taiwan has yet to receive any SLAM-ERs.¹⁵⁴ SLAM-ER has not been committed to Ukraine, although some have

151. U.S. Department of Defense, U.S. Naval Air Systems Command, “SLAM-ER,” *NAVAIR*, accessed October 9, 2024. (<https://www.navair.navy.mil/product/SLAM-ER>)

152. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, “Taipei Economic and Cultural Representative Office in the United States (TECRO) – AGM-84H Standoff Land Attack Missile-Expanded Response (SLAM-ER) Missiles,” October 21, 2020. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-16>)

153. U.S. Department of Defense, U.S. Naval Air Systems Command, “SLAM-ER,” *NAVAIR*, accessed October 9, 2024. (<https://www.navair.navy.mil/product/SLAM-ER>)

154. “SIPRI Arms Transfers Database,” *Stockholm International Peace Research Institute*, March 11, 2024. (<https://www.sipri.org/databases/armstransfers>)

suggested that the missiles could be paired with F-16s, perhaps including those operated by Ukraine.¹⁵⁵ If the United States provided Ukraine with SLAM-ERs through PDA, it would not directly affect Taiwan's order, which is planned to be new productions. Even if the United States committed SLAM-ER to Ukraine through USAI, it would be unlikely to impact Taiwan, as Ukraine would likely be placed behind Taiwan in the missile's production queue. SLAM-ER production is expected to occur after Harpoon missile production for HCDS, and a contract for SLAM-ER for Taiwan has not been awarded. The rough anticipated delivery timeline is 2027-2029.

Ukraine Impact: No Material Delay — SLAM-ER cannot be cited as an example in which security assistance for Ukraine impeded efforts to arm Taiwan. The United States has not committed the missiles to Ukraine. Even if that occurs, Ukraine would likely be placed behind Taiwan in the missile production queue if the missiles were committed to Ukraine through USAI.

Defense Industrial Base: Weak — As a Harpoon derivative, SLAM-ER faces the same long lead times for similar reasons, with a rough anticipated delivery timeline of 2027-2029.

155. Tyler Rogoway, "Ukraine's F-16s Could Come With These Weapons," *The Warzone*, June 6, 2023. (<https://www.twz.com/ukraines-f-16s-could-come-with-these-weapons>)



M109 PALADIN SELF-PROPELLED HOWITZER

What: The Paladin is a self-propelled 155 mm howitzer.¹⁵⁶

Why: The Paladin can target vehicles, infantry, and positions.

Details: DSCA announced an FMS of 40 Paladins to Taiwan in August 2021.¹⁵⁷ The United States has committed at least 18 Paladins to Ukraine through PDA.¹⁵⁸ There are no DCS for Paladin. According to IISS's Military

156. "Paladin M109A6 155mm Artillery System," *Army Technology*, February 28, 2020. (<https://www.army-technology.com/projects/paladin>)

157. U.S. Department of Defense, U.S. Defense Security Cooperation Agency, Press Release, "Taipei Economic and Cultural Representative Office in the United States (TECRO) – 155mm M109A6 Paladin Medium Self-Propelled Howitzer System," August 4, 2021. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-20>)

158. "Answering the Call: Heavy Weaponry Supplied to Ukraine," *Oryx*, April 11, 2022. (<https://www.oryxspioenkop.com/2022/04/answering-call-heavy-weaponry-supplied.html>); Howard Altman, "Boosting Ukraine's Maneuver Capabilities Focus of \$3B U.S. Aid Package," *The Warzone*, January 6, 2023. (<https://www.twz.com/boosting-ukraines-maneuver-capabilities-focus-of-3b-us-aid-package>)

Balance 2024, Taiwan already fields over 1,700 artillery pieces, not including mortars.¹⁵⁹ This includes 318 155 mm self-propelled howitzers and 340-plus 155 mm towed howitzers. Taiwan did not sign a Letter of Offer and Acceptance (LOA) for the Paladins and backed out in 2022. Taiwan's Ministry of National Defense cited a "crowded" production line, although the manufacturer disputed this.¹⁶⁰ However, the U.S. Army did reduce its purchase of Paladins by 54 systems, freeing up space on the production line, which likely accounts for the conflicting reports. The provision of these howitzers to Ukraine through PDA did not affect this decision by Taiwan, as it occurred well before Paladins were committed to Ukraine and because Ukraine's Paladins came from the U.S. military's existing inventory, an option which was not available for Taiwan at the time.¹⁶¹ Taiwan decided to purchase an additional 18 HIMARS instead.¹⁶²

Ukraine Impact: No Material Delay — The provision of Paladins to Ukraine from the U.S. military's inventory did not impede efforts to arm Taiwan because the systems provided to Ukraine were older models that came from U.S. military stockpiles. If Taiwan had stayed in the contract, it would have received newly produced systems from industry.¹⁶³

Defense Industrial Base: Requires Attention — Taiwan's withdrawal from the Paladin sale due to delays in the manufacture of new systems and the U.S. Army's reduction in purchases to free up space in the production line indicates some issues with manufacturing capacity.

159. "The Military Balance 2024," *International Institute for Strategic Studies*, February 13, 2024. (archived version available at <https://web.archive.org/web/20241203005245/https://www.iiss.org/publications/the-military-balance>)

160. Alex Wilson, "'Crowded' Production Lines Mean US Can't Deliver Howitzers to Taiwan on Time," *Stars and Stripes*, May 3, 2022. (https://www.stripes.com/theaters/asia_pacific/2022-05-03/us-taiwan-arms-sale-howitzers-china-ukraine-war-5877673.html); Mike Yeo, Jen Judson, and Joe Gould, "BAE Systems, Pentagon Question Reports of Howitzer Delay for Taiwan," *Defense News*, May 4, 2022. (<https://www.defensenews.com/global/asia-pacific/2022/05/04/bae-systems-pentagon-dispute-reports-of-howitzer-delay-for-taiwan>)

161. Jennifer Jacobs, "U.S. Adds Offensive Weapons for Ukraine in \$2.85 Billion Package," *Bloomberg*, January 6, 2023. (<https://www.bloomberg.com/news/articles/2023-01-06/us-adds-offensive-weapons-for-ukraine-in-2-85-billion-package>)

162. Kapil Kajal, "Taiwan Buys Additional HIMARS," *Janes*, May 17, 2023. (<https://www.janes.com/osint-insights/defence-news/defence/taiwan-buys-additional-himars>)

163. Mike Yeo, Jen Judson, and Joe Gould, "BAE Systems, Pentagon Question Reports of Howitzer Delay for Taiwan," *Defense News*, May 4, 2022. (<https://www.defensenews.com/global/asia-pacific/2022/05/04/bae-systems-pentagon-dispute-reports-of-howitzer-delay-for-taiwan>)



SWITCHBLADE 300 ANTI-PERSONNEL AND ANTI-ARMOR LOITERING MISSILE SYSTEM

What: The Switchblade 300 is a miniature, man-portable, loitering munition.¹⁶⁴

Why: The Switchblade 300 Block 10 can target infantry and unarmored vehicles. The Switchblade 300 Block 20 has an extended range and can defeat some armored vehicles.

Details: DSCA announced an FMS of 720 Switchblade 300s to Taiwan in June 2024.¹⁶⁵ The United States provided 700 Switchblade 300 Block 10s to Ukraine.¹⁶⁶ The Switchblade 300s were provided to Ukraine in two tranches of PDA transfers (100 and 300), as well as in one USAI contract for an additional 300 units. Dozens of countries are in some stage of procurement of Switchblade 300 Block 20s through the U.S. FMS process, but there are no active

¹⁶⁴. "Switchblade 300 Loitering Munition," *Army Recognition Group*, August 2, 2024. (<https://armyrecognition.com/military-products/army/unmanned-systems/unmanned-aerial-vehicles/switchblade-300>)

¹⁶⁵. U.S. Department of Defense, U.S. Defense Security Cooperation Agency, Press Release, "Taipei Economic and Cultural Representative Office in the United States – Switchblade 300 Anti-Personnel and Anti-Armor Loitering Missile System," June 18, 2024. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-33>)

¹⁶⁶. U.S. Department of Defense, "Fact Sheet on U.S. Security Assistance to Ukraine," January 25, 2023. (<https://media.defense.gov/2023/Jan/25/2003149684/-1/-1/1/UKRAINE-FACT-SHEET-JAN-25.PDF>)

DCS for Switchblade 300s. Switchblade 300s were committed to Ukraine early in the war but received mixed reviews from Ukrainian forces and were largely replaced for some target sets by much cheaper quadcopter drones that can carry a wider variety of payloads.¹⁶⁷ The manufacturer is no longer producing the Switchblade 300 Block 10s and has transitioned to the production of Block 20 variants, which have a longer range, perform better against electronic warfare, and can employ two types of warheads. Taiwan will receive the Block 20 variant, and delivery is tentatively expected before the end of 2025. In August 2024, the U.S. Army awarded a nearly \$1 billion contract for Switchblade 300 and 600s (a significantly larger system capable of striking heavily armored targets).¹⁶⁸ There is no evidence that a contract for Taiwan's Switchblade 300s has been awarded. The manufacturer ramped up production of the Switchblade 300 before Russia's 2022 invasion of Ukraine and increased the production of both Switchblade 300s and 600s since then. The production rate is sufficient to meet current demand.

Ukraine Impact: No Material Delay — The provision of Switchblade 300s committed to Ukraine was completed before Taiwan's order was placed, and there have been no subsequent orders from Kyiv. Therefore, the provision of the systems to Ukraine has not delayed deliveries to Taiwan, which are tentatively expected by the end of 2025, but did enable the manufacturer to improve the systems that Taipei will ultimately receive.

Defense Industrial Base: Strong — The manufacturer of the Switchblade 300 has ramped up production to meet demand for the system and can expand further as demand increases. The U.S. Army's large order, as well as significant international demand, should provide the predictability needed to invest in even greater production capacity if needed.

167. Heather Somerville and Brett Forrest, "How American Drones Failed to Turn the Tide in Ukraine," *The Wall Street Journal*, April 10, 2024. (<https://www.wsj.com/world/how-american-drones-failed-to-turn-the-tide-in-ukraine-b0ebbac3>)

168. Joseph Trevithick, "Army Just Signed \$1B Deal For Massive Order Of Switchblade Kamikaze Drones," *The Warzone*, August 28, 2024. (<https://www.twz.com/air/army-just-signed-1b-deal-for-massive-order-of-switchblade-kamikaze-drones>)



ALTIUS-600M

What: The ALTIUS-600M is a multi-mission loitering munition.¹⁶⁹

Why: The ALTIUS-600M can target infantry, armored vehicles, amphibious forces, and positions.

Details: DSCA announced an FMS of 291 ALTIUS-600M-Vs to Taiwan in June 2024.¹⁷⁰ The United States committed an unknown number of ALTIUS-600s to Ukraine by February 2023.¹⁷¹ There are no DCS for the ALTIUS-600. The ALTIUS-600 is a relatively new capability and the commitment to Ukraine and order by Taiwan are possibly the first large-scale orders for the system, meaning there is likely a higher degree of uncertainty surrounding production

¹⁶⁹. "ALTIUS-600 Small Unmanned Aircraft System," *Airforce Technology*, April 28, 2021. (<https://www.airforce-technology.com/projects/altius-600-small-unmanned-aircraft-system>)

¹⁷⁰. U.S. Department of Defense, U.S. Defense Security Cooperation Agency, Press Release, "Taipei Economic and Cultural Representative Office in the United States – ALTIUS 600M-V Unmanned Aerial Vehicles," June 18, 2024. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-34>)

¹⁷¹. U.S. Department of State, Bureau of Political Affairs, "U.S. Security Cooperation with Ukraine – Fact Sheet," September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>); Joseph Trevithick, "Ukraine Gets Huge Boost In Deadly Drone Capabilities From U.S.," *The Warzone*, February 24, 2023. (<https://www.twz.com/ukraine-gets-huge-boost-in-deadly-drone-capabilities-from-u-s>)

capacity and timeline.¹⁷² However, receiving large orders gives manufacturers the predictability needed to invest in production capacity.

Ukraine Impact: No Material Delay — The decision to provide the ALTIUS-600s to Ukraine is unlikely to have impacted the delivery of Taiwan's order because it occurred well before Taiwan's order was placed. Instead, the provision to Ukraine likely spurred production of the system and can provide valuable information regarding the system's performance in real-world conditions, which can benefit Taipei.

Defense Industrial Base: Requires Attention — Increased production of the ALTIUS-600 could help meet any future U.S. and Taiwanese requirements.

172. Thomas Newdick, "Our First Look At An ALTIUS-600M Loitering Munition Detonating," *The Warzone*, April 3, 2023. (<https://www.twz.com/our-first-look-at-an-altius-600m-loitering-munition-detonating>); Valerie Insinna, "Valkyrie drone launches even smaller drone from inside payload bay," *Defense News*, April 5, 2021. (<https://www.defensenews.com/air/2021/04/05/the-valkyrie-drone-launches-an-even-smaller-drone-from-inside-its-payload-bay>)

Weapon Systems With Actual or Possible Overlap Between Ukraine, Taiwan, and Israel

The following 12 weapon systems have both an FMS to Taiwan announced between January 1, 2015, and September 30, 2024, or are likely to be committed to Taiwan and are committed or likely will be committed or sold to Ukraine and Israel.



BGM-71 SERIES TOW MISSILE SYSTEM

What: The tube-launched, optically-tracked, wireless-guided missile weapon system, or TOW missile, is an anti-tank weapon that can be mounted on vehicles or ground-based launchers.¹⁷³

Why: The TOW missile can target armored vehicles and amphibious forces attempting to land or reinforce a beachhead.

Details: DSCA announced an FMS to Taiwan of 769 TOW missiles in December 2015.¹⁷⁴ The United States committed 9,000-plus TOW missiles to Ukraine, mostly through PDA.¹⁷⁵ According to SIPRI, Taiwan received 2,076 TOW missiles

173. "TOW 2 Wire-Guided Anti-Tank Missile," *Army Technology*, March 15, 2022. (<https://www.army-technology.com/projects/tow-2-missile>)

174. U.S. Department of Defense, Defense Security Cooperation Organization, Press Release, "Taipei Economic and Cultural Representative Office in the United States – TOW 2B Aero Radio Frequency (RF) Missile (BGM-71F-Series), Support and Training," December 16, 2015. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-tow>)

175. U.S. Department of State, Bureau of Political Affairs, "U.S. Security Cooperation with Ukraine – Fact Sheet," September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>)

from the United States between 1990 and 2015.¹⁷⁶ A contract for Taiwan's TOW missiles was awarded in April 2018, and another \$322.5 million contract for TOW missiles, including for international customers, was awarded in August 2023.¹⁷⁷ Taiwan's order for TOW missiles has expanded to more than 1,700, with deliveries expected to start in December 2024 and complete by the second quarter of 2027. Over 700,000 TOW missiles have been produced since the system was first introduced, and the U.S. military has procured around 800 TOW missiles per year for its own use in recent years.¹⁷⁸ The provision of TOW missiles for Ukraine via PDA did not delay the delivery of new TOW missiles to Taiwan, and PDA could be used to fulfill Taiwan's requirements in the future. Part of the reason Taipei's order went unfulfilled was a deficiency that shut down the production line for months while the issue was investigated. Israel has used TOW missiles in the past and may request more in the future, but it is currently utilizing its own anti-tank missiles, such as the SPIKE.¹⁷⁹

Ukraine Impact: No Material Delay — The United States is expected to start providing Taiwan with TOW missiles within the next few months despite the provision of TOW missiles to Ukraine.

Defense Industrial Base: Strong — The United States has significant stockpiles of TOW missiles and procures them in large quantities each year. A product deficiency had shut down the production line for months, but the line has since reopened.

176. "SIPRI Arms Transfer Database," *Stockholm International Peace Research Institute*, March 11, 2024. (<https://www.sipri.org/databases/armstransfers>)

177. U.S. Department of Defense, "Contracts For April 30, 2018," April 30, 2018. (<https://www.defense.gov/News/Contracts/Contract/Article/1507394>); Darrell Ames, "Army announces contract award for TOW Weapon System," *Defense Visual Information Distribution Service*, August 16, 2023. (<https://www.dvidshub.net/news/451700/army-announces-contract-award-tow-weapon-system>)

178. "Raytheon delivering wireless TOW missiles to US Army," *Raytheon*, August 21, 2019. (<https://raytheon.mediaroom.com/2019-08-21-Raytheon-delivering-wireless-TOW-missiles-to-US-Army>); U.S. Department of Defense, Department of the Army, "Missile Procurement, Army," March 2023. (<https://www.asafm.army.mil/Portals/72/Documents/BudgetMaterial/2024/Base%20Budget/Procurement/Missile%20Procurement%20Army.pdf>)

179. "Spike Anti-Tank Guided Missiles, Israel," *Army Technology*, June 23, 2023. (<https://www.army-technology.com/projects/gill-spike-anti-tank-missiles>)



120 MM TANK AMMUNITION

What: 120 mm tank rounds are fired by tanks produced by the United States and several of its partners, including the American Abrams, German Leopard II, and Israeli Merkava main battle tanks.

Why: 120 mm tank rounds can target infantry, armored vehicles, and hardened positions.

Details: DSCA announced an FMS to Israel of nearly 14,000 M830A1 120 mm tank rounds in December 2023, with a second FMS of over 32,000 M830A1 and/or M1147 rounds in August 2024.¹⁸⁰ Accompanying the order of 108 M1A2T Abrams tanks, DSCA announced an FMS to Taiwan of over 12,000 120 mm tank rounds, including 828 M830A1 rounds, in July 2019.¹⁸¹ Delivery of Taiwan's 120 mm tank rounds is expected in 2025-2026. The United

180. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Israel – M830A1 120mm Tank Cartridges," December 9, 2023. (<https://www.dscamilitary.com/press-media/major-arms-sales/israel-m830a1-120mm-tank-cartridges>); U.S. Defense Security Cooperation Agency, Press Release, "Israel – 120mm Tank Cartridges," August 13, 2024. (<https://www.dscamilitary.com/press-media/major-arms-sales/israel-120mm-tank-cartridges>)

181. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Taipei Economic and Cultural Representative Office in the United States (TECRO) – M1A2T Abrams Tanks and Related Equipment and Support," July 8, 2019. (<https://www.dscamilitary.com/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-9>)

States has committed an unknown number of 120 mm tank rounds to Ukraine.¹⁸² However, the number of U.S. 120 mm rounds committed to Ukraine may be relatively small, as the United States provided only 31 Abrams tanks to Ukraine. The Leopard 2 tanks committed by other NATO countries also have 120 mm main guns and can theoretically use some of the same ammunition as the Abrams, but each tank is likely to use the 120 mm rounds designed specifically for it.¹⁸³ This means NATO countries contributing Leopards are likely contributing accompanying ammunition as well. Additionally, the CEO of Rheinmetall stated, “We can produce 240,000 rounds of tank ammunition (120 mm) per year, which is more than the entire world needs.” This could be an alternate source of rounds for Ukraine.¹⁸⁴ The German government reportedly received a request from Israel for 10,000 120 mm rounds, which was reportedly still under consideration as of September 2024.¹⁸⁵ Israeli officials have reportedly raised concerns over the supply of 120 mm rounds.¹⁸⁶ This may indicate an issue with the defense industrial base, although fulfilling large orders on short notice would be a difficult task even for a healthy production line. Complicating matters is the fact that the M830A1 round that Taiwan and Israel have ordered is no longer in production.

Ukraine Impact: No Material Delay — Aid to Ukraine is unlikely to materially affect delivery to Israel or Taiwan given the small number of Abrams tanks provided to Ukraine.

Defense Industrial Base: Requires Attention — U.S. stockpiles of 120 mm tank rounds are strained, with demand exceeding supply. Some types of shells ordered by allies are no longer in production. However, there are alternative suppliers in partner countries, seemingly with spare production capacity.

182. U.S. Department of State, Bureau of Political Affairs, “U.S. Security Cooperation with Ukraine – Fact Sheet,” September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>)

183. Peter Beaumont, “Leopard 2 tanks: what are they and why does Ukraine want them?” *The Guardian* (UK), January 25, 2023. (<https://www.theguardian.com/world/2023/jan/25/leopard-2-german-tanks-what-are-they-why-does-ukraine-want>); “120mm KE-W A1° APFSDS-T,” *General Dynamics Ordnance and Tactical Systems*, accessed October 8, 2024. (<https://www.gd-ots.com/munitions/large-caliber-ammunition/120mm-kew-a1/#>)

184. Anneli Palmen and Sabine Siebold, “Rheinmetall eyes boost in munitions output, HIMARS production in Germany,” *Reuters*, January 29, 2023. (<https://www.reuters.com/business/aerospace-defense/rheinmetall-eyes-boost-munitions-output-himars-production-germany-ceo-2023-01-28>)

185. Matthias Gebauer, Christoph Schult, and Gerald Traufetter, “Bundesregierung prüft Lieferung von Panzermunition an Israel (German government examines delivery of tank ammunition to Israel),” *Der Spiegel* (Germany), January 16, 2024. (<https://www.spiegel.de/politik/deutschland/gaza-krieg-bundesregierung-prueft-lieferung-von-panzermunition-an-israel-a-0f0ce68d-7752-4b8e-81eb-9bd3a5692eeb>); Assaf Uni, “Germany delaying Israel tank shell consignment – report,” *Globes* (Israel), September 16, 2024. (<https://en.globes.co.il/en/article-germany-delaying-israel-tank-shell-consignment-report-1001489328>)

186. Anne Flaherty, Matt Gutman, Luis Martinez, Molly Nagle, and Kevin Shalvey, “Senior Israeli official says US slow-walking aid, which US disputes,” *ABC*, March 14, 2024. (<https://abcnews.go.com/International/senior-israeli-official-us-slow-walking-aid-us-disputes/story?id=108107192>)



F-16 FIGHTING FALCON MULTIROLE FIGHTER AIRCRAFT

What: The F-16 is a multirole fighter aircraft that can conduct air-to-air and air-to-surface attacks.

Why: F-16s can target ground forces, facilities, bases, ships, fighter aircraft, bombers, helicopters, cruise missiles, and drones with a wide variety of munitions.¹⁸⁷

Details: DSCA announced an FMS of 66 F-16s to Taiwan in August 2019.¹⁸⁸ According to IISS's Military Balance 2024, Taiwan already fields 140 F-16s.¹⁸⁹ The Biden administration allowed allies to transfer F-16s from their own

¹⁸⁷. U.S. Department of Defense, Department of the Air Force, "F-16 Fighting Falcon," September 2021. (<https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104505/f-16-fighting-falcon>)

¹⁸⁸. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Taipei Economic and Cultural Representative Office in the United States (TECRO) - F-16C/D Block 70 Aircraft and Related Equipment and Support," August 20, 2019. (<https://www.dscamail/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-11>)

¹⁸⁹. "The Military Balance 2024," *International Institute for Strategic Studies*, February 13, 2024. (archived version available at <https://web.archive.org/web/20241203005245/https://www.iiss.org/publications/the-military-balance>)

stocks to Ukraine.¹⁹⁰ There are no DCS for F-16s. The administration also approved allies to train Ukrainian F-16 pilots and conducted training of Ukrainian pilots in the United States.¹⁹¹ It is not clear whether the United States will transfer any of its F-16s to Ukraine, although that seems unlikely in the near future.¹⁹² Any additional F-16s provided to Ukraine will likely come from the existing stocks of U.S. allies, whereas the F-16s provided to Taiwan are new production models.¹⁹³ Taiwan's F-16s are tentatively expected to start arriving in 2024, with full delivery tentatively expected by 2026 despite delays due to software problems.¹⁹⁴

Ukraine Impact: No Material Delay — The provision of existing F-16s from U.S. allies to Ukraine does not impact the ability of the United States to produce new F-16s or provide them to Taiwan.

Defense Industrial Base: Requires Attention — The United States operates hundreds of F-16s and has an active production line for new advanced variants. However, there have been some delays in delivery due to software problems.

190. Eline Schaart, “Netherlands, Denmark confirm US has approved sending Ukraine F-16s jets,” *Politico*, August 18, 2023. (<https://www.politico.eu/article/ukraine-f16-jets-russia-war-netherlands-denmark-united-states>); Ido Vock and James Waterhouse, “Ukraine receives first F-16 fighter jets – Zelensky,” *BBC* (UK), August 4, 2024. (<https://www.bbc.com/news/articles/c4ng1p72wlwo>)

191. Carla Babb, “First Ukrainian pilots graduate from F-16 training in US,” *Voice of America*, May 29, 2024. (<https://www.voanews.com/a/first-ukrainian-pilots-graduate-from-f-16-training-in-us/7634529.html>)

192. Aamer Madhani and Lolita Baldor, “Biden’s shift on F-16s for Ukraine came after months of internal debate,” *Associated Press*, August 24, 2023. (<https://apnews.com/article/biden-ukraine-f16-decision-russia-64538af7c10489d7c2243dadbad31008>); C. Todd Lopez, “Latest Security Assistance for Ukraine Announced, White House Directs DOD to Allocate Remaining Appropriations,” *DOD News*, September 26, 2024. (<https://www.defense.gov/News/News-Stories/Article/Article/3918679/latest-security-assistance-for-ukraine-announced-white-house-directs-dod-to-all>)

193. John Tirpak, “First Phase of Taiwan F-16V Program Is Complete,” *Air & Space Forces Magazine*, February 5, 2024. (<https://www.airandspaceforces.com/first-phase-taiwan-f-16v-upgrade-complete>)

194. Joe Saballa, “Taiwan Mulls Mirage Fighter Service Extension Amid F-16 Delivery Delays,” *The Defense Post*, August 4, 2023. (<https://thedefensepost.com/2023/08/04/taiwan-mirage-extension-delays>); “Software Problems Delay US F-16 Deliveries, Taiwan Says,” *Voice of America*, May 25, 2023. (<https://www.voanews.com/a/software-problems-delay-us-f-16-deliveries-taiwan-says-/7109499.html>); “Taiwan says F-16 deliveries delayed, working to minimise damage,” *Reuters*, May 4, 2023. (<https://www.reuters.com/world/asia-pacific/taiwan-says-f-16-deliveries-delayed-working-minimise-damage-2023-05-04>); Ministry of National Defense of the People’s Republic of China, Press Release, “The Ministry of National Defense issues a press release in response to media reports that F-16 BLK 70 fighter jets newly purchased by our country will be delayed due to ‘technical obstacles’, but Bahrain has already obtained its first F-16 BLK 70 ahead of us,” May 24, 2023. (<https://www.mnd.gov.tw/english/Publish.aspx?title=News%20Channel&SelectStyle=Defense%20News%20&p=81567>)



AIM-9 SIDEWINDER MISSILE

What: The Sidewinder is a short-range air-to-air missile that can also function as a surface-to-air missile when paired with certain launchers.¹⁹⁵

Why: The Sidewinder can target aircraft, helicopters, cruise missiles, and drones.

Details: DSCA announced an FMS of 100 AIM-9X Block II Sidewinder missiles to Taiwan in September 2022.¹⁹⁶ The United States has committed an unknown number of earlier generation AIM-9M Sidewinder missiles to Ukraine since August 2023, likely through PDA and USAI.¹⁹⁷ Israel may order the Sidewinder missile, with DSCA last approving an FMS for up to 600 AIM-9X Sidewinder missiles in July 2014.¹⁹⁸ There are no DCS for Sidewinder missiles. Ukraine

¹⁹⁵. U.S. Department of Defense, Department of the Air Force, “AIM-9 Sidewinder,” November 14, 2022. (<https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104557/aim-9-sidewinder>)

¹⁹⁶. U.S. Department of Defense, U.S. Defense Security Cooperation Agency, Press Release, “Taipei Economic and Cultural Representative Office in the United States – AIM-9X Block II Sidewinder Missiles,” September 2, 2022. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-aim>)

¹⁹⁷. U.S. Department of State, Bureau of Political Affairs, “U.S. Security Cooperation with Ukraine – Fact Sheet,” September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>)

¹⁹⁸. U.S. Department of Defense, U.S. Defense Security Cooperation Agency, Press Release, “Israel – AIM-9X Sidewinder Missiles,” July 14, 2014. (<https://www.dsca.mil/press-media/major-arms-sales/israel-aim-9x-sidewinder-missiles>)

additionally received the AIM-9X Sidewinder by May 2024 from an unknown source(s).¹⁹⁹ According to SIPRI, Taiwan already received at least 1,082 Sidewinders of various types between 1990 and 2015.²⁰⁰ Ukraine's Sidewinders have been used with the National Advanced Surface-to-Air Missile System (NASAMS) and "FrankenSAM," a program that paired Sidewinders (and others missiles) with Soviet-era launchers to increase Ukrainian air defense capacity.²⁰¹ Sidewinder missiles are also likely compatible with Ukraine's F-16s. Ukraine's AIM-9Ms came from existing U.S. stocks, as the AIM-9M is no longer in active production. It first entered service in 1983 and was supplanted by the AIM-9X Block I in 2002.²⁰² The AIM-9X Block IIs that Taiwan ordered are new production models and are one of the most advanced Sidewinder variants. Taiwan is expected to receive its Sidewinder order toward the end of the decade. However, the DOD was acquiring over 600 per year as recently as FY23 and recently awarded contracts to increase the production of AIM-9X Block II Sidewinders to 2,500 per year, which may improve the delivery timeline.²⁰³

Ukraine Impact: No Material Delay — The provision of AIM-9M Sidewinders to Ukraine did not impede efforts to arm Taiwan because Ukraine's AIM-9s are older models from existing U.S. stocks and because Taiwan ordered a new production, advanced Sidewinder variant. The recent provision of AIM-9Xs to Ukraine may impact Taiwan's order if they are provided from U.S. stocks in sufficient quantity to impact PDA or if they come from another source that needs to be backfilled. At least as an interim step, the United States should consider meeting Taiwan's AIM-9X Sidewinder requirement with PDA.

Defense Industrial Base: Requires Attention — Sidewinder is produced in significant quantities, and that production is increasing to 2,500 per year, but Taiwan may not receive its full order until the end of this decade. The DOD is taking steps to increase production capacity, which could help expedite delivery to Taiwan. That increased production will prove necessary for several reasons, including increased international procurement of NASAMS.

199. Parth Satam, "Ukraine Fires AIM-9X Sidewinder Missiles from NASAMS," *The Aviationist*, May 29, 2024. (<https://theaviationist.com/2024/05/29/ukraine-fires-aim-9x-from-nasams>)

200. "SIPRI Arms Transfers Database," *Stockholm International Peace Research Institute*, March 11, 2024. (<https://www.sipri.org/databases/armstransfers>)

201. "National Advanced Surface to Air Missile System, Norway," *Airforce Technology*, August 7, 2023. (<https://www.airforce-technology.com/projects/nasams-defence-system-norway>); Mia Jankowicz, "Ukraine's FrankenSAM Air-Defense System Recorded Its First Kill," *Business Insider*, January 18, 2024. (<https://www.businessinsider.com/ukraine-frankensam-air-defense-shot-down-first-shahed-drone-russia-2024-1>)

202. U.S. Department of Defense, Department of the Air Force, "AIM-9 Sidewinder," November 14, 2022. (<https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104557/aim-9-sidewinder>); "AIM-9 Sidewinder," *Air & Space Forces Magazine*, accessed October 8, 2024. (<https://www.airandspaceforces.com/weapons-platforms/aim-9>)

203. U.S. Department of Defense, Office of the Under Secretary of Defense (Comptroller)/Chief Financial Officer, "Program Acquisition Cost by Weapon System United States Department of Defense Fiscal Year 2025 Budget Request," February 28, 2024. (https://comptroller.defense.gov/Portals/45/Documents/defbudget/FY2025/FY2025_Weapons.pdf); John Hill, "US DoD Increases AIM-9X Sidewinder Production to 2,500 Missiles," *Airforce Technology*, October 3, 2023. (<https://www.airforce-technology.com/news/us-dod-increases-aim-9x-sidewinder-missiles>)



AIM-120 ADVANCED MEDIUM-RANGE AIR-TO-AIR MISSILE (AMRAAM)

What: The AMRAAM is a beyond-visual-range air-to-air missile that can also function as a surface-to-air missile when paired with certain launchers.²⁰⁴

Why: The AMRAAM can target aircraft, helicopters, cruise missiles, and drones.

Details: DSCA announced an FMS of 200 AIM-120C-8 AMRAAMs to Taiwan in March 2023.²⁰⁵ The United States has committed an unknown number of AMRAAMs to Ukraine for use with NASAMS through PDA and

²⁰⁴. U.S. Department of Defense, Department of the Air Force, “AIM-120 AMRAAM,” February 3, 2024. (<https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104576/aim-120-amraam>)

²⁰⁵. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, “Taipei Economic and Cultural Representative Office in the United States – F-16 Munitions,” March 1, 2023. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-f-16>)

USAI.²⁰⁶ There are no DCS for AMRAAM. At least some AMRAAM variants are compatible with Ukraine's F-16s as well. According to SIPRI, Taiwan already received 338 AMRAAMs between 1990 and 2015.²⁰⁷ DSCA announced an FMS of 30 AIM-120C-8 AMRAAMs to Israel in August 2024.²⁰⁸ The AMRAAMS committed to Ukraine were not the 120C-8 variant that Taiwan and Israel have ordered, as the 120C-8 has not been fully fielded yet.²⁰⁹ If Taiwan fields NASAMS, it could increase its need for AMRAAMs in the future.²¹⁰ In June 2024, the Biden administration temporarily halted deliveries of Patriot and NASAMS interceptors (including AMRAAM) to all countries except Ukraine.²¹¹ However, National Security Council spokesman John Kirby clarified that this would not affect Taiwan or Israel.²¹² The Department of Defense awarded a \$1.15 billion contract for AIM-120 D-3 and AIM-120C-8 AMRAAMs for 19 countries in June 2023 and awarded a further \$1.2 billion contract modification in September 2024.²¹³ Production has reportedly increased from 500-800 a year to nearly 1,200 annually for the foreseeable future.²¹⁴

Ukraine Impact: No Material Delay — The provision of AMRAAMs to Ukraine did not impede efforts to fulfill Taiwan's March 2023 request, as Taipei ordered a yet-to-be-fully fielded model, whereas Ukraine's missiles came from existing stocks. It is not currently possible to assess how any C-8 or other modern variants of AMRAAM that Ukraine may receive in the future through USAI will affect Taiwan's or Israel's orders or how much Taiwan's potential purchase of NASAMS could affect its future needs. Congress and the administration should watch this closely to ensure the delivery queues are aligned with the National Security Strategy and the National Defense Strategy.

Defense Industrial Base: Weak — AMRAAM is procured in significant quantities, but demand is high and could increase significantly, while current stockpiles may be lower than desired.

206. U.S. Department of State, Bureau of Political Affairs, "U.S. Security Cooperation with Ukraine – Fact Sheet," September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>); "National Advanced Surface to Air Missile System, Norway," *Airforce Technology*, August 7, 2023. (<https://www.airforce-technology.com/projects/nasams-defence-system-norway>)

207. "SIPRI Arms Transfers Database," *Stockholm International Peace Research Institute*, March 11, 2024. (<https://www.sipri.org/databases/armstransfers>)

208. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Israel – Advanced Medium Range Air-to-Air Missiles," August 13, 2024. (<https://www.dsca.mil/press-media/major-arms-sales/israel-advanced-medium-range-air-air-missiles>)

209. Allyson Park, "Air Force Completes First Flight Test for Latest AMRAAM Variant," *National Defense Magazine*, September 1, 2023. (<https://www.nationaldefensemagazine.org/articles/2023/9/1/air-force-completes-first-flight-test-for-latest-amraam-variant>)

210. After the assessed period of this report ended on September 30, 2024, DSCA announced an FMS of 3 NASAMS systems and 123 AMRAAM-ERs to Taiwan in October 2024; see: U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Taipei Economic and Cultural Representative Office in the United States – National Advanced Surface-to-Air Missile System," October 25, 2024. (<https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-36>); "Taiwan says looking to buy NASAMS air defence system from US," *Reuters*, July 18, 2023. (<https://www.reuters.com/world/asia-pacific/taiwan-says-looking-buy-nasams-air-defence-system-us-2023-07-18>)

211. Howard Altman and Tyler Rogoway, "U.S. Diverting Missiles From Foreign Customers To Ukraine Could Have Repercussions Beyond Air Defense," *The Warzone*, June 21, 2024. (<https://www.twz.com/air/u-s-diverting-missiles-from-foreign-customers-to-ukraine-could-have-repercussions-beyond-air-defense>)

212. Nancy Youssef and Gordan Lubold, "U.S. Redirects Air-Defense Missile Deliveries to Ukraine," *The Wall Street Journal*, June 20, 2024. (<https://www.wsj.com/politics/national-security/u-s-to-redirect-air-defense-missile-deliveries-to-ukraine-e2753a20>)

213. U.S. Department of Defense, "Contracts For June 20, 2023," June 20, 2023. (<https://www.defense.gov/News/Contracts/Contract/Article/3433420>); U.S. Department of Defense, "Contracts For Sept. 11, 2024," September 11, 2024. (<https://www.defense.gov/News/Contracts/Contract/Article/3902891>)

214. Michael Marrow, "Raytheon to max out AMRAAM production for 'foreseeable future,' exec says," *Breaking Defense*, September 6, 2023. (<https://breakingdefense.com/2023/09/raytheon-to-max-out-amraam-production-for-foreseeable-future-exec-says>)



155 MM ARTILLERY AMMUNITION

What — 155 mm artillery rounds are fired by towed or self-propelled howitzers.

Why — 155 mm artillery can target infantry, armored vehicles, positions, and amphibious forces attempting to land or reinforce a beachhead.

Details — The United States received an Israeli request soon after October 7, 2023, for 57,000 155 mm artillery rounds, which Washington acted promptly to begin fulfilling that month.²¹⁵ Some of the 57,000 rounds were reportedly in the process of being transferred from U.S. stockpiles in Israel to the U.S.-owned European Command stockpile when Hamas attacked on October 7.²¹⁶ The transfer was reversed after a subsequent Israeli request. Additionally, in December 2023, the State Department approved an emergency sale to Israel of equipment that included fuzes, charges, and primers for 155 mm rounds as well as over 55,000 rounds.²¹⁷ There are ongoing discussions regarding the provision of additional 155 mm rounds to Israel. The United States has committed over 3 million 155 mm rounds to Ukraine, which has stretched U.S. stockpiles to near-minimum levels.²¹⁸ That is why the United States withdrew rounds from stockpiles around the world and borrowed 500,000 rounds from South Korea to backfill the U.S. inventory.²¹⁹ Taiwan does not have any pending 155 mm round orders through FMS (with the possible exception of Precision Guidance Kits that can be fitted onto 155 mm rounds) but does operate at least 658 155 mm towed and self-propelled howitzers, according to IISS's Military Balance 2024.²²⁰ The size of Taiwan's stockpiles of 155 mm rounds are classified, but Taiwan has not expended a significant amount of artillery rounds in several decades and domestically produces the M107 155 mm round.²²¹ Despite U.S. efforts to ramp up production, 155 mm artillery rounds are the munition currently experiencing the worst shortages.²²² Doug

215. Anthony Capaccio, "US Is Quietly Sending Israel More Ammunition, Missiles," *Bloomberg*, November 14, 2023. (<https://www.bloomberg.com/news/articles/2023-11-14/pentagon-is-quietly-sending-israel-ammunition-laser-guided-missiles>); Barak Ravid, "Scoop: U.S. to send Israel artillery shells initially destined for Ukraine," *Axios*, October 19, 2023. (<https://www.axios.com/2023/10/19/us-israel-artillery-shells-ukraine-weapons-gaza>)

216. Ronen Berman, Adam Entous, Thomas Gibbons-Neff, John Ismay, and Eric Schmitt, "Pentagon Sends U.S. Arms Stored in Israel to Ukraine," *The New York Times*, January 17, 2023. (<https://www.nytimes.com/2023/01/17/us/politics/ukraine-israel-weapons.html>); "US quietly shipping ammo to Ukraine from massive stockpile in Israel — report," *The Times of Israel* (Israel), January 18, 2023. (<https://www.timesofisrael.com/us-quietly-shipping-ammo-to-ukraine-from-massive-stockpile-in-israel-report>)

217. Matthew Lee, "The Biden administration once again bypasses Congress on an emergency weapons sale to Israel," *Associated Press*, December 29, 2023. (<https://apnews.com/article/us-israel-gaza-arms-hamas-bypass-congress-1dc77f20aac4a797df6a2338b677da4f>); U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Israel – 155mm Artillery Ammunition," December 29, 2023. (<https://www.dsca.mil/press-media/major-arms-sales/israel-155mm-artillery-ammunition>)

218. U.S. Department of State, Bureau of Political-Military Affairs, Press Release, "U.S. Security Cooperation with Ukraine," September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>)

219. Hyonhee Shin, "South Korea to lend 500,000 rounds of artillery shells to US -report," *Reuters*, April 12, 2023. (<https://www.reuters.com/world/south-korea-lend-500000-rounds-artillery-shells-us-report-2023-04-12>)

220. "The Military Balance 2024," *International Institute for Strategic Studies*, February 13, 2024. (archived version available at <https://web.archive.org/web/20241203005245/https://www.iiss.org/publications/the-military-balance>)

221. Han Cheung, "Taiwan in Time: Greeting by artillery fire," *Taipei Times* (Taiwan), June 16, 2019. (<https://www.taipeitimes.com/News/feat/archives/2019/06/16/2003717012>)

222. Carla Babb and Ostap Yarysh, "Without More Funds, US Unable to Hit Ammunition Production Goals," *Voice of America*, March 1, 2024. (<https://www.voanews.com/a/without-more-funds-us-unable-to-hit-ammunition-production-goals/7510881.html>)

Bush, former assistant secretary of the Army for acquisition, logistics and technology, said that Congress's approval of the supplemental production budget would enable the Army to exceed production levels of 100,000 rounds per month by the summer of 2025, up from 28,000 in October 2023.²²³ Europe is also expanding its production of 155 mm artillery rounds. The German company Rheinmetall is building a new factory and plans to produce up to 700,000 rounds per year between all of its plants by 2025.²²⁴ Other European countries and companies are also expanding their production capacities.²²⁵ However, Ukraine will continue to consume the vast majority of U.S. artillery production for the foreseeable future, as Ukraine's army heavily relies on artillery, a result of its Soviet legacy, the battlefield geography, and the attritional nature of the war Kyiv is fighting.²²⁶ Fortunately, Israel and Taiwan will require far fewer rounds than Ukraine. Israel will require fewer rounds because the Israel Defense Forces, like the U.S. military, concentrates far more of its firepower in airpower than Ukraine does.²²⁷ Israel's needs for 155 mm rounds will increase if Israel's ground war in Lebanon resumes. Even in that scenario, Israel's needs would not be of the same magnitude as Ukraine's consumption, as the Israeli military fired roughly 150,000 total artillery projectiles in the 2006 war with Hezbollah.²²⁸ Taiwan also has some use for artillery, primarily for stopping Chinese airborne or seaborne invasion forces that have landed from consolidating their positions to enable reinforcements. However, it is extremely unlikely that Taiwan will fire millions of artillery rounds in a conflict; short, intense battles over landing sites, similar to the Battle of Hostomel Airport, are more likely.²²⁹ Nevertheless, 155 mm artillery rounds are the munition most strained by the conflict in Ukraine.

Ukraine Impact: No Material Delay — Aid to Ukraine has not prevented the United States from supplying artillery shells to Israel, and Taiwan does not have any pending 155 mm round orders through FMS (with the possible exception of Precision Guidance Kits that accompanied the now canceled purchase of Paladin self-propelled howitzers). However, supplying shells to Ukraine initially did come quite close to delaying or limiting aid to Israel.

Defense Industrial Base: Weak — U.S. stockpiles of 155 mm rounds have been depleted to minimum levels. Even though the United States has increased production substantially, it will take a significant amount of time to increase production capacity to restock the U.S. inventory, replenish the stocks of NATO allies, and continue to meet the requirements of Ukraine and Israel.

223. "Interview with Douglas R. Bush, Assistant Secretary of the Army for Acquisition, Logistics and Technology and Army Acquisition Executive," *Defense Acquisition University*, July-August 2024. (<https://www.dau.edu/library/damag/july-aug2024/interview-douglas-bush>); Sam Skove, "Army aims to double 155mm shell production by October," *Defense One*, February 5, 2024. (<https://www.defenseone.com/policy/2024/02/army-aims-double-155mm-shell-production-october/393943>)

224. "Shoring up national security preparedness: Rheinmetall to build new ammunition plant – German Chancellor and Prime Minister of Denmark take part in groundbreaking ceremony," *Rheinmetall*, February 11, 2024. (<https://www.rheinmetall.com/en/media/news-watch/news/2024/02/2024-02-12-rheinmetall-builds-new-ammunition-factory-in-unterluess-ground-breaking-ceremony-with-chancellor-scholz>)

225. Rudy Ruitenberg, "US, France to lead artillery coalition for Ukraine," *Defense News*, January 18, 2024. (<https://www.defensenews.com/global/europe/2024/01/18/us-france-to-lead-artillery-coalition-for-ukraine>)

226. Patrick Hinton, "Lean on the Barrage: The Role of Artillery in Ukraine's Counteroffensive," *Royal United Services Institute*, July 12, 2023. (<https://rusi.org/explore-our-research/publications/commentary/lean-barrage-role-artillery-ukraines-counteroffensive>)

227. David Rodman, "The Role of the Israel Air Force in the Operational Doctrine of the Israel Defense Forces: Continuity and Change," *Air University*, 2018. (<https://www.airuniversity.af.edu/Portals/10/ASPJ/journals/Chronicles/rodman.pdf>); A somewhat analogous historical case to compare with Israel's campaign against Hamas is the Second Battle of Fallujah, where Marine Corps forces fired fewer than 6,000 rounds in a battle that took place in a dense urban area and lasted over a month and a half. That expenditure was roughly what Ukraine fired each day of its offensive.; Liam Collins, Jayson Geroux, and John Spencer, "Case Study #7 – Fallujah," *Modern War Institute*, July 25, 2023. (<https://mwi.westpoint.edu/urban-warfare-case-study-7-second-battle-of-fallujah>)

228. David E. Johnson, *The Second Lebanon War* (RAND Corporation, 2011), pages 9-94. (accessed via JSTOR <https://www.jstor.org/stable/10.7249/mg1085a-af.10>)

229. Liam Collins, Michael Kofman, and John Spencer, "The Battle of Hostomel Airport: A Key Moment in Russia's Defeat in Kyiv," *War on the Rocks*, August 10, 2023. (<https://warontherocks.com/2023/08/the-battle-of-hostomel-airport-a-key-moment-in-russias-defeat-in-kyiv>)



120 MM MORTAR AMMUNITION

What: 120 mm mortar rounds are fired by heavy mortars.

Why: 120 mm mortars can target infantry, vehicles, and positions.

Details: DSCA announced an FMS of over 50,000 120 mm mortar rounds to Israel in August 2024, for which deliveries are set to begin in 2026.²³⁰ The United States committed an unknown number of 120 mm mortar rounds of various types to Ukraine.²³¹ Taiwan does not have any pending orders for 120 mm mortar rounds through FMS, and there are no DCS for 120 mm mortar rounds. In 2019, the U.S. Department of Defense awarded a contract to General Dynamics-OTS for the production of the 120 mm family of mortar shell bodies.²³² Additional contracts include a \$22.6 million contract for the “Manufacture, Production, and Delivery of 120mm mortar shell bodies in support of

230. U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, “Israel – M933A1 120mm High Explosive Mortar Cartridges,” August 13, 2024. (<https://www.dsca.mil/press-media/major-arms-sales/israel-m933a1-120mm-high-explosive-mortar-cartridges>)

231. U.S. Department of State, Bureau of Political-Military Affairs, “U.S. Security Cooperation with Ukraine,” September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>)

232. U.S. Department of Treasury, Bureau of the Fiscal Service, “Indefinite Delivery / Indefinite Quantity (IDIQ) Contract PIID W15QKN19D0084,” *USA Spending*, accessed October 15, 2024. (https://www.usaspending.gov/award/CONT_IDV_W15QKN19D0084_9700)

Ukraine,” which was awarded in April 2024 and is expected to conclude in January 2028.²³³ The U.S. Army’s FY 2024 budget supports the procurement of over 142,000 120 mm rounds of all types.²³⁴ The German company Rheinmetall received an order in 2023 to supply Ukraine with approximately 100,000 120 mm mortar rounds as part of the German government’s aid package to Ukraine.²³⁵ Elbit Systems was recently awarded a contract by the Israeli Ministry of Defense for 120 mm mortar munitions, providing an additional source of 120 mm rounds for Israel.²³⁶

Ukraine Impact: No Material Delay — Aid to Ukraine is unlikely to delay deliveries to Israel by more than a year, and Taiwan has no outstanding 120 mm round orders through FMS. If Israel’s need for 120 mm mortar rounds becomes severe, the United States could choose to meet some or all of Israel’s requirements quickly using PDA.

Defense Industrial Base: Requires Attention — U.S. stockpiles of 120 mm mortar rounds are strained, with demand likely exceeding supply. Steps have been taken to increase U.S. production, and multiple suppliers exist in partner countries.

233. U.S. Department of Treasury, Bureau of the Fiscal Service, “Delivery Order (DO) PIID W15QKN24F0216,” *USA Spending*, accessed October 15, 2024. (https://www.usaspending.gov/award/CONT_AWD_W15QKN24F0216_9700_W15QKN19D0084_9700)

234. U.S. Department of Defense, Department of the Army, “Fiscal Year (FY) 2024 Budget Estimates Procurement of Ammunition, Army,” March 2023. (<https://www.asafm.army.mil/Portals/72/Documents/BudgetMaterial/2024/Base%20Budget/Procurement/Procurement%20of%20Ammunition%20Army.pdf>)

235. Joint Forces, Press Release, “Rheinmetall 120mm Mortar Ammunition for Ukraine,” November 8, 2023. (<https://www.joint-forces.com/defence-equipment-news/68732-rheinmetall-120mm-mortar-ammunition-for-ukraine>)

236. Harry McNeil, “Israel restocks \$190m mortar munitions amidst continuing conflict,” *Army Technology*, July 30, 2024. (<https://www.army-technology.com/news/israel-restocks-190m-mortar-munitions-amidst-continuing-conflict>)



JOINT DIRECT ATTACK MUNITION (JDAM)

What: The Joint Direct Attack Munition is a guidance kit that converts unguided bombs of various sizes into precision-guided munitions.²³⁷

Why: JDAMs can target enemy units, equipment, facilities, and bases.

Details: The United States reportedly delivered 3,000 JDAMs to Israel by December 2023 following Hamas's October 7 terror attack and has delivered many more since.²³⁸ An additional sale of 6,500 JDAMs was under review by the State Department in May 2024, and a \$600 million contract has been awarded to the manufacturer for JDAM production.²³⁹ Following October 7, 2023, during the Biden administration, there were unusual delays at the Department of State in processing some Israeli requests for air-launched munitions. Some requests that

237. U.S. Department of Defense, Department of the Air Force, Fact Sheet, "Joint Direct Attack Munition GBU- 31/32/38," accessed October 8, 2024. (<https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104572/joint-direct-attack-munition-gbu-313238>)

238. Jared Malsin and Nancy A. Youssef, "U.S. Sends Israel 2,000-Pound Bunker Buster Bombs for Gaza War," *The Wall Street Journal*, December 1, 2023. (<https://www.wsj.com/world/middle-east/u-s-sends-israel-2-000-pound-bunker-buster-bombs-for-gaza-war-82898638>)

239. Gordon Lubold and Nancy A. Youssef, "U.S. Stalls Weapons Shipment to Israel in Bid to Stop Rafah Offensive," *The Wall Street Journal*, May 8, 2024. (<https://www.wsj.com/politics/national-security/u-s-paused-weapons-shipment-to-israel-over-a-possible-rafah-offensive-1074521b>); U.S. Department of Defense, "Contracts for Sept. 30, 2024," September 30, 2024. (<https://www.defense.gov/News/Contracts/Contract/Article/3921460>)

took days in the past took months. Delays for these munitions are bureaucratic or political in nature and are not a function of U.S. production capacity. According to SIPRI, Israel previously received at least 12,489 JDAMs since 2010, and in 2015, the State Department approved an FMS to Israel of 14,500 JDAM tail kits, as well as a host of other munitions.²⁴⁰ These sales have accompanied the delivery of over 20,000 unguided air-dropped munitions of various types since October 7, to which the JDAM tail kits can be fitted.²⁴¹ However, missing from these FMS to Israel are any Joint Direct Attack Munition-Extended Range (JDAM-ER) variants, which convert unguided bombs into precision-guided glide munitions with a range of up to 45 miles. This is notable because the United States has committed to Ukraine an unknown number of JDAM-ERs since March 2023, which are launched from aircraft including MiG-29s and Su-27s.²⁴² Ukraine can also launch JDAM-ERs from F-16s. However, Ukraine's consumption of this munition is likely low, as Kyiv only has a small fleet of aircraft capable of launching the weapons and must contend with dense concentrations of Russian air defenses. To make matters worse, the DOD has not provided Ukraine with as many JDAM-ERs as it could given the large production capacity. Taiwan does not have any pending FMS orders for JDAM and would face the same issues as Ukraine does in flying its aircraft within a few dozen miles of the Chinese mainland to strike targets. Israel has not publicly requested JDAM-ER, as it does not need the extended range capabilities in Gaza since the Israeli Air Force enjoys air supremacy and can fly close to targets. Israel may eventually be interested in JDAM-ER for potential long-range strike operations; however, Israel already has its own glide bomb family, known as Smart, Precise, Impact, Cost Effective (SPICE).²⁴³ The production rate of JDAM was 10,500 annually in 2023, and JDAM has been produced in the past at a rate of 55,000 per year. Therefore, there is no significant tradeoff between providing Taiwan, Israel, or Ukraine with JDAM variants.

Ukraine Impact: No Material Delay — Providing JDAM-ER to Ukraine did not affect the ability of the United States to deliver significant quantities of JDAMs to Israel on short notice, and Taiwan does not have pending orders for JDAMs through FMS. Any delays in providing JDAMs to Israel following Hamas's October 7 attack are a function of bureaucratic or political delays, not insufficient U.S. stocks or production capacity.

Defense Industrial Base: Strong — The United States has stockpiled tens of thousands of JDAMs and has very significant spare production capacity.

240. "SIPRI Arms Transfers Database," *Stockholm International Peace Research Institute*, March 11, 2024. (<https://www.sipri.org/databases/armstransfers>); U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Israel – Joint Direct Attack Munition Tail Kits and Munitions," May 19, 2015. (<https://www.dsca.mil/press-media/major-arms-sales/israel-joint-direct-attack-munition-tail-kits-and-munitions>)

241. Humeysa Pamuk and Mike Stone, "Exclusive: US has sent Israel thousands of 2,000-pound bombs since Oct. 7," *Reuters*, June 29, 2024. (<https://www.reuters.com/world/us-has-sent-israel-thousands-2000-pound-bombs-since-oct-7-2024-06-28>)

242. Joseph Trevithick, "Winged JDAM Smart Bombs Are Now Operational In Ukraine," *The Warzone*, March 6, 2023. (<https://www.twz.com/winged-jdam-smart-bombs-are-now-operational-in-ukraine>); Stetson Payne, "MiG-29 Fulcrums Are Ukraine's JDAM-ER Bomb Trucks," *The Warzone*, July 8, 2023. (<https://www.twz.com/mig-29-fulcrums-are-ukraines-jdam-er-bomb-trucks>); Thomas Newdick, "Ukraine's Su-27s Are Launching JDAM-ER Winged Bombs Too," *The Warzone*, August 24, 2023. (<https://www.twz.com/ukraines-su-27s-are-launching-jdam-er-winged-bombs-too>)

243. "Spice 250 Precision Guided Munition, Israel," *Airforce Technology*, August 23, 2024. (<https://www.airforce-technology.com/projects/spice-250-precision-guided-munition>)



GBU-39B SMALL DIAMETER BOMB (SDB)

What: The Small Diameter Bomb is an air-launched 250-lb guided munition with glide capability.²⁴⁴

Why: The Small Diameter Bomb can target enemy units, equipment, facilities, and bases.

Details: The United States reportedly transferred at least 2,600 SDBs to Israel in the initial months after October 7, at least 1,000 of which Jerusalem had previously ordered through a direct commercial sale.²⁴⁵ According to SIPRI, Israel received 8,550 SDBs from the United States between 2012 and 2022.²⁴⁶ The United States has committed an unknown number of SDBs to Ukraine, but likely only in small numbers, as the Ukrainian Air Force struggles to employ glide

²⁴⁴. U.S. Department of Defense, Department of the Air Force, Fact Sheet, “GBU-39B Small Diameter Bomb Weapon System,” accessed October 8, 2024. (<https://www.af.mil/About-Us/Fact-Sheets/Display/Article/104573/gbu-39b-small-diameter-bomb-weapon-system>)

²⁴⁵. Humeira Pamuk and Mike Stone, “Exclusive: US has sent Israel thousands of 2,000-pound bombs since Oct. 7,” *Reuters*, June 29, 2024. (<https://www.reuters.com/world/us-has-sent-israel-thousands-2000-pound-bombs-since-oct-7-2024-06-28>); Anthony Capaccio, “Boeing Sped 1,000 Smart Bombs to Israel After Hamas Attacks,” *Bloomberg*, October 10, 2023. (<https://www.bloomberg.com/news/articles/2023-10-10/boeing-sped-1-000-smart-bombs-to-israel-after-the-hamas-attacks>)

²⁴⁶. “SIPRI Arms Transfers Database,” *Stockholm International Peace Research Institute*, March 11, 2024. (<https://www.sipri.org/databases/armstransfers>)

bombs due to dense concentrations of Russian air defenses.²⁴⁷ SDBs have been provided to Ukraine through PDA, with U.S. stockpiles replenished with USAI funding. To enable longer-range Ukrainian strikes, the United States delivered the Ground-Launched Small Diameter Bomb (GLSDB) to Ukraine in early 2024, albeit in small numbers.²⁴⁸ The slow delivery was due to the time needed to design, integrate, and produce the launcher and rocket motor, not the availability of the bomb portion of the system. The system had low efficacy as a result of Russian electronic warfare, a problem the manufacturer is attempting to address.²⁴⁹ The United States has procured over 38,000 of SDB Increment I and nearly 3,000 of SDB Increment II in total, according to Pentagon documents.²⁵⁰ An additional \$6.9 billion contract was awarded in September 2024 for further production of SDB Increment I, including production for Ukraine.²⁵¹ The manufacturer is currently producing approximately 8,000 SDBs annually and can produce up to 28,000 each year. Taiwan does not have any pending orders for SDB through the U.S. FMS program and would face the same issues as Ukraine does in flying aircraft close to the Chinese mainland to strike targets. While Taiwan has reportedly considered purchasing the GLSDB, Taiwan and Israel have not ordered it through FMS.²⁵² Therefore, there has been no impact on Taiwan or Israel because of the provision of the GLSDB to Ukraine.

Ukraine Impact: No Material Delay — Providing SDBs to Ukraine did not affect the ability of the United States to deliver large quantities of the munition to Israel on short notice because of large, existing stockpiles, and Taiwan does not have any pending orders for SDB through FMS.

Defense Industrial Base: Strong — The United States has procured tens of thousands of SDBs and continues to procure them at scale, including an improved variant.

²⁴⁷. Gareth Jennings, “Ukraine conflict: US to transfer more SDB glide bombs for stand-off strike,” *Janes*, October 1, 2024. (<https://www.janes.com/osint-insights/defence-news/defence/ukraine-conflict-us-to-transfer-more-sdb-glide-bombs-for-stand-off-strike>); Justin Bronk, Nick Reynolds, and Jack Watling, “The Russian Air War and Ukrainian Requirements for Air Defence,” *Royal United Services Institute*, November 7, 2022. (<https://rusi.org/explore-our-research/publications/special-resources/russian-air-war-and-ukrainian-requirements-air-defence>)

²⁴⁸. David Axe, “After A 12-Month Wait, The Ukrainians Are Finally Firing Their 90-Mile Glide-Bombs At The Russians,” *Forbes*, February 14, 2024. (<https://www.forbes.com/sites/davidaxe/2024/02/14/after-a-12-month-wait-the-ukrainians-are-finally-firing-their-90-mile-glide-bombs-at-the-russians>); Bradley Bowman and John Hardie, “Send the Ground-Launched Small Diameter Bomb to Ukraine,” *Breaking Defense*, December 19, 2022. (<https://breakingdefense.com/2022/12/send-the-ground-launched-small-diameter-bomb-to-ukraine>)

²⁴⁹. Mike Stone, “Ukraine’s long-range glide bomb blunted by Russian jamming,” *Reuters*, May 23, 2024. (<https://www.reuters.com/world/europe/ukraines-long-range-glide-bomb-blunted-by-russian-jamming-2024-05-23>)

²⁵⁰. U.S. Department of Defense, Department of the Air Force, “Department of Defense Fiscal Year (FY) 2025 Budget Estimates, Justification Book Volume 1 of 1,” March 2024. (https://www.saffm.hq.af.mil/Portals/84/documents/FY25/FY25%20Air%20Force%20Missile%20Procurement.pdf?ver=L9Em5rUIIWTS_7Fdhr9ypg%3d%3d)

²⁵¹. U.S. Department of Defense, “Contracts for Sept. 30, 2024,” September 30, 2024. (<https://www.defense.gov/News/Contracts/Contract/Article/3921460>)

²⁵². Inder Singh Bisht, “Ukraine War Delayed Taiwan’s 150-Kilometer Precision Bomb Purchase: Report,” *The Defense Post*, March 30, 2023. (<https://thedefensepost.com/2023/03/30/ukraine-taiwan-precision-bomb>)



SPICE GUIDANCE KIT

What: The Smart, Precise Impact, Cost Effective (SPICE) is an Israeli guidance kit that converts certain unguided bombs of various sizes into precision-guided glide munitions. SPICE differs from JDAM-ER by adding an electro-optical seeker to the nose of the munition, allowing for more precise targeting, even in electronically contested environments.

Why: SPICE can target enemy units, equipment, facilities, and bases.²⁵³

Details: The U.S. State Department approved a \$320 million sale to Israel of SPICE guidance kits in late October 2023.²⁵⁴ While SPICE is an Israeli-developed munition, parts of the weapon are built in the United States, which is why the State Department needed to approve the transfer of the kits to Israel.²⁵⁵ The October 2023 sale followed a

²⁵³. “Spice 250 Precision Guided Munition, Israel,” *Airforce Technology*, August 23, 2024. (<https://www.airforce-technology.com/projects/spice-250-precision-guided-munition>)

²⁵⁴. U.S. Department of State, Letter, “Transmittal No. DDTTC23-023 Certification of Proposed Issuance of an Export License Pursuant to Section 36(c) of the Arms Export Control Act,” Published in *The New York Times*, October 31, 2023. (<https://static01.nyt.com/newsgraphics/documenttools/5b66fdb955baeecd/5608873d-full.pdf>)

²⁵⁵. “Lockheed Martin Teams with Rafael To Market SPICE Air-to-Surface Guidance Kits,” *Lockheed Martin*, May 16, 2019. (<https://news.lockheedmartin.com/2019-05-16-Lockheed-Martin-Teams-with-Rafael-To-Market-SPICE-Air-to-Surface-Guidance-Kits>)

previous \$403 million sale of SPICE guidance kits that occurred in February 2020.²⁵⁶ There is no tradeoff between supplying Israel with SPICE and aiding Ukraine or Taiwan, as neither operates SPICE. There have been no reported production issues with SPICE. However, delays in International Traffic in Arms Regulations (ITAR) license approvals for U.S.-origin subcomponents in SPICE have delayed deliveries.

Ukraine Impact: No Material Delay — Supplying SPICE to Israel did not affect the delivery of aid to Ukraine or Taiwan, as neither operates the system.

Defense Industrial Base: Requires Attention — Israel’s reliance on air-launched munitions in the recent conflict and continued demand for the munition suggest the need to expand production and replenish stockpiles. Delivery has been slowed due to delays in license approvals.

²⁵⁶ Edward Wong, “The State Department Approves \$320 Million Sale of Guided Bomb Equipment to Israel,” *The New York Times*, November 6, 2023. (<https://www.nytimes.com/2023/11/06/world/middleeast/us-israel-bomb-equipment-sale.html>)



F-15 EAGLE MULTIROLE FIGHTER AIRCRAFT

What: The F-15 is a multirole fighter aircraft that can conduct air-to-air and air-to-surface attacks.

Why: The F-15 can target ground forces, facilities, bases, ships, fighter aircraft, bombers, helicopters, cruise missiles, and drones with a wide variety of munitions.

Details: DSCA announced an FMS of 50 new F-15IA multirole fighter aircraft to Israel in August 2024.²⁵⁷ The announcement also included mid-life update modification kits for the existing 25 F-15I multirole fighter aircraft and stated that deliveries are estimated to begin in 2029. According to IISS's Military Balance 2024, Israel already fields 75 F-15 aircraft in five different variants.²⁵⁸ The F-15EX was designed as a solution to replace aging F-15C/D variants and to augment F-15E fleets.²⁵⁹ The F-15IA is an Israeli-variant of the F-15EX Eagle II multirole fighter aircraft that Israel is procuring from the United States. Compared to older F-15 models flown by both the United States (F-15C/D)

²⁵⁷ U.S. Department of Defense, Defense Security Cooperation Agency, Press Release, "Israel – F-15IA and F-15I+ Aircraft," August 13, 2024. (<https://www.dsca.mil/press-media/major-arms-sales/israel-f-15ia-and-f-15i-aircraft>)

²⁵⁸ "The Military Balance 2024," *International Institute for Strategic Studies*, February 13, 2024. (archived version available at <https://web.archive.org/web/20241203005245/https://www.iiss.org/publications/the-military-balance>)

²⁵⁹ Brian Brackens, "Air Force Receives First F-15EX," *U.S. Air Force Life Cycle Management Center Public Affairs*, March 11, 2021. (<https://www.af.mil/News/Article-Display/Article/2534008/air-force-receives-first-f-15ex>)

and Israel (F-15I), the F-15EX offers, and the Israeli F-15IA will offer, higher speed, longer range, increased payloads, and lower operating costs for deep interdiction and air-to-air combat missions.²⁶⁰ The F-15I+ is an upgrade program for Israel's existing F-15I fleet, which also fulfills long-range strike and air superiority missions.²⁶¹ There are no DCS for F-15s. The United States has an active production line for the advanced F-15EX. Key regional partners in both the Middle East and the Pacific have approved FMS or statements of intent for country-specific advanced F-15E and F-15EX variants. This includes Japan, Saudi Arabia, Singapore, South Korea, and Qatar.²⁶² In August 2023, Indonesia signed a memorandum of understanding to procure 24 F-15EXs and was slated to become the first export customer for the variant.²⁶³ The Biden administration delayed congressional notification of its approval of the F-15IA and F-15I+ sales to Israel based on political considerations unrelated to production capacity.

Ukraine Impact: No Material Delay — The sale of new F-15IAs and modification kits to Israel does not affect Ukraine or Taiwan in terms of their multirole fighter capabilities because neither Ukraine nor Taiwan operates or has yet submitted formal requests for any model of F-15.

Defense Industrial Base: Requires Attention — The estimated delivery date of 2029 is concerning but not unexpected for new production models of advanced aircraft. To the degree that the production line(s) for F-15E, F-15EX, and country-specific variants overlap, there may be some friction between delivery schedules for different countries. Congress and the administration should look for opportunities to expand and expedite F-15EX/IA production and scrutinize delivery queues to ensure they are aligned with the National Security Strategy and the National Defense Strategy.

²⁶⁰ Greg Hadley, "State Department Approves Sale of New, Updated F-15s to Israel," *Air & Space Forces Magazine*, August 13, 2024. (<https://www.airandspaceforces.com/state-department-israel-sale-f-15>)

²⁶¹ Paul Tobin, "F-15I 'THUNDERS' Arrive in Israel," *Boeing*, January 19, 1998. (<https://boeing.mediaroom.com/1998-01-19-F-15I-THUNDERS-Arrive-in-Israel>)

²⁶² "Japan Upgrades F-15 Fleet," *Boeing*, January 21, 2022. (<https://www.boeing.com/features/2022/01/japan-upgrades-f-15-fleet>); Boeing, Press Release, "Boeing Unveils F-15 Qatar Advanced Jets," August 25, 2021. (<https://boeing.mediaroom.com/news-releases-statements?item=130909>)

²⁶³ Boeing, Press Release, "Indonesia Announces Commitment to Acquire Boeing F-15EX," August 21, 2023. (<https://boeing.mediaroom.com/news-releases-statements?item=131310>); Boeing, Press Release, "Boeing Showcases F-15EX for Poland's Air Dominance," September 7, 2023. (<https://boeing.mediaroom.com/news-releases-statements?item=131318>); Emanuel Fabian, "Gallant blasts Smotrich for mid-war holdup of fighter jet procurement," *The Times of Israel* (Israel), May 10, 2024. (<https://www.timesofisrael.com/gallant-blasts-smotrich-for-mid-war-holdup-of-fighter-jet-procurement>)



IRON DOME

What: Iron Dome is a multi-mission air defense system.

Why: Iron Dome and the Tamir interceptor provide the capability to intercept rockets, drones, mortars, and a small number of missiles.²⁶⁴

Details: In November 2023, the U.S. Army transferred all of its 312 Tamir interceptors to Israel and leased back the two Iron Dome batteries operated by the U.S. Army.²⁶⁵ Ukraine and Taiwan do not operate Iron Dome, so there is no tradeoff in providing Israel Tamir interceptors or the two U.S. Army Iron Dome batteries. There are no DCS for Iron Dome. Israel received an \$8.7 billion aid package from the United States in September 2024, including \$5.2 billion for air defense systems such as Iron Dome, David's Sling, and Directed Energy Weaponry, and \$3.5 billion for wartime

²⁶⁴. Jacob Knutson, "How Israel's Iron Dome missile defense system works," *Axios*, October 16, 2023. (<https://www.axios.com/2023/10/16/israel-hamas-iron-dome-defense-cost-explained>); "Iron Dome (Israel)," *Missile Threat*, Center for Strategic and International Studies, July 13, 2021. (<https://missilethreat.csis.org/defsys/iron-dome>)

²⁶⁵. Anthony Capaccio, "US Is Quietly Sending Israel More Ammunition, Missiles," *Bloomberg*, November 14, 2023. (<https://www.bloomberg.com/news/articles/2023-11-14/pentagon-is-quietly-sending-israel-ammunition-laser-guided-missiles>); Ashley Roque, "Army's Iron Dome batteries on 11-month lease with Israel, which could be extended," *Breaking Defense*, November 7, 2023. (<https://breakingdefense.com/2023/11/armys-iron-dome-batteries-on-11-month-lease-with-israel-which-could-be-extended>)

procurement.²⁶⁶ That funding will be critical to close the gap between the air and missile defense capacity Israel needs and the capacity it currently possesses.²⁶⁷ Israel is working to expand Tamir interceptor production, and RTX and Rafael are collaborating to stand up Tamir production capacity in the United States, estimated to begin in 2025.²⁶⁸ In an expanded war with Hezbollah, some of Israel's Iron Dome production capacity could be degraded or destroyed as reservists in those factories are called to the front lines, underscoring the need to create redundant production capacity in the United States for the four primary Iron Dome components.²⁶⁹ Israel is working to expand its production of Iron Dome systems, including the Tamir interceptor. There are also necessary efforts underway to create or expand redundant Iron Dome and Tamir production capacity in the United States.

Ukraine Impact: No Material Delay — Taiwan and Ukraine do not operate Iron Dome, so there was no tradeoff in supplying Israel with the two U.S. Army Iron Dome batteries or the service's Tamir interceptors.

Defense Industrial Base: Requires Attention — Israel has sufficient Iron Dome batteries and Tamir interceptors to address the rocket threat from Hamas but needs more to prepare for future conflicts with Tehran and its other terror proxies. Israel is working to expand its production of Iron Dome systems, including the Tamir interceptor. There are efforts underway to create or expand redundant Iron Dome and Tamir production capacity in the United States.

266. "Israel says it has secured \$8.7 billion U.S. aid package," *Reuters*, September 26, 2024. (<https://www.reuters.com/world/middle-east/israel-says-it-has-secured-87-billion-us-aid-package-2024-09-26>)

267. "Israel Not Publishing Iron Dome Performance Data," *Foundation for Defense of Democracies*, October 23, 2023. (<https://www.fdd.org/analysis/2023/10/23/israel-not-publishing-iron-dome-performance-data>)

268. "RTX, Rafael to build missile production facility in Camden, Arkansas," *RTX*, October 26, 2023. (<https://www.rtx.com/news/news-center/2023/10/26/rtx-rafael-to-build-missile-production-facility-in-camden-arkansas>)

269. Bradley Bowman and Lydia LaFavor, "Build Iron Dome in the United States To Prepare for Israel's Worst Day," *Real Clear Defense*, July 20, 2024. (https://www.realcleardefense.com/articles/2024/07/20/build_iron_dome_in_the_united_states_to_prepare_for_israels_worst_day_1045936.html)

Figure 3: Notable FMS Sales to Taiwan

(Highlighted systems in **yellow** have been committed to, may soon be committed to, or had an FMS sale approved for Ukraine and Taiwan.²⁷⁰ Highlighted systems in **blue** have been committed to, may soon be committed to, or had an FMS sale announced for Taiwan, Israel, and Ukraine.)

Date of DSCA Announcement	Item	Source
December 16, 2015	Javelin Missile	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-3
December 16, 2015	Stinger Missile	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-tecro-united-states
December 16, 2015	Phalanx CIWS	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-mk-15
December 16, 2015	TOW Missile	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-tow
December 16, 2015	Assault Amphibious Vehicle (AAV)	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-4
December 16, 2015	Oliver Hazard Perry Class Frigate	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-7
June 29, 2017	Standard Missile-2	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-tecro-united-5
June 29, 2017	Mk 54 Lightweight Torpedo Conversion Kit	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-tecro-united-4
June 29, 2017	Mk 48 Heavyweight Torpedo	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-tecro-united-3
June 29, 2017	AGM-154C JSOW	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-tecro-united-1
June 29, 2017	AGM-88B HARM	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-tecro-united-0
July 8, 2019	Stinger Missile	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-10
July 8, 2019	M1A2T Tank	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-9
	120 mm Tank Ammunition	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-9
August 20, 2019	F-16C/D Block 70	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-11

²⁷⁰. “Highlighted systems” in this appendix refers to instances in which the overall system (e.g., Abrams tank) overlaps between countries. The specific model (e.g., M1A1, M1A2T) does not necessarily overlap even if the system is highlighted; the details of that potential overlap are discussed in the entry for the respective system.

Date of DSCA Announcement	Item	Source
May 20, 2020	Mk 48 Heavyweight Torpedo	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-12
October 21, 2020	MS-110 Recce Pod System	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-14
October 21, 2020	AGM-84H SLAM-ER Missile	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-16
October 21, 2020	M142 HIMARS	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-15
	ATACMS	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-15
October 26, 2020	Harpoon Coastal Defense System	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-17
	RGM-84L-4 Harpoon Block II Missile	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-17
November 3, 2020	MQ-9B Reaper	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-18
August 4, 2021	M109A6 Paladin Howitzer	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-20
September 2, 2022	AGM-84L-1 Harpoon Block II Missile	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-agm
September 2, 2022	AIM-9X Block II Sidewinder Missile	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-aim
December 28, 2022	Volcano Anti-Tank Munition-Laying System	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-27
March 1, 2023	AGM-88B HARM	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-f-16
	AIM-120C AMRAAM	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-f-16
June 18, 2024	Switchblade 300	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-33
June 18, 2024	ALTIUS 600M-V	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-34

Figure 4: Additional FMS Sales to Taiwan

Some support/parts may slightly overlap with aid to Ukraine, but no major shortages or delays of these services/items due to lack of capacity have been reported.

Date of DSCA Announcement	Item	Source
December 16, 2015	Taiwan Advanced Tactical Data Link System	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-5
December 16, 2015	Support to maintain MIDS/LVT-1 and JTIDS	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-6
June 29, 2017	AN/SLQ-32(V)3 Electronic Warfare System Upgrade	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-tecro-united-2
April 15, 2019	F-16 Pilot Training	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-8
July 9, 2020	Repair and Recertification of PAC-3 SAM	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-13
December 7, 2020	Field Information Communications System (FICS)	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-19
February 7, 2022	Patriot International Engineering Services Program	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-21
April 5, 2022	Patriot Contractor Technical Assistance	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-22
June 8, 2022	Ship Spare Parts	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-ship
July 15, 2022	Contractor Technical Assistance Support	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-23
September 2, 2022	Contract Logistics Support	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-24
December 6, 2022	Aircraft Standard Spare Parts	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-26
December 6, 2022	Aircraft Non-Standard Spare Parts	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-25
June 29, 2023	Spare and Repair Parts	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-28
June 29, 2023	30 mm Ammunition	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-29
August 23, 2023	Infrared Search and Track Systems for F-16	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-30
December 15, 2023	Command, Control, Communications, and Computers (C4) Life Cycle Support	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-31
February 21, 2024	Taiwan Advanced Tactical Data Link System	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-32
June 5, 2024	F-16 Standard Spare and Repair Parts	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-f-1
June 5, 2024	F-16 Non-Standard Spare and Repair Parts	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-f-0
September 16, 2024	Return, Repair, and Reshipment of Spare Parts	https://www.dsca.mil/press-media/major-arms-sales/taipei-economic-and-cultural-representative-office-united-states-35

Policy Recommendations

To address the challenges identified in this report, the authors offer three sets of recommendations that relate to the U.S. defense industrial base, U.S. allies and partners, and U.S. defense spending.

U.S. Defense Industrial Base

- **Procure the maximum or near-maximum quantity industry can produce for key munitions and weapon systems in the coming fiscal year.** To increase defense production capacity, the United States should refill and expand military stockpiles and inventories and generate additional quantities of munitions and weapons that can be provided as needed to beleaguered allies and partners. The Department of Defense should request, and Congress should authorize and fund, the procurement of the maximum or near-maximum quantity of key weapon systems and munitions that the respective prime contractor is expected to be able to produce in the coming fiscal year.²⁷¹ At a minimum, this approach should be applied to any munition or system currently employed or requested by both the U.S. military as well as Taiwan, Ukraine, or Israel or that is expected to be in high demand in a Pacific war.

As part of the annual budget request or in an annual report, Congress should require the Department of Defense to list the projected maximum production capacity for the subsequent fiscal year for each such system or munition and provide justification for any instance in which the DOD is requesting less than 80 percent of the maximum available production capacity. Congress should put the burden of proof on the Pentagon to provide an explanation in such cases. If the explanation is not persuasive, Congress should require the maximum or near-maximum amount and provide the necessary authorization and appropriation to do so. When the respective military service would like to procure the maximum quantity

available but is not requesting to do so solely due to insufficient budget allocations, Congress should require the service to delineate such instances.

- **Require maximum production plans from industry.** The Pentagon and Congress should require prime contractors for key munitions and weapon systems to provide plans for increasing maximum production capacity as quickly as possible. The plans should detail the necessary steps, leading challenges, predicted timelines, and respective costs associated with various plans to increase maximum production levels.
- **Prioritize speed and scale over risk mitigation.** For statutory, regulatory, budgetary, bureaucratic, oversight, and cultural reasons, among others, the Pentagon tends to prioritize cost reduction and the avoidance of failures in its research, development, and acquisition programs. In normal times, that is appropriate — the Pentagon owes it to Congress and Americans to serve as a responsible steward of tax dollars. Every dollar wasted is a dollar not spent on something that Americans need. But an approach that prioritizes cost per unit and minimizing development risk rather than delivering transformative systems and munitions is dangerously misaligned with U.S. needs. The Trump administration should be careful to ensure that any Department of Government Efficiency (DOGE) efforts applied to the DOD do nothing to reduce or slow the production of weapons and munitions.

The Department of State and the Department of Defense, working with Congress and the defense industry, need to examine every statute, regulation, procedure, and expectation to ensure that speed and scale are the explicit and actual top priorities. That will mean rewarding those who move quickly and protecting them when they make reasonable mistakes in the pursuit of speed. This is one of the most important tasks for the secretary of defense.

²⁷¹ A primary reason that the U.S. DIB is not as healthy as it should be is that the Department of Defense has consistently ordered insufficient quantities of key munitions and systems for years and for multiple reasons, including inadequate defense budgets.

- **Approve DOD requests for more expansive use of multiyear procurement authorities.** Reliance on the “just-in-time” model, combined with small and irregular orders, has eroded the DIB over time. Multiyear procurement and block buy contracting create certainty for industry and incentivize private investment that can increase production capacity and speed delivery timelines.²⁷² Multiyear procurement also makes it easier to surge production to meet urgent needs compared to the current model in which some lines have closed altogether and can be restarted only with considerable expense and delay. Consistent with the recommendations of the NDS Commission, Congress should support DOD requests for “additional legislative authority to raise limits on multiyear production and to expand the authority to other programs.”²⁷³ Congress should provide the full appropriations necessary for multiyear procurement. Legislators should compare potential concerns related to multiyear procurement and block buy contracting with the costs of American service members not having what they need in a future war.
- **Revamp the process for establishing munitions requirements.** The Department of Defense should adjust its key munitions requirements and requests — and the processes that produce them. A reformed requirements process should include the number of munitions the United States would need to transfer to regional allies and partners in the most likely contingency, not just what the services need for their stockpiles and U.S. war plans. There will likely be strong bureaucratic pushback against such an idea, but purchasing and stockpiling the minimum amount needed by U.S. forces alone has proven insufficient to meet U.S. national security objectives and has left the Pentagon with an insufficient DIB. DOD stockpile and inventory requirements should also be scrutinized to see if the assumptions for U.S. forces remain valid. It is worth asking whether

current assumptions undergirding requirements reflect the changing capabilities of adversaries and their collaboration with one another as well as the lessons learned in Ukraine and the Middle East. Assumptions related to the following issues deserve particular attention: expected combat consumption rates; “just-in-time” production; access to resources; the vulnerability of producers to cyberattacks; unimpeded delivery from the United States to forward-deployed forces; and requirements related to pre-positioned stocks.

- **Scrutinize Pentagon assumptions and requirements.** As China, Russia, Iran, and North Korea cooperate and coordinate more closely, it is increasingly dangerous for decision-makers and Pentagon planners to assume the United States will confront only one major combat operation at a time. Congress should require a classified report from the Office of the Secretary of Defense (OSD) and each of the services on the assumptions underlying their requirements and budget requests to discern whether those assumptions are more tailored to the 1990s than today. Congress should then ask each of the combatant commands to submit a classified review of OSD’s and the services’ submissions, identifying any differences between the Pentagon’s position and that of the respective combatant command. When the services and combatant commands have different requirements for key systems and munitions, Congress should put the burden of proof on the services to explain the difference. Congress would also be wise to scrutinize war plans in different theaters that rely on the same units and assets, which can only be in one place at a time.
- **Make greater use of existing infrastructure to reduce procurement costs and delivery timelines.** Often, one of the most significant sources of delay in producing a new weapon system is the time required to construct new production facilities

²⁷² Ronald O’Rourke, “Multiyear Procurement (MYP) and Block Buy Contracting in Defense Acquisition: Background and Issues for Congress,” *Congressional Research Service*, August 5, 2024. (<https://crsreports.congress.gov/product/pdf/R/R41909>)

²⁷³ Jane Harman, Amb. Eric Edelman, Gen. John Keane, Thomas Mahnken, Mara Rudman, Mariah Sixkiller, Alissa Starzak, and Roger Zakheim, “Commission on the National Defense Strategy,” *RAND Corporation*, July 2024. (https://www.armed-services.senate.gov/imo/media/doc/nds_commission_final_report.pdf)

and warehouses. Defense contractors should look for opportunities to use existing infrastructure and warehouses when possible. The time associated with licensing, environmental assessments, and construction of new facilities can be substantial. Utilizing existing facilities may also save money as well as time.²⁷⁴

Allies and Partners

- **Provide Ukraine with the weapons it needs.** The United States should continue supporting Ukraine's efforts to repel the Russian invasion. As this report demonstrates, the provision of weapons to Ukraine has not materially slowed the provision of weapons to Taiwan or Israel in the 25 cases examined. Ukraine is not the cause of weakness in the U.S. DIB. Furthermore, support for Ukraine helps secure U.S. interests and sends a positive deterrent message to other potential aggressors. The amount of security assistance committed to Ukraine is equivalent to less than 3 percent of what the United States spent on

the Pentagon since the 2022 Russian invasion. That modest investment has substantially degraded the second-leading conventional military threat to the United States,²⁷⁵ decreased the chances of Russian aggression against NATO countries, sent a positive deterrent message to Beijing that the United States will not accept unprovoked aggression, and significantly strengthened the U.S. DIB.²⁷⁶ Some have argued that the United States must downsize its support for Ukraine and European security to prioritize Taiwan.²⁷⁷ As this report demonstrates, that assertion is flawed.

- **Work with allies and partners to maximize production.** America's adversaries, including China, Russia, Iran, and North Korea, are increasingly collaborating when it comes to weapons development, production, and transfers.²⁷⁸ China, Iran, and North Korea have all supported Russia's war in Ukraine.

Collaboration is also an imperative for the United States. Building on existing efforts, the United

274. Jason Price, "Marketbeat United States Industrial Q3 2024," *Cushman & Wakefield*, October 10, 2024. (<https://www.cushmanwakefield.com/en/united-states/insights/us-marketbeats/us-industrial-marketbeat#:~:text=Both%20vacant%20speculative,the%20Inland%20Empire>)

275. @Rebel44CZ, @naalsio26, @aloha9916, @Danspiun, @kemal_115, and Alexander Black, "Attack On Europe: Documenting Russian Equipment Losses During the Russian Invasion of Ukraine," *Oryx*, February 24, 2022. (<https://www.oryxspioenkop.com/2022/02/attack-on-europe-documenting-equipment.html>); Michael Gjerstad, "Russian T-90M production: less than meets the eye," *International Institute for Strategic Studies*, June 11, 2024. (<https://www.iiss.org/online-analysis/military-balance/2024/06/russian-t-90m-production-less-than-meets-the-eye>); @Brad_L_Bowman, X, November 1, 2024. (https://x.com/Brad_L_Bowman/status/1852423177571578292); For example, while Russia has large stockpiles of tanks, its production capacity for new equipment (as opposed to refurbishing Soviet stockpiles) is quite low. IISS estimates that the Russian wartime production of T-90 tanks in 2023 was 60-70 annually. Even at a rate of 100, it would take Russia over 30 years to replenish its tank losses. Similar patterns hold for other types of Russian equipment. The losses Ukraine has already inflicted on Russia will result in a decades-long reduction of Russian military power.

276. Bradley Bowman and H.R. McMaster, "Supporting Ukraine and Israel Will Help Deter Aggression Around the World," *Newsweek*, February 20, 2024. (<https://www.newsweek.com/supporting-ukraine-israel-will-deter-aggression-around-world-opinion-1870864>); @Brad_L_Bowman, X, November 1, 2024. (https://x.com/Brad_L_Bowman/status/1852423177571578292); Without any U.S. military personnel fighting in Ukraine, this assistance has helped Ukraine take out 10,500+ Russian tanks and other armored vehicles, 273+ Russian fixed- and rotary-wing aircraft, and 28+ naval vessels, including a guided missile cruiser, an attack submarine, and three corvettes.

277. Didi Tang, "Some in Congress want to cut Ukraine aid and boost Taiwan's. But Taiwan sees its fate tied to Kyiv's," *Associated Press*, October 9, 2023. (<https://apnews.com/article/ukraine-funding-taiwan-us-china-military-8cbb671399a51e0e34b9e40f72f51e56>)

278. Hal Brands, "The New Autocratic Alliances: They Don't Look Like America's- But They're Still Dangerous," *Foreign Affairs*, March 29, 2024. (<https://www.foreignaffairs.com/united-states/new-autocratic-alliances>); Jane Harman, Amb. Eric Edelman, Gen. John Keane, Thomas Mahnken, Mara Rudman, Mariah Sixkiller, Alissa Starzak, and Roger Zakheim, "Commission on the National Defense Strategy," *RAND Corporation*, July 2024. (https://www.armed-services.senate.gov/imo/media/doc/nds_commission_final_report.pdf); The Honorable Avril Haines and Lieutenant General Jeffrey Kruse, "Hearing to Receive Testimony on Worldwide Threats," United States Senate Committee on Armed Services, May 2, 2024. (<https://www.armed-services.senate.gov/hearings/to-receive-testimony-on-worldwide-threats-050224>); Xiaoshan Xue, "Analysis: China, Russia, North Korea and Iran described as new 'Axis of Evil' by some," *Voice of America*, October 23, 2024. (<https://www.voanews.com/a/analysis-china-russia-north-korea-and-iran-described-as-new-axis-of-evil-by-some/7836853.html>)

States should look for every opportunity to work with its unparalleled network of democratic partners to strengthen collaborative defense production capacity, innovation, and speed. It is important not only for complete systems but also for the many subcomponents that can serve as single points of failure or cause delay. Congress should require the Department of Defense to provide a report on existing multilateral defense production efforts, identifying additional steps, timelines, outcome-focused metrics, and ways in which Congress can help.

- **Expand U.S. arms sales to allies and partners.** In addition to supporting the American economy and workers, U.S. arms sales to allies and partners can help them become more capable militarily, thereby reducing the U.S. military's security burden. Arms sales to allies and partners also enable more effective combined U.S. military operations with them, creating favorable balances of power and bolstering deterrence and combat effectiveness. Arms sales to allies and partners also support American research and development, increase DIB production capacity, and help keep supply networks healthy for when Pentagon demand temporarily ebbs. Arms sales can also reduce weapons costs for the U.S. government through economies of scale. Moreover, when a foreign nation decides to purchase American weapons, that decision may also deprive U.S. adversaries and competitors of these valuable benefits.²⁷⁹

For these reasons, the White House should make clear to the Department of State and Department of Defense, and the political appointees who lead them, that the administration seeks to dramatically

expedite and expand U.S. arms sales to allies and partners. U.S. arms sales should be viewed as a fundamental tool of foreign policy and national security — not a peripheral afterthought. However, a policy of promoting arms sales will not yield maximum results if systematic problems related to FMS contracting and DIB production capacity are not addressed. Partners will be less interested in American arms if they believe they will confront significant delivery delays.

- **Review and reform the armed services' Foreign Military Sales contracting processes.** The delay between congressional notification of a prospective sale and the signing of a contract sometimes stretches multiple years, even for systems in active production. The existing process often prioritizes low cost-per-unit over expedient delivery. Given the threats confronting key partners, that priority is misplaced.²⁸⁰

Congress cannot rely on the DOD to fix this problem and should employ legislation to advance solutions. Congress should also require a report from the administration on the time between DSCA announcement and a signed contract to produce major systems or munitions for Taiwan, Ukraine, and Israel. The report should explain the causes of delays and what is being done to address them. Congress should also investigate service contractor training, retention, and incentives as well as the Pentagon practice of “bundling” multiple FMS cases together before awarding a contract. While combining orders from several allies and partners for the same system can reduce unit cost, the savings

²⁷⁹. For more details on these benefits, see: Bradley Bowman, “Objectives of U.S. Arms Sales to the Gulf: Examining Strategic Goals, Risks and Benefits,” *Foundation for Defense of Democracies*, June 16, 2020. (<https://www.congress.gov/116/meeting/house/110808/witnesses/HHRG-116-FA13-Wstate-BowmanB-20200616.pdf>)

²⁸⁰. A House Foreign Affairs Committee task force investigated delays in FMS and published a report in February 2024, finding multiple additional causes of delays, including a low threshold requiring congressional review and a lack of a common approach toward the FMS process between DOD, State, Congress, the defense industry, and U.S. allies and partners. The report also noted, “While there have been numerous studies commissioned from the Departments of State and Department of Defense (DoD), as well as the defense industry, no similar congressional effort has sought to specifically identify legislative fixes to the FMS process.” Rep. Mike Waltz, Rep. Seth Moulton, Rep. French Hill, Rep. Mike Garcia, Rep. Rich McCormick, Rep. Young Kim, and Rep. Jason Crow, “Foreign Military Sales TIGER Task Force: Report,” *House Foreign Affairs Committee*, February 7, 2024. (<https://foreignaffairs.house.gov/wp-content/uploads/2024/02/2.7.24-FMS-TIGER-Task-Force-Report.pdf>)

associated with such a practice must be weighed against the costs associated with delays in delivery to beleaguered partners. Sometimes, speed of delivery is more important than cost savings.

- **Update congressional reporting threshold values.** Under current law, the president must formally notify Congress 30 calendar days (depending on the country) before the administration can conclude an FMS or issue a license for a DCS valued at or above \$14 million for major defense equipment or \$50 million for defense articles and services.²⁸¹ The time frame is shortened to 15 days and the values raised to \$25 million and \$100 million, respectively, for Japan, Australia, South Korea, Israel, New Zealand, and NATO members. These threshold values were last updated in 1981. Congress should amend the FMS and DCS reporting threshold values in 22 U.S.C. 2753(d), 2776(b), and (c), as well as 2796b(a), to adjust for inflation and allow these thresholds to increase along with inflation in the future.²⁸²
- **Implement a time-bound State Department review process.** Under Section 2 of the Arms Export Control Act, the secretary of state is “responsible for the continuous supervision and general direction” of arms sales.²⁸³ Too often, the State Department conducts opaque, long-lasting policy reviews that create uncertainty and delay, sometimes encouraging partners to look elsewhere for weapons. The secretary of state should implement — and Congress should enshrine in statute — clear, time-bound milestones for the review and adjudication of FMS and DCS

cases for a prioritized list of countries. The State Department should establish a review board, chaired by the under secretary of state for arms control and international security, to process and adjudicate cases where there is significant disagreement within the department.

- **Require an annual report on weapons delivery queues and timelines.** For several years, the Biden administration resisted adjusting FMS weapons delivery queues to align them with the National Security Strategy and the National Defense Strategy.²⁸⁴ Yet in June 2024, the administration temporarily paused deliveries of Patriot PAC-3 interceptors and AMRAAMs to all nations except Ukraine and Taiwan, proving that adjustments are possible.²⁸⁵

To encourage sensible adjustments, Congress should require the secretary of state and the secretary of defense to provide the congressional national security committees with an annual report on arms deliveries to threatened democracies. To make the reporting requirement manageable, it could apply only to FMS cases that exceed \$150 million. The report should list all countries ahead of Taiwan, Ukraine, or Israel in a specific weapon or munition delivery queue and justify that sequencing. In instances where the queue has been adjusted to deliver capabilities sooner to Taiwan, Ukraine, or Israel, the report should detail the steps taken to ameliorate the concerns of any country moved down the list, including increased bilateral military exercises, the deployment or stationing of U.S. forces, or the provision of interim capabilities until the FMS case is fully delivered. The report should also list the estimated date of

281. Paul Kerr, “Arms Sales: Congressional Review Process,” *Congressional Research Service*, August 13, 2024. (<https://crsreports.congress.gov/product/pdf/RL/RL31675>)

282. Arms Export Control Act, 22 U.S.C. §2753(d). (<https://uscode.house.gov/view.xhtml?path=/prelim@title22/chapter39&edition=prelim>)

283. Arms Export Control Act, 22 U.S.C. §2752(b). ([https://uscode.house.gov/view.xhtml?req=\(title:22%20section:2752%20edition:prelim\)%20](https://uscode.house.gov/view.xhtml?req=(title:22%20section:2752%20edition:prelim)%20))

284. Bradley Bowman and Rear Adm. (Ret.) Mark Montgomery, “Expedite arms deliveries to beleaguered democracies,” *Defense News*, June 14, 2022. (<https://www.defensenews.com/opinion/commentary/2022/06/14/expedite-arms-deliveries-to-beleaguered-democracies>)

285. Howard Altman and Tyler Rogoway, “U.S. Diverting Missiles From Foreign Customers To Ukraine Could Have Repercussions Beyond Air Defense,” *The Warzone*, June 21, 2024. (<https://www.twz.com/air/u-s-diverting-missiles-from-foreign-customers-to-ukraine-could-have-repercussions-beyond-air-defense>)

full delivery for each such foreign military sale; any changes to the delivery date from previous reports; the reasons for those delays; existing actions to expedite delivery; additional actions that could be taken to expedite delivery; why the respective actions have not yet been taken; authorities or appropriations that Congress could provide to expedite the delivery; and a description of ongoing or potential measures to expedite the attainment of operational capability once the system or munition is delivered, including training with U.S. or allied forces in advance.

- **Reduce the number of systems on the FMS-Only list.** The U.S. government maintains a classified list of specific systems that are available for export only through FMS, as well as a publicly available listing of the general categories of military capabilities and systems that are broadly available for export only through FMS.²⁸⁶

The U.S. government has been reviewing the FMS-Only list to see if some systems could be removed. Importantly, DCS are still subject to approval by the State Department, as well as approval by Congress if the sale is above statutory thresholds. Congress should support and monitor this review of the FMS-Only list, pressing the administration to justify decisions to keep questionable systems on it since FMS delivery timelines are often far longer than those for

DCS. Permitting more arms exports via DCS could dramatically improve weapons delivery timelines, as it would bypass one of the leading causes for slow weapons deliveries: the DOD contracting process.

- **Expand the use of Presidential Drawdown Authority for Taiwan.** To maintain U.S. military readiness, Congress should appropriate the funds necessary to replenish arms transferred via PDA. The Biden administration made significant use of PDA to help Ukraine.²⁸⁷ In September 2024, it approved \$567 million in PDA for Taiwan, a welcome but insufficient step to meet Taipei's most urgent deterrent requirements.²⁸⁸ The administration and Congress should consider using PDA to send a wide array of interim capabilities to Taiwan until new systems being built finally arrive, especially if they are not expected to arrive until after 2026. When determining whether to use PDA, decision-makers should ask whether a system or munition would have more deterrent value toward Beijing in Taiwan's arsenal or the Pentagon's. The answers may vary. Congress should provide assertive annual oversight over this process and always ensure that the granting of PDA is accompanied by the necessary appropriated funds to replenish U.S. military stocks to avoid a reduction in American military readiness.

²⁸⁶. In some cases, it makes sense to export systems only via FMS. According to DSCA, DOD may recommend FMS-Only for systems for which the purchaser may need assistance 1) assimilating the technologies; 2) managing the acquisition/logistics; and 3) integrating complex systems with other combat systems. Other considerations include promoting interoperability with U.S. forces, as well as facilitating access to U.S. government databases and enhanced end-use monitoring or on-site accountability. In other words, FMS is often most appropriate for exquisite systems that involve cutting-edge technology. Regardless, the FMS-Only list includes a large number of categories, some of which may not belong on the list. This lengthy FMS-Only list is a problem, as deliveries via FMS often take much longer than deliveries via DCS. U.S. Department of Defense, Defense Security Cooperation Agency, *Security Assistance Management Manual* (Washington: Defense Security Cooperation Agency, 2012), Chapter 4. (<https://samm.dsca.mil/chapter/chapter-4#C4.3>)

²⁸⁷. U.S. Department of State, Bureau of Political-Military Affairs, "Use of Presidential Drawdown Authority for Military Assistance for Ukraine – Fact Sheet," December 2, 2024. (<https://www.state.gov/use-of-presidential-drawdown-authority-for-military-assistance-for-ukraine>)

²⁸⁸. "Biden approves \$567 mln in defense support for Taiwan, White House says," *Reuters*, September 29, 2024. (<https://www.reuters.com/world/biden-approves-567-mln-defense-support-taiwan-white-house-says-2024-09-30>)

Defense Spending

- **Increase defense spending by at least 3 to 5 percent above inflation each year.** Consistent with the recommendations of the bipartisan NDS Commission, the administration should request, and Congress should provide, an annual defense budget that grows each year at least 3 to 5 percent above inflation.²⁸⁹ Without these increases, it may not be possible to implement many of the above recommendations. If the consensus is that national security challenges are now more severe than they were during the Cold War, why is the United States spending so much less on defense now as a percentage of GDP or the federal budget?²⁹⁰ Deterring a conflict is far less costly than fighting a war, especially for service members.
- **Pass the annual defense appropriation bill before the end of the fiscal year.** The failure of the appropriations process and reliance on continuing resolutions create inefficiencies, put particular strain on the small- and medium-sized defense contractors needed for innovation and agility, waste billions of dollars, and delay the start of vital new programs. Our adversaries are sprinting, but it seems like business as usual in Congress. If Congress wants the administration and industry to move faster, it needs to do the same.

Conclusion

The bipartisan Commission on the National Defense Strategy assessed in its July 2024 report that “The threats the United States faces are the most serious and most challenging the nation has encountered since

1945.”²⁹¹ China, Russia, Iran, and North Korea are cooperating in unprecedented ways — making each of them more capable, resilient, and effective in its respective areas of ongoing or potential aggression. The results of their diplomatic, intelligence, military, cyber, and economic cooperation are greater than the sum of its parts, presenting genuine challenges and dilemmas for the United States and its allies.

Thankfully, the United States enjoys an extraordinary network of allies and partners willing to defend themselves and the interests they share with the United States. But they need American weapons. Providing those weapons to Taiwan, Ukraine, and Israel is a wise investment that serves U.S. interests. After all, transferring arms to partners willing to fight is much preferable to sending American troops into battle.

This report demonstrates that the United States has the means to simultaneously arm Taiwan, Ukraine, and Israel. Supporting Kyiv has not materially slowed support for Taiwan or Israel in any of the 25 cases examined. Nevertheless, serious weaknesses remain in the American DIB, and the U.S. FMS process requires comprehensive reform. These are long-standing problems unrelated to the war in Ukraine.

It is difficult to imagine a higher priority than taking steps to better secure the United States and bolster deterrence. That will require the Trump administration to spend more on defense, supercharge the U.S. defense industrial base, bolster U.S. military readiness, reform the Foreign Military Sales process, and expand security assistance to Taiwan, Ukraine, and Israel. Doing this will take time, so it is imperative to start now.

²⁸⁹. Jane Harman, Amb. Eric Edelman, Gen. John Keane, Thomas Mahnken, Mara Rudman, Mariah Sixkiller, Alissa Starzak, and Roger Zakheim, “Commission on the National Defense Strategy,” *RAND Corporation*, July 2024. (https://www.armed-services.senate.gov/imo/media/doc/nds_commission_final_report.pdf)

²⁹⁰. H.R. McMaster, “Axis of Aggressors: H.R. McMaster on Defending America’s Interests,” *Discussion with the Foundation for Defense of Democracies’ Center on Military and Political Power*, September 26, 2024. (<https://www.fdd.org/events/2024/09/26/axis-of-aggressors-hr-mcmaster-on-defending-americas-interests>)

²⁹¹. Jane Harman, Amb. Eric Edelman, Gen. John Keane, Thomas Mahnken, Mara Rudman, Mariah Sixkiller, Alissa Starzak, and Roger Zakheim, “Commission on the National Defense Strategy,” *RAND Corporation*, July 2024. (https://www.armed-services.senate.gov/imo/media/doc/nds_commission_final_report.pdf)

Appendix A: The U.S. Arms Sales Process

The United States has four primary mechanisms for transferring arms to other countries. The first process, FMS, is a program whereby “the U.S. government and a foreign government enter into a government-to-government agreement called a Letter of Offer and Acceptance (LOA),” according to the U.S. Defense Security Cooperation Agency.²⁹² In FMS, the Pentagon negotiates and signs contracts directly with defense contractors on behalf of the recipient nation. Under FMS, the U.S. government procures defense articles from American industry, acting as “an intermediary for international partners” and allowing them “to benefit from U.S. DOD technical and operational expertise, procurement infrastructure, and purchasing practices,” according to the Congressional Research Service, which distinguishes this process from how other countries typically conduct transfers. Unfortunately, this contracting process has also frequently contributed to significant delays in delivering systems to end users.²⁹³ Large systems, such as aircraft, ships, and tanks, almost always go through the FMS process. In fact, the U.S. government broadly considers many types of systems only available through FMS, including advanced radars, attack helicopters, fighter aircraft, multiple types of ground-based air defenses, MANPADS, missiles, standoff weapons, torpedoes, and various countermeasures.²⁹⁴

The Ukraine Security Assistance Initiative is a program started before the 2022 Russian invasion that is intended to “strengthen Ukraine’s capacity to more effectively defend itself against Russian aggression.” In FY23, the Pentagon provided \$12.1 billion in security assistance to Ukraine under USAI.²⁹⁵ Systems committed to Ukraine through USAI generally follow the same process as FMS, with the Pentagon contracting with companies to produce systems. Systems committed through USAI are contracts to produce new systems, which is distinct from the process of transferring existing systems from U.S. stockpiles using PDA.

Direct Commercial Sales is the second mechanism for transferring arms to other countries. DCS involves “a sale of defense articles or defense services made under a Department of State issued license by U.S. industry directly to a foreign buyer, and which is not administered by the DOD through FMS procedures,” according to the U.S. Defense Security Cooperation Agency.²⁹⁶

There is significantly less public information available regarding DCS compared to FMS, PDA, and EDA transfers. This report uses information on DCS when available but does not claim to capture all relevant DCS to Taiwan, Ukraine, or Israel within the designated time frame. The report affirmatively notes that no DCS exists for a system when that could be confirmed. This is the case for most of the covered systems, as they are on the FMS-Only list. However, the potential omission of some DCS from the analysis likely has at least two effects, which may counteract one another to some degree.

292. “Foreign Military Sales (FMS),” *U.S. Department of Defense, Defense Security Cooperation Agency*, accessed October 18, 2024. (<https://www.dsca.mil/foreign-military-sales-fms>)

293. Christina Arabia, Nathan Lucas, and Michael Vassalotti, “Transfer of Defense Articles: U.S. Sale and Export of U.S.-Made Arms to Foreign Entities,” *Congressional Research Service*, March 23, 2023. (<https://crsreports.congress.gov/product/pdf/R/R46337/4>); Bradley Bowman and Rear Adm. (Ret.) Mark Montgomery, “Taiwan Needs Our Help Now,” *The Dispatch*, April 17, 2023. (<https://thedispatch.com/article/taiwan-needs-our-help-now>)

294. U.S. Department of Defense, Defense Security Cooperation University, *Security Cooperation Management* (Arlington: Defense Security Cooperation University, 2023), page 15-1. (<https://www.dsccu.edu/sites/default/files/2024-04/15-chapter.pdf>)

295. U.S. Department of State, Bureau of Political-Military Affairs, “U.S. Security Cooperation with Ukraine – Fact Sheet,” December 2, 2024. ([https://www.state.gov/u-s-security-cooperation-with-ukraine/#:~:text=In%20FY%202023%2C%20DoD%20provided,USAI\)%20in%20eight%20separate%20tranches](https://www.state.gov/u-s-security-cooperation-with-ukraine/#:~:text=In%20FY%202023%2C%20DoD%20provided,USAI)%20in%20eight%20separate%20tranches))

296. “Definition,” *U.S. Department of Defense, Defense Security Cooperation Agency*, accessed October 18, 2024. (<https://samm.dsca.mil/glossary/direct-commercial-sale>)

On the one hand, potentially not including all relevant DCS in the analysis may underestimate the demand on the U.S. DIB for that system, thereby overestimating available slack production capacity. On the other hand, DCS offers another means for the United States to meet the military requirements of the three partners by allowing foreign governments to contract directly with U.S. companies. Accordingly, in some of the cases discussed, if there is an unknown DCS involved, this analysis may somewhat underestimate the demand on industry for the respective system and the time required for delivery but may overestimate the unmet military requirement. Future research should attempt to augment this report's analysis by including more information on relevant DCS.

Moreover, if there are DCS for the respective system for security partners other than Taiwan, Ukraine, and Israel, that would put additional demand on the DIB and potentially impact delivery timelines. As this report argues, in such cases, it is important to prioritize transfers to Taiwan, Ukraine, and Israel.

Excess Defense Articles is the third mechanism for transferring arms to other countries. With EDA, foreign governments may request the transfer of DOD or U.S. Coast Guard defense articles that are no longer needed and have been declared excess by the U.S. Armed Forces.²⁹⁷ EDA has not played a significant role

in providing aid to Ukraine, with the fact sheet only listing Mi-17 helicopters and four Island-class cutters provided through the program.²⁹⁸

FMS, DCS, and EDA go through a congressional review process, including formal and informal congressional notification and a window for Congress to disapprove of the sale if the sale is above a certain dollar threshold.²⁹⁹ The president has the authority to issue an emergency waiver for an FMS, which waives the congressional statutory review period. Congress could pass a joint resolution of disapproval, which would stop the sale if it became law. However, the president can veto the resolution, and Congress has never succeeded in using such a resolution to block a formally proposed arms sale.³⁰⁰

PDA is the fourth mechanism for transferring arms to other countries. Pursuant to section 506(a)(1) of the Foreign Assistance Act, PDA “allows for the speedy delivery of defense articles and services from Department of Defense stocks to foreign countries and international organizations to respond to unforeseen emergencies.”³⁰¹ This can be provided in response to an “unforeseen emergency” up to a funding cap established in law.³⁰² The Biden administration made repeated use of PDA to deliver weapons to Ukraine and made limited use of PDA for Taiwan.³⁰³

297. Christina Arabia, Nathan Lucas, and Michael Vassalotti, “Transfer of Defense Articles: U.S. Sale and Export of U.S.-Made Arms to Foreign Entities,” *Congressional Research Service*, March 23, 2023. (<https://crsreports.congress.gov/product/pdf/R/R46337>)

298. U.S. Department of State, Bureau of Political-Military Affairs, “U.S. Security Cooperation with Ukraine – Fact Sheet,” September 27, 2024. (archived version available at <https://web.archive.org/web/20240930190338/https://www.state.gov/u-s-security-cooperation-with-ukraine>)

299. Paul Kerr, “Arms Sales: Congressional Review Process,” *Congressional Research Service*, August 13, 2024. (<https://crsreports.congress.gov/product/pdf/RL/RL31675>); Bradley Bowman, “Objectives of U.S. Arms Sales to the Gulf: Examining Strategic Goals, Risks and Benefits,” *Foundation for Defense of Democracies*, June 16, 2020. (<https://www.congress.gov/116/meeting/house/110808/witnesses/HHRG-116-FA13-Wstate-BowmanB-20200616.pdf>); U.S. Department of Defense, Department of the Navy, “Excess Defense Articles (EDA),” accessed October 18, 2024. (<https://www.secnv.navy.mil/nipo/Pages/About/Security%20Assistance/Excess-Defense-Articles.aspx>)

300. Paul Kerr, “Arms Sales: Congressional Review Process,” *Congressional Research Service*, August 13, 2024. (<https://crsreports.congress.gov/product/pdf/RL/RL31675>)

301. U.S. Department of State, Bureau of Political-Military Affairs, “Use of Presidential Drawdown Authority for Military Assistance for Ukraine – Fact Sheet,” December 2, 2024. (<https://www.state.gov/use-of-presidential-drawdown-authority-for-military-assistance-for-ukraine>)

302. Christina Arabia, Andrew Bowen, and Cory Welt, “U.S. Security Assistance to Ukraine,” *Congressional Research Service*, May 22, 2024. (<https://crsreports.congress.gov/product/pdf/IF/IF12040>)

303. “Biden approves \$567 mln in defense support for Taiwan, White House says,” *Reuters*, September 29, 2024. (<https://www.reuters.com/world/biden-approves-567-mln-defense-support-taiwan-white-house-says-2024-09-30>)

The main difference between FMS and DCS on the one hand and PDA on the other is that the latter provides partners with *existing* American weapons from the Pentagon's arsenal, whereas FMS and DCS provide partners with *new* weapons built by American industry. Unlike FMS and DCS cases, PDA weapons can be delivered quickly, even in a few days. EDA are existing weapons as well, but the process typically takes longer. With FMS, the weapons are new, and the sale does not deplete the U.S. military's arsenal. One cannot say, therefore, that the provision of weapons to one partner via PDA slows the provision of weapons to another partner via FMS. In the long term, however, the use of FMS and the eventual backfilling of weapons sent from the U.S. military's arsenal via PDA both eventually put demand on the U.S. DIB.

Appendix B: Scope

This report does not seek to characterize the overall ability of any of the three partners to defend itself or the ability of the United States and its allies to send forces to help defeat aggression. In the case of Taiwan, such an assessment would need to examine not only Taipei's current military capability and capacity relative to the growing capabilities of the PLA but also the ability and

willingness of the United States and any allies to come to the aid of Taiwan quickly and effectively and to sustain that support militarily and politically over the duration of a conflict that could be longer and more costly than expected. Such an analysis is beyond the scope of this report. But according to the head of U.S. Indo-Pacific Command, Adm. Samuel Paparo, there is reason to believe that some U.S. stockpiles are too small, particularly air defense interceptors that have been used in Ukraine and the Middle East.³⁰⁴

This report simply seeks to 1) assess whether providing weapon systems to Ukraine has slowed their delivery to Taiwan and Israel; 2) evaluate the general health of the U.S. industrial base producing the respective systems; and 3) recommend ways to strengthen the American arsenal of democracy and thereby better secure U.S. interests.

If the United States can provide Taiwan with capable weapon systems in sufficient quantities in the next few years, Beijing may decide to avoid or postpone military aggression against Taipei.³⁰⁵ If the United States, however, does not provide Taiwan with those systems in a timely or sufficient manner, Chinese aggression becomes more likely. Forecasting the demands on the DIB for such a war is beyond the scope of this report.³⁰⁶

304. Tara Copp, "US arms stockpiles strained by Ukraine, Israel support: INDOPACOM boss," *Defense News*, November 21, 2024. (<https://www.defensenews.com/global/the-americas/2024/11/21/us-arms-stockpiles-strained-by-ukraine-israel-support-indopacom-boss>)

305. While PRC military aggression against Taiwan is the most dangerous scenario, the more likely scenario, at least initially, is a combination of economic and cyberattacks. Craig Singleton, Rear Adm. (Ret.) Mark Montgomery, and Benjamin Jensen, "Targeting Taiwan: Beijing's Playbook for Economic and Cyber Warfare," *Foundation for Defense of Democracies*, October 4, 2024. (<https://www.fdd.org/analysis/2024/10/04/targeting-taiwan>)

306. What is clear is that demands on the U.S. DIB would dramatically increase if deterrence fails in the Taiwan Strait and the United States intervenes to defeat PRC aggression.

Appendix C: Time Frames

The time frames for the Ukraine Impact and Defense Industrial Base classifications were selected based on publicly disclosed U.S. assessments that Xi Jinping has ordered the People's Liberation Army to be ready to conduct a successful invasion of Taiwan by 2027, a date that has been echoed by many others.³⁰⁷ A 2027 invasion is not definite, and large-scale aggression could occur before or after that date, but current assessments indicate that the PLA does not presently have the capabilities to accomplish what could be among the largest amphibious invasions in history, rendering an imminent invasion unlikely.³⁰⁸ In fact, Xi's order to prepare by 2027 indicates that Chinese leadership believes the PLA is unprepared.³⁰⁹

Other forms of military aggression, such as a blockade or large-scale missile strikes, are also possible but

would entail a significant risk of full-scale hostilities with Taiwan and the United States.³¹⁰ So, while the severity and scale of the China challenge necessitates that the United States work quickly to arm Taiwan, large-scale aggression may be unlikely in the next two years. If accurate, that means there is still some time to deliver the systems and munitions that Taiwan has purchased.³¹¹

It would be a mistake, however, for decision-makers to review this information and relax based on a misimpression that the United States has plenty of time. History is replete with examples of surprise attacks or aggression that came sooner than expected. One of the greatest problems in Washington when it comes to security assistance remains an insufficient sense of urgency. Addressing some of the defense industrial base shortcomings identified in this report will take years. That means there is no time to waste.

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- 307.** Olivia Gazis, "CIA Director William Burns: 'I wouldn't underestimate' Xi's ambitions for Taiwan," *CBS News*, February 3, 2023. (<https://www.cbsnews.com/news/cia-director-william-burns-i-wouldnt-underestimate-xis-ambitions-for-taiwan/>); Amy Hawkins, "Taiwan foreign minister warns of conflict with China in 2027," *The Guardian* (UK), April 21, 2023. (<https://www.theguardian.com/world/2023/apr/21/taiwan-foreign-minister-warns-of-conflict-with-china-in-2027>); Derek Grossman, "Taiwan Is Safe Until at Least 2027, but with One Big Caveat," *RAND Corporation*, November 10, 2021. (<https://www.rand.org/pubs/commentary/2021/11/taiwan-is-safe-until-at-least-2027-but-with-one-big.html>); Mallory Shelbourne, "Davidson: China Could Try to Take Control of Taiwan In 'Next Six Years,'" *USNI News*, March 9, 2021. (<https://news.usni.org/2021/03/09/davidson-china-could-try-to-take-control-of-taiwan-in-next-six-years>)
- 308.** U.S. Department of Defense, "Military and Security Developments Involving the People's Republic of China 2023," page 180. (<https://media.defense.gov/2023/Oct/19/2003323409/-1/-1/1/2023-MILITARY-AND-SECURITY-DEVELOPMENTS-INVOLVING-THE-PEOPLES-REPUBLIC-OF-CHINA.PDF>); David Sacks, "Why China Would Struggle to Invade Taiwan," *Council on Foreign Relations*, June 12, 2024. (<https://www.cfr.org/article/why-china-would-struggle-invade-taiwan>); "Taiwan Leader Says China Invasion Unlikely for Now," *Voice of America*, November 20, 2023. (<https://www.voanews.com/a/taiwan-leader-says-china-invasion-unlikely-for-now-/7378274.html>)
- 309.** Chris Panella, "The 'crown jewel' of the Chinese military appears to have a serious corruption problem, but the US can't afford to bet on its missiles all being defective," *Business Insider*, January 14, 2024. (<https://www.businessinsider.com/china-rocket-force-corruption-us-cannot-lower-guard-2024-1>)
- 310.** Mark Cancian, Matthew Cancian, and Eric Heginbotham, "The First Battle of the Next War: Wargaming a Chinese Invasion of Taiwan," *Center for Strategic and International Studies*, January 2023. (https://csis-website-prod.s3.amazonaws.com/s3fs-public/publication/230109_Cancian_FirstBattle_NextWar.pdf); Matthew Loh, "China surrounding Taiwan would be enough to drag the US into military conflict, said the majority of 52 US experts," *Business Insider*, January 29, 2024. (<https://www.businessinsider.com/china-taiwan-us-war-invade-quarantine-blockade-experts-csis-2024-1>)
- 311.** Bryant Harris, "Taiwan is buying US weapons, but Washington isn't delivering them," *Defense News*, August 30, 2024. (<https://www.defensenews.com/congress/2022/08/25/chinas-neighbors-are-buying-us-weapons-washington-isnt-delivering>)

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Acknowledgments

We are indebted to the more than two dozen experts in government, Congress, and industry who provided valuable feedback. This monograph is significantly better thanks to their willingness to spend time reading our drafts and sharing their valuable insights.

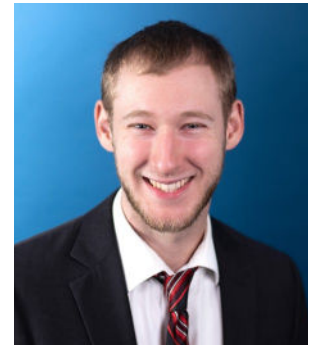
We are sincerely grateful to our many FDD colleagues who also provided substantive and helpful feedback. RADM (Ret.) Mark Montgomery, Lydia LaFavor, John Hardie, Cameron McMillan, Matt Zweig, Erin Blumenthal, and Mike Daum were especially helpful.

We also want to thank the interns from FDD's Center on Military and Political Power, Ben Woolsey, Logan Rolleigh, Mayer Goldberg, Kayla Anderson, and especially Analyse Hughes, for their research assistance.

Special thanks to Jonathan Schanzer and David Adesnik for the valuable suggestions that made the monograph more succinct and readable. Sincere thanks also to David May for top-notch proof and his impressive diligence and attention to detail. Allie Shisgal, vice president of program management, as well as Program Manager Katy Wickberg, played an important role in helping to shepherd the project to completion. FDD's exceptionally talented Creative Director Daniel Ackerman has once again produced a beautiful design, making the publication more attractive and accessible than we thought possible, with thanks to Elizabeth Sunshine for layout production and Andrew Aucoin for a unique icon system.

About the Authors

Ryan Brobst is a senior research analyst at FDD’s Center on Military and Political Power. His research focuses on Middle East security, including emerging threats, U.S. military posture, arms sales, weapons development, and regional military operations and exercises. He also conducts research and publishes analysis related to the war in Ukraine and efforts to deter aggression against Taiwan. Prior to joining FDD, Ryan served as a policy analyst at the Hoover Institution and as a graduate research assistant at Stanford University’s Center for International Security and Cooperation. He earned an M.A. in international policy from Stanford University as well as Bachelor of Arts degrees in international relations and Middle East/South Asia studies and minors in European history and East Asian studies from the University of California, Davis. Ryan has published his analysis in *Defense News*, *Breaking Defense*, *Defense One*, and others. His research has been featured in *The New York Times* and NBC News, and he has been quoted by *The Washington Post* and Associated Press.



Bradley Bowman serves as senior director of the Center on Military and Political Power at the Foundation for Defense of Democracies, where he focuses on U.S. defense strategy and policy. He has served as a national security advisor to members of the Senate Armed Services and Foreign Relations committees, as well as an active-duty U.S. Army officer, Black Hawk pilot, Council on Foreign Relations international affairs fellow, and assistant professor at West Point, where he taught courses on American politics, foreign policy, and grand strategy. He also taught a graduate course on “Congress and U.S. National Security Policy” at Georgetown University’s School of Foreign Service. Bradley has testified to Congress and appeared on CNN and BBC. His analysis has been published by *The Washington Post*, *The Wall Street Journal*, *Foreign Policy*, NBC News, Newsweek, *Breaking Defense*, *Defense News*, and others. He earned an M.A. in international relations from Yale University and a B.S. in American politics from the United States Military Academy at West Point.



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P.O. Box 33249
Washington, DC 20033-3249
(202) 207-0190
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