



Soldiers assigned to 1st Squadron "Garryowen," 7th Cavalry Regiment, 1st Brigade Combat Team "Ironhorse," 1st Cavalry Division use a map to plan a simulated mission during a Mobile Training Team Cavalry Leaders Course on 12 September 2014 at Fort Hood, Texas. Tactical, operational, and strategic war planning should incorporate specific measures to mitigate noncombatant casualties and unnecessary destruction to civilian infrastructure. Such measures will increase the likelihood of achieving the overall strategic objectives. (Photo by Spc. Paige Behringer, 1st Brigade Combat Team, 1st Cavalry Division Public Affairs Office)

# Operational Effectiveness and Civilian Harm Mitigation by Design

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**I**n December 2023, Secretary of Defense Lloyd Austin issued Department of Defense (DOD) Instruction 3000.17, *Civilian Harm Mitigation and*

*Response*. The instruction states that the protection of civilians is "fundamentally consistent with the effective, efficient, and decisive use of force."<sup>1</sup>



*Living up to our values requires constant vigilance and adaptation as new operational challenges emerge. Good intentions are not enough.*

This seminal guidance was heavily informed by the efforts of former Secretaries of Defense James Mattis, Mark Esper, and Christopher Miller to institutionalize hard-earned lessons about civilian harm from twenty-two years of war and begin adapting those lessons to shape preparation for future wars. In 2018, Mattis directed the Joint Staff to oversee a study on civilian harm, the results of which helped inform the intellectual underpinnings of the DOD Instruction.<sup>2</sup> Esper and Miller oversaw additional research to draw lessons to help mitigate and respond to civilian harm in the future, including for high-intensity and urban combat.<sup>3</sup> Many U.S. military commanders from the Civil War until today have understood the importance of mitigating civilian harm to achieve overall campaign success.

The purpose of this article is to help policymakers and warfighters understand how civilian harm mitigation and response (CHMR) matters for improving both strategic outcomes and operational effectiveness.<sup>4</sup> Before discussing its strategic and operational relevance, however, it is important to emphasize that CHMR plays a key role in helping the United States align its military actions with its values.

One difference between the United States and its potential adversaries is the greater value that the U.S. government puts on protecting human life and liberty at home and abroad. One need only observe the actions of the Russian military in Ukraine and read Chinese military doctrine on total war to understand how U.S. values are different.

Secretary Austin recognized that the U.S. military's values reinforced its effectiveness. His introduction to the DOD's 2022 CHMR action plan states,

Our efforts to mitigate and respond to civilian harm directly reflect our values and directly contribute to mission success. The excellence and professionalism in operations

essential to preventing, mitigating, and responding to civilian harm is also what makes us the world's most effective military force.<sup>5</sup>

Living up to our values requires constant vigilance and adaptation as new operational challenges emerge. Good intentions are not enough. Operationalizing the requirements and capabilities established in the DOD's CHMR policies is an extraordinary challenge, particularly when facing potential large-scale and high-tempo combat operations against near-peer adversaries. This is one reason why the DOD has established a "CHMR enterprise" of military operational and civilian protection experts across all of the DOD with a Civilian Protection Center of Excellence (CP COE) as its hub of expertise. While the CP COE is an Army organization, it has a DOD-wide, multi-domain mission to enable the joint force to "mitigate and respond to civilian harm, enhance operational effectiveness, and reinforce strategic success."<sup>6</sup>

## Tactical Actions—Strategic Success

Aligning actions and values increases the likelihood of achieving national security

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retired, served as deputy commanding general—air, Combined Joint Force Land Component Command for the liberation of Fallujah, Qayyarah, and Mosul. Isler was closely involved in planning ground operations, integrating air operations, synchronizing with Iraqi air and ground forces, and conducting air support throughout the campaign. Later, Isler led the first two years of Central Command advisory activities to improve combat performance and civilian harm mitigation with allies and partners. Isler now serves as a special advisor to the Office of the Under Secretary of Defense for Policy on civilian casualty prevention.





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objectives. The DOD's CHMR efforts help drive tactical actions toward strategic success in several ways. Demonstrable efforts to anticipate and mitigate civilian harm helps to earn and sustain public confidence in the military's operations. It can also affect the "will to fight" of populations and their militaries.<sup>7</sup> Any hope Russian President Vladimir Putin had that some Ukrainians might rally to support Russia's invasion were dashed when even ethnic Russians in Ukraine realized the differences between how Russian and Ukrainian military forces treated civilian populations.<sup>8</sup> The clear distinction between Ukraine's handling of civilians and Russian abuses have helped sustain domestic and international support for the Ukrainian government while strengthening the resolve of the United States and its allies to weaken Russia politically and economically.

There is also evidence that extending condolences in response to civilian harm diminishes local rates of insurgent violence, indicating that civilians are less likely to undermine military forces that treat them with care.<sup>9</sup> It can't be proven that a similar dynamic would operate in large-scale combat operations—for example, to shore up support of NATO forces among ethnic Russians in Baltic countries during a conflict with Russia—but it is clear that military behavior vis-à-vis civilian populations has strategic implications. Ukraine's efforts with its ethnic Russian population have been an important example of how earning and sustaining local support may prove pivotal when fighting a peer adversary on allied terrain.

Among our hardest won lessons is that mistakes resulting in civilian harm can put the entire mission at risk. Gen. David Petraeus's tactical directive to his forces in Afghanistan said, "Every civilian death diminishes our cause."<sup>10</sup> U.S. failures to limit civilian harm in Afghanistan led Gen. Stanley McChrystal to

say, "We're going to lose this f\*\*\*ing war if we don't stop killing civilians."<sup>11</sup>

Mitigating the risks of civilian casualties also helps to focus operational effects on degrading the enemy over the course of a conflict. For example, precision munitions can improve lethality against enemy forces while minimizing risks to civilian lives and structures. Detailed understanding of a civilian environment and a sustained dynamic common operating picture across battlefield domains helps anticipate potential risks to civilians, improves course of action selection and targeting, and reduces blind spots that can lead to mistaking civilians for targetable combatants.

Assessments and investigations of civilian harm can provide lessons that reduce the likelihood of future incidents, while also improving military tactics, techniques, and procedures (TTPs) for striking adversary forces and protecting our own forces. This is not speculation but rather evidence-based analysis captured in multiple DOD-sponsored studies.<sup>12</sup> For example, the 2010 *Joint Civilian Casualty Study*, directed by the chairman of the Joint Chiefs of Staff, found that special operations forces observed both increases in mission success and decreased rates of civilian casualties as they addressed root causes of civilian harm that had been identified through past assessments and investigations. The study also showed that as civilian casualties went down, coalition force casualty rates also went down.<sup>13</sup> Other Joint Staff-sponsored research found CHMR-focused guidance reduced civilian casualties by 20 percent in the first year with further reductions in subsequent years.<sup>14</sup> Encouragingly, both mission effectiveness against high value targets and force protection for U.S. forces were actually enhanced during this time.<sup>15</sup> While correlation does not equal causality, it is clear



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that improving awareness of civilian presence can also lead to improvements in targeted lethality and force protection and thus strategic victory. We have not only seen this in practice operationally, but it makes sense from first principles. A significant fraction of civilian harm results from misidentification; therefore, reducing misidentification helps forces better deliver lethal effects on valid military targets.

The DOD's CHMR policy preserves decision space for military commanders by improving how the joint force plans, trains, learns, and develops capabilities that provide better operational approaches, information, tools, and options. A "CHMR-ready" force will design an approach that emphasizes understanding the civilian environment and communicating that understanding among planners and operators. Better situational awareness overall and a common operating picture will improve broader air-ground coordination efforts. A CHMR-ready force will also incorporate civilian protection objectives and civilian harm estimates across the joint planning process and consider multiple courses of action to achieve desired effects with reduced civilian harm risks. While effective targeting certainly helps address both civilian harm mitigation and operational effectiveness, the tempo and scale of large-scale combat operations mean that a well-prepared, CHMR-ready force equipped up front with necessary civilian environment information is far more important than potential process improvements to an already-sophisticated U.S. military targeting cycle.

Finally, CHMR drives tactical actions toward strategic success through its positive effects on community resilience and post-conflict stabilization efforts. Future battlefields could include cities like Taipei, Riga, or Seoul. Military planning often focuses on red

(the adversary) and blue (allied forces), but it also needs to expand its aperture to understand "green"—namely civilians, and civilian structures and resources, on the battlefield. There are important opportunities for the U.S. government to reinforce allies' civil defense plans while improving whole-of-coalition situational awareness, planning, and mission execution. Allied forces and host nation governments can pursue CHMR-informed civil-military planning that reduces the risks to those civilians and their communities. Past urban combat experiences in places like Raqqa, Syria, illustrate how the pursuit of sometimes relatively minor tactical advantages on the battlefield lead to heavy-handed destruction of civilian structures and infrastructure, create new problems, and ultimately undermine strategic objectives.<sup>16</sup>

The U.S. government and its allies have opportunities to incorporate CHMR into postconflict stabilization planning and vice versa. Civilian harm extends well beyond the period of combat operations due to the second- and third-order effects of those operations. Life-sustaining essential services like medical care, water and sanitation, and transportation and communications can be disrupted for months or even years. Leaders must consider the impact of their military operations on these essential services if they hope to prevent famine, disease, and public unrest, and if they expect to translate military victories into strategic successes. Effective planning can give commanders a clearer understanding of the potential effects of operational decisions for transition to stabilization. Civilian-harm risk projections during planning can drive consideration of less harmful courses of action and enable U.S. forces, U.S. civilian agencies, and foreign government partners to preserve and restore the civilian environment.

The DOD should not attempt to replicate the important work undertaken by the State Department, U.S. Agency for International Development, or humanitarian organizations, but rather solicit its unique expertise to inform DOD efforts to mitigate and respond to civilian harm.

## How CHMR Strengthens Operational Effectiveness

For military commanders, mitigating civilian harm and operational effectiveness are two sides of the



Korean women and children search the rubble of Seoul for anything that can be used or burned as fuel on 1 November 1950. (Photo by Capt. F. L. Scheiber, U.S. Army, via the National Archives)

same coin. Warfighting functions and processes that determine civilian harm outcomes are the same ones that determine campaign success.<sup>17</sup> Commanders can leverage CHMR tools to enhance operational effectiveness by focusing lethal effects on defeating the enemy, maintaining focus on campaign objectives, and speeding joint force achievement of the commander's intent. By actively limiting effects that undermine operational objectives, CHMR accelerates achievement of campaign objectives.

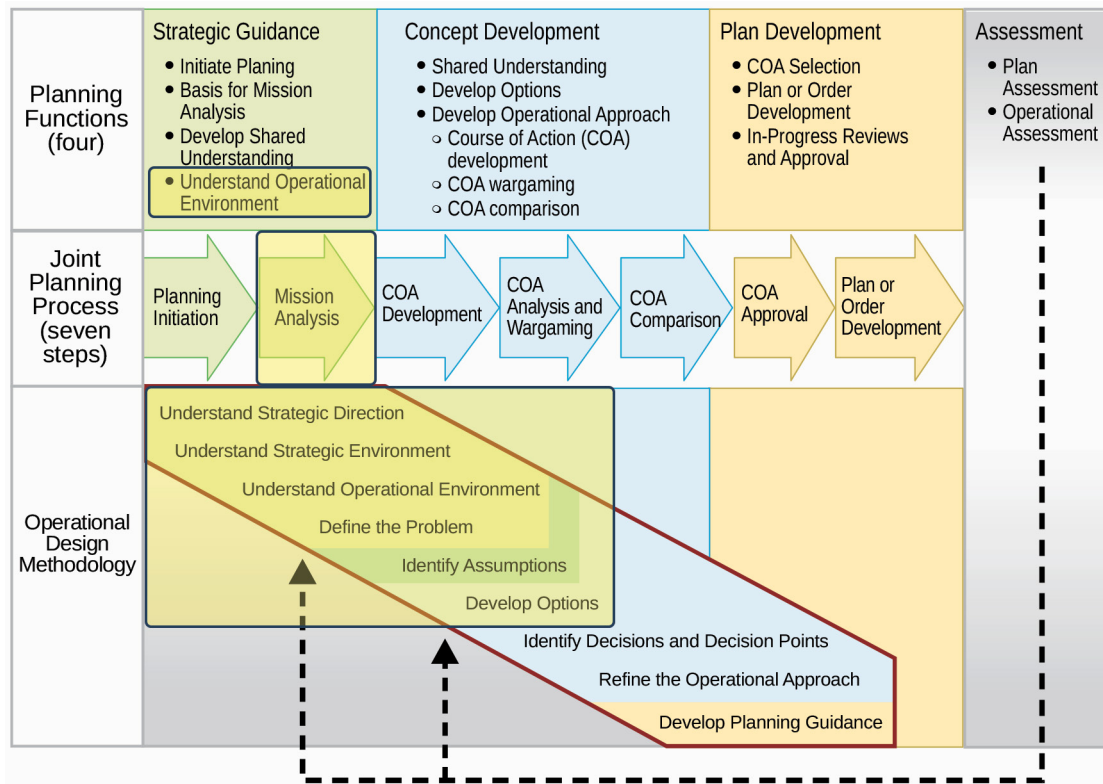
At the campaign level, joint force commanders (JFC) integrate CHMR into their commander's intent and planning guidance and execute CHMR best practices throughout their tactical- and operational-level activities. Commanders initiate CHMR integration throughout their campaign by expressing their intent to subordinate commanders and staffs during planning and execution. Meanwhile, commanders design their tactical- and operational-level processes with CHMR objectives, tools, and feedback mechanisms baked in. Most essential to overall CHMR outcomes is effective CHMR implementation at the operational level

of warfare. While tactical-level tools are essential to minimize risk in day-to-day activities, operational-level design and warfighting processes determine the overall impact on civilian harm in battles and campaigns. The counter-Islamic State (IS) campaign and battles for Fallujah, Mosul, and Raqqa reinforce the crucial importance of *operational-level* design and warfighting processes to CHMR outcomes.<sup>18</sup>

## Commander's Intent

Let's unpack why commander's intent, planning guidance, and operational design are such important factors to both CHMR and operational effectiveness. In the commander's intent, the JFC sets the vision for post-conflict conditions including the condition of critical infrastructure and the civilian population. This intent becomes the basis for planning across all echelons of command, drives the operational approach, and





Civilian harm mitigation and response (CHMR) applies across the joint planning process, and CHMR integration starts during mission analysis and shaping of the commander's intent. Highlighted areas indicate where commander guidance makes the greatest impact on CHMR outcomes. (Figure adapted by authors; originally from Joint Publication 5-0, *Joint Planning* [2020])

## Figure. Planning Functions, Process, and Operational Design Methodology

underwrites guidance to subordinate commanders and staff. Commander intent also forms the basis for rules of engagement interpretation, warfighting process design such as surveillance and targeting processes, command reporting (e.g., commander's critical information requirements), and operations guidance. Similarly, the JFC's intent determines the priorities for allocating planning time, personnel, and capabilities during planning and execution. Early integration of CHMR into the commander's intent ensures that CHMR is baked into the campaign with a design philosophy rather than bolted on as an additional "must-do." The commander's attitude toward CHMR and the commander's expression of that attitude in the intent are the most important determinants to effective CHMR integration into the plans and processes that govern the campaign.

Armed with the JFC's intent, subordinate commanders and staffs plan the operation and integrate CHMR via iterative *operational design* that structures

and tailors the campaign to the context of the operational environment to achieve the campaign's objectives (see the figure).<sup>19</sup> Integrating CHMR throughout planning, commanders and staffs consider the civilian population and the desired military end state as design elements of the plan and design maneuver and fires plans around the civilian population in a manner similar to their consideration of terrain.<sup>20</sup> For example, during the 2017 West Mosul operation in the counter-IS campaign, the coalition land component commander clearly expressed his desire to preserve Mosul's critical infrastructure in his visualization of the operation's end state and considered the civilian population as a design element. Coalition planners also encouraged Iraqi forces to plan their breach into the city and to secure a foothold in an industrial section of the town to enable coalition forces to conduct high tempo shaping and supporting fires while limiting the risk to civilians held within the city by IS.<sup>21</sup> Using CHMR as a design

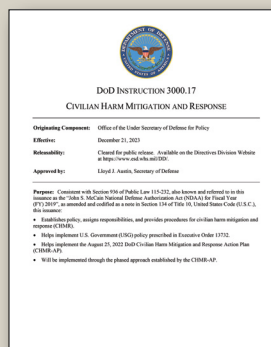
element preserves the commander's freedom of action and decision space, strengthens campaign legitimacy, and protects the commitment of allies and partners throughout the campaign.

## Opportunities to Build CHMR into Operations

Ally and partner capabilities, actions, and effects also drive operational design. Each ally and partner joins the campaign with different capabilities, intent, and tolerance for risk, including capabilities for CHMR across the spectrum of warfighting functions.<sup>22</sup> By tailoring the operational design to these capabilities and integrating ally and partner CHMR efforts, commanders and staffs align operational tasks to partner strengths while managing overall civilian harm risks. Commanders also tailor their engagements to address the importance of CHMR; invite ally and partner participation in CHMR assessments, planning and training teams; and share best practices before and during operations to enhance the capabilities of all participants. During the counter-IS and Afghanistan campaigns, effective coalition integration in CHMR improved coalition warfighting capabilities and mitigation throughout the campaign.<sup>23</sup> Similarly, during the Mosul operation of the counter-IS campaign, coalition and Iraqi commanders discussed needs and methods to preserve critical infrastructure throughout the city. Commanders consulted closely regarding decisions to preserve or disrupt critical infrastructure including the five bridges that connect the east and west portions of the city and aligned on methods to achieve intended outcomes that facilitated rapid reconstruction following Iraqi liberation. Effective ally and partner

integration becomes even more important in future conflicts with higher stakes and faster tempo, and versus adversaries with long-range and high-volume firepower and greater command of diplomatic and information spaces.

Additional operational-level activities to maximize CHMR integration include intelligence/surveillance, targeting, and the integration of maneuver and fire. Intelligence and surveillance determine the commander's perception of the battlespace including the location and status of enemy forces and noncombatants. Staffs should design the intelligence, surveillance, and reconnaissance (ISR) enterprise to enable a clear understanding of *both enemy and civilian* elements in the battlespace through the selection and allocation of collection assets, requirements creation, priorities creation, capability allocation, intelligence fusion, target discovery, target identification, and estimation of collateral effects. Meanwhile, civilian harm risks should be considered across *targeting processes* for both deliberate and dynamic strikes. CHMR is already well ingrained into deliberate targeting doctrine, phases, and process, and commanders should similarly apply CHMR across their dynamic targeting processes addressing emergent targets. While deliberate targeting provides the strongest levels of CHMR risk awareness and mitigation, *dynamic targeting* accounts for the preponderance of strikes after the initial kinetic phases of most campaigns. This is where commanders will face the greatest risks of civilian harm, especially during urban operations.<sup>24</sup> Because dynamic strikes compress the targeting timelines, risk is greatly compounded where there is high density of civilians, proximity of persons and structures to targets, and degraded ISR effectiveness.



Department of Defense (DOD) Instruction 3000.17, *Civilian Harm Mitigation and Response*, establishes policy, assigns responsibilities, and provides procedures for civilian harm mitigation and response. To read this DOD Instruction online, visit <https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/300017p.pdf>.

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Synchronized with targeting operations, to mitigate civilian harm risk, commanders and staffs should leverage *shaping* and *maneuvering* as design elements. Planning for shaping phases that include target discovery and target development ahead of decisive operations allows commanders to maximize deliberate strikes where harm mitigations are strongest, weaken the enemy ahead of ground assault, and minimize requirements for dynamic strikes where civilian harm risk is greater. During the counter-IS campaign, robust shaping phases ahead of decisive operations to liberate Qayyarah, Sharquat, and Tal Afar sharply reduced the need for dynamic strikes during the decisive phases as weakened enemy forces fled the cities once friendly forces established their foothold. Robust CHMR design in ISR and targeting enterprises and effective shaping will help commanders set the conditions to achieve campaign objectives while minimizing risks of unintended consequences.

## Assessments and Adaptation

Effective tactical-level implementation of TTPs by operators is essential to achieving the commander's intent for CHMR, and breakdowns in tactical-level actions can have catastrophic effects on strategic-level campaign objectives.<sup>25</sup> Effective execution at the tactical level is especially important in large-scale conflicts where commanders delegate target engagement authority, the authority to identify and engage lawful targets, to tactical-level commanders. In a large-scale conflict with China or Russia, the vast majority of strike decisions will not be made at the White House, the Pentagon, the combatant command, or the joint task force headquarters, but rather by officers at multiple echelons of command operating in a federated

targeting structure that is under immense pressure. Recent coalition urban combat operations in Raqqa, Syria, and Mosul, Iraq, illustrate some of the challenges these warfighters will face. However, instead of supporting Kurdish fighters and Iraqi special forces, it will be Americans and their highly modernized allies suffering casualties, requesting strikes to achieve their objectives, and relying on strikes for self-defense. In these scenarios pressure for rapid decision-making will be intense, even when information is scarce regarding risks to civilians and civilian structures.<sup>26</sup> The unique tactical and operational realities of large-scale operations in the Pacific and eastern Europe—and the strategic implications of civilian harm in these theaters—require the DOD to approach CHMR with the fresh thinking and adaptation that it is applying to other challenges. U.S. Indo-Pacific Command illuminated the criticality of information on civilian harm risk reaching commanders in its Keen Edge exercise in early 2024.

To reduce risks in large-scale operations where target engagement authorities are delegated to the lowest echelons, military forces will rely on years of training prior to their deployment for the capabilities and critical-thinking skills necessary for operational success and risk mitigation. CHMR considerations need to be baked into the DNA of military operators, just like their understanding of fires, maneuver, command and control, intelligence, and other warfighting functions. CHMR will not be a “mother may I” process overseen by a single staff judge advocate but rather a series of considerations to manage risk built into all warfighting functions. Effective integration of CHMR across combatant command and service training activities is essential to prepare joint forces for success in large-scale operations.

Effective tactical- and operational-level assessments are also essential to overall campaign effectiveness. Assessments enable commanders to recognize changes in the operational context and adapt the operation and processes that determine outcomes. Similarly, assessments allow operators to adapt TTPs to address emergent enemy tactics and changes in the operational context. During the 2017 Mosul operation, coalition forces were slow to recognize an emergent IS tactic to force large numbers of civilians to shelter unseen beneath carefully prepared IS defensive positions and draw coalition fires. This tactic led to a large coalition





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incident of 105 unintended and unforeseen casualties.<sup>27</sup> After an initial assessment, coalition forces rapidly adapted ISR operations to identify other IS locations of prepared civilian entrapment, and modified strike TTPs to account for the new IS tactics and the increasing density of civilians trapped in the city.<sup>28</sup> Effective tactical-level application of CHMR-informed TTPs and continuous TTP evolution to feedback from assessments during operations remains an essential foundation of harm mitigation throughout the campaign.

Overall, commanders maximize their operational effectiveness with strong CHMR integration across their operational-level functions and activities. Complemented by proficient operator performance of CHMR-informed TTPs, effective CHMR integration enhances their battlespace awareness, focuses lethal effects on the enemy, shapes the battlespace to achieve their intent, and speeds attainment of campaign objectives.

## Conclusion

Mitigating civilian harm is a moral imperative. It is one of the central ways in which the United States distinguishes itself from its adversaries in conflicts. It is also a strategic imperative. Civilian harm undermines political and military objectives, eroding the support of domestic populations and foreign governments. Moreover, addressing root causes of civilian harm through military adaptation has led to improved strategic outcomes. Finally, a force that effectively mitigates civilian harm is more operationally effective. The same improvements in campaign planning, targeting, and intelligence that reduce risks to civilians also contribute to a force that is more lethal to the adversary's military.

Civilian harm cannot be eliminated from armed conflict, and future wars pose challenges the United States has not seen for a generation. The speed and scale of strikes will require innovative, multidomain approaches to mitigating and responding to civilian harm. Preparation of our military forces must begin well before the onset of hostilities and include far more than improvements in targeting. Good practices will be institutionalized in doctrine, taught in military classrooms, and trained through exercises. Intelligence analysts will develop common operating pictures that include more information about civilians in the battlespace. Planners will more systematically consider civilian harm risks and develop courses of action that provide commanders with more options based on better information.

Efforts to protect civilians in war zones are not new, but the DOD's efforts in recent years to systematize and institutionalize these efforts is a potential game changer to expand strategic and operational advantages to future conflicts. The guidance issued by the secretary of defense in 2023 and chairman of the Joint Chiefs of Staff in 2024 weave CHMR into the DNA of America's military. The United States will better compete with adversaries in the information space and strengthen popular and allied support. Military commanders will employ better prepared forces and more thorough campaign designs.

The establishment of the DOD's CP COE as a hub of CHMR expertise supports commanders, planners, trainers, and other stakeholders in several ways. First, the CP COE serves as a repository for good practices and reach-back analytic support. Second, its experts deploy to help U.S. warfighters operationalize CHMR throughout planning and exercises. Third, it helps DOD stakeholders identify capability requirements and scan the horizon for technologies that reduce risks to civilians while enhancing operational effectiveness. Fourth, it builds CHMR expertise across the joint force from basic military schoolhouse familiarization to in-depth training and certification of CHMR professionals.

The U.S. Army established the CP COE in its role as the DOD's joint proponent for CHMR, and the Army is leading the way among military services to institutionalize CHMR good practices. But every general and flag officer has an intuitive understanding of the strategic risks posed by civilian harm based on twenty years of war. This is a challenge every service must address.



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Understanding the civilian environment and incorporating that into campaign design, target development, air-ground coordination, maneuver, and fires integration are all joint activities. Both the challenges and solutions are multidomain. Warfighters and military legal advisors agree that CHMR “can succeed only through an intentionally and deliberately all-domain approach.”<sup>29</sup>

The nature of war does not change, which means that civilians will continue to suffer in future wars as

they have in past ones. The character of war, however, does change. The joint force is simultaneously becoming more lethal against adversary militaries and more effective at mitigating and responding to civilian harm. This duality is crucial in a world saturated by social media, where the distance between tactical mistakes and strategic effects has never been shorter.

There is much to be done to prepare for future wars, but the U.S. military has never been better postured to conduct war in a way that is consistent with its values. It has never been more capable of giving commanders the information they need to strike the targets they need to strike while reducing risks to civilians. There remains significant room for improvement. Institutionalizing good CHMR practices will take years and require steady attention, something that is also true for traditional warfighting functions. But the challenges have been identified and are being addressed across the defense enterprise. Protecting civilians in future wars should never be an afterthought or learned on the fly. For the U.S. military, it will be by design. ■

## Notes

1. The instruction defines civilian harm as “civilian casualties and damage to or destruction of civilian objects (which do not constitute military objectives under the law of war) resulting from military operations. As a matter of DOD [Department of Defense] policy, other adverse effects on the civilian population and the personnel, organizations, resources, infrastructure, essential services, and systems on which civilian life depends resulting from military operations are also considered in CHMR [civilian harm mitigation and response] efforts to the extent practicable. These other adverse effects do not include mere inconveniences.” DOD Instruction 3000.17, *Civilian Harm Mitigation and Response* (U.S. Government Publishing Office [GPO], 21 December 2023), 4, 49, <https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/300017p.pdf>.

2. Joint Staff, *Civilian Casualty Review* (Washington, DC: DOD, 17 April 2018), <https://www.jcs.mil/Portals/36/Documents/Civilian%20Casualty%20Review%20Report%20Redacted.pdf>; Daniel Mahanty and Rita Siemion, “What to Make of the Pentagon’s Internal Civilian Casualties Review, and What Comes Next,” *Just Security*, 4 February 2019, <https://www.justsecurity.org/62491/departement-defense-pentagon-civilian-casualties-review-report/>.

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4. The authors use the DOD term, “civilian harm mitigation and response (CHMR),” though there is broad international use of the term “CHM” to reflect both mitigation and response.

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15. JCOA, *Joint Civilian Casualty Study*.

16. McNerney et al., "Understanding Civilian Harm in Raqqa."

17. Both definitions of "joint functions," in Joint Publication (JP) 3-0, *Joint Campaigns and Operations* (U.S. GPO, 2022), and "Army warfighting functions" in Army Doctrine Publication 3-0, *Operations* (U.S. GPO, 2019), represent the same conceptual framework of functions that commanders must execute to successfully conduct joint operations; Thomas Crosbie, "Getting the Joint Functions Right," *Joint Force Quarterly* 94 (3rd Quarter, 2019): 96–100, <https://ndupress.ndu.edu/Media/News/News-Article-View/Article/1913080/getting-the-joint-functions-right/>.

18. Crosbie, "Getting the Joint Functions Right"; Amos C. Fox, "The Mosul Study Group and the Lessons of the Battle of Mosul," *Land Warfare Paper 130* (Association of the United States Army, February 2020), <https://www.ausa.org/sites/default/files/publications/LWP-130-The-Mosul-Study-Group-and-the-Lessons-of-the>

[Battle-of-Mosul.pdf](#); McNerney et al., "Understanding Civilian Harm in Raqqa." Lessons from the coalition counter-Islamic State (IS) Raqqa operation demonstrated the importance of effective operational-level processes and CHMR, even with effective tactical-level processes and CHMR. In Raqqa, lack of effective deliberate targeting operations throughout the campaign and reliance on tactical-level targeting operations along the forward edge of partner forces led to undesirable CHMR end states even when appropriate tactical-level measures were in-place.

19. Operational design is also described as "the analytical framework that underpins planning" and "supports commanders and planners in organizing and understanding the operational environment as a complex interactive system." JP 5-0, *Joint Planning* (U.S. Government Publishing Office, 16 June 2017), xxi, III-4.

20. *Ibid.*, II-5, III-36.

21. One of the authors, Brig. Gen. Matthew Isler, served as a deputy commander for coalition ground forces and was closely involved in planning ground operations, integrating air operations, synchronizing with Iraqi air and ground forces, and conducting air support throughout the campaign.

22. JP 5-0, *Joint Planning*, IV-9.

23. Matthew Isler and Larry Lewis, in discussion with Michael McNerney, 2024.

24. Dynamic targeting accounted for most of the coalition strikes in the counter-IS campaign and in Afghanistan.

25. Tactics, techniques, and procedures driving CHMR outcomes include processes and methods for positive identification of targets, weapon-target pairing, and weaponeering to select and employ munitions that meet the commander's intent while minimizing unintended effects, prestrike collateral scans, aimpoint selection, impact angle, target sequencing, strike timing, and poststrike assessments.

26. McNerney et al., "Understanding Civilian Harm in Raqqa."

27. Matthew C. Isler, memorandum, "Executive Summary of the Investigation of the Alleged Civilian Casualty Incident in the al Jadidah District, Mosul," 25 May 2017, <https://www.centcom.mil/MEDIA/NEWS-ARTICLES/News-Article-View/Article/1193707/executive-summary-of-the-investigation-of-the-alleged-civilian-casualty-incident/>.

28. *Ibid.*

29. Alexis G. Grynkeiwich et al., "Civilian Harm Mitigation and Response: The Imperative of an All-Domain Approach," *Joint Force Quarterly* 114, no. 2 (3rd Quarter, 2024): 39, <https://digitalcommons.ndu.edu/joint-force-quarterly/vol114/iss2/6/>.