

# Non-Lethal Weapons and the Law of Armed Conflict: Minimizing Civilian Casualties on the Battlefield

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“I think the whole nature of warfare is changing”<sup>1</sup>

## I. Introduction

There have been tens of thousands of civilian casualties in the post-September 11th, 2003 invasions of Iraq and Afghanistan. Many of these deaths have been a result of enemy action,<sup>2</sup> but despite exercising reasonable precautions, and with a command focus on reducing civilian casualties,<sup>3</sup> civilian deaths have occurred as a direct result of U.S. combat operations. In addition to the negative impact civilian casualties can have on military operations, particularly in a counterinsurgency, there are specific obligations under the Law of Armed Conflict (LOAC), and general ethical and moral obligations as practitioners of the profession of arms, to reduce civilian casualties to the fewest reasonably possible.

Non-lethal weapons<sup>4</sup> (NLW) technology currently available to U.S. forces (or in development) provides promise in the effort to reduce civilian casualties but has been sparingly used during armed conflict. There have been attempts at introducing modern NLW technology to the current conflicts in Iraq and Afghanistan, but their application has so far been limited for reasons that are not clear.<sup>5</sup> Unfortunately, the future armed conflicts that the U.S. may find itself engaged in will likely be conducted in environments more densely packed with civilians and civilian

objects than ever before. The Chief of Staff of the Army’s Strategic Studies Group (SSG) recently researched the growing urban phenomenon of “megacities,” or those cities with a population of over ten million. The particular issues associated with these “megacities” make it likely the U.S. military will once again find itself dealing with the struggle to limit civilian casualties, while attempting to accomplish the strategic goals envisioned by our political leadership.

Crowded megacities, beset by poor living conditions, periodic rises in the price of commodities, water shortages, and unresponsive municipal services, will be fertile petri dishes for the spread of both democracy and radicalism, even as regimes will be increasingly empowered by missiles and modern, outwardly focused militaries.<sup>6</sup>

The use of NLWs in coming armed conflicts, in which targeting threats with traditional lethal force will result in massive unintended civilian casualties, is not only fully consistent with the fundamental principles of the LOAC, but provides commanders with increased ability to successfully apply the principles of discrimination and proportionality. In future conflicts civilian casualties will be unavoidable, but

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<sup>1</sup> Rick Atkinson, *Lean, Not-So-Mean Marines Set for Somalia*, WASH. POST, Feb. 25, 1995, at A22. (discussing the use of non-lethal weapons (NLWs) by Marines during the evacuation of United Nations peacekeepers from Somalia in 1995).

<sup>2</sup> It is practically impossible to ascertain reliable statistics on civilian casualties resulting from armed conflict due to difficulties in researching and reporting from such areas, and the large number of sources for such statistics, all having different motivations. However, even taking the most conservative approach, civilian casualties during Operation Iraqi Freedom average hundreds per month since the beginning of operations. HANNAH FISCHER, CONG. RESEARCH, SERV., R40824, IRAQ CASUALTIES: U.S. MILITARY FORCES AND IRAQI CIVILIANS, POLICE, AND SECURITY FORCES (2010), <http://fpc.state.gov/documents/organization/139351.pdf>. Civilian casualties during Operation Enduring Freedom are perhaps slightly lower, but still conservatively average well over a hundred per month. SUSAN G. CHESSER, CONG. RESEARCH SERV., R41084, AFGHANISTAN CASUALTIES: MILITARY FORCES AND CIVILIANS (2012). <http://fpc.state.gov/documents/organization/156522.pdf>

<sup>3</sup> “Often, the effects of civilian casualties, though a result of tactical action, can have operational...even strategic...impact on the campaign. Commanders and leaders at all levels must ensure their units instinctively grasp the importance of protecting the civilian population and minimizing civilian casualties. Failure in this area could cost us the campaign.” U.S. DEP’T OF ARMY, CTR. FOR ARMY LESSONS LEARNED HANDBOOK 12-16, AFGHANISTAN CIVILIAN CASUALTY PREVENTION (June 2012) [hereinafter CALL CIVCAS Handbook] (quoting General John Allen, commander of the International Security Assistance Force, Afghanistan).

<sup>4</sup> Non-lethal weapons (NLWs) are defined by the Department of Defense (DoD) as those “[w]eapons, devices, and munitions that are explicitly designed and primarily employed to incapacitate targeted personnel or materiel immediately, while minimizing fatalities, permanent injury to personnel, and undesired damage to property in the target area or environment. NLW are intended to have reversible effects on personnel and materiel.” U.S. DEP’T OF DEF., DIR. 3000.03E, DoD EXECUTIVE AGENT FOR NON-LETHAL WEAPONS (NLW) AND NLW POLICY (25 Apr. 2013) [hereinafter DoDD 3000.03E].

<sup>5</sup> Ed Cumming, *The Active Denial System: The Weapon that’s a Hot Topic*, THE TELEGRAPH (Jul. 20, 2010, 11:27 AM), <http://www.telegraph.co.uk/news/science/7900117/The-Active-Denial-System-the-weapon-thats-a-hot-topic.html> (discussing the employment of the Active Denial System (ADS) by the U.S. Army in Afghanistan and its subsequent withdrawal before any operational use).

<sup>6</sup> CHIEF OF STAFF OF THE ARMY, STRATEGIC STUDIES GROUP, MEGACITIES AND THE UNITED STATES ARMY: PREPARING FOR A COMPLEX AND UNCERTAIN FUTURE (June 2014) [hereinafter SSG-Megacities] (quoting ROBERT D. KAPLAN, THE REVENGE OF GEOGRAPHY: WHAT THE MAP TELLS US ABOUT COMING CONFLICTS AND THE BATTLE AGAINST FATE (2012)).

NLWs offer promise that those casualties can be reduced to a level not previously possible, and in full accordance with the LOAC. To that end, this article will begin with a discussion of the LOAC and the principles relevant to the use of NLWs, followed by a description of some of the NLWs in use and/or being developed by the Department of Defense (DoD). This article will also address the concern of international nongovernment organizations (NGO) with the use of NLW technology, with a focus on the use of NLW as fully supported by the overarching principles and ideals of those NGOs. Concluding that the use of NLWs are consistent with the moral and ethical values that are the bedrock of the modern profession of arms as practiced by members of the U.S. military.

## II. Legal Framework Governing the Use of NLWs

Humans have been engaging in the practice of killing each other and destroying things for political and/or social purposes for many millennia. Some form of regulation of those hostilities have been around for almost as long.<sup>7</sup> Modern LOAC derives essentially from two sources that were formerly relatively distinct although they have, for the most part, merged into one.<sup>8</sup> The LOAC has been described as emerging from the “Geneva tradition”<sup>9</sup> and the “Hague tradition,”<sup>10</sup> but it is important to note that because of the merger of the two strands of the LOAC in the last few decades, some concepts are found in both Hague and Geneva.<sup>11</sup>

<sup>7</sup> GARY D. SOLIS, *THE LAW OF ARMED CONFLICT: INTERNATIONAL HUMANITARIAN LAW IN WAR* 5 (2010). The late sixth century A.D. saw Roman Emperor Maurice order soldiers who injured a civilian make every effort to repair the injury or pay damages, and in 1139 the crossbow was banned as “deadly and odious to God” by the Catholic Second Lateran Council.

<sup>8</sup> This paper deals exclusively with “*jus in bello*,” or the law concerned with the regulation of conduct during an armed conflict, rather than “*jus ad bellum*” which are the rules governing when a state may resort to the use of force in international relations. INT’L & OPERATIONAL LAW DEP’T, THE JUDGE ADVOCATE GEN.’S LEGAL CTR. AND SCH., U.S. ARMY, *LAW OF ARMED CONFLICT DESKBOOK* 10 (2015).

<sup>9</sup> Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field (Geneva Convention No. I), Aug. 12, 1949, 6 U.S.T. 3114, 75 U.N.T.S. 31 [hereinafter GC I]; Convention for the Amelioration of the Condition of the Wounded, Sick, and Shipwrecked Members of Armed Forces at Sea (Geneva Convention No. II), Aug. 12, 1949, 6 U.S.T. 3217, 75 U.N.T.S. 85 [hereinafter GC II]; Convention Relative to the Protection of Civilian Persons in Time of War (Geneva Convention No. IV), Aug. 12, 1949, 6 U.S.T. 3516, 75 U.N.T.S. 287 [hereinafter GC IV]; Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of International Armed Conflicts (Protocol I), art. 35(1), art. 51, and art. 57(2), June 8, 1977, 1125 U.N.T.S. 3 [hereinafter AP I], and Protocol Additional to the Geneva Conventions of 12 August 1949, and Relating to the Protection of Victims of Non-International Armed Conflicts (Protocol II), art. 4(1) and art. 13(2), June 8, 1977, 1125 U.N.T.S. 609 [hereinafter AP II].

## A. Fundamental Law of Armed Conflict Principles

The Law of Armed Conflict (LOAC) arising from the Geneva and Hague traditions are fundamentally a legal regime designed to protect individual combatants and others who may be targeted on the battlefield (such as civilians who directly participate in hostilities)<sup>12</sup> from unnecessary suffering, and to safeguard those who are not taking a part in the hostilities, such as civilians. Four principles of the LOAC provide those protections and can be found in the four Geneva Conventions of 1949<sup>13</sup> and Additional Protocols I and II, drafted in 1977.<sup>14</sup>

### 1. Military Necessity

Military necessity can be the most difficult concept in the LOAC to understand in concrete terms. Francis Lieber, in his Code of 1863,<sup>15</sup> otherwise known as General Orders No. 100, defined military necessity in terms that are still used today with little change when discussing the concept, and explained a concept that provides both a wide latitude to cause death, injury, and destruction, and a definite limit to that power.<sup>16</sup> Article 14 of his code summarizes military necessity as consisting of “...the necessity of those measures which are indispensable for securing the ends of the war, and which are lawful according to the modern law and usages of war.”<sup>17</sup> Article 15 goes on to add that necessity “admits of all direct destruction of life or limb of armed enemies, and of other persons whose destruction is incidentally unavoidable in the armed contests of the war....”<sup>18</sup> There is a limit to the concept of military necessity, however, and it cannot be used as a

<sup>10</sup> Regulations Concerning the Laws and Customs of War on Land, annexed to Hague Convention (IV) Respecting the Laws and Customs of War on Land, art. 22 and art. 23, Oct. 18, 1907, T.S. 539. [hereinafter Hague Convention IV].

<sup>11</sup> See, e.g., SOLIS, *supra* note 7, at 83 (discussing the adoption of the Additional Protocols of 1977 leading to a fading distinction between the Hague and Geneva traditions).

<sup>12</sup> U.S. DEP’T OF DEFENSE, *LAW OF WAR MANUAL* para 5.9 (Jun. 2015) (discussing civilians losing their protection from being attacked with lethal force when “directly participating in hostilities”).

<sup>13</sup> See, e.g., GC I, *supra* note 9, art. 12; GC IV, *supra* note 9, art. 15.

<sup>14</sup> See, e.g., AP I, *supra* note 9, arts. 35(1), 51, 57(2); AP II, *supra* note 9, arts. 4(1), art. 13(2).

<sup>15</sup> U.S. War Dep’t, Gen. Order No. 100 (24 Apr. 1863) [hereinafter Gen. Order 100].

<sup>16</sup> JOHN FABIAN WITT, *LINCOLN’S CODE: THE LAWS OF WAR IN AMERICAN HISTORY* 235 (2012). See also U.S. DEP’T OF ARMY, *FIELD MANUAL* 27-10, *THE LAW OF LAND WARFARE* para. 3 (18 July 1956).

<sup>17</sup> Gen. Order 100, *supra*, note 15.

<sup>18</sup> *Id.*

justification for acts that would otherwise constitute a violation of the LOAC.<sup>19</sup>

## 2. Proportionality

Proportionality, in the *jus in bello* context, is concerned solely with prospect of the incidental civilian casualties, sometimes referred to by the more innocuous term “collateral damage,” caused as a result of military operations. Attacks in which civilians may be killed or injured, or damage and destruction to civilian objects occur, must be proportional to be considered lawful. Disproportionate attacks are defined in Additional Protocol I (AP I) to the Geneva Conventions<sup>20</sup> (although AP I uses the term “indiscriminate” rather than “disproportionate”), article 51(5)(b) as “an attack which may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated.”<sup>21</sup> What is “excessive” when it comes to civilian death, injury, or damage to property, is not defined<sup>22</sup> and is dependent on the circumstances existing at the time. Commanders are required to consider proportionality when ordering an attack that may result in civilian casualties or damage.<sup>23</sup> Such decisions are evaluated based on what facts were known to the commander (making reasonable attempts to gather all information available) at the time of the decision.<sup>24</sup>

<sup>19</sup> AP I, art. 35(1) states that “the right of the Parties to the conflict to choose methods or means of warfare is not unlimited.” See also U.S. DEP’T OF ARMY, FIELD MANUAL 27-10, THE LAW OF LAND WARFARE para. 3a (18 July 1956) (noting that “[m]ilitary necessity has been generally rejected as a defense for acts forbidden by the customary and conventional laws of war inasmuch as the latter have been developed and framed with consideration for the concept of military necessity.”).

<sup>20</sup> AP I applies in international armed conflicts (conflicts between States or “High Contracting Parties”) while Additional Protocol II (AP II) to the Geneva Conventions applies to non-international armed conflicts. There is no mention of proportionality in AP II, but the International Committee of the Red Cross (ICRC), some national courts, and the International Criminal Tribunal for the former Yugoslavia (ICTY) consider proportionality to be part of customary international law in non-international armed conflict. SOLIS, *supra* note 7, at 275.

<sup>21</sup> The United States has not ratified AP I but generally considers article 51(5)(b) to reflect customary international law and therefore binding. *Remarks on the United States Position on the Relation of Customary International Law to the 1977 Protocols Additional to the 1949 Geneva Conventions at the Sixth Annual American Red Cross-Washington College of Law Conference on International Humanitarian Law*, 2 AM. U.J. INT’L L. & POLICY 419 (1987) (Michael Matheson, U.S. Department of State Deputy Legal Advisor, presented at the conference and clarified those provisions of AP I the United States considered customary international law and those it did not.).

<sup>22</sup> W. Hays Parks points out that the concept of proportionality under U.S. domestic law would likely be considered constitutionally void for vagueness. W. Hays Parks, *Air War and the Law of War*, 32 AIR FORCE L. REV. 1, 5 (1990).

<sup>23</sup> AP I, *supra* note 9, art. 51(5).

## 3. Unnecessary Suffering

Unnecessary suffering, also referred to as superfluous injury, is applicable to combatants or other lawful military targets, such as civilians taking an active part in hostilities<sup>25</sup> and prohibits the infliction of wanton or gratuitous injury on the enemy beyond what is necessary to accomplish the legitimate military objective.<sup>26</sup> There are no easily defined factors that make what constitutes unnecessary suffering clear, but common sense tells us that suffering by combatants is an unavoidable consequence of armed conflict. Any analysis of unnecessary suffering involves determining if the suffering caused is significantly disproportionate to the military advantage gained by the weapon or method of attack used.<sup>27</sup> Despite the difficulty in defining precisely what “unnecessary suffering” means, the principle has led to banning certain weapons under international law, to include what some may consider a NLW, blinding lasers.<sup>28</sup>

## 4. Discrimination/Distinction

Linked to proportionality is the concept of discrimination, sometimes called distinction<sup>29</sup> and is considered the foundation of the humanitarian focus of the LOAC. Additional Protocol I states “[p]arties to the conflict shall at all times distinguish between the civilian population

<sup>24</sup> Known as the Rendulic rule when the prosecution of Nazi General Lothar Rendulic established the principle after World War II. It was reinforced in 2003 when the ICTY stated “In determining whether an attack was proportionate it is necessary to examine whether a reasonably well-informed person in the circumstances of the actual perpetrator, making reasonable use of the information available to him or her, could have expected excessive civilian casualties to result from the attack. Prosecutor v. Galić, Case No. IT-98-29-T, Judgement, ¶ 58 (Dec. 5, 2003) [hereinafter Galić].

<sup>25</sup> U.S. DEP’T OF DEFENSE, LAW OF WAR MANUAL para. 5.9 (Jun. 2015) (discussing civilians losing their protection from being attacked with lethal force when “directly participating in hostilities”).

<sup>26</sup> AP I, *supra*, note 9, art. 35(2).

<sup>27</sup> SOLIS, *supra* note 7, at 272.

<sup>28</sup> Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, Geneva, October 10, 1980, 1342 U.N.T.S. 137 [hereinafter CCW]. Protocol IV (1995) of the CCW, prohibits the employment of lasers that are specifically designed to cause permanent blindness as one of their combat functions. This prohibition does not cover lawful laser systems (such as rangefinding or target designation systems) that may have an incidental or collateral effect of causing blindness during legitimate military employment of such systems. *Id.* But see DoDD 3000.03E, *supra* note 4, para. 3.c (defining NLWs as those with intended reversible effects, thereby eliminating laser weapons intended to cause permanent blindness from being considered NLWs under U.S. policy).

<sup>29</sup> Article 13 of AP II addresses this principle in the context of non-international armed conflicts: “[t]he civilian population as such, as well as individual civilians, shall not be the object of attack . . .” AP II, *supra* note 9, art. 13.

and combatants and between civilian objects and military objectives and accordingly shall direct their operations only against military objectives.”<sup>30</sup> Distinction has two aspects, one relating to the obligation to attack only military objectives and the other to ensure that combatants distinguish themselves from the civilian population by wearing a uniform or distinctive sign that indicates they are lawful targets under the LOAC.<sup>31</sup> This is an important characteristic of distinction as it not only directly protects civilians from being inadvertently targeted, it is also intended to remove suspicion that combatants are attempting to blend into the civilian population.<sup>32</sup>

## B. Treaty Law

There is little in the way of formal treaties that directly address NLW technology. Although riot control agents as NLWs are not a focus of this article, it is useful to look at the one international treaty that comes the closest to directly regulating a form of NLW. In an international armed conflict, the Convention on the Prohibition of the Stockpiling and Use of Chemical Weapons and Their Destruction of 1993 (CWC) applies, which the U.S. has signed and ratified. The CWC prohibits, in part, parties to the treaty from using riot control agents (RCAs) as a method of warfare, ostensibly to avoid confusion regarding chemical weapons by keeping any chemical equipment off the battlefield entirely.<sup>33</sup> Executive Order (EO) 11850, signed by President Gerald Ford in 1975, is still relevant as U.S. policy regarding RCAs, despite being older than the CWC by almost twenty years. EO 11850 provides for presidential approval for use of RCAs as a defensive measure to save lives in an armed conflict in which the United States is a party, to include protecting convoys from terrorist, paramilitary groups, etc., in rear echelon areas; rescue of downed aircrew and escaping prisoners in remotely isolated areas; riots in areas of direct and distinct United States military control, to include controlling rioting enemy prisoners of war; and situations in which civilians are used to screen or mask an enemy attack and civilian loss of life can be avoided or reduced.<sup>34</sup> While this article does not directly address the use of chemical RCAs as contemplated by the CWC, the official policy towards their use is instructive in

that the CWC prohibits the use of chemical RCAs as a “method of warfare,”<sup>35</sup> which will be addressed later.

Beyond the CWC there is little treaty law that directly impacts NLWs and their use in armed conflict. As previously mentioned, the Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects (Convention on Certain Conventional Weapons or CCW), Protocol IV, bans the use of lasers on the battlefield that are specifically designed to cause blindness.<sup>36</sup> However, “blinding lasers” as contemplated by the CCW, Protocol IV, do not appear to meet the criteria of a NLW under the Department of Defense definition.<sup>37</sup> The previously discussed optical distracters, or laser dazzlers, would not fall within the prohibitions of the CCW as the effects of these NLW are temporary.

Clearly, other than the use of RCAs in light of the CWC, there is little guidance in treaties concerning a commander’s employment of NLWs on the battlefield. The question remains, however, of where NLWs fit within the LOAC principles and whether commanders can use such weapons across the spectrum of conflict without fear of criticism, or worse, that their use of NLWs is in violation of international law.

## III. NLWs Increase a Commander’s Ability to Adhere to the LOAC Principles

### A. NLWs and the LOAC Analysis

The United States has used NLWs during military operations numerous times over the last few decades; in

<sup>30</sup> AP I, *supra* note 9, art. 48. Article 51(2) adds “[t]he civilian population as such, as well as individual civilians, shall not be the object of attack.” *Id.* art. 51(2).

<sup>31</sup> SOLIS, *supra* note 7, at 251.

<sup>32</sup> Killing or wounding by resorting to feigning a protected status under the LOAC, known as perfidy, is considered a war crime. U.K. MINISTRY OF DEFENCE, THE MANUAL OF THE LAW OF ARMED CONFLICT para. 5.9 (2004) [hereinafter U.K. LOAC Manual].

<sup>33</sup> INT’L & OPERATIONAL LAW DEP’T, THE JUDGE ADVOCATE GEN.’S LEGAL CTR. & SCH., U.S. ARMY, LAW OF ARMED CONFLICT DESKBOOK 160 (2015).

<sup>34</sup> Exec. Order No. 11,850, 3 C.F.R. § 980 (1971-1975).

<sup>35</sup> Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction, art. I, ¶

5, Jan. 13, 1993, 1974 U.N.T.S. 3 [hereinafter CWC] (“Each state party undertakes not to use riot control agents as a method of warfare.”)

<sup>36</sup> Convention on Prohibitions or Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects, Oct. 10, 1980, 1342 U.N.T.S. 137 [hereinafter CCW]. The CCW has five protocols: Protocol I, prohibiting the use of weapons that cause injury by fragments that are undetectable by X-rays; Protocol II, prohibiting or restricting the use mines, booby traps, and other devices; Protocol III, prohibiting or restricting the use of incendiary weapons; Protocol IV, prohibiting the use of laser weapons that are designed, as a combat function, to cause blindness; and Protocol V, addressing post-conflict remedial actions regarding unexploded ordnance or “remnants of war.”

<sup>37</sup> DoDD 3000.03E, *supra* note 4 (NLW are developed and used with the intent to minimize the probability of serious injury and cause reversible effects).

Somalia,<sup>38</sup> in Iraq,<sup>39</sup> and Afghanistan.<sup>40</sup> While the outcomes may have been preferable to dead or severely injured civilians, the use of NLWs has not been without criticism from the international community.<sup>41</sup> However, the use of NLWs, as defined by the DoD,<sup>42</sup> is fully consistent with the principles of the LOAC.

### 1. Military Necessity and NLWs

As military necessity allows for the deliberate killing and/or permanent injury of combatants when necessary to accomplish military goals, and the incidental death and injury of innocent civilians, it seems a logical step to conclude that the use of NLW comports with the principle. NLWs are designed to have reversible physical effects on individuals and materiel<sup>43</sup> and therefore reduce death and injury overall in armed conflict.<sup>44</sup>

The genesis of the modern form of the LOAC was the laudable goal of reducing unnecessary death and injury, particularly to civilians, during armed conflicts.<sup>45</sup> NLW technology, if used properly and ethically, not only comports with the LOAC, it fundamentally advances the aspirations of the LOAC in reducing suffering among the victims of armed conflict. Any weapons technology designed to have temporary, reversible, effects can only be considered a revolution in the right direction when the trend for weapons development over the last few hundred years has been to make weapons more efficiently lethal.<sup>46</sup>

### 2. Proportionality and NLWs

NLWs would have the most utility to the commander in the field when proportionality is a concern (i.e. when potential civilians are present and intermingled with lawful targets) and can ultimately significantly limit civilian casualties while still allowing the commander to accomplish his or her mission. If the recent U.S. combat operations in Iraq and Afghanistan are

any guide, the use of NLWs will provide a commander with increased freedom to act in situations where the enemy will attempt to draw us into environments in which our usually overwhelming lethal firepower becomes not only ineffective, but often counter-productive.<sup>47</sup> As Lt. Gen. Anthony Zinni, noted after his experience in Somalia as commander of the evacuation force for Operation United Shield, “Nonlethal weapons when properly applied . . . make the United States more formidable, not less so.”<sup>48</sup> The aforementioned rise of megacities makes this concern much more salient as the U.S. military plans for future possible conflicts. The possibility of incidental death and injury to civilians is essentially ensured during combat operations in urban environments. A commander in an urban environment, acting reasonably based on the circumstances ruling at the time, can order an attack that may result in a high number of civilian casualties but be considered lawful under the LOAC. This is true as long as the loss of civilian life or damage to civilian property is not excessive when weighed against the concrete and direct military advantage to be gained.<sup>49</sup> Admittedly, this proportionality decision is one of the hardest, if not the hardest, a commander will need to make in his or her career, and there is unfortunately little guidance a commander can look to before ordering a release of munitions that will cause civilian deaths.<sup>50</sup>

However, weapons that cause fully reversible effects on those civilians incidentally affected fundamentally alter the proportionality assessment. As previously noted, the avoidance of civilian casualties has become a military advantage in itself, and to be sought after by commanders.<sup>51</sup> If a weapon is used that causes a brief feeling of intense heat with no lasting injury, such as the Active Denial System (ADS),<sup>52</sup> it should favorably factor into a commander’s proportionality assessment. In the same way that an assessment that a strike using lethal munitions will cause acceptable civilian casualties in relation to the military advantage gained, due to any nearby civilians being outside the reasonably anticipated area of weapon effects, the use of

<sup>38</sup> Atkinson, *supra* note 2.

<sup>39</sup> Lasers Used on Iraqi Drivers Who Won’t Stop, MSNBC (May 18, 2006, 2:49 PM), [http://www.nbcnews.com/id/12854973/ns/world\\_news-mideast\\_n\\_africa/t/lasers-used-iraqi-drivers-who-wont-stop/#.Vs0T0f4w\\_IU](http://www.nbcnews.com/id/12854973/ns/world_news-mideast_n_africa/t/lasers-used-iraqi-drivers-who-wont-stop/#.Vs0T0f4w_IU) (describing the employment of dazzling lasers at checkpoints and during convoy operations).

<sup>40</sup> Rotifers, *Non-Lethal GLARE Laser Dazzler in Afghanistan*, YOUTUBE (Apr. 2, 2008), [https://www.youtube.com/watch?v=mD\\_ciczJ7q0](https://www.youtube.com/watch?v=mD_ciczJ7q0)

<sup>41</sup> MSNBC, *supra* note 39. See also, Cumming, *supra* note 5.

<sup>42</sup> DoDD 3000.03E, *supra* note 4.

<sup>43</sup> *Id.*

<sup>44</sup> It is necessary to recognize that NLW are, by definition, not perfect and some permanent injury or death remains a possibility with their employment. DoDD 3000.03E, *supra* note 4. It should also be noted that the current NLW technology shows a highly successful rate of fully reversible effects. The ADS has been tested over 11,000 times on more than 700 human subjects, resulting in just two instances of injuries (second degree burns) that required any medical treatment at all. Susan LeVine, *The*

*Active Denial System: A Revolutionary Non-lethal Weapon for Today’s Battlefield* (June 2009), <http://ctnsp.dodlive.mil/files/2013/07/DTP-065.pdf>.

<sup>45</sup> U.K. LOAC Manual, *supra* note 32.

<sup>46</sup> DAVID A. MOREHOUSE, *NON-LETHAL WEAPONS: WAR WITHOUT DEATH 7-9* (1996). In the twentieth century alone, more than 160 million have died as a result of conflict, and of that number, only a small percentage, approximately 200,000 were killed as a result of nuclear weapons, considered the most destructive weapons available.

<sup>47</sup> CALL CIVCAS Handbook, *supra* note 3.

<sup>48</sup> Dennis B. Herbert, *Non-Lethal Weaponry: From Tactical to Strategic Applications*, JOINT FORCE Q. (Spring 1999).

<sup>49</sup> JOINT CHIEFS OF STAFF, JOINT PUB. 3-60, JOINT TARGETING at A-4 (31 Jan. 2013) [hereinafter JP 3-60].

<sup>50</sup> Parks, *supra* note 22.

<sup>51</sup> CALL CIVCAS Handbook, *supra* note 3.

<sup>52</sup> See *infra* app.

NLW will necessarily factor into an analysis of potential collateral damage. If within a few minutes of the strike the weapon's effects are completely dissipated, the proportionality analysis is qualitatively different than one done that must consider the death or permanent severe injury of civilians. This is not to say, however, that using NLW in certain situations will obviate the need for a proportionality assessment, but that the reversible nature of NLWs' effects should have a significant positive impact on the analysis done. Depending on the concrete and direct military advantage to be gained, an attack that causes ten civilians to suffer temporary and fully reversible pain has, on its face, a more favorable proportionality assessment than an attack that is expected to cause ten civilian deaths or serious permanent injury.

### 3. Discrimination and NLWs

What impact does this proportionality analysis have on the principle of discrimination, or distinction, under the LOAC? If proportionality (in the *jus in bello* context) is concerned solely with the avoidance of death and injury to civilians as a result of military operations to the greatest extent reasonably possible, and discrimination requires that only military objectives be targeted, then the use of NLWs also fundamentally changes the dynamic of the discrimination/distinction analysis. Using NLWs against military objectives in a way that may also affect civilians, with the intent being to avoid permanent civilian injury, fully comports with the underlying concerns that motivated the discrimination principle. It is necessary to parse out precisely the wording of the AP I articles concerning civilians and discrimination or distinction. AP I, art. 49 defines "attacks" as "acts of violence against the adversary, whether in offence or defence." This language relating to attacks as a method of warfare (i.e. "whether in the offence or defence") has implications for the use of NLWs in environments, such as urban areas, where civilians are present in large numbers. Civilians are often used to cover the movement, and attacks, of an enemy who do not abide by the LOAC rules and will

engage in perfidy by feigning the protected status of "civilian."<sup>53</sup> While this paper does not cover in depth the issues and law associated with chemical weapons, to include chemical NLWs<sup>54</sup>, it is instructive to delve into the aforementioned law and U.S. policy surrounding RCAs.

Executive Order 11850 clearly distinguishes the use of RCAs as a "method of warfare," or more specifically using the language from AP I, "acts of violence against an adversary..."<sup>55</sup> from uses in which the NLW effect on the legitimate military objective is incidental to the intended (non-lethal) effect on civilians. The purpose of RCAs is to avoid civilian casualties. Unfortunately, there is not a clear definition of "method of warfare" in international law,<sup>56</sup> and, at least in terms of EO 11850 and the CWC, the international community has purposefully left it somewhat vague.<sup>57</sup>

However, a distinction should be made between using NLWs as a "method of warfare," and their use as a means to reduce civilian casualties. W. Hays Parks argues that the term "method of warfare" has a distinct meaning that does not include the uses of RCAs contemplated in EO 11850.<sup>58</sup> The employment of RCAs in the scenarios contemplated by EO 11850 is incidental to the military objective. For example, the use of RCAs in the rescue of downed aircrew is intended to reduce the possibility of civilian casualties rather than to directly effectuate the recovery of the crewmembers.<sup>59</sup> In other words, the goal of RCAs in this scenario and others, to include when civilians are used to screen enemy attacks, is to fully distinguish between civilians and combatants. This use can be distinguished from, for example, using RCAs to flush enemy combatants out of their trenches so they may be targeted in the open with lethal weapons.<sup>60</sup> The avoidance of death and irreversible injury to civilians is the overarching goal of much of the LOAC.

The analysis under EO 11850 is equally valid for other non-chemically based NLWs that would not raise the question of whether they fall within the prohibitions of the CWC. The use of an ADS against targets in an urban environment, like

<sup>53</sup> *Hamas Exploitation of Civilians as Human Shields: Photographic Evidence*, ISRAEL MINISTRY OF FOREIGN AFF. (Mar. 6, 2008), <http://www.mfa.gov.il/mfa/foreignpolicy/terrorism/pages/hamas%20exploitation%20of%20civilians%20as%20human%20shields%20-%20photographic%20evidence.aspx>.

<sup>54</sup> Many chemical NLWs have particular issues that may be difficult to overcome with the current technology and knowledge available. The variables of human physiology make it difficult to predict or control the effects of their use on individuals, and some doubt that a safe and effective chemically based NLW can be developed. DAVID A. KOPLOW, *NON-LETHAL WEAPONS: THE LAW AND POLICY OF REVOLUTIONARY TECHNOLOGIES FOR THE MILITARY AND LAW ENFORCEMENT* 22 (2006). See also David P. Fidler, *The Meaning of Moscow: Non-Lethal Weapons and International Law in the 21st Century*, INT'L REV. OF THE RED CROSS [https://www.icrc.org/eng/assets/files/other/irrc\\_859\\_fidler.pdf](https://www.icrc.org/eng/assets/files/other/irrc_859_fidler.pdf) (discussing the Russian response to a terrorist attack and hostage taking event at a Moscow theatre in October 2002. Russian anti-terrorist forces pumped an incapacitating gas, suspected to be some form of fentanyl, into the building before storming it. It resulted in the death of over 100 hostages).

<sup>55</sup> SOLIS, *supra* note 7, at 251.

<sup>56</sup> Major Ernest Harper, *A Call for a Definition of Method of Warfare in Relation to the Chemical Weapons Convention*, 48 NAVAL L. REV. 132, 133 (2001).

<sup>57</sup> *Id.* at 134-40. (Describing the United States' opposition to the absolute banning of riot control agents (RCAs) in the CWC. Some nations, such as the United Kingdom, wanted an absolute prohibition on the use of RCAs, while the United States sought to retain the ability to use RCAs in certain situations. As a compromise during the negotiations, RCAs were banned as a "method of warfare" by the CWC, leaving open the interpretation of that phrase to the individual parties. President Clinton later attempted to amend EO 11850 to remove the use of RCAs during the rescue of downed aircrew and when civilians are used to screen attacks, but the Senate ratified the CWC on the condition that EO 11850 not be altered).

<sup>58</sup> Harper, *supra* note 56, at 154-55.

<sup>59</sup> *Id.* at 156.

<sup>60</sup> KOPLOW, *supra* note 54, at 38-39.

RCAs, has the ultimate goal of avoiding the use of lethal force that may kill or injure civilians. Moreover, non-chemically based NLWs do not raise the additional concerns of potential escalation to lethal chemical weapons that many critics have expressed about RCAs.<sup>61</sup>

#### 4. Unnecessary Suffering and NLWs

The DoD must review all weapons, to include NLWs, used by the U.S. military for legality under the LOAC,<sup>62</sup> and unnecessary suffering is one of the principles considered during that legal review. Unnecessary suffering is weighed against military necessity principle to determine if a weapon causes superfluous injury, or injury that is disproportionate to the military advantage sought to be gained by the use of the weapon.<sup>63</sup> It is intended to avoid unnecessary injury inflicted on combatants rather than that which may incidentally affect civilians.<sup>64</sup> An analysis of whether a weapon causes unnecessary suffering cannot be done without weighing it against other weapons considered lawful on the battlefield.<sup>65</sup> When weighed against conventional lethal weapons that are designed to cause death or serious injury, NLWs that are designed to cause temporary, completely reversible, effects,<sup>66</sup> would appear to meet the standard of avoiding unnecessary suffering. A convincing example of which is the testing conducted on the ADS resulting in no serious or long-term adverse effects on human subjects.<sup>67</sup>

#### B. Non-Governmental Organizations (NGOs) and NLWs

Some commentators affiliated with NGOs have expressed some skepticism relating to any increased use of NLWs in armed conflict. Eve Massingham, an official with the Australian Red Cross, cautions that NLWs may cause a weakening in the fundamental principle of the LOAC. She notes that any reduced proportionality concerns brought about by the use of NLWs fails to take into account the unknown

effects, possibly fatal, of those weapons on individuals or groups.<sup>68</sup> Setting aside the apparent minimal risk of fatalities resulting from some of the NLW technology in use or being developed,<sup>69</sup> what Ms. Massingham is proposing is an unreasonable heightened standard of care when using NLWs as opposed to traditional lethal weapons. Commanders are not required to take into account all possibilities that result from the use of any munition, to include when a weapon may malfunction or there is a unique and unknowable (to a commander who takes reasonable steps to gather as much information as possible) characteristic to the target or its surroundings.<sup>70</sup>

According to international law, a proportionality analysis need not incorporate the possibility of a Hellfire missile unexpectedly malfunctioning by losing its laser track and landing 500 meters away from its intended target.<sup>71</sup> Similarly, an unanticipated death or injury from a NLW should not be a factor that a commander must consider. However, implicit in Ms. Massingham's argument is the idea that NLWs do fundamentally alter the proportionality analysis. Her novel position that commanders should consider the unanticipated, or accidental, consequences of the use of NLWs flows logically from the fact that NLWs are designed to cause non-lethal and fully reversible effects.<sup>72</sup> Her argument is simply that the LOAC proportionality analysis should incorporate a new factor not previously required. However, to do so would be to hold NLW weapons to a higher standard than lethal weapons under the LOAC, and open the door for some to argue that the proportionality analysis framework varies from weapon to weapon.

Additionally, Professor David Fidler,<sup>73</sup> writing in the International Committee of the Red Cross's journal, *International Review of the Red Cross*, argues that Russia's experience with NLWs should cause the international community serious concerns in regards to their use in general.<sup>74</sup> However, while the death of over one hundred

<sup>61</sup> Harper, *supra* note 56, at 151-52.

<sup>62</sup> U.S. DEP'T OF DEF., DIR. 5000.01, THE DEFENSE ACQUISITION SYSTEM para. E1.1.15 (12 May 2003) [hereinafter DODD 5000.01]. Requires a legal review of all weapon systems acquired by the United States military. See also U.S. DEP'T OF ARMY, REG. 27-53, REVIEW OF LEGALITY OF WEAPONS UNDER INTERNATIONAL LAW para. 4a (1 Jan. 1979) (Requiring legal review of all weapons to ensure compliance with applicable treaties and customary international law, to include specifically the Hague and Geneva Conventions).

<sup>63</sup> SOLIS, *supra* note 7, at 271.

<sup>64</sup> *Id.* at 270.

<sup>65</sup> Richard B. Jackson & Jason Ray Hutchison, *Lasers are Lawful as Non-Lethal Weapons*, ARMY LAW., Aug. 2006, at 12, 17.

<sup>66</sup> DoDD 3000.03E, *supra* note 4.

<sup>67</sup> LeVine, *supra* note 44.

<sup>68</sup> Eve Massingham, *Conflict Without Casualties . . . a Note of Caution: Non-Lethal Weapons and International Humanitarian Law*, <https://www.icrc.org/eng/assets/files/review/2012/irrc-886-massingham.pdf>

<sup>69</sup> LeVine, *supra* note 44.

<sup>70</sup> Galić, *supra* note 24.

<sup>71</sup> AP I, *supra* note 9, art 51(5). AP I conflates the definitions of the LOAC principles of discrimination and proportionality in art. 51, but defines as "indiscriminate" an attack that "may be expected to cause incidental loss of civilian life, injury to civilians, damage to civilian objects, or a combination thereof, which would be excessive in relation to the concrete and direct military advantage anticipated." See also Galić, *supra* note 24, at ¶ 58 (Stating that the proportionality standard is whether "a reasonably well-informed person in the circumstances of the actual perpetrator, making reasonable use of the information available to him or her, could have expected excessive civilian casualties to result from the attack.").

<sup>72</sup> LeVine, *supra* note 44.

<sup>73</sup> David P. Fidler is a Professor of Law and the Harry T. Ice Faculty Fellow, Indiana University School of Law, Bloomington, Ind.

<sup>74</sup> Fidler, *supra* note 54. (The Russian anti-terrorist operation in Moscow involves the law enforcement paradigm rather than an armed conflict, but is important in the context of considering NLWs' effects and how those effects influence the LOAC analysis).

hostages is tragic and should be considered a cautionary tale for future hostage-taking events, it should not be used as a basis to argue NLWs are frequently lethal. The incident in Moscow involved a gas that the Russian authorities later identified as some form of the sedative fentanyl,<sup>75</sup> being pumped into a public building in an uncontrolled environment. Fentanyl is an opiate that provides the basis for anesthetics used only in tightly controlled procedures in medical operating rooms, due to their tendency to dangerously suppress respiration.<sup>76</sup> It is, therefore, not surprising that more than one hundred hostages died as a direct result of the gas. However, this result would place that substance outside the DoD definition of NLWs.<sup>77</sup>

There are also concerns that the use and proliferation of NLWs will lead to their misuse by terrorist groups, criminals, totalitarian regimes, and even open democratic governments.<sup>78</sup> The result of increased use of NLWs, according to this argument, will be their utilization as a means of torture by regimes with little regard for human rights, or even to suppress the free exercise of political speech during peaceful demonstrations.<sup>79</sup> While valid concerns, they are not insurmountable obstacles and can be addressed with various existing mechanisms, such as arms trade treaties that would limit transfers of conventional weapons in such situations.<sup>80</sup> Moreover, any concerns of internal use of NLWs to suppress dissent in otherwise democratic societies are already countered with domestic law that reflect universal international norms.<sup>81</sup>

Finally, some have argued that NLW will cause soldiers to resort to the use of force (albeit non-lethal) sooner than would otherwise be necessary.<sup>82</sup> Moreover, there is a fear that NLWs will encourage a nation's leadership to resort to force on an international level with a belief that fewer casualties will make the use of force more palatable to its own citizens and the international community.<sup>83</sup> The concern over the use of force at the international level is beyond the scope of this paper, but the fear that individual soldiers will too quickly resort to non-lethal force can be effectively addressed with existing mechanisms. Command emphasis on soldiers' weapon skills in general, and the specific rules governing the use of force for a particular military operation, is crucial for the appropriate use of lethal weapons in soldiers' hands. The same approach is sufficient for the appropriate use of NLWs.

#### IV. Conclusion

A convoy of U.S. military vehicles, en-route to an engagement with a key local leader, slowly and methodically winds its way through rundown city streets crowded with civilian cars, motorcycles, bicycles and pedestrians. An opposition non-state armed group, using Twitter and other social media platforms, mobilizes a large group of local disaffected teens and young adults to crowd the streets and block the convoy's path. Positioned deliberately within the crowd are hard-core members of the armed group, determined to incite violence against the convoy that will elicit a lethal response from the vehicles that kill numerous civilians, all caught on cell phone video and instantly spread on the World Wide Web via YouTube, Twitter, and Facebook. The crowd starts throwing rocks and bricks at the convoy, causing the soldiers to retreat within closed vehicle doors and hatches, when one of the armed group members throws a Molotov cocktail and another fires his AK-47 at the lead vehicle. The convoy returns fire with 7.62mm machine guns, killing the shooter, and three civilians who may or may not have been throwing rocks at the convoy. The possible fallout from this scenario need not be detailed here, but would almost certainly exponentially increase the hardships faced by the U.S. military forces executing their mission.

Contrast the outcome detailed above with one that involves the convoy having access to the ADS or MPM-NLWS detailed above. If, when the convoy commander recognized the gathering threat to the convoy in the massing of angry young locals, the convoy vehicles reacted with a non-lethal response the outcome would have been significantly different. Whether a millimeter wave blast of intense heat that subsides when those affected run or seek cover, or a flash-bang munition that disorients the bad actors long enough for the convoy to move through the threat area, had been used the effects would have quickly dissipated, leaving much less fodder for the opponent's strategic messaging campaign.

It's time for the generation who fought the war to take what they learned in the hills and valleys of a landlocked conflict, and apply it to a challenging new environment; it's time to think about the implications of the coming age of urban, networked, guerrilla war in the mega-slums and megacities of a coastal planet. It's time to

<sup>75</sup> KOPLOW, *supra* note 54, at 105.

<sup>76</sup> *Id.* at 105-06

<sup>77</sup> DoDD 3000.03E, *supra* note 4.

<sup>78</sup> NICK LEWER & STEVEN SCHOFIELD, NON-LETHAL WEAPONS: A FATAL ATTRACTION? 96-99 (1997).

<sup>79</sup> *Id.* at 97.

<sup>80</sup> *Overwhelming Majority of States in General Assembly Say 'Yes' to Arms Trade Treaty to Stave off Irresponsible Transfers that Perpetuate Conflict,*

*Human Suffering*, UNITED NATIONS PRESS RELEASE (Apr. 2, 2013), <http://www.un.org/press/en/2013/ga11354.doc.htm>

<sup>81</sup> The International Covenant on Civil and Political Rights, 999 U.N.T.S. 171, 6 I.L.M. 368 (1967), of which most nations are a party, provides for the protection of human rights when governments come into contact with their citizens during internal disputes.

<sup>82</sup> KOPLOW, *supra* note 54, at 140.

<sup>83</sup> *Id.* at 139.

drag ourselves – body and mind – out of the mountains.<sup>84</sup>

If, as David Kilcullen posits in his book and the Chief of Staff of the Army's Strategic Studies Group believes,<sup>85</sup> future conflicts will be centered in megacities containing tens of millions of civilians, the civilian casualty issues of the current conflict in rural Afghanistan will seem inconsequential.<sup>86</sup> Add in the assertion that “armies kill cities”<sup>87</sup> when operating in urban environments, and the utility of NLWs becomes readily apparent.

When the stated goal of the LOAC is, in part, to save civilians from suffering the consequences of armed conflict to the largest extent possible, the use of NLW should be considered a welcome addition to the options available to responsible armed forces operating where civilians may be present.

This is not to say that NLWs are the ultimate panacea to the terrible death and destruction that occurs during armed conflict. No technology is perfect, and the U.S. Department of Defense itself acknowledges that NLWs are not completely non-lethal every time.<sup>88</sup> Despite this, the current technology in development appears to alleviate most concerns as to the efficacy of the non-lethal part of NLWs' nomenclature.<sup>89</sup>

Finally, there are legitimate concerns with the spread of NLW into the hands of those who may not use them in an ethical or moral manner. The argument is that NLW could be used to suppress dissident minorities, discourage a population's right to peaceful assembly, to torture, and lead to a more rapid use of force than if only lethal weapons were available to military or police.<sup>90</sup> But this argument is the same one that can be levied against any new weapon or technology and the answer lies in training and command influence. The U.S. military entrusts incredibly lethal weapons to the hands of young men and women every day and relies on their training and commanders to ensure they are not used improperly. The same holds true for NLWs. In the same way that a soldier can learn not to resort to deadly force except in appropriate situations, he or she can, with the proper training and command oversight, be taught not to resort to non-lethal force until it is necessary.

The past and current conflicts faced by the United States, and the conflicts looming on the horizon, are evidence that we cannot rest on the tactics of the past. We must be prepared to incorporate technology that has, so far, been literally and figuratively sitting on a shelf. The DoD should further invest

in NLW technology, train for its proper use, and educate the international community on the correct legal analysis before others attempt to disseminate a misleading narrative.

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<sup>84</sup> DAVID KILCULLEN, *OUT OF THE MOUNTAINS: THE COMING AGE OF THE URBAN GUERRILLA* 262 (2013)

<sup>85</sup> SSG-Megacities, *supra* note 6.

<sup>86</sup> CALL CIVCAS Handbook, *supra* note 3.

<sup>87</sup> KILCULLEN, *supra* note 84, at 109. Kilcullen describes military operations in Kingston, Jamaica; Grozy, Chechnya; and Fallujah, Iraq, as being extremely destructive, even when, in the case of Fallujah, there is a conscious effort to minimize destruction to the greatest extent possible.

Quoted is a United States Army major in Vietnam discussing the 1968 battle of Ben Tre, “it became necessary to destroy the town to save it.” *Id.* at 111.

<sup>88</sup> DoDD 3000.03E, *supra* note 4.

<sup>89</sup> LeVine, *supra* note 44.

<sup>90</sup> LEWER & SCHOFIELD, *supra* note 77, at 97.

## Appendix A. Modern NLW Technology

The Joint Non-Lethal Weapons Directorate (JNLWD) at Marine Corps Base Quantico, Virginia, is the DoD's Joint Non-Lethal Weapons Program Executive Agent and coordinates the research, development, testing, and evaluation of NLWs.<sup>91</sup> The individual services also maintain NLW programs. The Army's proponent for NLWs is the Nonlethal Scalable Effects Center, United States Army Military Police School, at Fort Leonard Wood, Missouri.<sup>92</sup>

This article does not cover the entire range of NLW technology in use or in development, but will provide a brief overview of a few of the weapons currently being fielded or developed by the DoD.

### A. Fielded NLW technology.

The DoD has a variety of NLW technology currently available for use across a broad range of operations, from convoy and checkpoint operations, to vessel boarding and crowd control.<sup>93</sup> Many of these weapons have been in use for a number of years, in both military operations and domestic policing contexts.<sup>94</sup>

#### 1. Optical Distraction Devices

These devices, also known as dazzling lasers, are lasers with reversible effects that are generally used to disorient and warn or dissuade drivers or pedestrians from approaching a unit position too closely, with a range of over 150 meters in the day and over 2000 meters at night.<sup>95</sup>

#### 2. Flash Bang Munitions

Designed as counter-personnel munitions, flash bang weapons, such as the M84 Flash Bang Grenade, deliver a bright flash and loud bang, combining optical and acoustic effects, to disorient and suppress personnel in a variety of circumstances, such as checkpoints, crowd control, and building clearing operations.<sup>96</sup>

#### 3. Modular Crowd Control Munition (MCCM)

The MCCM looks similar to the venerable (and lethal) M18 Claymore mine, but delivers non-lethal blunt force trauma in the form of 600 rubber balls projected at high speed to a range of almost twenty meters. The MCCM is designed for use at entry control points, defensive actions, and crowd control.<sup>97</sup> Similar to the MCCM, is the Stingball Grenade, which can be hand thrown or launched from a modified 12-gauge shotgun to a range of approximately seventy meters. It also uses rubber pellets to suppress personnel and can be used for force protection, crowd control, and room clearing in urban operations.<sup>98</sup>

#### 4. M1006 40mm Non-Lethal Point Round

The Army currently uses the M1006, or Sponge Grenade, is fired from the M203 Grenade Launcher and is intended to deliver blunt force trauma to adults at ranges from ten to fifty meters. According to the Army's project manager for the M1006, this

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<sup>91</sup> *Non-Lethal Weapons Program*, U.S. DEPARTMENT OF DEFENSE, <http://jnlwp.defense.gov/About/Organization.aspx> (last visited Jan. 18, 2016).

<sup>92</sup> ARMY NONLETHAL SCALABLE EFFECTS CENTER, UNITED STATES ARMY MILITARY POLICE SCHOOL, <http://www.wood.army.mil/usamps/Organizations/Nonlethal/Nonlethal.html> (last visited Jan. 18, 2016).

<sup>93</sup> U.S. DEP'T OF DEF., JOINT NON-LETHAL WEAPONS DIRECTORATE, NON-LETHAL WEAPONS REFERENCE BOOK (2012).

<sup>94</sup> DAVID A. KOPLOW, NON-LETHAL WEAPONS: THE LAW AND POLICY OF REVOLUTIONARY TECHNOLOGIES FOR THE MILITARY AND LAW ENFORCEMENT 10 (2006)

<sup>95</sup> DoD NON-LETHAL WEAPONS PROGRAM, OVERVIEW BRIEF AND INFORMATION EXCHANGE (Jan. 15, 2015), [http://jnlwp.defense.gov/Portals/50/Documents/Resources/Presentations/Overview\\_Presentations/Keystone%20Brief\\_15Jan2015\\_logo\\_fix.pdf](http://jnlwp.defense.gov/Portals/50/Documents/Resources/Presentations/Overview_Presentations/Keystone%20Brief_15Jan2015_logo_fix.pdf) [hereinafter DoD NLW Brief].

<sup>96</sup> NON-LETHAL WEAPONS PROGRAM, U.S. DEPARTMENT OF DEFENSE, M-84 FLASH BANG GRENADE, <http://jnlwp.defense.gov/CurrentNonLethalWeapons/M84FlashBangGrenade.aspx> (last visited Jan. 19, 2016).

<sup>97</sup> NON-LETHAL WEAPONS PROGRAM, U.S. DEPARTMENT OF DEFENSE, MODULAR CROWD CONTROL MUNITION, <http://jnlwp.defense.gov/CurrentNonLethalWeapons/ModularCrowdControlMunition.aspx> (last visited Jan. 19, 2016).

<sup>98</sup> NON-LETHAL WEAPONS PROGRAM, U.S. DEPARTMENT OF DEFENSE, STINGBALL GRENADE, <http://jnlwp.defense.gov/CurrentNonLethalWeapons/StingballGrenade.aspx> (last visited Jan 19, 2016).

NLW can be used in a variety of situations, including crowd control, convoy protection, and use against individual threats by stunning them to enable safe detention.<sup>99</sup>

## B. Developing NLW Technology

### 1. Active Denial System (ADS)

The ADS is a vehicle mounted system designed to utilize millimeter waves (often incorrectly referred to as “microwave”) to cause a rapid and intense heating sensation on anyone in the ADS beam’s path, at ranges out to 1000 meters. Subjects exposed to the ADS beam quickly move away from the source of the beam to avoid continued exposure. The heating effect only penetrates the skin to depths of about 1/64 inch and does not alter the cellular structure of the skin, therefore causing no burn injuries on those exposed to the millimeter beam.<sup>100</sup> The ADS is designed to be used for force protection, convoy operations, crowd control, and offensive and defensive operations, among others.<sup>101</sup>

### 2. Mission Payload Module—Non-lethal Weapons System (MPM-NLWS)

The MPM-NLWS is a vehicle-mounted multiple tube launcher that can deliver flash bang non-lethal munitions at ranges up to 500 meters and also transition to lethal munitions if necessary. As with other NLW, it is designed for force protection, as well as force application.<sup>102</sup>

These is just a portion of the NLW technology currently being used or developed by the DoD. Others, including the Distributed Sound and Light Array (DLSA), providing acoustic and visual hailing capabilities, and Portable Vehicle Arresting Barrier, which can stop moving civilian vehicles, are also in use by the DoD.<sup>103</sup> Clearly, there is a significant desire, if not need, by the DoD to have a wide array of NLWs at its disposal. Moreover, there is no indication that the need will remain static in the near future.<sup>104</sup>

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<sup>99</sup> PROJECT MANAGER CLOSE COMBAT SYSTEMS, PD COMBAT MUNITIONS, M1006 40MM NON-LETHAL POINT ROUND, [http://www.pica.army.mil/pmccs/combattmunitions/nonlethalsys/nonlethalcapset/counterper/4nlc\\_41.htm](http://www.pica.army.mil/pmccs/combattmunitions/nonlethalsys/nonlethalcapset/counterper/4nlc_41.htm) (last visited Jan. 19, 2016).

<sup>100</sup> Susan LeVine, *The Active Denial System: A Revolutionary Non-lethal Weapon for Today’s Battlefield* (June 2009), CTR. TECH. & NAT’L SECURITY POL’Y, <http://ctnsp.dodlive.mil/files/2013/07/DTP-065.pdf>.

<sup>101</sup> NON-LETHAL WEAPONS PROGRAM, U.S. DEPARTMENT OF DEFENSE, ACTIVE DENIAL TECHNOLOGY, <http://jnlwp.defense.gov/FutureNonLethalWeapons/ActiveDenialTechnology.aspx> (last visited Jan. 19, 2016).

<sup>102</sup> DoD NLW Brief, *supra* note 95.

<sup>103</sup> *Id.*

<sup>104</sup> Susan D. LeVine & Joseph A. Rutigliano Jr., *U.S. Military Use of Non-Lethal Weapons: Reality vs Perceptions*, 47 CASE W. RES. J. INT’L L. 239, 246 (2015).