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Law Enforcement Use of Less-than-Lethal Weapons: Considerations for Congress

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SUMMARY

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Law Enforcement Use of Less-than-Lethal Weapons: Considerations for Congress

Incidents of police-involved shootings resulting in the death of unarmed civilians, such as Andre Hill in 2020, Bijan Ghaisar in 2017, and Michael Brown in 2014, have raised concerns about law enforcement use of deadly force, particularly involving firearms. In light of these concerns, growing attention has been paid to *less-than-lethal weapons* (LLWs) and the role LLWs may play in providing law enforcement officers alternatives to the use of deadly force.

A multitude of weapons marketed as less-than-lethal alternatives to firearms are currently in use by federal, state, and local law enforcement, including batons, pepper sprays, and stun guns. There are also a number of LLWs in development, such as unmanned aircraft systems (drones) equipped with tear gas, rubber bullets, and TASERs.

Some observers contend that LLWs offer the possibility of minimizing risk of death and serious injury to citizens and officers while simultaneously providing law enforcement with effective tools to incapacitate violent or noncompliant persons. Nevertheless, there is evidence that LLWs may present a number of potential health risks, lending credence to arguments that LLWs are *less-than-lethal* in name, but, depending on the circumstances of their use, can be *lethal* in practice. For example, a team of journalists led by the Associated Press, in collaboration with the Howard Center for Investigative Journalism programs at the University of Maryland and Arizona State University, documented over 1,000 deaths that followed local and state police officers' use of less-than-lethal force from 2012 to 2021. Similarly, a 2019 Reuters investigation of deaths related to law enforcement use of TASERs found that 1,081 individuals had died after being hit by a police TASER from 1983 to 2017.

Should policymakers consider examining ways to legislate on the use of LLWs, numerous issues may garner attention. Currently, there is no single, universally accepted definition of *less-than-lethal weapon*, and the use of the term varies greatly among U.S. federal, state, and local law enforcement agencies. Conceptualizing a definition for LLWs raises a number of questions, including whether LLWs should be defined

- under a label other than *less-than-lethal*,
- according to a common capability,
- according to a common operational utility,
- according to an intended use to minimize risk of death and permanent injury, or
- according to a common application.

Policymakers could consider whether it is beneficial to establish a statutory definition of *less-than-lethal weapon*. Codifying the meaning of LLWs could be useful in terms of clarifying what weapons are (and are not) classified as less-than-lethal, which may help sharpen the focus and potential efficacy of policies. On the other hand, some may argue that law enforcement agencies and departments are better suited to define LLWs and, thereby, address LLWs in their individualized use-of-force policies, based on their organization's specific needs, duties, and circumstances.

Moreover, there are relatively little federal data available on law enforcement officers' use of LLWs and, consequently, few studies analyzing the health effects caused by law enforcement's use of such weapons. Policymakers may wish to direct a federal agency or department to conduct research into LLW injury and mortality. Based on these findings, policymakers could consider legislative actions to influence law enforcement use of LLWs, such as (1) passing a bill encouraging or limiting federal law enforcement officers' usage of LLWs and (2) placing provisions on or withholding funding from existing federal grant programs to incentivize or discourage state and local law enforcement usage of LLWs.

Contents

Tables

Appendixes

Contacts

Introduction

Incidents of police-involved shootings resulting in the death of unarmed civilians, such as Andre Hill in 2020,[1] Bijan Ghaisar in 2017,[2] and Michael Brown in 2014,[3] have raised concerns about law enforcement use of deadly force, particularly involving firearms.[4] In light of these concerns, growing attention has been paid to purported *less-than-lethal weapons* (LLWs) and the role they may play in reducing law enforcement use of deadly force.

A multitude of weapons marketed as less-than-lethal alternatives to firearms are currently in use by federal, state, and local law enforcement, including batons, pepper sprays, and stun guns. These weapons are commonly deployed in situations where the use of force may be necessary to compel compliance by an unwilling subject but the use of deadly force may not be reasonable.[5] Examples of these situations may involve persons resisting arrest, intoxicated or mentally unwell individuals creating public safety risks, or volatile crowds turning violent.

Some observers contend that LLWs offer the possibility of minimizing risk of death and serious injury to citizens and officers while simultaneously providing law enforcement with an effective tool to incapacitate violent or noncompliant persons.[6] Nevertheless, there is evidence that LLWs may present a number of potential health risks, lending credence to arguments that LLWs are *less-than-lethal* in name, but that, depending on the circumstances of their use, they can be *lethal* in practice.[7]

This report focuses on the uses of LLWs specifically for law enforcement purposes. It discusses definitional debates over the relevant terminology, provides an overview of current and emerging LLWs in use by law enforcement, discusses law enforcement LLW use-of-force policies, explains LLW regulation under federal firearms laws, and presents policy considerations for legislators debating whether to define LLWs and how to affect federal, state, and local law enforcement use of LLWs.

[1] Associated Press, "Ex-officer found guilty in the 2020 shooting death of Andre Hill," November, 4, 2024, https://apnews.com/article/police-officer-andre-hill-trial-verdict-7c9405baf78daf4394cb74df9ad2191e.

[2] Tom Jackman, "Park Police officers who killed Bijan Ghaisar return to duty," MSN, January 13, 2025, https://www.msn.com/en-us/crime/general/park-police-officers-who-killed-bijan-ghaisar-return-to-duty/ar-BB1rozX5?ocid=BingNewsSerp.

[3] Associated Press, "Timeline of events in shooting of Michael Brown in Ferguson," August, 8, 2019, https://apnews.com/article/shootings-police-us-news-st-louis-michael-brown-9aa32033692547699a3b61da8fd1fc62.

[4] Darrel W. Stephens, *Officer Involved Shootings: Officers/Subjects Executive Summary*, National Police Foundation, 2019, p. 1, https://www.policinginstitute.org/wp-content/uploads/2019/05/2.-OIS_off_sub_8.28.19.pdf.

[5] Tom McEwen and Frank Leahy, *Less Than Lethal Force Technologies in Law Enforcement and Correctional Agencies*, Institute for Law and Justice, January 1994, p. 1.2, https://www.ojp.gov/pdffiles1/Photocopy/173088NCJRS.pdf.

[6] U.S. Department of Justice (DOJ), National Institute of Justice (NIJ), National Law Enforcement and Technology Center, *How 'Less' is Less Than Lethal*, TechBeat, 2000, p. 1, https://www.ojp.gov/pdffiles1/nij/nlectc/211820.pdf.

[7] Jacob Vaughn, "Imperfect Tools, Missing Standards, Poor Communication Add Danger to 'Less-Lethal' Weapons," *Dallas Observer*, November 3, 2020, https://www.dallasobserver.com/news/law-enforcement-experts-weigh-pros-cons-of-non-lethal-weapons-11959043; and Rohini J. Haar et al., *Lethal in Disguise 2: How Crowd-Control Weapons Impact Health and Human Rights*, Physicians for Human Rights, March 22, 2023, https://phr.org/our-work/resources/lethal-in-disguise-2/.

Conceptualizing Less-than-Lethal Weapons (LLWs)

There is no single, uniform definition of the term *less-than-lethal weapon*. Developing a clear definition of LLWs raises a number of conceptual challenges involving terminology, weapon capability, operational utility, intent, and application.

Terminology

Underlying the definitional debate of LLWs is a basic disagreement about what this class of weapons should be called. A number of names have been proposed over the years, including *less-than-lethal, less-lethal, non-lethal, pre-lethal,* and *soft-kill.* "Non-lethal" is the terminology of choice among military personnel, which was formalized by the U.S. Department of Defense (DOD) in Directive 3000.3.[8] Proponents argue that non-lethal is more appropriate than less-than-lethal because the former reflects the intended outcome of the weapon's use: non-lethality is the *goal* of using these weapons, not a guarantee.[9] However, others contend that the label *non-lethal* is a misnomer because the use of many weapons marketed as non-lethal has resulted in death or serious injury and that their use may not necessarily be non-lethal.[10] As a result of this critique, most law enforcement agencies use the terms *less-than-lethal* or *less-lethal*, which they argue reflect the underlying intent of those using these weapons while also recognizing the fact that these weapons have the capacity to kill.[11]

Similarly, some observers have questioned the categorization of LLWs as weapons. Some argue that the label *weapon* is inappropriate given the range of LLWs, like net-based devices, that do not fit into traditional understandings of weapons.[12] As such, some federal agencies refer to LLWs as less-than-lethal "technologies."[13] However, strictly categorizing LLWs as weapons avoids an overbreadth problem by ensuring that objects with well-known non-weapon uses are not

[8] DOD, *Department of Defense Directive: Policy for Non-Lethal Weapons*, Directive 3000.3, July 9, 1996, https://apps.dtic.mil/sti/tr/pdf/ADA315849.pdf. DOD updated the directive in 2018; see DOD, *DoD Executive Agent for Non-Lethal Weapons (NLW), and NLW Policy*, Directive 3000.03E, August 31, 2018, https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodd/300003p.pdf?ver=2018-10-24-112944-467.

[9] Rex Sheldon, "Nonlethal Policy, Nonlethal Weapons, and Complex Contingencies," *Naval War College*, February 5, 1999, pp. 4-5, https://apps.dtic.mil/sti/pdfs/ADA363056.pdf.

[10] R.M. Coupland, "'Non-Lethal' Weapons: Precipitating a New Arms Race," *British Medical Journal*, vol. 315 (July 12, 1997), p. 72.

[11] U.S. Department of Justice (DOJ), Office of Justice Programs (OJP), "Crime and War: An Analysis of Non-Lethal Technologies and Weapons Development," https://www.ojp.gov/library/publications/crime-and-war-analysis-non-lethal-technologies-and-weapons-development; DOJ, National Institute of Justice (NIJ), *Report on the Attorney General's Conference on Less Than Lethal Weapons*, March 1987, p. 2, https://www.ojp.gov/pdffiles1/Digitization/105195NCJRS.pdf. Recently, some law enforcement agencies have transitioned to using the term *less-lethal* over *less-than-lethal.* Although used interchangeably, subtle differences exist between the two terms. "Than" is a comparative adjective, which, when used in the phrase *less-than lethal weapon*, places the emphasis on the difference between LLWs and lethal weapons. By removing the comparative adjective, *less-lethal weapon* places the emphasis on the intent of the weapon. For purposes of this report, the label "less-than-lethal" is used.

[12] The term *weapon* is not defined in the Gun Control Act of 1968 or the National Firearms Act. Consequently, the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) assumes the common dictionary definition of "weapon": "an instrument of offensive or defensive combat." See ATF, *ATF Rul.1995-3*, https://www.atf.gov/firearms/docs/ruling/1995-3-3738mm-gasflare-guns-anti-personnel-ammunition-are-defined-nfa-weapons/download; and Adelina Tumbarska, "Non-Lethal Weapons – A Concept Difficult to Define," *International Scientific Journal "Security & Future,"* no. 4 (2017), p. 139.

[13] DOD, *DoD Executive Agent for Non-Lethal Weapons (NLW), and NLW Policy*, Directive 3000.03E, August 31, 2018, p. 12, https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodd/300003p.pdf?ver=2018-10-24-112944-467.

unintentionally classified as LLWs. For example, a police officer could use a baseball bat to incapacitate an individual in the same manner as a police baton; however, because baseball bats have well-known non-weapon uses, strictly defining LLWs as a weapon would preclude classification of baseball bats as LLWs.

Capability

There is a diverse array of weapons that are marketed as less-than-lethal, all of which have differing design features, technologies, and functions. Typically, a weapon is defined in terms of its *capability* to perform a specific function. A firearm, for example, is generally defined as any weapon that will expel, or is readily capable of expelling, a projectile by means of an explosive.[14] However, many weapons thought of as LLWs do not share a common capability. For example, several weapons marketed as LLWs expel chemical irritant projectiles using compressed air (e.g., pepper sprays), others transmit electroshocks through direct contact (e.g., stun guns), and some are capable of utilizing modern transducers to convert electric energy into painful sounds waves (e.g., Long Range Acoustic Devices).

Operational Utility

While purported LLWs may differ according to their design features, underlying technologies, and functions, some observers argue that the weapons have in common, and therefore should be characterized by, an operational utility to *incapacitate* an individual through non-lethal means. DOD, for example, defines LLWs as "weapons, 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."[15] However, debate exists about whether the term *incapacitation* captures the full breadth of LLWs' operational utilities. Although many purported LLWs (e.g., TASERs, pepper sprays, batons) may be employed by law enforcement officers to incapacitate targeted personnel, the North American Treaty Organization (NATO) identifies five other operational uses of LLWs: (1) to accomplish tasks in situations where the use of lethal force, although not prohibited, may not be necessary or desired; (2) to discourage delay, prevent, or respond to hostile activities; (3) to limit or control escalation; (4) to improve force protection (for officers); and (5) to disable equipment or facilities.[16] Because LLWs may have alternative or additional operational utilities, some may argue that LLWs should not be strictly defined in terms of an operational utility to incapacitate.

[14] 18 U.S.C. §921(a)(3); 26 U.S.C. §5845(a).

[15] DOD, DoD Executive Agent for Non-Lethal Weapons (NLW), and NLW Policy, Directive 3000.03E, August 31, 2018, p. 12, https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodd/300003p.pdf?ver=2018-10-24-112944-467.

[16] NATO, *NATO Policy on Non-Lethal Weapons*, press statement, October 13, 1999, https://www.nato.int/docu/pr/1999/p991013e.htm. NATO also notes that LLWs may be useful to help decrease the post-conflict costs of reconstruction. Although post-conflict reconstruction is a military-specific situation, some argue that there is also financial motivation for law enforcement—law enforcement use of LLWs could help reduce civil liability lawsuits alleging police unreasonable use of force, which have caused "financial hardship" for a "growing number of communities." See DOJ, NIJ, Report on the Attorney General's Conference on Less Than Lethal Weapons, March 1987, p. iii, https://www.ojp.gov/pdffiles1/Digitization/105195NCJRS.pdf.

Intent

Many LLW definitions promogulated by federal, state, and local agencies characterize LLWs in terms of the weapons' *intended* use to minimize loss of life.[17] The U.S. Department of the Interior (DOI), for example, defines an LLW as "an instrument, device or weapon designed or intended to be used in a manner not likely to cause death or serious bodily injury."[18] However, intent-based definitions are not without criticism. Amidst reports that the use of weapons purported to be less-than-lethal have caused serious injury and death, intent notwithstanding, some argue that LLWs should be defined using objective criteria, specifically based on human effects and incapacitation efficacy.[19] For example, the American Civil Liberties Union (ACLU) asserts that TASERs "cannot so simply be categorized as non-lethal" due to evidence that TASERs "can cause cardiac arrest and death."[20] While LLWs' potential effects may be relevant, others contend that intended use is necessary to differentiate LLWs from conventionally lethal weapons. For example, an International Committee of the Red Cross (IRC) surgeon noted that wounds from conventionally lethal weapons do not result in fatalities 100% of the time, leading him to question whether certain rifles and fragmentation weapons (which, he reports, inflict wounds that "kill (only) 20-25% of [combat] casualties") should be classified as LLWs rather than lethal weapons. [21] Removing intent from the definition, therefore, could allow for certain conventional weapons to also be classified as less-than-lethal.

Another point of tension involves contextualizing the relationship between lethal and less-than-lethal weapons. LLWs are often marketed as alternatives to conventionally lethal weapons. For instance, in a statement before the House Committee on Transportation and Infrastructure, Subcommittee on Aviation, former National Institute of Justice (NIJ) Director Sarah Hart informed Congress that "less-than-lethal weapons were developed to provide law enforcement, corrections, and military personnel with an alternative to lethal force."[22] However, it has been observed that law enforcement officers regularly employ weapons marketed as less-than-lethal in situations generally involving lower levels of violence, like crowd control or persons resisting arrest, where the use of lethal force or firearms may not be justified.[23] Consequently, some

[17] Many scholars describe the guiding principle of LLW development as "benign intent": the "humanitarian" motivation to create a weapon that, when used as designed and intended, minimizes loss of life. See Brian Rappert, "Scenarios on the future of non-lethal weapons," Contemporary Security Policy, vol. 22, no. 1 (2001), p. 64; and Neil Davison, *'Non-Lethal' Weapons* (New York, NY: Palgrave Macmillan, 2009), p. 3.

[18] DOI, *Department Manual*, Law Enforcement and Security, Use of Force, January 15, 2021, p. 2, https://www.doi.gov/sites/doi.gov/files/elips/documents/446-dm-20.pdf#:~:text=Less-Lethal%20Device.%20An%20instrument%2C%20device%20or%20weapon%20designed,control%20device%2C%20impact%20weapons%2C%20and%20certain%20chemical%20agents.

[19] For instance, the now disbanded Health Effects Advisory Panel, established by DOD's Joint Non-Lethal Weapons Directorate, proposed the following criteria that a weapon must meet to be categorized as an LLW: (1) the weapon incapacitates 98% of persons it is used against, (2) the weapon has no effect on no more than 1% of persons, (3) no more than 0.5% of persons suffer permanent physical damage, and (4) no more than 0.5% of persons are killed. Cited in David Fidler, "The International Legal Implications of 'Non-Lethal' Weapons," Michigan Journal of International Law, vol. 21, no. 51 (1999), p. 62. For a discussion of mortality risks associated with LLW use, see the section "Analyzing Health Effects of LLWs."

[20] ACLU, *News & Commentary: Tasers No Longer a Non-Lethal Alternative for Law Enforcement*, May 3, 2012, https://www.aclu.org/news/criminal-law-reform/tasers-no-longer-non-lethal-alternative-law.

[21] R.M. Coupland, "Non-Lethal" Weapons: Precipitating a New Arms Race," *British Medical Journal*, vol. 315 (July 12, 1997), p. 72.

[22] U.S. Congress, House Transportation and Infrastructure Committee, Aviation Subcommittee, *Arming Flight Crews Against Terrorist Acts*, 107th Cong., 2nd sess., May 2, 2002, H.Hrg. 107-80 (Washington, DC: GPO, 2002), p. 48.

[23] Geoffrey Alpert and Roger Dunham, "Policy and Training Recommendations Related to Police Use of CEDs: Overview of Findings From a Comprehensive National Study," *Police Quarterly*, vol. 13, no. 3 (2010), p. 246.

observers argue that LLWs may be better described as a *force multipliers* rather than lethal force alternatives.[24]

Application

Further complicating matters is that LLWs have both counter-personnel and counter-materiel applications.[25] Although the most well-known LLWs are designed to directly incapacitate or subdue humans (counter-personnel), there are many counter-materiel LLWs in use by law enforcement that are designed to incapacitate personnel by targeting materiel or infrastructure. For instance, law enforcement officers have employed strips of material embedded with sharp spikes (a weapon commonly considered to be less-than-lethal) to puncture the car tires of fleeing suspects.[26]

Proposed LLW Definitions

Consistent with these conceptual difficulties, there is no single agreed-upon definition of LLW. Because Congress has not defined LLW (or its related terms) in statute, the use of the term varies greatly among U.S. federal agencies. Some examples of the diversity of definitions among agencies are presented in **Table 1**.

Table 1. Selected Definitions of Less-than-Lethal Weapons and Related Terms

Organization	Term and Definition
U.S. Bureau of Justice Statistics (BJS)	"Less-lethal weapons" means "less-lethal technologies [that] give police an alternative to lethal force. These weapons are especially valuable when lethal force (1) is not necessary, (2) is justified and available for backup, but lesser force may resolve the situation, or (3) is justified, but its use could cause serious injury to bystanders or other unacceptable collateral effects."
U.S. Department of Defense (DOD)	"Non-lethal weapons" means "weapons, 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."
U.S. Department of Homeland Security (DHS)	"Less-lethal technologies" means "devices [that] are designed to be less likely to cause death when deployed than conventional weapons like firearms, and are used by law enforcement in two primary situations: crowd control and one-on-one suspect apprehension."

[24] R.T. Wyant and Tom Burns, *Risk Management of Less Lethal Options: Evaluation, Deployment, Aftermath, and Forensics*, 1st ed. (Boca Raton, FL: CRC Press, 2014), p. 27; Neil Davison, *'Non-Lethal' Weapons* (New York, NY: Palgrave Macmillan, 2009), p. 38; and Tom Raue, "The Technology of Control-A Guide to 'Less Lethal' Police Weaponry," in *Towards Anti-Policing: Prefiguring Possibilities Beyond the Thin Blue Line*, ed. Simon Springer and Richard J. White (Lanham, MD: The Rowman & Littlefield Publishing Group, Inc., 2024), p. 146.

[25] Counter-personnel weapons are designed for use against humans. Counter-materiel weapons are designed to damage equipment or infrastructure, such as vehicles or buildings.

[26] National Law Enforcement Memorial Fund, "Tire Deflation Devices: A Ten-Year Examination of Law Enforcement Fatalities," November 2023, https://nleomf.org/wp-content/uploads/2023/10/Tire-Deflation-Device-Paper-NLEOMF-9.27.23.pdf.

Organization	Term and Definition
U.S. Department of the Interior (DOI)	"Less-lethal device" means "an instrument, device or weapon designed or intended to be used in a manner not likely to cause death or serious bodily injury."
U.S. Federal Bureau of Investigation (FBI)	"Less-lethal weapon" means "a device designed or converted to expel or propel less lethal ammunition by any action, mechanism, or process for the purpose of incapacitating, immobilizing, or stunning a human being through the infliction of any less than lethal impairment of physical condition, function, or senses, including physical pain or discomfort."
U.S. Government Accountability Office (GAO)	"Less-lethal" means "tactics and weapons that are neither likely nor intended to cause death or serious injury."
U.S. National Institute of Justice (NIJ)	"Less-lethal weapon" means "any apprehension or restraint device that, when used as designed and intended, has less potential for causing death or serious injury than conventional police lethal weapons."

Sources: U.S. Department of Justice (DOJ), BJS, *Glossary: Less-lethal Weapons*, https://bjs.ojp.gov/glossary/less-lethal-weapons, accessed January 3, 2025; DOD, *DoD Executive Agent for Non-Lethal Weapons (NLW), and NLW Policy*, Directive 3000.03E, August 31, 2018, p. 12, https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodd/300003p.pdf?ver=2018-10-24-112944-467; DHS, Science and Technology Directorates, *Less Lethal Technologies for Law Enforcement*, July 8, 2022, https://www.dhs.gov/publication/st-less-lethal-technologies-law-enforcement; DOI, *Department Manual*, Law Enforcement and Security, Use of Force, January 15, 2021, p. 2, https://www.doi.gov/sites/doi.gov/files/elips/documents/446-dm-20.pdf#:~:text=Less-Lethal%20Device.%20An%20instrument%2C%20device%20or%20weapon%20designed,control%20device%2C%20impact%20weapons%2C%20and%20certain%20chemical%20agents; FBI, *Law Enforcement Officers Killed and Assaulted (LEOKA) Data Collection*, 2019, https://ucr.fbi.gov/leoka/2019/resource-pages/definitions; GAO, *Law Enforcement: Federal Agencies Should Improve Reporting and Review of Less-Lethal Force*, GAO-22-104470, December 21, 2021, pp. 1, 11, https://www.gao.gov/products/gao-22-104470; and DOJ, Office of Justice Programs (OJP), NIJ, *Study of Deaths Following Electro-Muscular Disruption: Interim Report*, June 8, 2024, p. 9, https://www.ojp.gov/pdffiles1/nij/222981.pdf.

Whether to consider a weapon—when used as designed and intended—as less-than-lethal may depend on one's understanding of that term. Although there is no single, universally agreed-upon definition of LLWs, one of the most visible definitions for law enforcement purposes comes from NIJ—the U.S. Department of Justice (DOJ) agency tasked with researching, developing, and evaluating LLWs appropriate for various law enforcement circumstances.[27] For the purposes of this report, CRS uses the NIJ's definition of LLW as "any apprehension or restraint device that, when used as designed and intended, has less potential for causing death or serious injury than conventional police lethal weapons."[28]

[27] David Hayeslip and Alan Preszler, *NIJ Initiative on Less-Than-Lethal Weapons*, DOJ, OJP, NIJ, Research in Brief, March 1993, https://www.ojp.gov/ncjrs/virtual-library/abstracts/nij-initiative-less-lethal-weapons.

[28] DOJ, OJP, NIJ, *Study of Deaths Following Electro-Muscular Disruption: Interim Report*, June 8, 2024, p. 9, https://www.ojp.gov/pdffiles1/nij/222981.pdf. NIJ further defines "restrain" to mean "to control, limit, or prevent movement." Weapons that are designed to disperse crowds of unruly persons are, in effect, controlling the movement of persons; therefore, any weapon, that has less potential for causing death or serious injury than conventional police weapons and is designed and intended to control crowds is classified as less-than-lethal for the purposes of this report.

Law Enforcement Use of LLWs

This section provides an overview of current and emerging LLWs used by law enforcement. The LLWs are categorized by technologies.

Conducted Energy Devices

Conducted energy devices (CEDs) are weapons designed to induce incapacitation by transmitting electroshocks, causing temporary muscle contraction and pain to the targeted personnel. Per a CRS analysis of the 2020 Law Enforcement Management and Administrative Statistics (LEMAS), 93.5% of all local, county, and state law enforcement agencies surveyed authorized their full-time sworn officers to use CEDs.[29] Similarly, a 2021 Government Accountability Office (GAO) report on LLW usage by federal law enforcement officers during the 2020 George Floyd protests found that 6 of the 10 federal agencies that deployed personnel—U.S. Customs and Border Protection (CBP), U.S. Immigration and Customs Enforcement (ICE), the Federal Protective Service (FPS), the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF), the U.S. Marshalls Service (USMS), the U.S. Park Police (USPP), and the National Guard—authorize all officers to use CEDs in crowd control situations.[30]

TASERs are the most commonly utilized CEDs by law enforcement officers.[31] Developers market the TASER as a less-than-lethal alternative to conventional firearms.[32] Rather than expelling a bullet, TASERs utilize compressed nitrogen gas or gunpowder to propel barbed, dart-shaped electrodes at targeted personnel. By nature of their design, law enforcement officers primarily utilize TASERs in close-proximity encounters with individuals who are perceived to pose a safety risk to an officer or others.

Other types of CEDs subdue targeted personnel through direct contact. Stun guns (small, hand-held devices that discharge an electric shock through direct contact) were originally created for U.S. Army use, but along with TASERs became among the first CEDs to be used by law enforcement.[33] Additionally, in some custodial settings officers are authorized to use restraint CEDs, such as stun belts (CED belts placed around a subject's waist, leg, or arm that are capable of delivering electroshocks through remote control activation) to aid in the transportation of

[29] The Bureau of Justice Statistics' LEMAS survey periodically collects data from a nationally representative sample of state, county, and local law enforcement agencies in the United States about their personnel, operations, policies, and procedures. The LEMAS survey does not collect any data from federal law enforcement agencies. The 2020 LEMAS data are the most recent available. See **Table A-1** for a breakdown of CED authorization by law enforcement agency type.

[30] GAO, *Law Enforcement: Federal Agencies Should Improve Reporting and Review of Less-Lethal Force*, GAO-22-104470, December 21, 2021, pp. 16, https://www.gao.gov/products/gao-22-104470 (hereinafter, "GAO, *Less-Lethal Force*"). GAO referred to CEDs as "electronic control devices" in the report. Note that this report did not collect any data on the number of federal agencies that authorize their officers to use LLWs in one-on-one encounters. In addition, it did not collect any data from federal law enforcement agencies who did not deploy officers during the protests, such as the Drug Enforcement Administration (DEA) and the U.S. Postal Inspection Service (USPIS).

[31] Specifically, the TASER model X26 is reportedly "the prevailing conducted energy device being acquired by law enforcement today." For more information, see DOJ, OJP, NIJ, *Study of Deaths Following Electro-Muscular Disruption: Interim Report*," June 8, 2024, p. 1, https://www.ojp.gov/pdffiles1/nij/222981.pdf.

[32] AXON, "A New Era in Less-Lethal Technology," https://www.axon.com/products/taser-10, accessed November 6, 2024.

[33] Matt Chiappardi, "A Chronology of the Stun Gun," *Burlington County Times*, December, 9, 2012, https://www.burlingtoncountytimes.com/story/news/2012/12/09/a-chronology-stun-gun/17396510007/.

inmates with histories of aggressive behavior.[34] There are also a number of direct contact CEDs designed to aid law enforcement and correctional officers in riot control situations, such as stun shields (riot shields designed to administer a contact shock through the press of a button) and shock sticks (baton-like devices equipped with two prongs at the tip capable of delivering an electric shock).[35]

Chemical Irritant Devices

Chemical irritant devices are weapons that temporarily subdue persons through the use of pain-inducing chemical compounds. Dispersal of these chemical compounds is intended to temporarily activate pain receptors in the eyes, mouth, throat, lungs, or skin. Chemical irritant projectiles, colloquially called *tear gas*, have long been employed by law enforcement officers as riot control agents. According to an analysis of the 2020 LEMAS survey, 65% of law enforcement agencies surveyed authorized the use of chemical irritant projectiles.[36] In addition, 3 of the 10 federal agencies that deployed personnel during the 2020 George Floyd protests—CBP, FPS, and the Federal Bureau of Prisons (BOP)—authorized all officers to use CEDs in crowd control situations.[37] Several chemical compounds make up tear gas, of which 2-chlorobenzalmalonitrile (CS) is the most common. Although called *tear gas*, law enforcement officers primarily deploy CS as a powder, discharged in bursts from a grenade or canister.[38] In tear gas grenades, CS is often combined with a flammable filler that, when burned, creates an acrid smoke that forces crowds to disperse in order to avoid the pain-inducing gas.[39]

Another common LLW is hand-held chemical irritant sprays. Law enforcement officers primarily employ chemical irritant sprays in one-on-one, close-proximity encounters. These weapons utilize compressed gas to propel a chemical irritant (in the form of a liquid, foam, or gel) at targeted personnel. Two types of chemical irritant sprays are currently in use by U.S. law enforcement: Mace (derived from the tear gas compound chloroacetophenone [CN]) and oleoresin capsicum (OC) spray (naturally derived from capsaicin in cayenne peppers). OC is the primary chemical irritant spray employed by law enforcement; 97.7% of local, county, and state law enforcement agencies authorize their officers to use it.[40] Moreover, 8 of 10 federal agencies that deployed personnel during the George Floyd protests—CBP, ICE, FPS, BOP, FBI, USMS, USPP, and the

[34] Police Executive Research Forum, *Conducted Energy Devices: Use in a Custodial Setting*, August 2009, https://www.policeforum.org/assets/docs/Free_Online_Documents/Use_of_Force/conducted%20energy%20devices%20-%20use%20in%20a%20custodial%20setting%202007.pdf#page=8.

[35] Police Executive Research Forum, *Conducted Energy Devices: Use in a Custodial Setting*, August 2009, https://www.policeforum.org/assets/docs/Free_Online_Documents/Use_of_Force/conducted%20energy%20devices%20-%20use%20in%20a%20custodial%20setting%202007.pdf#page=8.

[36] See **Table A-1** for a breakdown of chemical irritant projectile authorization by law enforcement agency type.

[37] GAO, *Less-Lethal Force*, p. 16. GAO referred to chemical irritant projectiles as "chemical munitions" in the report. Note that the report did not collect any data on the number of federal agencies that authorize their officers to use LLWs in one-on-one encounters. In addition, it did not collect any data from federal law enforcement agencies who did not deploy officers during the protests, such as the DEA and USPIS.

[38] Craig Rothenberg et al., "Tear gas: an epidemiological and mechanistic reassessment," *Annals of the New York Academy of Sciences*, vol. 1378, no. 1 (August 2016), p. 97.

[39] Dan Kaszeta, "Restrict use of riot control chemicals," *Nature*, vol. 573 (September 2019), p. 28.

[40] U.S. Department of Homeland Security (DHS), National Urban Security Technology Laboratory, *Less Lethal Technologies for Law Enforcement*, tech note, June 2019, p. 2, https://www.dhs.gov/sites/default/files/publications/saver-technote-less-lethal_28may2019_508.pdf. See **Table A-1** for a breakdown of OC spray authorization by law enforcement agency type.

National Guard—authorize all officers to use chemical irritant sprays.[41] Compared to Mace, OC spray offers three distinct advantages: it is cheaper, less likely to be windblown into the officer's face, and generally does not require medical attention for those sprayed.[42]

Although less common in the United States, a new chemical irritant spray made from the chemical compound pelargonic acid vanillylamide (PAVA) has gained popularity among foreign law enforcement agencies, particularly in the United Kingdom. PAVA is derived synthetically from the active components of OC. There are two types of PAVA sprays currently in use by foreign law enforcement officers: $PAVA_1$ spray (composed of a 50% aqueous ethanol) and $PAVA_2$ spray (composed of monopropylene glycol, ethanol, and water).[43] Unlike OC, PAVA is a single chemical compound, making it easier to assess both PAVA sprays' potential toxicologic and health effects.[44] In addition, $PAVA_2$'s nonflammable nature is appealing to officers who carry CEDs, as there is a decreased risk of accidental flame ignition.[45] However, PAVA is only effective when sprayed into a person's eyes, requiring more accuracy than OC to induce incapacitation.[46]

Kinetic LLWs

Kinetic LLWs are designed to induce incapacitation by imparting blunt force. Batons, also colloquially referred to as *nightsticks* and *billy clubs*, are the oldest kinetic LLWs, and 91.3% of law enforcement agencies responding to the LEMAS survey authorized their officers to use them.[47] Similarly, all 10 federal agencies that deployed personnel during the 2020 George Floyd protests—CBP, ICE, FPS, the U.S. Secret Service, ATF, BOP, FBI, USMS, USPP, and the National Guard—authorize all their officers to use batons.[48] First designed as straight, cylindrical clubs of wood, most law enforcement-issued batons have since adopted tapered-stick designs to allow for a more comfortable handle and wider striking distance. Batons are favored LLWs in correctional facilities and crowd control situations, where baton strikes to large muscle groups can effectively incapacitate subjects with low risk of permanent injury.

Blunt-force projectiles (BFPs) are also a popular less-lethal alternative to conventional ammunition; approximately 61% of law enforcement agencies responding to the LEMAS survey and three federal agencies that deployed officers during the George Floyd protests—CBP, FPS, and BOP—reported that they authorized officers to use such munitions.[49] Common examples of

[41] GAO, *Less-Lethal Force*, p. 16. GAO referred to chemical irritant projectiles as "chemical spray" in the report. Note that the report did not collect any data on the number of federal agencies that authorize their officers to use LLWs in one-on-one encounters. In addition, it did not collect any data from federal law enforcement agencies who did not deploy officers during the protests, such as the DEA and USPIS.

[42] Annmarie Cordner and Gary Cordner, "Overview of Law Enforcement Technology," in *Criminal Justice Technology in the 21st Century*, ed. Laura Moriarty, 3rd ed. (Springfield, IL: Charles C. Thomas Publisher, Ltd., 2017), p. 42.

[43] U.K. Home Office, *Comparison Report on CS and PAVA Sprays*, August 12, 2014, p. 6, https://www.gov.uk/government/publications/comparison-report-on-cs-and-pava-sprays.

[44] U.K. Home Office, *Comparison Report on CS and PAVA Sprays*, August 12, 2014, p. 4, https://www.gov.uk/government/publications/comparison-report-on-cs-and-pava-sprays.

[45] U.K. Home Office, *Comparison Report on CS and PAVA Sprays*, August 12, 2014, p. 7, https://www.gov.uk/government/publications/comparison-report-on-cs-and-pava-sprays.

[46] DHS, National Urban Security Technology Laboratory, *Less Lethal Technologies for Law Enforcement*, tech note, June 2019, p. 2, https://www.dhs.gov/sites/default/files/publications/saver-technote-less-lethal_28may2019_508.pdf.

[47] See **Table A-1** for a breakdown of baton authorization by law enforcement agency type.

[48] GAO, *Less-Lethal Force*, p. 16. Note that the report did not collect any data on the number of federal agencies that authorize their officers to use LLWs in one-on-one encounters. In addition, it did not collect any data from federal law enforcement agencies who did not deploy officers during the protests, such as the DEA and USPIS.

[49] See **Table A-1** for a breakdown of BFP authorization by law enforcement agency type. *GAO, Less-Lethal Force*, p. (continued...)

BFPs include rubber bullets, bean bag rounds, and paintballs. Rather than penetrating the body, these brightly colored munitions are designed to flatten upon impact, causing temporary blunt-force trauma to the skin. BFPs can be fired from standard or specialized firearms and are most often employed as longer-range crowd control weapons.

Although the primary mechanism for BFPs to induce incapacitation is through blunt-force trauma, there are a growing number of BFPs that induce incapacitation by overwhelming multiple senses. Already in use by a number of police departments, pepper spray balls are rifle-launched plastic projectiles that burst and disperse a cloud of chemical irritant (e.g., OC, PAVA, or CS) powder upon impact.[50] Pepper spray balls combine the incapacitation mechanisms of kinetic weapons and chemical irritants to increase pain experienced by the targeted personnel and, thus, increase the probability of incapacitation.

The water canon is another kinetic LLW deployed by law enforcement agencies. Principally used to disperse crowds of unruly persons, water cannons are vehicle-mounted, high-pressure jets designed to expel powerful streams of water or water mixtures (e.g., mixtures of water and chemical irritants) at targeted personnel.[51] Although there are some documented instances of water cannon use by U.S. law enforcement, such as the 2016 Dakota Access Pipeline protests,[52] the majority of U.S. law enforcement agencies do not use water cannons due to the weapons' perceived similarities to the fire hoses used against civil rights demonstrators in the 1960s.[53]

There are also a number of counter-materiel kinetic devices designed to stop vehicles. Vehicle-stopping kinetic LLWs were created as an alternative to high-speed chases, which are significantly dangerous to police and civilians, resulting in nearly two deaths every day.[54] Common examples of kinetic vehicle-stopping devices are caltrops (small metal devices composed of four or more spikes) and spike strips (strips of material embedded with sharp spikes), which officers deploy in front of a fleeing vehicle to puncture the tires and, thereby, disable the vehicle and apprehend the occupant(s). Although there are not any comprehensive

16. GAO refers to BFPs as "kinetic impact munitions" in the report. Note that the report did not collect any data on the number of federal agencies that authorize their officers to use LLWs in one-on-one encounters. In addition, it did not collect any data from federal law enforcement agencies who did not deploy officers during the protests, such as the DEA and USPIS.

[50] PepperBall, "PepperBall Helps Police Keep Peace on the Streets," press release, July 16, 2024, https://pepperball.com/blog/pepperball-helps-police-keep-peace-on-the-streets/.

[51] Leonard C. Miller, *Police Weapons Center: Water Cannon*, DOJ, OJP, Report Series 4-70, Washington, DC, 1970, https://www.ojp.gov/ncjrs/virtual-library/abstracts/water-cannon-police-weapons-center-report-series-4-70.

[52] Alan Taylor, "Water Cannons and Tear Gas Used Against Dakota Access Pipeline Protesters," *The Atlantic*, November, 21, 2016, https://www.theatlantic.com/photo/2016/11/water-cannons-and-tear-gas-used-against-dakota-access-pipeline-protesters/508370/.

[53] Although not commonly used by U.S. law enforcement, many foreign police departments in South Africa and certain European countries use water cannons as less-lethal crowd control weapons. DOJ, NIJ, *Report on the Attorney General's Conference on Less Than Lethal Weapons*, March 1987, p. 9, https://www.ojp.gov/pdffiles1/Digitization/105195NCJRS.pdf; Library of Congress, *The Civil Rights Act of 1964: A Long Struggle for Freedom*, https://www.loc.gov/exhibits/civil-rights-act/multimedia/birmingham-protests.html, accessed January 2, 2025.

[54] Utilizing data acquired from the National Highway Traffic Safety Administration's Fatality Analysis Reporting system (FARS), reporters from the *Times Union*, in partnership with the *San Francisco Chronicle*, found that 3,336 people (nearly two people per day) were killed in police vehicle pursuits from 2017 to 2022. See Susie Neilson et. al, "Database: Police chases kill hundreds every year—most victims aren't the drivers being pursued," *Times Union*, March 5, 2024, https://www.timesunion.com/projects/2024/police-chases-database/; and Susie Neilson et. al, "How the Chronicle built a national database of fatal police chases," *San Francisco Chronicle*, February 27, 2024, https://www.sfchronicle.com/us-world/article/police-chases-methodology-18685158.php.

federal statistics on U.S. law enforcement use of these devices, one manufacturer reports spike strips usage among 12,000 law enforcement agencies across the world.[55]

In addition, there are an increasing number of new kinetic vehicle-stopping devices aimed at improving officer safety. Typically, an officer must physically place a caltrop or spike strip in front of a fleeing vehicle, which, according to a 2023 study funded by the U.S. Department of Transportation (DOT), poses a "safety issue" because officers may not be adequately protected from the suspect's vehicle when deploying such devices.[56] Consequently, many law enforcement agencies have sought alternative, remote-controlled vehicle-stopping LLWs. One such emerging device is a reloadable, self-contained LLW that enables officers to deploy a spike strip up to 100 feet away using a hand-held remote control.[57] Another emerging LLW is a remote-controlled net-system called the Grappler that attaches to a police vehicle's bumper. Already installed on over 1,000 police vehicles, the Grappler can be lowered to shoot a nylon webbing around the rear tire of a suspect's vehicle, effectively bringing the vehicle to a halt.[58]

Acoustic Devices

Acoustic devices utilize acoustic energy (the energy carried by sound waves) to irritate or cause pain to a person's eardrums, resulting in temporary incapacitation. Although many acoustic LLWs have been proposed for counter-personnel application, some critics of their use have expressed uncertainty about the incapacitation efficacy of, as well as concern over hearing damage caused by, many of these devices.[59] As such, a limited number of acoustic devices are currently available to law enforcement. One such weapon is the Long Range Acoustic Device (LRAD). Marketed as an alternative to police bullhorns, LRADs are specialized loudspeakers that use modern transducers to deliver loud sounds over long distances.[60] LRADs are primarily employed by law enforcement officers to deliver loud warnings and instructions to crowds of unruly persons. However, LRADs also have the capability to emit high decibel deterrent tones, which cause temporary ear pain and ringing among targeted personnel. While there are no statistics on the number of law enforcement agencies authorized to use such devices, there are some documented usages of them for crowd control, including at a 2020 Black Lives Matter (BLM) protest in

[55] Stop Tick Ltd., "Stop Stick Solutions. Simple, Safe, Effective," https://stopstick.com/.

[56] National Law Enforcement Memorial Fund, *Tire Deflation Devices: A Ten-Year Examination of Law Enforcement Fatalities*, November 2023, https://nleomf.org/wp-content/uploads/2023/10/Tire-Deflation-Device-Paper-NLEOMF-9.27.23.pdf.

[57] Matador Law Enforcement Technologies, "NightHawk Pursuit Prevention Technology FAQs," https://matador-le.com/pages/faqs.

[58] Marc Martinez, "What's the Grappler Police Bumper? How this Arizona invention is stopping police chases," *Fox 10 Phoenix*, September 2, 2023, https://www.fox10phoenix.com/news/grappler-arizona-made-device-seeing-more-use-by-law-enforcement.

[59] North Atlantic Treaty Organization, *The Human Effects of Non-Lethal Technologies*, August 2006, pp. 4 - 2–4 - 3, https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=6ee43fb87c3cadd4750d39cd932044ce50c379c3. Specifically, NATO notes that the effects of acoustic devices "can be defeated with ear protection."

[60] A transducer is a device that changes one form of energy into another. In the case of LRADs, electrical energy is converted into sound waves.

Phoenix, AZ;[61] a 2014 BLM protest in Manhattan, NY;[62] and the 2009 G-20 protests in Pittsburgh, PA.[63]

Optical Devices

Optical devices are LLWs designed to use high intensity lights to temporarily obscure the vision of targeted personnel. Although a number of federal agencies, including NIJ and the U.S. Department of Homeland Security (DHS), have funded optical LLW research and development projects, concerns that optical devices may cause permanent blindness have resulted in very few optical LLWs being made available for law enforcement use.[64] One such device is the *flash-bang*: an optical *and* acoustic LLW. Shot from a launcher or thrown by hand, the flash-bang uses an explosive propellant to emit a bright flash of light (up to 8 million candela) and ear-piercing sound (up to 180 decibels), temporarily blinding, deafening, and disorienting nearby persons.[65] By combining the incapacitation mechanisms of optical and acoustic LLWs, flash-bangs overwhelm the senses of targeted individuals, enabling law enforcement officers to quickly apprehend disoriented suspects with limited resistance.[66] As a result, law enforcement officers primarily employ flash-bangs for tactical entry in situations involving hostages or barricaded individuals.[67] However, some law enforcement agencies (e.g., CBP, ICE, USSS, ATF, BOP, FBI, USMS, and USPP) also authorize select tactical teams and personnel to use flash-bangs to disperse crowds of violent persons.[68]

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[61] Phoenix Police Department, *Incident Report*, Phoenix, AZ, May 31, 2020, p. 4, https://dojrecords.phoenix.gov/Documents/P11_Incident_Report.pdf; and Genasys Inc., "LRAD Systems Provide New Methods of Policing to Protect Officers and the Public," press release, June 4, 2020, https://genasys.com/press-releases/genasys-inc-lrad-systems-deployed-by-first-responders-and-law-enforcement-for-critical-crowd-communications/.

[62] *Edrei v. Bratton*, 892 F.3d 525 (2d Cir. 2018).

[63] ACLU Pennsylvania, "City of Pittsburgh Settles G-20 Lawsuits," Pittsburgh, PA, November 14, 2012, https://www.aclupa.org/en/press-releases/city-pittsburgh-settles-g-20-lawsuits.

[64] NATO, *The Human Effects of Non-Lethal Technologies*, August 2006, p. 3-4, https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=6ee43fb87c3cadd4750d39cd932044ce50c379c3. For examples of optical LLWs funded by federal agencies, see Dave Hart and Garry Pate, *The Internet as a Technology & Information Resource: The Corrections Practitioner's Guide to "Surfing the Web*," DOJ, OJP, July 1998, p. 81, https://www.ojp.gov/pdffiles1/nij/175094.pdf; and DHS, Science and Technology Directorates, *Light-Emitting Diode Incapacitator*, October 31, 2014, https://www.dhs.gov/sites/default/files/publications/Light-Emitting%20Diode%20Incapacitator_0.pdf.

[65] Most modern flash-bangs use a *flash powder*, composed of a metal fuel (i.e., aluminum or magnesium) and an oxidizer (i.e., barium nitrate or potassium perchlorate). Sid Heal, *Diversionary Devices Manual*, National Tactical Officers Association, p. 15, https://ntoacommandcollege.org/wp-content/uploads/2019/02/Diversionary-Devices.pdf; and R.T. Wyantt, "Prevailing Less Lethal Options for Law Enforcement," in *Risk Management of Less Lethal Options: Evaluation, Deployment, Aftermath, and Forensics*, 1st ed. (Boca Raton, FL: CRC Press, 2014), p. 63.

[66] NATO, *The Human Effects of Non-Lethal Technologies*, August 2006, p. G-4, https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=6ee43fb87c3cadd4750d39cd932044ce50c379c3.

[67] R.T. Wyantt, "Prevailing Less Lethal Options for Law Enforcement," in *Risk Management of Less Lethal Options: Evaluation, Deployment, Aftermath, and Forensics*, 1st ed. (Boca Raton, FL: CRC Press, 2014), p. 65.

[68] GAO, *Less-Lethal Force*, p. 16. None of the 10 federal agencies surveyed in the report authorized *all* officers to use flash-bangs or other "diversionary devices" (devices that create a bright flash and loud noise to temporarily divert the attention of persons in the vicinity). Although the LEMAS survey did not collect any data on the number of local, county, or state law enforcement agencies that authorize the use of flash bangs, there are documented instances of flash-bang use among local and state law enforcement agencies. For examples of state and local police use of flash-bangs, see Patrick Maynard, "SDPD Makes Use of Dangerous Flash Bang Devices," Voice of San Diego, October 10, 2024, https://voiceofsandiego.org/2024/10/10/sdpd-makes-use-of-dangerous-flash-bang-devices/; and Tim Stelloh, "Ex-Georgia Deputy Acquitted After Flash Bang Grenade Hurts Toddler," NBC News, December 13, 2015, https://www.nbcnews.com/news/us-news/ex-georgia-deputy-acquitted-after-flash-bang-grenade-hurts-toddler-n479361; WCNC Charlotte, "Police: Error led to veteran SWAT officer's death," March 17, 2011, https://www.wcnc.com/article/news/local/police-error-led-to-veteran-swat-officers-death/275-418095283.

Although flash-bangs can be effective at subduing targeted personnel, some police departments have suspended their use following reports of serious injuries and deaths associated with police deployment of such weapons.[69] The use of explosive propellants carries a risk of accidental flame ignition (particularly if the flash-bang ignites near flammable material or on a human).[70] Consequently, a number of developers have created new flash-bangs capable of emitting high-intensity sounds and bright lights, and in some cases blinding strobes, through the use of batteries.[71] Compared to explosive-based flash-bangs, battery-powered flash-bangs have three distinct advantages: they are non-flammable, reusable, and can emit effects for a longer duration.[72] Some more technologically advanced battery-powered flash-bangs also allow officers to choose what effects to deploy (i.e., light only, sound only, strobe only, or sound and strobe together).[73] However, the acoustic effects produced by battery-powered flash-bangs are considerably less powerful than explosive-based flash-bangs, raising questions about the incapacitation efficacy of such devices.[74]

Less-than-Lethal Weaponized Unmanned Aircraft Systems (Drones)

An unmanned aircraft system, commonly called a *drone*, is defined in federal law as an aircraft capable of operations without direct human intervention from within or on the aircraft and the

[69] Katie Shepherd, "Portland Police Suspend Use of 'Flash-Bang' Grenades After Reports That Several Protesters Were Severely Injured By the Weapons," *Willamette Week*, August 6, 2018, https://www.wweek.com/news/courts/2018/08/06/portland-police-suspend-use-of-flash-bang-grenades-after-reports-that-several-protesters-were-severely-injured-by-the-weapons/.

[70] *Ignition* refers to the initiation of a flash-bang. Flash-bangs do not *detonate* because they use a deflagrating explosive rather than a detonating explosive. Detonating explosives are initiated by a supersonic shock wave, whereas deflagrating explosives are initiated by combustion. Sid Heal, *Diversionary Devices Manual*, National Tactical Officers Association, pp. 44, 136-137, https://ntoacommandcollege.org/wp-content/uploads/2019/02/Diversionary-Devices.pdf; and R.T. Wyantt, "Prevailing Less Lethal Options for Law Enforcement," in *Risk Management of Less Lethal Options: Evaluation, Deployment, Aftermath, and Forensics*, 1st ed. (Boca Raton, FL: CRC Press, 2014), p. 65.

[71] For examples of battery-powered flash bangs, see EOD, "Electronic Flash Bang," https://www.eod-gear.com/electronic-flash-bang/, accessed January 10, 2025; NEXTORCH, "NEXTORCH ND30 11,000 Lumen Distraction Device," https://www.nextorch.com/products/nextorch-nd30-11-000-lumen-flash-bang-distraction-device, accessed January 10, 2025; and FoxFury Lighting Solutions, "T.E.D.D. - Tactical Electronic Distraction Device," https://www.foxfury.com/t-e-d-d-tactical-electronic-distraction-device/, accessed January 10, 2025.

[72] Upon ignition, explosive-based flash-bangs emit light and sound for a few seconds. In contrast, battery-powered flash-bangs can emit effects for 10-30 seconds, with one device (the T.E.D.D.) advertising "60 minutes of continuous light and sounds." EOD, "Electronic Flash Bang," https://www.eod-gear.com/electronic-flash-bang/, accessed January 10, 2025; NEXTORCH, "NEXTORCH ND30 11,000 Lumen Distraction Device," https://www.nextorch.com/products/nextorch-nd30-11-000-lumen-flash-bang-distraction-device, accessed January 10, 2025; Police Ballistic Shield, Inc., "T.E.D.D. (Tactical Electronic Distraction Device)," https://policeballisticshield.com/t-e-d-d, accessed January 10, 2025; and FoxFury Lighting Solutions, "T.E.D.D. - Tactical Electronic Distraction Device," https://www.foxfury.com/t-e-d-d-tactical-electronic-distraction-device/, accessed January 10, 2025.

[73] FoxFury Lighting Solutions, "T.E.D.D. - Tactical Electronic Distraction Device," https://www.foxfury.com/t-e-d-d-tactical-electronic-distraction-device/, accessed January 10, 2025.

[74] Explosive-based flash-bangs can generate up to 180 decibels of sound. In contrast, most battery flash-bangs can only generate up to 120-130 decibels. R.T. Wyantt, "Prevailing Less Lethal Options for Law Enforcement," in *Risk Management of Less Lethal Options: Evaluation, Deployment, Aftermath, and Forensics*, 1st ed. (Boca Raton, FL: CRC Press, 2014), p. 63; EOD, "Electronic Flash Bang," https://www.eod-gear.com/electronic-flash-bang/, accessed January 10, 2025; NEXTORCH, "NEXTORCH ND30 11,000 Lumen Distraction Device," https://www.nextorch.com/products/nextorch-nd30-11-000-lumen-flash-bang-distraction-device, accessed January 10, 2025; Police Ballistic Shield, Inc., "T.E.D.D. (Tactical Electronic Distraction Device)," https://policeballisticshield.com/t-e-d-d, accessed January 10, 2025; and FoxFury Lighting Solutions, "T.E.D.D. - Tactical Electronic Distraction Device," https://www.foxfury.com/t-e-d-d-tactical-electronic-distraction-device/, accessed January 10, 2025.

equipment necessary for the safe and efficient operation of that aircraft.[75] As an increasing number of law enforcement agencies and departments purchase and use drones for a host of law enforcement purposes,[76] some policymakers have expressed interest in equipping drones with LLWs to incapacitate ground-based targets. For example, a legislative proposal in the 118th Congress (H.R. 5879) would have directed the Federal Aviation Administration (FAA) to study the "process of assessing and validating conducted energy devices or other non-lethal de-escalation equipment that may be attached to unmanned aircraft."

Although less-than-lethal weaponized drones are not currently in use by U.S. law enforcement, there are a number of less-than-lethal drones in development, equipped with BFPs, CEDs, chemical irritants, and LRADs.[77] Proponents argue that law enforcement officers can employ less-than-lethal weaponized drones to subdue violent rioters, apprehend persons with high-risk arrest warrants, and even incapacitate school shooters without risk of serious injury to the officer or targeted personnel.[78] However, some question whether less-than-lethal weaponized drones can accurately and effectively target specific persons without putting innocent bystanders at risk.[79] Others also caution that less-than-lethal weaponized drones are highly dependent on wireless systems, which creates a number of cybersecurity risks hackers could exploit.[80]

The use of drones equipped with LLWs also raises legal concerns. Section 363 of the FAA Reauthorization Act of 2018 (P.L. 115-254) prohibits the operation of drones armed with a

[75] 49 U.S.C. §44801(12).

[76] For an overview of law enforcement use of drones, see CRS Report R47660, *Law Enforcement and Technology: Use of Unmanned Aircraft Systems*, by Kristin Finklea.

[77] Some foreign police departments have reportedly purchased the "Skunk": a less-than-lethal drone equipped with paintballs, plastic balls, and other counter-personnel ammunition. See David Smith, "Drone with Pepper Spray Offered for Strike Control in South Africa," *Irish Times*, June 21, 2014, https://www.irishtimes.com/news/world/africa/drone-with-pepper-spray-offered-for-strike-control-in-south-africa-1.1840343. The manufacturer of the TASER also announced its intention to develop a "TASER drone system as part of a long-term plan to stop mass shootings" in 2022. However, the project is currently paused due to concerns raised by the company's ethics advisory panel. For more information, see AXON, "AXON Committed to Listening and Learning So That We Can Fulfill Our Mission to Protect Life, Together," press release, June 5, 2022, https://www.axon.com/news/technology/axon-committed-to-listening-and-learning.

[78] For example, during a May 2024 House Homeland Security Committee hearing, one Representative voiced his support for "TASER drones." Speaking to his experience as a former law enforcement officer, the Representative noted that "when we would have high-risk warrants, we would send a drone overhead just to evaluate the situation ... eventually we should put non-lethal [weapons] on drones ... use one to tase somebody ... I think it's go[ing to] save officers' lives." U.S. Congress, House Homeland Security Committee, the Subcommittee on Emergency Management and Technology and the Subcommittee on Counterterrorism, Law Enforcement, and Intelligence, Joint Hearing on Unmanned Aerial Systems and Emergency Response: *The Impact of Drones and Other Emerging Technology on U.S. Law Enforcement*, 118th Cong., 2nd sess., May 16, 2024.; H. Wingo, "Set Your Drones to Stun: Quadcopters to Disrupt Active Shooters," *Journal of Information Warfare*, vol. 17, no. 2 (Spring 2018), pp. 54-64; David Smith, "Drone with Pepper Spray Offered for Strike Control in South Africa," *Irish Times*, June 21, 2014, https://www.irishtimes.com/news/world/africa/drone-with-pepper-spray-offered-for-strike-control-in-south-africa-1.1840343.

[79] Christian Enemark, "Armed Drones and Ethical Policing: Risk, Perception, and the Tele-Present Officer," *Criminal Justice Ethics*, vol. 40, no. 2 (2021), p. 136; and Michael Board, "Bill proposes use of drones equipped with pepper spray at Texas schools that can't afford armed security," *MSN*, November 15, 2024, https://www.msn.com/en-us/news/technology/bill-proposes-use-of-drones-equipped-with-pepper-spray-at-texas-schools-that-can-t-afford-armed-security/ar-AA1u9r9z?ocid=BingNewsSerp.

[80] Kim Hartmann and Christoph Steup, "The vulnerability of UAVs to cyber attacks - An approach to the risk assessment," *Proceedings of the 5th International Conference on Cyber Conflict*, 2013, pp. 1-23, https://ieeexplore.ieee.org/document/6568373. It is worth noting that less-than-lethal drones would require the use of powerful camera technology to identify targets, which some warn could lead to "real time, persistent surveillance" that may disproportionally impact overpoliced communities. See Policing Project, "Statement of Resigning AXON AI Ethics Board Members," June 6, 2022, https://www.policingproject.org/statement-of-resigning-axon-ai-ethics-board-members.

"dangerous weapon" as defined in 18 U.S.C. §930(g)(2), absent specific authorization by the FAA administrator. In turn, a "dangerous weapon" is an item "that is used for, or is readily capable of, causing death or serious bodily injury" (minus certain pocket knives).[81] While some courts have previously classified certain LLWs, such as stun guns, as dangerous weapons, application of the definition to many other LLWs is an open question.[82] Because the courts have not directly examined the scope of what LLWs constitute dangerous weapons, the legality of equipping LLWs (at least without FAA authorization) on drones remains largely unresolved.

LLW Use-of-Force Policies

Law enforcement is permitted to use force to maintain law and order.[83] However, the Fourth Amendment places limitations on the degree to which police may exert lethal and less-than-lethal force during the course of duty. As determined by the Supreme Court in *Graham v. Connor*, 490 U.S. 86 (1980), law enforcement officers' use of force must be "objectively reasonable" in view of the totality of the facts and circumstances of the case.

Given that objective reasonableness is situationally dependent and a fact-intensive inquiry, it is difficult to make generalizations about when the use of force is appropriate, including the use of less-than-lethal force.[84] Consequently, most law enforcement agencies have adopted department-specific use-of-force policies to clarify the circumstances in which officers are permitted to use force. Per a 2016 NIJ-funded study, 80% of law enforcement agencies surveyed utilized a *force continuum*, composed of different levels, that provides detailed descriptions on the degree of force that may be used corresponding with the severity of the situation.[85] However, because there is no standardized use-of-force policy required across all law enforcement agencies, it was observed that use-of-force policies, particularly involving the appropriate use of LLWs, varied widely from jurisdiction to jurisdiction.[86]

LLW Regulation Under Federal Firearms Laws

Federal firearms laws do not define the term *less-than-lethal*. As such, the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF)—the principal federal authority tasked with classifying firearms under federal law—must classify each device, regardless of whether it is purported to be an LLW, based on the device's objective design features, whether the device is a weapon and whether it meets the definition of a "firearm" under the Gun Control Act of 1968 (GCA) and the National Firearms Act (NFA).[87] The GCA and NFA define a firearm to include any weapon that

[81] 18 U.S.C. §930(g)(2).

[82] *United States v. Wallace*, 800 F.2d 1509 (9th Cir 1986).

[83] For a legal discussion on the power and authority of police under state law, as well as the limitations on police authority as mandated under the U.S. Constitution, see John C. Klotter, *Legal Guide for Police: Constitutional Issues*, 9th ed. (Burlington, MA: Elsevier Inc., 2011), pp. 17-23.

[84] There exists some case law specific to reasonable use of weapons marketed as LLWs. For a brief discussion of case law related to the discharge of pepper sprays and CEDs, see CRS Legal Sidebar LSB10516, *Police Use of Force: Overview and Considerations for Congress*, by Michael A. Foster; and CRS In Focus IF12841, *Stun Guns, TASERs, and other Conducted Energy Devices: Issues for Congress*, by Jordan B. Cohen, Matthew D. Trout, and Jillian Long.

[85] William Terrill and Eugene Paoline, "Examining Less Lethal Force Policy and the Force Continuum: Results From a National Use-of-Force Study," *Police Quarterly*, vol. 16, no. 1 (2012), p. 45.

[86] William Terrill and Eugene Paoline, "Examining Less Lethal Force Policy and the Force Continuum: Results From a National Use-of-Force Study," *Police Quarterly*, vol. 16, no. 1 (2012), p. 57.

[87] ATF, "Firearms and Ammunition Technology," https://www.atf.gov/firearms/firearms-and-ammunition-technology, accessed November 5, 2024.

expels a projectile by action of an explosive.[88] Because federal firearms laws do not contain an exemption for LLWs, ATF has previously classified certain LLWs as firearms, including the following:

- **Explosive-Propellant Flash-Bangs.** Explosive-propellant flash-bangs are regulated as "destructive devices" and "firearms" under the GCA and NFA. The GCA and NFA, among other things, define a destructive device to include any "explosive, incendiary, or poison gas."[89] Because flash-bangs that use an explosive propellant (e.g., flash powder) are classified as an explosive by ATF, the weapons are regulated as destructive devices under the GCA and NFA.[90] Explosive-propellant flash-bangs are also classified and regulated as firearms because the GCA and NFA define a firearm to include any destructive device.[91]
- **Blunt-Force Projectile Guns.** Certain BFP guns are regulated as "destructive devices" and "firearms" under the GCA and NFA. Both the NFA and GCA define a destructive device to include any weapon designed with a barrel bore diameter greater than one-half inch that is capable of expelling a projectile by action of an explosive or propellant.[92] Therefore, blunt-force projectile guns with a barrel bore greater than one-half inch, that fire a projectile by means of an explosive, and when possessed with counter-personnel munition (such as pepper spray balls) are capable of use as a weapon are regulated as destructive devices under the GCA and NFA.[93] Moreover, because the GCA and NFA define a firearm to include any destructive device, any BFP gun classified as a destructive device is also classified and regulated as a firearm under the GCA and NFA.[94] However, other blunt-force projectile guns, like paintball guns, that use compressed air instead of the action of an explosive to expel a projectile are not classified as firearms under the GCA or NFA.[95]
- **Tear Gas Launchers**. Tear gas launchers capable of chambering and firing a self-contained cartridge are regulated as "firearms" under the GCA and "any other weapon" under the NFA because the launchers are (1) weapons intended for offensive or defensive use, (2) capable of firing by action of an explosive, (3) capable of being concealed on the person, and (4) designed without a rifled bore (a distinction the NFA draws because weapons lacking rifled bores are generally less accurate and more dangerous).[96]

[88] 18 U.S.C. §921(a)(3); 26 U.S.C. §5845(a).

[89] 18 U.S.C. §921(a)(4); 26 U.S.C. §5845(f).

[90] 18 U.S.C. §921(a)(4); 26 U.S.C. §5845(f). Flash-bangs are classified and regulated as explosives under Federal explosives law (Title 18 U.S.C. Chapter 40) and the Organized Crime Control Act. For more information, see ATF, *Explosives Industry Newsletter*, December 2003, p. 3, https://www.atf.gov/file/56536/download; and ATF, *Notification for Previously Exempted Special Explosive Devices*, November 2, 2023, https://www.atf.gov/file/185766/download.

[91] 18 U.S.C. §921(a)(3); 26 U.S.C. §5845(a).

[92] 18 U.S.C. §921(a)(4); 26 U.S.C. §5845(f).

[93] ATF, *ATF Rul. 95-3*, https://www.atf.gov/firearms/docs/ruling/1995-3-3738mm-gasflare-guns-anti-personnel-ammunition-are-defined-nfa-weapons/download.

[94] 18 U.S.C. §921(a)(3); 26 U.S.C. §5845(a).

[95] ATF, *ATF Rul. 2005-4*, https://www.atf.gov/file/55371/download.

[96] 26 U.S.C. §5845(e); and ATF, *Firearms Guide: Identification of Firearms Within the Purview of the National Firearms Act*, September 22, 2016, https://www.atf.gov/firearms/firearms-guide-identification-firearms-section-10#tear-gas-gun-12ga.

- **Rifled Bore TASERs.** Most TASERs manufactured today are not regulated by the GCA or NFA because the weapons use compressed nitrogen gas to expel electrodes.[97] Nevertheless, there exists one TASER model (TASER 10) that is regulated as a "firearm" under the GCA because it expels electrodes using an explosive propellant.[98] However, TASERs classified as firearms, with a hand grip bent at an angle to the bore and rifled bore(s), are not regulated under the NFA because the design feature qualifies the weapon for the exclusion found in the act's "any other weapon" definition for weapons having a rifled bore.[99]

LLWs regulated under federal firearms laws are subject to specific interstate transfer restrictions and certain registration requirements. The GCA generally prohibits the interstate shipment of firearms to unlicensed persons.[100] Likewise, the NFA generally imposes an excise tax on the transfer and making of all NFA firearms.[101] However, law enforcement agencies are not typically subject to these restrictions, as the GCA and NFA contain exemptions for qualifying governmental entities.[102]

Policy Considerations

Congress may consider several policy issues concerning LLWs, including how the term is defined, how LLWs should be federally regulated in a law enforcement context (if at all), and legislative actions to influence LLW use among law enforcement.

Evaluating the Need for a Federal Definition

Congress may evaluate the necessity of establishing a statutory definition of LLWs. On the one hand, codifying a definition of LLWs may be beneficial for regulatory purposes. The efficacy of potential regulatory efforts may depend on what weapons are (and are not) classified as less-than-lethal. Moreover, if Congress passes legislation influencing law enforcement officers' use of LLWs, it may be useful to communicate a clear definition of LLWs to the affected law enforcement agencies and officers. On the other hand, policymakers may leave the term undefined. Given that the responsibilities of a law enforcement officer are often agency-dependent, some may argue that individual law enforcement agencies and departments are best

[97] AXON, *TASER Pulse Energy Weapon: User Manual*, December 2022, p. 19, https://cdn.mediavalet.com/usva/axon/4YPvBcas9kqdmbnR29KnZQ/J-65DgFPf0upwfLislnZNg/Original/TASER%20Manual%20Civilian%20Pulse.pdf.

[98] International Association of Chiefs of Police, *Electronic Control Weapons*, September 2023, Footnote 15, https://www.theiacp.org/sites/default/files/2023-09/Electronic%20Control%20Weapons%20-%202023.09.pdf#page=11.

[99] ATF, *ATF Rul. 80-20*, https://www.atf.gov/firearms/docs/ruling/1980-20-rifle-bore-tasers-firearms/download.

[100] 18 U.S.C. §922.

[101] 26 U.S.C. §5811; 26 U.S.C. §5812.

[102] 18 U.S.C. §925(a)(1); 26 U.S.C. §5853. Tribal police departments generally do not qualify for the exemptions in 18 U.S.C. §925(a)(1) and 26 U.S.C. §5853 because Native American tribes and their police departments are not "part of, or agencies of, the United States government, or of a State government or political subdivision of a state." Nevertheless, ATF has recognized that tribal police departments that are deputized by the Bureau of Indian Affairs, the Department of the Interior, or a qualifying federal, state, or local law enforcement agency may qualify for the interstate transfer and tax exemptions in the GCA and NFA. However, non-deputized tribal police departments are not barred from obtaining regulated weapons and may obtain these weapons (including GCA-regulated LLWs) like any other private citizen. For more information, see ATF, *NFA Transfers to Tribal Police Departments*, Washington, DC, August 14, 2006, https://www.atf.gov/rules-and-regulations/nfa-transfers-tribal-police-departments.

suited to determine the definition of LLWs based on the organization's unique needs and circumstances.[103]

In questioning whether to define LLWs in federal statute, policymakers may also debate the usefulness of having a distinct class of weapons considered as less-than-lethal, when used as designed and intended. If LLWs only share an *intended use* to minimize loss of life, perhaps LLWs should simply be considered conventional weapons. Moreover, some may caution that affording certain weapons or a class of weapons a special less-than-lethal status may lead law enforcement agencies to adopt less restrictive LLW use-of-force policies due to the weapons' perceived nonlethality.[104] Others may argue that establishing LLWs as a distinct class of weapons poses two important implications for law enforcement: (1) LLWs may provide an alternative to the use of deadly force, such as conventionally lethal weapons, by not "offending" an individual's right to life and due process and (2) the use of LLWs may reduce civil liability lawsuits alleging police unreasonable use of force, which have caused "financial hardship" for a "growing number of communities."[105]

Federal Classification of LLWs

Should Congress choose to establish a statutory definition of LLWs, it may also consider additional measures to classify specific types of LLWs. Given the diversity of weapons marketed as less-than-lethal, some observers argue that a "stronger program to understand and characterize the effects and effectiveness" of LLWs is necessary to resolve disagreements about what weapons are less-than-lethal and provide guidance to LLW developers on how to successfully create new and improved LLWs. [106]

There are a number of federal agencies currently involved in the regulation of weapons purported to be less-than-lethal. For example, ATF oversees the regulation of all weapons classified as firearms under the GCA and NFA (regardless of whether the weapon is an LLW), the FAA regulates unmanned aircraft systems (including those equipped with LLWs), and the Food and Drug Administration (FDA) classifies radiation-emitting electronics (including LLWs, such as stun guns).[107] Policymakers could consider directing one of these agencies, a new agency, or multiple federal agencies to develop an LLW classification schema and maintain a publicly available list of weapons classified as less-than-lethal, when used as designed and intended.

[103] Law enforcement agencies and departments have unique jurisdictions and duties. For example, correctional officers employed at BOP are principally responsible for enforcing the rules and regulations inside federal prisons and jails, whereas ATF special agents are tasked with investigating violations of federal firearms and explosives laws.

[104] For example, in a study on police use of force, NIJ found that "some officers may turn to a CED too early in an encounter and may rely on a CED rather than on their conflict resolution skills or even on hands-on applications." Philip Bulman, *Police Use of Force: The Impact of Less-Lethal Weapons and Tactics*, DOJ, NIJ, March 2, 2011, https://nij.ojp.gov/topics/articles/police-use-force-impact-less-lethal-weapons-and-tactics.

[105] DOJ, NIJ, *Report on the Attorney General's Conference on Less Than Lethal Weapons*, March 1987, p. iii, https://www.ojp.gov/pdffiles1/Digitization/105195NCJRS.pdf; and Amelia Thomson-DeVeaux, Laura Bronner, and Damini Sharma, "Cities Spend Millions On Police Misconduct Every Year. Here's Why It's So Difficult to Hold Departments Accountable," *FiveThirtyEight*, February, 22, 2021, https://fivethirtyeight.com/features/police-misconduct-costs-cities-millions-every-year-but-thats-where-the-accountability-ends/.

[106] Naval Studies Board, *An Assessment of Non-Lethal Weapons Science and Technology*, Washington, DC, 2003, p. 7, https://nap.nationalacademies.org/catalog/10538/an-assessment-of-non-lethal-weapons-science-and-technology.

[107] FDA, *Stun Gun Product Classification*, https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPCD/classification.cfm?ID=RDL.

Collecting Data on Law Enforcement LLW Usage

Because most LLWs are used primarily to subdue or incapacitate personnel by inflicting pain, the potential for excessive use of LLWs by law enforcement remains a subject of concern. Recently, a number of police departments have faced backlash for their use of LLWs. In June 2024, for example, Phoenix Police Department officers were criticized for repeatedly tasing a deaf man suspected of assault.[108] Similarly, in June 2024, a jury found that a former Maryland police officer's use of pepper spray to subdue a "mouthy" suspect constituted excessive force.[109]

An underlying concern about potential excessive use of LLWs by law enforcement is the lack of data available on federal, state, and local law enforcement use of LLWs.[110] While the Bureau of Justice Statistics' LEMAS survey collects some data on local, county, and state law enforcement authorization to use certain LLWs, the survey does not collect any data from federal law enforcement agencies or any information about actual incidents of LLW usage. Moreover, the FBI's National Use-of-Force data collection system (a program that collects national-level statistics on federal, state, local, and tribal law enforcement use-of-force incidents) has not publicly released any incident data due to insufficient participation from law enforcement agencies (law enforcement agency participation in this program is voluntary).[111]

Further complicating matters is the limited number of studies analyzing the outcomes associated with differential treatment of LLWs in use-of-force policies. Substantial variations exist across law enforcement agencies in regard to the treatment of LLWs in these policies.[112] While a 2017 NIJ-funded study comparing three different police departments' use-of-force policies found that the "officers working in the agency with the least restrictive [less-than-lethal use-of-force policy] were more apt to use force" compared to the agencies with more restrictive use-of-force polices, the study did not investigate the health outcomes associated with these policies (i.e., whether specific use of force policies led to a reduction in citizen and police injuries) or whether the policies were associated with fewer citizen complaints and police misconduct lawsuits.[113]

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[108] Minyvonne Burke, "Charges dismissed against deaf man with cerebral palsy who was tased and repeatedly punched by Phoenix police," *NBC News*, October, 19, 2024, https://www.nbcnews.com/news/us-news/charges-dismissed-deaf-man-cerebral-palsy-was-tased-repeatedly-punched-rcna176231.

[109] Julia Marnin, "Cop pepper-sprays driver 'for mouthing off,' then lies about what happened, feds say," *MSN*, June 18, 2024, https://www.msn.com/en-us/news/crime/cop-pepper-sprays-driver-for-mouthing-off-then-lies-about-what-happened-feds-say/ar-BB1osdaG.

[110] For an overview of U.S. federal agency efforts to collect data on police use of force, see CRS In Focus IF10572, *What Role Might the Federal Government Play in Law Enforcement Reform?*, by Nathan James and Ben Harrington.

[111] FBI, "National Use-of-Force Data Collection," https://www.fbi.gov/how-we-can-help-you/more-fbi-services-and-information/ucr/use-of-force, accessed December 13, 2024; and FBI, "FBI Releases 2024 Quarterly Crime Report and Use-of-Force Data Update," press release, June 10, 2024, https://www.fbi.gov/news/press-releases/fbi-releases-2024-quarterly-crime-report-and-use-of-force-data-update.

[112] For example, ICE authorizes officers to use LLWs if a detainee is armed and/or barricaded or cannot be approached without danger to self or others, or if a delay in controlling the situation would seriously endanger the detainee or others or would result in a major disturbance or serious property damages. In contrast to ICE, CBP has different LLW use-of-force guidelines for crowd control situations and one-on-one encounters. CBP also has specific use-of-force guidelines for each type of authorized LLW. For a discussion of LLW use-of-force policies, see DHS, ICE, "Use of Force and Restraints," *National Detention Standards*, 2019, pp. 48-49, https://www.ice.gov/doclib/detention-standards/2019/2_8.pdf#:~:text=For%20the%20purpose%20of%20these%20standards%2C%20force%20is,reasonable%20efforts%20to%20resolve%20a%20situation%20have%20failed; and DHS, CBP, *CBP Use of Force Policy, Law Enforcement Safety and Compliance Directorate Operations Support 4500-002A*, January 2021, pp. 11-26, https://www.cbp.gov/sites/default/files/assets/documents/2021-Jul/cbp-use-of-force-policy_4500-002A.pdf.

[113] William Terrill and Eugene Paoline, "Police Use of Less Lethal Force: Does Administrative Policy Matter?," *Justice Quarterly*, vol. 34, no. 2 (2017), p. 210.

The principal investigators of a 2012 NIJ-funded study on police LLW use-of-force policies reported that the greatest challenge facing law enforcement was determining the proper placement of LLWs, such as CEDs and chemical irritants, in the use-of-force continuum.[114] As new and more complex LLWs continue to emerge, policymakers could take action to ensure there is appropriate guidance for federal law enforcement use of LLWs. For instance, Congress could consider directing a federal agency to create standardized use-of-force guidelines and mandating the guidelines' adoption among all federal agencies. Alternatively, Congress could continue allowing federal agencies to develop individualized use-of-force policies based on their unique needs and duties. In addition, Congress could consider directing a federal agency or department to collect data on LLW usage and injury outcomes associated with different LLW use-of-force policies.

Analyzing Health Effects of LLWs

Although touted as alternatives to lethal weapons, LLWs are not without risk of serious injury or death. A team of journalists led by the Associated Press, in collaboration with the Howard Center for Investigative Journalism programs at the University of Maryland and Arizona State University, documented over 1,000 deaths after local and state police officers' use of less-than-lethal force from 2012 to 2021.[115] Similarly, a Reuters investigation of deaths related to law enforcement use of CEDs found that 1,081 individuals had died after being shocked by a police TASER from 1983 to 2017. [116] Of those fatalities, 273 deaths involved a person showing signs of mental illness, emotional distress, or a neurological disorder and 245 deaths involved individuals with a heart condition.[117]

A number of difficulties emerge when attempting to assess the mortality risks associated with LLW use. Although the FBI's National Use-of-Force database collects incident data on law enforcement use of specific types of LLWs (such as TASERs), the FBI will not publicly release the incident data until 80% of U.S. law enforcement agencies respond to the survey.[118] Without access to a national database tracking incidents of law enforcement LLW deployment, researchers must rely on limited data sources, such as media reports, which are less likely to report non-fatal LLW incidents due to a perceived lack of "newsworthiness."[119] Additionally, law enforcement officers often employ LLWs in combination with other forms of force, making it difficult to identify the exact cause of death. For example, in a review of 400 deaths associated with law enforcement use of TASERs, Reuters noted that only 25% of cases indicated that TASERs were

[114] William Terrill and Eugene Paoline, "Examining Less Lethal Force Policy and the Force Continuum: Results From a National Use-of-Force Study," *Police Quarterly*, vol. 16, no. 1 (2012), pp. 57-61.

[115] Reese Dunklin et. al, "Why did more than 1,000 people die after police subdued them with force that isn't meant to kill?," Associated Press, March 28, 2024, https://apnews.com/article/associated-press-investigation-deaths-police-encounters-02881a2bd3fbeb1fc31af9208bb0e310.

[116] Reuters, "A Reuters Examination of 1,081 Deaths involving Tasers," 2019, https://www.reuters.com/investigates/special-report/usa-taser-database/.

[117] Reuters, "A Reuters Examination of 1,081 Deaths involving Tasers," 2019, https://www.reuters.com/investigates/special-report/usa-taser-database/.

[118] As of September 2024, 72% of U.S. law enforcement agencies were participating in the FBI's National Use-of-Force data collection. FBI, "FBI Releases 2024 Quarterly Crime Report and Use-of-Force Data Update," press release, September 30, 2024, https://www.fbi.gov/news/press-releases/fbi-releases-2024-quarterly-crime-report-and-use-of-force-data-update-q2; and FBI, "Crime Data Explorer: National Use-of-Force Data Collection," https://cde.ucr.cjis.gov/LATEST/webapp/#/pages/le/uof, accessed December 13, 2024;

[119] Michael D. White and Justin Ready, "Examining Fatal and Nonfatal Incidents involving the TASER," *Criminology & Public Policy*, vol. 8, no. 4 (November 18, 2009), p. 871.

the only use of force employed.[120] Moreover, persons who died from law enforcement use of CEDs and chemical irritants often had physical disabilities, mental disabilities, or underlying health conditions or were under the influence of drugs, creating ambiguity about the precise role of LLWs in fatal encounters.[121]

In light of these concerns, policymakers could consider legislative actions to research the potential health effects caused by various LLWs. While the NIJ began conducting a study in 2024 to address mortality risks associated with law enforcement usage of CEDs, few other federal agencies have published mortality statistics associated with law enforcement usage of other types of LLWs.[122] Congress may wish to direct a federal agency or department to conduct research on LLW mortality and serious injury rates, with a particular focus toward situations involving persons with known disabilities or certain health conditions. Based on these findings, policymakers could consider legislative actions to limit federal funding for LLWs that are deemed to consistently produce high fatality or injury rates.

Influencing Law Enforcement Use of LLWs

While federalism principles limit Congress's ability to pass laws directly impacting state and local law enforcement departments, it has broader authority to regulate federal law enforcement officers and agencies.[123] Policymakers could consider influencing LLW adoption by passing a bill encouraging or limiting federal law enforcement officers' usage of LLWs. Legislation influencing federal law enforcement LLW usage may also affect LLW usage among state and local law enforcement, as federal law enforcement agencies have been found to "skew the market and affect the technologies available to state and local agencies."[124]

In addition, Congress could consider options to affect LLW acquisition barriers for state and local law enforcement departments. The largest barrier law enforcement departments face is financial. Most law enforcement budgets are 80%-95% personnel, leaving little money left over for the purchase of new capital.[125] Some state governments have attempted to overcome this barrier by providing grants to state and local law enforcement for the purchase of LLWs.[126] Should Congress wish to similarly influence LLW usage, it could consider placing provisions or withholdings on existing federal grant programs, such as the Edward Byrne Memorial Justice

[120] Reuters, "A Reuters Examination of 1,081 Deaths involving Tasers," 2019, https://www.reuters.com/investigates/special-report/usa-taser-database/.

[121] John Gransfield, Jami Onnen, and Charles Petty, *Pepper Spray and In-Custody Deaths*, International Association of Chiefs of Police, executive brief, March 1994, p. 3, https://www.aele.org/law/2009all01/iacp-oc-deaths1994.pdf; and Amnesty International, *Amnesty International's Concerns about Taser Use: Statement to the US Justice Department Inquiry into Deaths in Custody*, 2007, p. 2, https://www.amnesty.org/en/wp-content/uploads/2021/05/AMR511512007ENGLISH.pdf.

[122] DOJ, OJP, NIJ, *Study of Deaths Following Electro-Muscular Disruption: Interim Report*," June 8, 2024, https://www.ojp.gov/pdffiles1/nij/222981.pdf.

[123] For more information, see CRS Legal Sidebar LSB10487, *Congress and Law Enforcement Reform: Constitutional Authority*, by Whitney K. Novak.

[124] Annmarie Cordner and Gary Cordner, "Overview of Law Enforcement Technology," in *Criminal Justice Technology in the 21st Century*, ed. Laura Moriarty, 3rd ed. (Springfield, IL: Charles C. Thomas Publisher, Ltd., 2017), p. 63.

[125] W. Dwayne Orrick, *Best Practices Guide for Budgeting in Small Police Agencies*, International Association of Chiefs of Police, p. 2, https://www.theiacp.org/sites/default/files/2018-08/BP-Budgeting.pdf; and Annmarie Cordner and Gary Cordner, "Overview of Law Enforcement Technology," in *Criminal Justice Technology in the 21st Century*, ed. Laura Moriarty, 3rd ed. (Springfield, IL: Charles C. Thomas Publisher, Ltd., 2017), p. 60.

[126] Illinois Criminal Justice Information Authority, *Less Lethal Alternatives for Law Enforcement*, https://icjia.illinois.gov/grants/programs/less-lethal-alternatives-for-law-enforcement/.

Assistance Grant (JAG) program, to incentivize or discourage state and local law enforcement usage of LLWs.[127]

Some policymakers have also proposed influencing law enforcement use of LLWs by defining LLWs and exempting such weapons from federal firearms laws.[128] On the one hand, exempting LLWs from federal firearms laws could increase LLW usage among certain law enforcement agencies, like tribal police departments, who do not generally qualify for the exemptions in 18 U.S.C. §925(a)(1) and 26 U.S.C. §5853.[129] Exempting LLWs from federal firearm laws could also promote LLW usage in jurisdictions where the use of any weapon classified as a firearm (regardless of whether it is marketed as less-than-lethal) constitutes deadly force, which some observers argue makes law enforcement officers reluctant to employ GCA- or NFA-regulated LLWs.[130] On the other hand, exempting LLWs from federal firearms law may have a relatively minor impact on law enforcement use of LLWs because (1) few LLWs are currently regulated under the GCA and NFA, (2) federal firearms laws contain provisions exempting qualifying law enforcement agencies from the NFA excise taxes and the GCA intrastate transfer restrictions, and (3) law enforcement agencies may simply replace their current LLWs with the newly deregulated LLWs, which some manufacturers argue are more "technological[ly] advanced" versions of existing LLWs.[131]

[127] For more information on the JAG program, see CRS In Focus IF10691, *The Edward Byrne Memorial Justice Assistance Grant (JAG) Program*, by Nathan James.

[128] For instance, a measure introduced in the 118th Congress (H.R. 3269/S. 4255) would have defined and exempted "less-than-lethal projectile devices" from the GCA and NFA. Although outside the scope of this report, Congress may also wish to consider how exempting LLWs from federal firearms laws may affect civilian use of LLWs.

[129] For discussion of tribal police departments' ability to qualify for the exemptions in 18 U.S.C. §925(a)(1) and 26 U.S.C. §5853, see footnote 102.

[130] Representative Scott Fitzgerald, "Enhancing Law Enforcement Safety: Advocating for H.R. 3269," press release, May 7, 2024, https://fitzgerald.house.gov/media/in-the-news/enhancing-law-enforcement-safety-advocating-hr-3269.

[131] See "LLW Regulation Under Federal Firearms Laws;" AXON Enterprise, Inc., Form 10-K, Washington, DC, 2022, https://www.sec.gov/Archives/edgar/data/1069183/000155837023002413/axon-20221231x10k.htm.

Appendix. Law Enforcement Agencies that Authorize the Use of LLWs

Table A-1. Percentage of Local, County, and State Law Enforcement Agencies that Authorize the Use of Less-than-Lethal Weapons (LLWs)

	Authorization Percentage by Agency Type				
LLW Type and Authorization Level	**Sheriffs' Offices**	**Local Law Enforcement Agencies**	**County Law Enforcement Agencies**	**State Law Enforcement Agencies**	**Total**
Conducted energy devices					
Authorized	96.7%	92.7%	98.5%	100%	96.7%
Almost always or always authorized	61.0%	53.2%	45.8%	60.4%	61.0%
Authorized under limited circumstances	35.7%	39.5%	52.7%	39.6%	35.7%
OC spray					
Authorized	94.4%	94.8%	88.6%	100.0%	94.4%
Almost always or always authorized	64.4%	56.7%	48.8%	66.7%	64.4%
Authorized under limited circumstances	30.0%	38.1%	39.8%	33.3%	30.0%
Baton					
Authorized	88.9%	91.8%	77.7%	97.9%	88.9%
Almost always or always authorized	47.1%	45.9%	23.3%	62.5%	47.1%
Authorized under limited circumstances	41.8%	45.9%	49.7%	35.4%	41.8%
Chemical irritant projectile					
Authorized	77.1%	61.8%	77.7%	97.9%	77.1%
Almost always or always authorized	23.3%	17.9%	23.3%	27.1%	23.3%
Authorized under limited circumstances	53.9%	43.8%	54.5%	70.8%	53.9%
Blunt force projectile					
Authorized	73.4%	58.2%	76.2%	93.8%	73.4%
Almost always or always authorized	15.5%	13.4%	23.3%	20.8%	15.5%
Authorized under limited circumstances	57.8%	44.7%	53.0%	72.9%	57.8%

Source: CRS analysis of the Bureau of Justice Statistics, Law Enforcement Management and Administrative Statistics (LEMAS) survey, 2020.

Notes: Details may not sum to totals due to rounding.

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