

3-D Printed Firearms: How We Got Here, The Ever-Changing Threat, and How We Might Prepare for the Future

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ABSTRACT:

The advent and increasing affordability of 3-D printers has brought with it new problems as well. Commercially available printers allow users to print almost anything they can think of as long as they have a design file for it. Most users use these tools to print fairly innocuous items, ranging from prototypes or models to tools, toys, and jewelry. However, the 3-D printer has also brought with it the ability for users to print unregistered and untraceable firearms from the privacy of their own homes. This problem first materialized in 2012 with Defense Distributed, an open-source company that creates digital schematics for firearms that can be downloaded and used to print those firearms by anyone with a proper 3-D printer. Defense Distributed uploaded various computer aided design (CAD) files, including the plans for a single shot pistol, The Liberator. The United States government was quick to step in and force the company to take down the CAD files while they decided if distribution of the design constituted a violation of the International Traffic in Arms Regulations (ITAR). A change in administration resulted in the government settling with Defense Distributed out of court. The Department of State issued the company a license allowing them to again distribute the plans online and announced that 3-D gun blueprints would no longer fall under the purview of ITAR. Defense Distributed's victory was short lived as various states brought lawsuits against the company, seeking to stop the dissemination of the CAD files online. While these lawsuits are ongoing, a temporary injunction remains in place that still prohibits the publishing of the gun blueprints. More recently, Defense Distributed decided to sell a CNC milling machine that is very similar to a 3-D printer. This device uses CAD files as a guide to mill aluminum into metal firearm frames and parts, allowing owners to make untraceable firearms in their homes. While these machines do not "print" an entire weapon they still present a potential threat to public safety. The most pressing threat posed by unregulated firearms is the proliferation of at-home ghost gun kits. While the Department of Justice is on the verge of closing significant federal regulatory loopholes that have helped allow this rise in ghost guns, the surge is indicative of more problems to come. This note will describe all of the relevant background behind the 3-D printing of firearms and the evolving legal landscape. This note will then proceed to discuss the current proliferation of ghost gun kits since the beginning of the COVID-19 pandemic within the larger context of untraceable firearms. This note will also consider the existing major firearm regulatory schemes and if any of them could be used to regulate 3-D firearms in the future. Furthermore, this note addresses various constitutional hurdles that lawmakers face in attempting to regulate 3-D printed guns, the 3-D printers, or the 3-D blueprints. Lastly, this note will discuss potential solutions to the 3-D gun regulation problem and how they might be implemented sooner rather than later.

I. BACKGROUND

A. 3-D Printers Background

i. History

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Described simply, 3-D printing is the construction of a three-dimensional object from a digital blueprint or CAD model. In reality, the term covers a variety of processes and technologies through which a whole host of materials are deposited or joined together to create the desired object.¹ While the material can vary, such as being liquid or powder, the general procedure is the same. The material is placed or joined layer by layer in an additive process. The concept of 3-D printing dates all the way back to 1950, but it would take until the 1980s before the technology was at all workable.² The capabilities of 3-D printers today are far more expansive than what was first developed in the 1980s, with the technology set to revolutionize almost all fields of production.

The earliest functional 3-D printing technologies that appeared in the 1980s were referred to as rapid prototyping. This is because it was initially seen as nothing more than a much quicker and cost-effective alternative to creation of industrial prototypes.³ Modern 3-D printers are significantly more affordable and widely available. No longer reserved for prototype creation, 3-D printers are used to print medical devices, machine parts, and almost anything a user can think up.⁴

B. Defense Distributed Scandals and Lawsuits

i. Defense Distributed v. U.S Department of State⁵

A whole new aspect to the national gun debate materialized in 2012 when a 25 year-old University of Texas Law Student unveiled *The Liberator* to the world.⁶ Cody Wilson successfully printed and test-fired a single shot pistol using a 3-D printer he purchased off of eBay. He had taken his entirely plastic pistol to a remote Texas gun range and succeeded in firing a 0.380 caliber bullet with it. The self-styled crypto-anarchist moved to immediately begin disseminating the CAD files online through Defcad, the website for his company Defense Distributed.⁷ Wilson had started this site only months before test firing the *Liberator*. The site was an extension of his Anarchist manifesto and belief that technology supersedes the law.⁸ Wilson believes that gun control will be a thing of the past in a future where anyone can print a firearm from the comfort of their home. This is part of his larger world view where he hopes for the existence of ungovernable black markets and crypto currency that cannot be tracked, traced, or controlled in any way by the government.⁹ Following his decision to upload the *Liberator*

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¹ *The Free Beginner's Guide*, 3D PRINTING INDUSTRY, <https://3dprintingindustry.com/3d-printing-basics-free-beginners-guide>.

² *Id.*

³ *Id.*

⁴ *Id.*

⁵ *Washington v. United States Dep't of State*, 315 F. Supp. 3d 1202 (W.D. Wash. 2018).

⁶ Andy Greenberg, *A Landmark Legal Shift Opens Pandora's Box for DIY Guns*, WIRED, July 10, 2018, <https://www.wired.com/story/a-landmark-legal-shift-opens-pandoras-box-for-diy-guns/>.

⁷ *Id.*

⁸ *Id.*

⁹ Andy Greenberg, *Waiting for Dark: Inside Two Anarchists' Quest for Untraceable Money*, WIRED, July 11, 2014, <https://www.wired.com/2014/07/inside-dark-wallet/>.

CAD file to Defcad, the blueprint was downloaded over 100,000 times before he hit a roadblock.¹⁰

This new experiment lasted only several days before Wilson was contacted by members of the Obama administration, specifically the Department of State, Bureau of Political Military Affairs, Office of Defense Trade Controls Compliance, Enforcement Division (DTCC/END).¹¹ Wilson was ordered to remove the CAD files from his company's website while the DTCC/END undertook a review of "technical data made publicly available" to determine if Wilson had violated any parts of the International Traffic in Arms Regulations (ITAR).¹² ITAR serves as the implementing regulations for the Arms Export Control Act (AECA).¹³ The letter sent to Wilson informed him that "until the Department provides Defense Distributed with final [commodity jurisdiction] determinations, Defense Distributed should treat the above technical data as ITAR-controlled."¹⁴ Defense Distributed responded by bringing suit against the U.S. Department of State.¹⁵ The State Department eventually decided to settle with Defense Distributed and to allow the publishing of 3-D gun blueprints.¹⁶ This set off a series of additional lawsuits that currently leaves the CAD files unable to be published online and will be discussed in more detail later in this note.

ii. Defense Distributed v. Grewal¹⁷

In 2018, while Defense Distributed was embroiled in its lawsuit with the U.S. Department of State, New Jersey Attorney General Gurbir Grewal issued a cease-and-desist letter to the company. In the letter, Attorney General Grewal directed Defense Distributed "to cease and desist from publishing printable-gun computer files for use by New Jersey residents."¹⁸ Grewal detailed his various concerns including that anybody in the state, regardless of criminal or mental health history would be able to access the files, allowing them to print their own weapons even if they were not allowed to own them under state law. Attorney General Grewal further noted that "the files you plan to publish offer individuals, including criminals, codes that they can use to create untraceable firearms—and even to make assault weapons that are illegal in my state."¹⁹ Grewal made clear that if Defense Distributed did not comply with the demands in the letter, he would take legal action to prohibit the company from posting and distributing their CAD files.²⁰

¹⁰ *Id.*

¹¹ Andy Greenberg, *State Department Demands Takedown Of 3D-Printable Gun Files For Possible Export Control Violations*, FORBES, May 19, 2013, <https://www.forbes.com/sites/andygreenberg/2013/05/09/state-department-demands-takedown-of-3d-printable-gun-for-possible-export-control-violation/?sh=2a31806b375f>.

¹² *Id.*; 22 C.F.R. § 120-130.

¹³ 22 U.S.C. § 2551 et seq.

¹⁴ *Id.*

¹⁵ Greenberg, *supra* note 11.

¹⁶ Lisa C. Mays & Reid Whitten, *The United States Munitions List: When Guns Come Off of the ITAR*, NAT'L L. REV. (Sep. 14, 2017), <https://www.natlawreview.com/article/united-states-munitions-list-when-guns-come-itar>.

¹⁷ *Def. Distributed v. Grewal*, 971 F.3d 485 (5th Cir. 2020).

¹⁸ Letter from Gurbir S. Grewal, Attorney General, New Jersey, to Defense Distributed (July 26, 2018) (available at https://nj.gov/oag/newsreleases18/DIY-Guns_Cease-and-Desist.pdf).

¹⁹ *Id.*

²⁰ *Id.*

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Attorney General Grewal did in fact need to take legal action. In July of 2018, New Jersey joined Washington State and several other states in a suit aimed at the State Department, Defense Distributed, and the Second Amendment Foundation. The lawsuit sought to enjoin the federal government from implementing certain aspects of the settlement agreement that it reached with Defense Distributed.²¹ On July 31, the Judge in that case issued the requested temporary restraining.²² A month later, these plaintiffs succeeded in obtaining a preliminary injunction enjoining the federal government from implementing the settlement.²³

While this lawsuit was ongoing, Defense Distributed brought federal suit against Attorney General Grewal for his efforts to block their distribution of weapon design CAD files.²⁴ Attorney General Grewal contended that Texas lacked the jurisdiction over him and the case. The District Court Judge sided with Grewal, stating that “that none of the above actions establish minimum contacts between any of the Defendants and Texas.”²⁵ However, on appeal, the Fifth Circuit overruled this and held that Attorney Grewal’s “cease-and-desist letter delivered into Texas, and the letter itself gave rise to distinct tort causes of action, which alone constituted purposeful availment” sufficient for the Texas court to exercise jurisdiction over Defense Distributed's complaint.²⁶

iii. Ghost Gunner 3

Defense Distributed now sells a CNC milling machine, called the Ghost Gunner 3, that is quite similar to a 3-D printer.²⁷ It allows individuals to create 80 percent aluminum frame firearms from the privacy of their home. It is fully legal as long as the individual is creating the weapons for personal use and not for sale. The resulting firearms, while still detectable by metal detectors, are without serial numbers and unregistered, rendering them untraceable. This device costs only \$2,000 and has become increasingly popular during the COVID-19 pandemic.²⁸ This process is far more involved than printing an entire gun from one file, but can be learned by almost anybody. While not as easy as printing plastic guns, this makes creating untraceable and dangerous firearms easier.²⁹

C. Changes to the United States Munitions List

The U.S. Department of State’s decision to allow the distribution of 3-D gun files as part of their settlement with Defense Distributed was part of a larger move by the Trump Administration. Dating back to 2017, the Trump Administration had endeavored to alter the

²¹ Washington v. United States Dep’t of State, 315 F. Supp. 3d 1202 (W.D. Wash. 2018).

²² *Id.*

²³ Washington v. United States Dep’t of State, 318 F. Supp. 3d 1247 (W.D. Wash. 2018).

²⁴ Def. Distributed v. Grewal, 971 F.3d 485 (5th Cir. 2020).

²⁵ Def. Distributed v. Grewal, 364 F. Supp. 3d 681, 686 (W.D. Tex. 2019).

²⁶ Def. Distributed v. Grewal, 971 F.3d 485, 488 (5th Cir. 2020).

²⁷ William Dabs, *Ghost Gunner: Make Legal Lowers and More Without Big Brother Knowing*, BALLISTIC MAG. (July 26, 2019), <https://www.ballisticmag.com/2019/07/26/ghost-gunner-legal-firearm-parts/>.

²⁸ *Id.*

²⁹ *Id.*

export controls of various firearms, ammunition, and weapons technology.³⁰ Specifically, the changes involved removal of small arms from the United States Munitions Control List (USML). The USML was created by the Arms Export Control Act (AECA) and is made up of 21 separate categories of weapons and related weapons technologies.³¹ Any of the goods that are on the USML are subject to strict oversight which includes a notification to Congress before export and they are overseen by the U.S. Department of State. The Trump Administration, through the State Department, published their updated export regimes in January of 2020.³² These updates removed small arms, Articles 1-3, from the USML.³³ This change reclassified these selected goods as simply commercial products, shifting them to the Commerce Control List. With this change comes a change in oversight and responsibility. Exportation of these goods falls under the purview of the U.S. Department of Commerce, which has far less stringent controls.³⁴ Included in the reclassified articles were technical data and blueprints for 3-D weapons. This change was supposed to reflect the State Department's reversal of stance on 3-D weapon blueprints in the wake of the settlement with Defense Distributed. That settlement included a State Department promise to change the classification of 3-D gun blueprints and eventually remove them from the USML, opening them up to distribution both nationally and internationally.³⁵ Furthermore, the State Department agreed to a temporary change to the USML that would remove 3-D gun blueprints from its purview while the notice and comment period for the changes was ongoing.³⁶ As discussed earlier, this revelation opened the door for a litany of states to bring suit that succeeded in winning a preliminary injunction against this temporary change in advance of the ultimate USML rule change.

The final rule published on January 23, 2020, included, amongst other changes, explicitly placing 3-D gun blueprints under the jurisdiction and control of the U.S. Department of Commerce.³⁷ Despite this, these specific changes never took place. The rest of the export regulations went into effect on March 9, 2020, but the changes pertaining to 3-D gun blueprints were met with the expected fierce resistance mentioned earlier in this note.³⁸ Washington State, accompanied by 16 other states, led the charge against the proposed changes, filing a Motion for Preliminary Injunction against this new reclassification.³⁹ The suit against the State Department specifically alleges violations of the Administrative Procedure Act (APA).⁴⁰ The APA governs the process by which federal agencies develop and implement regulations. One such requirement of the APA is that federal agencies must provide the public with notice and meaningful opportunity to comment on proposed changes to rules or regulations.⁴¹ Washington State and the

³⁰ Lisa C. Mays, *The United States Munitions List: When Guns Come Off of the ITAR*, 12 NAT'L L. REV. (Sep. 14, 2017).

³¹ 22 U.S.C. § 2551 et seq.; 22 C.F.R. § 121.1.

³² 85 Fed. Reg. 3819 (Jan. 23, 2020).

³³ *Id.*

³⁴ *Id.*

³⁵ Eric Halladay and Rachel Hanna, *Judge Enjoins Trump Administration's Easing of Restrictions on 3-D Gun Blueprints*, LAWFARE (Mar. 19, 2020, (9:00 AM)) <https://www.lawfareblog.com/judge-enjoins-trump-administrations-easing-restrictions-3-d-gun-blueprints>.

³⁶ *Id.*

³⁷ International Traffic in Arms Regulations, 85 Fed. Reg. 3819, 3821 (Jan. 13, 2020).

³⁸ Halladay & Hanna, *supra* note 35.

³⁹ *Washington v. United States Dep't of State*, 443 F. Supp. 3d 1245 (W.D. Wash. 2020).

⁴⁰ *Id.* at 1251; 5 U.S.C. § 551-559.

⁴¹ *Washington*, 443 F. Supp. 3d at 1256; 5 U.S.C. § 553(b).

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other plaintiff states accused the government of violating this requirement and taking action that was both “arbitrary and capricious.”⁴²

The first alleged violation is the failure to provide the public with notice and meaningful opportunity to comment on proposed changes involving 3-D gun blueprints and their place on the USML.⁴³ The Trump Administration initially published potential changes to the USML in May of 2018; however, the Administration failed to mention, specifically, any changes pertaining to 3-D gun blueprints or printing.⁴⁴ The public comment period for these changes officially ended in July of that same year, only one day before the settlement with Defense Distributed was made public.⁴⁵ The settlement was the first time that the impending rule changes had been revealed to involve changes specific to 3-D guns,⁴⁶ following when the initial temporary order removing 3-D gun blueprints from the USML was blocked by temporary injunction, as previously mentioned. The true nature of the USML rule changes was not made public until after the period for public comment had already closed.⁴⁷

The lawsuit alleges additional violations of the guidelines set forth by the APA itself. The judiciary has the power to review and set aside executive agency action only when the action is “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.”⁴⁸ Within the meaning of the APA, this is “where the agency has relied on factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.”⁴⁹ The court looked at the congressional goals and considerations that were a part of the AECA and found that the government had failed to consider all of the relevant factors.⁵⁰ The court also specifically mentions the State Department’s own assertions from 2018 that national security concerns supported placing 3-D gun blueprints on the USML in the first place.⁵¹

In determining whether injunctive relief was appropriate, the court, considering all of the circumstances, held that “the balance of equities and the public interests tip sharply in the States’ favor.”⁵² Additionally, the accumulation of presented evidence, from both the current and past litigation, sufficiently demonstrated the irreparable harm that would befall the plaintiff if the 3-D gun blueprints were to be removed from the USML.⁵³ With the court also believing the plaintiffs

⁴² *Washington*, 443 F. Supp. 3d at 1252; 5 U.S.C. § 706(2)(A).

⁴³ *Washington*, 443 F. Supp. 3d at 1253.

⁴⁴ *Washington*, 443 F. Supp. 3d at 1258.

⁴⁵ *Washington*, 443 F. Supp. 3d at 1252.

⁴⁶ *Halladay & Hanna*, *supra* note 35.

⁴⁷ *Id.*

⁴⁸ *Washington*, 443 F. Supp. 3d at 1255 (citing 5 U.S.C. § 706(2)(A) and *Safari Aviation Inc. v. Garvey*, 300 F.3d 1144, 1150 (9th Cir. 2002)).

⁴⁹ *Washington*, 443 F. Supp. 3d at 1258; *Motor Vehicle Mfr. Ass'n v. State Farm Ins.*, 463 U.S. 29, 44 (1983).

⁵⁰ *Id.* at 1259.

⁵¹ *Id.*

⁵² *Id.* at 1261.

⁵³ *Id.*

were reasonably likely to succeed on the merits of their arguments, the preliminary injunction was issued.⁵⁴ As of today, 3-D gun blueprints have not been removed from the USML.⁵⁵

II. PROLIFERATION OF GHOST GUNS DURING THE PANDEMIC

A. A Growing Problem

The COVID-19 pandemic brought with it a multitude of societal changes and nearly countless unexpected side effects. One such side effect has been the staggering proliferation of ghost guns being sold to private citizens across the country.⁵⁶ Unlike fully 3-D printed firearms or ghost guns that can be manufactured at home with a CNC milling machine, these come in nearly completed kits. These ghost gun kits take advantage of a loophole in federal law that classifies the individual pieces needed to make a homemade firearm as components rather than actual guns. What this means is that buyers do not have to pass a background check or even register the weapons once completed. The component parts as well as the completed guns also lack any serial numbers whatsoever. As with entirely 3-D printed or CNC milled homemade firearms, this means that these ghost gun kits are available to anyone, including the mentally ill, those with felony convictions, children, and domestic abusers otherwise constrained by orders of protection.⁵⁷

These ghost gun kits are typically sold as 80 percent receivers online, meaning that they are essentially firearms that are 80 percent completed.⁵⁸ The purchaser needs only to perform the last 20 percent of the assembly, and they are left with a fully functional firearm.⁵⁹ These kits are relatively inexpensive and surprisingly easy to put together, even for individuals without any gunsmithing or firearm experience. The kits often come with easy-to-follow instructions or links to YouTube video tutorials that walk the purchaser through completing the weapon step-by-step. The vast majority of DIY ghost gun kits require only a drill for completion, and the kits themselves almost always come with the drill bits needed.⁶⁰ Additionally, more and more of these ghost gun kits are shipped with a “jig.”⁶¹ The jig is a molded plastic mounting fixture that fits around the frame or receiver and makes assembly even easier than before.⁶² The jig can shorten the process and allow a purchaser to completely assemble their gun in as little as 15 minutes.⁶³

⁵⁴ *Id.* at 1262-63.

⁵⁵ *Id.* at 1262; 22 C.F.R § 121.1 (2021).

⁵⁶ Glenn Thrush, ‘Ghost Guns’: Firearm Kits Bought Online Fuel Epidemic of Violence, N.Y. TIMES (Nov. 17, 2021), <https://www.nytimes.com/2021/11/14/us/ghost-guns-homemade-firearms.html>.

⁵⁷ *Id.*

⁵⁸ Annie Karni, *Ghost Guns: What They Are, and Why They Are an Issue Now*, N.Y. TIMES (Nov. 14, 2021), <https://www.nytimes.com/2021/04/09/us/politics/ghost-guns-explainer.html?smid=url-share>.

⁵⁹ *Id.*

⁶⁰ *Id.*

⁶¹ *Id.*

⁶² *Id.*

⁶³ *Id.*

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Ghost guns can come in a variety of models, with Glock pistol replicas and AR-15 models being especially popular.⁶⁴ Their affordability only adds to their current demand, with an AR-14 build kit costing as little as \$345.⁶⁵ It is difficult to say exactly how many ghost gun kits have been sold exactly because of their lack of serial number or ability to be traced. There has been a rise in violent crime since the start of the pandemic. California for example, had a 27 percent increase in homicides from 2019 to 2020.⁶⁶ San Francisco's police chief, Bill Scott, has said that in 2019 roughly 6 percent of guns recovered in shooting homicides were ghost guns; in 2020, that number had risen to 44 percent.⁶⁷ Los Angeles Police Chief Michael Moore has stated that a third of all guns now recovered from shooting homicides are ghost guns from kits sold online.⁶⁸ Ghost guns recovered in Philadelphia have increased from 99 in 2019 to 250 in 2020. Likewise, there has been an increase from 29 ghost guns recovered in Baltimore in 2019 to 126 in 2020.⁶⁹

B. State and Local Attempts to Curb Ghost Guns

There have been attempts to address the increasing proliferation of ghost gun kits and violence resulting from their use. For example, San Francisco District Attorney Chesa Boudin joined forces with the Giffords Law Center to Prevent Gun Violence and law firm Kecker, Van Nest, and Peters to sue ghost gun kit sellers Blackhawk Manufacturing Group Inc., GS Performance, and MDX Corp.⁷⁰

The group claims that the companies are violating federal and state laws that regulate the manufacturing and sale of firearms.⁷¹ The group asserts that the manufacturers are deceiving customers about the ghost guns they sell.⁷² Boudin said that the increase in ghost guns disproportionately affects California, citing statistics from the Bureau of Alcohol, Tobacco, Firearms and Explosives. The statistics show that 65 percent of all ghost guns seized nationwide are seized in California.⁷³ Specifically, the lawsuit alleges that the ghost gun manufacturers violate California's false advertising laws by not informing consumers that their gun kits are missing required safety features, have not undergone otherwise required consumer safety tests,

⁶⁴ *Id.*

⁶⁵ *Id.*

⁶⁶ Glenn Thrush, *San Francisco Sues Three Online Retailers for Selling 'Ghost Guns'*, N.Y. TIMES (Sep. 10, 2021), <https://www.nytimes.com/2021/08/18/us/sf-ghost-guns.html>.

⁶⁷ *Id.*

⁶⁸ *Id.*

⁶⁹ Glenn Thrush, *'Ghost Guns': Firearm Kits Bought Online Fuel Epidemic of Violence*, N.Y. TIMES (Nov. 17, 2021), <https://www.nytimes.com/2021/11/14/us/ghost-guns-homemade-firearms.html>.

⁷⁰ Alaina Lancaster, *Keker, Giffords Law Center Team Up With SF DA's Office to Sue Ghost Gun Manufacturers*, RECORDER (Aug. 18, 2021), <https://www.law.com/therecorder/2021/08/18/keker-giffords-law-center-teams-up-with-sf-das-office-to-sue-ghost-gun-manufacturers/>; the Giffords Law Center to Prevent Gun Violence is a national public interest law center focused on the promotion of gun control and fights to put an end to gun violence. The group was founded in the wake of a mass shooting in San Francisco on July 1, 1993. Following another highly publicized incident, the January 8, 2011, shooting attack on Congresswoman Gabrielle Giffords, the group changed its name to include Gifford's name. The attack took place in Tucson, Arizona while Giffords was meeting with supporters. In total, six people were killed and thirteen suffered serious and life-threatening injuries (including Congresswoman Giffords).

⁷¹ *Id.*

⁷² *Id.*

⁷³ *Id.*

and may very well be in violation of state gun laws.⁷⁴ Furthermore, the lawsuit alleges that the manufacturers violate California’s Unfair Competition Law through their disregard of both state and federal gun laws.⁷⁵

In Los Angeles, a lawsuit was filed in August 2021 on behalf of two LAPD officers wounded in an ambush shooting.⁷⁶ Deputies Claudia Apolinar and Emmanuel Perez-Perez were shot and wounded while sitting in their patrol car on September 12, 2021. The attacker, Deonte Lee Murray, was a do-it-yourself ghost gun built from a kit sold by Nevada based manufacturer, Polymer80.⁷⁷ The gun was a model PF940c, which is almost a direct replica of a Glock handgun. Murray, who ordered the gun online, was prohibited from purchasing or possessing firearms due to numerous prior convictions including those for burglary, terroristic threats, receiving stolen property, firearm possession, and sales and possession of narcotics.⁷⁸ This lawsuit alleges that “defendants knew and could foresee — but consciously disregarded the risk — that they were creating and contributing to a direct and secondary market for illegal, unserialized and untraceable guns, knowing that their firearms were likely to end up in the hands of criminals and were likely to be used for criminal purposes.”⁷⁹ Additionally, the suit claims that Polymer80 “purposefully sold their products without markings to make it difficult for law enforcement to trace the firearm.”⁸⁰

C. President Biden and Department of Justice Response

In April of 2021, President Joe Biden issued a directive to the Department of Justice to take initiatives to help curb the proliferation of ghost guns resulting increase in violence.⁸¹ President Biden said that he wanted to “see these kits treated as firearms under the Gun Control Act.”⁸² The result, according to the President, would be that the components in the ghost gun kits would be required to have serial numbers and that the resulting weapons be classified legally as firearms.⁸³ Additionally, buyers would then be subject to background checks before being sold at-home ghost gun kits.⁸⁴

Roughly a month later, the Department complied with the President’s directive and issued a notice of proposed rulemaking that incorporated all of the President’s requested rule

⁷⁴ *Id.*

⁷⁵ *Id.*

⁷⁶ Robert Jablon, *L.A. County deputies who were shot in Compton ambush sue maker of ‘ghost gun’ kit*, L.A. TIMES (Aug. 10, 2021 8:03 AM), <https://www.latimes.com/california/story/2021-08-10/sheriff-deputies-sue-ghost-gun-kit-maker>.

⁷⁷ *Id.*

⁷⁸ *Id.*

⁷⁹ *Id.*

⁸⁰ *Id.*

⁸¹ Annie Karni, *Biden Takes Initial Steps to Address Gun Violence*, N.Y. TIMES (Apr. 8, 2021), <https://www.nytimes.com/2021/04/08/us/politics/biden-gun-control.html>.

⁸² *Id.*

⁸³ *Id.*

⁸⁴ *Id.*

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updates.⁸⁵ In making the announcement, Attorney General Merrick Garland said that “This proposed rule would help keep guns out of the wrong hands and make it easier for law enforcement to trace guns used to commit violent crimes, while protecting the rights of law-abiding Americans. Although this rulemaking will solve only one aspect of the problem, we have an obligation to do our part to keep our families and our neighborhoods safe from gun violence.”⁸⁶

The new rule has yet to go into effect, but could do so in early 2022. While law enforcement and the Department of Justice believe the rule change could curb some of the most blatant issues with ghost gun kits, the increasing availability and affordability of 3-D printers will continue to allow for another avenue to acquire illegal and untraceable weapons.

III. CURRENT FEDERAL FIREARM REGULATIONS

A. National Firearm Act

The National Firearm Act (NFA) was enacted in 1934 and mandates an excise tax on the transfer and manufacture of certain regulated firearms.⁸⁷ Additionally, it requires these certain firearms to be registered and tracked by the ATF.⁸⁸ The NFA targets certain firearms deemed to be especially dangerous and/or concealable, but does not consider pistols and handguns in this category despite being concealable.⁸⁹ Weapons mandating taxation as well as regulation by the act are called NFA firearms. NFA firearms include short-barreled rifles and shotguns, machine guns, suppressors, explosives, and “any other weapon” (AOW).⁹⁰ AOWs are any kind of device, excluding handguns, which can be concealed and used to discharge a projectile using explosive power.⁹¹ This includes things like a pen or umbrella modified to shoot bullets.⁹²

B. The Gun Control Act of 1968

The Gun Control Act of 1968 (GCA) was enacted not long after the assassinations of both Dr. Martin Luther King Jr. and Robert F. Kennedy.⁹³ The GCA regulates the interstate transport and transfer of firearms based on Congressional power under the Commerce Clause. For the most part, interstate transfer of firearms is prohibited except by manufacturers or dealers with the license to do so. Individuals can still purchase firearms interstate from a private individual, but the transfer must be facilitated by a licensed seller or dealer. Additionally, the GCA prohibits unlicensed purchasers from buying a handgun from a state other than their own.

⁸⁵ Press Release, U.S. Dep’t of Just., *Justice Department Proposes New Regulation to Update Firearm Definitions: Proposed Rule Seeks to Close “Ghost Gun” Loophole* (May 7, 2021), <https://www.justice.gov/opa/pr/justice-department-proposes-new-regulation-update-firearm-definitions>.

⁸⁶ *Id.*

⁸⁷ 26 U.S.C. § 5811 (2012).

⁸⁸ *Id.* § 5841.

⁸⁹ *See id.* § 5841(a)-(e).

⁹⁰ *Id.* § 5845(a)-(e).

⁹¹ *Id.* § 5845(e).

⁹² *See id.* § 5845(e).

⁹³ 18 U.S.C. § 921 et seq.

C. Brady Handgun Violence Protection Act

The Brady Handgun Violence Prevention Act of 1993 was enacted by Congress in the wake of the attempted assassination of President Ronald Reagan.⁹⁴ The Brady Act mandated federal background checks for firearm sales and purchases made through a federal license gun dealer.⁹⁵ It eventually led to the creation of the National Instant Criminal Background Check System (NICS), a background check system created and maintained by the FBI.⁹⁶ In the absence of additional state or federal requirements, transfer of a firearm is permitted upon approval from the NICS.⁹⁷ The NICS is essentially an extensive list of individuals who are not permitted to own or possess a firearm. NICS approval usually takes just a few minutes but can sometimes take several days. A transfer will be allowed if the check is not complete within three days, which is a limitation of the Brady Act.⁹⁸ Additionally, the Brady Act only applies to holders of a Federal Firearm License (FFL) and not private sellers conducting intrastate transfers.⁹⁹ There are also various exceptions, most notably for collectors selling firearms considered to be Curios & Relics.¹⁰⁰

D. Untraceable Firearms Act

The Untraceable Firearms Act effectively made illegal the manufacture, sale, transportation, and possession of guns with less than a certain amount of metal.¹⁰¹ This Act was specifically concerned with the ability for plastic (or other non-metal material) to be brought through metal detectors.¹⁰² Discussions surrounding renewing the Act in 2013 involved talks of expanding it to target 3-D printed weapons, but these changes were never enacted.¹⁰³

IV. CONSTITUTIONAL ISSUES WITH REGULATION

A. The First Amendment

The First Amendment guarantees several freedoms, one of which being the freedom of speech: “Congress shall make no law . . . abridging the freedom of speech, or of the press.”¹⁰⁴ The text of the amendment originally applied only to pure speech but has been expanded significantly over the course of United States’ history. The Supreme Court has held that the First Amendment’s safeguards also include protecting the right to expression through written words,

⁹⁴ BRADY UNITED, *History*, <https://www.bradyunited.org/history>; 18 U.S.C. § 922 (2018).

⁹⁵ 18 U.S.C. § 921 (2012).

⁹⁶ BRADY UNITED, “History of Brady,” *Resources*, available at: <https://www.bradyunited.org/history>.

⁹⁷ Molly Carter, *Gun Background Checks: How the State Came To Decide Who Can and Cannot Buy a Firearm*, AMMO, <https://ammo.com/articles/background-checks-guide-history-nics-how-they-work> (last visited May 14, 2022).

⁹⁸ *Id.*

⁹⁹ *Id.*

¹⁰⁰ *Id.*

¹⁰¹ 18 U.S.C. § 922(p) (2018).

¹⁰² *Id.*

¹⁰³ Andy Greenberg, *Bill to Ban Undetectable 3D Printed Guns Is Coming Back*, WIRED (Apr. 6, 2015, 7:00 AM), <https://www.wired.com/2015/04/bill-ban-undetectable-3-d-printed-guns-coming-back/>.

¹⁰⁴ U.S. CONST. amend. I.

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activities, and conduct.¹⁰⁵ Advancements in technology have led the Supreme Court to hold that electronic communications sent over the internet and computer code itself are a protected form of free speech.¹⁰⁶

Much of the controversy and disagreement surrounding the regulation of 3-D printed weapons involves the blueprints themselves and whether they deserve First Amendment protections. In their first lawsuit in Texas Federal Court in 2015, Defense Distributed asserted that the State Department's interpretation of the AECA, which placed 3-D gun blueprints on the USML, violated their First Amendment right to free speech.¹⁰⁷ The court, citing *Cornelius v. NAACP Legal Defense & Education Fund*, explained that in evaluating the free speech claim, the "first step is to determine whether the claim involves protected speech, the second step is to identify the nature of the forum, and the third step is to assess whether the justifications for exclusion from the relevant forum satisfy the requisite standard."¹⁰⁸ The State Department's response was that the 3-D gun blueprints did not constitute speech and as such, should be afforded no First Amendment protections.¹⁰⁹ Defendants characterized the blueprints as consisting of "merely of directions to a computer."¹¹⁰ They cited the holding in a 2nd Circuit case which asserted that such computer directions that "induce action without the intercession of the mind or the will of the recipient" do not constitute speech that is afforded First Amendment protection.¹¹¹ Defense Distributed was quick to point out that just one year later, the same 2nd circuit court directly addressed computer code and whether it constituted speech in *Universal City Studios v. Corley*.¹¹² That court held that even though computer code was largely unintelligible to the majority of people, it nonetheless constituted a language of sorts. That being established, the court continued by holding that "the fact that a program has the capacity to direct the functioning of a computer does not mean that it lacks the additional capacity to convey information, and it is the conveying of information that renders instructions 'speech' for purposes of the First Amendment."¹¹³

The court agreed with Defense Distributed on classifying the blueprints as speech, at least for the purposes of the preliminary injunction analysis.¹¹⁴ The court was also quick to acknowledge that the internet constitutes a public forum.¹¹⁵ The final issue of whether the restriction on 3-D gun blueprints was content-neutral or not, determining which level of scrutiny to apply in analyzing the validity of the restriction. The court recognized that undoubtedly the regulations applied to speech concerning a specific topic, however that does not mean that strict scrutiny should automatically be applied.¹¹⁶ They explained that 3-D gun blueprints were not

¹⁰⁵ Jessica Berkowitz, Note, *Computer-Aided Destruction: Regulating 3D-Printed Firearms Without Infringing on Individual Liberties*, 33 BERKELEY TECH. L.J. 51, 72 (2018).

¹⁰⁶ *Reno v. Am. Civ. Liberties Union*, 521 U.S. 844, 874-75 (1997); *Bernstein v. United States Dep't of State*, 922 F. Supp. 1426 (N.D. Cal. 1996).

¹⁰⁷ *Def. Distributed v. United States Dep't of State*, 121 F. Supp. 3d 680, 691 (W.D. Tex. 2015).

¹⁰⁸ *Id.* (citing *Cornelius v. NAACP Legal Defense & Educ. Fund, Inc.*, 473 U.S. 788, 797 (1985)).

¹⁰⁹ *Def. Distributed*, 121 F. Supp. 3d at 691.

¹¹⁰ *Id.*

¹¹¹ *Id.* (citing *Commodity Futures Trading Comm'n v. Vartuli*, 228 F.3d 94, 111 (2nd Cir. 2000)).

¹¹² *Id.* (citing *Universal City Studios, Inc. v. Corley*, 273 F.3d 429 (2nd Cir. 2001)).

¹¹³ *Def. Distributed*, 121 F. Supp. 3d at 692 (quoting *Universal City Studios*, 273 F.3d at 447).

¹¹⁴ *Def. Distributed*, 121 F. Supp. 3d at 692.

¹¹⁵ *Id.* at 693.

¹¹⁶ *Id.* at 694.

being regulated “based on the message” they were communicating, but rather that the “export regulation imposed by the AECA is intended to satisfy a number of foreign policy and national defense goals.”¹¹⁷ As such, the restrictions were held to be content-neutral, and therefore subject to intermediate scrutiny.¹¹⁸

Under intermediate scrutiny, the court explained, it must sustain the regulations “if they further an important or substantial governmental interest; if the governmental interest is unrelated to the suppression of free expression; and if the incidental restriction on alleged First Amendment freedoms is no greater than is essential to the furtherance of that interest.”¹¹⁹ Having determined already that the regulations were unrelated to the suppression of free expression, the court also had no issue in “finding there is a substantial governmental interest in regulating the dissemination of military information.”¹²⁰ On the final issue of whether the incidental restriction was greater than was essential, the court decided that it was not. The court pointed out that the plaintiffs were “free to disseminate the computer files at issue domestically in public or private forums, including via the mail or any other medium that does not provide the ability to disseminate the information internationally.”¹²¹ In making this determination the court also noted that the only circuit to address whether the AECA and ITAR violated the First Amendment had come to the conclusion that they did not.¹²² Having analyzed the Plaintiff’s First Amendment claims, the Court concluded that they had not shown a substantial likelihood of success on said claims.¹²³

The Fifth Circuit Court of Appeals upheld the lower court’s ruling, while the dissent criticized this decision as an affront to the plaintiff’s First Amendment rights.¹²⁴ The dissent lamented that the case was decided solely on national security issues and posits that “the majority seem deaf to this imminent threat to protected speech.”¹²⁵ Furthermore, the dissent wrote that the State Department’s regulatory and licensing scheme that forced Defense Distributed to take down their CAD files “invades the plaintiff’s First Amendment rights because it is both a content-based regulation that fails strict scrutiny and an unconstitutional prior restraint on protected speech.”¹²⁶ So, despite the fact that the majority upheld the ruling, arguments similar to the dissent may be considered more strongly in other circuits.

B. The Second Amendment

Perhaps more obviously, any future regulation of CAD files for 3-D printing weapons will be subject to Second Amendment protection. The actual text of the amendment reads: “A well regulated Militia, being necessary to the security of a free State, the right of the people to

¹¹⁷ *Id.*

¹¹⁸ *Id.*

¹¹⁹ *Time Warner Cable, Inc. v. Hudson*, 667 F.3d 630, 641 (5th Cir. 2012).

¹²⁰ *Def. Distributed*, 121 F. Supp. 3d at 694.

¹²¹ *Id.* at 695.

¹²² *United States v. Chi Mak*, 683 F.3d 1126 (9th Cir. 2012).

¹²³ *Def. Distributed*, 121 F. Supp. 3d at 696.

¹²⁴ *Def. Distributed v. U.S. Dep’t of State*, 838 F.3d 451 (5th Cir. 2016).

¹²⁵ *Id.* at 462.

¹²⁶ *Id.* at 466.

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keep and bear Arms, shall not be infringed.”¹²⁷ Historically, there has been disagreement over whether the rights to bear Arms was an individual right of every citizen or a collective right, meaning the federal government could not pass legislation stripping the states of their right to self-defense.

The Supreme Court stepped in to provide clarity on this long-time debate, albeit with a 5-4 decision, in *District of Columbia v. Heller*.¹²⁸ Scalia, writing for the majority, explained that although the Second Amendment may have been drafted with the intention of preserving the existence of militias, that it still acts to “guarantee the individual right to possess and carry weapons in case of confrontation.”¹²⁹ The Court looks to the historical background of the Second Amendment for confirmation because it “codified a *pre-existing* right.”¹³⁰ Scalia points out that the “very text of the Second Amendment implicitly recognizes the pre-existence of the right and declares only that it ‘shall not be infringed.’”¹³¹ Using the history of weapon possession in the United States as a guide, the Court held that the Second Amendment protects an individual’s right to possess weapons that have typically and lawfully been possessed by Americans in their home.¹³² With this test in mind, the court explained that “handguns are the most popular weapon chosen by Americans for self-defense in the home, and a complete prohibition of their use is invalid.”¹³³ Further support for this common use test lies in the long history of a prohibition on “the carrying of ‘dangerous and unusual weapons.’”¹³⁴ Of particular relevance to the legality of 3-D gun regulation, the court confirmed that “the Second Amendment extends, *prima facie*, to all instruments that constitute bearable arms, even those that were not in existence at the time of the founding.”¹³⁵

It is unclear exactly how the standards established in *Heller* would apply to 3-D printed gun regulations. The vast majority of gun blueprint CAD files are for types of weapons that are in “common use” like pistols, revolvers, and rifles.¹³⁶ So, if the court was to focus on the type of weapons the CAD files could be used to print rather than looking at gun blueprints as a new class of “firearm”, then it seems that *Heller* would preclude their outright prohibition. However, 3-D guns and the CAD files they are printed from are certainly not in common use historically or even currently in the United States. Perhaps the court would allow their regulation under *Heller*’s “dangerous and unusual” exception.

While it is relatively easy to see how 3-D printed firearms could be considered “unusual”, their dangerousness is less certain. The court may choose to look at the fact that they can be made entirely from plastics, and thus not detectable by metal detectors. Congress themselves have recognized the danger of undetectable guns with the UFA. Perhaps, the court would

¹²⁷ U.S. CONST. amend. II.

¹²⁸ *District of Columbia v. Heller*, 554 U.S. 570 (2008).

¹²⁹ *Id.* at 592.

¹³⁰ *Id.*

¹³¹ *Id.*

¹³² *Id.* at 625.

¹³³ *Id.* at 629.

¹³⁴ *Id.* at 627.

¹³⁵ *Id.* at 582.

¹³⁶ Nicolas R. Obermeyer, Comment, *Permission to Print: A Proposed Licensing Regime for 3D Printed Firearms*, 60 *Jurimetrics J.* 187, 200 (2020).

consider that guns made by unlicensed and inexperienced individuals should be considered less reliable and more dangerous.¹³⁷ Additionally, the court could focus on the untraceable aspect of 3-D printed guns in determining whether they are dangerous. However, individuals are already legally allowed to manufacture their own, unregistered firearms in many states, without the use of 3-D printers.

C. The Tenth Amendment

The U.S. Department of State's decision to settle with Defense Distributed led to a constitutional issue that is yet to be resolved. The settlement of course included allowing Defense Distributed to republish the 3-D gun blueprints that had previously been forced to take down pending resolution of the lawsuit. As discussed, this led the District of Columbia and eight states to file their own lawsuit against the Department of Defense.¹³⁸ This resulted in the temporary injunction enjoining Defense Distributed from posting the CAD files for the time being. One of the arguments put forth in the lawsuit is that the Department of State, in allowing the posting of the files as part of the settlement, had violated the Tenth Amendment.¹³⁹ The Tenth Amendment reads, "The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people."¹⁴⁰

The Plaintiff states claimed that the settlement had circumvented their ability to regulate firearms internally.¹⁴¹ These states believe that the power vested in them by the 10th Amendment give them the ultimate authority to regulate 3-D gun regulation within their state borders.¹⁴² This will be an interesting problem to overcome, as 3-D printed weapons present unique issues, especially from state to state. The internet has no borders and individuals from any state can access CAD files online. The best regulation for the future will most likely be federal in nature.

V. POTENTIAL SOLUTIONS

A. Expanding the Brady Handgun Violence Protection Act

One suggested method of regulating 3-D printed weapons is through an expansion of the Brady Handgun Violence Protection Act. The Brady Act was named after James Brady, Ronald Reagan's press secretary who was shot during the assassination attempt against the President.¹⁴³ His wife Sarah, along with James, lobbied and pushed until the Brady Act was passed. The two eventually founded the Brady Group that pushes for gun reform in the United States to this day, even though James Brady passed away in 2014.¹⁴⁴ The Brady group continues to push for changes that reduce gun violence in the country. The group has turned their attention to 3-D printed weapons in recent years, saying that 3-D guns "represent a supreme threat to our safety

¹³⁷ Jessica Berkowitz, *Computer-Aided Destruction: Regulating 3D-Printed Firearms Without Infringing on Individual Liberties*, 33 BERKELEY TECH. L.J. 51, 77.

¹³⁸ *Washington v. United States Dep't of State*, 318 F. Supp. 3d 1247, 1254 (W.D. Wash. 2018).

¹³⁹ *Id.*

¹⁴⁰ U.S. CONST. amend. X.

¹⁴¹ *Washington v. United States Dep't of State*, 318 F. Supp. 3d 1247, 1254 (W.D. Wash. 2018).

¹⁴² *Id.*

¹⁴³ BRADY UNITED, *History of Brady*, <https://www.bradyunited.org/history>.

¹⁴⁴ *Id.*

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and security.”¹⁴⁵ The Brady Group has filed lawsuits against the federal government relating to the Trump Administration’s decision to delist 3-D weapons from ITAR as part of their settlement with Defense Distributed.¹⁴⁶

Much like many intrastate weapon transfers between private individuals, 3-D printed weapons are outside the purview of the Brady Act. Printing a firearm or transferring it to another individual is not a transaction that is subject to background check approval through the NICS.¹⁴⁷ Even though 3-D printed guns can be completely unregistered and untraceable, they still require ammunition to be fired. This can be acquired by either purchasing assembled ammunition or buying gunpowder and making them at home. The proposal would expand the Brady Act to regulate ammunition and gunpowder sales.¹⁴⁸ It would also need to be expanded to include any kind of gunpowder alternative as well. It would not be difficult to amend the statute to include ammunition with any mention of the word firearm.¹⁴⁹ The ammunition purchases would be subject to the same NICS approval or could be waived with a qualified Brady Permit.¹⁵⁰

Proponents of this proposal note that adding ammunition to the Brady Bill protections would not be overly restrictive of access to ammunition.¹⁵¹ Furthermore, it should be viewed as constitutional based on the *Heller* decision in which the court said that their decision should not be seen as casting doubt upon existing firearm laws, like the Brady Act.¹⁵² Specifically, the court expressed support for “longstanding prohibitions on the possession of firearms by felons and the mentally ill” as well “laws imposing conditions and qualifications on the commercial sale of arms.”¹⁵³ This approach to regulating 3-D firearms is also supported by a study done by Boston University that found that universal background checks for firearm purchases was the most effective at curbing gun deaths. Significantly, the study posits that by implementing background checks for ammunition purchases, the firearm mortality risk could drop by 82 percent.¹⁵⁴

B. Jose Webster Untraceable Firearm Act

New York is frequently a leader when it comes to the expansion of firearm laws and regulations. The Jose Webster Untraceable Firearms Act is no exception. The bill, which passed the New York State Senate in July of 2020, looks to expand existing regulations to provide

¹⁴⁵ BRADY UNITED, *Emerging Dangers*, <https://www.bradyunited.org/issue/emerging-dangers>.

¹⁴⁶ Brett Molina, *3D guns: Brady Center sues Trump administration over blueprints*, USA TODAY (Dec. 20, 2018, 11:28 AM) <https://www.usatoday.com/story/news/nation/2018/12/20/3-d-guns-brady-center-sues-trump-administration-over-blueprints/2373334002/>.

¹⁴⁷ 18 U.S.C. § 921 (2012).

¹⁴⁸ Jessica Berkowitz, Note, *Computer-Aided Destruction: Regulating 3D-Printed Firearms Without Infringing on Individual Liberties*, 33 BERKELEY TECH. L.J. 51, 81 (2018).

¹⁴⁹ *Id.*

¹⁵⁰ 18 U.S.C. § 921 (2012).

¹⁵¹ Berkowitz, *supra* note 148, at 83.

¹⁵² *Heller*, 554 U.S. at 626-27.

¹⁵³ *Id.*

¹⁵⁴ Bindu Kalesan et al., *Firearm Legislation and Firearm Mortality in the USA: A Cross-Sectional, State-Level Study*, 387 LANCET 1847, 1847-54 (2016).

further protection against so-called “ghost guns”.¹⁵⁵ Ghost Guns are “dangerous and untraceable weapons with no serial numbers that circumvent New York’s gun safety laws.”¹⁵⁶ The legislation was named after Jose Webster, a 16-year old who was killed by a ghost gun in the South Bronx. It first defines a ghost gun as any firearm, rifle, or shotgun that is not serialized and registered in accordance with either state or federal law.¹⁵⁷ It goes further to prohibit the sale of ghost guns entirely while limiting possession of them exclusively to gunsmiths.¹⁵⁸ It would also prohibit anyone besides a licensed gunsmith from manufacturing or assembling any firearms and requires that they serialize all firearms, frames, or receivers they manufacture or assemble. Gunsmiths would also be required to register any and all firearms, frames, or receivers that are not otherwise covered by federal serialization law.¹⁵⁹

C. Regulation of 3-D Printers

Another proposal stems from the idea that any regulation of 3-D printed firearms must balance two competing but important interests. The first being that 3-D printing is a cutting-edge technology in its infancy with potentially limitless applications and benefits and as such should not be overly inhibited. The second is that there must exist some framework that can uphold public safety through either prohibiting or limiting dangerous or illegal items that could be printed.¹⁶⁰ With these factors in mind, the proposal is to create a specialized governmental department that would oversee and focus on exclusively on issues that arise from 3-D printing.¹⁶¹

The governmental oversight could take the form of either an entirely new federal agency or assign the responsibility to an existing entity. With the rise of 3-D printing and additive manufacturing, there would seem a need to address the novel and unique problems that these technologies bring with them. This would inevitably include issues outside of regulation, prohibition, or limitation of 3-D printed weapons. However, in terms of 3-D printed guns, the proposal would target the actual manufacturers of 3-D printers themselves.¹⁶² Much of current firearm legislation is not applicable to individual sellers and consumers, which is of course one of the reasons regulating 3-D printed firearms is so difficult. Like some firearm regulation this proposal takes aim at regulating larger manufacturers. Manufactures of 3-D printers would need to include software in all of their devices that was able to detect CAD blueprints of weapons or weapons parts.¹⁶³ The technology has been in existence for nearly a decade and continues to improve¹⁶⁴. The software installed on all 3-D printers would prohibit their owners from printing CAD files recognized to be firearms or firearm parts.

¹⁵⁵ Brad Hoylman, *New York State Senate Passes The Jose Webster Untraceable Firearms Act, The Nation's Toughest Ghost Gun Law*, N.Y. SENATE, (Jul. 23, 2020), <https://www.nysenate.gov/newsroom/press-releases/brad-hoylman/new-york-state-senate-passes-jose-webster-untraceable-firearms>.

¹⁵⁶ *Id.*

¹⁵⁷ Jose Webster untraceable firearms act, A.B. A9903A, 2019 Reg. Sess. (N.Y. 2019).

¹⁵⁸ *Id.*

¹⁵⁹ *Id.*

¹⁶⁰ Nicolas R. Obermeyer, *Permission to Print: A Proposed Licensing Regime for 3D Printed Firearms*, 60 JURIMETRICS J. 187, 205-06 (2020).

¹⁶¹ *Id.* at 206.

¹⁶² *Id.* at 207.

¹⁶³ *Id.*

¹⁶⁴ Cyrus Farivar, *Worried about accidentally 3D printing a gun? New software will prevent it*, ARSTECHNICA, (Jun. 26, 2013), <https://arstechnica.com/information-technology/2013/06/worried-about-accidentally-3d-printing-a-gun->

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The next part of the proposal involves the existence of government approved licenses that would allow someone to bypass this software. The permit application process would be similar to an application for a Federal Firearms License and would require the user's name, social security number, address, and photo identification.¹⁶⁵ All of this could be done from the comfort of one's home. Another step could be to combine this process with the background checks mandated under the Brady Act. Applications for a permit to print firearms would be subject to approval through the NICS. This would significantly limit unwanted and criminal access to dangerous 3-D printing capabilities.

Of course, there is always the danger that people will discover a work around for this software. Undoubtedly, there will be individuals that are able to hack the device and bypass the security features. However, this is not a problem unique to 3-D printing and there would need to be continuing work to improve and fix the security software as needed.

This is an approach that could be implemented sometime in the near future as a test run of sorts. Defense Distributed now sells a CNC milling machine that is quite similar to a 3-D printer. It allows individuals to create 80 percent aluminum frame firearms from their home.¹⁶⁶ It is fully legal as long as the individual is creating the weapons for personal use and not for sale. The resulting firearms are without serial numbers and unregistered. This device costs only \$2,000 and had become increasingly popular during the COVID pandemic. This is more involved than printing an entire gun from one file, but it can still be dangerous, and the weapons are untraceable.

This approach should be tested now by implementing the licensing scheme for the Defense Distributed Ghost Gunner 3 CNC milling machine. These machines can turn out weapons that are 80 percent metal and totally untraceable.¹⁶⁷ Users are able to print assault rifles like the AR-15 and AK-47. This is a much more pressing threat than entirely 3-D printed guns at the moment. Even if the resulting firearms themselves are not forced to be registered and serialized, this would keep dangerous individuals from purchasing the Ghost Gunner 3. It would also allow the government to monitor ownership of these machines as there will always be users who sell the guns despite the restrictions.

Currently, the significant proliferation of ghost gun do-it-yourself kits has become the most urgent gun violence threat. The Department of Justice is poised to implement updated federal regulations that would hopefully close the loopholes that allow ghost gun kits to be sold without serial numbers, without conducting background checks, and without adhering to consumer safety standards. Once those loopholes are closed, it seems likely that individuals will

new-software-will-prevent-it/; Giao N. Pham, Suk-Hwan Lee, Oh-Heum Kwon, & Ki-Ryong-Kwon, *Anti-3D_Weapon_Model_Detection_for_Safe_3D_Printing_Based_on_Convolutional_Neural_Networks_and_D2_Shape_Distribution*, 10 *Symmetry* 4, 90 (2018).

¹⁶⁵ See generally Berkowitz, *supra* note 137.

¹⁶⁶ Will Dabbs, *Ghost Gunner: Make Legal Lower and More Without Big Brother Knowing*, BALLISTIC (July 26, 2019) <https://www.ballisticmag.com/ghost-gunner-legal-firearm-parts/>.

¹⁶⁷ Michael del Castillo & Cyrus Farivar, *Inventor Of 3D-Printed Guns Scoffs As Biden Vows Crackdown*, FORBES (Feb. 4, 2022, 11:26am) <https://www.forbes.com/sites/michaeldelcastillo/2022/02/04/inventor-of-3d-printed-guns-scoffs-as-biden-vows-crackdown/?sh=4748d26b64fb>.

resort to milling or printing their own receivers and component parts or obtaining them illegally from private individuals with access to the required machinery.

VI. CONCLUSION

3-D printer technology is no longer a far-off future technology. It is here now and here to stay. The capabilities of 3-D printers and similar additive manufacturing will almost certainly continue to advance and become even more commonplace than it is today. The technology has the potential to infiltrate almost every kind of manufacturing industry. These developments bring with them both new issues and novel but familiar ones as well. Entirely 3-D printed firearms are not yet the threat they may be in the future. These entirely plastic guns are mostly small and not very durable. There is already a firearm crisis in this country and there are various pieces of legislation and regulatory framework that attempt to curb gun violence and criminal usage of firearms. These attempts at gun control are already inadequate in some regards and not presently equipped to tackle the problem of 3-D guns. Various states and the federal government are attempting to face the problem head on, but there exist a variety of hurdles to clear. First of all, the First, Second, and Tenth amendments all present unique issues in crafting controls for either 3-D printed weapons, 3-D printers, or the CAD files for 3-D guns.

Despite the issues, something needs to be done to ensure this country does not find itself with a 3-D firearm problem. The best approach would utilize some existing firearm regulations and regulatory framework, while also requiring a new federal oversight group. The Brady Act should be expanded to also regulate ammunition in addition to firearms. This would require a minimal amount of updating to the Act and could utilize the same framework and NICS background check system. It would help regulate 3-D firearms indirectly and would also provide some regulation for individuals already manufacturing their own untraceable firearms without a 3-D printer. In addition, the federal government should create a new agency or delegate the oversight of 3-D printing to an existing group. Manufacturers of 3-D printers should be targeted and mandated to include software that detects 3-D gun blueprints. The federal government can issue licenses to print 3-D guns that bypass the software and can fit these permits into the existing framework of the NICS background system. The federal government should implement this licensing approach now in regard to the Ghost Gunner 3 CNC device that Defense Distributed currently sells. While not able to print an entire gun, these systems are growing in popularity and constitute a greater present threat. While the Department of Justice works to stem the rise in at-home ghost gun kits, legislators and federal administrators need to take steps to prepare for the firearm threats that will follow imminent federal rule changes.