

GHOST GUNS:

HOW UNTRACEABLE FIREARMS
THREATEN PUBLIC SAFETY

EXECUTIVE SUMMARY

Ghost guns are one of the most pressing gun safety issues facing our country today, and the COVID-19 crisis only heightens the urgent need to act. Sales of ghost guns have reportedly spiked in recent months. The alarming proliferation of these untraceable, “DIY” weapons undermines gun safety laws, and too many families and communities have already borne the consequences. **We need to bring immediate accountability and transparency to the sale of ghost gun parts in every state.** If the Trump administration and Congress refuse to act, states should pass legislation to protect their residents from unregulated ghost guns.

WHAT ARE GHOST GUNS?

Federal and state gun safety laws—like background check requirements—typically apply only to fully assembled firearms and to frames or receivers (the part of the gun that contains the firing mechanism). The Bureau of Alcohol, Tobacco, and Firearms (ATF) has determined that these critical laws do not apply to “unfinished” frames or receivers, often colloquially referred to as “80% receivers.” As a result, these nearly completed firearm components can be manufactured and sold by unlicensed businesses without a background check, record of sale, or serial number. These weapons are called “ghost guns” because, without serial numbers and records of sale, they are untraceable in law enforcement investigations.

HOW ARE GHOST GUNS MADE?

In recent years, reckless businesses have increasingly taken advantage of this loophole by selling “DIY” gun kits designed to enable untrained amateurs to assemble a gun in minutes using common household tools. Those kits and parts are often sold online and at gun shows without any regulation or regard for public safety. Ghost guns can also be assembled using 3D-printed frames or receivers.

WHY ARE GHOST GUNS DANGEROUS?

Ghost guns are specifically designed to be attractive to firearm traffickers and people who can’t pass background checks. In 2016, a report by the US Government Accountability Office noted an “emerging reliance by criminal organizations on this source of weapons.” Since then, law enforcement agencies have increasingly uncovered “arsenals” of these weapons in investigations of organized gangs.

By early 2020, reports indicated that more than 40% of crime guns recovered by ATF in parts of states like California were unserialized, untraceable ghost guns, putting the public—including law enforcement—at serious risk. In 2019, gunmen firing assault-type ghost guns fatally shot law enforcement officers in an ambush attack in Sacramento and a deadly shootout in Riverside.



Individuals prohibited by law from possessing firearms have used or planned to use ghost guns in a series of horrific mass shootings:

- In 2017, a man under prosecution for multiple crimes killed six people and injured 10 in Rancho Tehama Reserve, California, with two assault-style rifles he assembled using parts ordered online.
- In 2018, a man prohibited from accessing guns built his own ghost gun from parts ordered online and perpetrated a mass shooting at his workplace in Middleton, Wisconsin.
- In 2019, a man in Dallas, Texas, who was prohibited from possessing firearms due to a history of domestic violence was arrested for possessing an AR-15-style rifle made with a 3D-printed receiver. When he was arrested, he was carrying a hit list with the names and addresses of several federal lawmakers.
- In late 2019, a 16-year-old used a ghost gun to kill two students and injure three others at Saugus High School in California. He was too young to legally purchase a gun.

WHAT CAN WE DO ABOUT GHOST GUNS?

Several reforms could help address the threat of ghost guns, including proposals to:

- Expand the definition of “firearm” under federal law to include unfinished frames and receivers, or otherwise halt the unregulated sale of unserialized ghost gun parts.
- Expressly prohibit the distribution of code for 3D-printing firearms and restrict the distribution of machines like the Ghost Gunner to licensed firearm manufacturers.
- Require that DIY firearms produced with 3D-printed parts comply with all gun safety laws (e.g. manufacturer licensing, serialization, and background checks).

FEDERAL GHOST GUN LEGISLATION

Legislation is pending in Congress to address the threat of ghost guns.

- Representative David Cicilline (D-RI) introduced the Untraceable Firearms Act, which would prohibit the manufacture and sale of firearms without serial numbers. Senator Blumenthal introduced an equivalent bill in the previous session of Congress, and reintroduced this bill in May of 2020.
- The House of Representatives adopted an amendment by Rep. Norma Torres (D-CA) to continue to prohibit online publication of blueprints for 3D-printing guns, which was ultimately blocked by the Senate.
- Senator Ed Markey (D-MA) and Representative Ted Deutch (D-FL) introduced the 3D Printing Safety Act to prohibit the online publication of computer-aided design files, which automatically program a 3D-printer to produce or complete a firearm.

STATE ACTION TO PROTECT AGAINST GHOST GUNS

Several states have taken courageous action to regulate ghost guns, either by requiring people who assemble ghost guns to serialize them, requiring sellers to obtain licenses and conduct background checks, or by stopping the sale of unserialized frames and receivers entirely. California, Connecticut, New Jersey, and Washington have already taken these critical steps to regulate the manufacture and sale of ghost guns. While these efforts are critical to public safety, because ghost guns flow freely across state lines, **comprehensive national legislation is needed to protect all communities from these dangerous weapons.**

Introduction

Nine years ago, a young man in California failed a background check. This individual had a history of making threatening statements to his classmates and was once caught with bomb-making materials. When he tried to buy a gun, the background check system worked as it was supposed to, and prevented his purchase.¹ That should have been the end of the story, but it wasn't.

The man purchased an unfinished firearm receiver—the lower part of a gun that contains the firing mechanism—without needing to pass a background check, finished it with some ordinary household tools, and combined it with other gun parts to build a fully functioning AR-15-style rifle.²

Two years later, in 2013, the man used the rifle he'd built to shoot his father and brother in their shared Santa Monica home. He set fire to the building before shooting a bystander in the street and then stopping a car and ordering the driver at gunpoint to take him to Santa Monica College. As they drove, the man fired at a city bus and at a car driven by Carlos Franco, a groundskeeper at the college who was driving his daughter Marcela to campus to buy books for her summer classes. Both Carlos and Marcela were fatally shot.

Upon arriving at the campus, he shot Margarita Gomez, a woman who lived near the college, who later died of her injuries. He then entered the school library, and fired at school employees who had barricaded themselves in a room. Responding police engaged the man in the library, and killed him in a shootout. Thirteen minutes had passed since he first opened fire at his home with his self-assembled gun.³

Even though he'd failed a background check when he attempted to buy a fully assembled gun, it was legal for him to buy the parts and instructions he needed to make his own. Because of loopholes in the way the federal government has defined firearms, an entire industry has grown up around so-called ghost guns. Under the guise of catering to hobbyists, these companies make it easy for people who are not legally allowed to own guns to obtain them.

Once completed, these guns are indistinguishable from those purchased in a gun shop, with one crucial difference: they don't have serial numbers, which makes them untraceable. If the shooter in Santa Monica had dropped his rifle and escaped, the police wouldn't have been able to trace the firearm back to its initial retail sale.

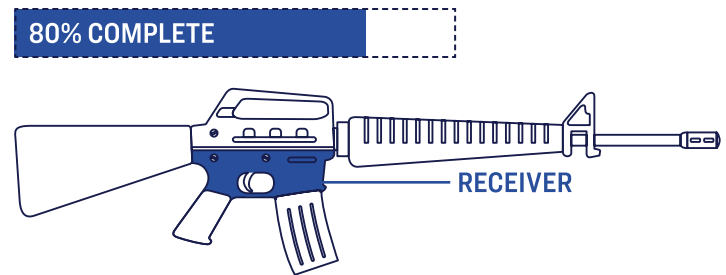
But as the Santa Monica shooting and numerous other tragic incidents have shown, ghost guns are just as deadly as traditional firearms, and should be regulated as such. As the COVID-19 pandemic continues to upend countless facets of American life, demand for ghost guns has surged, underscoring the importance of taking action to prevent innumerable future tragedies. It's long past time for our laws to catch up to our technology—or public safety will suffer.



Photo: Al Seib/Los Angeles Times

What Are Ghost Guns?

Ghost guns, sometimes referred to as “do-it-yourself” or “DIY” guns, are assembled by unlicensed individuals rather than licensed manufacturers. Ghost guns lack the serial numbers and other critical markings required by law that allow police to trace guns recovered in crimes and return stolen guns to their rightful owners. And, critically, they can be obtained without a background check.



Ghost guns are designed to evade all of the regulations that apply to the firearms industry—a regulatory framework that was created long before there were YouTube videos showing how easy it is to make a homemade gun. In 1968 Congress enacted the Gun Control Act (GCA), which prohibits the knowing sale of firearms to certain categories of people, such as convicted felons and fugitives from justice. Among other things, the GCA requires:

1. Entities engaged in the business of manufacturing or selling firearms to obtain a federal license;⁴
2. Licensed manufacturers and importers to serialize their firearms by affixing certain information, including the manufacturer or importer name and a serial number, on each firearm;⁵
3. Licensed gun dealers to conduct background checks on would-be gun buyers;⁶ and
4. All licensed manufacturers, importers, and dealers to retain records related to the sale of firearms.⁷

Within this framework, the GCA established the tools for a critical law enforcement process known as “tracing.” Law enforcement uses tracing when a firearm is recovered from a crime scene: using the serial number, the firearm can be traced through a chain of custody to the point of its first retail sale. Hundreds of thousands of traces are conducted each year, and more than seven million traces have been conducted since 1988.⁸

When it works correctly, this system prevents people prohibited from possessing guns from buying them from a firearms retailer. It also discourages firearm trafficking by requiring that retail sales take place in person, subject to a background check in which the identity of the purchaser is recorded, leaving behind a paper trail that links the firearm to its initial purchase.

Ghost guns disrupt this critical process by exploiting the way that Congress defined a “firearm” in 1968—a definition that has not been updated to this day. The law defines a “firearm” as, among other things, “any weapon (including a starter gun) which will or is designed to or may readily be converted to expel a projectile by the action of an explosive” or “the frame or receiver of any such weapon.”⁹ The frame or receiver—a “frame” on a handgun, or a “receiver” on a long gun—is the key component of the firearm that houses the firing mechanism.

Because a frame or receiver is characterized as a “firearm” under federal law, it is this component, and this component alone, that must carry a serial number, and that requires a background check before sale.

Once an individual has acquired a frame or receiver, he or she can obtain the rest of the parts needed to assemble a firearm without having to pass a background check.

To avoid federal firearm laws, ghost gun purveyors sell “unfinished” or “80%” frames or receivers: components that have been machined so that they are almost fully functional frames or receivers, but that require some additional machining to be entirely complete. Since at least 2009, the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) has issued guidance to these companies in the form of “determination letters” that have allowed for the unregulated sale of these products.¹⁰

For ATF, the key distinction is whether the “fire control cavity area” has been machined and if holes have been drilled or dimpled for the selector, trigger, and hammer pins. If they have not, then ATF does not consider the product to be a frame or receiver, which means that the federal government does not require licensing, background checks, or serialization on these unfinished parts.¹¹

As a result, ghost gun companies can sell unfinished frames and receivers, often packaged as “kits” with all of the other components and drill bits needed to assemble a firearm, without serializing their products and without conducting a background check. Customers can then drill out the few holes needed to convert the “unfinished” piece into a fully functional frame or receiver and assemble an unserialized, untraceable firearm. These kits are available for both handguns and long guns.

Ghost guns can also be made using a 3D printer, a device that uses plastic polymers to produce physical objects based on a computer-aided design (CAD) file. A 3D printer can be used to produce an entire firearm, although because these guns are typically made using plastic that is less durable than that used in traditional firearm manufacturing, weapons made entirely with a 3D printer tend to be much less robust than traditional weapons.¹² They fire only a single shot and break down extremely quickly; what’s more, an insufficiently tested 3D-printed gun may explode when it is fired, at great risk to the user.

CAD files and 3D printers can also be used to create a frame or receiver; these parts, when combined with other traditionally manufactured components, are much more robust: individuals who have used this hybrid process to build rifles have claimed that they have test fired hundreds of rounds with them.¹³ While 3D-printed frames and receivers appear less common than those made from unfinished parts, they pose a real danger: last year a man was convicted after law enforcement found him armed with a rifle with a 3D-printed receiver and a “hit list” of lawmakers and their home addresses. The man had previously attempted to purchase a firearm at a dealer, only to fail a background check because of his history of domestic violence; he then used a 3D printer to make a receiver and build a rifle.¹⁴

Ghost Guns Pose a Grave Threat to Public Safety

Ghost guns have already been used in school shootings: in 2019, just over thirty miles from Santa Monica College, a sixteen-year-old boy too young to buy a firearm used a ghost gun to shoot five of his classmates, killing two.¹⁵ Ghost guns have been used to attack police officers: in December of 2019, a man armed with a ghost gun fired on two officers in the District of Columbia;¹⁶ several months earlier, a California Highway Patrol officer was killed and two others were injured by a man armed with a ghost gun who had previously spent a decade in prison for the attempted murder of a police officer.¹⁷ And ghost guns have been used in workplace shootings: in 2018, a Wisconsin man who was prohibited from possessing firearms shot four of his coworkers with a ghost gun.¹⁸



Photo: Mario Tama/Getty Images

More often still, ghost guns are trafficked. For criminals selling guns on the black market, ghost guns are an attractive option. To buy a traditional gun from a licensed dealer, traffickers often use a “straw purchaser” without a criminal record who can successfully pass a background check. That individual must be present in person to complete the purchase, and must fill out paperwork that will forever link them to the gun. Dealers must complete additional paperwork when a buyer purchases multiple handguns, or in certain high-risk areas, multiple rifles.¹⁹ As a result, when some of the trafficked firearms are inevitably recovered as crime guns, law enforcement has a serial number and paperwork that they can trace back to the initial sale.

Ghost guns allow traffickers to avoid all of these challenges and risks. Law enforcement officers across the country are increasingly encountering trafficking rings that are mass manufacturing and selling untraceable firearms.²⁰ In Los Angeles, law enforcement busted a ten-member ghost gun trafficking ring and seized 45 firearms.²¹ In recent years ghost gun trafficking rings have been uncovered in other states across the country, including Colorado,²² Florida,²³ Iowa,²⁴ New Jersey,²⁵ New York,²⁶ North Carolina,²⁷ and Pennsylvania.²⁸

Certain companies incentivize this behavior by selling discounted bulk packages of ghost gun kits and parts.²⁹ Defense Distributed, a company most famous for distributing code that can be used to make firearms using a 3D printer, sells a milling machine it calls the “Ghost Gunner” that machines out unfinished frames and receivers to create fully functional components with ease.³⁰ One reporter who tried out the product said that it only required “a 12-year-old’s understanding of computer software” to use.³¹ A Washington man who was prohibited from possessing firearms was recently arrested after police found dozens of guns, including many ghost guns, in his home; the man also had a Ghost Gunner machine and was presumably using it to churn out these weapons for sale on the black market.³² Even without a dedicated milling machine, the process can be completed in a few hours with basic tools.³³

While law enforcement officials are unable to estimate how many ghost guns are currently in circulation due to the lack of serialization and absence of record-keeping requirements,³⁴ more than 40% of guns recovered in crimes in parts of California are now ghost guns.³⁵



Photo: Sarah Reingewirtz/MediaNews Group/Pasadena Star-News

The Threat from Ghost Guns Has Grown Particularly Acute

In the wake of the COVID-19 public health crisis, demand for guns in general³⁶—and ghost guns specifically—has spiked sharply. VICE News has reported that at least sixteen ghost gun companies have experienced such high demand that they have warned customers of delays.³⁷ One seller of ghost gun kits told VICE that, despite being a time of the year when he would expect demand to be lower, “sales are up like it’s Black Friday.” Another ghost gun kit seller said that a significant minority of the customers seeking the kits were “of the anti-government persuasion.”

It’s almost certain that some of the purchasers contributing to this spike in demand are not legally permitted to buy guns. This is particularly concerning from a public health and safety perspective because stay-at-home orders have coincided with an increase in domestic violence incidents.³⁸

To the extent that the surge in demand is driven by buyers who feel they have a heightened need for a gun in the present environment and may eventually decide they no longer need the weapon and sell or otherwise dispose of it, the result could be an even larger secondary market in untraceable ghost guns. That, in turn, could mean an ever larger number of guns that law enforcement recover from crime scenes but cannot trace back to their original owners.

We Can Stop the Proliferation of Ghost Guns

Fortunately, several responses could readily defuse the significant threat to public safety posed by ghost guns. ATF should acknowledge that unfinished frames and receivers are designed to be used in operable firearms, and may readily be converted to operate as completed firearms and receivers. Indeed, this is precisely why ghost gun companies sell them, and why their customers buy them. By any commonsense reading, they meet the federal definition of “firearm.” ATF should stop turning a blind eye toward the intentions of ghost gun companies and the ease with which their wares can be converted into operable firearms, rather than continuing to use the outdated fire cavity distinction of the Bureau’s own creation.

Absent action by ATF, Congress should easily amend the definition of “firearm” so that it clearly includes unfinished frames and receivers. Legislation introduced by Senator Richard Blumenthal in May 2020—a companion bill to the Untraceable Firearms Act introduced by Representative David Cicilline—would effect this important statutory change.

Because any comprehensive solution to the problem of ghost guns must come at the federal level, Congress should act immediately to address this critical threat to public safety. Otherwise, ghost gun companies and traffickers can evade any more localized laws and regulations by simply moving to another jurisdiction. For example, after New Jersey passed a comprehensive ghost gun law, a trafficking ring based there decided to ship ghost gun kits to Pennsylvania to avoid the new restrictions.³⁹

In the absence of federal action, states and municipalities can and should take steps that will make it harder to produce ghost guns within their borders. Several states and municipalities have already done so:



In 2016 **California** enacted legislation requiring that an individual seeking to make a homemade firearm must apply to the state for a serial number and affix that serial number to the gun.⁴⁰ The legislation also prohibited the knowing aiding or abetting of the home manufacture of a firearm by any person prohibited from possessing firearms under California law.⁴¹ Further legislation enacted in 2019 will require that the sale of ghost gun parts be conducted through a licensed dealer, with a background check and the creation of sales records, though these requirements are not scheduled to go into effect until 2025.⁴²



Connecticut enacted a similar statutory regime requiring an individual to apply to the state for a serial number and prohibiting the knowing aiding or abetting of the home manufacture by a prohibited person in 2019.⁴³



New Jersey has enacted strong legislation that prohibits the purchase or acquisition of parts, including unserialized frames or receivers (whether finished or unfinished), “from which a firearm without a serial number may be readily manufactured or otherwise assembled.”⁴⁴



Washington has prohibited manufacturing of untraceable firearms with the intent to sell them, as well as assisting in the manufacturing of an untraceable firearm by a person prohibited from possession.⁴⁵



In **Pennsylvania**, the attorney general has issued an opinion stating that unfinished frames and receivers constitute “firearms” under state law.⁴⁶ That opinion is the subject of ongoing litigation.⁴⁷

Municipalities have also taken steps to address the threat of ghost guns: New York City has prohibited the possession and disposition of an unfinished frame or receiver⁴⁸ and the District of Columbia has enacted similar emergency legislation on a temporary basis.⁴⁹

Legislative Solutions to Ghost Guns

Effective legislative solutions to ghost guns should include a few key elements. The first relates to the problem of their untraceability, which can be solved by imposing serialization and record-keeping requirements. Legislation should prohibit the possession, sale, or transfer of unfinished frames or receivers that lack serial numbers, and require that an unfinished frame or receiver be serialized before first retail sale. It is not sufficient to rely on the retail purchaser to serialize after the fact; the best place to intervene in the ghost gun supply chain is before the retail purchase of the unfinished frame or receiver.

For states, there are two potential ways to impose a serialization requirement. First, a government entity could generate serial numbers upon request that the manufacturer or retailer would affix before the first retail sale. Second, the manufacturer could generate and affix a serial number unique to them, along with identifying markings. In either case, the markings should also identify the jurisdiction and law that is imposing these requirements. These serialization requirements should be combined with record retention requirements that parallel those imposed under federal law in the case of the sale of a firearm, and all such records should be transmitted to a law enforcement entity. Taken together, these interventions would allow for law enforcement to trace a firearm made from a frame or receiver that is finished by a purchaser.

The second key element for states seeking to regulate ghost guns relates to background checks and prohibited persons. Legislation should include a procedure to check that the purchaser of an unfinished frame or receiver is not prohibited from possessing a firearm. One way for states to achieve this is to require would-be purchasers to first obtain a “personal firearm manufacturing license,” which would allow the holder to purchase an unfinished frame or receiver. While other qualifications could be imposed, a minimum qualification should be passing a background check. Any retail sale of an unfinished frame or receiver should be prohibited unless the purchaser shows proof of identity and that he or she holds the appropriate license. Finally, a person who is prohibited from possessing a firearm should be prohibited from possessing an unfinished frame or receiver (even if it is serialized).

Ghost guns pose an acute threat to public safety, and that threat is only increasing in light of their growing popularity and the COVID-19 pandemic. There are steps that can be taken at the state and local levels to reduce risk, and governments should pursue those to the fullest extent. But this is ultimately a problem in the federal law, and it is incumbent on the federal government to step up, because only it can enact a comprehensive solution. We must work urgently to reduce those dangers, because the stock of untraceable guns available to traffickers, criminals, and prohibited people grows with every passing day.



Photo: Astrid Riecken/Washington Post

END NOTES

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- ² Matt Stevens, “Remorse, but not Hate, in Note Left by Santa Monica Gunman,” *Los Angeles Times*, June 13, 2013, <https://www.latimes.com/local/la-xpm-2013-jun-13-la-me-0614-santa-monica-shooting-20130614-story.html>. In addition to the rifle he made himself, the man carried a revolver described by law enforcement as a “curio” or “relic,” meaning an outdated weapon considered to be of interest to collectors. See Bureau of Alcohol, Tobacco, Firearms & Explosives, *Curios & Relics*, <https://www.atf.gov/firearms/curios-relics>.
- ³ The description of this shooting comes from the City of Santa Monica’s report: “City of Santa Monica June 7th 2013 Shooting Incident,” March 2014, https://www.smgov.net/uploadedFiles/Departments/OEM/Video_Archive/Santa%20Monica%20Shooting%20Experience%20OverFeb%202014.pdf. Additional details about the victims from “Who They Were: Santa Monica Shooting Victims,” *Los Angeles Times*, June 9, 2013, <https://graphics.latimes.com/towergraphic-santa-monica-shooting-rampage/>.
- ⁴ 18 U.S.C. § 922(a)(1)(A).
- ⁵ 18 U.S.C. § 923(i).
- ⁶ 18 U.S.C. § 922(t). The background check requirement was added in 1993 when the GCA was amended by the Brady Handgun Violence Prevention Act, Pub. L. 103-159.
- ⁷ 18 U.S.C. § 923(g)(1)(A).
- ⁸ “Fact Sheet – National Tracing Center,” Bureau of Alcohol, Tobacco, Firearms & Explosives, May 2019, <https://www.atf.gov/re-source-center/fact-sheet/fact-sheet-national-tracing-center>.
- ⁹ 18 U.S.C. § 921(a)(3).
- ¹⁰ See Letter from John R. Spencer, Chief, Firearms Technology Branch, Bureau of Alcohol, Tobacco, Firearms & Explosives, to Chris Coad, Ultra-Tech, Inc., May 20, 2009, available at ETF 23, *Cal. Rifle & Pistol Ass’n v. Bureau of Alcohol, Tobacco, Firearms & Explosives*, No. 1:14-CV-01211 (E.D. Cal. Jan. 9, 2015), at Administrative Record 135 (certified filing by ATF collecting Bureau-issued determinations regarding unfinished frames and receivers).
- ¹¹ See “Are ‘80%’ or ‘Unfinished’ Receivers Illegal,” Bureau of Alcohol, Tobacco, Firearms & Explosives, accessed May 12, 2020, <https://www.atf.gov/firearms/qa/are-%E2%80%9C80%E2%80%9D-or-%E2%80%9Cunfinished%E2%80%9D-receivers-illegal> (asserting that an unfinished receiver with “a solid, un-machined fire-control cavity area with no holes or dimples for the selector, trigger, or hammer pins” is not regulated as a “firearm,” while one with “a partially machined fire-control cavity and does meet the GCA definition of a firearm”).
- ¹² 3D-printed guns are made almost entirely from plastic. Some models use a common nail as a firing pin. Because federal law requires that firearms be detectable by metal detectors, 18 U.S.C. § 922(p) plans for 3D-printed guns sometimes instruct the end-user to insert a piece of metal into the firearm. Without such a component, 3D-printed guns may be prohibited under existing federal law.
- ¹³ E.g., Cyrus Farivar, “Download This Gun’: 3D-printed Semi-automatic Fires Over 600 Rounds,” *Ars Technica*, March 1, 2013, <https://ars-technica.com/tech-policy/2013/03/download-this-gun-3d-printed-semi-automatic-fires-over-600-rounds/>.
- ¹⁴ Department of Justice, “Man Carrying Prohibited 3D-Printed Gun Found with List of Lawmakers’ Addresses,” February 13, 2019, <https://www.justice.gov/usao-ndtx/pr/man-carrying-prohibited-3d-printed-gun-found-list-lawmakers-addresses>.
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