



**Policing
Project**
NYU School of Law

Axon's Project ION

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A Report on Axon's Proposal for Taser-Equipped Drones

Authored by former members of the Axon AI Ethics Board and
the Policing Project at New York University School of Law

Photo Credit: Axon Enterprise

About the Policing Project

The Policing Project at New York University School of Law partners with communities, policymakers, police, and technology companies across the country to bring democratic accountability to policing so that it better matches American ideals and community needs. Our work is intended to help center a community-driven vision for public safety, one that is equitable, non-discriminatory and respectful of public values. For more information, visit www.PolicingProject.org.

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About This Report

Axon Enterprise is one of the country's leading vendors of policing technology. The company is perhaps best known for the Taser, an electric shock or "conducted energy" weapon which has been deployed by 94% of policing agencies in the United States. Axon also is known as the country's largest producer of body-worn cameras and the developer of Axon Evidence, a platform for managing digital evidence. Seeking guidance regarding the ethical development of these and other products, Axon founded the Axon AI Ethics Board, an independent review board created to advise the company on civil rights and civil liberties issues relating to AI-powered policing technologies.

In 2021, Axon informed its Ethics Board that it was planning to develop a Taser weapon which could be attached to devices such as drones and robots. This product, called "ION," would enable police to deploy Tasers remotely. For over a year, the Board considered whether Axon should proceed with developing this technology. To facilitate this review, the Board created a subcommittee dedicated to working on the ION proposal, including conducting research, consulting with Axon personnel, and drafting preliminary recommendations, which then were considered by the full Board at regular meetings. Ultimately, Axon agreed that a full public report on the Board's decision would be issued.

With Axon's acquiescence, the Board decided to limit its evaluation to a narrow scenario which the Board felt presented the most compelling use for ION: as an alternative to firearms in situations in which proximity to an armed individual would endanger officer safety. Because Tasers only are effective to 25 feet, they require an officer to be in relatively close proximity to the person against whom the Taser is used. Therefore, Tasers are not always a viable option when an individual is armed with a weapon; in these cases, police often resort to firearms, which can be fired from a longer range. The ability to deploy a Taser remotely presumably would limit the use of firearms by police, and potentially save lives. That was the use case the Board found most immediately persuasive.

Rather than debate the issue in the abstract, the Board structured its discussions around the idea of a pilot program. The idea was that even with a compelling use case, weaponizing drones or robots was a big step. Better to design a pilot with features intended to protect civil rights and civil liberties and see if in those specific terms proceeding made sense. The Board deliberated in two stages. First, the Board developed an ideal set of policies and safeguards which it believed stood the best chance of mitigating ethical concerns regarding Taser weapon technology mounted on a drone. Second, the Board deliberated on whether, in light of these policies and safeguards, an ION pilot program ought to go forward.

Ultimately, the Board voted, by a vote of eight to four, that Axon should not proceed with a pilot program. In the ordinary course, this Report would explain the reasoning behind the Board's determination.

Less than three weeks after the Board's vote, however, and before the Board had an opportunity to explain its reasoning to Axon, Axon announced publicly that it was proceeding with the development of Taser-equipped drones — effectively a version of ION. The announcement ostensibly was prompted by the tragic school shooting in Uvalde, and the technology was presented as a solution to mass school shootings. The Board had not evaluated this use for the technology, nor had it been asked to do so.

In the wake of Axon's announcement, nine of the Board's twelve members resigned, citing concerns about the company's plans and its failure to consult the Ethics Board according to the governing protocols. For some of the resigning Board members, Axon's focus on deploying this technology in schools was particularly concerning. Not only would Axon's plans entail the installation of persistent surveillance (a form of surveillance the Board had long cautioned Axon against), several members of the Board believed that weaponized drones stood little chance of solving the problem of mass shootings. The company's sudden decision to announce the development of weaponized drones in this context struck many members of the Board as trading on the tragic shootings which had just occurred in Uvalde and Buffalo. The Board disbanded shortly thereafter.

In the interest of public transparency and accountability, and because we believe there is a lot to be learned from our year of deliberations, the nine resigning Board members, in conjunction with the Policing Project at New

York University School of Law, have authored the following report regarding Axon's proposed weaponized drone program.

Each of the authors of this Report previously signed non-disclosure agreements with Axon prohibiting, among other things, the unauthorized disclosure of non-public information about potential future products. However, those NDAs do not prevent the authors from commenting on aspects of products that Axon has already disclosed publicly. This Report does not disclose any product information that has not previously been made public by Axon (e.g., in press releases, in statements made by Axon leadership, or in publicly-available patent filings).

Background

The Taser is a “conducted energy device,” or “CED.”¹ CEDs such as Tasers use electricity to cause involuntary muscle contractions in suspects, making them easier to subdue.² Electricity is delivered to individuals through barbed probes which are launched using compressed nitrogen.³

Tasers are less likely to cause death than firearms, although they are not without risk. Studies have found that the vast majority of people shocked by a Taser suffer no injuries or only minor injuries.⁴ Yet in some cases Tasers can cause serious injuries such as head injuries and bone breaks and, in rare instances, death.⁵

Despite long-standing controversy surrounding their use, Tasers have been adopted widely by policing agencies. Indeed, approximately 94 percent of domestic policing agencies now issue Tasers.⁶

In 2021, Axon informed the Ethics Board that it was planning to develop a *modular* Taser device called “ION.” ION would be a Taser that could be attached as a module to devices such as drones and robots. This would enable police to deploy a Taser *remotely*, potentially making it an alternative to traditional firearms in situations in which proximity to an individual would endanger officer safety.

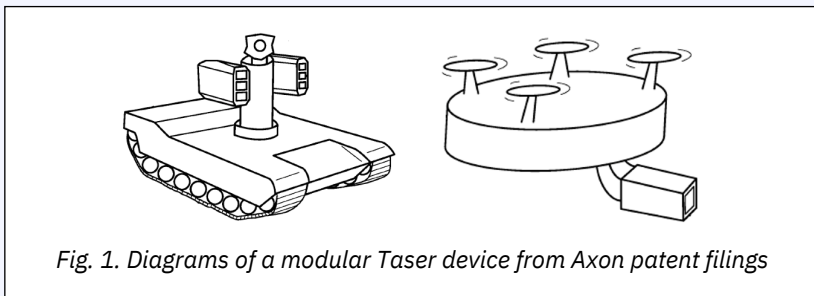


Fig. 1. Diagrams of a modular Taser device from Axon patent filings

The Board agreed to conduct an ethical evaluation of this technology, understanding that the prospect of weaponized police drones raises potentially-significant ethical issues.

A. *Scope of the Board's Deliberations*

Recognizing the ethical issues potentially posed by weaponized drones, the Board decided to consider only a pilot of the ION concept. The idea was that the Board first would construct a pilot with all the safeguards it felt appropriate to the use of a weaponized drone, and the study of such use. Only then, in the context of a pilot around a specific use case (described below), would the Board vote on whether Axon should move ahead. This section describes the provisions, controls, and protocols the Board felt were required in any pilot of a weaponized drone.

In its discussions, several Board members felt that certain use cases for this technology, such as for crowd control at protests or for patrolling the border, were inappropriate and did not warrant any further consideration. Still, the Board felt that certain limited uses for ION deserved fuller evaluation.

Consequently, the Board decided to narrow its evaluation to a pilot program centered around a single use case: police piloting Taser-equipped drones in situations in which proximity to an individual would endanger officer safety. The Board believed that this presented the most compelling use for the technology. Because Tasers have a relatively short range, they are not always a viable option when an individual is armed with a weapon. Taser 7 cartridges have a maximum range of 25 feet, but in practice operators usually need to be closer to hit their target reliably.⁷ Therefore, in many situations involving armed individuals, officers may resort instead to firearms to diffuse a situation while ensuring their safety.⁸ The ability to deploy a Taser remotely in these situations would offer officers an alternative to using firearms, potentially saving the life of the individual who had drawn officer attention, while enhancing the safety of officers.

With this understanding of a narrow pilot program in mind, the Board worked to develop a set of policies and safeguards which it believed stood the best chance of mitigating ethical concerns around the use of Taser technology mounted on a drone.

B. Development of Policies and Safeguards

The Board began its structuring of a pilot by refining general ethical principles Axon itself had created to govern the development of ION. These principles included (a) that ION should be used to save lives and not take them, and thus operators are duty bound to de-escalate when possible and deploy only non-deadly force; (b) that humans must be held accountable for their decisions to deploy force, and (c) that there must be rigorous oversight and transparency, including an after-action review of all uses of force. Axon also proposed a set of basic product safeguards, including authentication of all ION users and audit trails to log all activities.

The Board then developed a much broader set of policies and safeguards designed to mitigate ethical concerns around an ION pilot. These are reproduced in full in the **Appendix**. An overview of the Board's recommendations follows:

1. Product Design Recommendations

- A. ION should never include autonomous (non-human controlled) weapons, nor weapons designed to be lethal (such as firearms).
- B. ION should meet certain safety thresholds, including high accuracy rates across different weather conditions, controls to prevent misfiring and targeting errors, and security measures to prevent hacking and unauthorized access.
- C. ION should have a firing lock-out which prevents firing of the Taser until a supervisor has confirmed that such use of force complies with applicable laws and policies.
- D. ION should include mandatory transparency portals disclosing to the public information about each use of the technology, including video footage of the incident.
- E. The implementation of any AI system assisting in aiming the weapon should undergo an independent algorithmic audit to ensure the minimization of racial and other bias.
- F. Axon should collect data regarding product performance and outcomes (such as use of force rates and dispositions) and provide this data to researchers and the public.
- G. ION drones should be clearly marked to indicate that they are official police vehicles, and they should indicate the particular agency to which they belong.
- H. ION drones should record video for the entirety of each incident in which they are used.

2. Policy Recommendations

- A. Policing agencies should be required to obtain legislative authorization to use ION and should be required to adopt an internal policy governing its use.
- B. An agency's internal policy should prohibit all uses of ION except for those expressly permitted by the policy.
- C. An agency should have an ION use of force policy, including that officers attempt first to de-escalate the situation without using ION, provided the suspect does not pose an imminent threat.
- D. An agency's policy should require a supervisor or independent investigation into each use of ION, culminating in a public after-action report.
- E. Agencies should require officers to be on the scene when operating ION and, unless it would endanger safety, have a line of sight both to the drone and suspect.

3. Training Recommendations

- A. Users should receive training in the operation of ION, including consistent deployment of the Taser and accounting for variables such as wind, obstacles, and bystanders.
- B. Users should receive training to ensure proficiency in all applicable laws and policies governing ION use.
- C. Users should undergo de-escalation training tailored to the ION context.

4. Sales/Export Recommendations

- A. Axon should thoroughly vet customers before selling ION to them. A pilot program should be limited to the United States, United Kingdom, and European Union.
- B. Axon should have the means to, and should, disable or claw back the technology from any customer using ION in an inappropriate manner.

In addition, members of the Board expressed interest in learning whether the adoption of Tasers increased the use of force generally, and whether the answer to that question varied in the United States (where most officers carry firearms) or a country like the United Kingdom (where they do not). Axon agreed to fund a literature review on this issue, to be conducted by a social scientist.

This review found that most of the existing studies do not tell us the causal effects of deploying Tasers on the use of force by police. Of the three studies that do, the evidence is mixed:

- One study of the Chicago Police Department suggests that after being equipped with Tasers, “officers substituted from no-/low-/intermediate-level force to the use of TASERS” with “no countervailing reduction in firearm use.”⁹ Use of force increased by 10% overall. Use of force incidents decreased, however, after Axon changed their training materials in 2012.
- Another study involving the Las Vegas Metropolitan Police Department suggests that officers substituted from intermediate and higher-level force to Tasers.¹⁰ The officers in this study, however, were participating in a training scenario where the risk of danger was nonexistent — these officers may well have behaved differently under real-world conditions.
- Finally, a study conducted in the United Kingdom indicated “that the presence of TASER-equipped officers increased the frequency with which officers used some type of force by 23%,” relative to shifts in which there were no Taser-equipped officers.¹¹ One important caveat, however, is that the study did not randomize which officers were equipped with Tasers. One possibility is that there were differences between the officers who were and were not assigned Tasers — for example, “if more aggressive officers signed up for TASER training first, then the greater use of force among officers in the treatment group could be due to this pre-existing difference in aggressiveness, rather than the availability of TASERS.”¹² With this caveat in mind, the results of the study are in line with a concern raised by some Board members that, because most officers in the United Kingdom do not carry firearms, it is less likely that Tasers will reduce lethal force in that region.

In short, more research is required in order to assess the impact of Tasers on use of force. The existing evidence is mixed, although it does suggest that one important factor in the relationship between availability of Tasers and use of force outcomes is appropriate training regarding use of Tasers. It also raises the question whether introducing Tasers in places where police possession of firearms is prevalent may lead to different outcomes than in places where police do not carry firearms, decreasing use of force in the former and increasing it in the latter.

The Board Vote

After considering the issue of Taser technology mounted on a drone for a year, including deliberating in the context of the single-use case pilot program discussed above, the Board voted on the question of whether to recommend Axon proceed with a pilot program. That vote assumed Axon's implementation of all aspects of the Board's pilot design. The vote was preceded by a lengthy discussion. Ultimately, the Board voted eight members to four against Axon proceeding with an ION pilot. Recognizing the values on both sides, all members of the Board acknowledged it was a difficult decision. The discussion was extremely robust.

This section sets forth the Board's reasoning for its vote. It begins with an overview of the potential benefits and harms of ION that were identified by the Board during the year of deliberations. It then summarizes the arguments made against proceeding with a pilot even with the safeguards that pilot included. This summary is not meant to capture the reasoning of any one Board member, because Board members differed in their thinking. Rather, it is a composite of the views expressed, to serve as a record for those considering similar technologies in the future.

A. Potential Benefits

All members of the Board agreed that the problem of police shootings in the United States must be addressed urgently. Over one thousand people have been shot and killed by police over the past year.¹³ Although the Taser itself can help address this problem, as described above the conventional Taser has distance limitations. Members of the Board saw the potential of ION to help address this issue — that is, if used as intended, it could enable police to avoid the use of lethal force.

Some members of the Board noted, however, that the United States is exceptional in terms of the frequency of police shootings. For example, in the most recent year of data, Germany experienced eleven police killings; England and Wales experienced three.¹⁴ Thus, the benefits of ION outside of the United States remain unclear, and some Board members felt the U.S. and non-U.S. determinations needed to remain separate.

In general, though, the Board unanimously viewed the potential benefit as a serious one — sufficiently serious that we felt the concept warranted serious study and deliberation.

B. Potential Harms

1. Misuse

One of the most serious concerns expressed by some Board members was the potential for misuse. There have been disturbing reports regarding the use of Tasers against young children, individuals who are handcuffed or otherwise restrained, and individuals who have engaged only in verbal “resistance.”¹⁵ One study noted that police abuse of Tasers, though apparently rare, presents an opportunity for troubled officers to dole out “street justice.”¹⁶ Taser misuse occasionally can result in injury and, in rare instances, death.¹⁷ What is true of Tasers in general could be true of ION as well.

2. Increased use of force

Although the theory of the Taser is that it decreases the use of lethal force, there are concerns that it could *increase* the use of *non-lethal* force. As discussed above, one study of the Chicago Police Department suggests that equipping officers with Tasers caused an increase in the use of force overall.¹⁸ Notably, however, after officers were retrained in Taser use, use of force rates fell.¹⁹ As noted above, the Board believes more study of this issue is warranted.

3. Dehumanization

The Board considered the potential for dehumanization when weaponized drones are used. A growing literature on military use of drones notes the unique characteristics of remote use of force — humans appear as figures on a computer screen, and decisions to use force often are made by teams rather than by a single individual. Some scholars warn that these factors could lead to dehumanization of individuals targeted by the drone and could diminish operators’ sense of personal moral culpability for their decisions, leading to increased use of force.²⁰

4. Use of force standards

Relatedly, existing use of force rules may be inadequate in the context of remote use of force. The Fourth Amendment requires that police use of force be “reasonable” — an objective standard based on the particular facts and circumstances of the case.²¹ This incorporates the perspective of officers on the ground — who, due to their proximity to the individual against whom force might be used, may fear for their safety.²² If ION obviates the need to send officers into harm’s way, agencies may need to reassess their use of force policies. This issue is complicated further by the fact that agencies differ in where they rank Tasers on the force continuum.²³

5. Negative public response

Board members generally were concerned that many members of the public would respond negatively to the prospect of armed police drones. The dramatic power asymmetry characterized by police use of armed drones could lead to diminished public acceptance of drones and robots generally. This was particularly of concern because there may well be beneficial use cases for non-weaponized drones and robots. Relatedly, the actual deployment of weaponized drones could cause individuals or crowds to panic, potentially leading to injury or death.²⁴

6. Police militarization

Weaponized drones long have been associated with military use. Their deployment by agencies could contribute to the militarization of domestic policing, or the perception of such militarization, potentially undermining community relations and distorting law enforcement’s view of their mission.²⁵

7. Operational risks

Factors such as mechanical failures, operator error, or bad weather could cause drones to crash or ION strikes to go awry.²⁶ Bad actors might hack police drones or robots (or deploy drones or robots of their own).²⁷ And in some circumstances it may be preferable to have police on the scene in person — for example, to enhance operational awareness, create better conditions to negotiate with a hostage-taker, or to better observe a suspect’s demeanor and actions.²⁸ The advent of weaponized drones could habituate

officers to conduct police work from a distance, even when doing so is disadvantageous.

8. Racial disparities

The disproportionate use of new technologies by police in marginalized communities has been well-documented.²⁹ Some experts warn that the disproportionate deployment of drones in Black and brown communities is inevitable absent policies and safeguards to counteract this.³⁰

9. Market forces

Axon's release of ION may prompt other market participants to launch competing products. These products potentially could lack the safeguards that the Board felt Axon should build into ION. Moreover, ION could normalize the use of weaponized drones by law enforcement, hastening the transition to more lethal weapons. Relatedly, ION, once developed, could be reverse-engineered and deployed by governments with a record of human rights abuses.³¹

C. Board Deliberations

In light of these benefits and harms, the Board deliberated and voted on the single-use case pilot.

Four members of the Board voted that Axon should proceed with an ION pilot program. Police shootings are a tragic and seemingly intractable problem in the United States — over one thousand people were shot and killed by police over the past year. The ability to deploy a Taser remotely could reduce significantly the number of these incidents. To be sure, these Board members took very seriously the ethical issues that weaponized drones raise. Yet they felt that the proposed safeguards mitigated the harms sufficiently that in light of the opportunity to reduce police killings substantially, a pilot program in a small number of cities should proceed. For some of these Board members, the requirement that any deployment of ION be democratically authorized was a particularly important factor in their support for a pilot.

Eight members of the Board voted that Axon should not proceed with a pilot. These Board members took extremely seriously the potential life-saving benefit of Taser weapons mounted on drones, and acknowledged that Axon

was willing to implement safeguards. But the members of the majority felt any discussion of safeguards must be assessed not in the abstract, but in light of the actual state of the world. These Board members believed that the proposed safeguards were insufficient to mitigate the harms of the technology, in large part owing to several structural problems with policing today. These structural problems included:

1. The limits of agency policies

As discussed, the proposed safeguards included various policy requirements which were meant to ensure that ION would be used only in appropriate circumstances. But there are serious limitations to agency policies at present. They are not self-executing: in order to be effective, policies must be enforced rigorously and with appropriate oversight. Yet, that is too often lacking in law enforcement today.

2. The limits of agency use of force rules

Relatedly, rules around use of force are necessary, but not sufficient, to prevent abuses. Indeed, although Taser-specific use-of-force policies are common, so too are examples of Tasers being used (or abused) by officers outside the bounds of such policies. One reason for this is the fact that policing agencies and officers often are shielded from liability for their actions. For example, the legal doctrine of qualified immunity grants officers immunity from civil suits unless they have violated clearly established law.³² And even if an officer is found liable, widespread police indemnification ensures that officers almost never personally contribute to settlements or judgments.³³ Thus, there was no assurance of adherence to the limitations in the pilot.

3. The variance in agency capacity and quality

One pervasive problem is the huge variance in policing agency capacity throughout the United States. There are some 18,000 agencies nationwide, from the very smallest of just a few officers to the largest, comprising thousands of officers. And those agencies have been shown to be of varying quality, as demonstrated by agencies of all sizes ending up the subject of a U.S. Department of Justice investigation or consent decree. The pilot was designed with the "ideal" agency in mind. But should the pilot succeed, sales

could be made to a wide range of agencies. Even if Axon did not sell to all agencies, the existence of weaponized drones might become common. Yet, Board members had concerns that variance in agency quality would put yet another serious weapons system into the hands of officers unprepared to use it responsibly.

4. The limits of sales/export controls

For a technology such as ION, the Board agreed that it is crucial for Axon to vet its customers. Yet, as a practical matter, Axon only has limited ability to know its customers, given that agencies in turn must employ officers. Many officers dismissed for misconduct at one agency find work at another — a phenomenon known as the “wandering officer.” One study of law enforcement agencies in Florida found that in any given year, an average of just under 1,100 officers who were previously fired worked for policing agencies in the state.³⁴ Even if Axon could know its customer for the purpose of a pilot, there was skepticism that would be true should the product ultimately be rolled out more widely.

5. The limits of an enforcement-focused approach

Some members of the Board felt that a focus on expensive new weapons and surveillance systems could impede investment in more sustainable solutions such as alternatives to police response that also might save lives. Such alternatives might be appropriate in the case of individuals who are in mental or emotional crisis. Some scholars have argued that in order to address the harms of policing, we must develop alternatives to enforcement and police responses.³⁵

Two other considerations bear mentioning. First, if Axon were to design and release ION in a responsible manner, it could have a positive influence on the industry overall. Axon is a company with market power and influence; if it were first to the market with this type of technology, it could set a high ethical bar, influencing public expectations regarding safeguards and policymaking around weaponized drones and robots. On the other hand, releasing the product also raises concerns about a race to the bottom. By launching ION, Axon might accelerate a process in which competitors would come to market with weaponized drones and robots lacking Axon's safeguards. This could create market pressures on Axon that could cause the company to back away

from its ethical commitments in the long run. And whether or not it did so, the market then would be open to products with fewer controls.

Finally, some members of the Board believed that the decision whether to pursue ION at all should depend on the particular country in which ION would be sold. As discussed above, police shootings are far more common in the United States than in other industrialized nations. Even if there is an argument for ION in the United States, it is more difficult to see that argument in countries where the rate of police shootings is very low.

For whatever reasons persuaded each of them, eight of the twelve members of the Board believed that proceeding with a pilot program — even one with the ideal set of safeguards the Board developed — would be unwise. In the view of these Board members, until we have addressed some of the fundamental problems with policing today — each of which warrants serious attention — it would be inappropriate to deploy this technology.

Axon's Announcement

As indicated above, less than three weeks after the Board's vote, Axon announced publicly that it was proceeding with the development of Taser-equipped drones.³⁶ The announcement cast ION as a solution to the problem of *mass shootings* — particularly school shootings, a use case the Board had not advised on.³⁷ Axon's CEO, Rick Smith, said that the impetus for the announcement was the school shooting at Robb Elementary in Uvalde Texas, a tragic incident in which 21 children and teachers lost their lives.³⁸

As Axon executives explained publicly, these new plans for ION might entail mounting Taser-equipped drones in school ceilings — likely behind discrete covers designed to protect against vandalism.³⁹ In response to a shooting, the ION-equipped drone could be activated and piloted by a remote operator.⁴⁰ The operator would be assisted by camera networks installed at the school.⁴¹ Although these cameras would be owned and operated by the school, police could be granted temporary access in response to a shooting incident.⁴² The company stated that a functional proof of concept would be available by the following year.⁴³

Axon apprised the Board of these plans shortly before going public. Board members, in strong terms, expressed disagreement with Axon's decision to go public at that time. Although the use of ION in response to school shootings had been discussed briefly as a potential use case, the Board had never evaluated it — it had never proposed safeguards specific to this use case nor even considered the special concerns that deploying weaponized drones and surveillance systems in schools might raise. For some members of the Board, the rushed nature of Axon's announcement, before a thorough examination of the concept could be conducted, was deeply troubling. Moreover, the notion of addressing school shootings with weaponized drones struck many Board members as deeply impractical. Among other things, mass shooters often wear body armor, reducing or eliminating the effectiveness of Tasers, and it was unclear how the drones were to get to the part of the school where a shooter might be. Axon itself recognized this difficulty, subsequently suggesting all doors would have to have cuts through which a drone could pass.

Several Board members were concerned about the aspect of Axon's plans involving the deployment of persistent surveillance in schools. Although the ostensible purpose of installing such surveillance would be to facilitate the remote operation of a drone, it is not difficult to imagine such a system being used for routine surveillance. Research shows that school surveillance does not necessarily make students safer, but often is used to identify and punish students for relatively minor infractions.⁴⁴ This increases the rate of suspensions and other discipline, which is associated with lower academic performance and lower rates of college attendance.⁴⁵ Black students are four times more likely to attend a school with a high level of surveillance.⁴⁶

Further, the Board believed that Axon's decision to move forward with this announcement constituted a breach of its promise to consult the Ethics Board before making such announcements or decisions. The Board had never evaluated the use of weaponized drones in schools, and Axon's announcement came before the company had even begun to find workable solutions to address the Board's concerns about a far more limited pilot.

In the days following Axon's announcement, as the company continued to push its new concept for ION in the media, it became clear that Axon was not planning on reassessing its plans. Especially in light of Axon's failure to consult its own Ethics Board prior to making its announcement, nine of the twelve members of the Ethics Board felt they no longer could serve on the Board and resigned, issuing a statement which read in part:

Although we all joined this Board understanding that we are advisory only—and have seen Axon reject our advice on some prior occasions—rushing ahead to embrace use of surveillance-enabled, Taser-equipped drones, especially when its Board was urging against unnecessarily precipitate action, is more than any of us can abide. We have lost faith in Axon's ability to be a responsible partner.

In light of these resignations, Axon announced that it was "pausing work on this project and refocusing to further engage with key constituencies to fully explore the best path forward."⁴⁷ Nonetheless, Rick Smith, Axon's CEO, recently reported that the company now is engaging with teachers, educators, policymakers, and the general public in an attempt to increase acceptance of weaponized drones.⁴⁸

Conclusion

Despite our conclusion — reached after thorough consideration — that now is not the time for development of weaponized drones, we should not resign ourselves to the status quo in which tens of thousands of people have been killed or injured in police shootings. On this point we agree with Axon, and the many other people who feel similarly. But technology alone will not solve some of the root difficulties with policing, and it was those root problems that gave the majority of the Board that voted against the pilot pause.

As for Axon’s proposal to deploy ION in schools, we believe these plans simply are not a realistic solution to the problem of mass shootings. Importantly, Axon’s proposal does nothing to address the *cause* of mass shootings — the availability of high-powered weapons and the failure to control who has access to them. Proposals to “harden” schools into militarized fortresses are a means to avoid dealing with the real problem: the guns and the shooters. Even if shootings could be stopped inside of a school building, what prevents someone from committing a mass shooting on a playground, or in church, or a supermarket? Are we prepared to live in a world in which every conceivable gathering space must be outfitted with advanced weaponry? A focus on hardening schools lets policymakers off the hook for their failure to meaningfully address the problem of gun violence at its source.

We are willing to believe that Axon created the ION concept with good intentions, but unless and until we have developed better systems for police accountability, transparency, and oversight, this technology has too much potential to inflict harm. In assessing its future plans, we would hope that Axon takes this point to heart. We also hope our concerns about the present state of policing and gun violence motivate change in those terms as well.

The Ethics Board's Proposed Safeguards

1. *Product Design*

First, the Board considered safeguards that Axon could implement through the design of the TASER module and/or its accompanying software.

A. No lethal or autonomous weapons

The Board agreed that ION should never include weapons designed to be lethal, such as firearms. The principal benefit of ION, in the Board's view, was its potential to save lives; the idea of a firearm-equipped drone or robot was a non-starter.

Likewise, the Board agreed that autonomous weapons should be ruled out – the decision to deploy force always must be made by a human. The Board clarified that decisions whether to deploy force must be made on a case-by-case basis. This means that a human operator should not be permitted to give ION a standing instruction (for example, to fire upon all suspects holding a firearm). Rather, each individual use of the TASER weapon must be made by a human.

B. Minimum safety thresholds

The Board agreed that ION should only be deployed once the product has reached certain minimum safety thresholds. Although the Board declined to set exact benchmarks, it unanimously agreed that ION must have (a) high accuracy rates across different weather conditions, (b) controls to prevent misfires or targeting errors, and (c) security measures which protect against hacking and unauthorized access.

C. Firing lock-out

For purposes of the pilot program, the Board agreed that ION should include a "firing lock-out." This would be a feature which would lock officers out of firing the Taser weapon until a supervisor has confirmed that the use of force

complies with applicable policies. For example, if an agency's policy restricted ION use to the incapacitation of suspects armed with a weapon, ION could lock officers out of firing until a supervisor has confirmed that the suspect is armed.

D. Transparency portals

The Board agreed that Axon should develop transparency portals with information about each incident in which ION is deployed. This information would include the nature of the offense, disposition, and video footage of the incident, with appropriate redactions. The Board agreed that agencies should be required to use the transparency portal, with information being released to the public after a reasonable period of time.

The Board acknowledged that the nature of the information disclosed might vary depending on state or local laws governing such disclosures. However, the Board agreed that if a jurisdiction's laws prohibited use of a transparency portal outright, Axon should not sell ION in that jurisdiction.

E. Addressing algorithmic bias

The Board agreed that Axon should condition the implementation of any AI system that assists in aiming the Taser weapon on that system undergoing a public and independent algorithmic audit to ensure, among other things, the minimization of any racial or other bias.

F. Data collection

The Board agreed that Axon should automatically collect and retain data regarding both product performance (e.g., accuracy of suspect identification and targeting) and outcomes (e.g., use of force rates, case dispositions). This information should be aggregated and provided to social scientists and to the public in an anonymized form.

G. Markings

The Board agreed that any ION-equipped vehicle should be clearly marked so that members of the public can easily understand that it is an official police

vehicle. Moreover, the markings should clearly indicate the particular law enforcement agency to which the vehicle belongs.

H. Video recording

The Board agreed that ION-equipped vehicles should record video for the entirety of each incident in which it is used, regardless of whether or not the Taser weapon is deployed.

2. *Policy/Regulation*

The Board next addressed the need for laws and policies governing ION use.

A. Democratic authorization

All but one member of the Board agreed that prior to deploying ION, the pilot agency should be required (a) to obtain legislative authorization for ION use and (b) to adopt an internal policy meeting certain minimum requirements set by Axon. One member of the Board believed that only an internal policy should be required.

B. Policies governing use

The Board agreed that agencies should be required to adopt a policy carefully defining how ION may be used. This policy should prohibit all uses of ION except for those expressly permitted by the policy.

C. Use of force standards

The Board agreed that agencies should be required to have an ION-specific use of force policy. This policy may well differ from a use of force policy governing ordinary Tasers. This is because ION would permit officers to deploy force remotely, enabling them to engage suspects without putting their safety at risk.

The Board agreed that more study and discussion was required regarding what an appropriate ION use of force standard would look like. However, the Board did agree that any ION use of force policy should require officers to

attempt de-escalation measures prior to deploying force, provided the suspect does not pose an imminent threat to others.

D. Review mechanisms

The Board agreed that any agency deploying ION should have a policy requiring an investigation into each use of the technology, either at a supervisor level or through an independent oversight entity. This review would culminate in a public after-action report.

E. Line of sight requirement

The Board agreed that in order to ensure operational awareness, agencies should have a policy requiring officers to be on the scene when operating ION. Moreover, unless it would endanger officer safety, those operating ION should have a line of sight to both the drone/robot and suspect prior to the firing of the TASER module.

3. Training

The Board next discussed the need for appropriate training for ION users. The Board considered the possibility that Axon could create its own training program and restrict access to authorized users who have completed a rigorous testing and certification protocol, including periodic recertification. The Board also considered whether Axon should simply set forth best practices for training and certification and leave implementation to state training agencies.

Ultimately, for purposes of the pilot, the Board agreed that Axon should be deeply involved in the training process, in collaboration with the agency selected for the pilot program. In particular, the Board agreed that ION users should be trained in three key areas.

A. Operational training

The Board agreed that ION users should receive training in the safe operation of ION-equipped vehicles. This should include training in consistently and

accurately deploying the TASER module, and appropriately accounting for variables such as wind conditions, inclement weather, obstacles, and the presence of bystanders.

B. Policy training

The Board agreed that ION users should receive training to ensure their proficiency in all applicable policies governing ION use, including the use of force policy and policies governing permissible uses of the technology.

C. De-escalation training

The Board agreed that ION users should undergo de-escalation training tailored to the drones and robots context, which Axon could develop in consultation with appropriate experts and stakeholders.

4. *Sales*

Finally, the Board considered the implementation of measures which restrict who has access to ION technology.

A. "Know Your Customer" program

The Board agreed that Axon should create a "Know Your Customer" program through which the company could thoroughly vet customers before selling ION to them. For example, Axon should not sell ION to countries with a history of human rights abuses.

During the Board's discussion of sales and export controls, Axon agreed that it would limit the pilot program to the United States, United Kingdom, and European Union.

B. Clawback provisions

The Board agreed that Axon should commit to disabling or clawing back the technology from customers using the technology in an inappropriate manner. The Board noted that further consideration was needed regarding what form



this clawback would take. One possibility discussed was to sell ION not as a product, but as a service, thereby enabling Axon to block irresponsible entities from operating the technology.

Endnotes

¹ See Geoffrey P. Alpert, et al., NAT'L INST. OF JUST., OFF. OF JUST. PROGRAMS, U.S. DEP'T OF JUST., POLICE USE OF FORCE, TASERS AND OTHER LESS-LETHAL WEAPONS 1 (2011).

² See *id.* at 2.

³ See *id.* Electricity also can be delivered through contact with the device itself — a feature known as “drive-stun” mode. See *id.*; This method generally does not cause incapacitation, but rather seeks to use pain to induce the suspect’s cooperation. *Drive-Stun Backup*, AXON, https://my.axon.com/s/article/Drive-stun-backup-x26p?language=en_US (last visited Sept. 6, 2022).

⁴ See *id.* at 2. Axon claims that nearly a quarter of a million people have been saved from death or serious injury due to Taser use. See Christopher Mele & Johnny Diaz, *Tasers: Are These Police Tools Effective and Are They Dangerous?*, N.Y. TIMES (Apr. 14, 2021), <https://www.nytimes.com/article/police-tasers.html>.

⁵ See *id.* at 2. Probes can cause puncture wounds and burns, and if fired into a suspect’s eye can cause blindness. *Id.* According to Amnesty International, since 2001, at least 500 people in the United States have died after being shocked with CEDs. *USA: Stricter Limits Urged as Deaths Following Police Taser Use Reach 500*, AMNESTY INTERNATIONAL (Feb. 12, 2012), <https://www.amnesty.org/en/latest/news/2012/02/usa-stricter-limits-urged-deaths-following-police-taser-use-reach>. One study of hundreds of CED-related deaths found that 90 percent of those who died were unarmed. *Id.*

⁶ See Linda So, *Black Americans Disproportionately Die in Police Taser Confrontations*, REUTERS (June 15, 2020, 6:49 AM), <https://www.reuters.com/article/us-minneapolis-police-protests-tasers-in/black-americans-disproportionately-die-in-police-taser-confrontations-idUSKBN23M16E>.

⁷ See AXON, TASER 7 CEW USER MANUAL; Mele & Diaz, *supra*.

⁸ See Von Kliem, *The 21-Foot ‘Rule’ Is Back in the News*, LEXIPOL (Sept. 25, 2019), <https://www.lexipol.com/resources/blog/the-21-foot-rule-is-back-in-the-news> (discussing the 21-Foot Rule —the idea that in 1.5 seconds, the average person can sprint 21 feet).

⁹ See Jennifer L. Doleac & Maya Mikdash, *The Effects of TASERS on Policing Outcomes: A Summary of the Research Literature*, at 3 (Dec. 2022) (on file with author) (discussing Bocar Ba & Jeffrey Grogger, *The Introduction of TASERS and Police Use of Force: Evidence from the Chicago Police Department*, NBER (2018)).

¹⁰ See *id.* at 2 (discussing William Sousa, et al., *The Impact of TASERS on Police Use-of-Force Decisions: Findings From a Randomized Field-Training Experiment*, 6(1) J. EXPERIMENTAL CRIM., 35–55 (2010)).

¹¹ See *id.* at 4 (discussing Barak Ariel et al., *The “Less-Than-Lethal Weapons Effect” — Introducing TASERS to Routine Police Operations in England and Wales: A Randomized Controlled Trial*, 46(2) CRIM. J. & BEHAVIOR 280–300 (2019)).

¹² See *id.*

¹³ *Fatal Force: Police Shootings Database*, WASH. POST, (Jan. 22, 2020). <https://www.washingtonpost.com/graphics/investigations/police-shootings-database>.

¹⁴ Amelia Cheatham & Lindsay Maizland, *How Police Compare in Different Democracies*, COUNCIL ON FOREIGN RELATIONS, <https://www.cfr.org/backgrounder/how-police-compare-different-democracies#chapter-title-0-6> (last updated Mar. 29, 2022 at 2:45pm EST).

¹⁵ *Moretta v. Abbott*, 280 F. App'x 823, 824 (11th Cir. 2008); Andrea J. Ritchie, *#SayHerName: Racial Profiling and Police Violence Against Black Women*, 41 HARBINGER 187, 191 (2016); Ian A. Mance, *Power Down: Tasers, the Fourth Amendment, and Police Accountability in the Fourth Circuit*, 91 N.C. L. REV. 606, 625 (2013).

- ¹⁶ Philip Matthew Stinson, Bradford W. Reynolds & John Liederbach, *Police Crime and Less-than-Lethal Coercive Force: A Description of the Criminal Misuse of TASERs*, 14 INT'L J. OF POLICE SCI. & MGMT. 1, 14 (2011).
- ¹⁷ AMNESTY INTERNATIONAL, AMNESTY INTERNATIONAL'S CONCERNS ABOUT TASER USE: STATEMENT TO THE U.S. JUSTICE DEPARTMENT INQUIRY INTO DEATHS IN CUSTODY 4 (2007).
- ¹⁸ Ba & Grogger, *supra*.
- ¹⁹ *See id.*
- ²⁰ Tyler Wall & Torin Monahan, *Surveillance and Violence from Afar: The Politics of Drones and Liminal Security-Scapes*, 15 THEORETICAL CRIMINOLOGY 239 (2011); Peter Olsthoorn Lambèr Royakkers, *Risks and Robots – Some Ethical Issues* (2011); Note, Kyle Stelmack, *Weaponized Police Drones and Their Effect on Police Use of Force*, 15 U. PITT. J. TECH. L. & POL'Y 276 (2015); Alaa Hijazi, *Psychological Dimensions of Drone Warfare*, 38 CURRENT PSYCHOLOGY 1285 (2019).
- ²¹ This objective standard “requires careful attention to the facts and circumstances of each particular case, including the severity of the crime at issue, whether the suspect poses an immediate threat to the safety of the officers or others, and whether he is actively resisting arrest or attempting to evade arrest by flight.” *Graham v. Connor*, 490 U.S. 386, 396 (1989).
- ²² Elizabeth E. Joh, *Policing Police Robots*, 64 UCLA L. REV. DISCOURSE 516 (2016).
- ²³ Hunter M. Boehme, Allison Martin & Robert J. Kaminski, *Evaluating the 4th Circuit's Decision to Limit Officer Use of Tasers: A Descriptive and Time-Series Approach*, POLICE PRAC. & RESEARCH (2021).
- ²⁴ *See* Christian Enemark, *Armed Drones and the Ethical Policing: Risk, Perception, and the Tele-Present Officer*, 40 CRIM. JUSTICE ETHICS 124 (2021).
- ²⁵ *See* Kristin Bergtora Sandvik, *The Political and Moral Economies of Dual Technology Transfers: Arming Police Drones*, in DRONES AND UNMANNED AERIAL SYSTEMS (2016).
- ²⁶ *See* Sandvik, *supra*.
- ²⁷ *See* Elizabeth E. Joh, *Police Robots Need to Be Regulated to Avoid Potential Risks*, N.Y. TIMES (Nov. 16, 2016), <https://www.nytimes.com/roomfordebate/2016/07/14/what-ethics-should-guide-the-use-of-robots-in-policing/police-robots-need-to-be-regulated-to-avoid-potential-risks>; Sandvik, *supra*.
- ²⁸ *See* Enemark, *supra*.
- ²⁹ *See* Caren Kaplan & Andrea Miller, *Drones as “Atmospheric Policing”: From US Border Enforcement to the LAPD*, 31 PUBLIC CULTURE 419 (2019).
- ³⁰ *See* John Gruhl & Michael Combs, *Police Drones: Coming to a Neighborhood Near You*, 20 NAT'L POL. SCI. REV. 56 (2019).
- ³¹ *See* Alex Hollings, *Counterfeit Air Power: Meet China's Copycat Air Force*, POPULAR MECHANICS (Sept. 19, 2018), <https://www.popularmechanics.com/military/aviation/g23303922/china-copycat-air-force>.
- ³² *See* City of Tahlequah, *Oklahoma v. Bond*, 142 S. Ct. 9, 11 (2021); *Rivas-Villegas v. Cortesluna*, 142 S. Ct. 4, 7 (2021); *Ziglar v. Abbasi*, 137 S. Ct. 1843, 1866 (2017); *Mullenix v. Luna*, 577 U.S. 7, 11 (2015).
- ³³ Joanna C. Schwartz, *Police Indemnification*, 89 N.Y.U. L. REV. 3, 937 (2014).
- ³⁴ Ben Grunwald & John Rappaport, *The Wandering Officer*, 129 YALE L. J. 1676, 1718 (2020).
- ³⁵ Barry Friedman, *Disaggregating the Policing Function*, 169 U. PENN L. REV. 4, 980 (2021).
- ³⁶ *Axon Announces TASER Drone Development to Address Mass Shootings*, AXON (June 2, 2022, 7:30 AM) <https://www.prnewswire.com/news-releases/axon-announces-taser-drone-development-to-address-mass-shootings-301559913.html>.

³⁷ *Id.*

³⁸ Anthony Cuthbertson, *Taser-equipped Drone Designed to Stop Mass Shootings Put on Hold*, YAHOO! MONEY, June 7, 2022, <https://bit.ly/3Xm0TE1>.

³⁹ *I Am Rick Smith, the CEO and Founder of Axon Enterprise. A Few Years Ago, in a Graphic Novel, I Shared an Idea for Using Technology to Stop Mass Shootings. Now My Company is Working to Make the Idea a Reality.* AMA!, REDDIT, <https://bit.ly/3ILF64V> (last visited Nov. 18, 2022).

⁴⁰ See AXON, *supra* note 36.

⁴¹ *Id.*

⁴² *Id.*; REDDIT, *supra* note 39.

⁴³ AXON, *supra* note 36.

⁴⁴ See Tony Pals & Tong Wu, *Study Snapshot: The Infrastructure of Social Control: A Multi-Level Counterfactual Analysis of Surveillance, Punishment, Achievement, and Persistence*, AM. EDUC. RES. ASSOC. (Apr. 11, 2021), <https://www.aera.net/Newsroom/Study-Snapshot-The-Infrastructure-of-Social-Control-A-Multi-Level-Counterfactual-Analysis-of-Surveillance-Punishment-Achievement-and-Persistence>.

⁴⁵ See *id.*

⁴⁶ See *id.*

⁴⁷ Rick Smith, *Axon Committed to Listening and Learning So That We Can Fulfill Our Mission to Protect Life, Together*, AXON (June 5, 2022), <https://www.axon.com/news/technology/axon-committed-to-listening-and-learning>.

⁴⁸ Issie Lapowsky, *Axon's Plan for Taser Drones in Schools Isn't Dead Yet*, PROTOCOL (Sept. 1, 2022), <https://www.protocol.com/policy/axon-rick-smith-interview>; David Griffith, *New Technologies from Axon and Its Partner Can Improve Active Shooter Response*, POLICEMAG.COM (Oct. 3, 2022), <https://www.policemag.com/646808/new-technologies-from-axon-and-its-partners-can-improve-active-shooter-response>.