First Report of the Axon AI & Policing Technology Ethics Board

June 2019

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01
Introduction & Summary

In 2018, Axon Enterprise, Inc. established an **AI and Policing Technology Ethics Board**. The purpose was to help guide and advise the company on ethical issues relating to its development and deployment of new artificial intelligence (AI)-powered policing technologies that are under consideration or development, not to formally approve particular products. **This is the first report of the Board.**

In Part II, we provide background on how the Board operates, including a variety of lessons we have learned about how ethics boards such as this one can be in the best position to succeed. We also identify a variety of issues on which the Board has offered advice to Axon, including on two points we highlight here:

- Although Axon's position in early meetings was that it could not (and should not) dictate customer policies, nor patrol misuse of its products, the Board has continually pushed back on this position. We have suggested strongly that Axon develop products that, insofar as possible, cannot be used in problematic ways and that provide for built-in transparency and easy auditing.
- Axon long has been a company that sells its products to law enforcement and public safety organizations. Naturally, it markets toward that customer base. Board members have consistently made the point that, in fact, the "customer" for Axon products is the community that those law enforcement and public safety organizations serve and that product design and marketing should bear this in mind.

Next, in Part III, we describe an evaluative Framework the Board has adopted for considering Axon's development of new products and technologies based on AI. We see this Framework as a way not only to guide the Board's discussions but also a lens through which Axon leadership and employees can view their own work, hopefully internalizing lessons from the Board. We believe this Framework could be of general use to the industry.

Finally, in Part IV, we provide our initial thinking on the use of face recognition technologies.

As described in much more detail in the pages that follow, we have a set of general conclusions, and then specific recommendations for Axon. Our primary conclusions are as follows:

01 Face recognition technology is not currently reliable enough to ethically justify its use on body-worn cameras. At the least, face recognition technology should not be deployed until the technology performs with far greater accuracy and performs equally well across races, ethnicities, genders, and other identity groups. Whether face recognition on body-worn cameras can ever be ethically justifiable is an issue the Board has begun to discuss in the context of the use cases outlined in Part IV.A, and will take up again if and when these prerequisites are met.

02 When assessing face recognition algorithms, rather than talking about "accuracy," we prefer to discuss false positive and false negative rates. Our tolerance for one or the other will depend on the use case.

03 The Board is unwilling to endorse the development of face recognition technology of any sort that can be completely customized by the user. It strongly prefers a model in which the technologies that are made available are limited in what functions they can perform, so as to prevent misuse by law enforcement.

04 No jurisdiction should adopt face recognition technology without going through open, transparent, democratic processes, with adequate opportunity for genuinely representative public analysis, input, and objection.

05 Development of face recognition products should be premised on evidence-based benefits. Unless and until those benefits are clear, there is no need to discuss costs or adoption of any particular product.

06 When assessing the costs and benefits of potential use cases, one must take into account both the realities of policing in America (and in other jurisdictions) and existing technological limitations.

Throughout the report, we also make several recommendations directed specifically at Axon, including:

Respond publicly to this report, including to the Board's conclusions and recommendations regarding face recognition technology.

Commit, based on the concerns raised by the Board, not to proceed with the development of face matching products, including adding such capabilities to body-worn cameras or to Axon Evidence (Evidence.com).

Elaborate publicly in greater detail about Axon's face recognition work to date and current plans regarding face recognition products.

Invest company resources to work, in a transparent manner and in tandem with leading independent researchers, to ensure training data are statistically representative of the appropriate populations and that algorithms work equally well across different populations.

Continue to comply with the Board's Operating Principles, including by involving the Board in the earliest possible stages of new or anticipated products.

Work with the Board to produce products and services designed to improve policing transparency and democratic accountability, including by developing products in ways that assure audit trails or that collect information that agencies can release to the public about their use of Axon products.

Internalize our ethical Framework for assessing new products, including by developing in-house checklists, protocols, or other tools that engineers, product managers, and other employees can use to think through the ethical implications of their work separate from the Board.

02

How this Board Operates & Lessons Learned

AI ethics boards like ours are still very much an experiment, and an important one, particularly in the absence of government regulation of AI technologies.

We begin with a discussion of how the Board operates. We provide this information for the sake of transparency but also so that others might help us improve, as well as learn from our experience.

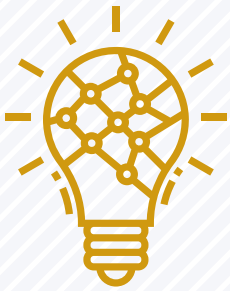
AI ethics boards like ours are still very much an experiment, and an important one, particularly in the absence of government regulation of AI technologies. As technology plays an ever-growing role in daily life and legislatures and courts remain typically slow to react, we believe it is incumbent on private companies to engage in a degree of self-governance. But even industry leaders like Axon are unlikely to have the expertise and perspective to do so on their own. This is how Boards like ours have an essential role to play.

Our Board's Membership and the Importance of a Diverse Board

The Board is an eleven-member external advisory body made up of experts from varying fields including AI, computer science, privacy, law enforcement, civil liberties, and public policy. The current Board members are:

- Ali Farhadi
- Barry Friedman
- Christy E. Lopez
- Jeremy Gillula
- Jim Bueermann
- Kathleen M. O'Toole
- Mecole Jordan
- Miles Brundage
- Tracy Ann Kosa
- Vera Bumpers
- Walt McNeil

For more information about the Board members and their backgrounds, please visit: **https://www.axon.com/info/ai-ethics**.



At present, we have members who are lawyers, members who are technologists, at least one member from affected communities, and members who have law enforcement and civil rights enforcement backgrounds.

This Board does not purport to be representative of all the many stakeholders with an interest in Axon products and technologies and their uses. Although more diverse than similar boards, we believe that the Board membership is not as diverse as it should be. We have discussed our concerns about the diversity of perspective on this Board with each other and with Axon personnel and are working to improve on this dimension. (We discuss our Board selection process below.) Among the various forms of perspective diversity on our mind, we are conscious of the fact that we are by-and-large a United States based group, although—as we discuss below—Axon operates in an international market. We will be exploring ways to broaden our membership without making the Board unworkable.

In fairness to Axon, when it constituted this Board, it asked members of the civil liberties and racial justice community to participate; ultimately, most of those members declined, and there was an **open letter** published expressing concern about this Board and its composition and working principles. That letter can be found as **Attachment A** to this report.

We understand the concerns that were expressed and have labored to carry out our work in a manner that addresses those concerns to the greatest extent possible. At the same time, we regretted and continue to regret that some of those individuals who were asked to participate have not, because their knowledge and expertise would be invaluable in our work.

As a result of these individuals declining to participate, two things have occurred. First, there have been continued attempts to assure diversity along a number of dimensions, from relative expertise to life experience and background. Axon picked the initial members, with some consultation with some Board members in the process. Since then, Axon has increased the membership of the Board, bringing on members who were suggested by the initial Board members and ratified by the existing Board. At present, we have members who are lawyers, members who are technologists, at least one member from affected communities, and members who have law enforcement and civil rights enforcement backgrounds.

Second, in part in response to concerns raised by Board members about Board self-perpetuation, at our last meeting, we discussed a process by which the Board could nominate new members in a more orderly fashion. (We note, again, that Axon

has been entirely welcoming of suggestions for Board participation and has helped us recruit the Board we feel is needed.) This will continue to be a priority area for the Board going forward, including establishing clearer protocols for Board member selection.

Although every Board member certainly has his or her own reasons for joining this Board, there were two aspects of this work that were significant factors in causing most of us to join. First, and most important for the operation of any ethics Board, we were promised a high degree of independence and access to information when performing our work. Given the Board structure and position, it seemed to many of us that the Board was in a credible position to influence Axon's work. Second, as individuals who have all dedicated much of our lives to public service in various capacities, we believe that Axon's position as a major player in the world of policing technology presents us with an opportunity to try to influence the use of technology by law enforcement more broadly and in this way promote the public good.

Axon pays the travel expenses of Board members. In addition, each member is given $5,000 per year, plus a $5,000 honorarium per full board meeting (of which there are two per year). We have not asked and do not have full knowledge, but Board members have varying practices, from not accepting the honorarium, to accepting it, to donating it to charitable causes. The work for this Board can be time consuming, and the payment of honoraria seems to us altogether appropriate.

Our Scope of Work and the Importance of Not Unnecessarily Limiting the Scope of the Board's Input

As our name implies, the Board is invited to comment on AI and policing technologies. In theory, this might include every product in Axon's lineup, from in-use TASER Conducted Electrical Weapons to hypothetical face recognition technology. We quickly discovered, however, that both because of the limits of our time and our expertise, the Board cannot possibly hope to meaningfully vet every product or update Axon brings to market. For example, although receiving a short

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briefing on the TASER 7, Axon Body 3, and Fleet 2, the Board has not discussed each of these products in detail, and we neither deliberated about them nor discuss them here.

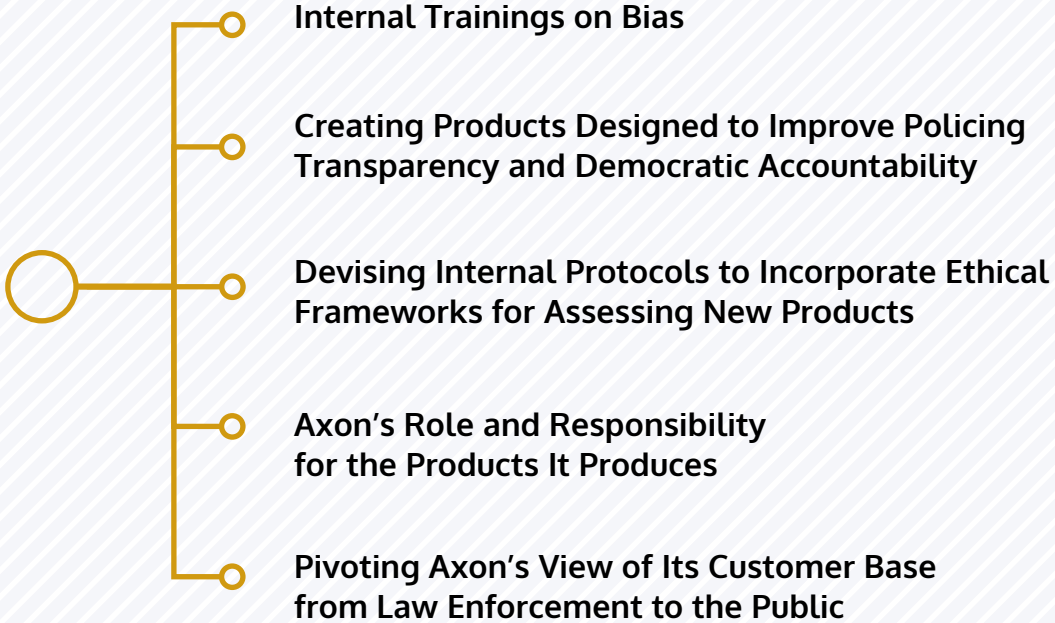
Instead, the Board has chosen to primarily focus on AI-powered technologies that are under consideration or development. Although, for reasons of confidentiality explained below, we cannot discuss all of the technologies and products that Axon has brought to the Board, we can note that Axon has consulted us on both Redaction Assistant (released May 2019) and face recognition (discussed in more detail in Part IV below).

Nor have our discussions been limited to specific products—hypothetical or otherwise. The Board has taken a proactive view of our role, including individual members as well as the Board *proposing* ideas of our own to Axon. Although Axon is under no obligation to move these ideas forward, we consider it an important role of the Board to be proactive in suggesting ways to improve policing across the country and not merely be responsive to Axon's products. Here we identify some of the issues on which we gave unsolicited advice, indicating (if we know) what Axon has done in response.

1. We offered advice on how Axon might improve its internal trainings in order to internalize our guidance. At our suggestion, Axon already is providing implicit bias training to its employees. This came about as part of a discussion of algorithmic bias.

2. We suggested to Axon that it might produce products designed to improve policing transparency and democratic accountability. Although we will not discuss these ideas in detail at this point,

The Board is in Conversation with Axon About:



we can say that they cover a wide range of problems affecting modern policing. Axon staff seemed extremely intrigued by the possibilities we suggested; we will see what, if anything, emerges from this in the future.

3. We asked Axon to create internal protocols to incorporate our ethical Framework for assessing new products. We discuss this at length below (see Part III). For now, we want to underscore the importance of this point, not just for Axon but for the tech industry as a whole. It may prove impossible for every company to have an ethics board and for every product to be vetted that way. Just as we expressed concern about training those who produce these products in bias, we think it essential that companies set up protocols and checklists for new products so that, from the very conception, the sorts of ethical issues we discuss here can be monitored and baked in. Axon staff again seemed receptive to the idea; the Board will continue to monitor this issue for progress.

4. Perhaps one of our most important sets of conversations revolved around Axon's role and responsibility with regard to the products it produces. Axon's position in early meetings was that it could not dictate to customers how products were used, nor its customers' policies, and that it could not feasibly patrol misuse of its products. The Board has continually pushed back on this position, pointing out (among other things) that Axon can and does control certain aspects of its product use. These conversations have been very productive. We think it is fair to say that although (as we recognize) Axon faces consumer pressures, Axon leadership nonetheless has heard us and given thought to the points we have made. This relates to the point above about building in the right protocols to ensure product development proceeds on an ethical and appropriate path from the start. One suggestion we made strongly is that Axon develop products that insofar as possible cannot be used in troubling ways or that provide for transparency and easy auditing with regard to use. Again, we believe this suggestion was taken seriously. Time will tell where it leads, and we will continue to discuss and monitor the issue.

5. Finally, the Board made the point—which we believe Axon is hearing—that its conception of its customer base requires some alteration. Axon long has been a company that sells its products to law enforcement and public safety organizations. Naturally, it markets toward that customer base. Board members have made the point—and we are emphatic in this regard—that in fact the "customer" for Axon products is the community that those law enforcement and public safety organizations serve and that product design and marketing should bear this in mind.

Facilitating a Free Exchange of Information and Conducting Productive Meetings

Since the Board was constituted, it has met three times: April 2018 in Scottsdale, AZ (Axon HQ), October 2018 in New York, NY (NYU School of Law), and April 2019 in Seattle, WA (Axon Seattle). Not all Board members have attended all meetings, though we have taken care to have available the means to participate from a distance. Still, we recognize this is always less optimal than everyone being present in person. To this end, we are working to find ways to meet in places that are more accessible to a far-flung Board.

Board meetings typically occur over a two-day period. Conversation is structured by the agenda but freewheeling after that.

Axon employees attend ex officio and participate in our discussions. Regular attendees have been CEO Rick Smith, Chief Information Security Officer Jenner Holden, VP of AI and Machine Learning Moji Solgi, as well as other staff responsible for product development, privacy, or AI and machine learning development. Constantly present and our facilitator in many aspects of our work is Mike Wagers, who is the AI Board lead (primarily liaison) for Axon.

In addition, between the second and third meetings, we determined that to move at a faster pace, it made sense to create a subcommittee on face recognition, which could hold phone conversations on a regular basis. The membership of that subcommittee shifted over time but included: Brundage, Friedman, Lopez, Jordan, Kosa, O'Toole, as well as various Axon employees.

So far, the Board has worked collaboratively, and despite a diversity of strongly held views, we often have managed to reach consensus. At the least, the matters discussed in this report have the assent of the full Board.

Although much has gone well in our structure, deliberations, and relationship with Axon, this is a learning experience, and we do not pretend that it has been without bumps.

Although much has gone well in our structure, deliberations, and relationship with Axon, this is a learning experience, and we do not pretend that it has been without bumps. In particular, the way in which we receive information from Axon and the way in which we deliberate have evolved over time.

Next, we review some key aspects of our relationship.

1. LIMITED NON-DISCLOSURE AGREEMENT

In order for the Board to provide meaningful advice, we need full access to information. We need to be able to ask specific questions and receive candid answers. The Board has submitted detailed questions to Axon engineers and product managers and received detailed responses without which we could not do our work.

At the same time, we understand that Axon has legitimate concerns about keeping certain information confidential, particularly information relating to products that are still in development.

In order to accommodate these competing concerns, the Board members have signed limited non-disclosure agreements (NDAs). Signing these NDAs was one reason that some in the civil rights community were reluctant to participate, but with respect, we ultimately came to a different conclusion. The NDAs (a) have fostered free and open conversation among us and Axon employees about Axon's plans; and (b) have not fettered us in our ability to express ourselves publicly either about Axon's operations or technological development generally.

In addition to protecting trade secrets and truly proprietary information, our NDAs treat in-development products differently than public products. Specifically, when discussing technology that still is under development, the Board treats all information and conversation as confidential. Once the technology is made public, however, the Board is free to discuss that technology. If a technology is not brought to production, the Board keeps the information confidential. Even then, Axon has

encouraged public discussion of our general thinking, both with stakeholders we personally know and with the media. In every instance of which we are aware, when members of the media asked to discuss a topic with us, Axon greenlighted whatever information we wished to provide. (To be clear, we do not need a green light to talk with the media, but sometimes we've wanted to provide information that arguably was covered by the NDAs.)

2. OPERATING PRINCIPLES

At our initial meeting, the Board established a number of operating principles. Those operating principles can be found at **www.axon.com/info/ai-ethics** and are included as Attachment B to this report.

These principles are distinct from any substantive values we might bring to our discussions. They were intended to guarantee that we would have the information we need to make decisions and to assure our independence. To that end, the principles were structured as commitments from Axon to the Board.

So far, Axon has been fastidious about adherence to these operating principles. In fact, initially Axon's adherence to these principles was so thorough that, as we discuss below, disclosure and adherence were taking up a great deal of the Board's time. We have taken steps to address this issue and to facilitate more fruitful Board meetings.

3. OMBUDSPEOPLE

Early in our process, in part to ensure compliance with the operating principles and also to create another internal oversight mechanism within the company, the Board and Axon felt it essential to set up internal processes to allow company employees to express any ethical concerns. We did so by designating two ombudspeople: There is a designated Axon employee, Mike Wagers, who sits outside of the internal chain of command and is our Axon Board lead, and there is a Board ombudsperson, Tracy Ann Kosa. Kosa has met with employees, and employees are encouraged to contact either if there are concerns.

The availability of ombudspeople will, we believe, be particularly valuable should Axon—as we hope—turn our ethical Framework into operative principles and protocols in the design of products. If anyone on the Axon staff believes product development is not occurring consistently with those protocols or guidelines, the Board is available to hear those concerns without fear of attribution.

4. FACILITATING PRODUCTIVE MEETINGS

Early in our existence, it was a point of some frustration for some Board members that a substantial portion of our meeting times were taken up by Axon presenting product ideas and information to the Board. This was done to ensure Axon was in compliance with our Operating Principles, but this arrangement had two downsides: First, there remained little time for substantive discussion by and among the Board. Second, Board members were not given sufficient time to study and analyze the information. In one notable case, we learned about Axon product development quite close to a Board meeting at which we were to discuss it.

We see no ill intent on Axon's part. We are all learning, and this appeared to be nothing but the ordinary scramble to staff and brief a new entity. But still, it interfered with our ability do our job.

After the first two meetings, Board members expressed to Axon their desire that the meetings be more efficient. Axon responded to these expressions in a number of ways. Our meeting schedules now factor in product development timelines, giving us sufficient time to meet and provide feedback before products are too far into development. Axon staff also now provide briefings and materials—often short videos—in advance of Board meetings so that we do not have to spend our time together learning about product development and instead can ask questions and have substantive conversations.

5. STAFFING THE BOARD

In another effort to make meetings more productive and facilitate output of material from the Board, Axon asked the Policing Project at New York University School of Law to staff the Board. This was in part in response to Board member concerns about whether individual meetings were making as much progress as we might on issues before us. Axon believed this would give the Board greater independence, direction, and efficiency. Other Board members were notified of this decision and asked if there was any objection; there was none. And, in fact, the Policing Project has from that time largely driven the agenda of the Board meeting (with consultation, of course, among Board members), and in no instance has Axon done anything other than work collaboratively and help further the Board's directives, as set out by Policing Project staff. The Policing Project is a not-for-profit center at New York University Law School whose mission is bringing democratic accountability and equity to policing practices. The Director of the Policing Project, Barry Friedman, holds a Board seat. Policing Project staff, primarily Farhang Heydari, play a substantial role in staffing. The Policing Project received $20,000 from Axon in order to defray some of its expenses staffing the Board and preparing this report. More information on the Policing Project is available at **www.policingproject.org**.

The Policing Project currently drafts agendas, facilitates Board conversations, helps develop substantive materials, when possible reviews Axon materials in advance to make suggestions about content and efficiency of presentation, and helps schedule meeting times. Policing Project staff do this collaboratively with staff from Axon. In the main, Axon has been open to virtually every suggestion from the Policing Project or Board members about direction and the nature of our work.

We have found it essential to be involved in the earliest possible stage of product development.

Early involvement means that we can guide Axon's research and that we can suggest design modifications before they become cost-prohibitive for the company.

Additional Lessons Learned

1. THE IMPORTANCE OF EARLY BOARD INVOLVEMENT

As discussed above, we have found it essential to be involved at the earliest possible stage of product development, preferably before Axon even begins to design a product. Early involvement means that we can guide Axon's research and that we can suggest design modifications before they become cost-prohibitive for the company. By involving us early, we may dissuade the company from moving forward with a product or at a minimum persuade the company to rethink its design. We go into some particulars below, but it appears to be the case that our deliberations have caused Axon to shift directions, both as to what products it develops and the nature of those products. It is more difficult to do this if our input is sought far into the developmental stage; this is a point we would stress for other AI boards.

One particular aspect of early participation is that we can guide Axon in developing products that allow for building in features that further the values we, and the communities from which we come, care about, among them privacy, racial equity, transparency, and oversight of law enforcement use of products. To be more specific, Axon can develop products in ways that assure audit trails or that collect information that agencies can release to the public about their use of Axon products.

2. WORKING ITERATIVELY

The process of providing advice and recommendations cannot be a one-off procedure. It takes time to absorb information from Axon, confer with other Board members, ask follow up questions, and provide meaningful recommendations. In order for this process to yield significant results, it must be iterative.

Our Board has attempted to achieve this through various methods, including multiple full Board meetings, forming subcommittees to study particular issues, and submitting written questions directly to Axon. Throughout this process, the Axon team has been entirely responsive and accommodating to our requests for information. In no instance have we asked for information and failed to receive it.

3. THE IMPORTANCE OF PUBLIC ENGAGEMENT AND TRANSPARENCY

Although we believe our work has had a real impact on how Axon operates, we are keenly aware that a group of eleven people has inherent limits. Board members do what we can individually to engage members of the public, media, policing experts, civil rights leaders, and many others so as to both inform our work and to bring their diverse perspectives to the table. But Axon also must be part of these efforts.

Although the company and its leadership have been forthcoming and engaging with the Board, they could do more when it comes to engaging the public. This Board's report (and Axon's response) is a step in that direction. But Axon could, for example, share additional information on its research (or planned research) on mitigating algorithmic bias or what it perceives as the shortcomings with existing technology. We fully understand that there may be limits to how engaging and transparent Axon feels it can be. Still, as a leader in the policing technology space, Axon's example could set a standard for others in the field.

03
Product Evaluation Framework

The Board felt it important to develop a tool to help us think through and guide our discussions. It is essential that this tool be useful not only in assessing how technologies might impact police work but about their impact on communities and individuals and unintended consequences.

The Board has been (and we expect, will continue to be) asked to provide advice and recommendations on a variety of real and hypothetical technologies. The Board felt it important to develop a tool to help us think through and guide our discussions. It is essential that this tool be useful not only in assessing how technologies might impact police work but also the impact on communities and individuals and unintended consequences. Over the course of many discussions, what emerged is the Framework outlined below and also as Attachment C to this report. We note that the version below is still a work in progress, one that we expect will change over time.

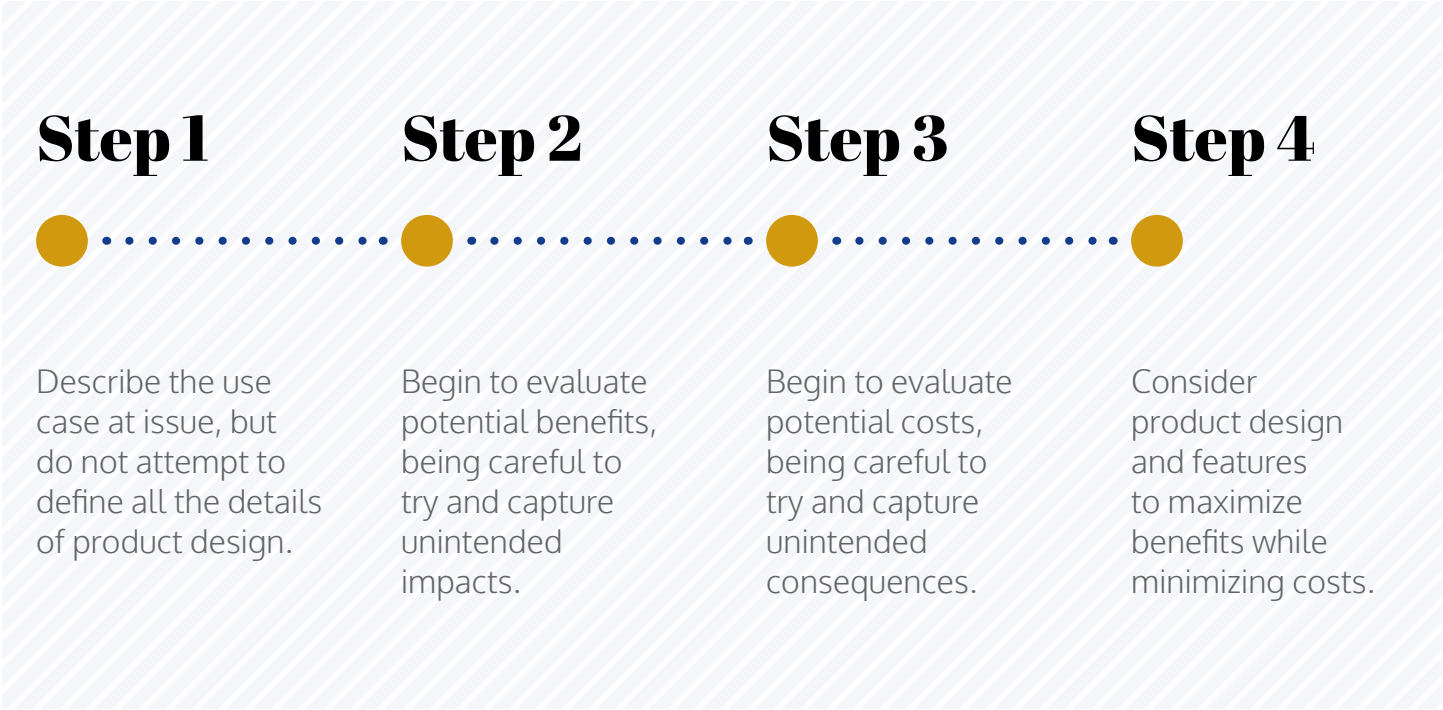
This Framework is not intended to be a calculator that produces clear answers. (Indeed, we are skeptical that one could ever produce such a tool in this value-laden space.) We intend the Framework to serve as a lens through which Board members and Axon employees alike can evaluate a specific use of a technology. It does not need to be mechanically applied, and earlier in a product life cycle, more of the information will be speculative. Still, we have found it to be useful in focusing on issues that are not always immediately apparent.

To that end, the Board has recommended strongly that Axon work to internalize this Framework. That is, that—as we have said repeatedly—Axon develop in-house checklists, protocols, or other tools that engineers, product managers, and other employees can use to think through the ethical implications of their work separate from the Board. This recommendation is consistent with our experience that involving the Board's work at the earliest possible stage will maximize our impact. We have seen some evidence that Axon is responsive to this—for example, although prior to adoption of this Framework, Axon took our advice as to unconscious bias training for employees. We look forward to further reporting from Axon as to its integration of this process.

One note: The Board sees products and hears ideas at various points in the process. Sometimes we do not do anything other than discuss what is a hypothetical use case. At other times, there is a tangible product, such as the case with various redaction tools Axon makes available on Axon Evidence (Evidence.com). Necessarily, our evaluation and deliberations under this Framework vary, given how tangible or hypothetical an idea is at the time. We can only evaluate what we know.

A Four-Step Process

When considering a new technology or proposed product, we used this process as a guide. Basically, it is a benefit-cost approach, with most of our value add being in the Guidelines that follow (below). Typically, our deliberations were built around use cases—possible uses of the product under consideration. Our process was as follows:



In general, we envision this process to be iterative. In other words, when one arrives at step 4 and thinks through potential product design features, it may be necessary to retake stock of potential benefits and costs before arriving at a decision. Nor should this process be read to assume that every use case should make it to step 4. Indeed, it may well be the case that a particular use case ends at Step 2 because we cannot identify a meaningful benefit. As our discussion of use cases below indicates, this was, in fact, the result of some of our conversations.

In following this Framework, we fully acknowledge that assessing potential benefits and costs is an inherently difficult and value-laden process and that reasonable lawyers, ethicists, social scientists, advocates, engineers, and product managers reasonably could disagree. Thus, although we favor quantifying costs and benefits where possible—and especially when a specific product is within contemplation—we found ourselves unlikely to be able to do so at all steps of the way. Still, this Framework was useful in guiding our discussions and directing us to focus on tangible issues and questions for Axon to weigh.

Guidance on Assessing Potential Benefits

Although most products bring an expected benefit, we found it essential not to speed through this stage of the process. Thus, for each use case, we asked:

1. What is the specific problem(s) the product is intended to solve?

- "Problem," here, might be a law enforcement problem (e.g., improving law enforcement methods), it might be a social problem, or it might be a problem relating to the internal operations of a police department. It is important, particularly when framing the problem as a "law enforcement" problem, to be able to articulate the public safety goal that would be addressed through the use of technology, rather than considering "law enforcement needs" as an end in itself. This approach is essential to ensuring that the ultimate consumer of every Axon product is the community that a policing agency serves.

2. How important / what is the magnitude of the problem you expect to solve?

3. How certain is it that the technology will address the problem?

- Have there been evaluations (either internal or external)?
- Are there product performance concerns that might limit effectiveness?
- Will benefits be evenly distributed throughout society?
- What countermeasures might individuals take in response to the adoption of this tool, and how much would such countermeasures reduce the expected benefits?

4. Could using the technology have unintended or secondary benefits on any of the following issues:

- Minimize criminalization of low-level offenses?
- Additional control and protection of personal data?
- Mitigation of racial and/or identity bias?
- Improved transparency or public trust?
- Better compliance with U.S. constitutional requirements?
- Other societal benefits?

Guidance on Assessing Potential Costs

We have done our best to maintain a holistic assessment of potential social costs of a given technological use.[1] We are well aware that hard or quantifiable costs can at times loom larger than intangibles simply because of the difficulty of valuing intangibles. One key in conducting this assessment is thinking through *downstream* or *unintended* consequences. Although the questions we ask will necessarily depend on the nature of the technology, for most use cases we ask:

1. Once deployed, can the technology be used (or misused) in ways other than contemplated in this use case?

2. Will this use of technology lead to greater criminalization (people being stopped, ticketed, arrested, or incarcerated) or to policing in counterproductive ways?

3. How will this use of technology impact personal information privacy? Be sure to consider:

- What data are captured and from whom? How are they aggregated and/or mined?
- What are the data retention practices?
- Who owns the data? Who has access and what are the security practices?

4. Does the use of the technology raise concerns regarding racial or other identity bias or disparities? Be sure to consider:

- Disparities in design (e.g., whether the technology itself has any inherent bias, including algorithmic bias relating to personal identity, for example, by employing statistically unrepresentative training data or exhibiting any algorithmic bias)?
- Disparities in operation (e.g., whether the technology might be used in ways that create or exacerbate identity bias and/or disparities)?

5. Does the use of the technology raise transparency-related concerns, either in how Axon communicates with members of the public or how police agencies engage with members of the public?

6. Does the use of the technology raise risks of directly or indirectly violating constitutional or other legal rights, including but not limited to: unlawful searches, unlawful seizures/arrests, excessive force, discovery/disclosure violations (such as Brady, Giglio, Rosario, etc.), or First Amendment concerns?

7. Are there other potential social costs that have not yet been considered, including but not limited to:

- Whether there might be a unique impact on any specific subgroup (e.g., children, LGBTQ communities, socioeconomically disadvantaged communities)?
- Whether there are historic considerations that may make particular communities distrustful of this technology?
- The potential for mission creep (either over time or in response to critical events)?
- The impact of how others in the industry will respond to Axon's precedent?
- Any global/international human rights impact?

[1] Note that any true benefit-cost analysis must take into account hard costs, including but not limited to long-term retention and data storage costs. Although these types of costs are an important consideration both to police departments and their communities, we focus here on ethical considerations, not financial ones. Still, customers of Axon, and the communities they serve, should consider matters like opportunity costs.

04

Early Thoughts & Recommendations Regarding Face Recognition Technology

Although there may well be some uses of face recognition that prove societally acceptable over time, an issue on which we do not opine, almost any use of face recognition—and certainly uses by government and policing agencies—comes with serious concerns.

In addition to establishing our evaluative Framework, face recognition is the matter that has occupied the most of the Board's time since its inception, and this is the first substantive technology about which the Board is prepared to make a public statement.

Axon distinguishes between different aspects of face recognition technology. For example, Axon distinguishes between face matching, face detection, face re-identification.[2] Face matching algorithms can identify a particular face by matching it to one in a target database—this is what people most commonly mean when they refer to "face recognition" technology. Face detection, on the other hand, merely identifies the presence of a face. And face re-identification involves identifying the recurrence of the same face in video in which it already has been identified.

Axon is conducting research and product development around face detection and face re-identification, although the latter has not yet been released in a product. This research and development is primarily for the use of Axon's redaction assistant tool, which is intended to facilitate the redaction of body camera footage so that the footage can be disclosed.[3] The Board is strongly in support of this type of redaction software because the failure to release body camera footage, or high costs in redacting it for release, can undermine the transparency that body cameras promised. Redaction software presents a way to address this problem.

Axon has represented to the Board that although there are no Axon personnel currently working on employing face *matching* in a product, they are closely monitoring the latest research and products and conducting their own research. Our understanding is that, to date, Axon's research has focused on how to make data used to train face detection algorithms more statistically representative of the populations on which any product might be used. In its response to this document, we recommend that Axon state publicly in greater detail its face recognition work to date and current plans regarding face recognition products.

In our early work, we chose to focus on face recognition because some individuals or institutions were discussing the use of face recognition on body cameras, which is one of Axon's primary products, and because of the potential impact on our society of any use of face recognition.

Although there may well be some uses of face recognition that prove societally acceptable over time, an issue on which we do not opine, almost any use of face recognition—and certainly uses by government and policing agencies—comes with serious concerns.

[2] See Moji Solgi, A Quick Guide to Face Recognition with AI (Dec. 7, 2018), **https://www.axon.com/company/news/face-recognition-with-ai**.

[3] Although we are informed this is all Axon is working on at the moment, knowledge is of course knowledge, and once learned, is retained and potentially could be adapted to other uses.

Depending on the quality of images compared, people may be falsely identified (or, as in the use case we discuss below of Amber alerts, falsely ruled out). False positives provide a matter of particular concern when law enforcement is involved, because of the potential risks inherent in any law enforcement context. In its current state, face recognition is less accurate when identifying women compared to men and young people compared to older people. As discussed later in this report, this inaccuracy worsens when trying to identify people of color compared to white people, a troubling disparity that would only perpetuate or exacerbate the racial inequities that cut across the criminal justice system.

Privacy is another concern. In our camera-saturated society, face recognition allows for the collection of personal details about peoples' lives: what doctors they visit, where their children play sports or hang out, what groceries they buy, or meetings they attend. Without strong policies and security in place, it is unclear how long these images might be stored or who might gain access to them. Even if face recognition works accurately and equitably—and we stress in detail that at present it does not—the technology makes it far easier for government entities to surveil citizens and potentially intrude into their lives. This sort of loss of privacy is and should be of concern to every individual, but it also may be of particular concern to some groups in society—such as LBGTQ individuals—who have been especial targets of outing, harassment, or enforcement.[4]

When evaluating the potential harms of face recognition, it is important to recognize that Axon operates in an international environment. At present, Axon sells its body cameras in the United States but also in the United Kingdom, Sweden, Australia, Canada, and New Zealand, and sells TASERS far more globally. It is always contemplating broader markets. Not only are the harms (and benefits) of face recognition evaluated in different ways in different communities and cultures, but the legal regimes differ as well. We have alluded to U.S. constitutional requirements, but in considering harms and courses of action, Axon must take account of those varying regimes. There are unique international human rights concerns that must be considered, such as those described in the United Nation's Human Rights Council's August 2018 report on the threats of advancing technologies.

To be clear, this document is not meant to be a comprehensive evaluation of the pros and cons of face recognition technology in all use cases, both governmental and private. Our role has been to guide Axon leadership in an ethical evaluation of potential face recognition products, particularly on body cameras. We do not try to catalog the research that has been done to date or every concern that one might have. Still, we do believe many of the views we express here are transferable to other products and other producers of those products, especially when the end user is a government.

Process to Date

It became clear to the Board early in its tenure that face recognition technology was one the Board would need to consider. Some technology companies and police departments have moved with haste in deploying this technology, which concerns

[4] Face recognition technology may present unique concerns for transgender individuals. See, e.g., Matthew Gault, Facial Recognition Software Regularly Misgenders Trans People, Motherboard (Feb 19 2019), **https://www.vice.com/en_us/article/7xnwed/facial-recognition-software-regularly-misgenders-trans-people**; Os Keyes, The Misgendering Machines: Trans/HCI Implications of Automatic Gender Recognition. Proc. ACM Hum.-Comput. Interact. 2, CSCW, Article 88 (November 2018), **https://doi.org/10.1145/3274357**.

us greatly, because we do not see how it could have been done—and we have seen no evidence it was done—with sufficient consideration of the huge potential social costs of deploying this technology. Others have called for complete bans.

For the most part, however, the Board felt that there has been insufficient healthy and productive engagement among those holding different perspectives in the debate regarding face recognition. As a Board, we believe it would be useful for stakeholders to figure out how to engage constructively to ensure sound regulation of what is a very powerful technology, with both notable benefits and costs. Such engagement requires, from the outset, greater transparency from technology companies.

The Board began our process with a substantial period of education. In part, this education involved Board members spending personal time understanding the detailed concerns raised (and research performed) by many outside parties on this issue. We also spent substantial time understanding the technical limitations of face recognition technology today.

We also asked Axon a series of detailed questions about the technical capabilities of its products (particularly body cameras) in an effort to understand how a face recognition algorithm might operate in practice. Axon provided detailed and (from our perspective) sober assessment, including considerations in both directions.

With this basic understanding, the Board turned to discussion of particular use cases, using the ethical Framework presented above to guide our discussions. The use cases we discussed are not necessarily ones Axon is contemplating; rather, the Board worked in tandem with Axon employees to imagine what one *might* do with face recognition-equipped body-worn cameras or other police technologies.

In beginning to consider face recognition, one quickly realizes that this technology has an incredibly wide range of applications, from the seemingly innocuous to the unprecedentedly pervasive. As a Board, we felt our role was to begin to think about whether and where to draw a line between uses that potentially might be palatable uses and non-starters and in the process begin to identify important principles and lessons for Axon.

The technology makes it far easier for government entities to surveil citizens and potentially intrude into their lives. This sort of loss of privacy is and should be of concern to every individual, but it also may be of particular concern to some groups in society—such as LBGTQ individuals—who have been especial targets of outing, harassment, or enforcement.

THE BOARD DISCUSSED THREE DISTINCT USE CASES, ONES THAT WE THOUGHT COVERED A FAIR RANGE OF *POTENTIALLY* LESS CONTROVERSIAL USES.

Use Case #1

Using face recognition during a motor vehicle stop to identify a driver who has forgotten her license.

Use Case #2

Using face recognition to identify missing persons (e.g., Silver Alerts[5] or Amber Alerts) who are voluntarily added to the system by family members.

Use Case #3

Using face recognition to identify a small subset of individuals designated to a "most wanted" list by local law enforcement.

Every one of these hypotheticals was more complicated than it seemed and raised all manner of detailed questions that we had not anticipated initially. Although we do not offer simply up or down conclusions regarding any one of these uses, we have arrived at a number of conclusions and recommendations that we believe could help guide face recognition research and development.

Preliminary Conclusions Regarding Face Recognition Technology

The Board has considered the use of face recognition technology on body-worn cameras at some length and has come to the following general conclusions. In the next section, we provide additional guidance regarding specific use cases.

01 Face recognition technology is not currently reliable enough to ethically justify its use on body-worn cameras. At the least, face recognition technology should not be deployed until the technology performs with far greater accuracy and performs equally well across races, ethnicities, genders, and other identity groups. Whether face recognition on body-worn cameras

[5] Silver Alert is a public notification system in the United States to broadcast information about missing persons—especially senior citizens with Alzheimer's disease, dementia, or other mental disabilities—in order to aid in locating them.

can ever be ethically justifiable is an issue the Board has begun to discuss in the context of the use cases outlined in Part IV.A, and will take up again if and when these prerequisites are met.

In our view, under real-world conditions, even state-of-the-art face recognition technology is simply not sufficiently reliable to ethically justify its use on body-worn cameras.

Much of the discussion today about the "accuracy" of face recognition is largely a misnomer. Many talk about face recognition being 99% (or some other percentage) accurate. But such claims are technologically meaningless until one specifies the parameters. That is, what are the conditions under which the image will be captured and analyzed: Is the camera moving or not? How far away is the face? What's the viewpoint? What are the lighting conditions? What computer platform is being used? Under ideal conditions, 99.9% accuracy might be easy to achieve, but especially in the policing space in which our considerations occurred, this is almost never the case. [6]

Rather than think about accuracy in the abstract, we focused on face recognition under real-world conditions—specifically, when deployed on a body camera. Under such conditions, it is our understanding that face recognition technology performs quite poorly, both in terms of false positives and false negatives. Until the technology can improve its reliability substantially, we believe it would be irresponsible to bring such a product to market. The Board expects to revisit this issue periodically as the technology improves.

In addition to overall unreliability, we conclude that face recognition technology is not ready for law enforcement use because there continue to be meaningful and troubling disparities in how it operates. The truth is that current technology does not perform as well on people of color compared to whites, on women compared to men, or young people compared to older people, to name a few disparities. These disparities exist in both directions—a greater false positive rate and false negative rate.

One cause of these biases is statistically unrepresentative training data—the face images that engineers use to "train" the face recognition algorithm. These images are unrepresentative for a variety of reasons but in part because of decisions that have been made for decades that have prioritized certain groups at the cost of others.

These disparities make real-world face recognition deployment a complete non-starter for the Board. Until we have something approaching parity, this technology should remain on the shelf. Policing today already exhibits all manner of disparities (particularly racial). In this undeniable context, adding a tool that will exacerbate this disparity would be unacceptable.

But we recommend Axon go further. We recommend Axon invest company resources, in tandem with leading independent researchers, to work to ensure training data are statistically representative of the appropriate populations and that algorithms work equally well across different populations. In making this recommendation, we do not presuppose that face recognition technology will inevitably be used by Axon, but we acknowledge the reality that many jurisdictions and companies are using it today. Axon should be transparent and proactive in its efforts to address this problem.

While discussing accuracy and reliability of

[6] A possible exception might be comparing the face of someone being booked to a pre-existing mugshot database.

algorithms, we would be remiss if we did not acknowledge the widely discussed concern in the tech industry that the population of engineers and other relevant staff tends to have fewer racial and ethnic minorities and women than the general population. Many have noted the impact of this fact on the field, including on the accuracy and reliability of facial recognition technology.[7] Both the Board and Axon are aware of this concern as well and have committed to working together on the issue going forward.

02 When assessing face recognition algorithms, rather than talking about "accuracy," we prefer to discuss false positive and false negative rates. Our tolerance for one or the other will depend on the use case.

As discussed above, "accuracy" includes two different aspects—false positives and false negatives. No matter how advanced the technology becomes, there is generally a tradeoff between the two. Choosing to calibrate a face recognition algorithm toward minimizing false positives generally means accepting a greater incidence of false negatives.

Choosing how to weight an algorithm (away from false positive or away from false negatives) should depend on the particular use case. For example, in a non-enforcement scenario such as locating persons subject to a Silver Alert, one could imagine good arguments for weighting the algorithm toward false positives. But in enforcement scenarios—for example, the most wanted list—one might rightfully be more concerned with false positives than negatives because of the prospect of priming officers for a negative encounter with an innocent person.

03 The Board is unwilling to endorse the development of face recognition technology of any sort that can be completely customized by the user. It strongly prefers a model in which the technologies that are made available are limited in what functions they can perform, so as to prevent misuse by customers.

Throughout our discussions, one repeated concern was the possibility (or inevitability) of mission creep. In other words, should Axon develop a face recognition tool with one use case in mind, what is to stop a law enforcement customer from putting the algorithm to use in a different way? For the Board, this is a concern that must be addressed head on.

For one, we are strongly opposed to Axon (or any company) designing a body camera, enabled with face recognition, for law enforcement to use as they see fit. There are simply too many agencies, and too many choices and a long history of not using emerging technologies in responsible ways. In essence, we advocate for a distinction between an AI-powered platform—which would allow users to do as they will—and a specific product experience, restricting the range of uses at the time of sale, with the latter being the only way we can conceive of approving the use of face recognition technology going forward.

[7] See High-Level Expert Grp. on Artificial Intelligence, *Ethics Guidelines for Trustworthy AI* 18 (2019); Saheli Roy Choudhury, *A.I. has a bias problem that needs to be fixed:* World Economic Forum, CNBC (Sept. 18, 2018), **https://www.cnbc.com/2018/09/18/world-economic-forum-ai-has-a-bias-problem-that-needs-to-be-fixed.html**.

This can be achieved either technologically or through regulation. On the technology front, we believe Axon and other companies should ensure that its cameras cannot be altered to run a less accurate, more biased face recognition algorithm. We expect companies, including Axon, to build in specific technological checks—for example, our initial discussions strongly suggest we prefer a SnapChat model of face recognition technology in which body cameras are not recording or retaining images but rather are used on a one-off basis. There are guardrails that technology can facilitate.

We also are strong believers in the need for government regulations of face recognition. Although we applaud Axon's restraint and commitment to ethics through the creation and use of this Board, we know that we do not have all the answers and are not representative of all the communities in which face recognition might eventually be deployed. We cannot rely on private companies to regulate themselves entirely, although we certainly can hold them to high ethical standards. To that end, we call upon governments—federal, state, or local—to step in and fill this regulatory gap, as some have already begun to do.[8]

Courts certainly have a role to play in protecting the legal rights of individuals, particularly individuals' whose voices may be undervalued and unheard in current democratic processes. Courts as a whole have been insufficiently attentive to the risks of new technologies in the law enforcement space, particularly with regard to privacy, racial equality, and the risk of false positives—the latter being virtually inevitable with almost all technologies used to target individuals.

At the same time, we do not believe that these questions can or should be left to courts alone to answer, because courts are too slow to react to emerging technologies and to date have not done much to update constitutional protections for the modern era. Courts alone cannot provide the degree of detail necessary to regulate a complex technology. Moreover, we do not find the suggestion of using judicial warrants to answer all of our concerns. Not only are the evidentiary standards for warrants perhaps not enough in some use cases, but the use of any technology for mass surveillance purposes defies regulation by warrants anyway. In the end, we strongly believe that specific legislation, policy, or other regulation is needed to set the boundaries of what is and is not permissible.

04 No jurisdiction should adopt face recognition technology without going through open, transparent, democratic processes, with adequate opportunity for genuinely representative public input and objection.

Having spent some time thinking through the implications of face recognition technology, the Board is resolute in our belief that communities and government must be involved in decisions to acquire and deploy face recognition technology. We believe this not merely because we live in a democracy and believe in public participation but because we understand that decisions around face recognition technology involve difficult decisions about which reasonable people can disagree. These types of decisions should be made in an open and transparent manner, in ways that allow for democratic accountability.

Consider, for example, the issue of whether police should be permitted to use mugshot databases or driver's license databases as their face recognition target database. There are

[8] In making this comment, we do not endorse any of the specific legislative efforts to date.

those who advocate for mugshot databases, largely because doing so limits the size of the target database and therefore limits the power of the face recognition tool. At the same time, there are others who cringe at the prospect of using mugshots, given the historical inequities that have gone in to arrest patterns in many places round this country, and instead would prefer that if face recognition is to be deployed, that the burden fall as evenly across the population as possible.

These are reasonable disagreements that often, at present, are decided purely by policing officials, with little public input or engagement. When it comes to a tool as powerful as face recognition, we believe that more democratic input is necessary. Democratic input does not necessarily mean a public vote on every issue, but at a minimum, it means an open and transparent process involving institutions of society other than the police.

05 Development of face recognition products should be premised on evidence-based benefits. Unless and until those benefits are clear, there is no need to discuss costs or adoption of any particular product.

When imagining a new product, it is easy to think about hypothetical problems and theoretical benefits. For one thing, it seemed evident to us, given the basic limitation of human memory and well-documented evidence of misidentifications, that face recognition technology has great potential to outperform humans and minimize some costs. Indeed, when evaluating any policing technology, it is always essential to ask "compared to what?"

That said, when considering a tool with the potential power of face recognition, it is essential to focus on problems that actually exist—that is, for which there is real-world evidence of their existence and scale. Only with this type of concrete information can one make a realistic assessment of potential benefits and then begin to weigh those benefits against costs.

Consider our first hypothetical: using face recognition to identify drivers who don't have their license. We think there is great potential benefit in avoiding police bringing someone down to the station just to verify their identity. But we found ourselves uncertain how often this situation actually occurs. Our law enforcement representatives learned informally that this might be a common enough occurrence. But without some sense of scale, as well as a consideration of the methods used to deal with the problem at present, it is difficult to make an informed decision about whether or not to move forward.

06 When assessing the costs and benefits of potential use cases, one must take into account both the realities of policing in America (and in other jurisdictions) and existing technological limitations.

Considering a use case means little if done without a realistic understanding of how policing actually occurs. Take the first hypothetical—using face recognition to confirm a driver's identity. One safeguard the Board considered was whether this use might only occur with the driver's consent. Although this is an important step, assuming this measure will solve all problems ignores the reality at present and historically of so-called "consensual" police encounters—that consent is a complicated psychological issue and that overuse of consent has been a

significant driver of disparities in policing.[9]

As a further example, we discussed the issue of enforcing open warrants under the third hypothetical above. Although we can see many benefits to locating the most serious violent offenders, one must understand that the vast majority of open warrants across the country are for low-level offenses that have little to do with public safety and that there remain huge racial and socioeconomic disparities in these warrant databases.[10]

Even with regard to the most compelling case—that of locating people who are in the target database because loved ones are searching for them—there are fair questions about whether such a registry should rest in the hands of the police or in a third-party registry.

At the most basic level, any assessment of costs and benefits must understand that there are communities across this country that are rightfully skeptical of any technology that makes policing more "efficient" and results in more police-individual encounters. Hence, our core recommendation is that face recognition only be adopted through open, transparent, and democratically accountable means, with judicial review available to protect the rights of those unprotected in the political process.

Just as we advocate that use cases be considered in their real-world context in terms of how policing actually occurs, so too do we advocate a clear understanding of the current state of policing technology. In addition to comments made above about the technological limits of face recognition algorithms, one must also understand the hardware limits (in this case, body-worn cameras).

For example, body cameras have one very practical limitation—battery life. The realities of battery life today mean that continuous streaming and face scanning over the course of an officer's shift is impossible. Instead, it more likely means that face recognition on body cameras will be triggered by the officer in the field, which offers a potential point to insert controls, such as requiring the officer to narrate her justification for the stop or face scan or to request supervisor approval.

This does not mean that the technology will remain static—nothing ever does—but understanding these limits is important in evaluating use cases and in thinking through potential product design.

[9] Psychological research reveals that people do not always feel free to refuse requests for their consent and offers some reasons. People may feel compelled to comply with police officers or other authority figures. They may also fear what will happen if they refuse. See, e.g., Marcy Strauss, *Reconstructing Consent*, 92 J. CRIM. L. & CRIMINOLOGY 211, 239 (2001). Additionally, statistics show that black and Hispanic drivers are more likely to undergo consent searches, even though such searches are less likely to reveal contraband. See, e.g., Frank R. Baumgartner, Derek A. Epp, Kelsey Shoub & Bayard Love, *Targeting young men of color for search and arrest during traffic stops: evidence from North Carolina, 2002-2013*, 5 POLITICS, GROUPS, & IDENTITIES 107, 117 (2017) (analyzing 18 million traffic stops in North Carolina and finding that black men were twice as likely to be searched with consent than white men); see also ACLU of Illinois, *Racial Disparity in Consent Searches and Dog Sniff Searches: An Analysis of Illinois Traffic Stop Data from 2013* (2014).

[10] High numbers of open warrants for low-level offenses have been reported in jurisdictions across the country. In early 2019, the New Jersey Supreme Court dismissed nearly 790,000 outstanding warrants for minor offenses, including running red lights, speeding, and parking violations. S.P. Sullivan, *N.J. Supreme Court just tossed 787,000 parking tickets and other old cases*, NJ.COM (Jan. 17, 2019), **https://www.nj.com/politics/2019/01/nj-supreme-court-just-tossed-787000-parking-tickets-and-other-old-cases.html**; see also James C. McKinley Jr., *644,000 Old Warrants Scrapped for Crimes Like Public Drinking*, N.Y. TIMES (Aug. 9, 2017), **https://www.nytimes.com/2017/08/09/nyregion/644000-old-warrants-scrapped-for-crimes-like-public-drinking.html**; Bob Egelko, *SF judge explains why 66,000 arrest warrants were discarded*, SAN FRANCISCO CHRONICLE (Dec. 7, 2016), **https://www.sfchronicle.com/crime/article/S-F-judge-explains-why-66-000-arrest-warrants-10645460.php**. Disparities also exist in who is subject to these warrants. For example, in Ferguson, Missouri, 92% of arrest warrants issued by the municipal court in 2013 were in cases against African Americans. U.S. Dep't of Justice, Investigation of the Ferguson Police Department 62-63 (2015). Similarly, in June 2014, there were 1.1 million open warrants for people who failed to appear in New York courts for low-level offenses. An estimated 81% of the 7.3 million people who received those summonses between 2001 and 2013 were black or Hispanic. Sarah Ryley, Laura Bult & Dareh Gregorian, *Daily News analysis finds racial disparities in summonses for minor violations in 'broken windows' policing*, NEW YORK DAILY NEWS (Aug. 4, 2014), **https://www.nydailynews.com/new-york/summons-broken-windows-racial-disparity-garner-article-1.1890567**; see also *How NYC is tackling 1.4 million open arrest warrants for 'quality-of-life' crimes*, PBS NewsHour (Jan. 16, 2016), **https://www.pbs.org/newshour/show/how-nyc-is-tackling-1-4-million-open-arrest-warrants-for-quality-of-life-crimes**.

05
Conclusion

This is the first report of our AI and Policing Technology Ethics Board. We intend to continue our work, along the lines that we have set out here, and to issue reports in the future if and when we believe we have things of value to say or simply to inform the public of our progress. We very much hope our thoughts here will influence Axon itself, which has convened us, as well as the broader technology industry, particularly those industry segments that make products available to governments.

06 Attachments

April 26, 2018, Letter to Axon AI Ethics Board regarding Ethical Product Development and Law Enforcement

https://civilrights.org/resource/axon-product-development-law-enforcement

18MillionRising.org

ACLU

AI Now Institute at NYU

Algorithmic Justice League

American Friends Service Committee

Center for Media Justice

Center on Privacy & Technology at Georgetown Law

Color Of Change

Communities United for Police Reform (CPR)

Data for Black Lives

Democracy NC

Detroit Community Technology Project

Electronic Frontier Foundation

Electronic Privacy Information Center (EPIC)

Ella Baker Center for Human Rights

Fayetteville PACT

Free Press

Law for Black Lives - DC

Lawyers' Committee for Civil Rights Under Law

Legal Aid Society

Media Alliance

Media Mobilizing Project

NAACP

NAACP Legal Defense and Educational Fund, Inc.

National Hispanic Media Coalition

National Urban League

NC Black Leadership and Organizing Collective

NC Black Women's Roundtable

NC Statewide Police Accountability Network

New America's Open Technology Institute

Open MIC (Open Media and Information Companies Initiative)

Our Data Bodies Project

Siembra NC

South Asian Americans Leading Together (SAALT)

The Leadership Conference Education Fund

The Leadership Conference on Civil and Human Rights

The Tribe

UnidosUS

Upturn

Urbana-Champaign Independent Media Center

WITNESS

Working Narratives

April 26, 2018

Dear Axon AI Ethics Board:

We write to express our strong interest in the Board's upcoming work to guide Axon on ethics issues, and our serious concerns with the current direction of Axon's product development. We are a broad coalition of national and local civil rights and civil liberties groups. Many of us represent communities that are deeply affected by law enforcement abuses.

Law enforcement in this country has a documented history of racial discrimination. Some agencies have routinely and systematically violated human and constitutional rights. Some have harassed, assaulted, and even killed members of our communities. These problems are frequent, widespread, and ongoing.

Because Axon's products are marketed and sold to law enforcement, they sometimes make these problems worse. For example, Axon's body-worn camera systems, which should serve as transparency tools, are now being reduced to powerful surveillance tools that are concentrated in heavily policed communities.

Axon has a responsibility to ensure that its present and future products, including AI-based products, don't drive unfair or unethical outcomes or amplify racial inequities in policing. Axon acknowledges this responsibility—the company states that it "fully recognize[s] the complexities and sensitivities around technology in law enforcement, and [is] committed to getting it right."

This Board must hold Axon to its word. We urge the Board to assert the following at the outset of its work:

1. **Certain products are categorically unethical to deploy.**

Chief among these is real-time face recognition analysis of live video captured by body-worn cameras. Axon must not offer or enable this feature. Real-time face recognition would chill the constitutional freedoms of speech and association, especially at political protests. In addition, research indicates that face recognition technology will never be perfectly accurate and reliable, and that accuracy rates are likely to differ based on subjects' race and gender.[1] Real-time face recognition therefore would

[1] For example, researchers at MIT recently demonstrated that multiple commercially available face characterization algorithms—performing a far simpler task than face recognition—exhibited disproportionally high error rates when presented with darker-skinned faces, and the highest error rates when presented with the faces of dark-skinned females. Joy Buolamwini & Timnit Gebru, *Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification* (2018), http://proceedings.mlr.press/v81/buolamwini18a/buolamwini18a.pdf.

inevitably misidentify some innocent civilians as suspects. These errors could have fatal consequences—consequences that fall disproportionately on certain populations. Real-time face recognition could also prime officers to perceive individuals as more dangerous than they really are and to use more force than the situation requires. No policy or safeguard can mitigate these risks sufficiently well for real-time face recognition ever to be marketable.

2. **Robust ethical review requires centering the voices and perspectives of those most impacted by Axon's technologies.**

This Board includes well-respected academics, practitioners, advocates, and law enforcement representatives. But an ethics process that does not center the voices of those who live in the most heavily policed communities will have no legitimacy. The Board must invite, consult, and ultimately center in its deliberations the voices of affected individuals and those that directly represent affected communities. In particular, survivors of mass incarceration, survivors of law enforcement harm and violence, and community members who live closely among both populations must be included.

3. **Axon must pursue all possible avenues to limit unethical downstream uses of its technologies.**

Axon's product design decisions can sometimes prevent certain unethical uses of its products, but design decisions alone are insufficient to ensure that the company's products are used ethically. The Board should propose novel ways to limit unethical uses of Axon's products. For instance, with the Board's help, Axon could develop contractual terms that prohibit customers from using its products in unethical ways, and that allow Axon to withdraw products from certain customers if it learns of unethical or unlawful uses. The company could also refuse to sell a particular technology or feature to an agency unless the agency adopts vital policy safeguards that are transparent, enforceable, and supported by impacted communities. Axon could also make it easier for the public to learn how law enforcement agencies use its products by including public transparency and accountability directly in its design decisions. If Axon cannot effectively limit downstream unethical uses for a particular product, the Board should recommend against the development or sale of that product.

4. **All of Axon's digital technologies require ethical review.**

This Board should ensure that its scope includes all of Axon's digital products, both because they could be data sources in the development of future AI products, and because they implicate independent ethical concerns. For example, Axon's Evidence.com is a massive central repository of digital evidence that, if improperly handled, would compromise the safety and privacy of both officers and civilians. Another existing product, Axon Citizen, allows community members to

submit tips and evidence to law enforcement, which could amplify racial bias and other discriminatory behavior. All of Axon's current and future digital products should be examined by this Board.

We look forward to engaging with the Board as its work moves forward.

Signed,

18MillionRising.org
ACLU
AI Now Institute at NYU
Algorithmic Justice League
American Friends Service Committee
Center for Media Justice
Center on Privacy & Technology at Georgetown Law
Color of Change
Communities United for Police Reform (CPR)
Data for Black Lives
Democracy NC
Detroit Community Technology Project
Electronic Frontier Foundation
Electronic Privacy Information Center (EPIC)
Ella Baker Center for Human Rights
Fayetteville PACT
Free Press
Law for Black Lives - DC
Lawyers' Committee for Civil Rights Under Law
Legal Aid Society
Media Alliance
Media Mobilizing Project
NAACP
NAACP Legal Defense and Educational Fund, Inc.
National Hispanic Media Coalition
National Urban League
NC Black Leadership and Organizing Collective
NC Black Womens Roundtable
NC Statewide Police Accountability Network
New America's Open Technology Institute
Open MIC (Open Media and Information Companies Initiative)
Our Data Bodies Project
Siembra NC
South Asian Americans Leading Together (SAALT)
The Leadership Conference Education Fund
The Leadership Conference on Civil and Human Rights
The Tribe
UnidosUS
Upturn
Urbana-Champaign Independent Media Center
WITNESS
Working Narratives

Axon AI Ethics Board Operating Principles

Excerpted from **https://www.axon.com/info/ai-ethics**:

1. When considering a new AI application or police technology for which there may be substantial ethical risks, we will ensure that the board has an opportunity to discuss its pros and cons, and how it can be done most ethically. We will discuss new products with the board before launching a product that raises ethical concerns so that they can provide us with guidance on new product development.

2. We will keep the board informed as to which tools we implement to allow oversight and transparency regarding how key AI and related technologies are being utilized, and how these tools are operating. We will build tools and systems to enable oversight around how these technologies are used in the field.

3. We will provide meaningful information to the Board about the logic involved in constructing our algorithms. We will clearly describe our thinking behind our models, what they are intended to do, ways in which they might be misused, and our efforts to prevent such misuse.

4. We will provide a description to the Board of the data on which a model was or is continuously trained. We will demonstrate that we have considered the potential biases in the data on which an algorithm was or is continuously trained and the assumptions used in the model. We will explain the steps taken to mitigate any negative consequences associated with bias or inaccuracy in our trained models.

5. We will provide a list of all the inputs used by an algorithm at inference time to the Board. For each AI algorithm running on our devices or services, we will provide a list of its input parameters along with a description for each parameter.

6. We will provide the Board with the measures we have taken to ensure high levels of data security and privacy. Our public safety customers and their communities need to be confident that their data is appropriately protected to meet security and privacy requirements. We will discuss these measures with the Board.

To hold ourselves responsible to these operating principles, the following two avenues are available to anyone within the company to raise and address their concerns.

1. Contact the AI and Policing Technology Ethics Board Lead. The Board lead is outside of the AI Team chain of command. S/he will attempt to address concerns with Axon leadership. The current lead is Mike Wagers: **mwagers@axon.com**.

2. Contact the external AI and Policing Technology Ethics Board Ombudsperson. Each year, the Board will identify one member to act as an ombudsperson to hear any concerns from the AI team. That person will work with other members of the Board and with Axon leadership to address concerns. The current Board ombudsperson is Tracy Ann Kosa: **kosat@seattleu.edu**.

Product Evaluation Framework

Step 1: Describe the use case at issue, but do not attempt to define all the details of product design.

Step 2: Begin to evaluate potential benefits, being careful to try and capture unintended impacts.

Step 3: Begin to evaluate potential costs, being careful to try and capture unintended consequences.

Step 4: Consider product design and features to maximize benefits while minimizing costs.

GUIDANCE ON ASSESSING POTENTIAL BENEFITS

1. What is the specific problem(s) the product is intended to solve?

- "Problem," here, might be a law enforcement problem (e.g., improving law enforcement methods), it might be a social problem, or it might be a problem relating to the internal operations of a police department. It is important, particularly when framing the problem as a "law enforcement" problem, to be able to articulate the public safety goal that would be addressed through the use of technology, rather than considering "law enforcement needs" as an end in itself. This approach is essential to ensuring that the ultimate consumer of every Axon product is the community that a policing agency serves.

2. How important/what is the magnitude of the problem you expect to solve?

3. How certain is it that the technology will address the problem?

- Have there been evaluations (either internal or external)?
- Are there product performance concerns that might limit effectiveness?
- Will benefits be evenly distributed throughout society?
- What countermeasures might individuals take in response to the adoption of this tool, and how much would such countermeasures reduce the expected benefits?

4. Could using the technology have unintended or secondary benefits on any of the following issues:

- Minimize criminalization of low-level offenses?
- Additional control and protection of personal data?
- Mitigation of racial and/or identity bias?
- Improved transparency or public trust?
- Better compliance with U.S. constitutional requirements?
- Other societal benefits?

GUIDANCE ON ASSESSING POTENTIAL COSTS

1. Once deployed, can the technology be used (or misused) in ways other than contemplated in this use case?

2. Will this use of this technology lead to greater criminalization (people being stopped, ticketed, arrested, or incarcerated) or to policing in counterproductive ways?

3. How will this use of technology impact personal information privacy? Be sure to consider:

- What data are captured and from whom? How are they aggregated and/or mined?
- What are the data retention practices?
- Who owns the data? Who has access, and what are the security practices?

4. Does the use of the technology raise concerns regarding racial or other identity bias or disparities? Be sure to consider:

- Disparities in design (e.g., whether the technology itself has any inherent bias, including algorithmic bias relating to personal identity, for example, by employing statistically unrepresentative training data or exhibiting any algorithmic bias)?
- Disparities in operation (e.g., whether the technology might be used in ways that create or exacerbate identity bias and/or disparities)?

5. Does the use of the technology raise transparency-related concerns, either in how Axon communicates with members of the public or how police agencies engage with members of the public?

6. Does the use of the technology raise risks of directly or indirectly violating constitutional or other legal rights, including but not limited to: unlawful searches, unlawful seizures/arrests, excessive force, discovery/disclosure violations (such as Brady, Giglio, Rosario, etc.), or First Amendment concerns?

7. Are there other potential social costs that have not yet been considered, including but not limited to:

- Whether there might be a unique impact on any specific subgroup (e.g., children, LGBTQ communities, socioeconomically disadvantaged communities)?
- Whether there are historic considerations that may make particular communities distrustful of this technology?
- The potential for mission creep (either over time or in response to critical events)?
- The impact of how others in the industry will respond to Axon's precedent?
- Any global/international human rights impact?