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**In Association with Patrice F. Band**

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August 25, 2010

**VIA SAME DAY COURIER**

The Honourable Jim Bradley  
**Ministry of Community Safety and  
Correctional Services**  
25 Grosvenor Street, 18th Floor  
Toronto ON M7A 1Y6

Dear Minister Bradley:

**Re: Regulation of Long Range Acoustic Devices pursuant to Regulation 926 or  
*Police Services Act***

We write on behalf of the Canadian Civil Liberties Association ("CCLA") to request that the Solicitor General regulate Long Range Acoustic Devices ("LRAD") as weapons pursuant to Regulation 926 "Equipment and Use of Force" made under the *Police Services Act*.<sup>1</sup>

LRADs are largely untested, "sub-lethal" devices designed for crowd control and other policing and military activities. LRADs are designed to temporarily incapacitate targeted individuals and are capable of causing extreme pain and permanent hearing loss. They belong to a class of sub-lethal weapons which control human behaviour through sensory degradation and pain. Due to their weapon-like qualities, LRADs are commonly referred to as "sonic cannons" or "sound cannons". Originally developed for use on the high seas,

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<sup>1</sup> *Equipment and Use of Force*, R.R.O. 1990, Reg. 926 pursuant to the *Police Services Act*, R.S.O. 1990, c. P.15.

sonic cannons recently have been deployed by police and military forces in urban settings to disperse crowds and force compliance of individuals through pain and discomfort.

The CCLA submits that sonic cannons come within the meaning of a “weapon” for the purposes of Ontario Regulation 926. Not only are they designed to temporarily incapacitate, threaten and intimidate individuals, but they are capable of causing permanent injury and harm. The use of sonic cannons by police forces in the province must therefore be approved by the Solicitor General and undergo the appropriate regulation, pursuant to s. 14 of Regulation 926.

In Part I of this submission, we outline the CCLA's ongoing litigation against the Toronto Police Services (“TPS”) and Ontario Provincial Police (“OPP”) with respect to the use of LRADs in the absence of regulations established under Regulation 926. In Part II, we review literature and evidence which supports the categorization of LRADs as sub-lethal acoustic weapons. Finally, in Part III, we set out detailed submissions supporting the CCLA's position that LRADs are “weapons” within the meaning of Regulation 926. For the reasons set out below, we submit that the Solicitor General must appropriately regulate these new devices under Regulation 926 to ensure safe, uniform province-wide standards for their use by police forces in Ontario.

## **I. Background: sonic cannon litigation**

### **A. Toronto Police Services and Ontario Provincial Police' sonic cannons**

In the Spring of 2010, in preparation for the G20 Summit, the TPS and OPP purchased sonic cannons for the purposes of crowd control and policing both during and after the Summit. The TPS purchased three handheld units that can be heard 600 meters away and whose volume can reach 137 decibels (LRAD 100X model).<sup>2</sup> The TPS also purchased a fourth vehicle-mounted unit which can reach 143 decibels audible from as far as 1500 meters (LRAD 300X model).<sup>3</sup> The OPP purchased one handheld LRAD 100X model and two tripod-mounted LRAD 300X sonic cannons. The sonic cannons are capable of emitting sounds that exceed the human threshold for pain which is widely considered to fall between 110-120 decibels. The sonic cannons were purchased without any approval by the Solicitor General.

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<sup>2</sup> LRAD Corporation, 100X product sheet (Tab 1).

<sup>3</sup> LRAD Corporation, 300X product sheet (Tab 2).

## B. Sonic cannons

Sonic cannons were originally developed to protect American naval warships in international waters.<sup>4</sup> The devices have distinct "communications" and "alert" functions. The former blasts loud, pre-recorded human-voice messages, including commands that individuals or crowds disperse. The "alert" function is used to direct a high-pitched piercing sound at a target. As described by the manufacturer, "The warning tone provides a non-lethal deterrent, shapes behaviour, and supports intent determination while preserving time for force escalation".<sup>5</sup>

Sonic cannons have been employed in different contexts since 2003. Sonic cannons are in use in war zones in Iraq and Afghanistan, where United States forces deploy them for crowd control, area denial, and clearing buildings.<sup>6</sup> They have also been used to deter maritime piracy against both military and commercial vessels, and have been used by Japanese whalers to repel anti-whaling activists.<sup>7</sup> While police in the United States had used the "communication" function on sonic cannons to broadcast information to large crowds on a number of occasions, the 2009 G-20 Summit in Pittsburgh was the first time that the "alert" function was deployed in a civilian setting in the US.<sup>8</sup>

Sonic cannons are largely untested. There has been little to no independent Canadian scientific research into the short-term and long-term effects of sonic cannons, particularly

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<sup>4</sup> Affidavit of Dr. David Murakami Wood at para. 4 (Tab 3) in *CCLA v. Toronto Police Service*, 2010 ONSC 3525 (S.C.J.) (Tab 13).

<sup>5</sup> LRAD Corporation, 100X product sheet (Tab 1).

<sup>6</sup> *Ibid.*; Robert M. McNab & Richard L. Scott, "Non-lethal weapons and the long tail of warfare" (2009) 20:1 *Small Wars & Insurgencies* 141, at 147 (Tab 4); Georges-Henri Bricet des Vallons, "L'arme non létale dans la stratégie militaire des Etat-Unis: imaginaire stratégique et genèse de l'armement" (2007) 67 *Cultures & Conflits* 63 at para. 40 (Tab 5).

<sup>7</sup> Georges-Henri Bricet des Vallons, "L'arme non létale dans la stratégie militaire des Etat-Unis: imaginaire stratégique et genèse de l'armement" (2007) 67 *Cultures & Conflits* 63 at para. 44 (Tab 5).

<sup>8</sup> Affidavit of Dr. David Murakami Wood at para. 14 (Tab 3) in *CCLA v. Toronto Police Service*, 2010 ONSC 3525 at para. 43 (S.C.J.) (Tab 13); Jennifer Yang, "Toronto Police get 'sound cannons' for G20" *Toronto Star* (27 May 2010) (Tab 6); John Goddard, "Sonic gun like 'root canal,' former G20 protester says" *Toronto Star* (27 May 2010) (Tab 7).

for their use in urban environments like the city of Toronto.<sup>9</sup> Most of the existing information on sonic cannons is produced by the manufacturers themselves.

### **C. CCLA requests to disarm alert function**

The sonic cannons raise important questions of interest to the CCLA and its membership, and to members of the Canadian public. As such, on May 21, 2010, General Counsel to the CCLA, Nathalie Des Rosiers, met with members of the Integrated Security Unit, a joint security team led by the Royal Canadian Mounted Police ("RCMP") in partnership with, *inter alia*, the TPS and OPP. The Integrated Security Unit was responsible for providing security during the G20 Summit. At this meeting the CCLA discussed the intended deployment of sonic cannons by members of the Unit and requested an assurance from the TPS that it would not deploy its sonic cannons during the G-20 Summit.<sup>10</sup> The CCLA asked that, alternatively and at a minimum, the TPS agree to disarm the weapon or "alert" function of its cannons.

On June 1, 2010, the CCLA reiterated its request in a letter to TPS Chief William Blair. In the letter, the CCLA outlined its concerns with the use on members of the public of a sonic weapon which had not yet been approved by the Solicitor General, as required under provincial legislation. The CCLA also communicated its grave concerns with respect to the health and safety implications of deploying an untested, unapproved weapon that can cause permanent physical harm to individuals.

### **D. RCMP disapproves use of sonic cannons for crowd control in urban settings**

On June 3, 2010 it was reported in the media that the RCMP does not support the use of sonic cannons for crowd control in urban settings. As reported in the *Globe and Mail*, the RCMP's use of sonic cannons is limited to marine operations.<sup>11</sup>

An RCMP internal review of sonic cannons does not support the use of sonic cannons as crowd-control devices because of limitations in the technology when used on land and the possibility that the weapon will "caus[e] hearing damage to those targeted or in close proximity". The RCMP's internal review concluded:

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<sup>9</sup> Affidavit of Dr. Robert Harrison at paras. 12-13 (Tab 8) in *CCLA v. Toronto Police Service*, 2010 ONSC 3525 (S.C.J.) (Tab 13) at para. 33.

<sup>10</sup> At this time, the OPP had not publicly announced that it, too, had purchased sonic cannons.

<sup>11</sup> Colin Freeze, "Mounties shun 'sound cannons' in urban setting ahead of G20" *Globe and Mail* (3 June 2010) (Tab 11).

Until further medical research has been completed/compiled and supporting data can provide practitioners assurances that these acoustical devices can be used safely and effectively, [the RCMP] have adopted the stance that the potential risks associated with their use currently outweigh the benefits that the RCMP can draw from utilizing this technology in a crowd control situation.<sup>12</sup>

The RCMP Internal Review raises several inter-related concerns about the use of sonic cannons, including the following:

- **Manufacturers' claims are misleading:** "While the demonstration received was, at first blush, 'impressive', subsequent research has taught us that not all claims professed by the manufacturer/representatives proved to be wholly accurate, hence the need for prospective clients to be vigilant (i.e. buyer beware)" (p. 1). "Manufacturer claims that LRAD can communicate effectively at ranges in excess of 500m are greatly exaggerated. Dr. Brungart (sic) studies have shown that most Off-the-shelf products will work effectively at distances closer to 100m range. Anything beyond this distance requires the use of higher, distorted sound pressure, which diminishes the effectiveness of the communication and, conversely, increases the likelihood of causing hearing damage to the receiver (listener)." (p.2)
- **Risk of hearing damage due to need to increase volume level when used on land:** "As the span of distance one wishes to transmit communications over increases, the requirement for substantial projection authority of the acoustical device must also be greater. The insertion loss experienced by the presence of various structures surrounding the intended receiver (listeners) can render the effectiveness of the intended communications ineffective. Both of these factors will invariably result in forcing operators to significantly increase the volume level of the LRAD to achieve their objectives. In doing so, this substantially increases the accompanying sound pressures emitted by the system, which may result in causing hearing damage to those targeted or in close proximity." (p.2)

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<sup>12</sup> RCMP Internal LRAD Review at 3 (Tab 9).

- **Harmful effects on by-standers:** "While the manufacturer's claim that their LRAD has a very narrow band of audio directivity (+/- 15 degrees) independent field tests prove this to be false. Consequently, whenever a LRAD communication is directed under demanding circumstances, higher sound pressures will be produced by the acoustical levels being emitted towards unintended bystanders or personnel found within the directional periphery." (p. 2)

The RCMP internal review further reports that the Boston Police Department, after having deployed its sonic cannon "in the streets in live situations", has "since ceased using their LRAD in crowd control situations out of a concern for public safety and fear of civil litigation issues".<sup>13</sup>

Similarly, in response to pressure from civil liberties groups, and in accordance with the RCMP's recommendations, the Vancouver Police Department undertook to disable the "alert" function on its sonic cannons during the recent Vancouver Olympics.<sup>14</sup>

#### **E. Injunction and court order**

On June 9, 2010, after receiving no response from Chief Blair to its requests to disarm the sonic cannons, the CCLA, in conjunction with the Canadian Labour Congress ("CLC"), filed a court application and motion for an interlocutory injunction. The CCLA and CLC sought to restrain the TPS' and OPP's use of the "alert" function on sonic cannons and the "communications" function at a sound level above that prescribed by Ontario occupational health and safety legislation pending the disposition of the application. The CCLA and CLC took the position that the sonic cannons required approval as "weapons" under Regulation 926. They also submitted that the use of sonic cannons against protestors would violate the rights to freedom of expression, peaceful assembly and association protected under the *Canadian Charter of Rights and Freedoms*.

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<sup>13</sup> RCMP Internal LRAD Review at 3 (Tab 9).

<sup>14</sup> RCMP Internal LRAD Review (Tab 9); Colin Freeze, "Mounties shun 'sound cannons' in urban setting ahead of G20" *Globe and Mail* (3 June 2010) (Tab 11); Megan Stewart. "VDP will disable 'sonic cannon' Chu tells police board, Mayor Robertson gives Chief his vote of confidence" *Vancouver Observer* (18 November 2009) (Tab 12).

At the time the application was filed, neither the TPS nor the OPP had developed protocols for the use of the sonic cannons. Over the course of the two weeks prior to the hearing, the TPS and OPP developed Standard Operating Procedures (“SOP”) for the LRADs. Both the TPS and OPP amended their SOPs as the preparation for the hearing unfolded and cross-examinations on affidavits were conducted.<sup>15</sup>

The motion was heard on June 23, 2010, by Justice Brown of the Ontario Superior Court. On June 25, 2010, Justice Brown dismissed the injunction against the OPP and granted a limited injunction against the TPS’ planned use of the sonic cannon’s alert function. In his reasons Justice Brown found that

- “Neither police force sought the consent of the Solicitor General before acquiring their LRADs because they viewed the devices as communications tools, not weapons requiring such approval.” (Para. 47)
- “Neither police force sought independent advice about the performance and effects of LRADs prior to their acquisition; both forces relied on the manufacturer’s representations.” (Para. 47)
- “... if the TPS operates the Alert function on their 100X and 300X models in accordance with their current operating procedures, there is a very real likelihood that demonstrators may suffer damage to their hearing.” (Para. 97)
- “... a very real likelihood exists that demonstrators may suffer damage to their hearing from the proposed use of the Alert function at certain distances and volumes.” (Para. 117)
- “... I cannot ignore the cautious approaches taken by the RCMP and the Vancouver Police to the use of LRADs.” (Para. 136)
- “... in light of the novelty of the devices in this jurisdiction, the lack of experience with them, the absence of independent scientific or medical articles on the effect of their use, I conclude that the balance of convenience favours enjoining the use of the Alert function on the TPS 100X and 300X models for Public Safety Unit purposes as currently stipulated in that force’s standard operating procedures.” (Para. 137)

Accordingly, Justice Brown enjoined the TPS from deploying the Alert function on its sonic cannons. He dismissed the injunction against the OPP since it “adopted more conservative crowd separation distances, as well as lower maximum volume limits at shorter distances than did the TPS” (para. 136).

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<sup>15</sup> *CCLA v. Toronto Police Service*, 2010 ONSC 3525 at para. 56 (S.C.J.) (Tab 13)

The TPS subsequently agreed to amend its standard operating procedures to conform to the more stringent requirements of the OPP's operating procedures.<sup>16</sup>

Following the injunction, the CCLA requested that the TPS and OPP seek a determination from the Solicitor General as to whether the sonic cannons were weapons for the purposes of Regulation 926. The TPS and OPP refused to do so, but advised the CCLA that they would not oppose the CCLA making a request to the Solicitor General for such a determination.

The parties agreed to adjourn until October 2010 the court application with respect to the regulation of LRADs under of Regulation 926.

## **II. Sonic Cannons: Sub-lethal acoustic weapons**

### **A. Sub-lethal weapons**

Sonic cannons are only sold to military and law enforcement agencies. They belong to a new and increasingly used class of weapons which were originally marketed as "non-lethal", but have now been acknowledged to be "less lethal" or "sub-lethal". The latter terms acknowledge that "there is no guarantee that any weapon can be 100% non-lethal".<sup>17</sup> Non-lethal or "less lethal" weapons have been defined in academic literature as follows:

Non-lethal weapons are specifically designed to incapacitate people or disable equipment, with minimal collateral damage to buildings and the environment; they should be discriminate and not cause unnecessary suffering; their effects should be temporary and reversible; and they should provide alternatives to, or raise the threshold for, use of lethal force.<sup>18</sup>  
[emphasis added]

Non-lethal weapons include devices which use kinetic energy (i.e., rubber and plastic bullets), conducted energy (i.e., Tasers), chemicals (i.e., irritants, pepper spray and tear gas etc.), and acoustic energy (i.e., LRADs) in order to temporarily incapacitate individuals

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<sup>16</sup> Supplementary reasons of Justice Brown, 25 June 2010: *Canadian Civil Liberties Association v. Toronto Police Service*, 2010 ONSC 3698 (S.C.J.) (Tab 14).

<sup>17</sup> Nick Lewer & Neil Davison, "Non-lethal technologies—an overview" (2005) 1 *Disarmament Forum* 37 at 37 (Tab 15).

<sup>18</sup> *Ibid.*

and control their behaviour.<sup>19</sup> Tasers as well as gas, chemical or aerosol weapons are already regulated under Regulation 926.

According to Dr. Raymond Downs, a former manager for the Less Lethal Technology program at the National Institute of Justice, in order to be effective a less lethal weapon:

... must incapacitate, debilitate or disrupt the thought process of an individual, several individuals or a crowd of people for a period of time that enables law enforcement or correctional officers to restrain the subject(s) or in the case of a crowd, disperse them or prevent their advance.<sup>20</sup>

Dr. Downs describes three categories of physiological phenomena which are employed by less lethal weapons to influence or control human behaviour:

... fully or partially immobilizing movement, depriving or degrading one or more senses and producing pain. Almost every existing or proposed less lethal weapon can fit into one or more of these categories.<sup>21</sup>

Acoustic weapons, such as the LRAD, incapacitate targeted individuals by sensory deprivation or degradation and by pain compliance, both of which target the ears and hearing sense. With respect to sensory deprivation or degradation, Dr. Down states:

Depriving or degrading the use of human sense can often prevent a targeted subject from effectively threatening an officer or others either physically with hands or feet or with a weapon. The effect may sometimes be slight and/or fleeting but still be sufficient to give officers an adequate "edge" allowing them time to employ other less lethal tools or simply "swarm" and physically overpower a subject resulting in minor or no injuries to the subject or officers. . . . Loss or degradation of hearing, even if below the pain threshold, may not have much effect on the behavior of an individual but can prevent communication between multiple subjects and their coordinated behavior in

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<sup>19</sup> *Ibid.* at 37-39. See also Raymond L. Downs, "Less lethal weapons: a technologist's perspective" (2007) 30:3 *Policing: An International Journal of Police Strategies & Management* 358 (Tab 10).

<sup>20</sup> Raymond L. Downs, "Less lethal weapons: a technologist's perspective" (2007) 30:3 *Policing: An International Journal of Police Strategies & Management* 358 at 359 (Tab 10).

<sup>21</sup> *Ibid.*

a riot scenario.<sup>22</sup>

Pain compliance is described as follows:

Inducing pain in the context of a less lethal weapon and incapacitation is meant here to create a sensation that is so unpleasant that a person will immediately or gradually, depending on the type and degree of the source of pain, change their dangerous and/or illegal behavior to stop the effect.<sup>23</sup>

Dr. Downs further notes that:

The appeal of acoustic technology is its potential to act as a stand off less lethal weapon particularly for area denial or for dispersing uncontrollable crowds and rioters. As the energy of the sound drops off with distance, in principle rioters could be pushed back or prohibited from moving forward at some reasonable distance from the source where the sound intensity becomes too painful.<sup>24</sup>

#### **B. Risk to Hearing Caused by Sonic Cannons**

The very reason why sonic cannons are considered "effective" as crowd control tools is because they focus high intensity sound into a beam or cone. The pitch and intensity of a sonic cannon is intended to be intolerable and to force dispersal of crowds.<sup>25</sup>

As recognized in the RCMP Internal LRAD Review, despite the manufacturers' claims to safety, sonic cannons - like Conducted Energy Weapons - can cause harm and injury. Based on the levels of sound produced, these devices are capable of emitting a sound beam that can incapacitate an individual, cause permanent hearing loss and possible side effects such as loss of equilibrium, nausea and migraines.<sup>26</sup>

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<sup>22</sup> *Ibid.* at 359.

<sup>23</sup> *Ibid.*

<sup>24</sup> *Ibid.* at 367.

<sup>25</sup> Affidavit of Dr. Robert Harrison at para. 27 (Tab 8) in *CCLA v. Toronto Police Service*, 2010 ONSC 3525 (S.C.J.) (Tab 13) at para. 33.; Affidavit of Dr. David Murakami Wood Affidavit at paras. 11-12 (Tab 3).

<sup>26</sup> Lewer & Davison, *supra* note 17 at 37-39 (Tab 15); Robert M. McNab & Richard L. Scott, "Non-lethal weapons and the long tail of warfare" (2009) 20:1 *Small Wars & Insurgencies* 141 at 147 & 149 (Tab 4).

Hearing damage can occur at 90 decibel sound pressure level, where the exposure is over 30 minutes. One hundred decibel sound pressure can cause hearing damage in about 15 minutes.<sup>27</sup> At 120 decibel sound pressure, hearing damage can occur in a matter of seconds. As an illustration, 120-140 decibels is akin to standing next to a jet plane as it is taking off.<sup>28</sup>

According to the manufacturer of the LRAD, the human threshold of pain occurs between 110-120 decibel sound pressure.<sup>29</sup> Physiologically, pain is a sign of damage being caused to the ear.<sup>30</sup> Even the smallest available sonic cannon is capable of producing painfully loud sound over a distance of 16 meters.

Even in the absence of pain, exposure to very intense noise can cause damage to the cochlea of the inner ear which may not show up until years later. Disruption to the delicate mechanics of the inner ear can sometimes improve within a few hours or days, but most often there is not a complete recovery and there is permanent hearing loss. On the other hand, where the hair cells in the inner ear are damaged by very loud sounds it invariably results in permanent hearing loss. As stated by expert research scientist, Dr. Harrison:

Humans are born with only one set of these hair cells. These hair cells [if damaged] do not recover or regenerate.<sup>31</sup>

The "alert" function on sonic cannons emits sound beams at one frequency or a narrow range of frequencies. This is most harmful to the ear because it can cause localized damage to the inner ear. The "communications" function can also cause painfully loud sound and cause hearing loss or damage at close range. Moreover, in an urban setting, the focussed sound beam from sonic cannons can reflect off buildings and other solid structures and thereby amplify the intensity of the sound beam experienced by targeted

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<sup>27</sup> Affidavit of Dr. Robert Harrison at paras.11 & 18 (Tab 8) in *CCLA v. Toronto Police Service*, 2010 ONSC 3525 (S.C.J.) (Tab 13) at para. 33.

<sup>28</sup> Affidavit of Dr. David Murakami Wood at para. 10 (Tab 3).

<sup>29</sup> LRAD Operations and Safety Training (Tab 16).

<sup>30</sup> Affidavit of Dr. Robert Harrison at paras. 19 & 24 (Tab 8) in *CCLA v. Toronto Police Service*, 2010 ONSC 3525 (S.C.J.) (Tab 13) at para. 33.

<sup>31</sup> Affidavit of Dr. Marshall Chasin -27 in *CCLA v. Toronto Police Service*, 2010 ONSC 3525 (S.C.J.) at paras. 15-16 (Tab 17).

individuals and innocent bystanders by as much as six decibels.<sup>32</sup> Six decibels is equivalent to a doubling of sound intensity.<sup>33</sup>

Furthermore, the sound beam of a sonic cannon may in fact not be as narrowly focussed as manufacturers claim. The RCMP's internal review notes that "independent field tests prove this [claim of a very narrow sound beam (+/- 15 degree)] to be false".<sup>34</sup> The sonic cannon at high sound pressures can therefore have "the undesired effect of having excessive audio levels being emitted towards unintended bystanders or personnel found within the directional periphery".<sup>35</sup> Moreover, the level of drop off in sound intensity outside of the sound beam is unknown.<sup>36</sup>

### C. Need for further independent studies

It is widely recognized that there is a lack of independent scientific research on the effects of LRADs on humans and their use in urban environments. As noted by Dr. Downs, "Like other new less lethal weapon technologies, there is an absence of journal articles describing the LRAD. Information appears available only from the developers and from popular technology news sources."<sup>37</sup>

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<sup>32</sup> *CCLA v. Toronto Police Service*, *supra* note 15 at para. 61 (Tab 13). See also Cross-examination of Dr. Harrison -27 in *CCLA v. Toronto Police Service*, 2010 ONSC 3525 (S.C.J.) at 12-14, lines 21 - 5, questions 40-45 (Tab 18).

<sup>33</sup> Cross-examination of Dr. Robert Harrison -27 in *CCLA v. Toronto Police Service*, 2010 ONSC 3525 (S.C.J.) at 31, lines 3-7, question 107 (Tab 19); Affidavit of Dr. Robert Harrison at paras. 25 (Tab 8).

<sup>34</sup> RCMP Internal LRAD Review at 2 (Tab 9).

<sup>35</sup> *Ibid.*

<sup>36</sup> Cross-examination of Dr. Robert Harrison in *CCLA v. Toronto Police Service*, 2010 ONSC 3525 (S.C.J.) at 10-11, lines 8 - 19, questions 33-35 (Tab 20) and 14-15, lines 23 - 25, questions 49-51 (Tab 21).

<sup>37</sup> Downs, *supra* note 20 at 380, footnote 7 (Tab 10). See Neil Davison & Nick Lewer, "Research Report No. 8", Bradford Non-Lethal Weapons Research Project (March 2006) at 34: "A report assessing the health effect was produced by Joint Non-Lethal Weapons Directorate collaborator Pennsylvania State University and funded by M2 Technologies but it does not appear to be publicly available" (Tab 22).

Even the acoustician retained by the OPP in response to the litigation acknowledged the need for further, more comprehensive study of the sonic cannons. Indeed, he viewed the G20 Summit as an invaluable opportunity to study the use of sonic cannons in urban settings<sup>38</sup>

As found by Justice Brown, neither the OPS nor the OPP sought independent advice about the performance and effects of LRADs prior to their acquisition. Instead, both forces relied exclusively on the manufacturer's representations.<sup>39</sup>

### III. Regulation of Weapons Under Regulation 926

The issue of whether certain sonic cannons qualify as "weapons", and therefore need approval as such, has been a live issue in various jurisdictions and contexts in the last several years. For example, there was a debate over the categorization, and required approval, of sonic cannons as weapons before the recent Vancouver Olympics. As noted above, ultimately, the Vancouver Police undertook to disable the "alert" function on the sonic cannons during the Olympics. The Vancouver Police also undertook to seek approval from the Police Board before using the "alert" function in the future.<sup>40</sup>

#### A. The *Police Services Act* and Regulation 926

The *Police Services Act* governs the provision of police services in the province. The Act applies to the OPP and municipal police forces in Ontario. Among other things, the Act sets out the duties of police officers which include preserving the peace and preventing crimes and other offences.<sup>41</sup>

Regulation 926 ("Equipment and Use of Force") regulates and prescribes the use of equipment and the use of force by a police force or any of its members. Sections 14 and

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<sup>38</sup> Cross-examination of Tim Kelsall -27 in *CCLA v. Toronto Police Service*, 2010 ONSC 3525 (S.C.J.) at 18, lines 3-17, questions 78-79 (Tab 23) and 19, lines 1-10, question 82 (Tab 24).

<sup>39</sup> *CCLA v. Toronto Police Service*, *supra* note 15 at para. 47 (Tab 13)

<sup>40</sup> Supplementary Affidavit and Exhibits of Abigail Deshman -27 in *CCLA v. Toronto Police Service*, 2010 ONSC 3525 (S.C.J.)(Tab 25).

<sup>41</sup> *Police Services Act*, R.S.O. 1990, c. P.15, s. 135(1) 15. and 16.

14.1 of the Regulation govern the use of "weapons" other than a firearm.<sup>42</sup>

Section 14 expressly prohibits a member of a police force from using a weapon, other than a firearm, on another person unless the following conditions have been met:

- (a) that type of weapon has been approved for use by the Solicitor General [now Ministry of Community Safety and Correctional Services];
- (b) the weapon conforms to technical standards established by the Solicitor General; and
- (c) the weapon is used in accordance with standards established by the Solicitor General.<sup>43</sup>

The requirement of approval under Regulation 926 ensures accountability and a measure of public oversight in the weapons used by police in Ontario. It also ensures that new weapons technologies conform to established technical standards, and that they may be safely deployed. It is essential to public safety and accountability that the Ministry establish uniform province-wide standards for the use, maintenance and deployment of new technologies by police forces in Ontario.

The term "weapon" is not defined in the Regulation or the *Police Services Act*. Only the terms "handgun" and "firearm" are defined in the Regulation, the latter of which is defined with reference to the definition of the term contained in s. 2 of the *Criminal Code*.

## **B. Purposive analysis**

Courts have endorsed an approach to legislative interpretation which takes into account the purposes and statutory context of the provisions being interpreted. An interpretation of Regulation 926 must give effect to the Regulation's purpose of regulating the police's use of force and ensuring that police use equipment that can cause harm in a safe and appropriate manner. The regulation of tear gas and aerosol weapons under the Regulation indicates the legislature's intention that devices and substances used for the purposes of crowd control may also fall within the term "weapon" as used in the Regulation. In addition, the regulation of tear gas and aerosol weapons in the Regulation demonstrates the legislature's intention that "weapons" not be limited to lethal devices, but rather, extend to sub-lethal weapons as well. Indeed, Tasers have been regulated as weapons pursuant to the Regulation.

A purposive approach supports a finding that a sonic cannon is a weapon within the meaning of Regulation 926. Regulation 926 serves an important public safety purpose,

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<sup>42</sup> *Equipment and Use of Force*, R.R.O. 1990, Reg. 926.

<sup>43</sup> *Ibid.* at s. 14.

which places "control over the selection and use of devices that could function as weapons in civilian, not police, hands".<sup>44</sup> As set out above, sonic cannons are capable of causing serious physical harm to individuals. Moreover, the use of sonic cannons in urban settings poses a very real risk of harm to the public because solid structures such as buildings and cars can reflect and amplify the intensity of the sound beam. As well, as set out in the RCMP Internal Review and other academic literature, there are indications that manufacturer's claims of directionality and safety are inaccurate.<sup>45</sup> In recent years, the previously underestimated weapon-like qualities of Tasers have come to be widely recognized and addressed following unintended deaths arising from the use of Tasers by police.<sup>46</sup> The same scrutiny ought to be applied to other "sub-lethal" devices such as sonic cannons before injuries occur. The use of sonic cannons by police forces in the province therefore ought to be appropriately regulated by the Solicitor General.<sup>47</sup>

### C. Objective approach to definition of "weapon"

The definition of other terms in the Regulation with reference to the *Criminal Code* would suggest that the term "weapon" should be given a broad, objective interpretation such as that given to the term under the *Criminal Code*. The *Criminal Code* provides two definitions of the term "weapon". Section 2 of the *Criminal Code* defines a "weapon" as follows:

"weapon" means any thing used, designed to be used or intended for use

- (a) in causing death or injury to any person, or
- (b) for the purpose of threatening or intimidating any person

and, without restricting the generality of the foregoing, includes a firearm. [Emphasis added.]

This definition of weapon applies to all persons and all contexts, not just to police. A narrower definition of weapon is found in section 270.1 of the *Criminal Code*, which creates the offence of disarming a police officer. In that context, a weapon is defined as follows:

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<sup>44</sup> *CCLA v. TPS*, *supra* note 15 at para. 118 (Tab 13).

<sup>45</sup> *Downs*, *supra* note 20 at 367.

<sup>46</sup> Braidwood Commission on Conducted Energy Weapon Use, "Restoring Public Confidence: Restricting the Use of Conducted Energy Weapons in British Columbia" (June 2009) (Tab 28); "Why?: The Robert Dziekanski Tragedy" (May 2010)

<sup>47</sup> *Equipment and Use of Force*, *supra* note 42 at s. 14.1.

## Disarming a peace officer

270.1 (1) Every one commits an offence who, without the consent of a peace officer, takes or attempts to take a weapon that is in the possession of the peace officer when the peace officer is engaged in the execution of his or her duty.

### Definition of "weapon"

(2) For the purpose of subsection (1), "weapon" means any thing that is designed to be used to cause injury or death to, or to temporarily incapacitate, a person. [Emphasis added.]

Even applying the narrower definition of weapon found in s. 270.1, it is submitted that a sonic cannon clearly comes within the meaning of a weapon because it is *designed to temporarily incapacitate* a person. As set out above, it belongs to a class of sub-lethal weapons which by design are intended to influence and control behaviour through sensory deprivation or degradation and/or pain compliance. Like other sub-lethal weapons, including Tasers, tear gas, and rubber bullets, sonic cannons are capable of temporarily incapacitating individuals in order to provide police "an adequate 'edge' allowing them time to employ other less lethal tools or simply "swarm" and physically overpower a subject resulting in minor or no injuries to the subject or officers".<sup>48</sup>

The TPS and OPP have refused to obtain approval from the Solicitor General or the Ministry of Community Safety and Correctional Services on the basis that they do not consider the sonic cannons to be "weapons", but "communications tools". That the police may have a subjective intention of using sonic cannons as communications devices does not change the fact that these devices are designed for, and capable of, incapacitating and causing harm to individuals.

Courts have used an objective analysis of the *Criminal Code* definition of "weapon", one that does not depend on the subjective intention of the individual wielding the weapon. With respect to the definition of weapon under s. 2 of the *Criminal Code*, courts have found that the addition of the terms "designed to be used" to the definition of "weapon" in the 1992 amendment to the *Criminal Code* makes clear that the test for whether something is a weapon is not purely subjective. That is, there is no need to show that the person using an object or device intends to use it as a weapon. It is sufficient to show that the object or device was designed to be used as a weapon.<sup>49</sup>

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<sup>48</sup> Downs, *supra* note 20 at 359.

<sup>49</sup> *R. v. Lamy*, [2002] 1 S.C.R. 860 at paras. 15-17 (Tab 26); *R. v. Johns* (1995), 177 A.R. 42 at para. 8 (Alta. Prov. Ct.) (Tab 27).

- (4) Fourth, it is disingenuous to claim that the LRAD when used as a communications device is not a weapon. Individuals and crowds are forced to stay at a safe distance because of the intensity of the sound. An individual intent on breaching the police line will be exposed to painfully loud sounds as he or she approaches, regardless of whether the LRAD is being used solely to communicate a message. As described by Dr. Downs,

As the energy of the sound drops off with distance, in principle rioters could be pushed back or prohibited from moving forward at some reasonable distance from the source where the sound intensity becomes too painful.<sup>51</sup>

In the end, it is forced compliance through sound.

- (5) Fifth, as recognized in the academic literature, sonic cannons have a rheostat control, which leaves the actual use to which the device is put in the hands of the operator.<sup>52</sup> The separation between communications device and sub-lethal weapon is therefore slight, if not non-existent. As noted in the RCMP Internal Review, when used on land, particularly in crowd-control situations, operators of the LRAD invariably increase the volume of the sound beam in order to be heard above the noise level of the crowd.

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<sup>51</sup> Downs, *supra* note 20 at 367.

<sup>52</sup> Neil Davison, "The Contemporary Development of "Non-Lethal" Weapons" Bradford Non-Lethal Weapons Research Project, Department of Peace Studies, University of Bradford (May 2007) at 16 (Tab 29); Georges-Henri Bricet des Vallons, "L'arme non létale dans la stratégie militaire des Etat-Unis: imaginaire stratégique et genèse de l'armement" 2007 67 Cultures & Conflits at para. 41 (Tab 5); and Neil Davison & Nick Lewer, "Research Report No. 8", Bradford Non-Lethal Weapons Research Project (March 2006) at 33 (Tab 22).

- (6) Sixth, and related to this, the establishment of formal regulations by the Solicitor General would reduce the likelihood of “usage creep”. Research into the use of new technologies such as sonic cannons has shown that operators of new technologies often do not follow the guidelines governing their use.<sup>53</sup> This phenomenon was also documented by the Braidwood

Inquiry into the police's use of conducted energy weapons in British Columbia.<sup>54</sup> The risk of “usage creep” likely would be reduced if the Solicitor General established formal regulations pursuant to Regulation 926.

- (7) Finally, the analysis of whether the sonic cannon is a weapon ought not to be a question of semantics. The TPS and OPP should not be permitted to avoid appropriate regulation of a potentially dangerous weapon by labelling it a communications device. Unfortunately, the United States appears to have eschewed a functional and purposive approach to the question of whether the sonic cannon is a weapon for the purposes of arms control measures. The LRAD remains unregulated in the US largely because it is promoted by the manufacturer and the military as a “communications” or “signalling” device.<sup>55</sup> Researcher Neil Davison describes the US military’s tendency to replace the term “weapon” with more euphemistic terminology:

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<sup>53</sup> For example, the Police Bureau of Pittsburgh bought sonic cannons for deployment at last year's G-20 Summit. The Pittsburgh police had been trained to use the sonic cannons following guidelines from the LRAD Corporation. The guidelines advised that the sonic cannons' "alert function" should be used for no more than four seconds and generally between two and four seconds. As reported in the media and shown on videos posted on the Internet, the police - contrary to their training - operated the sonic cannons for several minutes at a time rather than two to four seconds: Affidavit of Dr. Murakami Wood at paras. 15-17 (Tab 3).

<sup>54</sup> Braidwood Commission on Conducted Energy Weapon Use, “Restoring Public Confidence: Restricting the Use of Conducted Energy Weapons in British Columbia” (June 2009) at p. 318 (Tab 28).

<sup>55</sup> Robert M. McNab & Richard L. Scott, “Non-lethal weapons and the long tail of warfare” (2009) 20:1 Small Wars & Insurgencies 141 at 147 (Tab 4).

Another consideration [in terms of legal regulation of acoustic and directed energy weapons] surrounds the ever increasing tendency of the military to refer to “non-lethal” weapons not as weapons but as “capabilities” or “technologies”, which extends to individual types of weapons. This semantic strategy is largely for policy and public relations effect in gaining acceptance of new weapons or even prohibited weapons (in the case of biochemical weapons). However, it seems there have been legal implications. The Long Range Acoustic Device (LRAD) has avoided the military legal review that is required for all new weapons systems apparently because it [is] not classified by the US military as a weapon.<sup>56</sup> [Emphasis added.]

The US’s approach to the LRAD has been criticized by analysts, including William Arkin, a prominent military analyst who writes a column for the *Washington Post*. In Mr. Arkin’s opinion, “the U.S. is making a serious mistake by trying to quietly deploy a new pain-inducing weapon without first airing all of the legal, policy and human rights issues associated with it”.<sup>57</sup> It is our submission that the Solicitor General ought to take an objective and purposive approach to defining the term weapon, and avoid the pitfalls of semantics. To hold otherwise would allow form to trump substance in a way that risks harm to members of the public in the province.

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<sup>56</sup> Neil Davison, “The Contemporary Development of “Non-Lethal” Weapons” Bradford Non-Lethal Weapons Research Project, Department of Peace Studies, University of Bradford (May 2007) at 37 (Tab 29).

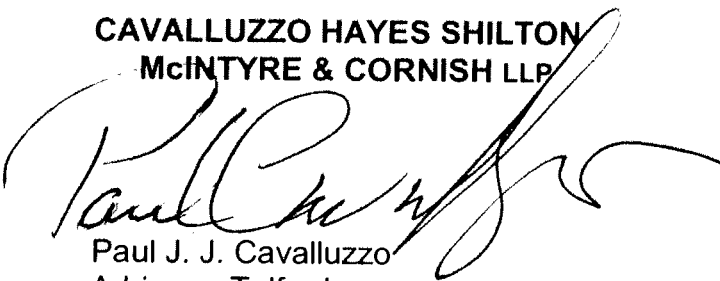
<sup>57</sup> Lewer & Davison, *supra* note 17 at 42 (Tab 15), citing Military Analyst, William Arkin, 2004, “The Pentagon’s Secret Scream: Sonic Devices that Can Inflict Pain – or Even Permanent Deafness Are Being Deployed”, *Los Angeles Times* (7 March 2004) (Tab 30).

#### IV. Conclusion

For all the reasons set out above, we submit that sonic cannons constitute "weapons" within the meaning of Regulation 926. Sonic cannons belong to a class of sub-lethal weapons on the basis that they are designed to temporarily incapacitate, threaten and intimidate targeted individuals. Moreover, sonic cannons produce a sound beam that can exceed the human threshold for pain and cause permanent injury and hearing loss. The Solicitor General ought to take a precautionary and proactive approach to minimize the risk of harm to individuals in the future. These new devices require public and scientific scrutiny before they are deployed on individuals and crowds. As such, the Solicitor General should appropriately regulate these new devices and thereby ensure safe, uniform standards for their use by police forces across the province.

Yours very truly,

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Encls.

cc: Ms Nathalie Des Rosiers, General Counsel  
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