A prospective Police Technology Assessment of the use of non-penetrating projectiles for public order maintenance and riot control

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ABSTRACT
At the request of the Dutch Police, a prospective Police Technology Assessment was performed to assess the feasibility of non-penetrating projectiles (both single- and multi-pellet) for public order maintenance. Data were gathered via a literature study, expert interviews and focus groups to analyse human factors involving both police officers and targeted individuals in the operational contexts police officers face during public order situations. There appeared to be little need for additional weapons for public order maintenance: the weapons already available (in addition to the long baton), such as tear gas and water cannon are seldom used, public order situations where police officers resorted to their firearm were exceedingly rare. Whereas single pellet projectiles are designed to target individual perpetrators within a crowd, multi pellet projectiles are meant to assist in dispersing a crowd. Looking at the operational contexts in which these weapons are to be used, it appears that accurate targeting of individuals is difficult, even for experienced shooters and there is considerable risk of severe injury. A problem with multi-pellet projectiles is both that differentiated use is not possible, as it is not possible to predict where the projectiles will end up, and that it is relatively easy for targeted individuals to take counter measures. Both types of projectiles can only be deployed responsibly in very specific large scale public order disturbances where a more or less homogenous group perpetrators use potentially life-threatening violence. The conclusion of the assessment is that implementation of non-penetrating projectiles for public order maintenance or riot control does not provide a realistic or effective potential use in line with the public order management concept in use in the Netherlands, whereas use of such projectiles would carry great risks, which include risks to the societal support for the way the police maintains public order.

Keywords: non-penetrating projectiles, kinetic weapons, police technology assessment, less-than-lethal weapons, public order, use of force

1 Paper presented at 10th European Symposium on Non-Lethal Weapons
https://www.politieacademie.nl/kennisonderzoek/kennis/mediatheek/PDF/101338.PDF
1. INTRODUCTION

On August 22, 2009, over 20 police officers were fiercely attacked by a group of hard core hooligans attending a dance event at the beach in Hoek van Holland near Rotterdam, the Netherlands [1]. The officers withdrew into the dunes fearing for their lives and 21 of them fired a total of 72 shots. Most were warning shots, but some were aimed at (the legs of) their attackers. One of the attackers was hit fatally. This was the first (and until now only) death as a result of a police bullet fired during public order disturbance in the Netherlands. Subsequent research commissioned by the Ministry of Internal Affairs and the mayor of Rotterdam concluded that there certainly was not a new trend to deliberately attack police or others and that serious disturbances are extremely rare in the Netherlands [1].

In spite of this conclusion, there are regular calls (especially after some incident occurred) for new or improved less-than-lethal weapons to complement those already available. In addition to long batons, Dutch riot police units (mobile units) are equipped with tear gas and can deploy water cannon, police dogs and mounted police. In 2014, with the amalgamation of 26 regional police forces into one national police, a formal police committee expressed a desire for a new look at the potential of police less-than-lethal weaponry, especially with regard to dealing with public order disturbances [2]. On the basis of an inventory of available less-than-lethal weapons and a task analysis performed by the Netherlands Organisation for applied scientific research TNO [3] it was decided to further explore the potential of non-penetrating projectiles (both of the single and multi-pellet types), fired by kinetic weapons.

Non-penetrating projectiles (NPPs) are designed to be used against individuals from some distance to discourage them, to incapacitate them temporarily or to mark them for later arrest and (in the case of multi pellet projectiles) to disperse crowds. The projectiles are to be aimed at the lower belly or upper leg. A recent overview compiled by the German Bundesrat shows that these types of projectiles are widely being used by police services in Europe and Turkey, however generally not in the realm of public order maintenance/riot control but for use by special units to arrest or incapacitate dangerous individuals.

The question that the Dutch police wanted to be answered was: what are the strengths and weaknesses and what is the added value of using non penetrating projectiles in public order maintenance and riot control for the Dutch police? We used Police Technology Assessment (PTA) as a method to answer this question. In the remainder of these paper we will first explain what PTA entails, lay out the investigative steps taken to carry out the assessment/study and provide a synthesis of results. We conclude by answering the research question.

2. POLICE TECHNOLOGY ASSESSMENT (PTA)

As introduced by Orbons & Adang [4], PTA is derived from Defence Technology Assessment (DTA, see [5]), which takes note of the fact that non or less-than-lethal weapons are no ‘neutral’ and invariant instruments of force [6] and that any analysis of these weapons should take into account the socio-technical framework in which they are to be positioned. This framework embraces a range of factors of influence including training, guidelines and behaviour as well as individual and societal perceptions of the weapon. Between these factors of influence complex interactions exist [7].

PTA consists of three key complexes that together shape the outcome of the implementation of a new use-of-force technology or weapon. These are the weapon and technology complex, the user complex and the target complex. The complexes are addressed and analysed within both the operational and political-societal contexts in which the weapon is to be deployed (Figure 1). Through this approach expected outcomes of the deployment of the weapon within the operational context in which it is applied can be compared with the expectations and needs underlying the desire or decision to introduce a weapon in the police organisation. Understanding the mechanisms at play in the operational context requires an analysis focusing on the factors of influence defining each of the three complexes.

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2 In the Netherlands, the term less-than-lethal is generally used and seen as more accurate than non-lethal
3 In Hoek van Holland, none of these options were available to the officers concerned, as mobile units were not deployed. In the end the attacked officers were saved by the arrival of mounted police
4 https://www.bundestag.de/blob/529198/a52021ac1fc3723e368d86086e74cc11/wd-3-160-17-pdf-data.pdf
5 According to media reports, within Europe, NPPs are used for riot control purposes in Northern Ireland, Spain and France.
The Police Technology Assessment framework defined to analyse and explain differences between expectations and actual outcomes of police weapon employment (adapted from [4])

The **weapon & technology complex** encompasses the physical and technical parameters and performance characteristics of the weapon concept, the impact the weapon is designed to have on the human target, the reliability of physiological effect, and the extent to which the effect is susceptible for operator performance and intent.

The **user (police) complex** includes the factors related to the attitude and performance of the organization and personnel that deploy and employ the weapon. Skills, experience, training and education, policy guidance, rules of engagement, mental and physical state, judgement and user’s perception of the potential target individual are determinants of the user complex.

The **target group complex** incorporates factors related to the subject exposed to the weapon and possibly the group (s)he is part of. These factors include the attitude, mental and physical state of the subject and possible group members, the perception of the user and its organization and background, motivation, experience, preparedness for violent engagement, specific countermeasures and, in case of a group, target group dynamics.

The **operational context** includes situational factors that directly influence the use and functioning of the weapons concerned, such as location, weather conditions and also preparation and nature and content of available information.

The broader **societal-political context** includes factors that indirectly have an effect, such as policy considerations, media reports and political discussions. The PTA of the single and multi-pellet non-penetrating projectiles is of a prospective nature, as the Dutch police did not yet have experience with these weapons in the context of public order maintenance or riot control.

The data to describe the various factors of influence will have to be collected through qualitative interviews with police subject matter experts (including instructors and commanders), official reports and documents, and open source publications including scholarly publications and media reports. A PTA starts with making an inventory of needs and expectations on the one hand and a summary of publicly available information. From this, specific questions to be asked during the interviews are derived. Interviewees are selected based on their expertise and

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6 Special units within the Dutch police and Royal Marechaussee do possess different types of kinetic weapons (specifically Brügger & Thomert Rubber Shot Cartridge 40 mm which can fire projectiles with 28 rubber pellets with a 15 mm diameter) and the FN-303 system (that can fire single pellet projectiles containing pepper spray or paint), but these have never been used in public order maintenance or riot control.
knowledge they have with regard to one or more elements of the PTA (weapon, users, targets, context). Interviews are then held with to gain qualitative insights into these elements. After analysis of all available information from all sources with the help of a software programme for qualitative analysis, the results of the analysis are discussed in a focus group with experts. Synthesizing the data from the above variety of sources with different perspectives on deployment serves to optimize the validity of the analysis. Next, the Dutch operational context will be presented.

3. INVESTIGATIVE STEPS

For this PTA the following steps have been taken:

1. Literature search for academic publications, media reports and public documentation provided by manufacturers of kinetic weapons/ NPPs. Even though kinetic weapons have been in use for decades, there is little independent research available on their use in public order maintenance/riot control

2. Data were gathered on serious public order incidents in the Netherlands, especially with regard to the use of firearms and less-than-lethal weapons over a 16 year period (2003 - 2018). For the purpose of this study, incidents were considered as “serious” when violence against the police occurred that was characterized at the time as extreme, when more than one police officer got injured or when use was made of the firearm, water cannon or tear gas

3. Based on all use-of-force reports filed in 2016, a representative sample was analysed with regard to the use of force in public order contexts [8]

4. Interviews were held with 17 experts and practitioners. Interviewees were used as informants about elements of the PTA that formed part of their expertise and included representatives of TNO, practitioners involved in public order management, authorities with responsibilities over the way police conduct public order management, a human rights organization (Amnesty International) and the National Ombudsman. Interviews were structured according to a previously developed topic list that included both general questions that were the same for every interviewee and questions specifically geared towards the interviewee’s expertise. With their consent, interviews were recorded on a voice recorder and transcribed afterwards.

5. Transcribed interviews were subsequently analysed using the qualitative programme Atlas.ti. Coding took place using a so-called a priori approach incorporating the different elements of the PTA. The results of the analysis were then combined with the results of the literature search

6. Subsequently, an expert meeting was organised with practitioners and representatives from TNO, Amnesty International, the National Ombudsman on June 26 2018 to share, discuss and refine the analysis

4. PTA SYNTHESIS

Below, results of the PTA will be synthesised, starting with a description of the operational context that the Dutch police faces, followed by a summary of stated needs and expectations. The three main elements of the PTA (weapon, user and target) will then be dealt with and the synthesis ends with a brief description of relevant aspects of the societal-political context.

4.1 Operational context

Looking at the period 2003-2018, use of the firearm and less-than-lethal weapons during public order disturbances is quite rare.7 Before and after the 2009 incident in Hoek van Holland no incident occurred where aimed shots were fired at a crowd or at individual perpetrators. On five occasions in this period, warning shots were fired (once by a member of a mobile unit, four times by “ordinary” patrol officers in the absence of deployment of mobile units).8 On two occasions (both during a deployment of mobile units), firearms were drawn and aimed at perpetrators, but no shots were fired.9 Teargas has not been used in the past 15 years in the context of public order maintenance/riot control. Two times permission was asked (and given) to use teargas, but in the end it was not actually deployed.

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7 A similar conclusion was drawn by Naeyé in his analysis of all use-of-force reports filed in 2000 [9].

8 1: During a festival, officers feel threatened by a group and fire warning shots (Rotterdam freedom festival 5/5/2009) 2. After a football match, fans throw stones and fireworks at regular police officers and mounted police officers. Two of these officers fire warning shots. No mobile units were yet deployed. (Utrecht- Twente 4/12/2011). 3. Citizens protesting the establishment of a large centre for asylum seekers in their municipality threaten to storm a council meeting. A mobile unit group commander fires two warning shots when his group comes under pressure and is fiercely attacked (Geldermalsen 15/12/2015) 4. Rioters try to storm a police station after the shooting death of a citizen. Officers defending the access to the police station fire two warning shots. Arrival of mobile units resolves the situation (Schilderswijk 15/12/2015). 5. A regular police officer fires one warning shot when he is accosted by members of a family when police act against a bonfire getting out of hand (Papendrecht 31/12/2015).

9 6. Fifty individuals try to enter an annex to a football stadium. When they break the glass door and throw fireworks, members of an arrest unit point their guns to prevent them from entering the building. Quick intervention by mobile units resolves the situation. (Maasgebouw 17/9/2011). 7. Members of mobile units draw their guns to prevent a confrontation between tow fan groups near a stadium (Ajax - Cambuur 8/3/2014).
Water cannons were deployed twice.\textsuperscript{10} On several occasions charges by mounted police played an important role in ending a violent attack on police officers. A unique instance of use of a less-than-lethal weapon was the use of a beanbag by a SWAT team during an operation against drug trafficking in a football stadium\textsuperscript{11}.

Adang and others \cite{Adang2009} showed that mobile unit deployments related to public order maintenance were mostly related to football matches (54% of 1412 deployments in the years 2002-2007), less often related to protest (18% and events (16%). Police do not register in what proportion of cases mobile units were in fact put in action or were confronted with violence. Deployment of mobile units in case of community disturbances is quite rare (5% of deployments), but it is especially these deployments that receive extensive media attention.

Our analysis of use-of-force reports provides another perspective on public order maintenance \cite{8}. In a random sample of 720 use-of-force reports (out of a total of 17,017) pertaining to 440 different incidents 15% of all reported use-of-force took place in a public order context, most often related to the night-time economy and much less often to football matches, protests or new year’s eve disturbances. In just 5% of all public order related incidents, force was used by ten or more officers. In almost half of all public order related incidents, force was used against three or more persons at the same time. The force used in public order contexts mainly concerned physical force (51% of the cases) and use of the long baton (21%). Police dogs were deployed less often (9%, usually in a threatening way only). In two cases a weapon was drawn but not fired.\textsuperscript{12} In one case four warning shots wear fired directed at an individual suspected of wearing a bomb belt.

One worrying trend is given by disturbances occurring during New Year’s Eve: although the number of incidents has gone down, the dangers of fireworks of ever increasing power have increased. Some extremely dangerous illegal fireworks are not only used in celebrations, but on occasion also thrown at police officers \cite{11}.

In summary, the operational context for public order related policing is mainly to be found in daily police work, such as policing the night time economy and new year’s eve rather than in large scale disturbances. In large scale disturbances, life threatening situations that lead to a need to use the fire-arm are extremely rare. If there is a need to use the firearm in these circumstances, it is usually not by members of mobile units but rather by ordinary officers in cases where mobile units were not deployed. Generally, mobile units are quite capable of dealing with public order disturbances and only rarely need to resort to the use of water cannon or tear gas. In several escalating situations, mounted police played a crucial role in dispersing violent attackers.

\subsection*{4.2 Expectations and needs}

As a draft version for public consultation of a new “Instructions for Police Use of Force” (Ambtsinstructie)\textsuperscript{13} formulates it, the use of non-penetrating projectiles would allow police officers to prevent physical contact and incapacitate an individual from a larger distance than would be possible by using pepper spray or a baton and to make it possible in the context of public order disturbances with extreme violence to discourage violent individuals or keep them at a distance with an eye to officer safety, without causing serious injuries to citizens. Addition of NPPs would allow for more and more tailored options in riot control, postponing the potential need for the use of lethal force. The expectation is that NPPs will cause less serious injuries than using police dogs and is more discerning than use of teargas, water cannon or a charge by mobile units. Availability of NPP could have a deterrent, and thereby de-escalating effect.

More generally, the memo that provided the impetus for looking into the potential of new less-than-lethal weapons for policing public order disturbances stated that, as a result of developments in society, a new balance was needed between dialogue, de-escalation and taking direct action (“hard when necessary, soft when possible”). The expectation is that less-than-lethal weapons will contribute to a more effective and efficient police deployment.

\subsection*{4.3 Weapon complex: characteristics and functioning}

Different forms of NPP have been in use by police forces all over the world for over fifty years.\textsuperscript{14} In this paper, both single and multi-pellet projectiles will be considered, sometimes taken together, sometimes where appropriate, separately. Both are intended to provide pain stimuli to one (single) or more (multi) targets. Single pellet projectiles

\begin{footnotes}
\item[10] Once during serious riots in the context of a high risk football match (Rotterdam, 17 april 2005) numerous officers were injured. Water cannon was used and permission to use teargas was obtained. After officers had put on their gas masks, violent perpetrators left the (Adang e.a., 2009: 17-19). After 2005, the water cannon was deployed only once during a protest in 2007 in Amsterdam.
\item[11] Bodycam images can be seen at https://www.hartvannederland.nl/nieuws/2017/bodycambeelden-vrijgegeven-van-inval-supportershome-twente/\textsuperscript{15}
\item[12] In one instance a suspect suddenly drew a knife, in the other an individual was suspected of being in possession of a fire-arm.
\item[13] https://www.internetconsultatie.nl/ambtsinstructie
\item[14] https://www.aclu.org/sites/default/files/field_document/kinetic_impact_projectiles.pdf provides an overview
\end{footnotes}
are designed to be used against individuals from a distance of up to 70m to discourage them, to incapacitate them temporarily or to mark them for later arrest. The projectile is to be aimed at the lower belly or upper leg. Many types of projectiles are available, varying in hardness and composition. Some projectiles contain paint, teargas or pepper spray.

Multi-pellet projectiles are designed to be fired at small groups with the aim to stop or disperse them. A multi-pellet projectile contains a number of rubber bullets (pellets). After firing the projectile from a distance of up to 30m, it breaks open and a cloud of pellets travels in the direction of the target group, preferably hitting the legs of individuals within the group either directly or indirectly after ricocheting off the ground.

Both single and multi-pellet projectiles require a line of sight between the officer firing the projectile and the target(s). Kinetic weapons firing the projectiles exist for a number of years and can be considered to be fully developed and easy to use. It is possible to add sights or a laser beam.

4.4 User complex

The Dutch draft new Instructions for Police Use of Force state that NPPs could be used in the following public order related circumstances (if permission for use is obtained first from the mayor and ordered by a superior officer):

- to temporarily incapacitate or mark an individual that seriously disrupts public order and cannot be arrested immediately, in order to arrest him at a later stage
- (multi pellet projectiles only) to disperse gatherings or assemblies that constitute a serious and immediate threat to the safety of persons or properties
- to stave of direct threats to the life of persons or avert grievous bodily harm

Some of the interviewed experts feel that the likelihood of serious disturbances in the Netherlands is exceedingly small. Others, especially those in the largest cities, feel otherwise and tell about situations they experienced where they lacked proper weapons. They point to the existence of experienced and well-prepared opponents that are not deterred easily. They feel the need for a weapon to deal with extreme forms of violence. Some of the experts feel that a combination of tactical deployment, short charges, use of the long baton, putting police dogs in the front and deployment of mounted police is sufficient to keep violent perpetrators at a distance. Good preparation and use of intelligence is considered crucial. Local authorities feel that mobile units do not lack means to operate. There is a certain pride that the Dutch police with its mobile units have been able to handle crowds and prevent large scale escalations.

If kinetic weapons would be introduced, the most likely scenario would be for specialised members of mobile units to be trained in a way that each group (consisting of eight members) has a member trained in the use of the weapon. The training would be comparable to that given to group members in possession of a weapon to fire tear gas grenades. The training should be extensive to maximise the possibility that the intended less-than-lethal effect will be achieved.

The use of NPPs has effects on the tactical concept as a whole. Training for mobile units as a whole should reflect this, as well as the training for commanders that deploy these units at a tactical or strategic level.

Interviewed potential users regard the marking and later arrest of violent perpetrators as unrealistic, given the fact that already in the present situation, rioters frequently change or discard clothing to avoid recognition. The ability to stop violent perpetrators from a safe distance is seen as a clear advantage, although many express doubts about the accuracy that can be obtained under hectic operational circumstances. Experiences from countries that deploy kinetic weapons confirm these doubts: even very experienced shooters hit vulnerable body parts or uninvolved, non-targeted bystanders. Research into the use of NPPs (plastic baton rounds) in Northern Ireland showed that the interaction between user and weapon is of critical importance for adequate use: “The operator’s skills, training, self-confidence, and mental attitude during real deployments are pre-conditional for achieving the required physical effect on the target individual.” According to the author, it proved to be a real challenge to use the weapon with the required accuracy from the distance that operational circumstances dictated. Another challenge was to prevent use of the weapons, against the rules, from a short distance, to punish violent perpetrators.

Different perspectives also exist with regard to multi-pellet projectiles. Some feel these have no added value. The fact that multi-pellets do not differentiate between different individuals in a crowd is seen as a definite
disadvantage. Some see a value for multi pellet projectiles for what they call “light” self-defence, where the projectiles could help to keep violent perpetrators at a distance in situations where use of the firearm would not be appropriate.

Interviewees generally agree that NPPs are less suitable to be used against large, heterogeneous crowds, as gather during festivals and protests or during community disturbances. Situations that would be more suitable are characterised by life-threatening violence or extreme violence performed by a homogeneous group.

Many potential users (as well as other stakeholders, see below) wonder whether kinetic weapons are a good fit for the Dutch police. They ask themselves what the psychological effect will be if the Dutch police starts shooting at groups or crowds, albeit with NPPs. Whereas some point to potential de-escalating effects of the availability of kinetic weapons, others expect an escalating effect, both in the long and short term.

4.5 The target complex

Both types of NPPs cause pain, with the pain caused by single pellet projectiles being more intense than that caused by multi-pellet projectiles. There is by now extensive documentation that NPPs can cause serious injuries. In addition, the effect of NPPs (especially single pellet ones) could be psychological: knowing that one could be hit from a distance any time could have a deterrent effect on would-be rioters. The effect of multi pellet projectiles is more of a “do not approach” nature. In many operational situations, violent perpetrators do not operate in front of a crowd, but from a position where they take cover behind others, including young people/children.

The area where an individual will be hit is unpredictable with multi-pellet projectiles. Within the crowd, there will be numerous individuals that are not violent as well as journalists, bystanders and plainclothes police officers. Multi-pellet projectiles will affect them all. It is unclear whether the pain stimulus caused by a multi-pellet projectile will have an effect on individuals that are intoxicated or under the influence of drugs.

International research indicates that NPPs have an escalating effect and could contribute to an arms race [14].

Research by Orbons on the use of plastic baton rounds in Northern-Ireland shows that, quite apart from the characteristics of the weapons, the effects of deployment depend on the place where the body is hit [13]. In operational practice, there is a large variety in the size and movability of targeted individuals, leading to a large variety in effects. In many cases, targeted individuals took protective measures or used tactics to avoid being exposed to the weapons. As a result, frequently innocent bystanders were hit.

Haar and others reviewed research published between 1990 and 2017 about injuries as a result of all types of NPPs [15]. They report that the larger the distance, the less accurate and the greater the likelihood for non-targeted individuals (including bystanders) to be hit. The likelihood of injury increased considerably when projectiles were fired from a distance smaller than that recommended. It was not always clear what constituted a safe distance and this varied considerably between weapons. Especially hits on the head and neck often led to serious or permanent injuries (e.g. loss of an eye) or death. NPPs containing a metal core or metal parts often did penetrate the skin and were highly likely to lead to injuries.

Haar and others recommend international guidelines for the use of NPPs [15]. They conclude that NPPs are not suitable to assist in arresting suspects and are also less suitable to disperse a crowd, in part because they lead to immobilisation of affected individuals. When used to disperse crowds, the likelihood of random victims is considerable.\(^\text{16}\) Not surprisingly, the use of NPPs regularly leads to indignant reactions in society, as recent events in France referred to earlier illustrate.

As Kenny and others [16] show, deployment of NPPs for riot control requires insight in crowd behaviour and crowd dynamics. Crowd and riot control concepts in use by police and military in many countries are often based on incorrect assumptions and stereotypes and outdated theoretical concepts. This is different in the Netherlands (see below).

Orbon’s research on the use of plastic baton rounds in Northern-Ireland [13] showed that the deployment of these projectiles and their effects are inextricably linked to the history of the conflict and specific events in the ongoing interactions between military and police on the one hand and citizens on the other, leading to a lowering of the threshold to deploy the NPPs.

\(^{16}\) See previous footnote and https://www.cityofboston.gov/Images_Documents/sternreport_tem3-8954.pdf
4.6 Political-societal context

Since January 2013, the Dutch police employ a knowledge based concept of public order policing [10] based on a flexible deployment of mobile units that can rapidly scale up or down and operate based on the four principles of crowd policing and public order management of education, facilitation, communication and differentiation formulated on the basis of modern crowd psychology [17] that are consistent with a “policing by consent” approach. In this concept, the role of mobile units is not limited to high profile riot control tactics. It is recognised that riot control is only a relatively rare and very specific (and confrontational) aspect of more general crowd management measures. Most of the respondents indicated NPPs would not fit within Dutch culture nor would they fit within this policing by consent approach. Especially “shooting at a crowd”, albeit with less-than-lethal ammunition, was seen as problematic. The expectation was that reactions in society would be overwhelmingly negative. On the other hand, some police respondents expected the public to appreciate a firm response against violent perpetrators in riot situations. Even though in practice deployment of teargas or water cannon is not refused when it is asked for, these police respondents feel police are sometimes too hesitant and authorities too reluctant to deploy these weapons. In their view, the availability of NPPs would allow for a more tailored approach and prevent more serious incidents. However, as the draft new Instruction for Police Use of Force indicates, the idea that NPPs could be deployed by police without previous authorisation seems a mirage.

In Europe, little is known about the use of NPP for riot control purposes, except for the use of plastic baton rounds during the Troubles in Northern Ireland, where their use has been heavily criticised [12]. More recently, the use of so-called flash balls by French police has met with criticism\(^{17}\), as has the use of rubber projectiles in Catalonia.\(^{18}\)

Human rights organisations such as Amnesty International are very critical of NPPs because of the risk of serious injury, especially when firing multiple projectiles at once. Amnesty critiques the broad leeway given to police in the draft New Instructions for Police Use of Force and the lack of clear-cut criteria.\(^{19}\)

A report from Physicians for Human Rights in cooperation with several human rights organisations [18] concludes:

- **Kinetic impact projectiles (KIPs)** in general are not an appropriate weapon to be used for crowd management and, specifically, for dispersal purposes; most cannot be used effectively and safely against crowds. At close ranges, levels of lethality and patterns of injury of some KIPs become similar to live ammunition.

- **Indiscriminate KIPs** that fire multiple projectiles, such as shotgun pellets and other types of ammunition, should be prohibited in the context of protest. It is virtually impossible to deploy these safely and effectively against crowds or individuals.

- **Some KIPs** are able to provide a comparatively less lethal and accurate alternative. Their deployment should be restricted to circumstances where a threat to life or a threat of serious injury exists, and where all other means to protect lives are inapplicable. These should be used minimally and with caution, since they still have high potential to cause serious injury or death.

5. CONCLUSION

So, what are the strengths and weaknesses and what is the added value of using NPPs in public order maintenance and riot control for the Dutch police Characteristic for NPPs is the search for a balance between a projectile that has the desired effect on the one hand, which requires sufficient energy at the moment of impact and a projectile that decreases the likelihood of causing serious injury (Omega foundation, 2000: xxvii). It is furthermore well established that the accuracy of kinetic weapons decreases under dynamic and stressful operational circumstances (that are of course characteristic of for riot situations). The strong point of single pellet weapons is their ability to target individual perpetrators of violence from a distance. Characteristic conditions for use of the weapons are situations where extreme violence is being perpetrated that could lead to serious injuries and where the violent perpetrators form part of a fairly homogeneous group. Compared to tear gas and water cannon, single pellet projectiles do not target crowds/ groups as a whole, but provide a differentiated approach. This is obviously not the case for multi-pellet projectiles. The disadvantage of single pellet projectiles is that, even for well-trained officers, accurate targeting is difficult under

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operational circumstances, which greatly increases the likelihood of hits at more vulnerable body parts or non-targeted individuals. With multi-pellet projectiles, it is impossible to predict which targets will be hit and where they will be hit. The inclusion of chemical irritants in pellets increases the risk that officers aim closer to more vulnerable body parts for the irritants to have an effect. Effective use of markers for later arrest seems dubious: it is easy to change clothing and it will remain difficult to later link marked individuals to specific acts of violence.

For multi-pellet projectiles, it is fairly easy for violent perpetrators to take protective counter-measures and it can be questioned if the pain stimulus provided will always be sufficient to have the desired effect, especially with intoxicated individuals or those under the influence of drugs.

For both single and multi-pellet projectiles, high demands should be put on the training and competencies of officers firing the projectiles. It is not just the shooters that need to be trained: introducing kinetic weapons in the Dutch police would also require changes in the concept of policing public disorder and training of all mobile units will have to be adapted accordingly.

Both single and multi-pellet projectiles would generally only be able to be deployed in very specific operational circumstances: not against heterogeneous groups, usually not in relation to events and protests or community disturbances and not in the case of small-scale public order disturbances (characterised as these are by relatively short distances between officers and perpetrators and the presence of large numbers of bystanders). In addition, introduction and use could potentially have an escalating effect in the long term [14, 19], thus changing the interaction between police and citizens for the worse.

Both single and multi-pellet projectiles are difficult to reconcile with the Dutch mobile unit concept and tactics introduced in 2013. The concept is based on proximity to police and citizens to be able to exert maximum influence on the course of events where necessary, with the opportunity to flexibly upscale or downscale as required.

In summary, the results of the Police Technology Assessment, taking into account all aspects related to operational deployment, lead to the conclusion that NPPs are unlikely to be able to live up to the expectations that were formulated: the desired effects will probably not be reached and the risk of negative effects is considerable. At the same time, the analysis raised questions about the real operational need for kinetic weapons. On the one hand TNO [3] concluded that the existing less-than-lethal weapons in use functioned well. On the other hand, situations where Dutch police officers have to resort to their fire-arm in a public order context are quite rare. Independent evaluations indicate that in cases where did this occur, tactical and organisational errors were to blame, rather than lack of appropriate less-than-lethal weapons. A focus on weapons, furthermore, risks a misplaced trust in technology to solve problems of a different nature [19]. Also, the operational context of public order policing in the Netherlands is very different from one like that in Northern Ireland during the Troubles, a period characterised by the widespread use of firebombs, improvised explosive devices and firearms by rioters that made interventions at close range impossible [12]. Still, the use of plastic baton rounds in Northern Ireland was considered to be highly problematic and so far, the more acceptable, effective and potentially less lethal alternative the Patten Commission asked for has not yet been found [20]. In this respect it is worth taking note of the words of sir Hugh Orde (former chief constable of the Royal Ulster Constabulary, the present day Northern Ireland Police Force), uttered in his capacity as president of the British Association of Chief Police Officers, during the 2011 London riots: "I do not think it would be sensible in any way shape or form to deploy water cannon or baton rounds in London. Baton rounds are very serious bits of equipment. I would only deploy them in life-threatening situations".  

Where the draft of the new Dutch Instructions for Use of Force would allow for the use of kinetic weapons against individuals that seriously disturb public order and form a threat to persons or properties (the way it is formulated in the explanatory statement to the instruction), the conclusion of this police technology assessment is that, because of the dependency of operational conditions, limits to the accuracy and risks inherent in the use in operational situations (especially against heterogeneous groups or when only property is threatened) use of kinetic weapons will be at odds with basic use-of-force principles of proportionality and subsidiarity contained in Police Law [21]. For the Dutch police, acquiring kinetic weapons to fire NPPs would have little added value in dealing with public order disturbances in terms of desired effects and opportunities for use while it would carry significant risks, including risk to the societal support for the way the police maintains public order and is perceived to act in a legitimate way.

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21 https://www.theguardian.com/uk/2012/mar/14/met-police-baton-rounds-riots
References


