

# Corporate Policy and Strategy Committee

10.00am, Tuesday, 28 March 2017

## Silent Fireworks

Item number	7.8
Report number	
Executive/routine	Executive
Wards	All

### Executive Summary

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This report is in response to a [Council motion](#) which asked for information on the effects of firework noise on buildings, people and animals. The motion also asked for an exploration of other options which might maintain the spectacle but reduce the noise impact, such as silent fireworks. The legislative background is explained and the impact of firework noise is discussed. While there are no fireworks which are completely silent, quieter fireworks and alternatives such as laser displays are explored. However, event organisers and industry professionals regard these as 'add-ons' rather than constituting a viable substitute for entire fireworks displays.

### Links

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Coalition Pledges	<a href="#">P24</a>
Council Priorities	<a href="#">CP6</a>
Single Outcome Agreement	<a href="#">SO1</a>

## Silent Fireworks

### 1. Recommendations

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- 1.1 That the Corporate Policy and Strategy Committee notes this report.

### 2. Background

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- 2.1 At the Council meeting on 15 December 2016 Councillor Mowat submitted the following motion in terms of Standing Order 16:

Council:

- 2.1.1 Recognises that the fireworks set off regularly in the city add excitement, colour and gaiety to celebrations in Edinburgh but that there is an impact from these regular fireworks on the residents living close to the launch sites and that there are concerns that the increasing scale of such may be having adverse impacts; and
- 2.1.2 Calls for a report in two cycles to investigate:
- What impact the noise of the bangs has on the health and wellbeing of people and animals;
  - What damage may be caused to property from the vibrations from the large pyrotechnic displays;
  - What other options are available for keeping the spectacle but reducing the impact such as silent fireworks.

### 3. Main report

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- 3.1 Currently there is no recognised maximum noise level for fireworks displays in residential areas. In terms of legislation governing fireworks, there are several controls:
- Firstly, the Pyrotechnic Articles (Safety) Regulations 2015 state that all category F1-F3 fireworks must not exceed 120dB (A, Imp) when measured at the safety distance (e.g. 15 metres for category F3 fireworks). This places an onus on manufacturers to design fireworks to meet this criterion. Category F1-3 fireworks are those which can be sold to the general public.
  - Category F4 fireworks can only be sold and used by fireworks professionals. There are no legal restrictions on the noise levels Category F4 fireworks can produce. However the overarching Noise at Work Regulations would apply, and responsibility would lie with display organisers to ensure that noise levels were within safe limits. Presently, there is no evidence that noise levels experienced

by the general public stemming from organised fireworks displays in the city are exceeding safe limits.

- 3.2 Secondly, the Fireworks (Scotland) Regulations 2004 prohibits the use of fireworks between the hours of 23.00 – 07.00, except for certain holidays, e.g. Chinese New Year, New Year’s Eve, Diwali and 5 November; or where the Local Authority has granted a dispensation. When a dispensation is granted the event must be publicly advertised no later than seven days prior to the commencement of the event. The Local Authority may refuse a dispensation if it is satisfied that there is significant potential for:
- death of persons or injury, alarm, distress or anxiety to persons;
  - death of animals or injury or distress to animals; and
  - destruction of, or damage to, property.
- 3.3 There is no legislative or numerical definition as to what is regarded a “silent” or “quiet” firework, although the fireworks industry will generally describe them as being less than 120dB (A, Imp) and to lack the characteristic “bang” of a firework. (The noises produced tend to be described as whistles or crackles). Most of the energy from fireworks is in the 125, 250 and 500Hz frequency bands which are much higher than the frequencies normally associated with vibrations.
- 3.4 Large scale displays to be viewed from a distance need to achieve a significant amount of height to be able to be seen by the audience over that distance and to progressively climb above the smoke layer from previous firings. This height and the accompanying large bursts of colour can only be achieved with the use of propellants. These propellants, or explosives, are what create the loud bangs associated with fireworks displays.
- 3.5 A fireworks display which comprised solely of “quiet” fireworks would be limited in height, and therefore in the range from which people could view it. It would also be of reduced impact in terms of the drama and spectacle that people associate with large-scale firework displays, and the expectations that contemporary audiences bring to such shows.
- 3.6 Laser and lighting displays were used to augment the 2016 Hogmanay fireworks display in the city, but there are no plans to consider using them to replace fireworks entirely. They rely on cloud cover for their effect, and they lack the ‘big bang’ literally and figuratively of an aerial fireworks display. They are also not a cheap option, costing about the same as an equivalent fireworks display.
- 3.7 Environmental Health can find no studies or reports which indicate that the air-borne vibration from fireworks causes structural damage to buildings. Following a question from the Edinburgh [Evening News](#) in 2012, Historic Scotland stated that “There is no evidence to suggest that firework displays during the Tattoo or other annual events have any effect on the stability of rock faces below Edinburgh Castle. We previously undertook a full year of vibration monitoring at the Castle to establish

if fireworks would have any effects on historic glass. The results showed there were no vibrations from any activity at the Castle sufficient to crack glass.”

- 3.8 Damage to property from any source of vibration is dependent upon the duration, strength and frequency of the vibration, but also the sensitivity and state of repair of the building. It is not possible to directly link a source of vibration as a cause of specific damage to a property. As a consequence of this, when construction works are undertaken, it is common practice for contractors to undertake a dilapidation survey to identify existing defects in nearby properties. This is to avoid later claims of causing domestic or structural vibration damage which pre-existed any works.
- 3.9 For the year 2016, the City of Edinburgh Council Noise Team received a total of eleven complaints regarding noise from fireworks. All of the complaints related to the loudness of the fireworks, as well as one concern about the effect on pets, and six about the timings of the displays. Of these eleven, the Royal Edinburgh Military Tattoo (REMT) generated four complaints and the Royal Yacht Britannia two. The Edinburgh International Festival and Hogmanay firework displays gave rise to one complaint each, and the others were concerning fireworks from an unknown origin.
- 3.10 In order to try to reduce the noise impact of their displays, in 2015 the REMT asked their supplier to reduce the blowing charge on their aerial fireworks, and to reduce the maximum calibre of their aerial shells from 125mm to 100mm. It is suggested anecdotally that this may have resulted in a small reduction in noise levels, but there is no scientific evidence to support this. Nevertheless, the REMT has continued with these restrictions in current displays.
- 3.11 There appears to be little evidence to suggest that fireworks displays have a detrimental impact on the health and wellbeing of healthy individuals who are either spectating or within earshot. Any prolonged exposure to loud noise carries a risk of hearing damage, but in the case of fireworks displays, the main risk is to those who are involved in the delivery of the display, and who may be much closer to the aerial shells at the point of ignition. The public are normally kept well away from any firework source. The further the distance from the noise source, the lower the risk of hearing damage.
- 3.12 There is a small percentage of the population who suffer from post-traumatic stress disorder, hyper-sensitivity, or a phobia related to loud bangs who may experience distress when witnessing fireworks displays. For the majority of those individuals any adverse effects are greatly lessened by prior warning of the noise. Displays that happen at the same time each year and are therefore predictable, e.g. Hogmanay, the Tattoo, Festival fireworks and bonfire night are generally regarded as less of a problem.
- 3.13 For animals too, such as household pets, if their owners are made aware in advance of the likelihood of a display giving rise to loud noises, then there are steps they can take to minimise any animal distress. These include e.g. a ‘Sounds Scary’, a CD which helps desensitise dogs to loud bangs, and a ‘thundershirt’ anxiety coat which is available for both cats and dogs. There is now a wealth of helpful

information on the internet readily available to pet-owners to help them minimise any distress which might arise from exposure to fireworks displays.

- 3.14 A former Executive Director of the American Pyrotechnics Association, Emeritus Professor Dr John Conkling is widely regarded as one of the world's foremost experts on pyrotechnics. He has succinctly summarised the central issue for major displays thus: "Because they do not include big aerial explosions, quiet shows cannot entertain a large audience." The public who attend large-scale fireworks displays expect to hear explosions and loud bangs as part of the experience, and these add to the sense of occasion and celebration which organisers endeavour to create.

#### **4. Measures of success**

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- 4.1 This report is for information only.

#### **5. Financial impact**

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- 5.1 This report is for information only and has no financial impact.

#### **6. Risk, policy, compliance and governance impact**

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- 6.1 There are no risk, policy, compliance or governance impacts arising from this report.

#### **7. Equalities impact**

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- 7.1 There is no impact on equalities issues arising from this report.

#### **8. Sustainability impact**

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- 8.1 Not applicable.

#### **9. Consultation and engagement**

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- 9.1 The following organisations were consulted regarding this report: Council Environmental Health Team, Council Events Team, Festivals Edinburgh, various commercial pyrotechnic companies, Royal Edinburgh Military Tattoo, Unique Events Ltd.

## 10. Background reading/external references

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- 10.1 [The Pyrotechnic Articles \(Safety\) Regulations 2015; House of Commons Briefing Paper on Regulation of Fireworks 2015](#)

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## 11. Links

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<b>Coalition Pledges</b>	<b>P24</b> - Maintain and embrace support for our world-famous festivals and events
<b>Council Priorities</b>	<b>CP6</b> – A creative, cultural capital
<b>Single Outcome Agreement</b>	<b>SO1</b> - Edinburgh's economy delivers increased investment, jobs and opportunities for all
<b>Appendices</b>	None