



Oleoresin Capsicum (OC) Bylaw



Contributing Author:	Crime Analysis & Intelligence Section
Date:	Created 2019AUG14 Updated 2022AUG04
Title:	Oleoresin Capsicum (OC) Bylaw
Version Number:	6.0

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Acknowledgement

The content of this document has been a collaborative effort developed through the contributions of numerous members throughout the Edmonton Police Service. In addition, Cst. Andrew FURMAN, the Legal Advisors Section, the GIS Program Unit, and others were involved in collecting data for this report; their efforts were critical throughout and are to be acknowledged.

Document Control

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Executive Summary

In February 2017, members of the Edmonton Police Service (EPS) began investigating a notable number of criminal occurrences involving what was reasonably believed to be bear spray along the Light Rail Transit (LRT) system (and subsequently throughout the city of Edmonton), and endeavoured to find solutions on how to curtail this issue. Colleagues in various organizations, businesses, and agencies were contacted to discuss this matter and viable solutions. It was determined that bear spray can be multifaceted in its context both in criminal and non-criminal situations. Manufacturing and safety standards have been created for non-prohibited oleoresin capsicum (OC) spray products at the federal and provincial level; however, there do not appear to be regulations in place at seller and consumer levels that can be utilized at street level by municipal policing agencies. Complementary to this, limitations in multi-level regulations may cause concerns for non-police organizations, businesses, and persons related to public, private, and employee safety.

Multiple solutions are available to ensure these gaps are filled, such as creating bylaws (or similar) outlining standard practices for the sale and use of bear spray and other oleoresin capsicum (OC) spray products or providing businesses and consumers with appropriate information on how to safely store or dispose of bear spray-type products.

Key Findings

- Bear spray is an area-type defensive aerosol spray, and is part of a larger family of aerosol spray products that contain an oleoresin capsicum (OC) irritant
- Bear spray used in inappropriate contexts may become a concern due to its spray range, potency, and ability to affect multiple complainants or large areas at one time
- There are regulations on manufacturer and shipment safety regarding bear spray and other non-prohibited oleoresin capsicum (OC) sprays, but no clear regulations regarding personal and commercial sale, use, storage, and disposal
- Currently, unsafe seller and consumer use of bear spray in Edmonton is not consistently regulated in non-criminal situations, creating gaps in the Police and the City's abilities to ensure public safety (examples of gaps include, but are not limited to limited seizure abilities, inconsistent sale practices, and lack of enforceable conditions surrounding unsafe transportation or accidental discharges)
- Several cities are attempting to or have successfully implemented municipal-level regulations to tackle oleoresin capsicum (OC) spray-related concerns
- Bear spray-related occurrences have overall increased every year since 2015 (decreases noted in 2016 and 2021)
- 2020 and 2021 bear spray-related occurrences are reported to have increases between 91 – 100% higher than those reported in 2015
- Urbanized and/or more central areas appear to report higher numbers of bear spray-related occurrences (hot spots) compared to green spaces and city borders (cold spots)
- Downtown Branch reported the highest number of bear spray-related occurrences every year except in 2016
- Between 2015 – 2021, assaults constituted the highest number of bear spray-related occurrence group types (24% of all occurrences reported), including 191 assaults against police or other officers
- There are lower rates of bear spray seizures by the Edmonton Police Service compared to the overall amount of bear spray-related occurrences that are reported (i.e., in 2021, there were 772 file occurrences involving bear spray seizures, although 3273 occurrences were reported to have involved bear spray in some capacity in 2021)

Limitations & Definitions

There are various defensive oleoresin capsicum (OC) spray products in circulation such as bear spray, dog spray, and pepper spray. This report will focus on bear spray due to its higher oleoresin capsicum (OC) content, larger spray range, and longer irritancy. For the purposes of this report, the term “bear spray” will be used to reference the aerosol sprays involved in the data collected, however, specific sprays associated to the data may be of a different variety. Canisters can be manipulated so in that attending officers are unable to determine the type of aerosol product used; therefore, multiple types of OC spray were included in this analysis.

Only EPROS files containing one viable occurrence location were included in the creation of maps and location-related tables/charts. EPS Headquarters was not included in location-related statistics. Parallel to this, Z values were not available, there it cannot be determined if an event occurred at street level or possibly above/below ground (i.e., in an underground LRT station).

This analysis is also limited in that EPS data contains only occurrences that have been reported to police or observed by police (and resulted in an occurrence file being generated), as well as files that matched the query parameters input by the user, were included in the analysis. Files that contain different key words, or key words in a misspelled manner, were not included in the results. Complementary to this, files may contain these keywords incidentally. Given the need for a broad search of occurrences, this means that there is a possibility that bear spray occurrences outlined below are over-reported.

Additional limitations may apply for external data, and qualitative data was collected may not include all available cases. Percentages noted throughout the report are approximations.

Overview of Bear Spray Products & Regulations

What is Bear Spray?

Bear spray is an area-type defensive weapon housed in an aerosol spray canister, which allows a user to repel a threat from a great distance by spraying an irritant in its general direction. There are various other defensive spray-type products, such as dog or pepper spray, which have the same effect, however, are intended to be used from a smaller distance, are of lower potency, and disperse less spray as a result.¹ The active ingredient in these sprays is oleoresin capsicum (OC), an oily residue from hot cayenne peppers.²

Figures #1 and #2 provide a general overview of bear spray product(s) currently available for purchase from Sabre Red, a company that sells various defensive products. In general, there are several types of bear spray products that contain different amounts of OC (1 – 2% concentration) and can discharge at varying distances.

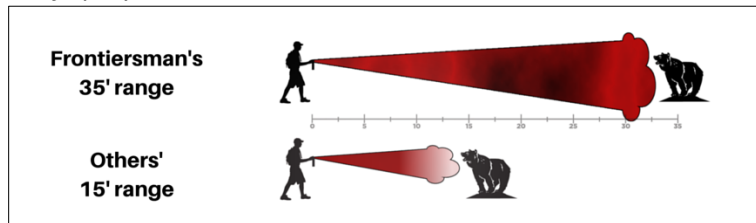
¹ As per Security Equipment Corporation, 2017

² <https://adventure.howstuffworks.com/bear-spray1.htm>, accessed 2019JUN10

Figure 1. Sabre Red Bear Spray product³



Figure 2. Sabre Red Illustration of Spray Abilities⁴



Safety in Manufacturing

Robert NANCE, the Vice President of Operations at Security Equipment Corporation (Sabre Red), explained that there is a safety mechanism added to bear spray canisters commonly called a safety clip or safety wedge (orange clip as seen in Figure #1), and this is the only known safety mechanism currently in use by companies manufacturing similar products.⁵ The safety clip prevents the trigger from being pushed down accidentally. Sabre Red's website also provides a list of safety tests conducted on their products, such as heat and leakage testing, to ensure the safety of the canister itself.⁶

Companies such as Sabre Red are required to follow all manufacturing and safety protocols when developing bear spray products, thus safety can be assured prior to bear spray being available at businesses for purchase and then being personally used. There may be instances where sale and use of these products become unsafe or misleading. Figure #3 is highlights a photo obtained from the Property Exhibit Unit (EPS) showing canisters that have been seized by the Edmonton Police Service.

³ <https://www.sabrerred.com/pepper-spray/frontiersman-225-g-orange-safety-wedge>, accessed 2019MAY03

⁴ <https://www.sabrerred.com/bear-spray>, accessed 2019MAY03

⁵ As per Security Equipment Corporation, 2017

⁶ <https://www.sabrerred.com/how-we-do-it-0>, accessed 2019JUN10

Figure 3. Examples of bear spray products seized by the Edmonton Police Service⁷



Current Laws & Regulations

The intended use of bear spray is to repel bears, therefore bear spray itself is a legal product and not deemed a prohibited weapon as defined in the *Criminal Code*. However, given the safety issues surrounding bear spray, this product can be used as a weapon (i.e., to incapacitate a person), is considered dangerous, non-mailable matter, and must adhere to specific labeling, manufacturing, safety protocols to minimize risk and misuse. Figures 3 to 6 outline various regulations that can be applied to bear spray and other oleoresin capsicum (OC) spray products at the provincial or federal levels, as well as in criminal situations.

In contrast to the various regulations outlined in Figures #3 - #6 and below, procedures and expectations are not clearly outlined at the consumer and purchasing levels of bear spray products. The Edmonton Police Service and the City of Edmonton currently do not have street-level tools available to regulate improper or unsafe canisters in multiple situations after initial production and commercial shipment.

Figure 3. Excerpt from *Criminal Code Part III, Firearms and Other Weapons*⁸

prohibited weapon means

- (a) a knife that has a blade that opens automatically by gravity or centrifugal force or by hand pressure applied to a button, spring or other device in or attached to the handle of the knife, or
- (b) any weapon, other than a firearm, that is prescribed to be a prohibited weapon; (*arme prohibée*)

⁷ Photo received from Property Exhibit Unit (EPS) 2019APR23

⁸ <https://laws-lois.justice.gc.ca/eng/acts/C-46/page-13.html#h-117003>, accessed 2022FEB17

Figure 4. Excerpt from Regulations Prescribing certain Firearms and Other Weapons... SOR/98-462⁹

Former Prohibited Weapons Order, No. 1

1 Any device designed to be used for the purpose of injuring, immobilizing or otherwise incapacitating any person by the discharge therefrom of

(a) tear gas, Mace or other gas, or

(b) any liquid, spray, powder or other substance that is capable of injuring, immobilizing or otherwise incapacitating any person.

Figure 5. Two excerpts from the Pest Control Products Regulations SOR/2006-124¹⁰

Label — presentation

23 (1) All information that is required to be shown on a label must appear in a manner that is clearly legible and indelible.

(2) Any written, printed or graphic matter on the marketplace label of the pest control product must not detract from or obscure the required information.

Packages

33 (1) The package of a pest control product must be constructed to contain the product safely under normal conditions of storage, display and distribution.

Safe access to contents

(2) Every package must be constructed to permit

(a) the withdrawal of any or all of the contents in a manner that is safe to the user; and

(b) the closing of the package in a manner that will contain the pest control product safely under normal storage conditions.

Minimize degradation

(3) Every package must be constructed to minimize the degradation or change of its contents.

When package essential to safety

(4) If the package is essential to the safe and effective use of the pest control product, it must be constructed to meet any specifications that the Minister may specify in the conditions of registration under paragraph 8(1)(a) of the Act.

⁹ <https://laws-lois.justice.gc.ca/eng/regulations/SOR-98-462/page-2.html#docCont>, accessed 2022FEB17

¹⁰ <https://laws-lois.justice.gc.ca/eng/regulations/sor-2006-124/FullText.html>, accessed 2022FEB09

Figure 6. Excerpt from *Transportation of Dangerous Goods Act (S.C. 1992, c.34)*¹¹



Complementary to the above, Canada Post also lists bear spray as a Class 2 Dangerous Good and is considered non-mailable matter,¹² and additional regulations at the Federal and Provincial levels¹³ exist in relation to manufacturing, safety, and use.

With the above in mind, there are sections under the *Environmental Protection and Enhancement Act (EPEA)*¹⁴ that can potentially be utilized at a municipal level, but not in a meaningful way. For example, under the Environmental Protection and Enhancement Act (EPEA), it is an offence to, “sell, distribute, use, apply, handle, store or transport a pesticide ... except in accordance with the regulations with respect to that pesticide and the label for that pesticide.”¹⁵ The definition of “label” is a label within the meaning of the *Pest Control Products Act (Canada)*¹⁶ or the *Fertilizers Act (Canada)*¹⁷. There are no specific regulations respecting oleoresin capsicum (OC) spray, therefore, any prosecution under this section would rely solely on what the label prescribes. The penalty for breach of that section is, “(a) in the case of an individual, to a fine of not more than \$50 000, or (b) in the case of a corporation, to a fine of not more than \$500 000”¹⁸. There are no ticketing options available for this section, therefore police would have to follow the procedures for summary conviction offences under the Criminal Code.

As shown in Figure #3, numerous oleoresin capsicum (OC) spray canisters seized by the Edmonton Police Service have been manipulated. Without the label, any charges or prosecution based on the what the label says becomes difficult at best, if not impossible. There is also no standardization for the recommendations listed on each label, therefore manufacturers may have different requirements. If a retailer chooses to carry more than one type of oleoresin capsicum (OC) spray, they may be faced with conflicting labels on how to properly sell, store, transport, or dispose of each item. Without the label attached, police are unable to determine if the canister in question is a prohibited weapon or a legal type of oleoresin capsicum (OC) spray such as bear spray, limiting seizure abilities.

¹¹ <https://laws-lois.justice.gc.ca/eng/acts/t-19.01/FullText.html>, accessed 2022FEB09

¹² <https://www.canadapost-postescanada.ca/cpc/en/support/articles/non-mailable-matter/transportation-of-dangerous-goods-classes-and-index.page>, accessed 2022FEB17

¹³ Canadian Pest Management Regulatory Agency (PMRA), Environmental Protection and Enhancement Act (EPEA)

¹⁴ c. E-12 RSA 2000, ss. 154, 163, 227, 228

¹⁵ s. 163

¹⁶ S.C. 2002, c. 28

¹⁷ R.S.C., 1985, c. F-10

¹⁸ s. 228

Analysis from a Police Perspective (2015 – 2021)

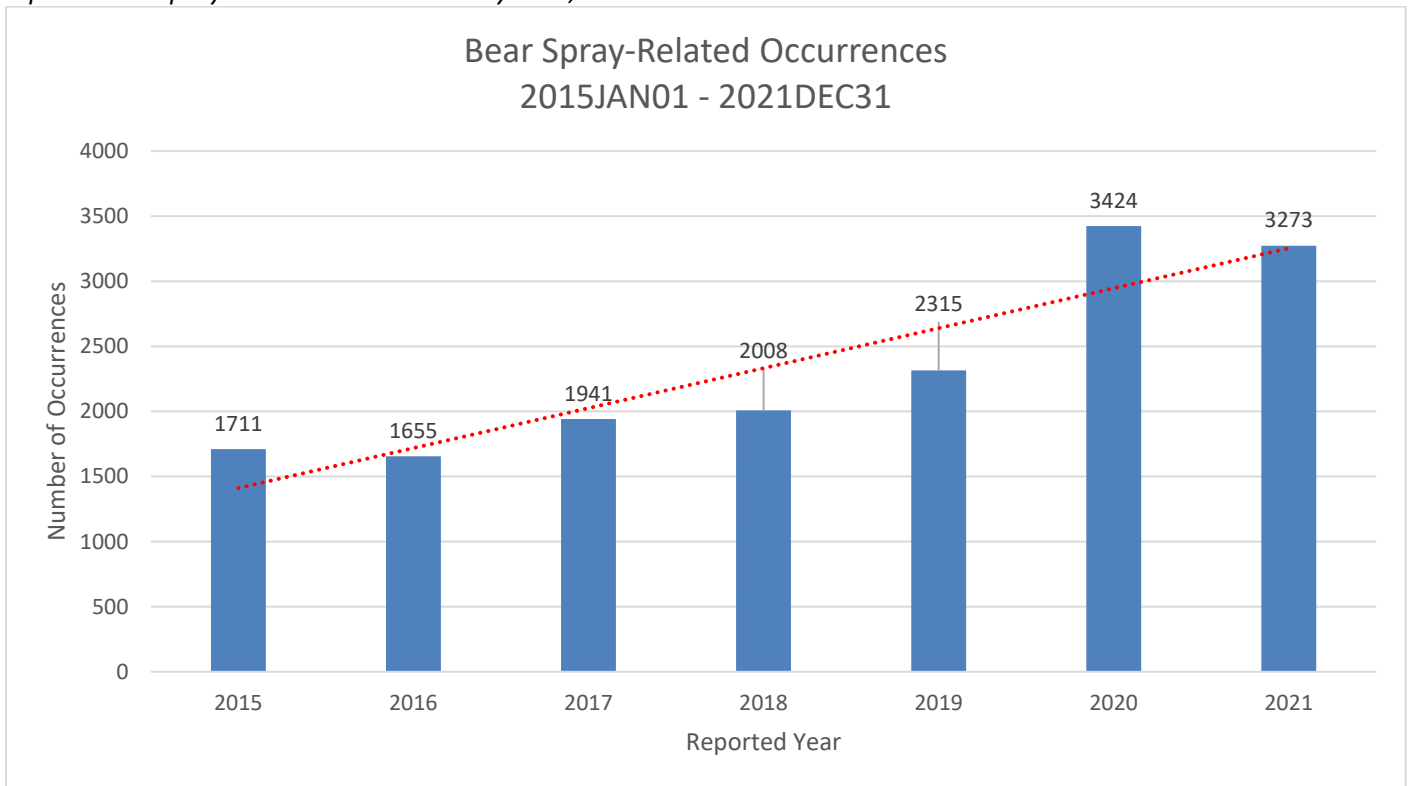
Overview of Edmonton Police Service Data

Graph #1 shows an overall increasing trend of reported bear spray-related occurrences between 2015 to 2021.

2020 and 2021 show the highest number of occurrences by a noticeable margin. Occurrences increased approximately 48% from 2019 into 2020. Although there was a slight decrease from 2020 to 2021 (-4%), overall, comparing 2019 to 2021, there was still an increase of approximately 41%. 2020 and 2021 account for 41% of all bear spray-related occurrences reported between 2015 – 2021.

Year over year changes between 2015 – 2019 are reported to be between approximately -3% (decrease) to 17% (increase), however, the number of reported occurrences in 2020 and 2021 report 100% and 91% increases in occurrences, respectively, compared to occurrences in 2015. This means the number of occurrences doubled from 2015 compared to 2020, and then almost doubled comparing 2015 to 2021.

Graph 1. Bear Spray-Related Occurrences by Year, 2015JAN01 – 2021DEC31¹⁹



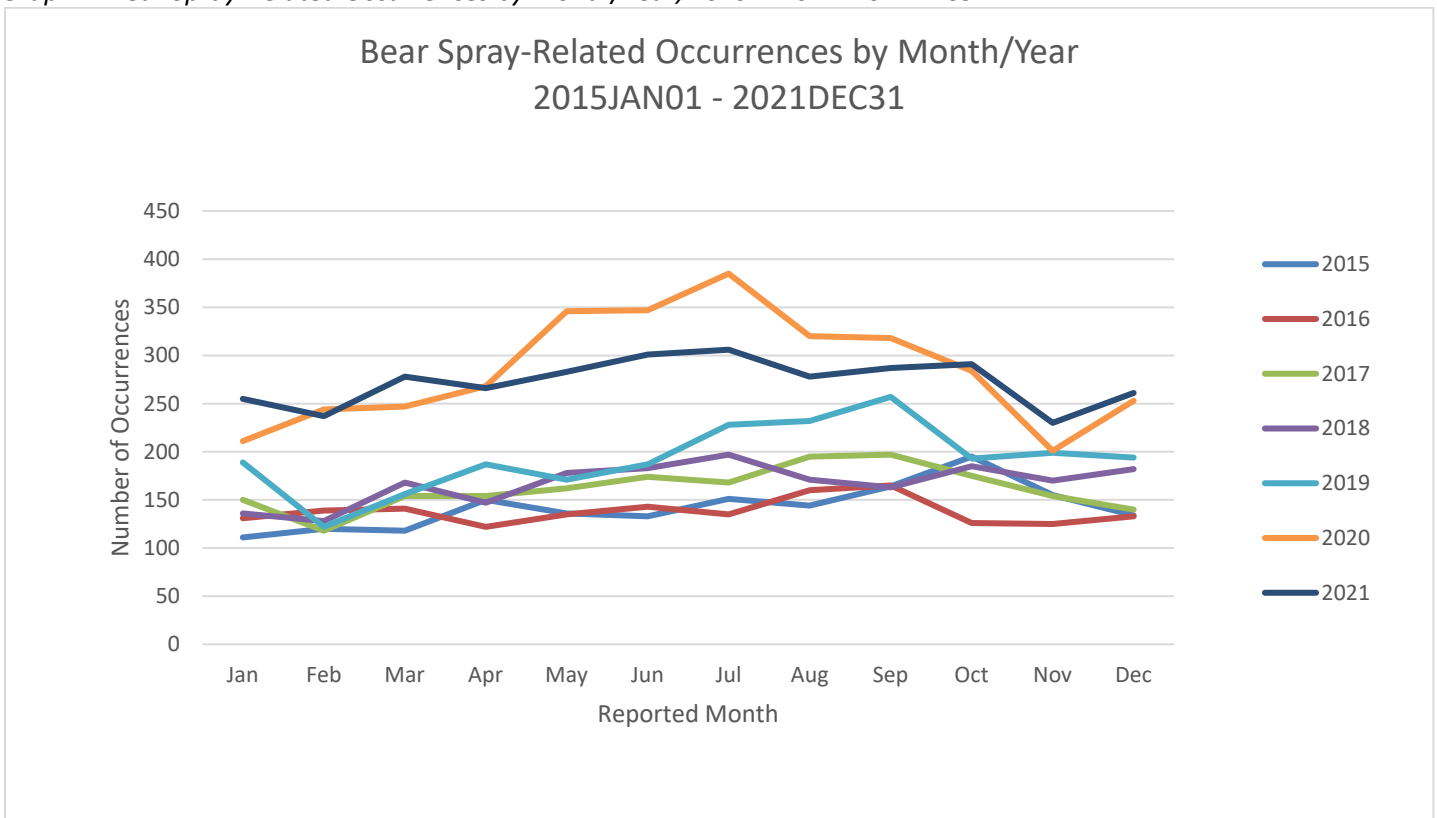
¹⁹ Based on 16,327 occurrences

Graph #2 illustrates the month-by-month trend in bear spray-related occurrences between 2015 to 2021.

Notably, 2020 shows the highest occurrences in almost every month compared to any other year, with 2021 showing similarly high numbers. 2020 displays one inclusive large peak over the summer months, whereas 2021 shows steadier numbers over the summer and autumn months.

There appears to be two different year over year patterns related to bear spray occurrences. Years 2016, 2020, and 2021 show flatter trendlines with more balanced-out peaks and dips throughout the year, whereas 2015, and 2017 to 2019 show a general increasing trend as the months go by, notably in the middle to latter parts of each year.

Graph 2. Bear Spray-Related Occurrences by Month/Year, 2015JAN01 – 2021DEC31²⁰



²⁰ Based on 16,327 occurrences

Occurrence Types

Assaults ranked the most common occurrence group type reported to the Edmonton Police Service every year, and Stand-Alone Weapons files were consistently within the Top Three. According to Chart #1, Assaults accounted for almost one in four (24%) bear spray-related occurrences reported between 2015 – 2021. The top 10 occurrence group types compromised approximately 68% of all reported bear spray-related occurrences.

More specifically, Assault BH/Weapon was the top reported occurrence file type overall (3142 occurrences). Possession of Weapons (904 occurrences), and Trouble with Person (753) were also within the Top Three occurrence file types overall between 2015 – 2021.

Within the assaults group, there were 191 various assaults reported against Police or Other Officers. 83/191 assaults against Police or Other Officer were reported just in 2020 or 2021.

Chart 1. Top 10 Occurrence Group Types Related to Bear Spray, 2015JAN01 – 2021DEC31²¹

Occurrence Group Type	Number of Occurrences	Percent of Total Occurrences
Assaults	3963	24%
Stand-Alone Weapons	1496	9%
Trouble With/Not Known	1242	8%
Drugs	819	5%
Robberies - Personal	815	5%
Street Checks	657	4%
Breaches	618	4%
PSP	486	3%
Warrant Executions	478	3%
Robberies - Commercial	474	3%

²¹ Occurrence file types are grouped together (i.e., “Assaults” contain all variations of Assault, including but not limited to: Assault, Assault BH/Weapon, Assault Police, Aggravated Assault, etc. (excludes Sexual Assaults))

Stand-Alone Weapons does not include occurrence types where weapons are used in the commission of another offence (i.e., Includes files such as “Possession of Weapon” but did not include files such as “Personal Robbery with a Weapon”, “Assault BH/Weapon”, etc.)

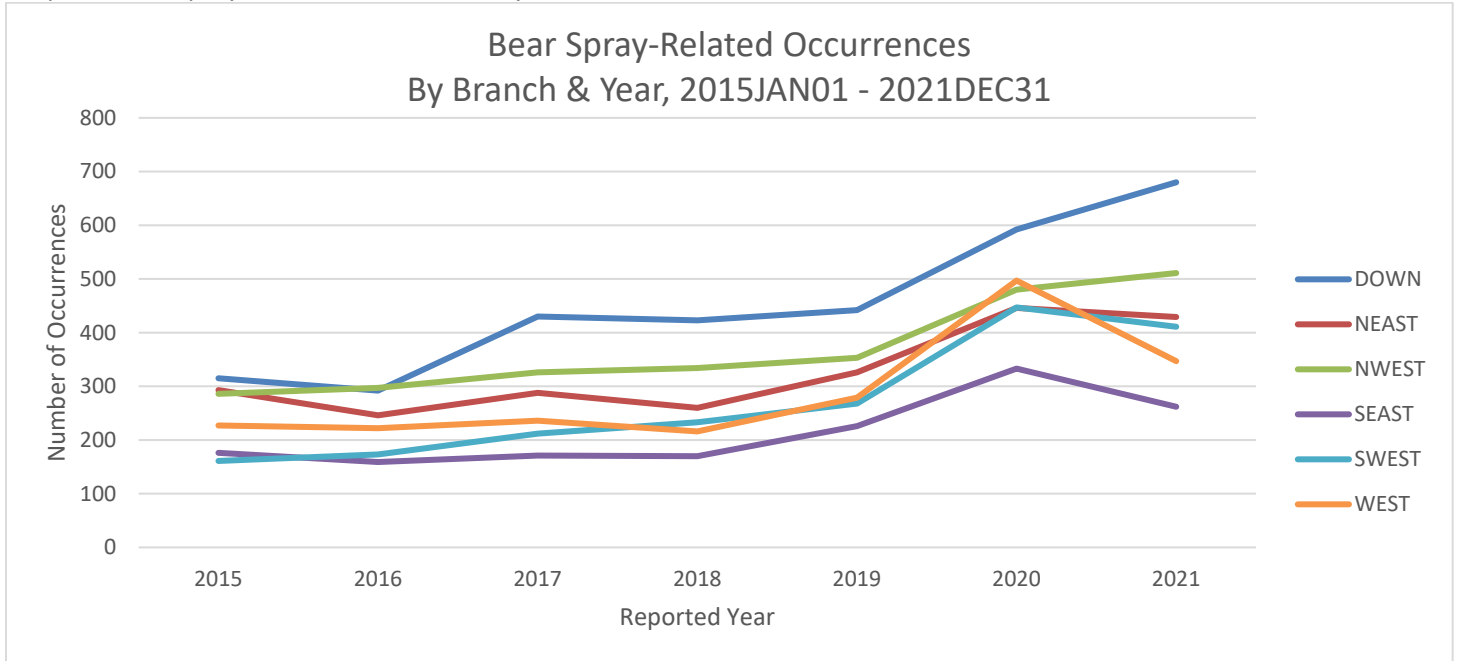
Percentages based on 16,327 occurrences

Locations

Graph #3 provides an overview of year-to-year bear spray-related occurrences, broken down by branch.

This graph indicates all branches have shown general increasing trends from 2015 – 2021, with a few decreases observed in 2016 and 2021. Although citywide there was a decrease in bear spray-related occurrences comparing 2020 to 2021, Downtown and Northwest Branches each saw increases (15% and 6%, respectively). In fact, Northwest Branch has reported increases every single year between 2015 – 2021.

Graph 3. Bear Spray-Related Occurrences by Branch/Year, 2015JAN01 – 2021DEC31²²



As shown in Chart #2, Downtown Branch accounts for 24% of all bear spray-related occurrences between 2015 – 2021; however, it should be noted that Downtown Branch covers approximately 2% of the land area patrolled by the Edmonton Police Service.²³ Downtown Branch has reported between 21 – 26% of all bear spray-related occurrences each year (2017, 2018 and 2021 all reported at 26%), whereas all other divisions encompassed between 10 – 21% of bear spray-related occurrences each year.

Chart 2. Percent of Total Bear Spray-Related Occurrences, 2015JAN01 – 2021DEC31²⁴

Branch	Number of Occurrences	Percent of Total Occurrences
DOWN	3174	24%
NWEST	2587	19%
NEAST	2288	17%
WEST	2024	15%
SWEST	1905	14%
SEAST	1497	11%

²² Based on 13,475 plotted occurrences

²³ Based on a total land area of 782km² referenced from available divisional boundary data

²⁴ Based on 13,475 plotted occurrences

Chart #3 outlines the number of bear spray-related occurrences reported in relation to various location types of interest.

62% of all bear spray-related occurrences have been reported within 100m (approximately one city block) of an Edmonton Transit System bus stop, and 32% of all occurrences within 50m. 46% of all bear spray occurrences between 2015 – 2021 occurred within 400m of a school (approximately a five-minute walk). 2016 of these 6209 occurrences near schools were Junior or Senior High schools, with the remaining as Elementary grade or below. Opposite to this, green spaces accounted for approximately 301 bear spray-related occurrences over the last seven years (2% of total occurrences). It can be reasonably assumed these green spaces provide opportunities for legitimate bear spray use, compared to the more urbanized areas where higher numbers of occurrences appear to be noted.

Chart 3. Bear Spray-Related Occurrence Location Proximities, 2015JAN01 – 2021DEC31²⁵

Location Type & Distance	Number of Occurrences	Percent of Total Occurrences
100m of a Bus Stop	8336	62%
400m of a School	6209	46%
50m of a Bus Stop	4356	32%
500m of LRT Station centroid	2670	20%
400m of a Jr/Sr High School	2016	15%
300m of LRT Station centroid	1500	11%
100m of LRT Line	1310	10%
100m of LRT Station centroid	460	3%
Park/greenspace	301	2%

Chart #3 also indicates 2670 occurrences have been reported within 500m of the centre of an LRT station (approximately 1/5 of all reported occurrences between 2015 – 2021). This overlaps with data collected, showing several repeat locations (reporting multiple occurrences) can be found in the Downtown Branch and appear to somewhat follow along the LRT line citywide.²⁶

Additionally, Consecutive and Intensifying Hotspots are found to also somewhat follow along the LRT line citywide, and as well as in and around the Downtown Branch. It can be assumed that these hotspots are generally more urbanized, and in opposition to where Consecutive Coldspots or non-trending areas are located, along the City of Edmonton’s borders.²⁷

²⁵ There may be overlap in location points (i.e. an occurrence may have been reported at a bus stop in front of a school, therefore that occurrence will be counted twice, once for the bus stop and another for the school). Percentages will total more than 100% due to this overlap (based on 13,475 plotted occurrences)

²⁶ Refer to Appendix A: Locations with Multiple Bear Spray-Related Occurrences 2015JAN01 – 2021DEC31

²⁷ Refer to Appendix B: Space Time Analysis of Bear Spray-Related Locations, 2015JAN01 – 2021DEC31 and Appendix C: Definitions

Chart #4 list the busiest streets in terms of bear spray involvement.

118 Avenue reports the highest number of bear spray occurrences directly occurring on or near the road. 9% of all bear spray-related occurrences between 2015 – 2021 have been reported within 100 metres of the centre of 118 Avenue. Many of the other top 10 arterial roads intersect the Downtown Branch or are known to be occupied by high foot and vehicle traffic.

Chart 4. Bear Spray Occurrences reported near Arterial Roadways, Top 10, 2015JAN01 – 2021DEC31²⁸

Street Name	Number of Occurrences	Percent of Total Occurrences
118 AVENUE NW	1251	9%
101 STREET NW	588	4%
JASPER AVENUE NW	580	4%
97 STREET NW	460	3%
82 AVENUE NW	397	3%
107 AVENUE NW	393	3%
82 STREET NW	371	3%
95 STREET NW	316	2%
111 AVENUE NW	313	2%
STONY PLAIN ROAD NW	275	2%

Additionally, inquiries were made to 17 convenience stores located in Downtown, Northwest, and Northeast Branches regarding selling practices. Display and storage varied by location; however, most businesses were noted to have kept bear spray products secure (i.e., behind the counter, inside a glass display case). 2/17 locations explicitly advised identification is checked for each purchase. Nine locations stated they require paperwork to be filled out to conduct a sale of bear spray, however many locations were unable to provide completed paperwork for reference.

Of note, the branches where these storefronts are located have reported the three highest number of bear spray-related occurrences out of the six Edmonton Police Service branches between 2015 – 2021, accounting for 60% of the total occurrences.

²⁸ Includes arterial roads only (high capacity, principal roads)

Calculated distance is approximately 100 metres from centre of the road (or the centre of each road on either side of a median)
 There may be overlap in location points (i.e., an occurrence may have been reported at an intersection, therefore that occurrence will be counted twice, once for each arterial road)

Percentages will total more than 100% due to this overlap (based on 13,475 plotted occurrences)

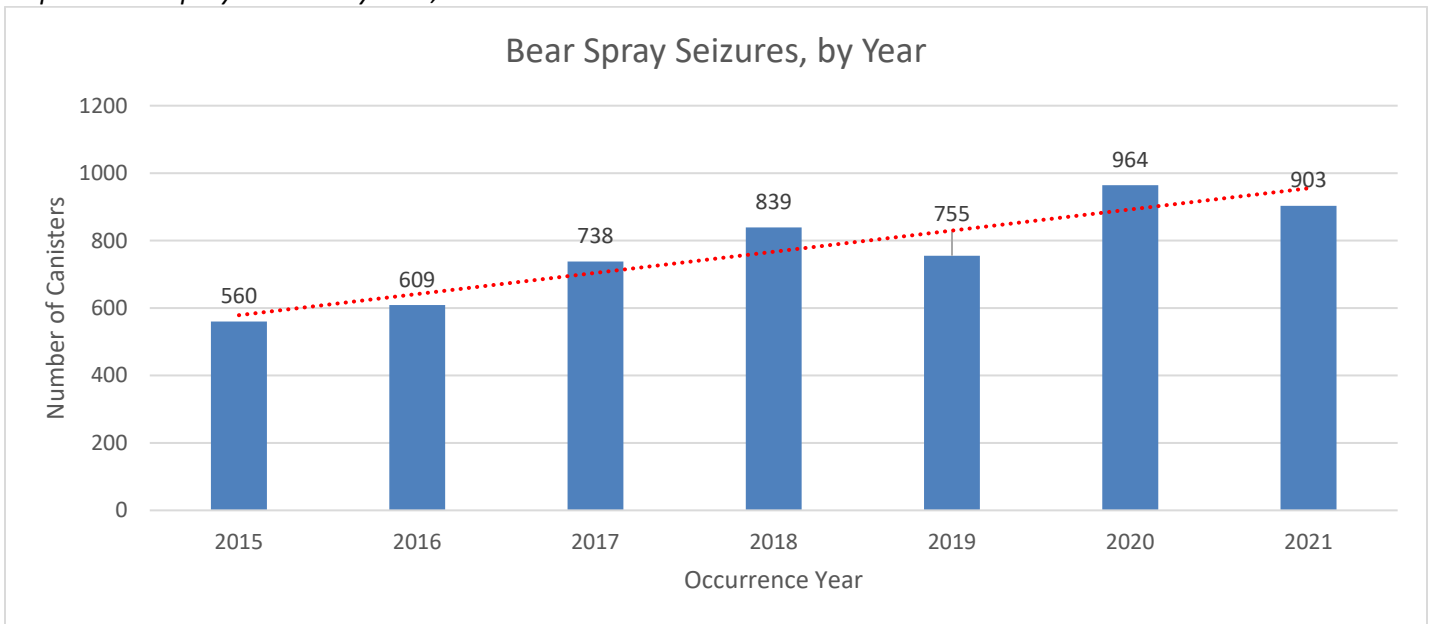
Bear Spray Seizures

Bear spray seizures conducted by the Edmonton Police Service can be the result of either: situations in which bear spray is deemed to be an exhibit (i.e., as a weapon, or found in opposition of court-ordered conditions) or situations where bear spray canisters are voluntarily surrendered for safekeeping or destruction.

Graph #4 outlines the number of bear spray canisters seized and submitted to by the Property Exhibit Unit (EPS).

This graph shows a similar overall trend to bear spray-related occurrences, except with decreases in seizures noted in 2018 and 2021 (rather than 2016 and 2021 for overall occurrences). 2020 reports the highest number of occurrences involving bear spray seizures, jumping 28% from 2019 to 2020, after a decrease going from 2018 to 2019. 2021 saw a decrease in canisters seized compared to 2020, however remained higher than any other year from 2015 – 2019, and 2021 still shows a 61% increase in canister seizures compared to 2015.

Graph 4. Bear Spray Seizures by Year, 2015JAN01 – 2021DEC31²⁹



²⁹ Based on total number of canisters seized (5368, i.e., one occurrence may have two or more canisters seized at one time)

Graph #5 instead compares the number of occurrences involving bear spray seizures (regardless of absolute number of canisters seized per occurrence) to all bear spray-related occurrences reported to the Edmonton Police Service. In 2021, 772 occurrences involved the seizure of one or more bear spray canisters, although there were 3273 occurrences reported to have involved bear spray in the same year. This equates to almost one in four occurrences involving a seizure (24%). Given that there were 903 canisters reported to be seized in 2021, it appears there have been instances where more than one canister has been observed in a single occurrence.

Graph #5. Files with Bear Spray Seizures Within Bear Spray Occurrences by Year, 2015JAN01 – 2021DEC31³⁰

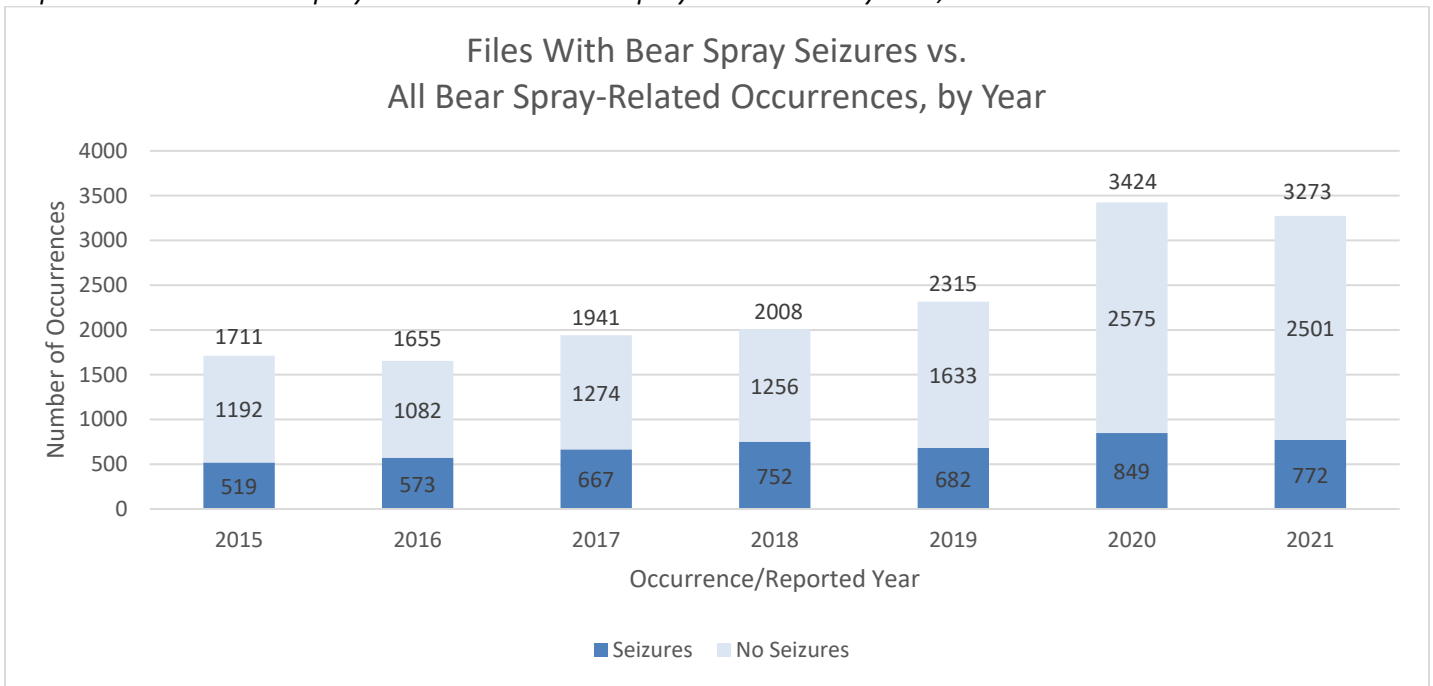


Chart #5 shows the types of seizures recorded. More than half of canisters seized are listed as an Exhibit or Weapon, meaning 3319 canisters have been seized for evidentiary purposes between 2015 – 2021, and 2049 have been seized for non-evidentiary purposes.

Chart #5. Bear Spray Seizures by Year & Category³¹

Seizure Type	2015	2016	2017	2018	2019	2020	2021	Total
EXHIBIT	366	384	451	529	469	580	520	3299
SAFEKEEPING/FOUND	190	223	283	307	284	381	381	2049
WEAPON	4	2	4	3	2	3	2	20
Grand Total	560	609	738	839	755	964	903	5368

³⁰ Based on 16,327 occurrences and 4814 occurrences involving seizures, compared in absolute terms

Does not account for the number of canisters seized per occurrence (i.e., some occurrences had multiple canisters seized)

³¹ Based on total number of canisters seized (5368, i.e., one occurrence may have two or more canisters seized at one time)

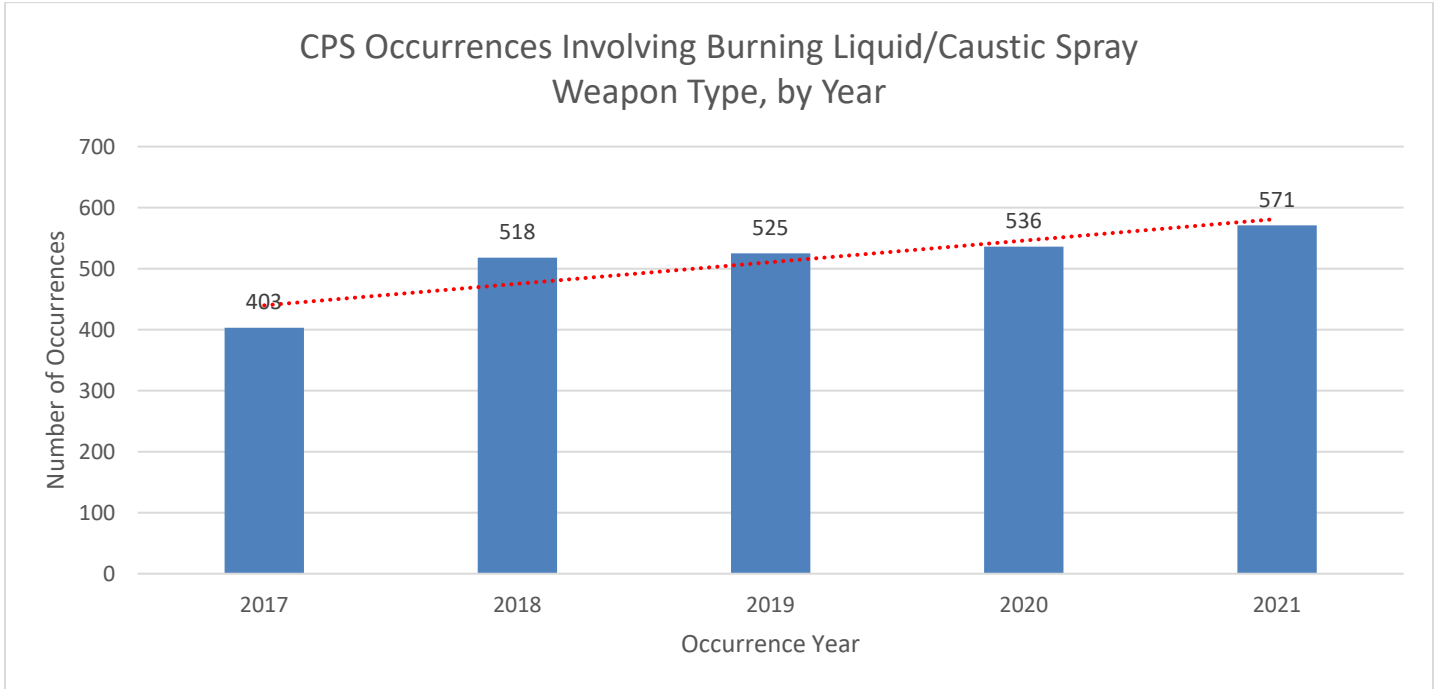
Safekeeping/Found category are items not used as evidence in investigations

Other Agency Overview

Calgary Police Service

Calgary Police Service has reported year-over-year increases in bear spray use between 2017 – 2021. Most recently, from 2020 – 2021, Calgary Police Service saw an increase of 7% in occurrences where bear spray was utilized as a weapon. Notably, the increase from 2017 to 2021 overall is reported at 42%.

Graph 6. Calgary Police Service Occurrences Involving the Use of Bear Spray Weapons, 2017JAN01 – 2021DEC31³²



The Calgary Police Service is hoping to work with the City of Calgary to add a bear spray amendment to current City bylaws in the future.

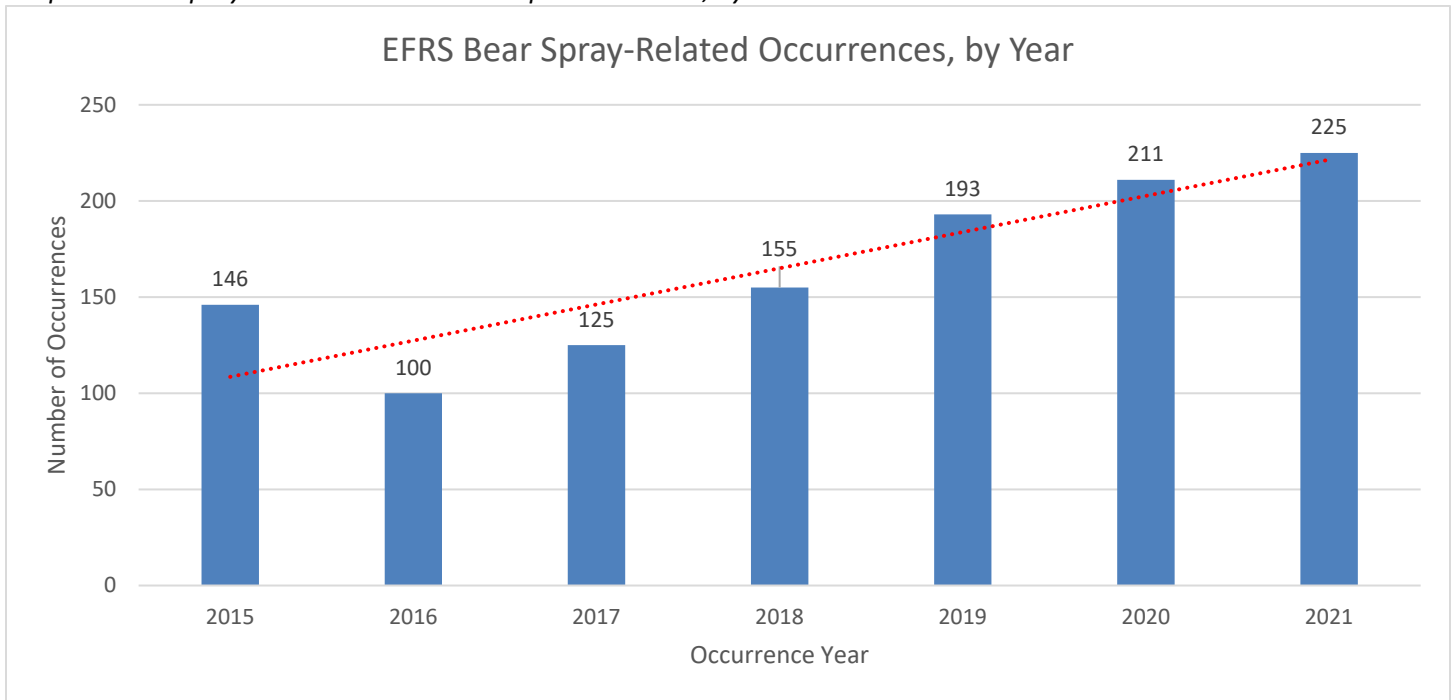
³² Data collection methodology differs from Edmonton Police Service
Based on occurrences with weapon type coded as Burning Liquid or Caustic Spray

Edmonton Fire Rescue Services (EFRS)

Graph #7 showcases bear spray-related occurrences attended to by the Edmonton Fire Rescue Services between 2015 – 2021.

Year-over-year trends parallel those of the Edmonton Police Service, with the exception that EFRS saw an increase in 2021 occurrences compared to 2020, where EPS saw a decrease between the same time frames.

Graph 7. Bear Spray Related Occurrences Reported to EFRS, by Year



EFRS attendance at bear spray-related occurrences is on average, one hour (median amount of time in attendance is 24 minutes). There are extenuating circumstances where their presence is required for longer time frames. For example, one event in 2017 is logged at 579 hours as the location affected by bear spray required constant assistance with ventilation.

Between one and 11 units have been sent to attend these types of occurrences, with two on average being called out for assistance.

Alberta Health Services

Data received from AHS is limited, however, bear spray does affect this agency.

Conclusion & Recommendations

Oleoresin capsicum (OC) spray products such as bear spray have been shown to be prevalent within the course of police work and consequently can affect other external partners, agencies, businesses, and persons within the City of Edmonton.

Preventative measures can fill the gap in current regulations at the seller and consumer levels, and in parallel, provide the Edmonton Police Service and the City of Edmonton with tools to avoid further victimization from non-prohibited oleoresin capsicum (OC) sprays such as bear spray. Examples of these measures may include but are not limited to bylaws outlining rules surrounding the sale, personal transportation, use, and/or disposal of oleoresin capsicum (OC) spray and other aerosol products or implementing convenient and safe solutions for storing and disposing of oleoresin capsicum (OC) spray. Additionally, this may also create an educational opportunity for citizens to learn how to safely purchase, transport, use, and dispose of bear spray and prevent accidental discharges.

Examples of bylaws implemented surrounding oleoresin capsicum (OC) sprays include:

1. City of Chilliwack Bylaw No. 5056 A bylaw to protect the public and improve the general welfare of the community through the regulation of pepper spray and bear spray sales³³
2. City of Surrey By-Law No. 13622 (Amended by 13708) Surrey Sale of Pepper Spray Regulation³⁴
3. City of Prince Albert Bylaw No. 6 of 2019 A Bylaw of the City of Prince Albert to regulate the discharge of firearms and dangerous weapons within the City of Prince Albert³⁵

The necessary requirements for an Oleoresin Capsicum (OC) Bylaw should include:

- A broad description of the spray to cover all types of devices and variety of products used
- Clearly be aimed at any type of spray whether for use against humans or animals
- An offence for illegal possession where the safety mechanisms have been tampered with or removed
- An offence for illegal possession if the label has been tampered with, covered, or removed
- Those offences should be for mere possession alone and the spray should not have to be otherwise be used in any illegal or negligent manner
- A nuisance type offence for negligent discharge in a public place
- Consistent business rules for the display, storage, and sale of all types of oleoresin capsicum (OC) spray

³³

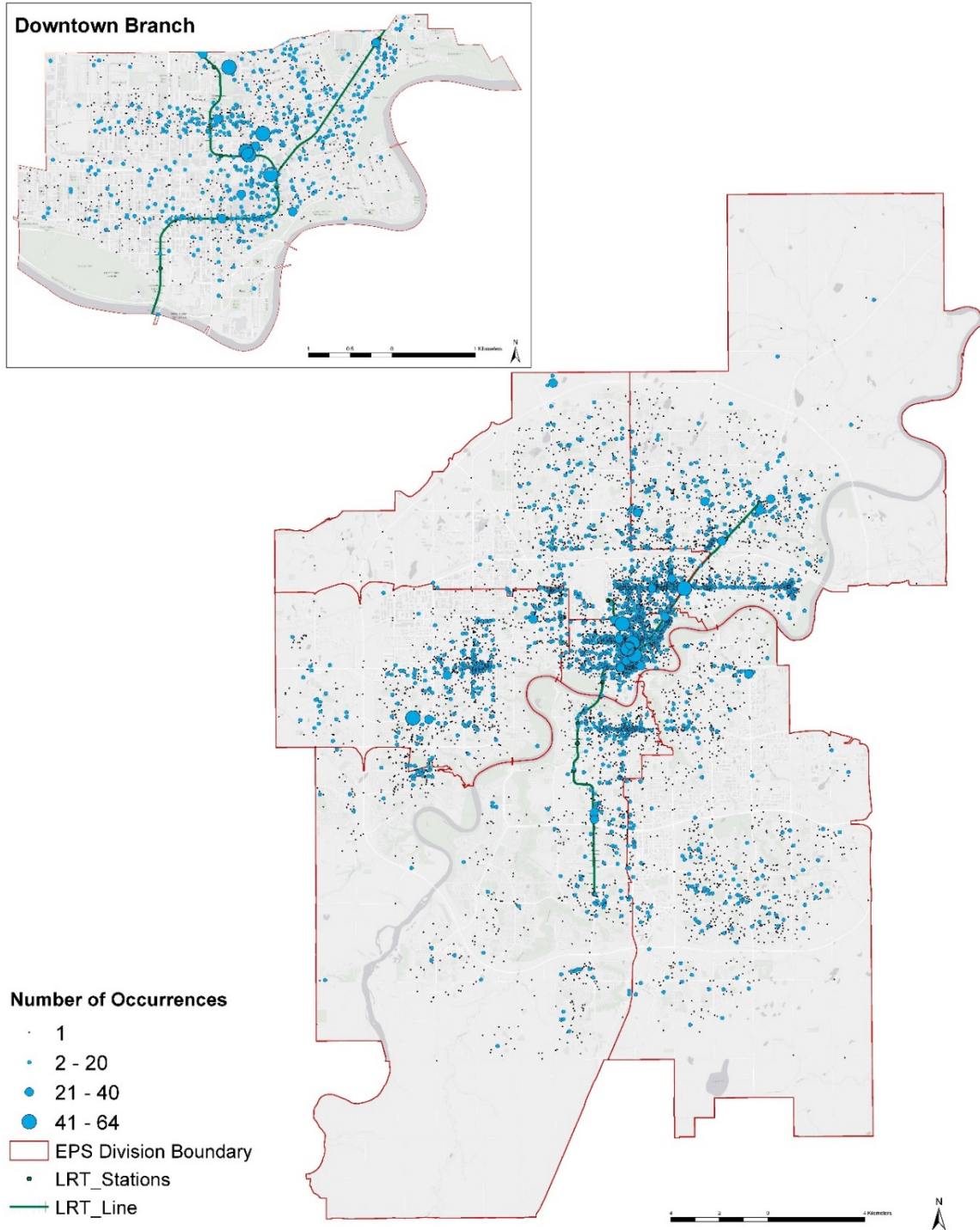
<https://www.chilliwack.com/main/attachments/Files/363/Sale%20of%20Pepper%20Spray%20and%20Bear%20Spray%20Regulation%20Bylaw%202021%2C%20No.%205056.pdf>, accessed 2022FEB22

³⁴ https://www.surrey.ca/sites/default/files/bylaws/BYL_reg_13622.PDF, accessed 2022FEB22

³⁵ <https://www.citypa.ca/Modules/Bylaws/Bylaw/Download/fd3bbabf-47f2-4695-8d57-eeef75462144>, accessed 2022FEB22

Appendix A³⁶

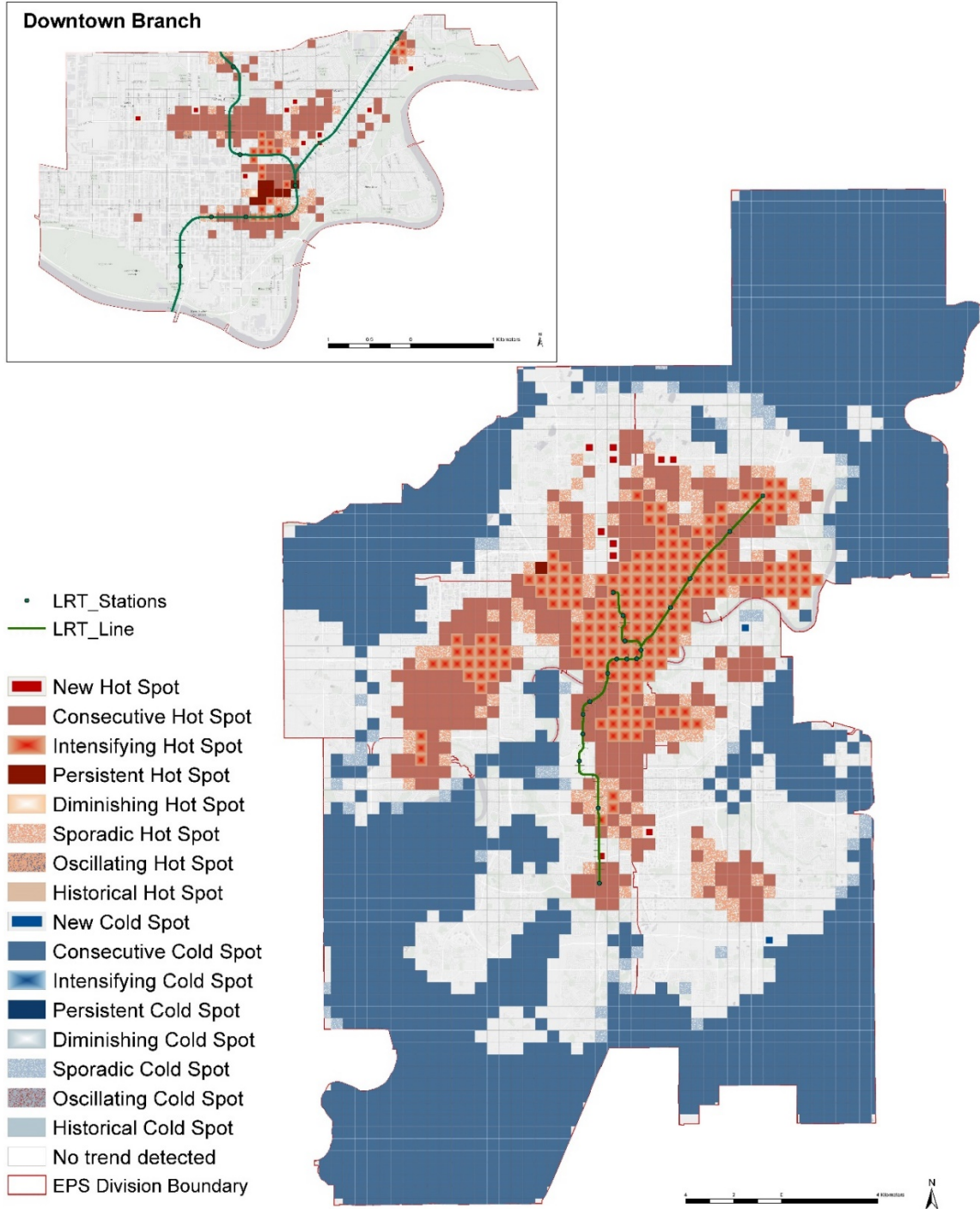
Locations with Multiple Bear Spray-Related Occurrences 2015JAN01 - 2021DEC31



³⁶ Based on 13,475 plotted occurrences
Created 2022FEB15

Appendix B³⁷

Space Time Analysis of Bear Spray-Related Occurrences 2015JAN01 - 2021DEC31



³⁷ Based on 13,475 plotted occurrences
Created 2022FEB15

Appendix C³⁸

Pattern Name	Definition
No Pattern Detected	Does not fall into any of the hot or cold spot patterns defined below.
New Hot Spot	A location that is a statistically significant hot spot for the final time step and has never been a statistically significant hot spot before.
Consecutive Hot Spot	A location with a single uninterrupted run of statistically significant hot spot bins in the final time-step intervals. The location has never been a statistically significant hot spot prior to the final hot spot run and less than ninety percent of all bins are statistically significant hot spots.
Intensifying Hot Spot	A location that has been a statistically significant hot spot for ninety percent of the time-step intervals, including the final time step. In addition, the intensity of clustering of high counts in each time step is increasing overall and that increase is statistically significant.
Persistent Hot Spot	A location that has been a statistically significant hot spot for ninety percent of the time-step intervals with no discernible trend indicating an increase or decrease in the intensity of clustering over time.
Diminishing Hot Spot	A location that has been a statistically significant hot spot for ninety percent of the time-step intervals, including the final time step. In addition, the intensity of clustering in each time step is decreasing overall and that decrease is statistically significant.
Sporadic Hot Spot	A location that is an on-again then off-again hot spot. Less than ninety percent of the time-step intervals have been statistically significant hot spots and none of the time-step intervals have been statistically significant cold spots.
Oscillating Hot Spot	A statistically significant hot spot for the final time-step interval that has a history of also being a statistically significant cold spot during a prior time step. Less than ninety percent of the time-step intervals have been statistically significant hot spots.
Historical Hot Spot	The most recent time period is not hot, but at least ninety percent of the time-step intervals have been statistically significant hot spots.
New Cold Spot	A location that is a statistically significant cold spot for the final time step and has never been a statistically significant cold spot before.
Consecutive Cold Spot	A location with a single uninterrupted run of statistically significant cold spot bins in the final time-step intervals. The location has never been a statistically significant cold spot prior to the final cold spot run and less than ninety percent of all bins are statistically significant cold spots.
Intensifying Cold Spot	A location that has been a statistically significant cold spot for ninety percent of the time-step intervals, including the final time step. In addition, the intensity of clustering of low counts in each time step is increasing overall and that increase is statistically significant.
Persistent Cold Spot	A location that has been a statistically significant cold spot for ninety percent of the time-step intervals with no discernible trend, indicating an increase or decrease in the intensity of clustering of counts over time.
Diminishing Cold Spot	A location that has been a statistically significant cold spot for ninety percent of the time-step intervals, including the final time step. In addition, the intensity of clustering of low counts in each time step is decreasing overall and that decrease is statistically significant.
Sporadic Cold Spot	A location that is an on-again then off-again cold spot. Less than ninety percent of the time-step intervals have been statistically significant cold spots and none of the time-step intervals have been statistically significant hot spots.
Oscillating Cold Spot	A statistically significant cold spot for the final time-step interval that has a history of also being a statistically significant hot spot during a prior time step. Less than ninety percent of the time-step intervals have been statistically significant cold spots.
Historical Cold Spot	The most recent time period is not cold, but at least ninety percent of the time-step intervals have been statistically significant cold spots.

³⁸ <http://desktop.arcgis.com/en/arcmap/10.3/tools/space-time-pattern-mining-toolbox/learnmoreemerging.htm>, accessed 2019JUN10