



OC Spray Bylaw Proposal Follow Up



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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, external agency partners were involved in collecting data for this report; their efforts were critical throughout and are to be acknowledged.

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1. Executive Summary

In February 2017, members of the Edmonton Police Service (EPS) began investigating a notable number of 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, and other types of oleoresin capsicum (OC) spray, can be multifaceted in its context both in criminal and non-criminal situations. Manufacturing and safety standards have been created for non-prohibited OC spray products at the federal and provincial level; however, at the time, there did not appear to be regulations in place at seller and consumer levels that could be utilized at the street level by municipal policing agencies. Complementary to this, limitations in multi-level regulations could cause concerns for non-police organizations, businesses, and citizens in relation 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 OC spray products, as well as providing businesses and consumers with appropriate information on how to safely store, transport, or dispose of OC spray-type products.

2. Key Findings

- Numbers of OC spray-related occurrences have trended upwards between 2015 to 2023 for the Edmonton Police Service (EPS), Edmonton Fire Rescue Services (EFRS), and Calgary Police Service (CPS)
- Numbers of OC spray seizures have generally trended upwards between 2015 to 2023 (EPS)
- Occurrences involving OC spray seizures account for approximately 20% to 35% of total Occurrences each year between 2015 to 2023 (EPS)
- 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)
- Violent occurrences accounted for approximately 40% of OC-spray related occurrences

3. Limitations and Definitions

There are various defensive oleoresin capsicum (OC) spray products in circulation such as bear spray, dog spray, and pepper spray. Initial focus was 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 “OC spray” will be used to reference the aerosol sprays involved in the data collected, however, specific sprays associated to the data may be of various types. Subsequently, canisters can be manipulated so in that attending officers are unable to determine the type of aerosol product used or seized; therefore, multiple types of OC spray were included in this analysis.

The term OC spray may be used to encompass a variety of similar products such as bear spray, pepper spray, etc. and may be used interchangeably throughout the report.

Location data is based on a Full Occurrence Address associated to each EPS Occurrence File Number. EPS Headquarters, and any incomplete location data was not included in statistical geography. 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).

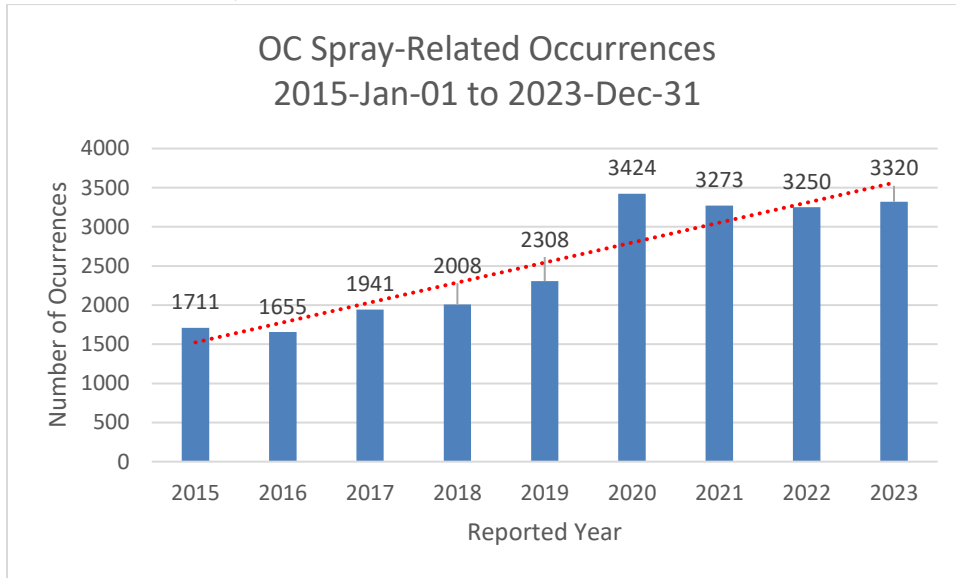
This analysis is also limited in that EPS data contains only Occurrences that have been reported to police or observed by police (and resulted in an occurrence file being generated), as well as files that matched the query parameters input by the user. Files that contain different key words, or key words 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 OC spray statistics 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.

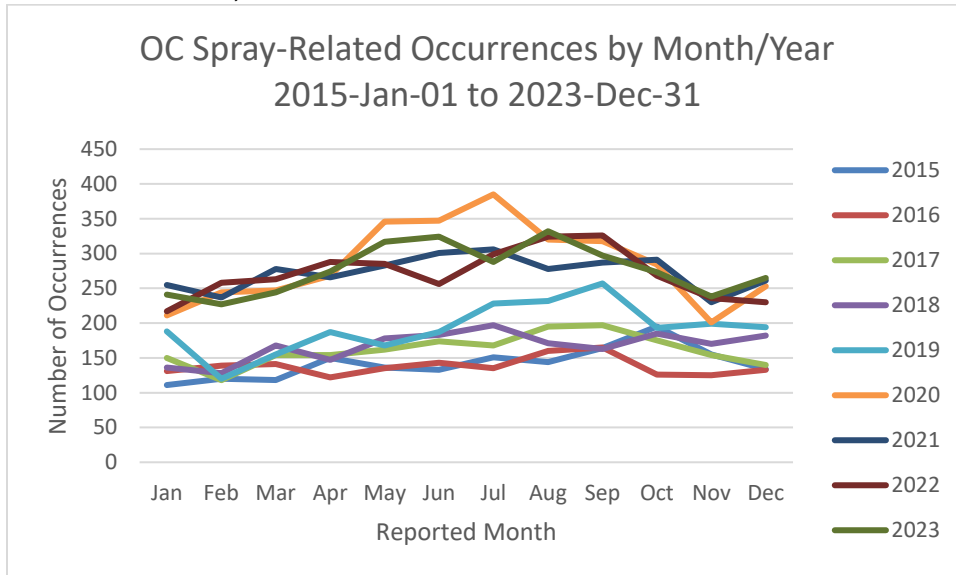
4. Edmonton Police Service Data

Overview

Graph 1. OC Spray-Related Occurrences, 2015-Jan-01 – 2023-Dec-31¹



Graph 2. OC Spray-Related Occurrences, 2015-Jan-01 – 2023-Dec-31²



¹ Based on 22,890 reported Occurrence File Numbers

² Based on 22,890 reported Occurrence File Numbers

Chart 1. Occurrence Categories Related to OC Spray, 2015-Jan-01 – 2023-Dec-31³

| Occurrence Category | Number of Occurrences | Percent of Total Occurrences ⁴ |
|---------------------|-----------------------|---|
| Violent | 9208 | 40% |
| Non-Violent | 4442 | 19% |
| Disorder | 3585 | 16% |
| Weapons | 2127 | 9% |
| Other | 1486 | 6% |
| Drugs | 1003 | 4% |
| Not Entered | 685 | 3% |
| Traffic | 348 | 2% |
| Not Assigned | 6 | 0% |
| Grand Total | 22890 | 100% |

Geographical Data

Graph 3. OC Spray-Related Occurrences by Branch/Year, 2015-Jan-01 – 2023-Dec-31⁵

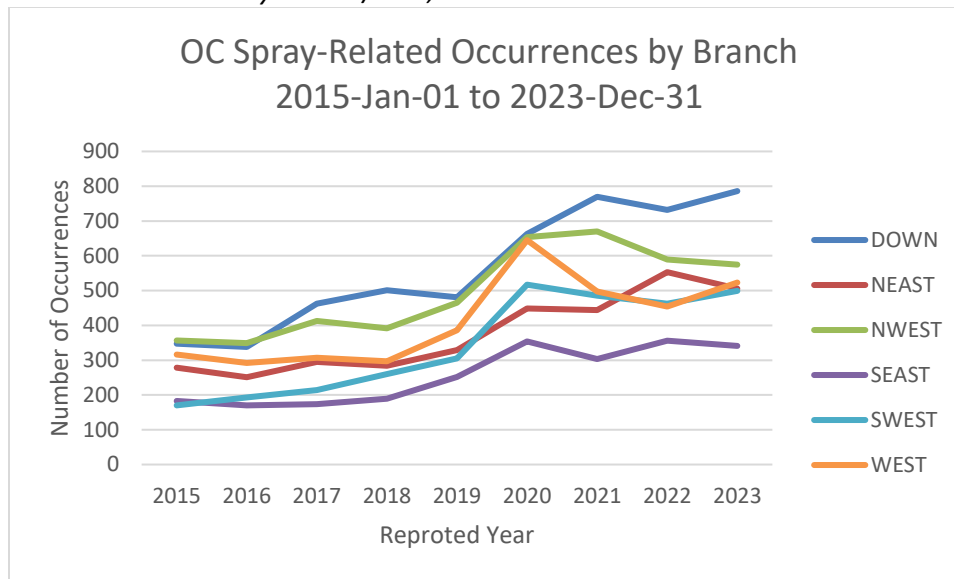


Chart 2. Percent of Total OC Spray-Related Occurrences, 2015-Jan-01 – 2023-Dec-31^{6,7}

| Branch | Number of Occurrences | Percent of Total Occurrences | Percent of Total Land Size (Edmonton) ⁸ |
|--------------------|-----------------------|------------------------------|--|
| Downtown | 5080 | 23% | 2% |
| Northwest | 4464 | 20% | 12% |
| West | 3717 | 17% | 17% |
| Northeast | 3389 | 15% | 23% |
| Southwest | 3105 | 14% | 25% |
| Southeast | 2322 | 11% | 21% |
| Grand Total | 22077 | 100% | 100% |

³ Based on 22,890 reported Occurrence File Numbers

⁴ Percentages are approximations

⁵ Based on 22,077 reported Occurrence File Numbers

⁶ Based on 22,077 reported Occurrence File Numbers

⁷ Percentages are approximations

⁸ Data Source: EPS GIS Spatial Database Engine

Chart 3. OC Spray-Related Occurrence Location Proximities, 2015-Jan-01 – 2023-Dec-31^{9 10}

| Location Type & Distance | Number of Occurrences | Percent of Total Occurrences ¹¹ |
|------------------------------|-----------------------|--|
| 100m of a Bus Stop | 12147 | 55% |
| 400m of a School | 10082 | 46% |
| 50m of a Bus Stop | 6159 | 28% |
| 400m of LRT Station centroid | 3944 | 18% |
| 100m of LRT Line | 2428 | 11% |
| 100m of LRT Station centroid | 923 | 4% |
| 100m of a School | 727 | 3% |
| Park/greenspace | 620 | 3% |

Appendix A provides an overview of hot and cold spots within the city of Edmonton.

Complainant/Victim Data

13, 242 Occurrences have complainants and/or victims linked. 22,233 total complainants and/or victims were identified, with 19, 965 unique persons involved. This means, there may be persons who have been involved in more than one OC spray-related Occurrence.

Chart 4. Complainants/Victims Involved in OC Spray-Related Occurrences, 2015-Jan-01 to 2023-Dec-31¹²

| Reported Gender | Number of Complainants/Victims |
|-----------------|--------------------------------|
| Male | 13790 |
| Female | 8253 |
| Unknown/Blank | 131 |
| Other | 6 |

⁹ 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)

¹⁰ Bus stop data excludes “Archived” labeled bus stops (City of Edmonton AEGIS data)

¹¹ Percentages are approximations

¹² Based on 22,233 total complainants/victims (includes persons who have been involved in more than one Occurrence)

Graph 4. Complainants/Victims Involved in OC Spray-Related Occurrences by Age Range, 2015-Jan-01 to 2023-Dec-31¹³

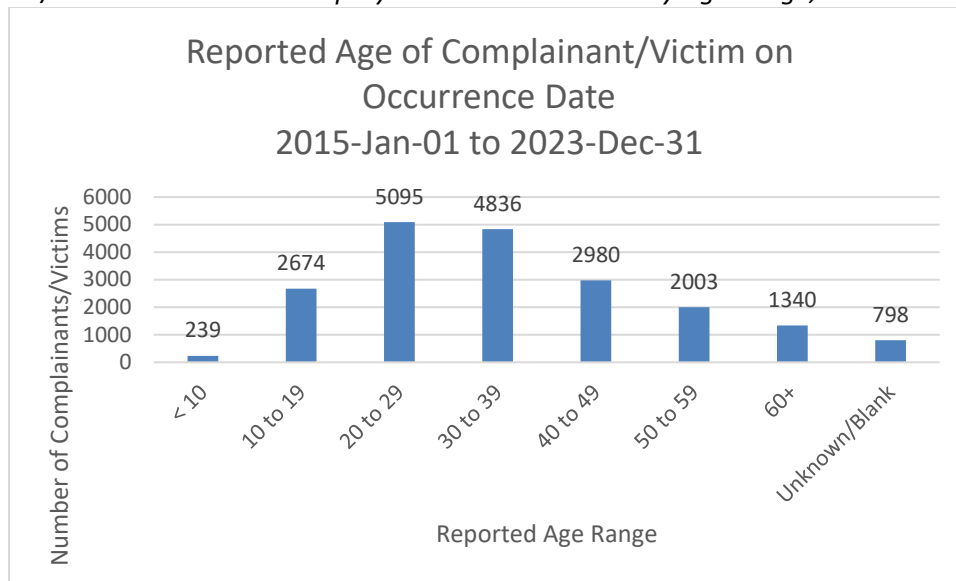
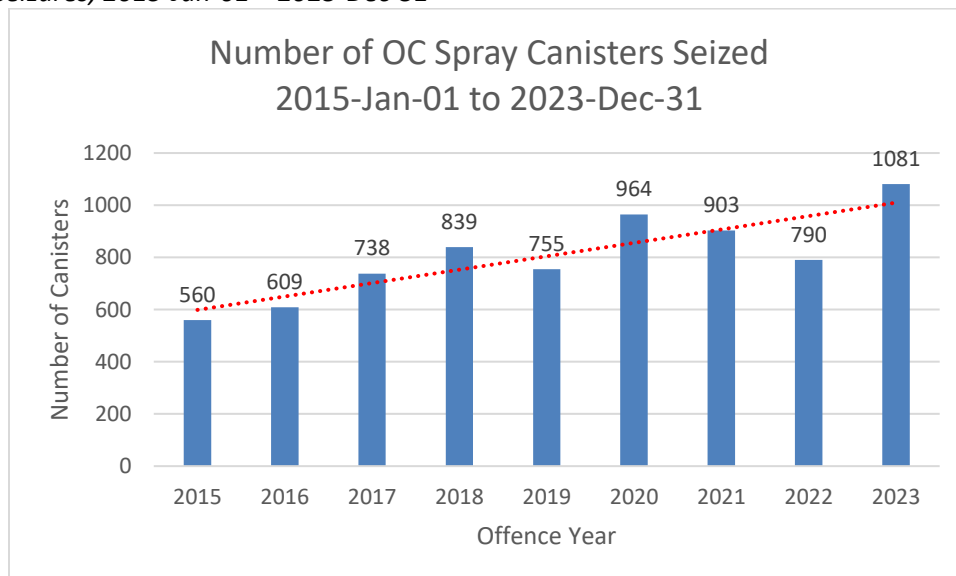


Chart 5. Number of Complainants/Victims Per Occurrence, 2015-Jan-01 to 2023-Dec-31¹⁴

| Number of Complainant/Victims | Percent of Occurrences ¹⁵ |
|-------------------------------|--------------------------------------|
| 1 | 72% |
| 2 to 9 | 27% |
| 10+ | 1% |
| Grand Total | 100% |

Seizure Data

Graph 5. OC Spray Seizures, 2015-Jan-01 – 2023-Dec-31¹⁶



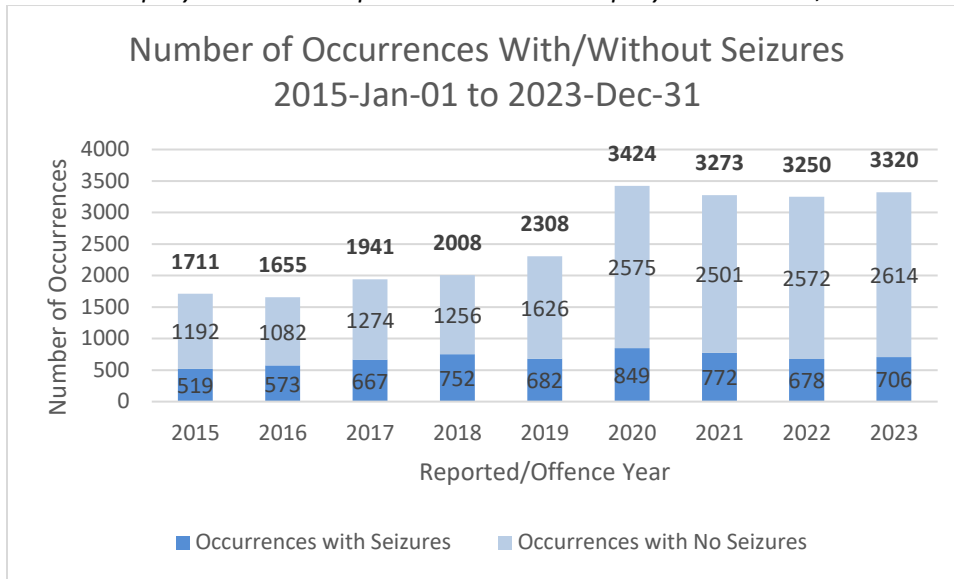
¹³ Based on 19,965 unique complainants/victims (not does include repeat complainants/victims)

¹⁴ Based on Occurrences linked to 22,233 total complainants/victims (includes persons who have been involved in more than one Occurrence)

¹⁵ Percentages are approximations

¹⁶ Based on 7,239 canisters seized between 6,198 Occurrence Files Numbers

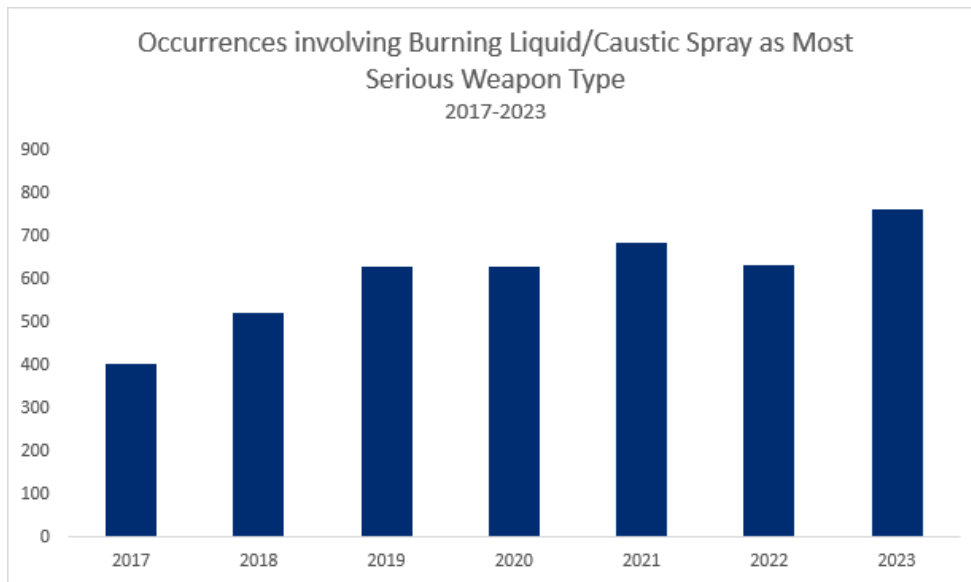
Graph 6. Occurrences with OC Spray Seizures Compared to Overall OC Spray Occurrences, 2015-Jan-01 – 2023-Dec-31¹⁷



5. External Agency Partner Data

Calgary Police Service (CPS) Data

Graph 7. Calgary Police Service Occurrences Involving Burning Liquid/Caustic Spray Weapons, 2017-Jan-01 – 2023-Dec-31¹⁸



Most recently, Calgary Police Service has had 764 Occurrences where UCR data indicates Burning Liquid/Caustic Spray as the most serious weapon type involved.¹⁹

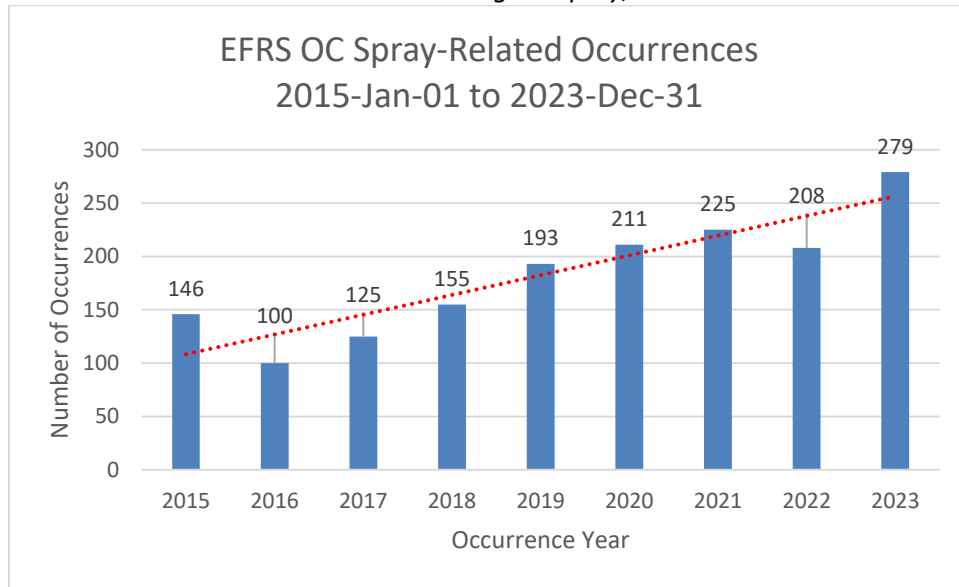
¹⁷ Based on 6,198 reported Occurrence File Numbers with seized canisters submitted and 22,890 total reported Occurrence File Numbers

¹⁸ Graph provided by Calgary Police Service

¹⁹ Methodology for data collection of Calgary Police Service differs than that of the Edmonton Police Service

Edmonton Fire Rescue Services (EFRS) Data

Graph 8. Edmonton Fire Rescue Services Occurrences Involving OC Spray, 2015-Jan-01 – 2023-Dec-31²⁰

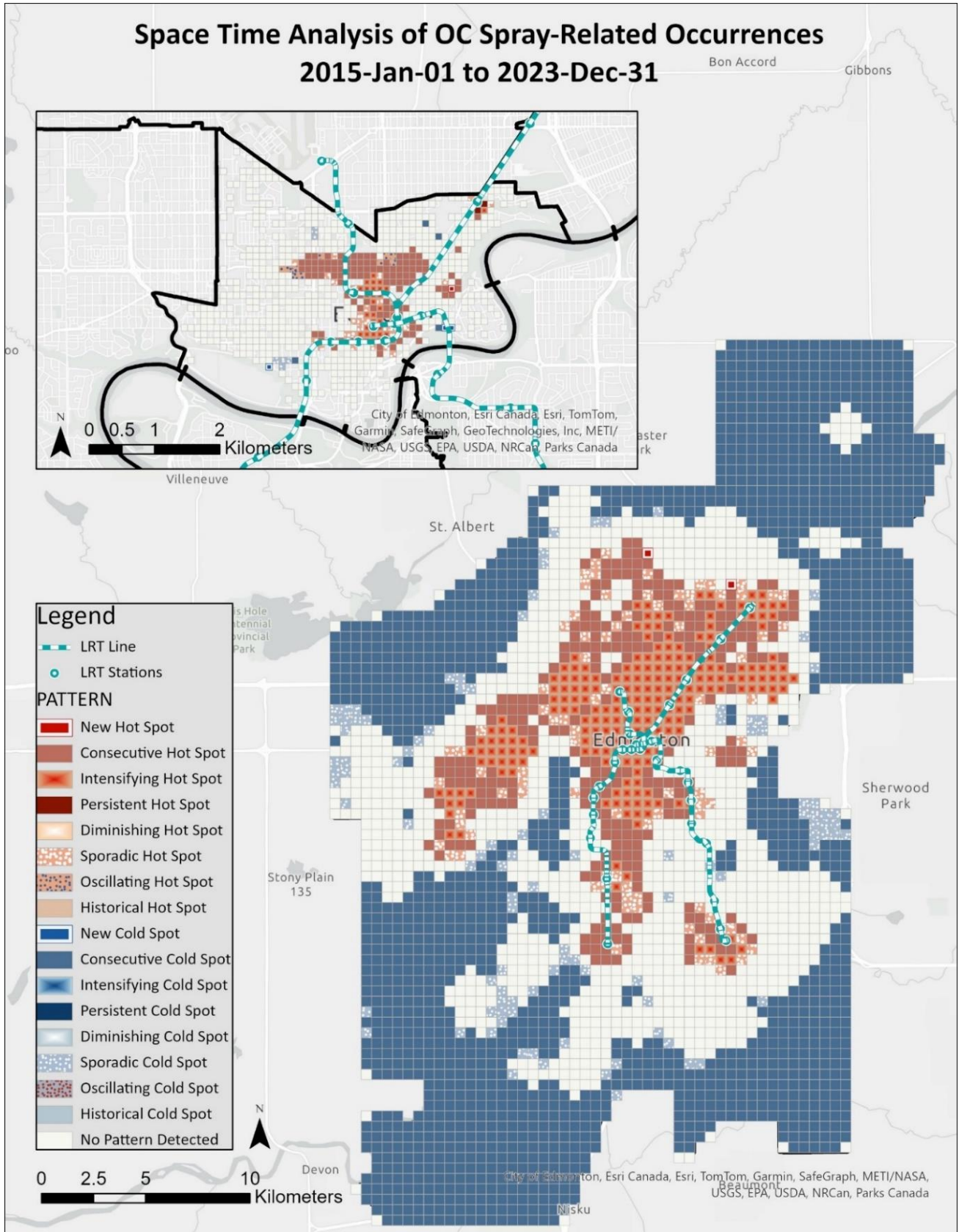


39% of Occurrences reported to EFRS involved multiple units per Occurrence. The average length of EFRS Occurrences reported between 2015 – 2023 was approximately 50 minutes (median time approximately 24 minutes).

²⁰ Data provided by Edmonton Fire Rescue Services (EFRS)

6. Appendices

Appendix A: Emerging Hot Spot Analysis, 2015-Jan-01 – 2023-Dec-31



Appendix B: Emerging Hot Spot Analysis Categories²¹

| 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. |

²¹ <https://desktop.arcgis.com/en/arcmap/10.3/tools/space-time-pattern-mining-toolbox/learnmoreemerging.htm> last accessed 2024-02-29

| Pattern Name | Definition |
|------------------------|--|
| 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 |

