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REVIEW OF SELECT FIRE INFORMATION DATA STANDARDS FROM A CANADIAN CONTEXT

Abstract

This report provides a summary to support future development of harmonized national fire information data standards for Canada through consensus.

Statistics Canada's Centre for Statistical and Data Standards (CSDS)
for the National Research Council of Canada

Date

2025 October 2

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List of acronyms and abbreviations

Acronym	Definition
AFAC	[Australia and New Zealand] National Council for Fire and Emergency Services (formerly the Australasian Fire and Emergency Services Authorities Council)
AIRS	Australasian Incident Reporting System (also referred to as the Australian Incident Reporting System, when applied in Australia)
CCFMFC	Council of Canadian Fire Marshals and Fire Commissioners
CCJCSS	Canadian Centre for Justice and Community Safety Statistics
EU	European Union
FSRI	[US] Fire Safety Research Institute (part of UL Research Institutes)
IRS	[UK] Incident Reporting System
ISO	International Organization for Standardization
NERIS	National Emergency Response Information System (currently in transition from the system known as NFIRS)
NFID	National Fire Information Database
NFIRS	National Fire Incident Reporting System (currently in transition to a new system known as NERIS)
NIFSC	National Indigenous Fire Safety Council
UL	Underwriters Laboratories
USFA	US Fire Administration

Executive summary

This report addresses the need to review and update fire incident reporting practices and data collection methods in Canada to help inform and accelerate future discussions on what could be national fire information data standards. The initial intent of the National Fire Information Database (NFID) pilot was as a first step toward a comprehensive census, this summary of recent international efforts provides foundational work to help support future discussions. To improve fire incident data collection and management, Canada can draw insights from recent:

- redesigns of the fire data collection systems in the United States and Australia,
- guidance developed for the fire statistics definitions and publication of tailored datasets in the United Kingdom,
- publication of the ISO/TS 17755 Part 2 standard for fire safety statistical data vocabulary, and
- development of a proposed framework for the European Union (EU) in the EU FireStat Project.

The report summarizes the findings of an environmental scan of the Canadian fire incident concepts, definitions and data fields in comparison to standards used in the EU, the United Kingdom, Australia, and the United States, and considering the framework proposed in the EU FireStat Project. Learning from global best practices, Canada has an opportunity to align its fire incident data reporting practices and collection methodology across Canadian jurisdictions.

Data standards play a crucial role in enhancing data quality and comparability. By adopting harmonized national data standards with consistent terminologies and classifications, Canada can:

- improve the accuracy and reliability of fire incident reporting,
- improve the ease with which data is aggregated across Canada, allowing for broader comparison of data, and
- reduce costs by benefiting from the common training materials and system implementation across jurisdictions.

The report provides actionable recommendations for standardization. It proposes the application of a tiered approach to data standards, building on the EU FireStat Project concept for the Canadian context. The proposed tiered approach supports consistency between the Canadian jurisdictions, while providing flexibility and practicality with the ability to address all NFID variables plus emerging issues. As a foundational step, this research project focuses on establishing well-defined terminologies to standardize data collection methods that would support the creation of a cohesive national framework for fire incident information collection. This information is intended to inform and accelerate discussions to develop harmonized national fire data standards through consensus. Ultimately, this effort to improve the accuracy, reliability and consistency of fire information in Canada will:

- inform evidence-based policy and technical discussions,
- allow for the identification of changing or emerging fire trends, and
- support the development and review of performance-based fire safety design approaches, including fire hazard and risk assessments, and selection of scenarios in fire safety engineering.

Purpose of report

The information contained within the report will provide an initial summary of the current state of the Canadian context and select international fire information collection manuals and practices. It would provide a consistent starting point for future discussions on harmonized national fire information data standards between all Fire Marshals' and Fire Commissioners' offices and their partners, in relation to work connected to the larger Council of Canadian Fire Marshals and Fire Commissioners' (CCFMFC) NFID Project.

During the course of this project, regular progress updates were shared with the CCFMFC's NFID Project, and in turn with the members of the CCFMFC. Key findings were shared with the members of the CCFMFC, and feedback was incorporated into the environmental scan effort. The intent is for this report to provide a reference to inform and accelerate future discussions supporting the development of harmonized national fire information data standards for Canada through consensus.

Clear and transparent communication of the current state and potential options is foundational to facilitate discussions, collaboration and prioritization on all aspects of developing harmonized national fire information data standards. This would be foundational to the larger NFID Project and would allow for the collection of consistent and comparable fire data across Canada.

Key considerations

The report, which reviews select fire information data standards from a Canadian context, examines Canadian fire reporting practices with a focus on the National Fire Information Database (NFID). It also considers practices and recent proposals in select countries. It provides a background for standardizing fire incident reporting on a national level through fire information data standards.

Based on the findings of this report, key recommendations for consideration include:

- Standardizing identified fire statistics concepts, ensuring that they are complete in scope and are using the most suitable terminology.
- Considering input formats for current provincial, territorial, and federal Canadian standards in fire incident reports, guidelines, and reference manuals, and incorporate into national data standards that would support consistent collection of fire information and consolidate training materials.
- Considering the use of a tiered approach to data standards to support:
 - transparency of what is selected to be collected;
 - consistency between the Canadian jurisdictions for each tier selected, while provision of flexibility and practicality of the framework to address:
 - priority tiers based on the collection systems, and
 - special interest tiers to address emerging topics that may differ between jurisdictions.
- Considering accuracy of address information:
 - parse the address information collection into individual fields to reduce input errors
→ fields: suite; number; street; municipality
 - add additional descriptive fields to capture 'non-addressable' locations;
 - collect latitude and longitude coordinates to support address information and for use in mapping applications such as geographic information systems.
- Determining follow-up procedures by fire investigators for the use of administrative data to fill data gaps using death statistics and medical records investigating possible autofill options in relation to administrative data in jurisdictions that support this capability.
- Considering to include the 'natural phenomenon' category in the 'acts or omissions' classification to align with categories proposed in the EU FireStat Final Report.
- Establishing procedures for the collection of data on emerging issues (e.g., homelessness and battery fires) to ensure standardization so all jurisdictions are referencing the same content and using appropriate and agreed-upon response categories.
- Ensuring a lifecycle process for standards once they have been developed as a way to link to past versions for historical data purposes, so past data is not lost.
- Introducing, once standards have been established, a regular cycle for the review and updating process (evergreening) to ensure the standards continue to be relevant and in line with evolving and emerging topics that reflect the changing landscape.

1 Introduction

Fire incident data are part of an integrated public safety solution, protecting Canadians from coast to coast to coast. This information can serve several essential functions, including reducing fire losses, fatalities, and injuries; identifying safety intervention opportunities; guiding evidence-based public policy in the allocation of resources and funds; and the development and review of fire risk assessments and selection of scenarios for fire safety performance-based engineering design.

Canadian jurisdictions currently mandate their own fire collection requirements. The majority of fire response in Canada, and subsequent collection of information is conducted by local, municipal fire services staffed mostly by volunteers¹.

The National Fire Information Database (NFID) is a voluntary aggregation of data on fire statistics in collaboration with provincial, territorial and Canadian Forces Fire Marshals and Fire Commissioners offices across Canada. Common variables that have been shared by each jurisdiction for inclusion in the NFID are published^{2,3} through the Canadian Centre for Justice and Community Safety Statistics (CCJCSS) at Statistics Canada. Whereas the NFID serves to provide a greater understanding of the nature and extent of fire incidents, at present it does not provide a national picture.

The NFID was intended to be a census of fire incidents across Canada. With no sustainable funding, the program has been put on pause. With the United Kingdom⁴, the United States⁵, and Australia⁶ redesigning their fire information collection systems, and recent updates to ISO/TS 17755-2⁷ and a proposed framework that was developed in the FireStat Project⁸ for the European Union (EU), there is an opportunity for Canada to leverage recent efforts and lessons learned to incorporate into redesigning the NFID and put in place standards that would allow for the collection of consistent and comparable fire data across Canada.

This summary of recent developments and review from a Canadian context builds upon past summaries of international practices, including: the EU FireStat Project Task 0⁹, which includes a summary of previous research and studies of national fire incident data collection systems; Task 1¹⁰, which includes a

¹ Paul, Maxim, et al., 2016, "Report on the Feasibility of a Canadian National Fire Information Database," School of Criminology & Criminal Justice, University of the Fraser Valley. <https://www.surrey.ca/sites/default/files/media/documents/ReportontheFeasibilityofaCanadianNationalFireInformationDatabase.pdf> (accessed March 20, 2024)

² Statistics Canada, 2017, *National Fire Information Database (NFID), Detailed information for 2005 to 2014*, <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&Id=380003>

³ Statistics Canada, 2023, *National Fire Information Database (NFID), Detailed information for 2015 to 2021*, <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&Id=1395546>

⁴ Government of the United Kingdom, 2024, *GOV.UK, Fire statistics guidance, Fire Statistics definitions*, <https://www.gov.uk/government/publications/fire-statistics-guidance/fire-statistics-definitions>

⁵ FEMA, 2024, *About the National Emergency Response Information System*, <https://www.usfa.fema.gov/nfirs/neris/about-neris/>

⁶ Commonwealth of Australia, 2021, "Block A-Complete for all Incidents", *AFAC AIRS Instruction Manual*, <https://www.data.qld.gov.au/ckan-opendata-attachments-prod/resources/1ff2c5de-4f47-48fd-82e2-ec5b6f14e173/maina-metadata.pdf?ETag=e13f03745dd5dfc1613859ca44f54889>

⁷ International Organization for Standardization (ISO), 2020, "Fire safety—Statistical data collection—Part 2: Vocabulary," ISO/TS 17755-2:2020(en), <https://www.iso.org/obp/ui/en/#iso:std:iso:ts:17755:-2:ed-1:v1:en>

⁸ FireStat, E.U., 2022, "EU FireStat project: closing data gaps and paving the way for pan-European fire safety efforts," *Final Report*, <https://eufirestat-efectis.com/files/eufirestatproject-ET01223473AN1.pdf>

⁹ FireStat, E.U., 2021, "EU FireStat Project-Final report Task 0," *Diagnostic*, https://eufirestat-efectis.com/files/20210315_Task0_Report.pdf

¹⁰ The University of Edinburgh, 2021, *Task 1 Final Report: Terminology and Data Collection Methodology, – Closing data caps and paving the way for pan-European Fire Safety Efforts*, https://www.eufirestat-efectis.com/files/20210628_Task1_Report-1.pdf

summary of data definitions and classifications; and the final EU FireStat Project report¹¹ and summaries of this work by Manes, et al.^{12,13}

2 Objective and background

2.1 Objective

The objective of this report is to provide a summary of the review of existing fire incident definitions and data fields used in Canada and compare them against those used in the EU, the United Kingdom, Australia and the United States, and recent efforts to redesign systems and develop new frameworks. This report provides recommendations for consideration to support standardization for the current Canadian context.

2.2 Background

Data standards provide a set of agreed-upon and documented guidelines, specifications, accepted practices, technical requirements, or terminologies. They enable consistent and repeatable definitions, permitted values, structuring, and sharing of data.

Data standards can help lower costs for information collection and analysis, facilitate data sharing, improve transparency, and ensure quality statistical information. Providing well-defined and broadly agreed-upon concepts and variables serves to reduce ambiguity and minimize misinterpretations of associated data.

In Canada, differences in reporting and in levels of training by jurisdiction can result in variations in data completeness and quality. There are currently no fire data standards to provide consistent and comparable information on the fire situation on a national level (fire fatalities, fire injuries, fire safety measures, etc.). Filling data gaps for national conceptual frameworks would be facilitated by achieving consensus on definitions for the key areas such as fire incidents. Getting definitions right is not purely an academic exercise. How key areas are defined determines statistical estimates that will influence how the information can be used; for example, to evaluate and shape public policy, to inform evidence-based technical discussions, to identify emerging trends, or support the development and review of fire risk assessments and selection of scenarios for fire safety engineering for performance-based design approaches.

Establishing well-defined and commonly agreed upon terminology to describe fire incident data variables will help create a consistent national picture. It will help reduce the burden in collection, aid in the collection of quality fire statistics and lead to a reduction in data gaps. More complete data coverage with common terminology will provide the ability to compare fire information between jurisdictions and offer a sound national overview. Having standardized concepts and variables that are comparable will aid in planning and allocating resources on a Canada-wide scale.

¹¹ FireStat, E.U., 2022, "EU FireStat project: closing data gaps and paving the way for pan-European fire safety efforts," *Final Report*, <https://eufirestat-efectis.com/files/eufirestatproject-ET01223473AN1.pdf>

¹² Manes, Martina, et al., 2023, "Closing Data Gaps and Paving the Way for Pan-European Fire Safety Efforts: Part I—Overview of Current Practices for Fire Statistics," *Fire Technology* 59(4), pp. 1925-1968, <https://link.springer.com/article/10.1007/s10694-023-01415-6>

¹³ Manes, Martina, et al., 2023, "Closing data gaps and paving the way for Pan-European Fire Safety Efforts: Part II—Terminology of fire statistical variables," *Fire technology* 59(4), pp. 1969-2000, <https://link.springer.com/article/10.1007/s10694-023-01408-5>

3 Review of Canadian and selected fire information collection processes: an environmental scan

This section outlines the steps taken to review the fire incident variables collected within Canada, along with the findings from the review of the EU's FireStat project. It details the scope of the review and the limitations encountered during the process.

3.1 Overview of environmental scan approach

The overview of the methodology used to analyze the fire incident variables included the following steps:

- Initial review of the content of the NFID Data Dictionary^{14,15}
- Review of Statistics Canada data tables released by the CCJCSS, and the variables used to disseminate this information:
 - Table 35-10-0192-01¹⁶ Incident-based fire statistics, by type of fire incident and type of structure
 - Table 35-10-0193-01¹⁷ Incident-based fire statistics, by source of ignition and act or omission
 - Table 35-10-0194-01¹⁸ Fire-related deaths and persons injured, by cause of death or injury and reason for non-evacuation
 - Table 35-10-0195-01¹⁹ Fire-related deaths and persons injured, by type of structure
 - Table 35-10-0196-01²⁰ Incident-based fire statistics, by performance of smoke alarm device, residential fires
 - Table 35-10-0197-01²¹ Incident-based fire statistics, by performance of sprinkler system, structural fires
- Review of the findings of EU's FireStat Project
 - The EU reports compared the terminology of fire statistics variables of 27 EU member states and 8 other countries and brought together the knowledge and expertise of 9 national fire safety institutions.
 - EU FireStat project: closing data gaps and paving the way for pan-European fire safety efforts, Final Report, proposes common terminology and methods to collect necessary

¹⁴ Statistics Canada, 2017, *National Fire Information Database (NFID)*, Data Dictionary, Version 2.0, http://nfidcanada.ca/wp-content/uploads/2017/09/NFID-Data-Dictionary_final.pdf

¹⁵ Note: While there is a 2023 version of the National Fire Information Database (NFID), <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvVariableList&Id=1395546>, there has yet to be a public release of the accompanying Data Dictionary.

¹⁶ Statistics Canada. Table 35-10-0192-01. Incident-based fire statistics, by type of fire incident and type of structure, <https://doi.org/10.25318/3510019201-eng>

¹⁷ Statistics Canada. Table 35-10-0193-01. Incident-based fire statistics, by source of ignition and act or omission, <https://doi.org/10.25318/3510019301-eng>

¹⁸ Statistics Canada. Table 35-10-0194-01. Fire-related deaths and persons injured, by cause of death or injury and reason for non-evacuation, <https://doi.org/10.25318/3510019401-eng>

¹⁹ Statistics Canada. Table 35-10-0195-01. Fire-related deaths and persons injured, by type of structure, <https://doi.org/10.25318/3510019501-eng>

²⁰ Statistics Canada. Table 35-10-0196-01. Incident-based fire statistics, by performance of smoke alarm device, residential fires, <https://doi.org/10.25318/3510019601-eng>

²¹ Statistics Canada. Table 35-10-0197-01. Incident-based fire statistics, by performance of sprinkler system, structural fires, <https://doi.org/10.25318/3510019701-eng>

data to obtain meaningful datasets based on standardised terms and definitions²² that provides a summary of all the aspects of the project.

- Details of the tasks and parts of the project were published as:
 - EU FireStat Project-Final report Task 0 – Diagnostic, a literature review of work on fire statistics is presented, separated into studies focusing on national fire statistics and studies focusing on international comparison between practices²³
 - EU FireStat Project-Final report Task 1 – Terminology and Data Collection Methodology, focused on the EU Member States and other European and non-European countries²⁴
 - EU FireStat Project Final report Task 4 – Terminology, identifies the most appropriate names, definitions, and appropriate values for variables in describing categories of interest about fire incidents collected at the European level²⁵
 - Closing Data Gaps and Paving the Way for Pan-European Fire Safety Efforts: Part I—Overview of Current Practices for Fire Statistics, Fire Technology²⁶
 - Closing data gaps and paving the way for Pan-European Fire Safety Efforts: Part II—Terminology of fire statistical variables, Fire technology²⁷
- Compilation of data standard definition comparisons for a selection of example variables that were recommendations from the EU list FireStat Project tiers.
- Review of terms and definitions from the International Organization for Standardization (ISO) Fire safety standards technical specification for vocabulary ISO/TS 17755-2²⁸ that was published in 2020.
- To build the international picture for comparison, review of reference guides and incident reports from:
 - the United States, drawing from:
 - Version 5.0 of the National Fire Incident Reporting System²⁹ (NFIRS), in combination with
 - Information available for the beta version of the newly developed National Emergency Response Information System³⁰ (NERIS), including³¹:
 - an executive guide
 - illustrative data collection spreadsheets
 - technical specifications for developers

²² FireStat, E.U., 2022, "EU FireStat project: closing data gaps and paving the way for pan-European fire safety efforts," *Final Report*, <https://eufirestat-efectis.com/files/eufirestatproject-ET01223473AN1.pdf>

²³ FireStat, E.U., 2021, "EU FireStat Project-Final report Task 0," *Diagnostic*, https://eufirestat-efectis.com/files/20210315_Task0_Report.pdf

²⁴ FireStat, E.U., 2021, "EU FireStat Project-Final report Task 1," *Terminology and Data Collection*, https://www.eufirestat-efectis.com/files/20210628_Task1_Report-1.pdf

²⁵ FireStat, E.U., 2021, "EU FireStat Project-Final report Task 4," *Terminology*, https://eufirestat-efectis.com/files/20211028_Task4_Report.pdf

²⁶ Manes, Martina, et al., 2023, "Closing Data Gaps and Paving the Way for Pan-European Fire Safety Efforts: Part I—Overview of Current Practices for Fire Statistics," *Fire Technology* 59(4), pp. 1925-1968, <https://link.springer.com/article/10.1007/s10694-023-01415-6>

²⁷ Manes, Martina, et al., 2023, "Closing data gaps and paving the way for Pan-European Fire Safety Efforts: Part II—Terminology of fire statistical variables," *Fire technology* 59(4), pp. 1969-2000, <https://link.springer.com/article/10.1007/s10694-023-01408-5>

²⁸ International Organization for Standardization (ISO), 2020, "Fire safety—Statistical data collection—Part 2: Vocabulary," ISO/TS 17755-2:2020(en), <https://www.iso.org/obp/ui/en/#iso:std:iso:ts:17755:-2:ed-1:v1:en>

²⁹ USFA National Fire Data Center, 2015, "National Fire Incident Reporting System 5.0 Complete Reference Guide," https://www.usfa.fema.gov/downloads/pdf/nfirs/nfirs_complete_reference_guide_2015.pdf

³⁰ USFA, 2023, National Emergency Response Information System, *DRAFT Incident Schema V0.1*.

³¹ FSRI, 2024, NERIS Core Data Schemas Released in Beta, <https://fsri.org/program-update/neris-core-data-schemas-released-beta>

- the United Kingdom incident recording systems³², and
- Australia, reviewing the Australian Incident Reporting System (AIRS) instruction manual³³ and definitions of terms³⁴

3.2 Scope

The scope of the environmental scan was focused on data standards for the collection of fire information that aligns with the scope of the NFID (structure, vehicle and outdoor fires, noting that the inclusion of wildland urban interface fires is limited, and wildfires are not included in this database). The report summarizes the findings from an environmental scan of Canadian and select international and national (namely the EU, the United Kingdom, Australia, and the United States) fire information collection processes and the recently proposed framework by the EU FireStat Project, as identified in Section 0, with the intent of identifying practices and terminologies for comparison with the Canadian context.

Following the finding of the development of a tiered approach by the EU FireStat Project (as summarized in Section 0), the potential flexibility and practicality of this concept for a range of jurisdictions was raised. The report then focuses on suggesting a potential approach that adopts and adapts the concept of the use of tiers for the Canadian context. This summary would provide a starting point for discussions between Canadian jurisdictions to develop national fire information data standards. Such future discussions would refine the details of standards developed through consensus.

This summary of information and suggestions for consideration during future development of national fire information data standards is intended to provide general guidance on potential options that would inform and accelerate the future discussions. This report may also be of use to help inform future work of the potential benefit from a deeper dive on certain topics or an update on items that were in progress at the time of this report.

3.3 Limitations

Some of the information gathered during the environmental scan is from sources that are developing new fire information systems or are revising their existing system. Therefore, it is recommended that the use of the information summarized in this report is considered in conjunction with verifying for updates of these developments for aspects that are of key interest, as changes or refinements may occur following the preparation of this report.

The information in this report reflects data available at the time of compilation, from material contained in version 5.0 of the NFIRS reference guide³⁵ and from the modules of the draft version 1.0 of NERIS^{36,37} that was released for the beta testing³⁸ of the new framework. To support the future development of NFID

³² Government of the United Kingdom (GOV.UK), 2012, "Incident recording system—questions and lists, Version 1.6–(XML Schemas v1-0p)." <https://www.gov.uk/government/publications/incident-recording-system-for-fire-and-rescue-authorities>

³³ Queensland Government, 2021, "QFES Incident Meta Data, Block A Meta Data", *AFAC AIRS Instruction Manual - Block A-Complete for all Incidents*, (originally published in 1997, revised in 2021, last updated Nov 2024), <https://www.data.qld.gov.au/dataset/qfd-incident-data/resource/1ff2c5de-4f47-48fd-82e2-ec5b6f14e173>; and <https://www.data.qld.gov.au/ckan-opendata-attachments-prod/resources/1ff2c5de-4f47-48fd-82e2-ec5b6f14e173/maina-metadata.pdf?ETag=e13f03745dd5dfc1613859ca44f54889> (accessed April 25, 2024)

³⁴ New South Wales Fire and Rescue, 2024, *Open Data, Definition of Terms*, <https://www.fire.nsw.gov.au/page.php?id=9379>

³⁵ USFA, 2015, *National Fire Incident Reporting System 5.0 Complete Reference Guide*, National Fire Data Center, https://www.usfa.fema.gov/downloads/pdf/nfirs/NFIRS_Complete_Reference_Guide_2015.pdf

³⁶ USFA, 2023, National Emergency Response Information System, *DRAFT Incident Schema V0.1*,

³⁷ USFA, DHS and FSRI, 2023, NERIS Core Data Schemas Released in Beta, <https://fsri.org/program-update/neris-core-data-schemas-released-beta>

³⁸ FSRI, 2024, *NERIS National Emergency Response Information System, Extended National Engagement Period for NERIS Draft Data Framework*, <https://fsri.org/program-update/extended-national-engagement-period-neris-draft-data-framework>

standards, it is recommended to verify any updates to definitions and classifications in the new versions of NERIS.

The recommendations include draft or beta information for systems that were in development and not in place at the time of release of this report. They are suggested for consideration as potential best practices and are outlined in this report to reduce the burden when working towards maximum data coverage for a future national data standard.

While some international fire information data standards support the collection of information beyond fire incidents (e.g., emergency medical services, incidents involving hazardous materials, wildland fires, and false alarms), these subjects are beyond the scope of the current NFID. Although additional subjects are suggested to be considered for standardization in the future, this report is focused on the alignment with the current NFID, namely deliberate and negligent fire incident information, and is intended to support the initial steps needed at this time. Future work, such as the development of additional standards, could subsequently build on this foundational work.

Data standards would be developed through consensus, therefore the summary and recommendations for consideration in this report are intended to help inform and accelerate discussions between Canadian jurisdictions and partners, and such discussions would be expected to refine the details of the standards developed.

4 Fire incident definition and reporting systems

For Canada, the information aggregated in the NFID³⁹ are limited to reported fire incidents that cause deaths or injuries, or which destroy or damage property having a value that may be expressed in terms of dollars. This aligns with the legislated reporting requirements for each jurisdiction. Deliberate or negligent fires are reported, while false alarms are not.

Based on a summary⁴⁰ of EU member state fire information terminologies and data collection methodologies, fire incident information is generally collected according to three categories: accidental fires, deliberate fires and false alarms. However, there are variations among EU member states. For example, while fire information collection manuals may include definitions for false alarms, they may not include definitions for accidental and deliberate fires. Additionally, relatively few member states have a formal definition of what constitutes a false alarm.

The proposed new framework developed in the EU FireStat Project⁴¹ was for collecting fire information for building fires, where the Fire Service attended the scene would confirm whether a fire was either ongoing or had been extinguished, and the fire resulted in damage to people (either injuries or fatalities at the fire scene), property (of at least 100 euros) or the environment (requiring clean up of contamination). Deliberate (intentional) and negligent (unintentional) fires are included in the primary causal factor variable that is included in the two-tier framework. False alarms are not included among the variables, terminologies or classifications proposed for a two-tier framework of key variables to collect.

³⁹ Statistics Canada, 2017, *National Fire Information Database (NFID)*, Data Dictionary, Version 2.0, http://nfidcanada.ca/wp-content/uploads/2017/09/NFID-Data-Dictionary_final.pdf

⁴⁰ FireStat, E.U., 2021, "EU FireStat Project-Final report Task 1," *Terminology and Data Collection*, https://www.eufirestat-efectis.com/files/20210628_Task1_Report-1.pdf

⁴¹ FireStat, E.U., 2022, "EU FireStat project: closing data gaps and paving the way for pan-European fire safety efforts," *Final Report*, <https://eufirestat-efectis.com/files/eufirestatproject-ET01223473AN1.pdf>

The ISO Technical Standard for Fire Safety – Statistical data collection⁴² includes vocabulary definitions for each of these categories: accidental fires (Clause 3.2), deliberate fires (Clause 3.24) and false alarm fires (Clause 3.35).

The US NFIRS⁴³ includes the collection of information for general fire incidents, structure fires, and wildland fire incidents⁴⁴ for negligent (accidental) and deliberate (intentionally set)⁴⁵ fires, as well as for other types of calls (e.g., medical services, hazardous conditions with no fire). False alarms are recorded. NERIS⁴⁶ is being developed in partnership between USFA and the US Department of Homeland Security's Science and Technology Directorate and is supported by a contract with the Fire Safety Research Institute (FSRI). NERIS includes the collection of information for fire incidents and false alarms⁴⁷, similar to the NFIRS standards, and with the ability to adapt to emerging hazards during a single incident⁴⁸ and to address emerging challenges⁴⁹.

The United Kingdom^{50,51} Incident Recording System (IRS) collects information for accidental and deliberate fires, with the United Kingdom having specific definitions for each of these categories. The IRS also used to collect non-fire incident information, such as flooding, traffic collisions, fatalities and injuries. False alarms are recorded in the IRS.

In Australia, a fire event is an incident that is reported to a fire service organisation and requires a response.⁵² Fire events include (but are not limited to):

- structure fires (that is, fires inside a building or structure), regardless of whether there is damage to the structure
- landscape fires, including bushfires and grass fires, regardless of the size of the area burnt, other fires, including vehicle and other mobile property fires, and outside rubbish fires.

⁴² ISO, 2020, "Fire safety—Statistical data collection—Part 2: Vocabulary," ISO/TS 17755-2:2020(en), <https://www.iso.org/obp/ui/en/#iso:std:iso:ts:17755:-2:ed-1:v1:en>

⁴³ USFA National Fire Data Center, 2015, "National Fire Incident Reporting System 5.0 Complete Reference Guide," https://www.usfa.fema.gov/downloads/pdf/nfirs/NFIRS_Complete_Reference_Guide_2015.pdf

⁴⁴ Wildland fire incidents may be reported via either the general Fire Module or, if available, by the state reporting authority, the Wildland Fire Module.

⁴⁵ Information for intentionally set fires is collected in the general Fire Module in combination with a specialized Arson Module.

⁴⁶ USFA, 2023, *National Emergency Response Information System Development Status and Timeline*, <https://www.usfa.fema.gov/nfirs/neris/neris-status-timeline/>

⁴⁷ FSRI, 2025, *NERIS Core Data Schemas Released in Beta*, <https://fsri.org/program-update/neris-core-data-schemas-released-beta>

⁴⁸ NERIS, 2024, *NERIS Core Data Schemas, Executive Guide, Version 0.1 Beta*, <https://fsri.org/program-update/neris-core-data-schemas-released-beta>

⁴⁹ FSRI, 2025, *NERIS Version 1 Launches to Support Data Modernization for the Fire Service*, <https://fsri.org/program-update/neris-version-1-launches-support-data-modernization-fire-service>

⁵⁰ GoUK, 2024, "Fire Statistics definitions," *Fire statistics guidance*, <https://www.gov.uk/government/publications/fire-statistics-guidance/fire-statistics-definitions> (accessed April 25, 2024)

⁵¹ GoUK, 2024, *Guidance, Fire and rescue incident statistics: Methodology and quality report, 1st published August 2020, updated October 2024*, <https://www.gov.uk/government/publications/fire-statistics-guidance/fire-and-rescue-incident-statistics-methodology-and-quality-report>

⁵² Commonwealth of Australia, 2025, Report on Government Services 2025, Emergency management (part D), Produced by the Productivity Commission on behalf of the Steering Committee for the Review of Government Service Provisions, <https://www.pc.gov.au/ongoing/report-on-government-services/2025/data-downloads>

The Australian Incident Reporting System (AIRS) is a national standard for collection of incident information; however, individual agencies can still determine what is captured within their jurisdictions.⁵³ The AIRS standard includes the collection of types of incidents, including fire and explosions, hazardous conditions (not a fire), rescue and emergency medical services, other service calls, and false alarms⁵⁴. Note that false alarms of fire, emergency or another incident may be a legal offense⁵⁵; therefore, the priority on collecting false alarm related information may differ from other international jurisdictions. In addition, previous data standards defined fire incidents to include imminent occurrences; as this standard was withdrawn in 2015, caution is recommended when considering historical data and references to the standards.⁵⁶

4.1 Canadian context

The intention of the NFID to be a comprehensive census database has yet to be realized. The NFID contains information on 161 variables⁵⁷, of which 73 possible variables were based on the Council of Canadian Fire Marshals and Fire Commissioners' (CCFMFC) *Canadian Code Structure on Fire Loss Statistics* document.⁵⁸

Standardization remains a challenge, as provinces and territories have their own sets of fire incident reports, associate training manuals and reference guides. Each jurisdiction in Canada is responsible for the collection of fire incidents. While members of the CCFMFC and the Canadian Association of Fire Chiefs were instrumental in providing guidance and direction regarding the data content for the NFID, the Canadian Centre for Justice and Community Safety Statistics, a division at Statistics Canada, developed the NFID Data Dictionary⁵⁹ used for the national fire data pilot project.

The most recent release of the NFID in June 2023 included data collected from 2015 to 2021. It represented 60.4% of the Canadian population and included data from Nova Scotia, New Brunswick, Ontario, Manitoba, British Columbia, Yukon and the Canadian Armed Forces.⁶⁰ This represented a decline in reporting from the previous reference period of 2005 to 2014, which represented 72% of the Canadian population with participation from New Brunswick, Ontario, Manitoba, Saskatchewan, Alberta, British Columbia, and the Canadian Armed Forces.⁶¹ Without a complete census, historical comparisons will be restricted to those jurisdictions that submitted data in both reporting periods.

⁵³ An example of the use of AIRS Block A for Queensland: Queensland Government, 2024, "QFES Incident Meta Data, Block A Meta Data", *AFAC AIRS Instruction Manual - Block A-Complete for all Incidents*, (originally published in 1997, revised in 2021, last updated Nov 2024), <https://www.data.qld.gov.au/dataset/qfd-incident-data/resource/1ff2c5de-4f47-48fd-82e2-ec5b6f14e173>; and <https://www.data.qld.gov.au/ckan-opendata-attachments-prod/resources/1ff2c5de-4f47-48fd-82e2-ec5b6f14e173/maina-metadatas.pdf?ETag=e13f03745dd5dfc1613859ca44f54889>

⁵⁴ NSW Fire + Rescue, 2024, Open Data, Definition of Terms, Fire and Rescue New South Wales, <https://www.fire.nsw.gov.au/page.php?id=9379>

⁵⁵ For example, ACT Government, 2024, *Emergencies Act, Number A2004-28, including Amendment up to A2024-33*, Australian Capital Territory Government, <https://www.legislation.act.gov.au/a/2004-28/default.asp>

⁵⁶ Standards Australia, 1991, "Australian fire incident reporting system, Part 1: Description and implementation," AS 2577.1-1992, Withdrawn in 2015, <https://www.standards.org.au/standards-catalogue/standard-details?designation=as-2577-1-1992>

⁵⁷ Statistics Canada, 2017, *National Fire Information Database (NFID)*, Data Dictionary, Version 2.0, http://nfidcanada.ca/wp-content/uploads/2017/09/NFID-Data-Dictionary_final.pdf

⁵⁸ Council of Canadian Fire Marshals and Fire Commissioners (CCFMFC), 2002, "Canadian Code Structure on Fire Loss Statistics," http://www.ccfmfc.ca/pdfs/code_structure_2002.pdf

⁵⁹ Statistics Canada, 2017, *National Fire Information Database (NFID)*, Data Dictionary, Version 2.0, http://nfidcanada.ca/wp-content/uploads/2017/09/NFID-Data-Dictionary_final.pdf

⁶⁰ Statistics Canada, 2023, *National Fire Information Database (NFID)*, *Detailed information for 2015 to 2021*, <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&Id=1395546> (accessed February 8, 2024).

⁶¹ Statistics Canada, 2017, *National Fire Information Database (NFID)*, *Detailed information for 2005 to 2014*, <https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&Id=380003>

Initial studies based on the NFID indicated that among the jurisdictions that were able to submit data, information was not complete for all reference years or for all categories, which resulted in 'unknown' values. While 'unknown' values were removed from data files, they had the effect of artificially inflating proportions of known values.⁶²

4.2 International context

The United States' national database of fire incident information, the National Fire Incident Reporting System (NFIRS), represents the world's largest national database for fire incidents.⁶³ The system is currently undergoing a redesign and will be known as the National Emergency Response Information System (NERIS).⁶⁴

The current/legacy system, NFIRS, has been identified to⁶⁵:

- have gaps that limit the community emergency response capacity and capability for both everyday incidents and large-scale disasters;
- have limitations that impact the quantity, quality and timeliness of data submitted; and
- be an outdated system built on obsolete code that is not interoperable with new systems, resulting in the inability to integrate important information about the national fire situation.

The NERIS system is focusing on tools to reduce the input burden for firefighters, with the goal "to collect only the most critical information about the incident to inform risk and emergency deployment in the community"⁶⁶. One of the key elements of the statutory requirements of the National Fire Data Centre mandates, listed under the methods for carrying out the program, is to "develop standardized data reporting methods", which the NERIS system is set to fulfill.⁶⁷ The NERIS Incident Schema contains essential information related to the specific response in a format that will look familiar to the one firefighters used in collecting this data, including⁶⁸:

- final incident type (when provided automatically from dispatch)
- final incident location and use (when provided automatically from dispatch)
- detailed information related to the classified emergencies
- exposure information (if applicable)
- actions and tactics used to control and mitigate the incident
- mutual and automatic aid
- metrics associated with casualties and rescues

⁶² Statistics Canada, 2017, "Fire statistics in Canada, 2005 to 2015," *Selected Observations from the National Fire Information Database*, <https://nfidcanada.ca/wp-content/uploads/2017/09/Fire-statistics-in-Canada-2005-to-2014.pdf> (accessed February 8, 2024)

⁶³ FEMA, 2011, *About NFIRS*, <https://web.archive.org/web/20111015135248/http://www.usfa.fema.gov/fireservice/nfirs/about.shtm> (accessed June 13, 2024)

⁶⁴ FEMA, 2024, *About the National Emergency Response Information System*, <https://www.usfa.fema.gov/nfirs/neris/about-neris/> (accessed June 17, 2024)

⁶⁵ FEMA, 2024, *About the National Emergency Response Information System*, <https://www.usfa.fema.gov/nfirs/neris/about-neris/> (accessed June 17, 2024)

⁶⁶ NERIS, 2024, *NERIS Core Data Schemas, Executive Guide, V 0.1 Beta*, https://d1gi3fvbl0xj2a.cloudfront.net/2024-05/beta_schema_executive_guide.pdfhttps://d1gi3fvbl0xj2a.cloudfront.net/2024-05/beta_schema_executive_guide.pdf

⁶⁷ FEMA, 2024, *About the National Emergency Response Information System*, <https://www.usfa.fema.gov/nfirs/neris/about-neris/> (accessed June 17, 2024)

⁶⁸ NERIS, 2024, *NERIS Core Data Schemas, Executive Guide, V 0.1 Beta*, https://d1gi3fvbl0xj2a.cloudfront.net/2024-05/beta_schema_executive_guide.pdf

In addition, the beta version of NERIS has an emerging hazard module contained within the Incident Schema, which allows for quick adaptation to capture other emergencies without disrupting the core statistical units of the Incident Schema.

Following the NERIS BETA launch⁶⁹ in March 2024⁷⁰ with available resources including an executive guide, illustrative data collection spreadsheets and technical specifications for developers⁷¹, the NERIS version 1.0 was then launched on November 4, 2024. The beta testing phase by selected fire departments⁷² was still underway at the time of the preparation of this report. The intended aims of NERIS include a revamped data framework, easy integration with other systems, and near real-time access to information^{73, 74}.

The Australian standard for collection of data on fire incidents, AS 2577, was initially published in 1982⁷⁵, then revised to the Australian fire incident reporting system in 1992⁷⁶ before being withdrawn in 2015. Standards Australia and the Australian and New Zealand National Council for Fire and Emergency Services (AFAC) entered into a Memorandum of Understanding for the development and revision of standards relating to the management of fire related risks, fire protection and fire safety.⁷⁷ AFAC led the development of the Australasian Incident Reporting System and the AFAC Operational Performance Technical Group manages updates to the AIRS Manual.⁷⁸ When considering the application in Australia, it is referred to as the Australian Incident Reporting System (AIRS) in many documents⁷⁹. This report focuses on the Australian context for this summary. AIRS was initially launched in 1995 as a national standard for the collection of fire information; however, individual agencies determine what is captured within their jurisdiction.⁸⁰ The initial version included an option using an e-form for incident reporting by

⁶⁹ USFA, 2024, National Emergency Response Information System Development Status and Timeline, <https://www.usfa.fema.gov/nfirs/neris/neris-status-timeline/>

⁷⁰ USFA, 2024, Six Fire Departments Onboarded onto the New National Emergency Response Information System, <https://www.usfa.fema.gov/about/media-releases/usfa-announces-the-launch-of-the-prototype-version-of-neris/>

⁷¹ FSRI, 2024, NERIS Core Data Schemas Released in Beta, <https://fsri.org/program-update/neris-core-data-schemas-released-beta> <https://fsri.org/program-update/neris-core-data-schemas-released-beta>

⁷² FSRI, 2024, After Successful Prototype, NERIS expands to 50 New Fire Departments in Beta Testing, <https://fsri.org/program-update/after-successful-prototype-neris-expands-50-new-fire-departments-beta-testing>

⁷³ USFA, 2024, National Emergency Response Information System Features, <https://www.usfa.fema.gov/nfirs/neris/neris-features/>

⁷⁴ DHS, USFA, and FSRI, 2024, NERIS Information Sheet, Empowering Effective Emergency Response, <https://www.usfa.fema.gov/downloads/pdf/neris/neris-information-sheet.pdf>

⁷⁵ Standards Australia, 1983, AS 2577, Australian fire incident reporting system, <https://www.standards.org.au/standards-catalogue/standard-details?designation=as-2577-1983>

⁷⁶ Standards Australia, 1992, AS 2577.1, Australian fire incident reporting system, Part 1 Description and implementation, <https://www.standards.org.au/standards-catalogue/standard-details?designation=as-2577-1-1992>

⁷⁷ AFAC, 2017, About AFAC, AFAC the National Council for Fire and Emergency Services, <https://www.afac.com.au/auxiliary/about>

⁷⁸ AFAC, 2017, AFAC Collaboration Model, <https://www.afac.com.au/teams>

⁷⁹ For example, Commonwealth of Australia, 2025, Report on Government Services 2025, Emergency management (part D), Produced by the Productivity Commission on behalf of the Steering Committee for the Review of Government Service Provision, <https://www.pc.gov.au/ongoing/report-on-government-services/2025/emergency-management>

⁸⁰ An example of the use of AIRS Block A for Queensland: Queensland Government, 2024, "QFES Incident Meta Data, Block A Meta Data", AFAC AIRS Instruction Manual - Block A-Complete for all Incidents, (originally published in 1997, revised in 2021, last updated Nov 2024), <https://www.data.qld.gov.au/dataset/qfd-incident-data/resource/1ff2c5de-4f47-48fd-82e2-ec5b6f14e173>; and <https://www.data.qld.gov.au/ckan-opendata-attachments-prod/resources/1ff2c5de-4f47-48fd-82e2-ec5b6f14e173/main-metadata.pdf?ETag=e13f03745dd5dfc1613859ca44f54889>

firefighters.⁸¹ In 2015, the system was updated to the Electronic Australasian Information Reporting System (eAIRS).⁸² The details vary by jurisdiction based on when AIRS was adopted and implemented.

Considering the time of implementation, revisions and the ability for jurisdictions to refine the AIRS Data Dictionary, caution is recommended to be used when comparing data across Australian jurisdictions.⁸³ For example, in Victoria, when fires reach a certain size, they are considered complexes, rather than individual events. The size of each complex is not reflected in the data reported for fire incidents but would be available in the detail of a fire incident report.⁸⁴ Therefore, it is recommended not to compare data across Australian jurisdictions without checking the context, but data is generally more comparable (subject to caveats) within jurisdictions over time.⁸⁵

Australia is also in the process of improving the incident information systems through one of the AFAC 2022-2026 strategic directions⁸⁶. Specifically, AFAC strategic direction number 3, for using credible and timely information and data to better support effective intelligence-based decision-making and modern systems, is planned to be addressed through various means, including:

- working collaboratively with other organisations and sectors to build capability for data and information;
- generating intelligence from data and information from a wide range of sources, including remote sensing, media, social media and all other available sources;
- sharing data and information within and between agencies and other stakeholders to create a Decision Support System to use at incident, regional, state and national levels; and
- enhancing community understanding of risk and mitigation approaches by information exchange with communities through available and emerging technologies.

Interrelated with this is AFAC strategic direction number 5, for fire and emergency services to be informed by knowledge, innovation and research by strategies including: ensuring knowledge and information is collected, stored and made accessible across the sector; and enhancing evidence-based decision-making by using available data, information and research to improve outcomes. AFAC strategic direction number 6 calls for effective and transparent governance through clarity in information sharing that could lead to collaboration on evidence-based decision-making for strategic and transparent practices.

While the AIRS data dictionary may not be an explicit focus of the strategic work planned by AFAC through to 2026, it is a fundamental framework that underlies the systems to support useful and usable information that is key to these strategic areas. Therefore, it is possible that the use and integration with other systems and applications that is the focus of the strategic plan may provide additional insights that may help refine the fundamental framework in useful ways. Thus, it is suggested to maintain awareness of developments to be able to benefit for potential successes and lessons learned.

⁸¹ New South Wales Fire Brigades, 2002, *Annual Report 1999|2000*, ISSN 07292163, https://www.fire.nsw.gov.au/gallery/files/pdf/annual_reports/annual_report_1999_00.pdf

⁸² New South Wales Government, 2017, *Fire & Rescue NSW Annual Report 2016/17*, https://www.fire.nsw.gov.au/gallery/files/pdf/annual_reports/annual_report_2016_17.pdf

⁸³ Commonwealth of Australia, 2025, *Report on Government Services 2025*, Emergency management (part D), Produced by the Productivity Commission on behalf of the Steering Committee for the Review of Government Service Provision, <https://www.pc.gov.au/ongoing/report-on-government-services/2025/emergency-management>

⁸⁴ AFAC, 2017, *Landscape Fire Performance Measures Data Dictionary, Guideline Version 1.0*, AFAC Publication ID: 3057, <https://www.afac.com.au/insight/doctrine/article/current/landscape-fire-performance-measures-data-dictionary>

⁸⁵ Australian Government, 2022, *Report on Government Services 2022, Part D Emergency management, Section 9 Emergency services for fire and other events*, <https://www.pc.gov.au/ongoing/report-on-government-services/2022/data-downloads/rogs-2022-partd-section9-emergency-services-interpretative-material.pdf>

⁸⁶ AFAC, 2021, *Strategic Directions 2022- 2026*, Australasian Fire and Emergency Service Authorities Council, <https://www.afac.com.au/docs/default-source/network/afac-strategic-directions-2022-2026.pdf>

The International Organization for Standardization (ISO) published definitions for vocabulary to support the data collection for fire safety in 2020, as the technical specification ISO/TS 17755 Part 2⁸⁷; it was last reviewed and confirmed in 2024⁸⁸. ISO/TS 17755 Part 2 was developed to provide definitions for common terminology used in international and national fire statistics databases. The development of the harmonized definitions was based on the background work that is summarized in the technical report ISO/TR 17755⁸⁹, published in 2014. It was noted in the first edition of ISO/TS 17755 Part 2 that the development of a harmonized methodology for collecting fire statistics would be part of future work. At the time of preparation of this report, the work programme for the technical committee ISO/TC 92⁹⁰ includes:

- revisiting and updating the survey of national and international fire statistics practices (building on the 2014 version of ISO/TR 17755 to be a future Part 1 of the ISO 17755 series); and
- working on the design and implementation of fire incident data collection systems (a new part in the ISO 17755 series, Part 3).

As with other active work in this area, it is suggested to maintain awareness of the progress of the work on the ISO 17755 series.

In the United Kingdom, Reports on Primary Fire incidents data collection were introduced in 1994. The Incident Reporting System (IRS) was introduced with a web-enabled collection system in 2007⁹¹, in order to address various changes, including statutory responsibilities of the fire and rescue services, introduction of Integrated Risk Management Plans, and the need for a national network. The Government of the United Kingdom has published guidance on the IRS fire statistics definitions⁹² (that complements and does not replace the IRS manual) for those collecting the information. Additional guidance⁹³ was also developed for using the IRS to support the publication of incident information and is tailored to different types of datasets⁹⁴ that provides additional context on how variables are intended to be used when analysing the information. While the data-user guidance on the fire statistic definitions continues to be updated, the IRS manual has followed the system release versions and has been consistent since 2012.

The EU FireStat Project⁹⁵ suggested and defined a core set of fire standards that could be implemented across the EU. The EU FireStat Project Phase 1 final report summarized a proposed two-tier approach to a harmonization process for 14 variables that were identified as the highest priority to collect:

- First tier of eight proposed variables, which are seen as simpler to adopt by most jurisdictions and are estimated to require the least effort to harmonize;

⁸⁷ ISO, 2020, "Fire safety—Statistical data collection—Part 2: Vocabulary," ISO/TS 17755-2:2020(E), <https://www.iso.org/obp/ui/en/#iso:std:iso:ts:17755:-2:ed-1:v1:en>

⁸⁸ ISO, 2025, *Homepage for ISO/TS 17755-2:202, Fire safety – Statistical data collection, Part 2: Vocabulary*, <https://www.iso.org/standard/80067.html>

⁸⁹ ISO, 2014, "Fire safety—Overview of national fire statistics practices," ISO/TS 17755:2014(E), <https://www.iso.org/obp/ui/#iso:std:iso:tr:17755:ed-1:v1:en>

⁹⁰ ISO, 2025, *Technical committee work programme for standards by ISO/TC 92, Fire Safety*, <https://www.iso.org/committee/50492/x/catalogue/p/0/u/1/w/0/d/0>

⁹¹ GoUK: 2012, *Incident recording system—questions and lists, Version 1.6 (XML Schemas v1-0p)*, <https://assets.publishing.service.gov.uk/media/606302eee90e072d96eb3610/incident-recording-system-questions-and-lists-version-1.6-XML-Schemas-v1-0p-from-April-2012.pdf>

⁹² GoUK: 2024, *Guidance, Fire statistics definitions, (last updated October 2024)*, https://assets.publishing.service.gov.uk/media/5a78f3f940f0b62b22cbe1a8/Incident_Recording_System_-_Questions_and_Lists_-_Version_1.6_-_XML_Schemas_v1-0p_in_use_from_April_2012.pdf

⁹³ GoUK, 2021, *Publishing Incident Recording System data on the fire and rescue service at an incident level: Project overview*, <https://www.gov.uk/government/statistics/fire-statistics-incident-level-datasets/project-overview>

⁹⁴ GoUK, 2024, *Official Statistics, Fire statistics incident level datasets*.

⁹⁵ FireStat, E.U., 2022, "EU FireStat project: closing data gaps and paving the way for pan-European fire safety efforts," *Final Report*, <https://eufirestat-efectis.com/files/eufirestatproject-ET01223473AN1.pdf>

- Second tier of six proposed variables, which are seen to require more effort to implement.

The overall intent of this two-tier approach was that jurisdictions with relatively smaller collection system support could focus on the implementation of the first tier initially, and then while building capacity in a practical way, the second tier could be implemented later. For jurisdictions with collection systems with more robust support, both tiers might be implemented in the initial stage. All jurisdictions would be able to collect any other variables of interest, while those that choose to implement the tiers would be collecting information consistently.

There are limitations of the Phase 1 work of the EU FireStat Project in the context of potentially implementing the proposed framework, including:

- no jurisdiction had adopted the EU FireStat project set of fire standards at the time of the preparation of this report;
- the development was led primarily by end users of fire information, with others engaged through surveys;
- the two tiers address a total of only 14 harmonized variables, noting that each jurisdiction can collect other variables of interest in parallel; but there is no harmonization of the additional variables; and
- follow up stages of work were recommended; so monitoring of future plans and progress would be encouraged.

While there are some limitations of the proposed framework and development, the general concept of the adaptation of a tiered approach to allow flexibility for the range of Canadian jurisdictions poses a potential practical way for jurisdictions to consistently collect fire information.

5 A proposed application of a tiered approach for the Canadian context

Building on the concept of tiers of variables developed in the EU FireStat project⁹⁶ as a proposed framework, this section discusses a proposed adaptation and application of this within the Canadian context. This draft outlines a potential approach that could be used to inform and accelerate future discussions.

Overall, the potential application of a tiered approach to address the need for flexibility of each jurisdiction while supporting the consistency of the variables selected could take the form of:

- Tier 1 to address the highest priority of variables to implement;
 - Proposing a combination of variables in Tier 1 and 1A that may better form a single Tier 1
- Tier 2 to address the second highest priority of variables to implement, if the collection system and capacity is sufficient for implementation;
- additional tiers to address the remainder of NFID Data Dictionary⁹⁷ variables and any additional variables associated with emerging issues, where these optional tiers could be selected by jurisdictions.

This framework could be developed so that the tiers can be selected by each jurisdiction according to the interest and their systems, while supporting both flexibility and consistency of the information collected. For example:

⁹⁶ FireStat, E.U., 2022, "EU FireStat project: closing data gaps and paving the way for pan-European fire safety efforts," *Final Report*, <https://eufirestat-efectis.com/files/eufirestatproject-ET01223473AN1.pdf>

⁹⁷ Statistics Canada, 2017, *National Fire Information Database (NFID)*, Data Dictionary, Version 2.0, http://nfidcanada.ca/wp-content/uploads/2017/09/NFID-Data-Dictionary_final.pdf

- Tier 1 could be a mandatory tier, where the variables are selected based on priority to provide useful and practical information for comparison between jurisdictions. The variables would be selected with consideration for the range of collection systems in the jurisdictions, to facilitate all jurisdictions to be able to implement them.
- Tier 2 could be the next mandatory tier. Jurisdictions with smaller collection systems could plan and work towards implementing in the future, while jurisdictions with more robust collection systems might immediately adopt both Tiers 1 and 2. Combined, the information collected for Tiers 1 and 2 would be the highest priority variables to implement for collection across all jurisdictions.
- Tier 3 and beyond would be optional, so jurisdictions could choose to implement all variables of the NFID Data Dictionary⁹⁸, or could select tiers of interest while continuing to build system capacity to implement others.

Any variable collected in the harmonized tiers would support data consistency. Additional tiers could be developed or refined in the future to address emerging issues and interests. Future proofing could be built into the way the tiered approach is developed and maintained.

A brief summary of the variables recommended for consideration for potential Tier 1 (combining the suggestions for Tiers 1 and 1A) and Tier 2 is provided in the following sections.

5.1 Potential Tier 1 variables for consideration for standardization

This section builds on the concept of the proposed Tier 1 variables in the EU FireStat Project⁹⁹ for consideration in the Canadian context.

The proposed Tier 1 variables for standardization are as follows:

- 1 – incident time
- 2 – incident date
- 3 – incident location
- 4 – number of fatalities
- 5 – number of injuries
- 6 – age of fatality
- 7 – act or omission (EU FireStat Project variable ‘primary causal factor’)
- 8 – property classification (EU FireStat Project variable ‘building type classification’)

The additional proposed Tier 1 variables, included as Tier 1A for consideration, are the following:

- fire safety features (EU FireStat Project variable ‘fire safety measures’)
- heat source
- item first ignited

5.2 Potential Tier 2 definitions for future consideration

This section looks at the remaining Tier 2 variables and classifications or code sets based on an adaptation of the EU’s FireStat Project¹⁰⁰ proposed framework. As these variables would take more effort to implement and would require further examination, they are recommended for future consideration.

⁹⁸ Statistics Canada, 2017, *National Fire Information Database (NFID)*, Data Dictionary, Version 2.0, http://nfidcanada.ca/wp-content/uploads/2017/09/NFID-Data-Dictionary_final.pdf

⁹⁹ FireStat, E.U., 2022, "EU FireStat project: closing data gaps and paving the way for pan-European fire safety efforts," *Final Report*, <https://eufirestat-efectis.com/files/eufirestatproject-ET01223473AN1.pdf>

¹⁰⁰ FireStat, E.U., 2022, "EU FireStat project: closing data gaps and paving the way for pan-European fire safety efforts," *Final Report*, <https://eufirestat-efectis.com/files/eufirestatproject-ET01223473AN1.pdf>

The remaining proposed variables for Tier 2 harmonization are as follows:

- building height (EU FireStat variable 'number of floors')
- area of origin
- flame and smoke spread (EU FireStat variable 'articles contributing to fire development')

6 Conclusion and next steps

This report provides a summary of the environmental scan of existing fire incident definitions and data fields used in Canada, and compares them against those used in the EU, the United Kingdom, Australia and the United States. In addition, the outputs from the recent EU FireStat Project¹⁰¹ that proposed a harmonized tiered approach for 14 variables that could be applied to the EU member states was also reviewed.

After the review of the proposed tiered approach that was developed by the EU FireStat Project and considering the potential flexibility and practicality for a range of jurisdictions, the report focuses on adapting a tiered approach for the Canadian context.

When considering the adaptation of the concept of using tiers, based on the proposed framework developed by the EU FireStat Project, an approach considering the Canadian context is proposed.

A set of tiered variables is proposed that closely corresponds to those proposed for harmonization by the EU FireStat Project. It differs from the proposed EU FireStat Project framework recommendations by proposing:

- additional variables for consideration to enhance the eight proposed variables and suggests a further three Tier 2 variables be elevated for Tier 1 consideration. These additional variables were referred to as Tier 1A in the report.
- the consideration of the tiered approach (e.g., Tier 3 and beyond) to address all remaining NFID Data Dictionary¹⁰² variables, including targeted topic tiers, to address emerging challenges that may be of interest to certain jurisdictions so that the tier could be developed and refined to support consistent collection of information when selected.

The summary of the proposed Tiers 1 and 2 for a Canadian context summary would provide a starting point that would facilitate and accelerate discussions between the Canadian jurisdictions. Such future discussions would refine the details of the potential use of tiers for a data standard developed through consensus.

Furthermore, while the EU FireStat Project proposed a framework to harmonize 14 variables for the EU jurisdictions, a tiered approach for the Canadian context could be adapted to:

- encompass all current NFID variables, so there is a clear path towards collecting all fire information variables in a harmonized way;
- develop additional future tiers that could address emerging areas that would allow jurisdictions to select these based on interest and the capacity of their systems, and any other jurisdiction that also selected that tier would be collecting fire information consistently, allowing for easier comparison across jurisdictions.

¹⁰¹ FireStat, E.U., 2022, "EU FireStat project: closing data gaps and paving the way for pan-European fire safety efforts," *Final Report*, <https://eufirestat-efectis.com/files/eufirestatproject-ET01223473AN1.pdf>

¹⁰² Statistics Canada, 2017, *National Fire Information Database (NFID)*, Data Dictionary, Version 2.0, http://nfidcanada.ca/wp-content/uploads/2017/09/NFID-Data-Dictionary_final.pdf

With Tiers 1 and 2 developed to consider the Canadian context and select the highest priority variables to align, Tiers 3 and beyond could be developed to address the remainder of NFID Data Dictionary¹⁰³ variables and any additional variables associated with emerging issues, where these optional tiers could be selected by jurisdictions. Furthermore, future proofing could be built into the way the tiered approach is developed and maintained.

Properly structured data standards would support ease of inclusion on emerging issues through evergreening, the ongoing review and the updating of standards to reflect the current landscape. A conscious approach to this would support alignment that would enable some jurisdictions to implement the collection of information on these emerging issues, while other jurisdictions could implement them at a later time, according to each jurisdiction's systems, capabilities, capacity and interests.

When establishing potential new data standards for the NFID, it is essential to consider historical data. Specifically, procedures to map, track or link historical variables and classifications from previous NFID versions and Canadian jurisdictions data collection systems are important considerations for any new NFID data standard developed. Thoughtful planning around data standards ensures continuity while facilitating data collection and adapting to emerging topics.

This summary report is intended to be a starting point to collect ideas and strategies to help accelerate discussions within Canada. Future work in this area is recommended to be developed through consensus, considering the perspectives of all the jurisdictions for data owners, collectors and users.

¹⁰³ Statistics Canada, 2017, *National Fire Information Database (NFID)*, Data Dictionary, Version 2.0, http://nfidcanada.ca/wp-content/uploads/2017/09/NFID-Data-Dictionary_final.pdf

Appendix A Glossary

Classification: a systematic grouping of the values that a variable can take comprising mutually exclusive classes, covering the full set of values, and often providing a hierarchical structure for aggregating data. More than one classification can be used to represent data for a given variable.

Code set: the numeric grouping, or classification, of the information.

Standard: a set of agreed-upon and documented guidelines, specifications, accepted practices, technical requirements, or terminologies for diverse fields. They can be mandatory or voluntary and are distinct from acts, regulations, and codes, although standards can be referenced in those legal instruments.

Variable: a characteristic of a statistical unit being observed that may assume more than one of a set of values to which a numerical measure or a category from a classification can be assigned.

Appendix B Consideration of variables for standardization

This section examines examples of selected variables for consideration for standardization. A subset was chosen from variables outlined in the tiered approach in [Section 5](#) of the report. The next steps will include a more detailed review and consultation on these, and all, variable definitions and their associated classifications.

B.1 Incident location

Geographic location information provides data for spatial analysis and is typical of the information collected for fire incident characteristics.

Canadian context

Incident location is not a standardized variable in the NFID Data Dictionary¹⁰⁴. It is generally observed to be collected by each jurisdiction participating in the NFID survey cycles. Typically, the incident location represents a city, municipality, town or village; however, there may be other location descriptions. The values indicated are those that are reported by the fire jurisdiction.

Currently, jurisdictions are asked to populate the municipality and the address of the incident, the address information being one record (e.g., suite, number, street, city) occurring on one line. This is observed to be associated with incomplete and inconsistent record entries, where support in collecting the information may reduce reporting burden and improve the accuracy of the data, resulting in the consistent collection of location and address information.

International context

The United States¹⁰⁵, United Kingdom¹⁰⁶ and Australia (Queensland)¹⁰⁷ each capture address information in separate fields, indicating the minimum fields that are mandatory for collection. The United States and Australia collect statistical local area information that can be cross-referenced to the U.S. Census Bureau and the Australian Bureau of Statistics' Standard Geographical Classification, respectively. A map grid is another means used to collect location information, with this being an optional field in the United States and mandatory in the United Kingdom collection systems. Australia has retired their map grid field and replaced it with collection by Global Positioning System (GPS) to record the latitude and longitude position of fire incidents.

Following the lead of both the United Kingdom and the United States, a consideration for the Canadian context could be that address information be parsed into separate fields to minimize user error and to allow cross-reference to other sources of data. To standardize the capture of 'non-addressable' information, fields such as 'Intersection; In front of; Rear of; Adjacent to; Directions' that are included in the United States model could be investigated as options to enhance data capture. GPS may be sourced as an alternate or an optional solution. While these

¹⁰⁴ Statistics Canada, 2017, *National Fire Information Database (NFID)*, Data Dictionary, Version 2.0, http://nfidcanada.ca/wp-content/uploads/2017/09/NFID-Data-Dictionary_final.pdf

¹⁰⁵ USFA, 2015, "National Fire Incident Reporting System 5.0 Complete Reference Guide," https://www.usfa.fema.gov/downloads/pdf/nfirs/nfirs_complete_reference_guide_2015.pdf

¹⁰⁶ GOV.UK, 2012, "Incident recording system—questions and lists, Version 1.6—(XML Schemas v1-0p)," <https://assets.publishing.service.gov.uk/media/606302eee90e072d96eb3610/incident-recording-system-questions-and-lists-version-1.6-XML-Schemas-v1-0p-from-April-2012.pdf>

¹⁰⁷ Queensland Government, 2021, "QFES Incident Meta Data, Block A Meta Data", *AFAC AIRS Instruction Manual - Block A-Complete for all Incidents*, <https://www.data.qld.gov.au/dataset/qfd-incident-data/resource/1ff2c5de-4f47-48fd-82e2-ec5b6f14e173>; and <https://www.data.qld.gov.au/ckan-opendata-attachments-prod/resources/1ff2c5de-4f47-48fd-82e2-ec5b6f14e173/maina-metadata.pdf?ETag=e13f03745dd5dfc1613859ca44f54889>

may be considered to be beneficial, reporting burden must always be balanced against record completion.

Why is the variable needed?

The current lack of standardization of the location variable lessens the confidence in the ability to produce an accurate, comprehensive and comparable geographic picture of fire incidents across the country. Standardization presents the opportunity to gain vital insights pertaining to fire location.

The ability to fill data gaps, including non-addressable locations, is becoming even more important as the built environment continues to change. For instance, homelessness has seen the emergence and growth of tent cities across the country. Without adequate data to track these dwellings, they will not be included in incident reporting, building inventories or in analysis for response planning. This runs the risk of inadequate or improper resource allocation.

Where people reside within Canada is an important factor. While Indigenous people are five times more likely than non-Indigenous people to die from a fire, that risk doubles when they live on reserve.¹⁰⁸

The accuracy of location information may allow for linking to other databases. For example, linking to Statistics Canada's census data can provide population counts at various levels of geography. Linking fire incidents to a particular level of geography, such as a census subdivision (CSD; a municipality), a census metropolitan area (CMA) or a census agglomeration (CA), allows for the analysis of the current geographic distribution of fires.¹⁰⁹

While location provides the geographic context to where fires occur, there is also a social component to these locations. Geospatial analysis allows for demographic and socio-economic information factors to be integrated so that the relationship between the location of the fire and other underlying factors can be spatially examined.

Factors such as housing density, the size of a population and its composition contribute to fires in population centres,¹¹⁰ while rural areas have the contributing factors of a higher number of older and vacant properties, the use of gas/space heaters,¹¹¹ and the potential distance from firefighting resources to increase the risk of fatalities from residential fires.¹¹² The collection of accurate location information in a national database would support communities that fall in these areas, providing services and resources tailored to them to reduce fire losses in the future.

In summary, the creation of a standardized incident location variable will fill data gaps and enable a complete demographic profile. The underlying risks and causes of fire incidents tied to the socio-economic aspect of an area will be available through linkages to Census of Population data. The more complete the incident location information, the richer the demographic profiles

¹⁰⁸ Nation Talk, 2024, *Indigenous Health Today*, <https://ihtoday.ca/new-study-shows-that-indigenous-peoples-across-canada-are-between-5-and-17-times-more-likely-to-die-in-a-fire-compared-to-the-rest-of-the-population/> (accessed April 22, 2024)

¹⁰⁹ Beaulieu, E., Smith, J., Zheng, A. et al., 2020, "The geographic and demographic distribution of residential fires, related injuries, and deaths in four Canadian provinces," *Can J Public Health* 111, 107-116, <https://doi.org/10.17269/s41997-019-00256-7>

¹¹⁰ Beaulieu, E., Smith, J., Zheng, A. et al., 2020, "The geographic and demographic distribution of residential fires, related injuries, and deaths in four Canadian provinces," *Can J Public Health* 111, 107-116, <https://doi.org/10.17269/s41997-019-00256-7>

¹¹¹ Clare, J., & Kelly, H., 2017, *Fire and at risk populations in Canada analysis of the Canadian National Fire Information Database*. Retrieved from <https://cjr.ufv.ca/wp-content/uploads/2018/04/Murdoch-University-Fire-and-at-Risk-Populations.pdf>

¹¹² Jowett, A. J., 2015, Urban, rural and in-between - fire rescue. *Fire Rescue Magazine*, <https://www.firefighternation.com/firefighting/urban-rural-and-in-between/>

for the area. This may help to predict and prevent fires in areas with similar spatial and socio-demographic characteristics.

B.2 Number of fatalities

While the first three proposed Tier 1 variables involve incident characteristics (time, date and location), the number of fatalities (or deaths) is a fire casualty characteristic of fire incidents.

Canadian context

The number of fatalities represents the total number of persons (civilians or firefighters) who were victims of a single fire incident.^{113,114}

Using the language from the NFID Data Dictionary¹¹⁵, fire deaths are defined as:

- a fire death (civilian):
 - A person (i.e., civilian or non-firefighter) “...killed accidentally as a direct result of a fire or a person who died from a fire injury within one year following the date on which the injury was sustained, providing the person was not a member of a fire department”.
- a death involving fire (civilian):
 - “A person who was in a place where fire occurred, but who may have died from a cause other than the fire itself (e.g., a person who dies in an automobile accident where the vehicle catches fire prior to death, a suicide by burning or asphyxia, an incendiary fire set for the specific reason of killing).”
 - Noting that “... [a] person who dies from burns or asphyxia in a vehicle as a result of a collision is NOT considered a fire death. A person who dies by accident as a result of an incendiary fire is considered to be a fire death.”
 - “When there is doubt about suicide or murder, the person has been classified as a fire death.”
- a fire action death (firefighter):
 - “A member of a fire department killed accidentally while in the process of fighting a fire or who died from a fire action injury within one year following the date on which the injury was sustained.”
 - Noting that “...[a] firefighter killed as a result of an accident while en route to or returning from the scene of an actual fire or who died from an injury received in such an accident, is considered to be a fire action death.”

The NFID produces two datasets: one for incident information and one for victim information. These data sets are linked using the ‘Incident ID’ variable. The number of fatalities variable is part of the fire incident information data set. Details of each person who is a casualty of a fire incident would be part of the victim data set, where data is collected in a separate form for each person.

Firefighters fill in casualty reports at the scene of a fire incident. It is important to consider the burden of information collection when filling in these reports, as the accuracy of the information captured is critical. As such, clear guidance is important for reducing input errors and aiding

¹¹³ Statistics Canada, 2017, *National Fire Information Database (NFID)*, Data Dictionary, Version 2.0, http://nfidcanada.ca/wp-content/uploads/2017/09/NFID-Data-Dictionary_final.pdf

¹¹⁴ Statistics Canada, 2017, *National Fire Information Database (NFID)*, User Guide, http://nfidcanada.ca/wp-content/uploads/2017/09/NFID-User-Guide_CAFRC_July-2017-1.pdf

¹¹⁵ Statistics Canada, 2017, *National Fire Information Database (NFID)*, Data Dictionary, Version 2.0, http://nfidcanada.ca/wp-content/uploads/2017/09/NFID-Data-Dictionary_final.pdf

quality assurance. There may also be opportunities to link to other databases, which may be useful in supporting consistent and accurate information collection after the time of the fire incident.

The NFID cautions that fire incident reporting is not consistent, which results in an unknown level of under-reporting across the country.¹¹⁶

Caution should be applied when relying solely on the Canadian Coroner Medical Examiner Database's ICD-10 categories to classify fire deaths. The EU FireStat Project¹¹⁷ identified areas of possible discrepancy between what was reported on fire incident reports and the ICD-10 categories used on death certificates. For instance, uncertainty can occur in areas such as classifying deaths from suicide or vehicle deaths.¹¹⁸ Additionally, a Swedish study¹¹⁹ showed that using a national database as a primary source of information for fire fatalities resulted in them being underestimated by 20% when matched against data from three national sources which included information from death registries. The authors of the study concluded that the only way to get adequate data is to use more than one source.

International context

The United States^{120,121}, the United Kingdom¹²², Australia¹²³ (Queensland¹²⁴), and ISO/TS 17755 Part 2¹²⁵ all collect information on fire fatalities and is proposed in the EU FireStat Project¹²⁶ framework. The EU FireStat Project definition of fire fatalities refers to the initial count of fatalities. The definition proposed by the EU FireStat Project follows the United States recommendation of a one-year time frame for death from injuries occurring from fire incidents (and is also consistent with the NFID Data Dictionary¹²⁷ definition, as described in the previous section). The duration and what is considered a fire death differs by country.

Fire fatalities in the United States are captured on death certificates through coroners or vital records. In Australia, information on fire fatalities is now sourced from the Australian Bureau of Statistics (ABS).

Why is the variable needed?

The number of fire fatalities is a key indicator in helping to understand the effectiveness of prevention programs, resources and training, and to inform the development or refinement of such programs and plans. Clear guidelines are important in supporting consistent collection of

¹¹⁶ Statistics Canada, 2017, *National Fire Information Database (NFID)*, Data Dictionary, Version 2.0, http://nfidcanada.ca/wp-content/uploads/2017/09/NFID-Data-Dictionary_final.pdf

¹¹⁷ FireStat, E. U., 2021, "EU FireStat Project-Final report Task 0," *Diagnostic*, https://eufirestat-efectis.com/files/20210315_Task0_Report.pdf

¹¹⁸ FireStat, E. U., 2021, "EU FireStat Project-Final report Task 0," *Diagnostic*, https://eufirestat-efectis.com/files/20210315_Task0_Report.pdf

¹¹⁹ Jonsson A, et al., 2015, "Assessing the number of fire fatalities in a defined population," *Journal of Safety Research*, vol 55, pp. 99-103. <https://doi.org/10.1016/j.jsr.2015.10.001>

¹²⁰ USFA, 2023, National Emergency Response Information System, *DRAFT Incident Schema V0.1*.

¹²¹ USFA National Fire Data Center, 2015, "National Fire Incident Reporting System 5.0 Complete Reference Guide."

¹²² GOV.UK, 2012, "Incident recording system—questions and lists, Version 1.6—(XML Schemas v1-0p)."

¹²³ FireStat, E. U. "EU FireStat Project-Final report Task 0," *Diagnostic*. (2021)

¹²⁴ Commonwealth of Australia, 2021, "Block A-Complete for all Incidents", *AFAC AIRS Instruction Manual*, <https://www.data.qld.gov.au/ckan-opendata-attachments-prod/resources/1ff2c5de-4f47-48fd-82e2-ec5b6f14e173/maina-metadata.pdf?ETag=e13f03745dd5dfc1613859ca44f54889> (accessed April 25, 2024)

¹²⁵ International Organization for Standardization (ISO), 2020, "Fire safety—Statistical data collection—Part 2: Vocabulary," ISO/TS 17755-2:2020(en), <https://www.iso.org/obp/ui/en/#iso:std:iso:ts:17755:-2:ed-1:v1:en>

¹²⁶ Ahrens, Marty, et al., 2022, "EU FireStat project: closing data gaps and paving the way for pan-European fire safety efforts," *Final Report*.

¹²⁷ Statistics Canada, 2017, *National Fire Information Database (NFID)*, Data Dictionary, Version 2.0, http://nfidcanada.ca/wp-content/uploads/2017/09/NFID-Data-Dictionary_final.pdf

information that would provide complete data for jurisdictions and that could be used to establish a comprehensive national picture.

Robust data would contribute to supporting better socio-economic profiles to focus citizen education programs. Accurate and timely numbers of fire death data could be used to help inform guidance for fire safety and prevention measures, including public education and awareness programs, and/or firefighting equipment requirements and new protocols used to prevent future fatalities.

B.3 Property classification

When collecting the description of the property where a fire occurred, it is acknowledged that it can be difficult to determine the type of use made of the area within a building. There may be many different uses, activities and/or occupancies within a building, structure or other facility where a fire has occurred.

Starting with the Canadian context, the property classification is used in combination with the major occupancy variable. Related variables are also briefly described to help provide a more holistic concept of the range of variables, so that the relative importance of certain variables can be better discussed.

Canadian context

In the NFID Data Dictionary¹²⁸, two primary variables (each with associated variables providing more detail) are used to capture the type of use(s) present in the building, structure or facility and in the area where the fire occurred.

The major occupancy variable captures the overriding (or major) use of a building, structure or facility that is under a single management and has two or more uses. If there is only one major occupancy type for the building, the entry identifies this, capturing details of residential types of occupancies and using a classification to identify all other single occupancy type buildings. There is also a classification for buildings that have multiple occupancy types, but none are major. The grouped variable, major group occupancy, provides classifications for ten general categories of the occupancy type of the building, structure or facility. These two related variables provide some insight into the complexity of different types of uses, activities and occupancies in the building where the fire occurred.

The property classification variable captures the type of use of the area where the fire occurred within the building, structure or facility. If two or more areas within a building are involved in the fire, the type of use where the fire originated is reported. The grouped variable, property classification group, provides classifications for ten categories. An additional variable, property classification subgroup, has classifications that expand on the ten basic grouped categories in property classification group, but does not provide as much detail as the classifications of the property classification variable. These three related variables provide a picture of the use, occupancy or activity in the space where the fire occurred (or at least started) within the building.

There is general alignment between the NFID Data Dictionary classifications for the variables major occupancy, major group occupancy and property classification group, and the list of

¹²⁸ Manes, Martina, et al., 2023, "Closing Data Gaps and Paving the Way for Pan-European Fire Safety Efforts: Part I—Overview of Current Practices for Fire Statistics," *Fire Technology* 59(4), pp. 1925-1968, <https://link.springer.com/article/10.1007/s10694-023-01408-5>

occupancies used in the National Model Codes¹²⁹, as applicable to the design and construction of buildings. While there is still general alignment with categories of classifications for the property classification and property classification subgroup variables, there is more detail of the use and activities in spaces in the classifications. It is recommended to consider alignment where possible, to link information in municipal or local building databases, so that the major occupancies and lists of intended uses and activities might be pre-populated or provide a more convenient list for selection when reporting for a fire incident.

The details of the classifications for property classification are extensive, with approximately 10 major categories, up to 10 sub-categories, and each with up to 10 classifications. The property classification subgroup variable provides an example of detail on properties with a more manageable number of classifications that could be selected to reduce the reporting burden for firefighters, when compared to the property classification variable. The City of Winnipeg, for instance, utilizes quick reference guides¹³⁰ that summarize the most common response codes for building, property, and vehicle fires.

International context

The majority of EU member countries¹³¹, the United States^{132,133}, the United Kingdom¹³⁴ and Australia (Queensland)¹³⁵ collect information related to the classification of the uses, activities and occupancies in a building and in the space where the fire started within a building, structure or facility, but each system has their own variables and classifications. The EU FireStat Project¹³⁶ also proposed the variable ‘type of building’, which is based on the Eurostat¹³⁷ classification of types of construction, including residential, non-residential (such as public and industrial buildings), buildings under construction and maps to the section, division, group and class of the Eurostat. It is used to collect information about the type of building where the fire occurred. Similarly, technical standard ISO/TS 17755 Part 2¹³⁸ also has definitions for types of properties, such as dwelling fires, home fires, or residential fires.

¹²⁹ National Model Codes; for example, the National Building Code of Canada 2020: CCBFC, 2020, *National Building Code of Canada, Volume 1*, <https://nrc-publications.canada.ca/eng/view/ft/?id=515340b5-f4e0-4798-be69-692e4ec423e8>

¹³⁰ City of Winnipeg, 2016, *Fire reporting code chart – Winnipeg*, https://firecomm.gov.mb.ca/docs/stats_code_chart_2016.pdf

¹³¹ FireStat, E.U., 2022, "EU FireStat project: closing data gaps and paving the way for pan-European fire safety efforts," *Final Report*, <https://eufirestat-efectis.com/files/eufirestatproject-ET01223473AN1.pdf>

¹³² USFA National Fire Data Center, 2015, "National Fire Incident Reporting System 5.0 Complete Reference Guide." https://www.usfa.fema.gov/downloads/pdf/nfirs/nfirs_data_analysis_guidelines_issues.pdf

¹³³ USFA, 2023, National Emergency Response Information System, *DRAFT Incident Schema V0.1*.

¹³⁴ GOV.UK, 2012, "Incident recording system—questions and lists. Version 1.6—(XML Schemas v1-0p)," <https://assets.publishing.service.gov.uk/media/606302eee90e072d96eb3610/incident-recording-system-questions-and-lists-version-1.6-XML-Schemas-v1-0p-from-April-2012.pdf>

¹³⁵ Queensland Government, 2021, "QFES Incident Meta Data, Block A Meta Data", *AFAC AIRS Instruction Manual - Block A-Complete for all Incidents*, <https://www.data.qld.gov.au/dataset/qfd-incident-data/resource/1ff2c5de-4f47-48fd-82e2-ec5b6f14e173>; and <https://www.data.qld.gov.au/ckan-opendata-attachments-prod/resources/1ff2c5de-4f47-48fd-82e2-ec5b6f14e173/maina-metadata.pdf?ETag=e13f03745dd5dfc1613859ca44f54889>

¹³⁶ FireStat, E.U., 2022, "EU FireStat project: closing data gaps and paving the way for pan-European fire safety efforts," *Final Report*, <https://eufirestat-efectis.com/files/eufirestatproject-ET01223473AN1.pdf>

¹³⁷ Eurostat, 2024, *Statistics Explained, Glossary: Classification of types of construction (CC)*, [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Classification_of_types_of_construction_\(CC\)](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Classification_of_types_of_construction_(CC))

¹³⁸ ISO, 2020, "Fire safety—Statistical data collection—Part 2: Vocabulary," ISO/TS 17755-2:2020(en), <https://www.iso.org/obp/ui/en/#iso:std:iso:ts:17755:-2:ed-1:v1:en>

There are also interpretation differences to consider, as not all countries define buildings in the same way. For instance, the EU FireStat Project¹³⁹ summaries of information for EU member countries notes that residences considered holiday homes in one country may not be in another country.

Where comparison with international data is of interest, concordances may be required to be developed for ease of comparison between a Canadian standard and classifications for the type of buildings or use, activities, and occupancies of the spaces within buildings where a fire occurs that are used by other countries.

Why is the variable needed?

As most reported fire incidents are residential in nature¹⁴⁰, the type of space where the fire occurred within a building, structure or facility is recommended as a key variable. This information is important to help analyses to inform whether:

- current building and fire codes, and system design, installation, testing and maintenance best practices for fire safety and protection are meeting expectations,
- improvement is necessary; or
- new trends are emerging.

Building practices, codes, prevention programs, behaviours and more influencing factors for fire starts, spread and outcomes change over time; therefore, alignment of the applicable construction technologies, code requirements and other factors with fire incident statistics over time is complex.

However, it is important to consider a holistic situation for the intended use of the information. For example, in the Alberta Fire Statistics Reporting Manual¹⁴¹, a balance is noted. That is, a good database, in combination with an appropriate analysis, can facilitate the identification and description of fires that might have developed differently or might not have occurred at all if certain building or fire code changes had been in place. However, no incident database can address all the subtleties of the impact of codes. It is also noted that data available for statistical analysis is foundational for the development and review of performance-based alternative solution designs.

Therefore, a holistic approach to how the information is intended to be used is recommended when considering a tiered approach, particularly for the selection and the prioritization of variables to describe where within the building the fire occurred and information about the structure (e.g., type of building, general construction, year of construction, building height, building floor area, what systems and detection is present and operational). Specifically, consider what variable(s) would provide a useful and practical balance in relation to building and fire codes and construction technologies, and consider the prioritization of these variables in the context of a tiered framework to transparently identify the consistency and flexibility of the conscious design of mandatory and optional tiers. Furthermore, it is also recommended to

¹³⁹ FireStat, E.U., 2022, "EU FireStat project: closing data gaps and paving the way for pan-European fire safety efforts," *Final Report*, <https://eufirestat-efectis.com/files/eufirestatproject-ET01223473AN1.pdf>

¹⁴⁰ Statistics Canada, 2023, "Fire incidents increase during the pandemic", <https://www150.statcan.gc.ca/n1/daily-quotidien/230608/dq230608a-eng.htm>

¹⁴¹ Alberta Government, 2006, Fire Statistics Reporting Manual (Revised 2006), <https://open.alberta.ca/dataset/8064b4f3-1549-47b9-a021-3ddda124e31b/resource/7fa15705-163d-4878-b209-fe464e358b06/download/3773608-2006-fire-statistics-reporting-manual.pdf>

review how the classifications for each variable align with building and fire codes, practices, prevention programs and more that would want to be explored using the collected information.

B.4 Features and benefits of standardization

Standardization brought about through the insight of provincial and territorial partnerships will create consistency in reporting guides, user manuals and training material to help ensure quality data. Guidelines will be produced demonstrating best practices for processes and procedures, as not all jurisdictions will be at the same level when implementing collection systems. Reducing data gaps will make it possible to compile more robust fire statistics on topics of interest or concern, while the enhanced compatibility that standardization brings will provide the opportunity to produce comparable information nationally.

Appendix C Acknowledgements

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