

NFPA® 950

Standard for Data Development and Exchange for the Fire Service

2015 Edition



NFPA®, 1 Batterymarch Park, Quincy, MA 02169-7471, USA
An International Codes and Standards Organization

IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA® STANDARDS

NOTICE AND DISCLAIMER OF LIABILITY CONCERNING THE USE OF NFPA STANDARDS

NFPA® codes, standards, recommended practices, and guides (“NFPA Standards”), of which the document contained herein is one, are developed through a consensus standards development process approved by the American National Standards Institute. This process brings together volunteers representing varied viewpoints and interests to achieve consensus on fire and other safety issues. While the NFPA administers the process and establishes rules to promote fairness in the development of consensus, it does not independently test, evaluate, or verify the accuracy of any information or the soundness of any judgments contained in NFPA Standards.

The NFPA disclaims liability for any personal injury, property or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, or reliance on NFPA Standards. The NFPA also makes no guaranty or warranty as to the accuracy or completeness of any information published herein.

In issuing and making NFPA Standards available, the NFPA is not undertaking to render professional or other services for or on behalf of any person or entity. Nor is the NFPA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances.

The NFPA has no power, nor does it undertake, to police or enforce compliance with the contents of NFPA Standards. Nor does the NFPA list, certify, test, or inspect products, designs, or installations for compliance with this document. Any certification or other statement of compliance with the requirements of this document shall not be attributable to the NFPA and is solely the responsibility of the certifier or maker of the statement.

REMINDER: UPDATING OF NFPA STANDARDS

Users of NFPA codes, standards, recommended practices, and guides (“NFPA Standards”) should be aware that NFPA Standards may be amended from time to time through the issuance of Tentative Interim Amendments or corrected by Errata. An official NFPA Standard at any point in time consists of the current edition of the document together with any Tentative Interim Amendment and any Errata then in effect.

In order to determine whether an NFPA Standard has been amended through the issuance of Tentative Interim Amendments or corrected by Errata, visit the Document Information Pages on NFPA’s website. The Document Information Pages provide up-to-date, document specific information including any issued Tentative Interim Amendments and Errata.

To access the Document Information Page for a specific NFPA Standard, go to <http://www.nfpa.org/docinfo> to choose from the list of NFPA Standards or use the search feature on the right to select the NFPA Standard number (e.g., NFPA 101). In addition to posting all existing Tentative Interim Amendments and Errata, the Document Information Page also includes the option to sign-up for an “Alert” feature to receive an email notification when new updates and other information are posted regarding the document.

IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA® STANDARDS

ADDITIONAL NOTICES AND DISCLAIMERS

Updating of NFPA Standards

Users of NFPA codes, standards, recommended practices, and guides (“NFPA Standards”) should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of Tentative Interim Amendments or corrected by Errata. An official NFPA Standard at any point in time consists of the current edition of the document together with any Tentative Interim Amendments and any Errata then in effect. In order to determine whether a given document is the current edition and whether it has been amended through the issuance of Tentative Interim Amendments or corrected through the issuance of Errata, consult appropriate NFPA publications such as the National Fire Codes® Subscription Service, visit the NFPA website at www.nfpa.org, or contact the NFPA at the address listed below.

Interpretations of NFPA Standards

A statement, written or oral, that is not processed in accordance with Section 6 of the Regulations Governing the Development of NFPA Standards shall not be considered the official position of NFPA or any of its Committees and shall not be considered to be, nor be relied upon as, a Formal Interpretation.

Patents

The NFPA does not take any position with respect to the validity of any patent rights referenced in, related to, or asserted in connection with an NFPA Standard. The users of NFPA Standards bear the sole responsibility for determining the validity of any such patent rights, as well as the risk of infringement of such rights, and the NFPA disclaims liability for the infringement of any patent resulting from the use of or reliance on NFPA Standards.

NFPA adheres to the policy of the American National Standards Institute (ANSI) regarding the inclusion of patents in American National Standards (“the ANSI Patent Policy”), and hereby gives the following notice pursuant to that policy:

NOTICE: The user’s attention is called to the possibility that compliance with an NFPA Standard may require use of an invention covered by patent rights. NFPA takes no position as to the validity of any such patent rights or as to whether such patent rights constitute or include essential patent claims under the ANSI Patent Policy. If, in connection with the ANSI Patent Policy, a patent holder has filed a statement of willingness to grant licenses under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, copies of such filed statements can be obtained, on request, from NFPA. For further information, contact the NFPA at the address listed below.

Law and Regulations

Users of NFPA Standards should consult applicable federal, state, and local laws and regulations. NFPA does not, by the publication of its codes, standards, recommended practices, and guides, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Copyrights

NFPA Standards are copyrighted. They are made available for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of safe practices and methods. By making these documents available for use and adoption by public authorities and private users, the NFPA does not waive any rights in copyright to these documents.

Use of NFPA Standards for regulatory purposes should be accomplished through adoption by reference. The term “adoption by reference” means the citing of title, edition, and publishing information only. Any deletions, additions, and changes desired by the adopting authority should be noted separately in the adopting instrument. In order to assist NFPA in following the uses made of its documents, adopting authorities are requested to notify the NFPA (Attention: Secretary, Standards Council) in writing of such use. For technical assistance and questions concerning adoption of NFPA Standards, contact NFPA at the address below.

For Further Information

All questions or other communications relating to NFPA Standards and all requests for information on NFPA procedures governing its codes and standards development process, including information on the procedures for requesting Formal Interpretations, for proposing Tentative Interim Amendments, and for proposing revisions to NFPA standards during regular revision cycles, should be sent to NFPA headquarters, addressed to the attention of the Secretary, Standards Council, NFPA, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101; email: stds_admin@nfpa.org

For more information about NFPA, visit the NFPA website at www.nfpa.org. All NFPA codes and standards can be viewed at no cost at www.nfpa.org/freeaccess.

Copyright © 2014 National Fire Protection Association®. All Rights Reserved.

NFPA® 950

Standard for

Data Development and Exchange for the Fire Service

2015 Edition

This edition of NFPA 950, *Standard for Data Development and Exchange for the Fire Service*, was prepared by the Technical Committee on Data Exchange for the Fire Service. It was issued by the Standards Council on November 11, 2014, with an effective date of December 1, 2014.

This edition of NFPA 950 was approved as an American National Standard on December 1, 2014.

Origin and Development of NFPA 950

In 2007, at the recommendation of the late Bill McCammon, NFPA Treasurer, a letter was advanced by the Metro Fire Chiefs Association (a joint section of the NFPA and the IAFC) and signed by six of the major international fire service organizations, requesting that the NFPA Standards Council embark on an effort to develop a standard on “data exchange” for fire departments.

As described in the letter, the purpose of the new standard would be to enable a higher level of technology penetration in the fire service to enhance data sharing and analytic capability. The issue was framed to support effective communication and information management on a routine basis and to enhance situational awareness before, during, and after disasters. This information exchange need was identified as particularly critical with respect to the following:

- (1) The ability to exchange geographic information between local systems and evolving regional and national systems to support such functions as vulnerability/risk assessment and coordinated incident management
- (2) The requirements of evolving mutual aid and resource exchange programs
- (3) The requirements for participation in systems designed to monitor local, regional, and national preparedness levels during times of high risk
- (4) Fire and emergency service access to and utilization of critical infrastructure data collected and distributed through national systems

The effort was initiated to enhance the analysis of organizations, promote exchange of concepts and data development, focus on GIS systems efforts with an industry-wide perspective rather than a “one-off,” per-organization approach, and streamline and maintain comprehensive inducements to invest in data systems for the digital age.

Solicitation of members was approved by the Standards Council, and subsequent industry-wide response created the membership necessary to draft code-type and scope documents. Efforts by that group at the initial meeting, held at the IAFC headquarters in Fairfax, Virginia, resulted in the Standards Council creating a committee and approving efforts to create a standard on Fire Service Data Exchange (NFPA 950) in 2008.

The new Technical Committee, Data Exchange for the Fire Service, met several times between November 2008 and February 2011 and produced a draft, approved by the Standards Council, to go out for public input in the Fall 2014 cycle. The 2015 edition is the inaugural edition of NFPA 950.

Technical Committee on Data Exchange for the Fire Service

Edward P. Plaugher, *Chair*

International Association of Fire Chiefs, SC [E]
Rep. International Association of Fire Chiefs

Andrew D. Bailey, U.S. Department of Interior, ID [E]

Talbot J. Brooks, Delta State University, MS [SE]

Eugene P. Cieri, Emergency Logistical Assessments, LLC, CT [SE]

Leandro E. Cieri, City of Hartford Fire Department, CT [U]

Ron G. Corona, Los Angeles City Fire Department, CA [U]

Jeffrey P. Hartberger, Hilton Head Island Fire Rescue, SC [U]

Vickie Hodges, State Farm Insurance Companies, IL [I]

Sarah Ierley, Montgomery County Fire & Rescue Service, MD [E]

Louis A. LaVecchia, Milford, CT [SE]

Crystal McDuffie, APCO International, FL [SE]
Rep. Association of Public-Safety Communications
Officials International Inc.

James Middleton, Mariposa County Fire Department, CA [U]

Rep. Volunteer & Combination Officers Section

Jonathan W. Moore, International Association of Fire
Fighters, DC [L]

Paul Morgan, Alameda County Regional Emergency
Communication Center, CA [E]

Kenneth A. Pravetz, City of Virginia Beach Fire
Department, VA [E]

Michael J. Price, Entrada/San Juan, Inc., WA [SE]

David A. Schmidt, Elgin Fire Department, IL [U]

Jennifer Schottke, ESRI, VA [M]

Robert W. Shoemaker, Insurance Services Office, Inc., NJ [I]

Paul Siebert, Frisco Fire Department, TX [E]

James C. Smalley, Scituate, MA [SE]
Rep. National Alliance for Public Safety GIS
Foundation

Christine Klingman Thies, City of Austin Fire
Department, TX [U]

Chris Tubbs, Mercer Island Fire Department, WA [U]

Michael D. Varney, State of Connecticut, CT [E]

Michael F. Weins, RCC Consultants, Inc., VA [SE]

Rep. Integrated Justice Information Systems Institute

Ty Wooten, National Emergency Number Association, VA [U]

Alternates

Thomas Dewey, Advanced Justice Systems, CA [SE]
(Alt. to M. F. Weins)

Jay English, APCO International, FL [SE]
(Alt. to C. McDuffie)

Russell G. Johnson, ESRI, CA [M]
(Alt. to J. Schottke)

Kevin P. Kuntz, Insurance Services Office, Inc., NJ [I]
(Alt. to R. W. Shoemaker)

Nathaniel J. Melby, Town of Campbell Fire Department,
WI [U]
(Alt. to J. Middleton)

Thomas R. Mueller, California University of
Pennsylvania, PA [SE]
(Alt. to T. J. Brooks)

Thomas M. O'Toole, International Association of Fire
Fighters, DC [L]
(Alt. to J. W. Moore)

Kimber Rosehille Pederson, U.S. Department of the
Interior, ID [E]
(Alt. to A. D. Bailey)

Jamilatu Zakari, Austin Fire Department, TX [U]
(Alt. to C. K. Thies)

Nonvoting

Marie E. Martinez, U.S. Department of Homeland
Security, MD [C]

Chris Farrell, NFPA Staff Liaison

This list represents the membership at the time the Committee was balloted on the final text of this edition. Since that time, changes in the membership may have occurred. A key to classifications is found at the back of the document.

NOTE: Membership on a committee shall not in and of itself constitute an endorsement of the Association or any document developed by the committee on which the member serves.

Committee Scope: This Committee shall have primary responsibility for documents that establish frameworks to 1) provide for the identification, development, management, and exchange of essential data; and 2) enhance an inter-operable geospatial data environment for fire and emergency services. This includes documents that establish criteria for and promote the exchange and use of data in common formats critical to the support for decision making in all phases of administration, planning, prevention, preparedness, mitigation, response, and recovery.

Contents

Chapter 1 Administration	950– 4	4.4 Application of the Standard	950– 6
1.1 Scope	950– 4	Chapter 5 Data Administration	950– 6
1.2 Purpose	950– 4	5.1 External Data	950– 6
1.3 Application	950– 4	5.2 Internal Data	950– 6
1.4 Equivalency	950– 4	5.3 Data Exchange	950– 7
1.5 New Technology	950– 4	Chapter 6 System and Data Design Standards	
Chapter 2 Referenced Publications	950– 4	(Scalable)	950– 7
2.1 General	950– 4	6.1 General	950– 7
2.2 NFPA Publications	950– 4	6.2 Addresses	950– 7
2.3 Other Publications	950– 4	6.3 Date and Time	950– 8
2.4 References for Extracts in Mandatory		6.4 Incident Typing Information	950– 8
Sections	950– 5	6.5 Text	950– 8
Chapter 3 Definitions	950– 5	6.6 Images and Video	950– 8
3.1 General	950– 5	6.7 CAD, RMS, CAD/CAD, CAD/RMS, and	
3.2 NFPA Official Definitions	950– 5	RMS/RMS Exchange	950– 8
3.3 General Definitions	950– 5	Annex A Explanatory Material	950– 8
Chapter 4 Processes	950– 6	Annex B Additional Resources (Reserved)	950– 8
4.1 General	950– 6	Annex C Informational References (Reserved)	950– 8
4.2 Acquisition	950– 6	Index	950– 9
4.3 Data Management	950– 6		

NFPA 950

Standard for

Data Development and Exchange

for the Fire Service

2015 Edition

IMPORTANT NOTE: This NFPA document is made available for use subject to important notices and legal disclaimers. These notices and disclaimers appear in all publications containing this document and may be found under the heading “Important Notices and Disclaimers Concerning NFPA Standards.” They can also be obtained on request from NFPA or viewed at www.nfpa.org/disclaimers.

NOTICE: An asterisk (*) following the number or letter designating a paragraph indicates that explanatory material on the paragraph can be found in Annex A.

A reference in brackets [] following a section or paragraph indicates material that has been extracted from another NFPA document. As an aid to the user, the complete title and edition of the source documents for extracts in mandatory sections of the document are given in Chapter 2 and those for extracts in informational sections are given in Annex C. Extracted text may be edited for consistency and style and may include the revision of internal paragraph references and other references as appropriate. Requests for interpretations or revisions of extracted text shall be sent to the technical committee responsible for the source document.

Information on referenced publications can be found in Chapter 2 and Annex C.

Chapter 1 Administration

1.1 Scope.

1.1.1* This standard is designed to standardize data for operable information sharing in support of the all-hazards response.

1.1.2 This standard describes a digital information structure and associated requirements and workflows common to fire and emergency services delivery and management for emergency response and administrative use.

1.2 Purpose.

1.2.1 The purpose of this document is to provide a standard framework for the development, management, and sharing of data for all-hazards response agencies and organizations.

1.2.2 This standard defines system structure, design, process and performance management, and data requirements to support the fire service and enable consistent and accurate data exchange between systems.

1.2.2.1 Standard data formats and other key attributes support the administration, planning, prevention, preparedness, mitigation, response, and recovery missions of local, state, and federal fire service operations and administration.

1.2.2.2 Data elements shall be enabled for geospatial attribution.

1.2.2.3 Data use shall be determined locally by the AHJ, including analytical and geospatial data use in decision making in an interoperable data environment.

1.3 Application.

1.3.1 This standard will leverage existing industry standards. Nothing herein is intended to restrict any jurisdiction from exceeding these minimum requirements.

1.4 Equivalency. Nothing in this standard is intended to prohibit the use of systems, methods, or approaches of equivalent or superior performance to those prescribed by this standard. Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.5 New Technology.

1.5.1 Nothing in this standard shall be intended to restrict new technologies or alternate arrangements, provided the level of compliance prescribed by this standard is met.

Chapter 2 Referenced Publications

2.1 General. The documents or portions thereof listed in this chapter are referenced within this standard, and shall be considered part of the requirements of this document.

2.2 NFPA Publications. National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 1026, *Standard for Incident Management Personnel Professional Qualifications*, 2014 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, 2013 edition.

2.3 Other Publications.

2.3.1 ISO Publications. International Organization for Standardization, ISO Central Secretariat, 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland.

ISO 19115, *Geographic information — Metadata*, 2003.

ISO 8879, *Information processing — Text and office systems — Standard Generalized Markup Language (SGML)*, 1986.

ISO 19136, *Geographic information — Geography Markup Language (GML)*, 2007.

ISO/IEC 14766, *Information technology — Telecommunications and information exchange between systems — Use of OSI applications over the Internet Transmission Control Protocol (TCP)*, 1997.

ISO/IEC FCD 24706, *Information technology — Metadata for technical standards*.

2.3.2 U.S. Government Publications. U.S. Government Printing Office, Washington, DC 20402.

National Fire Information Record System (NFIRS), version 5.0, January 1999.

Standard for Symbolology, Homeland Security Working Group, Federal Geographic Data Committee, July 2012.

Topographic Mapping *Standard for Symbolology*, U.S. Geological Survey, U.S. Department of the Interior.

United States National Grid Standard FGDC-STD-011-2001.

Federal Geographic Data Committee (FGDC), *United States Thoroughfare, Landmark, and Postal Address Data Standard (DRAFT)*, 2011.

2.3.3 Other Publications.

International Committee on Electromagnetic Safety (ICES) Data Backup Standard.



Merriam-Webster's Collegiate Dictionary, 11th edition, Merriam-Webster, Inc., Springfield, MA, 2003.

National Emergency Medical Services Information System (NEMSIS), version 3.3.1, February 2013.

National Oceanic and Atmospheric Administration, North American Datum of 1983 (NAD 83), National Geodetic Survey.

2.4 References for Extracts in Mandatory Sections.

NFPA 1026, *Standard for Incident Management Personnel Professional Qualifications*, 2014 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems*, 2013 edition.

Chapter 3 Definitions

3.1 General. The definitions contained in this chapter shall apply to the terms used in this standard. Where terms are not defined in this chapter or within another chapter, they shall be defined using their ordinarily accepted meanings within the context in which they are used. *Merriam-Webster's Collegiate Dictionary*, 11th edition, shall be the source for the ordinarily accepted meaning.

3.2 NFPA Official Definitions.

3.2.1* Approved. Acceptable to the authority having jurisdiction.

3.2.2* Authority Having Jurisdiction (AHJ). An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

3.2.3 Shall. Indicates a mandatory requirement.

3.2.4 Should. Indicates a recommendation or that which is advised but not required.

3.2.5 Standard. An NFPA Standard, the main text of which contains only mandatory provisions using the word “shall” to indicate requirements and that is in a form generally suitable for mandatory reference by another standard or code or for adoption into law. Nonmandatory provisions are not to be considered a part of the requirements of a standard and shall be located in an appendix, annex, footnote, informational note, or other means as permitted in the NFPA Manuals of Style. When used in a generic sense, such as in the phrase “standards development process” or “standards development activities,” the term “standards” includes all NFPA Standards, including Codes, Standards, Recommended Practices, and Guides.

3.3 General Definitions.

3.3.1 Acquisition. The process of creating, collecting or purchasing data for use in a system.

3.3.2 All-Hazards. Any incident or event, natural or human-caused, that warrants action to protect life, property, environment, public health, or safety, and to minimize disruption of government, social, or economic activities. [1026, 2014]

3.3.3 Attribute Data. Information about a geographic feature.

3.3.4 Audio Data. Auditory presentation of sounds stored as a file.

3.3.5 Computer Aided/Assisted Dispatch (CAD). A combination of hardware and software that provides data entry, makes resource recommendations, notifies and tracks those resources before, during, and after alarms, preserving records of those alarms and status changes for later analysis. [1221, 2013]

3.3.6 Conflation. The process or result of fusing items into one entity; fusion; amalgamation.

3.3.7 Data. The lowest fractional element from which information and then knowledge can be derived; as electronically acquired, captured, stored, queried, analyzed, or transmitted; electronic or computerized in nature.

3.3.8 Data Development. The act of capturing or improving by expanding, enlarging, or refining systems in the data environment.

3.3.9 Data Exchange. The structured transmission of data from one discrete system to another by electronic means.

3.3.10 Data Sharing (Information). The act of exchanging electronic information.

3.3.11 Database Audit. The process of monitoring access to and modification of database objects and resources, including the documentation of sources and any subsequent custody changes.

3.3.12 Deflation. The partitioning of one data group into smaller blocks or units of data.

3.3.13 Extensible Markup Language (XML). A document markup language containing structured information.

3.3.14 External Data. Data acquired from and/or maintained by an outside source.

3.3.15* Geography Markup Language Encoding Standard (GML). Extensible Markup Language (XML) schema for expressing geographical features.

3.3.16 Geospatial/Spatial. Pertaining to the location and dimensions of geographic entities which may be represented in a geographic context.

3.3.17 Image Data. Visual representation of an object, scene, person, or abstraction produced on a surface.

3.3.18 Interchange. The act of replacing one data item with another.

3.3.19 Internal Data. Data captured, created and/or maintained by the AHJ's computing systems.

3.3.20 Line Data. Represented by a series of connected points (nodes or vertices).

3.3.21 Logical Security. Security protocols preventing unauthorized access to systems and/or data.

3.3.22 Metadata. A detailed description of content and context of the data being exchanged.

3.3.23 Nonspatial Data. Data lacking a spatial component.

3.3.24 Performance Management. Oversight of process management to ensure that the ensemble of activities consistently meet organizational goals in an effective and efficient manner.

3.3.25 Physical Security. Protection that encompasses the areas containing system hardware, locations of wiring used to connect the systems, support services, backup provisions, and any other parts of systems.

3.3.26 Point Data. Data that can be represented by a single coordinate set.

3.3.27 Polygon Data. Data represented by a series of connected points (nodes or vertices) that form a closed loop.

3.3.28 Process Management. Ensemble of activities to ensure that data and process goals are consistently being met in an effective and efficient manner.

3.3.29 Raster Data. A spatial data type that defines space as an array of equally sized cells arranged in rows and columns and composed of single or multiple bands.

3.3.30 Records Management System (RMS). A system that stores and organizes records to facilitate data-driven decisions.

3.3.31 System Development. The creation of a system or interoperable system of systems designed to exchange data, use, or visualize data.

3.3.32 System Security. The protection of hardware, software, networks, and data from physical and logical events that could cause serious loss or damage to an enterprise, agency, or institution. This includes, but is not limited to, protection from fire, natural disasters, burglary, theft, vandalism, terrorism, intrusion, or cyber attack.

3.3.33 Text Data. Data limited to display as ASCII characters.

3.3.34 Transmission Control Protocol/Internet Protocol (TCP/IP). The set of communications rules used for wired and wireless networks.

3.3.35 Triangulated Irregular Network (TIN). A vector data structure that partitions geographic space into contiguous, nonoverlapping triangles.

3.3.36 United States National Grid Standard (USNG). An alphanumeric referencing system derived from the Military Grid Reference System (MGRS) that has been overlaid on the Universal Transverse Mercator (UTM) numerical grid.

3.3.37 Vector Data. Spatial information that can be geographically represented as a point, line, or polygon with accompanying attribute data.

Chapter 4 Processes

4.1* General. This chapter establishes requirements for data acquisition, management, and sharing of data as it pertains to fire and emergency services functions.

4.2 Acquisition. Data elements referenced within this standard shall be captured and updated on a regular basis as per requirements set forth in Chapters 5 and 6.

4.3 Data Management. Policies and procedures shall be in place to support data elements within this chapter:

4.3.1 Policies and procedures shall ensure the integrity, security, and accuracy of data pertinent to the scope of this standard and in accordance with Chapters 5 and 6.

4.3.2 Policies and procedures shall include a method for validating the successful transfer of data through the use of a checksum or similar error checking methodology to ensure data integrity during the exchange.

4.3.3 Policies and procedures shall ensure the timeliness of data supporting fire and emergency services covered by the scope of this standard and in accordance with Chapters 5 and 6.

4.3.4 Policies and procedures shall ensure that a spatial component is included with each appropriate piece of data covered by the scope of this standard and in accordance with Chapters 5 and 6.

4.3.4.1 The horizontal precision of all well-defined features shall be depicted in data sources at an accuracy no less than 10 m (33 ft).

4.3.5 Policies and procedures shall provide metadata for all data covered by the scope of this standard and in accordance with Chapters 5 and 6.

4.4* Application of the Standard.

4.4.1 Data elements under the authority of this standard shall consist of the following categories:

- (1) Spatial
 - (a) Vector
 - (b) Raster
 - (c) Triangulated Irregular Network (TIN)
- (2) Nonspatial
 - (a) Text
 - (b) Image
 - (c) Audio
 - (d) Video

4.4.2* Processes associated with data acquisition, management, or exchange to accomplish conflation, deflation, or interchange of data to or from one or more sources or applications shall meet the elements required in Chapter 5 and 6.

Chapter 5 Data Administration

5.1 External Data. Policies that describe acquisition, management, and application of external data shall be established and reviewed annually.

5.2 Internal Data. Policies shall be established and reviewed annually that describe acquisition, management, and application of internal data.

5.2.1 At a minimum, policy shall meet the requirements (all categories) for quality assurance and control, system and data security, and physical and logical security as given in 5.2.1.1 through 5.2.1.4.5.

5.2.1.1 Quality Assurance and Control.

5.2.1.1.1 The state of completeness, validity, consistency, and timeliness of data shall be documented in the metadata as described in 5.2.1.3.

5.2.1.1.2 The underlying accuracy and precision of data shall be expressed within the limits and tolerances of the devices and means used to collect the data.

5.2.1.1.3 A policy shall be established for evaluating data covered by the standard with respect to 5.2.1.1.1 and 5.2.1.1.2 annually.

5.2.1.2 System and Data Security.

5.2.1.2.1 Policies shall be established for the protection of hardware, software, and networks from physical and logical



events that could cause serious loss or damage to an enterprise, agency, or institution.

5.2.1.2.2 Data under the purview of this standard shall be backed up and maintained in accordance with applicable Institute for Computational Engineering and Sciences (ICES) and National Institute of Standards and Technology (NIST) standards.

5.2.1.3 Metadata.

5.2.1.3.1 Metadata shall be provided for all data covered by this policy.

5.2.1.3.2 Metadata shall conform to International Standards Organization requirements for metadata as stated by ISO 19115 for data having a geographic component and ISO/IEC FCD 24706 (draft) for nonspatial data.

5.2.1.3.3 Metadata shall be completed for author, date and time of creation, date and time of last change, units of measure used, description of attributes, and, where applicable, spatial reference or coordinate system (projection, datum, and units).

5.2.1.4 Physical and Logical Security. Data exchange shall include physical and logical security.

5.2.1.4.1 Database Audit. All data exchanged under the purview of this standard shall support database auditing.

5.2.1.4.2 Permissions. Rights regarding the distribution of data shall be retained by the data provider.

5.2.1.4.3 A policy shall be written that documents these rights and establishes a means for documenting release of information.

5.2.1.4.4 A data provider shall establish physical and logical security requirements for data contributed.

5.2.1.4.5 It shall be the responsibility of the data recipient to ensure that such security requirements are maintained upon receipt from the provider.

5.3* Data Exchange. Data exchange attributes shall be constructed in compliance with existing data exchange standards as identified in this section.

5.3.1 Spatial Data.

5.3.1.1 A spatial data component shall accompany all data elements for which a location is determined and described.

5.3.1.2 The accuracy and precision of data exchanged shall not exceed that of the device or service through which the data were acquired, collected, or calculated as described in the metadata.

5.3.1.3 The geographic component of spatial data shall be exchanged as unprojected latitude and longitude in decimal degrees referenced to the North American Datum of 1983 (NAD83).

5.3.1.4 Symbolology.

5.3.1.4.1 An attribute shall exist for a symbol class that depicts the geographic feature or resource type and capability using an appropriate symbol established by the Federal Geographic Data Committee Homeland Security Working Group and the U.S. Geological Survey Topographic Mapping Standard for Symbolology.

5.3.1.5 Labeling.

5.3.1.5.1 The attribute component of spatial data exchanged shall support the following labeling requirements.

5.3.1.5.2 An attribute shall exist that supports the labeling of a geographic feature by name up to 24 characters in length.

5.3.1.5.3 Attributes shall exist that support the labeling of point features by latitude and longitude.

5.3.1.5.3.1 The latitude and longitude label attribute shall be depicted as absolute (unprojected) coordinates referenced to the North American Datum of 1983 (NAD83).

5.3.1.5.3.2 The latitude and longitude label attribute shall be depicted as degrees, decimal minutes.

5.3.1.5.3.3 The latitude label attribute shall be expressed with the appropriate alphanumeric designator: E or W.

5.3.1.5.3.4 The longitude label attribute shall be expressed with the appropriate alphanumeric designator: N or S.

5.3.1.5.3.5 The latitude and longitude label attribute shall be expressed to a precision and accuracy no greater than that at which the data were collected, acquired, or calculated.

5.3.1.5.4 An attribute shall exist that supports the labeling of a point feature by U.S. National Grid.

5.3.1.5.4.1 The U.S. National Grid attribute shall be expressed to a precision and accuracy no greater than that at which the data were collected, acquired, or calculated.

5.3.2 Nonspatial Data.

5.3.2.1 Text shall be stored and exchanged as ASCII text, with data elements separated by commas.

5.3.2.2 All other nonspatial data shall be exchanged in their native format.

5.3.3* Coordination and Data Sharing. The AHJ shall adopt Extensible Markup Language (XML) as defined in ISO 8879 and Geographic Markup Language (GML) as defined in ISO 19136 as the data coordination and sharing standard.

5.3.4 The AHJ shall use existing Transmission Control Protocol/Internet Protocol (TCP/IP) standards for data exchange.

5.3.4.1 Data exchange shall comply with ISO/IEC 14766.

Chapter 6 System and Data Design Standards (Scalable)

6.1 General.

6.1.1 This chapter provides minimum requirements for specific data types and information management systems for data acquisition, display, interchange, and management.

6.2 Addresses.

6.2.1 Addressable locations shall contain street number, prefix direction (where applicable), prefix type (where applicable), street name, suffix direction (where applicable), street type, municipality, postal code, county, and state in accordance with the FGDC *United States Thoroughfare, Landmark, and Postal Address Data Standard*.

6.3 Date and Time.

6.3.1 Date and time shall be formatted as YYYYMMDDHHMMSS.

6.3.2 Time shall be referenced in Coordinated Universal Time (UTC).

6.3.3 Local time shall be calibrated against National Institute of Standards and Technology (NIST) at least every 24 hours within plus or minus (+/-) 0.25 second.

6.4 Incident Typing Information.

6.4.1 Incident typing shall conform at a minimum to NFIRS/NEMSIS coding.

6.4.2 Incident typing shall support “Plus 1” NFIRS coding locally.

6.5 Text.

6.5.1 Text shall be written using ASCII characters (nonextended).

6.6 Images and Video.

6.6.1 Images. Images shall be exchanged in a generally accepted reception format as determined by the AHJ.

6.6.2 Video. Video shall be exchanged in a generally accepted reception format as determined by the AHJ.

6.7* CAD, RMS, CAD/CAD, CAD/RMS, and RMS/RMS Exchange.

6.7.1 Design and construction of CAD/CAD, CAD/RMS, and RMS/RMS interfaces and applications shall comply with all technical elements set forth in Chapters 4, 5, and 6 of this standard.

Annex A Explanatory Material

Annex A is not a part of the requirements of this NFPA document but is included for informational purposes only. This annex contains explanatory material, numbered to correspond with the applicable text paragraphs.

A.1.1.1 The standardization of existing and future mission critical data for emergency services facilitates safe, effective, and efficient decision making.

A.3.2.1 Approved. The National Fire Protection Association does not approve, inspect, or certify any installations, procedures, equipment, or materials; nor does it approve or evaluate testing laboratories. In determining the acceptability of installations, procedures, equipment, or materials, the authority having jurisdiction may base acceptance on compliance with NFPA or other appropriate standards. In the absence of such standards, said authority may require evidence of proper installation, procedure, or use. The authority having jurisdiction may also refer to the listings or labeling practices of an organization that is concerned with product evaluations and is thus in a position to determine compliance with appropriate standards for the current production of listed items.

A.3.2.2 Authority Having Jurisdiction (AHJ). The phrase “authority having jurisdiction,” or its acronym AHJ, is used in NFPA documents in a broad manner, since jurisdictions and

approval agencies vary, as do their responsibilities. Where public safety is primary, the authority having jurisdiction may be a federal, state, local, or other regional department or individual such as a fire chief; fire marshal; chief of a fire prevention bureau, labor department, or health department; building official; electrical inspector; or others having statutory authority. For insurance purposes, an insurance inspection department, rating bureau, or other insurance company representative may be the authority having jurisdiction. In many circumstances, the property owner or his or her designated agent assumes the role of the authority having jurisdiction; at government installations, the commanding officer or departmental official may be the authority having jurisdiction.

A.3.3.15 Geography Markup Language Encoding Standard (GML). GML serves as a modeling language for geographic systems as well as an open interchange format for geographic transactions on the Internet. As with most XML-based grammars, there are two parts to the grammar — the schema that describes the document and the instance document that contains the actual data. A GML document is described using a GML schema, which allows users and developers to describe generic geographic data sets that contain points, lines, and polygons.

A.4.1 Standardized data provide for more reliable interoperability between entities, systems, and processes to support incident-related operational objectives.

A.4.4 The committee recognizes the rapidly changing nature of technology. As such, the standard is not intended to limit the development or implementation of processes or systems. However, the results of advances in technology should not violate the core intent of this document.

A.4.4.2 Examples of applications and systems requiring the exchange of data include records management systems interfacing with National Fire Information Reporting Systems and the National Emergency Medical Services Information System. These should support the requirements established herein or as also modified locally.

A.5.3 A National Information Exchange Model (NIEM) data model is a mature and stable data dictionary of agreed-on terms, definitions, and formats, independent of how information is stored in individual agency systems.

A.5.3.3 To standardize the exchange of data two established protocols are specified: XML for the transfer of nonspatial data elements and GML for the transfer of geospatial data elements.

A.6.7 A standard approach should be used for implementation of all system interfaces. Information sharing initiatives should conform to the NIEM.

Annex B Additional Resources (Reserved)

Annex C Informational References (Reserved)



Index

Copyright © 2014 National Fire Protection Association. All Rights Reserved.

The copyright in this index is separate and distinct from the copyright in the document that it indexes. The licensing provisions set forth for the document are not applicable to this index. This index may not be reproduced in whole or in part by any means without the express written permission of NFPA.

-A-	
Acquisition	
Definition.....	3.3.1
Additional Resources (Reserved)	Annex B
Administration	Chap. 1
Application	1.3
Equivalency.....	1.4
New Technology	1.5
Purpose	1.2
Scope.....	1.1
All-Hazards	
Definition.....	3.3.2
Approved	
Definition	3.2.1, A.3.2.1
Attribute Data	
Definition.....	3.3.3
Audio Data	
Definition.....	3.3.4
Authority Having Jurisdiction (AHJ)	
Definition	3.2.2, A.3.2.2
-C-	
Computer Aided/Assisted Dispatch (CAD)	
Definition.....	3.3.5
Conflation	
Definition.....	3.3.6
-D-	
Data	
Definition.....	3.3.7
Data Administration	Chap. 5
Data Exchange.....	5.3, A.5.3
Coordination and Data Sharing.....	5.3.3, A.5.3.3
Nonspatial Data.....	5.3.2
Spatial Data.....	5.3.1
Labeling	5.3.1.5
Symbology.....	5.3.1.4
External Data.....	5.1
Internal Data	5.2
Data Development	
Definition.....	3.3.8
Data Exchange	
Definition.....	3.3.9
Data Sharing (Information)	
Definition	3.3.10
Database Audit	
Definition	3.3.11
Definitions	Chap. 3
Deflation	
Definition	3.3.12
-E-	
Explanatory Material	Annex A
Extensible Markup Language (XML)	
Definition	3.3.13
External Data	
Definition	3.3.14
-G-	
Geography Markup Language Encoding Standard (GML)	
Definition.....	3.3.15, A.3.3.15
Geospatial/Spatial	
Definition	3.3.16
-I-	
Image Data	
Definition	3.3.17
Informational References (Reserved)	Annex C
Interchange	
Definition	3.3.18
Internal Data	
Definition	3.3.19
-L-	
Line Data	
Definition	3.3.20
Logical Security	
Definition	3.3.21
-M-	
Metadata	
Definition	3.3.22
Metadata.....	5.2.1.3
-N-	
Nonspatial Data	
Definition	3.3.23
-P-	
Performance Management	
Definition	3.3.24
Physical and Logical Security.....	5.2.1.4
Database Audit.....	5.2.1.4.1
Permissions.....	5.2.1.4.2
Physical Security	
Definition	3.3.25
Point Data	
Definition	3.3.26
Polygon Data	
Definition	3.3.27
Process Management	
Definition	3.3.28
Processes	Chap. 4
Acquisition	4.2
Application of the Standard	4.4, A.4.4
Data Management	4.3
General	4.1, A.4.1
-Q-	
Quality Assurance and Control.....	5.2.1.1
-R-	
Raster Data	
Definition	3.3.29
Records Management System (RMS)	
Definition	3.3.30
Referenced Publications	Chap. 2
General	2.1
NFPA Publications	2.2

Other Publications.....	2.3		
References for Extracts in Mandatory Sections	2.4		
-S-			
Shall			
Definition.....	3.2.3		
Should			
Definition.....	3.2.4		
Standard			
Definition.....	3.2.5		
System and Data Design Standards (Scalable)	Chap. 6		
Addresses	6.2		
CAD, RMS, CAD/CAD, CAD/RMS, and RMS/RMS			
Exchange	6.7, A.6.7		
Date and Time	6.3		
General	6.1		
Images and Video	6.6		
Images	6.6.1		
Video	6.6.2		
Incident Typing Information	6.4		
Text.....	6.5		
System and Data Security	5.2.1.2		
		System Development	
		Definition	3.3.31
		System Security	
		Definition	3.3.32
		-T-	
		Text Data	
		Definition	3.3.33
		Transmission Control Protocol/Internet Protocol (TCP/IP)	
		Definition	3.3.34
		Triangulated Irregular Network (TIN)	
		Definition	3.3.35
		-U-	
		United States National Grid Standard (USNG)	
		Definition	3.3.36
		-V-	
		Vector Data	
		Definition	3.3.37

Sequence of Events for the Standards Development Process

As soon as the current edition is published, a Standard is open for Public Input

Step 1: Input Stage

- Input accepted from the public or other committees for consideration to develop the First Draft
- Committee holds First Draft Meeting to revise Standard (23 weeks)
 - Committee(s) with Correlating Committee (10 weeks)
- Committee ballots on First Draft (12 weeks)
 - Committee(s) with Correlating Committee (11 weeks)
- Correlating Committee First Draft Meeting (9 weeks)
- Correlating Committee ballots on First Draft (5 weeks)
- First Draft Report posted

Step 2: Comment Stage

- Public Comments accepted on First Draft (10 weeks)
- If Standard does not receive Public Comments and the Committee does not wish to further revise the Standard, the Standard becomes a Consent Standard and is sent directly to the Standards Council for issuance
- Committee holds Second Draft Meeting (21 weeks)
 - Committee(s) with Correlating Committee (7 weeks)
- Committee ballots on Second Draft (11 weeks)
 - Committee(s) with Correlating Committee (10 weeks)
- Correlating Committee First Draft Meeting (9 weeks)
- Correlating Committee ballots on First Draft (8 weeks)
- Second Draft Report posted

Step 3: Association Technical Meeting

- Notice of Intent to Make a Motion (NITMAM) accepted (5 weeks)
- NITMAMs are reviewed and valid motions are certified for presentation at the Association Technical Meeting
- Consent Standard bypasses Association Technical Meeting and proceeds directly to the Standards Council for issuance
- NFPA membership meets each June at the Association Technical Meeting and acts on Standards with “Certified Amending Motions” (certified NITMAMs)
- Committee(s) and Panel(s) vote on any successful amendments to the Technical Committee Reports made by the NFPA membership at the Association Technical Meeting

Step 4: Council Appeals and Issuance of Standard

- Notification of intent to file an appeal to the Standards Council on Association action must be filed within 20 days of the Association Technical Meeting
- Standards Council decides, based on all evidence, whether or not to issue the Standards or to take other action

Committee Membership Classifications^{1,2,3,4}

The following classifications apply to Committee members and represent their principal interest in the activity of the Committee.

1. M *Manufacturer*: A representative of a maker or marketer of a product, assembly, or system, or portion thereof, that is affected by the standard.
2. U *User*: A representative of an entity that is subject to the provisions of the standard or that voluntarily uses the standard.
3. IM *Installer/Maintainer*: A representative of an entity that is in the business of installing or maintaining a product, assembly, or system affected by the standard.
4. L *Labor*: A labor representative or employee concerned with safety in the workplace.
5. RT *Applied Research/Testing Laboratory*: A representative of an independent testing laboratory or independent applied research organization that promulgates and/or enforces standards.
6. E *Enforcing Authority*: A representative of an agency or an organization that promulgates and/or enforces standards.
7. I *Insurance*: A representative of an insurance company, broker, agent, bureau, or inspection agency.
8. C *Consumer*: A person who is or represents the ultimate purchaser of a product, system, or service affected by the standard, but who is not included in (2).
9. SE *Special Expert*: A person not representing (1) through (8) and who has special expertise in the scope of the standard or portion thereof.

NOTE 1: “Standard” connotes code, standard, recommended practice, or guide.

NOTE 2: A representative includes an employee.

NOTE 3: While these classifications will be used by the Standards Council to achieve a balance for Technical Committees, the Standards Council may determine that new classifications of member or unique interests need representation in order to foster the best possible Committee deliberations on any project. In this connection, the Standards Council may make such appointments as it deems appropriate in the public interest, such as the classification of “Utilities” in the National Electrical Code Committee.

NOTE 4: Representatives of subsidiaries of any group are generally considered to have the same classification as the parent organization.

Submitting Public Input / Public Comment through the Electronic Submission System (e-Submission):

As soon as the current edition is published, a Standard is open for Public Input.

Before accessing the e-Submission System, you must first sign-in at www.NFPA.org. *Note: You will be asked to sign-in or create a free online account with NFPA before using this system:*

- a. Click in the gray Sign In box on the upper left side of the page. Once signed-in, you will see a red “Welcome” message in the top right corner.
- b. Under the Codes and Standards heading, Click on the Document Information pages (List of Codes & Standards), and then select your document from the list or use one of the search features in the upper right gray box.

OR

- a. Go directly to your specific document page by typing the convenient short link of www.nfpa.org/document#, (Example: NFPA 921 would be www.nfpa.org/921) Click in the gray Sign In box on the upper left side of the page. Once signed in, you will see a red “Welcome” message in the top right corner.

To begin your Public Input, select the link The next edition of this standard is now open for Public Input (formally “proposals”) located on the Document Information tab, the Next Edition tab, or the right-hand Navigation bar. Alternatively, the Next Edition tab includes a link to Submit Public Input online

At this point, the NFPA Standards Development Site will open showing details for the document you have selected. This “Document Home” page site includes an explanatory introduction, information on the current document phase and closing date, a left-hand navigation panel that includes useful links, a document Table of Contents, and icons at the top you can click for Help when using the site. The Help icons and navigation panel will be visible except when you are actually in the process of creating a Public Input.

Once the First Draft Report becomes available there is a Public comment period during which anyone may submit a Public Comment on the First Draft. Any objections or further related changes to the content of the First Draft must be submitted at the Comment stage.

To submit a Public Comment you may access the e-Submission System utilizing the same steps as previous explained for the submission of Public Input.

For further information on submitting public input and public comments, go to: <http://www.nfpa.org/publicinput>

Other Resources available on the Doc Info Pages

Document information tab: Research current and previous edition information on a Standard

Next edition tab: Follow the committee’s progress in the processing of a Standard in its next revision cycle.

Technical committee tab: View current committee member rosters or apply to a committee

Technical questions tab: For members and Public Sector Officials/AHJs to submit questions about codes and standards to NFPA staff. Our Technical Questions Service provides a convenient way to receive timely and consistent technical assistance when you need to know more about NFPA codes and standards relevant to your work. Responses are provided by NFPA staff on an informal basis.

Products/training tab: List of NFPA’s publications and training available for purchase.

Community tab: Information and discussions about a Standard