NFPA®

130

Standard for Fixed Guideway Transit and Passenger Rail Systems

2020

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ISBN: 978-1455923465 (PDF)

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NFPA® 130

Standard for

Fixed Guideway Transit and Passenger Rail Systems

2020 Edition

This edition of NFPA 130, *Standard for Fixed Guideway Transit and Passenger Rail Systems*, was prepared by the Technical Committee on Fixed Guideway Transit and Passenger Rail Systems and acted on by NFPA at its June Association Technical Meeting held June 17–20, 2019, in San Antonio, TX. It was issued by the Standards Council on August 5, 2019, with an effective date of August 25, 2019, and supersedes all previous editions.

This document has been amended by one or more Tentative Interim Amendments (TIAs) and/or Errata. See "Codes & Standards" at www.nfpa.org for more information.

This edition of NFPA 130 was approved as an American National Standard on August 25, 2019.

Origin and Development of NFPA 130

The Fixed Guideway Transit Systems Technical Committee was formed in 1975 and immediately began work on the development of NFPA 130. One of the primary concerns of the committee in the preparation of this document centered on the potential for entrapment and injury of large numbers of people who routinely use these types of mass transportation facilities.

During the preparation of the first edition of this document, several significant fires occurred in fixed guideway systems, but fortunately the loss of life was limited. The committee noted that the minimal loss of life was due primarily to chance events more than any preconceived plan or the operation of protective systems.

The committee developed material on fire protection requirements to be included in NFPA 130, *Standard for Fixed Guideway Transit Systems*. This material was adopted by NFPA in 1983. The 1983 edition was partially revised in 1986 to conform with the *NFPA Manual of Style*. Incorporated revisions included a new Chapter 8; a new Appendix F, Creepage Distance; minor revisions to the first four chapters and to Appendices A, B, C, and E; and a complete revision of Appendix D.

The scope of the 1988 edition was expanded to include automated guideway transit (AGT) systems. The sample calculations in Appendix C were revised, and Appendix D was completely revised.

The 1990 edition included minor changes to integrate provisions and special requirements for AGT systems into the standard. Table 1 from Appendix D was moved into Chapter 4, Vehicles, and new vehicle risk assessment material was added to Appendix D.

Definitions for *enclosed station* and *open station* were added in the 1993 edition, along with minor changes to Chapters 2 and 3; the 1995 edition made minor changes to Chapters 1, 2, and 3.

The 1997 edition included a new chapter on emergency ventilation systems for transit stations and trainways. A new Appendix B addressing ventilation replaced the previous Appendix B, Air Quality Criteria in Emergencies. Also, the first three sections of Chapter 6 (renumbered as Chapter 7 in the 1997 edition), Emergency Procedures, were revised, and several new definitions were added.

The 2000 edition of NFPA 130 addressed passenger rail systems in addition to fixed guideway transit systems. The document was retitled *Standard for Fixed Guideway Transit and Passenger Rail Systems* to reflect that addition, and changes were made throughout the document to incorporate passenger rail requirements. Additionally, much of Chapter 2 was rewritten to incorporate changes that were made to the egress calculations in NFPA *101®*, *Life Safety Code®*. The examples in Appendix C were modified using the new calculation methods. The protection requirements for Chapter 3 were modified, addressing emergency lighting and standpipes. Chapter 4 also was modified to clarify and expand the emergency ventilation requirements.

The 2003 edition was reformatted in accordance with the 2003 *Manual of Style for NFPA Technical Committee Documents*. Beyond those editorial changes, there were technical revisions to the egress requirements and calculations for stations. The chapter on vehicles was extensively rewritten to include a performance-based design approach to vehicle design as well as changes to the traditional prescriptive-based requirements.

The 2007 edition included revisions affecting station egress calculations, the use of escalators in the means of egress, vehicle interior fire resistance, and power supply to tunnel ventilation systems. The chapter on vehicle maintenance facilities was removed because requirements for that occupancy are addressed in other codes; the performance-based vehicle design requirements were substantially revised to more accurately address the unique qualities of rail vehicles.

The 2010 edition of NFPA 130 included provisions that allowed elevators to be counted as contributing to the means of egress in stations. The 2010 edition also contained revisions relating to escalators, doors, gates, and turnstile-type fare equipment. The units in the standard were updated in accordance with the 2004 *Manual of Style for NFPA Technical Committee Documents*. Several fire scenarios were added to Annex A to provide guidance on the types of fires that can occur in vehicles, stations, and the operating environment as well.

The 2014 edition of NFPA 130 included substantial reorganization of Chapters 5 and 6 for consistency and consolidation of wire and cable requirements into a new Chapter 12. Other changes included reconciliation of terminology related to enclosed trainways and engineering versus fire hazard analyses; revisions to interior finish requirements; revisions to requirements for prevention of flammable and combustible liquids intrusion in Chapters 5 and 6; and improvements to Annex C.

The 2017 edition of NFPA 130 added several new definitions and modified requirements for materials used as interior wall and ceiling finishes. Requirements were added for enclosed stations to be equipped with a fire alarm system and stations, and enclosed trainways to be equipped with an emergency communication system, as outlined in revised Chapter 10. A new Annex B provided guidance on establishing noise levels in order to maintain a minimum level of speech intelligibility through the emergency communications system. In Annex C, modifications were made to the example showing means of egress calculation. A new Annex H provided information on fire scenarios and methodologies used for predicting fire profiles.

The 2020 edition of NFPA 130 adds several new definitions, and the concept and permissible uses of limited combustible materials. Chapter 8 adds a testing alternative for miscellaneous, discontinuous small parts; requirements for testing of adhesives and sealants; and requirements for testing and analysis for vehicles with end frame assemblies. Chapter 9 adds requirements for consideration of the possibility of multiple concurrent emergencies. A new Annex B consolidates recommendations from Annexes D, G, and H regarding emergency ventilation. A new Annex D consolidates all non-emergency ventilation provisions from Annexes B, D, G, and H. Other changes include reconciliation of terminology related to enclosed trainways; engineering versus fire hazard analyses and egress; means of egress and exit; clarification of construction types for various station and trainway configurations; and new requirements for the consideration of background noise relating to emergency procedures and design of emergency communications systems in Chapters 9 and 10.

Technical Committee on Fixed Guideway Transit and Passenger Rail Systems

Jarrod Alston, *Chair*
Arup, MA [SE]

Richard M. Arvin, Annapolis Fire & Life Safety Engineering, MD [U]
Rep. Washington Metropolitan Area Transit Authority (WMATA)

David M. Casselman, Lea & Elliott, Inc., TX [SE]

James J. Convery, Amtrak, NJ [U]

Angelina Dorman, Southwire, GA [M]

Thomas Eng, Los Angeles County Metro Transportation Authority, CA [U]

Katherine Fagerlund, JENSEN HUGHES Consulting Canada Ltd., Canada [SE]

Michel Fournier, Societe de Transport de Montreal (STM), Canada [U]

Charles J. Giblin III, Maryland State Fire Marshal's Office, MD [E]
Rep. International Fire Marshals Association

Bernard J. Kennedy, IV, U.S. Department of Transportation, MA [RT]
Rep. U.S. Department of Transportation

William E. Koffel, Koffel Associates, Inc., MD [M]
Rep. Automatic Fire Alarm Association, Inc.

Max Lakkonen, Institute for Applied Fire Safety Research, Germany [RT]

Pierre Laurin, Toronto Transit Commission, Canada [U]

Kevin M. Lewis, Bombardier Transportation, PA [M]

Silas K. Li, Parsons Brinckerhoff, Inc., NY [SE]

Harold A. Locke, Locke & Locke Inc., Canada [SE]

David Mao, U.S. Department of Transportation, DC [E]
Rep. U.S. Department of Transportation

Scott W. McAleese, Chicago Transit Authority, IL [U]

Steven W. Roman, LTK Engineering Services, PA [SE]

Henry X. Schober, New York City Transit Authority, NY [U]
Rep. Metropolitan Transportation Authority

Dilip S. Shah, AECOM Technical Services, Inc., CA [SE]

Joshua H. Teo, Bay Area Rapid Transit District (BART), CA [U]

Robert C. Till, John Jay College of Criminal Justice, NY [SE]

William Ventura, FDNY, NY [E]

David J. Volk, Port Authority Trans Hudson, NJ [U]

Leong Kwok Weng, Land Transport Authority, Singapore, Singapore [U]

John Powell White, IFT/Fire Cause Analysis, CA [SE]

Steven C. White, MTA-Long Island Rail Road, NY [E]
Rep. Metropolitan Transportation Authority

Alternates

Bruce Dandie, RRT PTY LTD, Australia [SE]
(Alt. to Robert C. Till)

Matthew W. Davy, Arup, MA [SE]
(Alt. to Jarrod Alston)

John F. Devlin, JENSEN HUGHES, MD [SE]
(Alt. to Katherine Fagerlund)

Jason Eng, Bay Area Rapid Transit District (BART), CA [U]
(Alt. to Joshua H. Teo)

Gary L. English, Underground Command And Safety, WA [SE]
(Alt. to Harold A. Locke)

Robert W. Falvey, Lea & Elliott, Inc., FL [SE]
(Alt. to David M. Casselman)

Daniel P. Finnegan, Siemens Industry, Inc., IL [M]
(Alt. to William E. Koffel)

Paul Fok, Land Transport Authority, Singapore, Singapore [U]
(Alt. to Leong Kwok Weng)

Martha K. Gulick, Port Authority of New York & New Jersey, NJ [U]
(Alt. to David J. Volk)

Ritch D. Hollingsworth, LTK Engineering Services, PA [SE]
(Alt. to Steven W. Roman)

Thomas P. Kenny, New York City Transit Authority, NY [U]
(Alt. to Henry X. Schober)

Thomas Alan Langer, Los Angeles County Metro Transportation Authority (LACMTA), CA [U]
(Alt. to Thomas Eng)

Andrew Louie, WSP Parsons Brinckerhoff, NY [SE]
(Alt. to Silas K. Li)

Daniel E. Nichols, State of New York Metropolitan Transportation Authority, NY [E]
(Alt. to Steven C. White)

Neil E. Nott, Washington Metropolitan Area Transit Authority (WMATA), VA [U]
(Alt. to Richard M. Arvin)

Thomas P. O'Dwyer, Aecom, NY [SE]
(Alt. to Dilip S. Shah)

Zoran Radojevic, Toronto Transit Commission, Canada [U]
(Alt. to Pierre Laurin)

Muriel Villalta, Bombardier Transportation, Canada [M]
(Alt. to Kevin M. Lewis)

Steve Virostek, Fire Cause Analysis, CA [SE]
(Alt. to John Powell White)

Nonvoting

Arnold Dix, School Medicine, UWS, Australia [SE]

Frank J. Cihak, FJC Transit Consultants, VA [SE]
(Member Emeritus)

Norman H. Danziger, Boynton Beach, FL
(Member Emeritus)

Edward K. Farrelly, E. Farrelly & Associates, NJ
(Member Emeritus)

Robert E. Solomon, NFPA Staff Liaison

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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 pertaining to fire safety requirements for underground, surface, and elevated fixed guideway transit and passenger rail systems including stations, trainways, emergency ventilation systems, vehicles, emergency procedures, communications and control systems and for life safety from fire and fire protection in stations, trainways, and vehicles. Stations shall pertain to stations accommodating occupants of the fixed guideway transit and passenger rail systems and incidental occupancies in the stations.

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Standard for

Fixed Guideway Transit and Passenger Rail Systems

2020 Edition

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. 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 and extracted publications can be found in Chapter 2 and Annex G.

Chapter 1 Administration

1.1 Scope.

1.1.1* This standard shall cover life safety from fire and fire protection requirements for fixed guideway transit and passenger rail systems, including, but not limited to, stations, trainways, emergency ventilation systems, vehicles, emergency procedures, communications, and control systems.

1.1.2 Fixed guideway transit and passenger rail stations shall pertain to stations accommodating only passengers and employees of the fixed guideway transit and passenger rail systems and incidental occupancies in the stations. This standard establishes minimum requirements for each of the identified subsystems.

1.1.3 This standard shall not cover requirements for the following:

(1) Conventional freight systems
(2) Buses and trolley coaches
(3) Circus trains
(4) Tourist, scenic, historic, or excursion operations
(5) Any other system of transportation not included in the definition of *fixed guideway transit system (see 3.3.64.1)* or *passenger rail system (see 3.3.64.2)*
(6)* Shelter stops

1.1.4 To the extent that a system, including those listed in 1.1.3(1) through 1.1.3(6), introduces hazards of a nature similar to those addressed herein, this standard shall be permitted to be used as a guide.

1.2 Purpose. The purpose of this standard shall be to establish minimum requirements that will provide a reasonable degree of safety from fire and its related hazards in fixed guideway transit and passenger rail system environments.

1.3 Application.

1.3.1 This standard shall apply to new fixed guideway transit and passenger rail systems and to extensions of existing systems.

1.3.2 The portion of the standard dealing with emergency procedures shall apply to new and existing systems.

1.3.3* The standard also shall be used for purchases of new rolling stock and retrofitting of existing equipment or facilities except in those instances where compliance with the standard will make the improvement or expansion incompatible with the existing system.

1.3.4 This standard shall also apply as a basis for fixed guideway transit and passenger rail systems where nonelectric and combination electric-other (such as diesel) vehicles are used. Where such vehicles are not passenger-carrying vehicles or are buses or trolley coaches, the standard shall not apply to those vehicles but shall apply to the fixed guideway transit and passenger rail systems in which such vehicles are used.

1.4* Equivalency. Nothing in this standard is intended to prevent or discourage the use of new methods, materials, or devices, provided that sufficient technical data are submitted to the authority having jurisdiction to demonstrate that the new method, material, or device is equivalent to or superior to the requirements of this standard with respect to fire performance and life safety.

1.4.1 Technical Documentation. Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.4.2 Approval. The new methods, materials, or devices shall be approved for the intended purpose.

1.4.3* Equivalent Compliance. Alternative systems, methods, materials, or devices approved as equivalent shall be recognized as being in compliance with this standard.

1.5 Units and Formulas.

1.5.1 SI Units. The metric units of measurement in this standard are in accordance with the International System of Units (SI).

1.5.2 Primary and Equivalent Values. If a value for a measurement as given in this standard is followed by an equivalent value in other units, the first stated value shall be regarded as the requirement. A given equivalent value might be approximated.

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 4, *Standard for Integrated Fire Protection and Life Safety System Testing,* 2018 edition.

NFPA 10, *Standard for Portable Fire Extinguishers,* 2018 edition.

NFPA 13, *Standard for the Installation of Sprinkler Systems,* 2019 edition.

NFPA 14, *Standard for the Installation of Standpipe and Hose Systems,* 2019 edition.

NFPA 22, *Standard for Water Tanks for Private Fire Protection,* 2018 edition.

NFPA 25, *Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems,* 2020 edition.

NFPA 70®, National Electrical Code®, 2020 edition.

NFPA 72®, National Fire Alarm and Signaling Code®, 2019 edition.

NFPA 91, *Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists, and Particulate Solids,* 2015 edition.

NFPA *101®, Life Safety Code®,* 2018 edition.

NFPA 110, *Standard for Emergency and Standby Power Systems,* 2019 edition.

NFPA 220, *Standard on Types of Building Construction,* 2018 edition.

NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations,* 2019 edition.

NFPA 253, *Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source,* 2019 edition.

NFPA 262, *Standard Method of Test for Flame Travel and Smoke of Wires and Cables for Use in Air-Handling Spaces,* 2019 edition.

NFPA 275, *Standard Method of Fire Tests for the Evaluation of Thermal Barriers,* 2017 edition.

NFPA 286, *Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth,* 2019 edition.

NFPA 703, *Standard for Fire Retardant–Treated Wood and Fire-Retardant Coatings for Building Materials,* 2018 edition.

NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems,* 2019 edition.

2.3 Other Publications.

2.3.1 AMCA Publications. Air Movement and Control Association International, Inc., 30 West University Drive, Arlington Heights, IL, 60004-1893.

ANSI/AMCA 210, *Laboratory Methods of Testing Fans for Aerodynamic Performance Rating*, 2007.

ANSI/AMCA 250, *Laboratory Methods of Testing Jet Tunnel Fans for Performance*, 2012.

ANSI/AMCA 300, *Reverberant Room Method for Sound Testing of Fans*, 2014.

2.3.2 APTA Publications. American Public Transportation Association, 1300 I Street NW, Suite 1200 East, Washington, DC 20005.

APTA PR-PS-S-002, Rev 3, *Standard for Emergency Signage for Egress/Access of Passenger Rail Equipment*, 1998, revised 2007.

2.3.3 ASHRAE Publications. ASHRAE Inc., 1791 Tullie Circle, NE, Atlanta, GA 30329-2305.

ASHRAE Handbook — Fundamentals, 2013.

ASHRAE 149, *Laboratory Methods of Testing Fans Used to Exhaust Smoke in Smoke Management Systems*, 2013.

2.3.4 ASTM Publications. ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959.

ASTM C1166, *Standard Test Method for Flame Propagation of Dense and Cellular Elastometric Gaskets and Accessories,* 2006 (2016).

ASTM D2724, *Standard Test Methods for Bonded, Fused, and Laminated Apparel Fabrics*, 2007 (2015).

ASTM D3574, *Standard Test Methods for Flexible Cellular Materials — Slab, Bonded, and Molded Urethane Foams*, 2017.

ASTM D3675, *Standard Test Method for Surface Flammability of Flexible Cellular Materials Using a Radiant Heat Energy Source*, 2017.

ASTM D7568, *Standard Specification for Polyethylene-Based Structural-Grade Plastic Lumber for Outdoor Applications*, 2017.

ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*, 2018a.

ASTM E119, *Standard Test Methods for Fire Tests of Building Construction and Materials*, 2018a.

ASTM E136, *Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C*, 2016a.

ASTM E162, *Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source*, 2016.

ASTM E648, *Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source*, 2017a.

ASTM E662, *Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials*, 2017a.

ASTM E814, *Standard Test Method for Fire Tests of Penetration Firestop Systems*, 2013a (2017).

ASTM E1354, *Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter*, 2017.

ASTM E1537, *Standard Test Method for Fire Testing of Upholstered Furniture*, 2016.

ASTM E1590, *Standard Test Method for Fire Testing of Mattresses*, 2017.

ASTM E2061, *Standard Guide for Fire Hazard Assessment of Rail Transportation Vehicles*, 2018.

ASTM E2652, *Standard Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C*, 2016.