

# Accessible Means of Egress/Emergency Evacuation

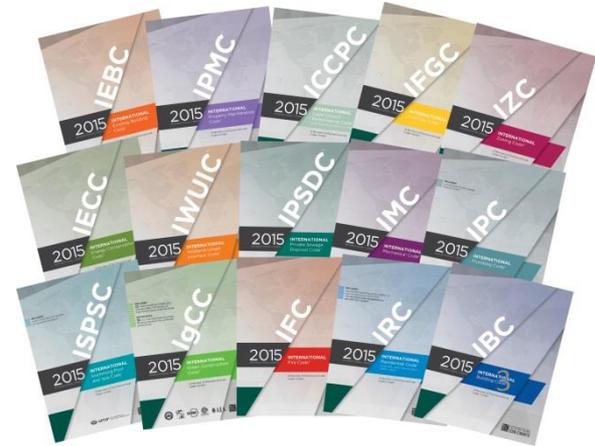
Presenter: Kimberly Paarlberg, RA  
International Code Council

# Agenda

- What is the International Building Code (IBC)?
- Types of disasters to addressed in IBC
- Emergency evacuation from a fire
  - Planning
  - Notification & Communication
  - Means of Egress (MOE)
  - Accessible Means of Egress (AMOE)
  - New Technology

# What are the International Codes?

- The **International Building Code (IBC)** is a model building code developed by the International Code Council (ICC).
- The ICC has a family of codes providing **minimum** requirements for public health and safety.
- It has been adopted throughout most of the United States at the state or local level as a **referenced** document. States do make **amendments**.
- Published every 3 years so that requirements stay current with industry advances.

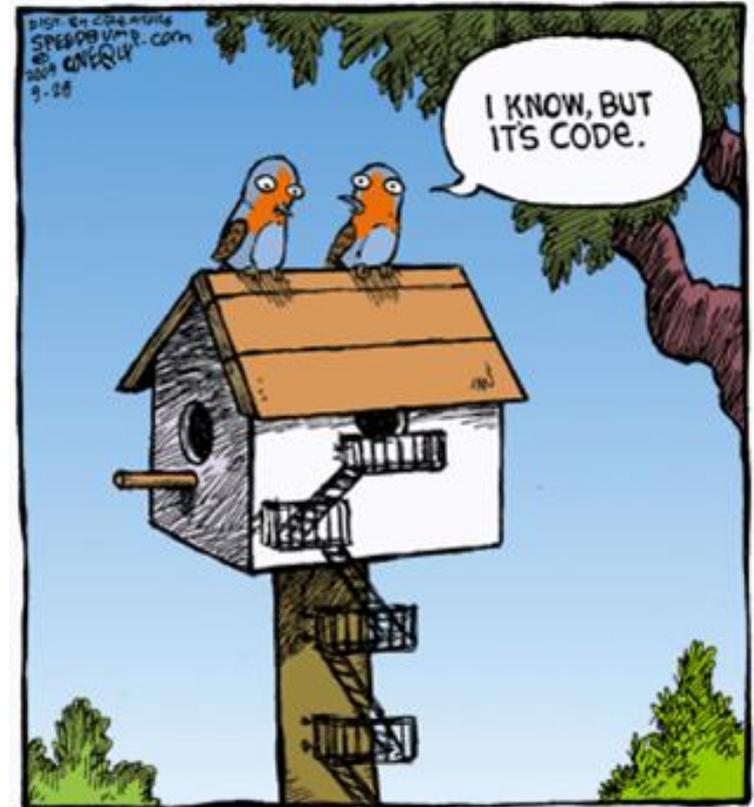


# What are the International Codes?

- The IBC addresses construction and design of **new** buildings and **alterations**.
- The IFC code addresses the **operation** of a completed building.
- For example, the building code sets criteria for the **number, size and location** of exits in the design of a building while the fire code requires the exits of a completed building to not be blocked.
- The building code also deals with access for persons with disabilities – both in and out.

# Enforcement

- The architect, contractor and building owner are required to comply with federal **and** state regulations.
- The building code official and fire official enforce **state/local** laws. These laws reference the IBC for minimum building requirements.
- The building code official does **not** enforce federal laws, including the ADA.



# Means of egress

- Refers to the ability to exit the structure, primarily in the event of an emergency, such as a fire.
- A means of egress is broken into **three** parts: the path of travel to an exit, the exit itself, and the path to a safe area outside.

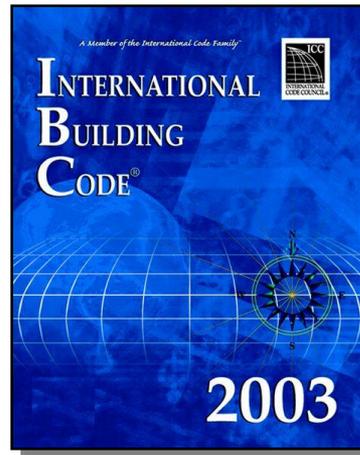
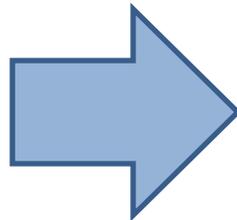
# Means of egress

Requirements are based on:

- The **number of exits** required for a structure based on its intended **use** and the **number of people** who could be in the place at one time as well as their **relative locations**.
- **Special needs**, such as hospitals, nursing homes, and prisons where evacuating people may have special requirements.
- Possible **hazards** (such as in industries) where flammable or toxic chemicals will be in use.

# ADA & ABA Standards §207

Require compliance with the International Building Code (IBC) for accessible means of egress



IBC 2003  
Section 1007

**OR**



IBC 2000 with 2001  
Supplement  
Section 1003.2.13

# ADA & ABA Standards

- What about compliance with later editions?
- Permitted where equivalent or better (“equivalent facilitation” in the ADA Standards Section 103)



# Are you or your community prepared for this?



# Types of hazards

- Fire
- Earthquake
- Wildfires
- Severe weather
  - Snow/Ice
  - Flood/Storm Surge
  - Tornado/Hurricane/High Winds

# Prepare Yourself and Your Family

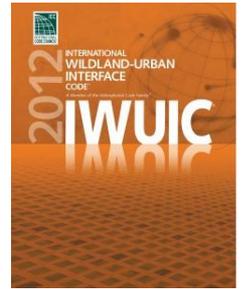
- *Although no one can prevent disasters from occurring, there are many things you can do to make the impact less devastating for your family.*
- Every home should have 3 key elements in place before a disaster strikes:
  - Evacuation Plan
  - Communication Plan
  - Emergency Supply Kit

# Wildfires



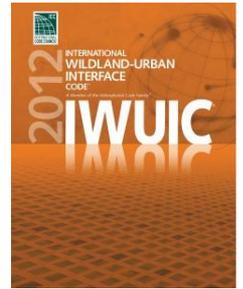


# In Wildfire Areas



- ICC's *International Wildland-Urban Interface Code*® contains detailed requirements to minimize the hazards.
  - Fire service access; premises identification; access to water and equipment.

# In Wildfire Areas

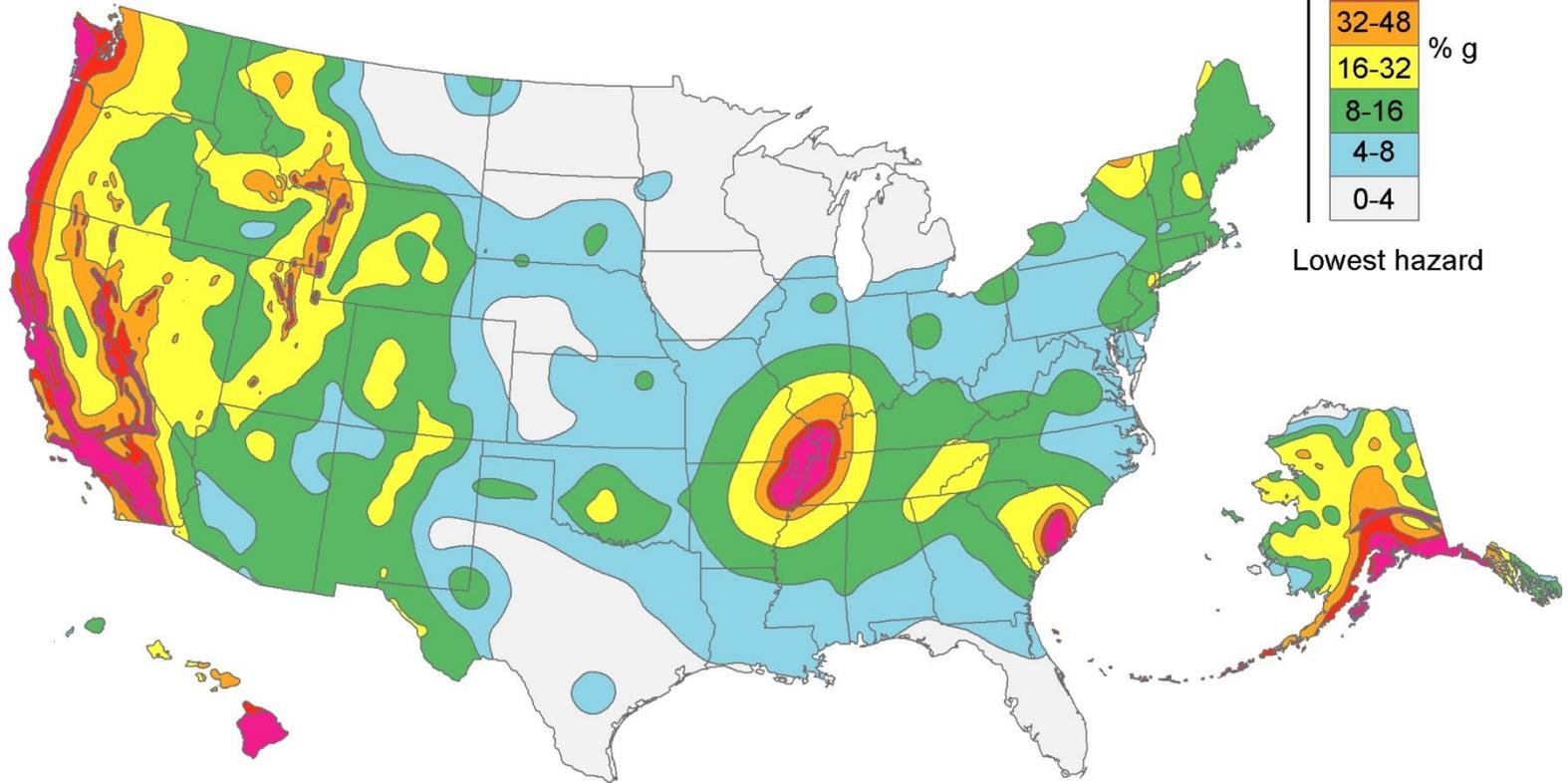


- What you can do –
  - Plant fire prone trees and shrubs away from your home and far enough apart so they won't ignite one another.
  - Install noncombustible 1/4 inch or smaller mesh screening on attic/soffit vents and around elevated wood decks to keep out embers.
  - Maintain a “defensible” space around your home by clearing all flammable vegetation a minimum of 30 feet around all structures.
  - Consider installing protective shutters or heavy fire-resistant drapes.

# Earthquakes

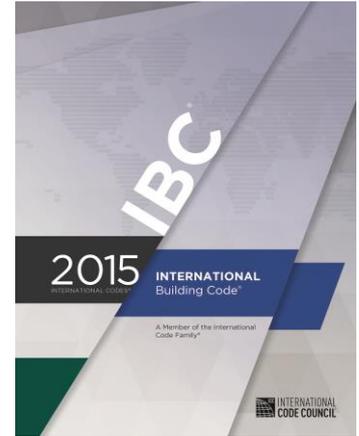


# Earthquakes



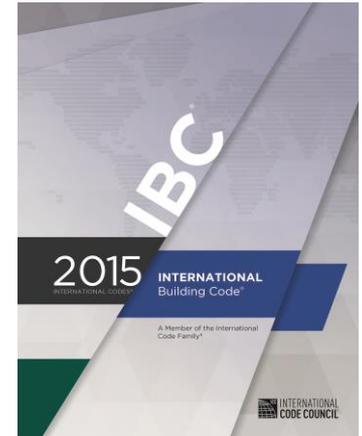
# In Earthquake Areas

- The IBC contains requirements for earthquake design
  - Seismic resistance systems to improve building resistance to earthquakes
  - Reduce the risk of life loss or injury of occupants



# In Earthquake Areas

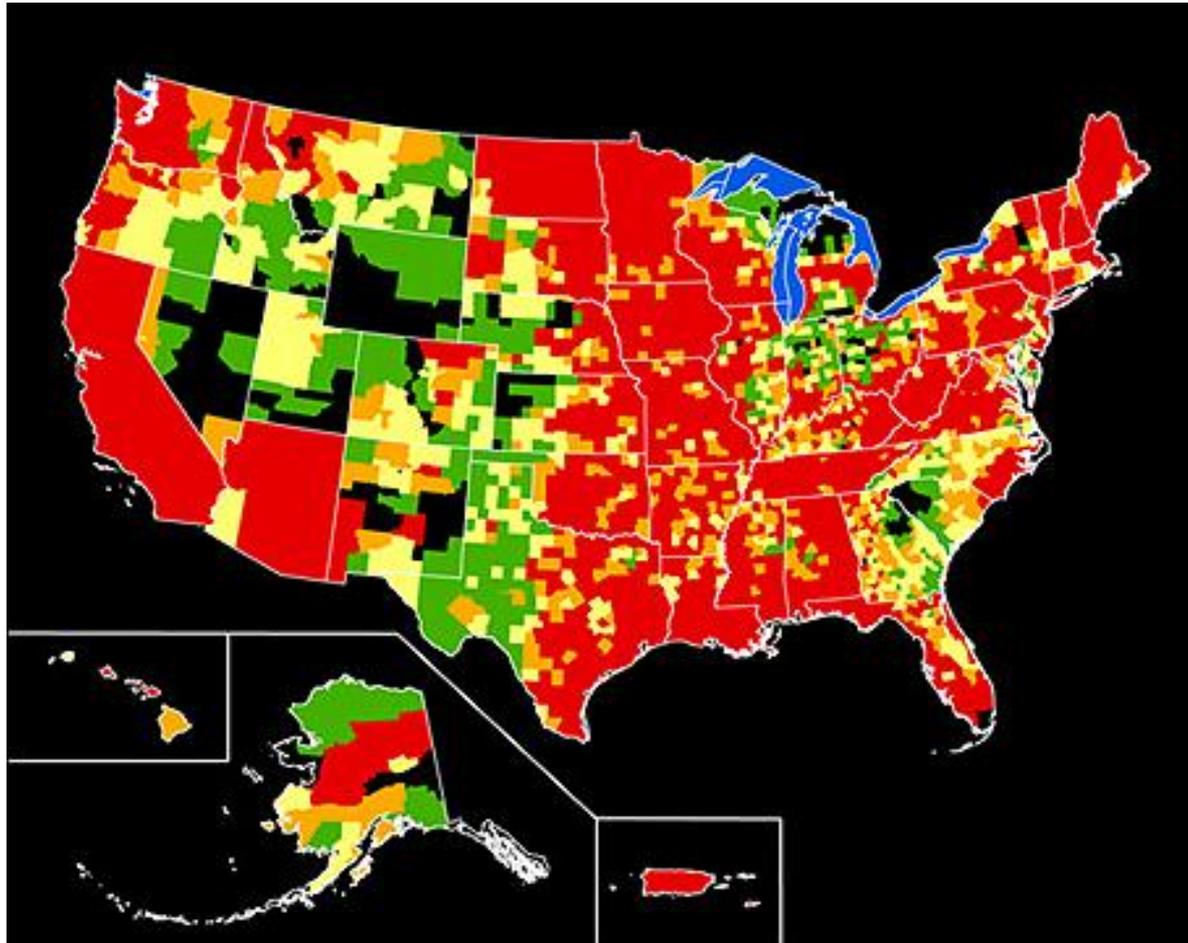
- What you can do –
  - Make sure your home is securely anchored to its foundation
  - Strap water heaters, appliances and TVs to wall studs.
  - Anchor bookshelves, heavy furniture, appliances and televisions to wall studs.
  - Secure pictures, mirrors and ornaments to the wall with appropriate fasteners.
  - Know where and how to shut off electricity, gas, and water services.



# Floods/Storm Surge



# Floods/Storm Surge



# In Flood/Storm Surge Areas

- The IBC contains requirements for building in flood and coastal areas.
- This is in cooperation with FEMA and the NFIP.
- Elevating your home above the base flood elevation (the elevation associated with the "100-year flood") is the best method of protecting your home, and is a requirement for new homes.

# In Flood/Storm Surge Areas

- What you can do –
  - Don't wait – evacuate!
  - Elevate mechanical equipment such as water heaters, furnaces, air conditioner units, circuit breaker boxes.
  - Anchor propane tanks.
  - Know where gas and water shutoffs are located.



# Tsunami



## Appendix M Tsunami-Generated Flood Hazard.

- Addressing a tsunami risk for all types of construction in a tsunami hazard zone through building code requirements would typically not be cost effective, making tsunami-resistant construction impractical at an individual building level.
- The appendix does allow the adoption and enforcement of requirements for tsunami hazard zones that regulate the presence of high risk or high hazard structures.

# Volcanoes

Not in the codes now.

Community planning similar to tsunamis?



# High winds



# High Winds

- The IBC has requirements for high wind and weather protection.
- The requirements for high winds are not enough to protect your home or business from a tornado or hurricane.

# High Winds

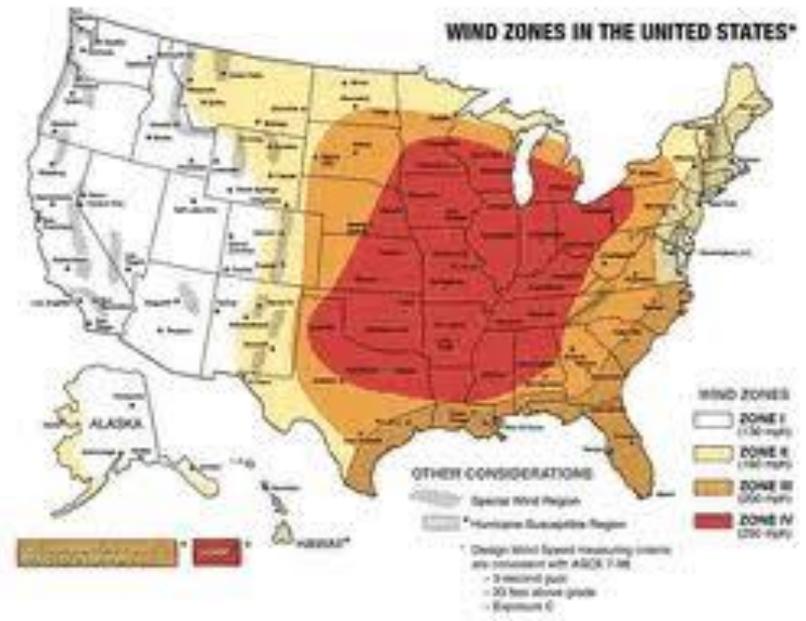
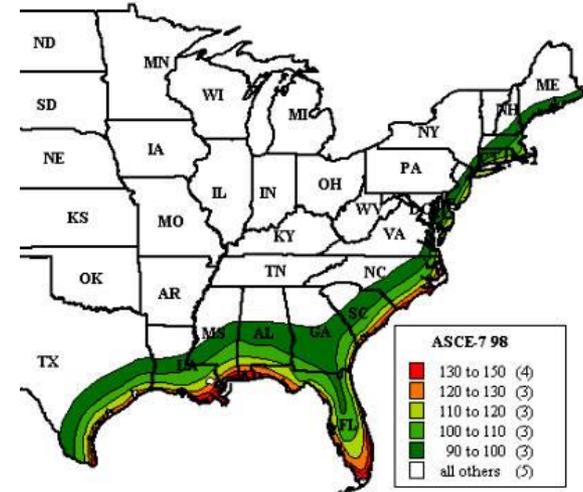
- What you can do –
  - Install permanent shutters, or plan to protect your windows and glass doors with plywood panels.
  - The roof of your house is very vulnerable to high winds. Reinforce the connection between the roof and walls with hurricane straps and bracing to resist uplift.
  - Reinforce double-entry front doors as well as garage doors.
  - Clear away dead or weak tree branches that may break off and damage your house in high winds.

# Tornadoes and Hurricanes



# Wind loads

- Wind load contour maps
- Hurricanes 
  - Atlantic coast and Gulf of Mexico
  - Hawaii, Puerto Rico, Guam and Virgin Islands
- Tornado 
  - Mid-west and eastern states
  - Alaska, American Samoa, Guam, Hawaii, Puerto Rice, Virgin Islands



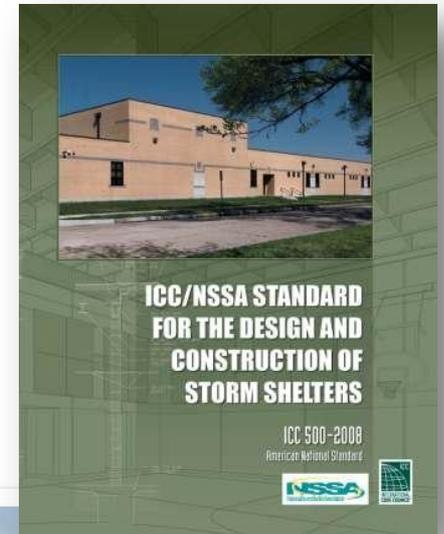
# Types of shelters

- Shelters used for hurricanes
- Shelters used for tornadoes
- The primary difference in these two types is the expected duration of the storm.
  - Hurricane shelters – 24 hours
  - Tornado shelters – 2 hours



# Types of shelters

- **Community shelters**
  - Any shelter that is not a residential shelter
- **Residential shelters**
  - Limited to 16 occupants maximum
  - Limited to a residence or small group of residences
- **ICC/NSSA 500** – Standard for the Design and Construction of Storm Shelters



# Fires

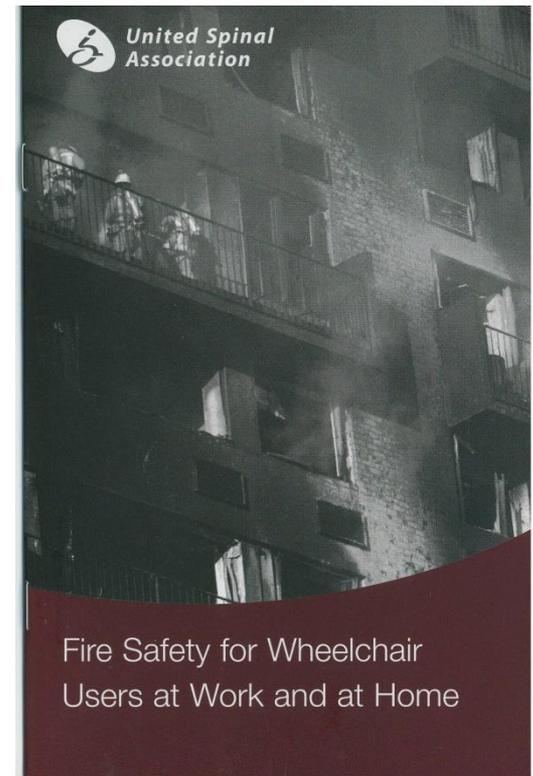


# Fire Protection

- The IBC contains requirements for fire rated construction, sprinklers, alarms and smoke detectors.
- What you can do –
  - Replace batteries in smoke detectors
  - Have a fire evacuation plan at work and at home and practice it.
  - Participate in the planning for fire and safety evacuation plans.

# In case of fire

- United Spinal resource - <http://www.unitedspinal.org/pdf/WheelchairFireSafety.pdf>
- Prepare yourself
- Participate in the planning where you live and work

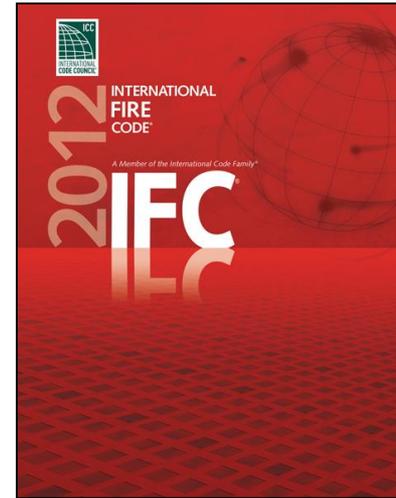


# Planning



# Pre-Planning for Emergencies

- Fire evacuation plans
- Fire safety plans
- Lockdown plans
- Associated drills
- Worked out with the building owner/renter and the fire department
- Updated annually or when necessitated by changes
- Available for review



# Pre-Planning for Emergencies

Required in:

- Assembly
- Churches over 2,000 occupants
- Educational
- College dormitories
- High Hazard
- Institutional
- Hotels
- Group homes

# Pre-Planning for Emergencies

Required in:

- High-rise buildings
- Covered malls > 50,000 sq.ft.
- Mercantile & Factory (> 500 occupants on the 1st floor and basements or 2nd floor > 100 occupants)
- Underground buildings
- Assembly, Educational and Mercantile with atriums

# Fire Evacuation Plans

- Emergency routes
- Strategy - Evacuation or defend in place
- Critical equipment operation
- Assisted rescue procedures
- Verifying full evacuation
- Emergency responders
- Notification of occupants
- Notification of fire department
- Emergency voice/alarm communication system

# Fire Safety Plans

- Reporting emergency
- Evacuation or relocation of occupants
- Site plans – occupancy assembly point, fire hydrants, fire truck route
- Floor plans – exits, routes, areas of refuge, fire alarm, extinguishers, fire hoses
- Major fire hazards
- Persons responsible

# Lock-down plans

- Occupant notification
- Emergency responders notification
- Accountability
- Recall
- Communication
- Coordination
- Training

# Emergency Drills

- Assembly – quarterly
- Business – annually
- Educational – monthly
- Factory – annually
- Institutional – quarterly on each shift
- Hotel - quarterly on each shift
- Apartments/dorms – 4 times annually
- Group homes - quarterly on each shift
- High rise - annually

# Notification & Communication

# Signage

- Evacuation plans at elevators
- Signage at any non-accessible exits



# Signage

- Visual exit signs at stairway entrances
- Tactile exit signs at stairway entrances



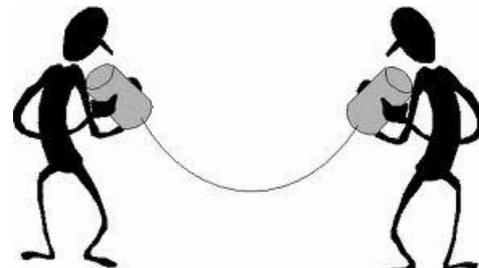
# Signage

- Visual signage within the stairway
- Tactile signage indicating floor levels
- Tactile signage at the door leading to the exit discharge



# Two-way Communication

- Within areas of refuge
- At elevator lobbies in sprinklered buildings (2009, 2012 and 2015 IBC)
- Variety of options
- Allow for communication and feedback between emergency responders and people who need assistance



# Audible and Visible alarms

- Installed in accordance with NFPA 72.
- Manual fire alarm pull stations must be accessible.



# Visible Alarms

- All public spaces.
- All common spaces.
- Group I-1 (assisted living) and R-1 (hotel) units per Table 907.9.1.3.
- Future expansion for:
  - Individual employee work areas.
  - Smoke alarms in Group R-2 (apartments) units.



# Sprinkler automatic notification

- Activation of the sprinkler system automatically notifies the fire department
- Upon arrival the fire department can use the sprinkler panel to identify the floor where the fire is happening
- Standby power on the elevators allow for the fire department to move to the fire floor so they can offer assistance.



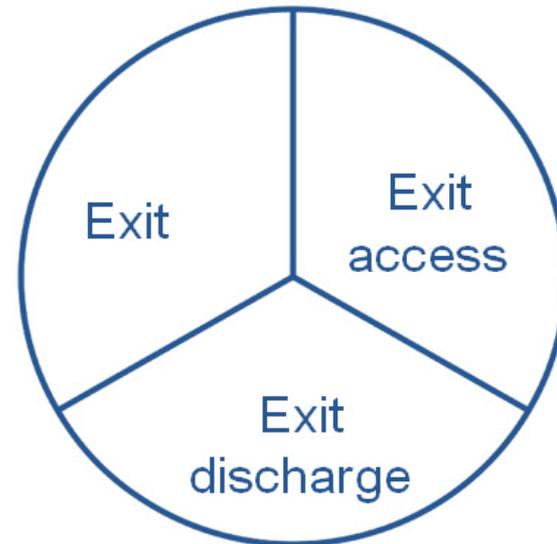
# Means of Egress (MOE)

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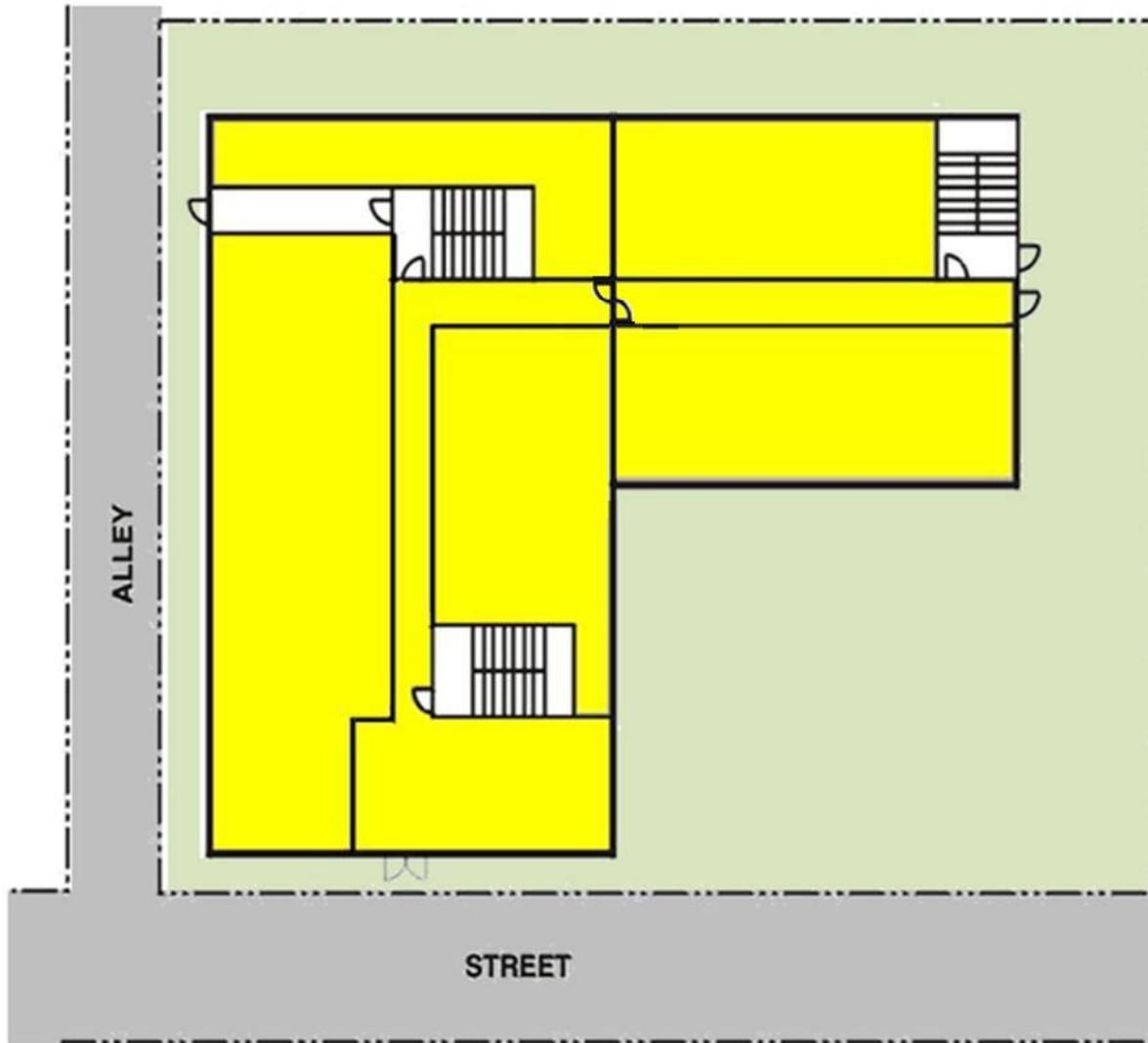
A means of egress is  
an unobstructed path to leave  
buildings, structures, and spaces

Comprised of:

- Exit Access
- Exits
- Exit Discharge



# MOE: Exit Access



The path from any location in a building to an exit

Drawing courtesy of Access Board

# Accessible Exit Access

Ramps

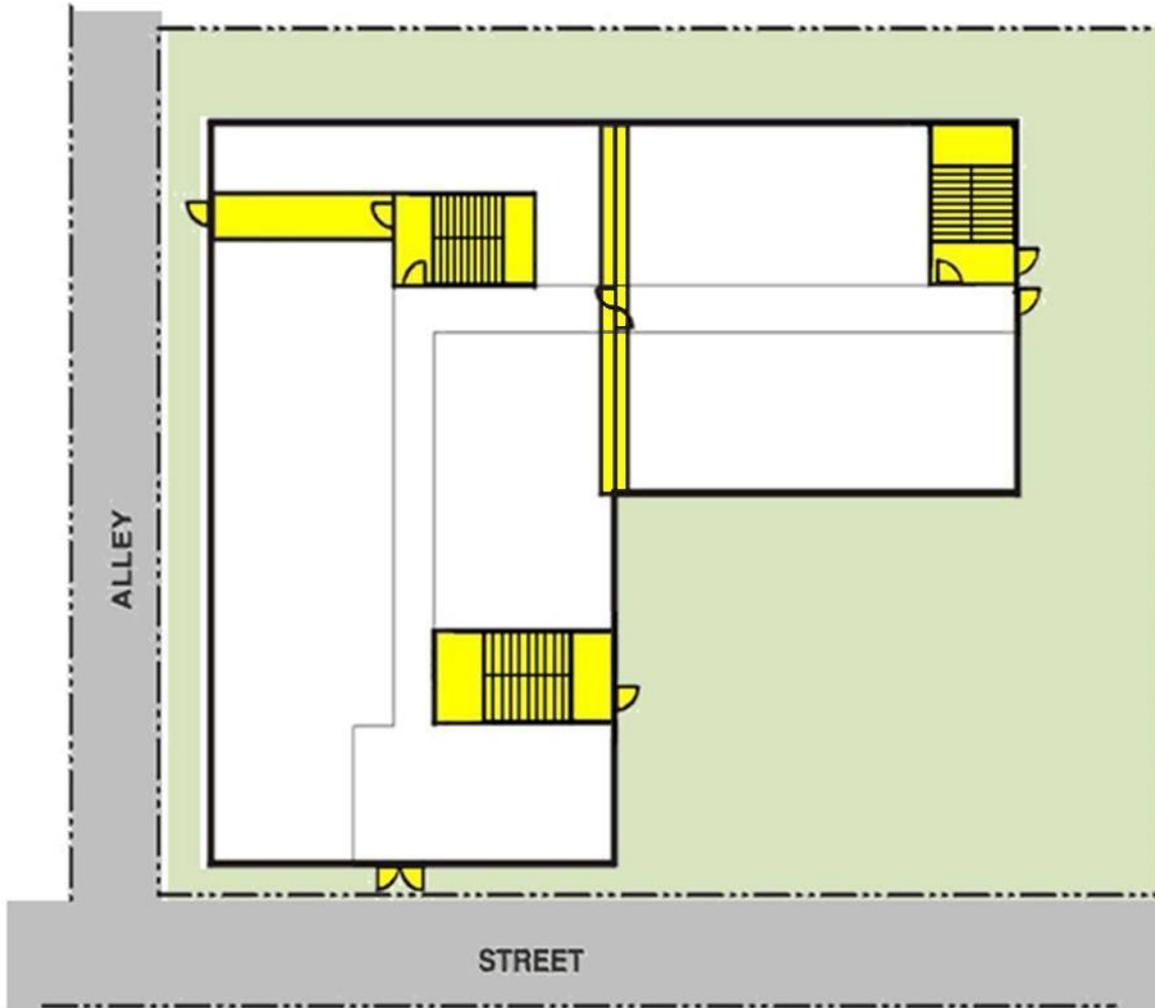


Horizontal surfaces



Platform lifts with standby power

# MOE: Exits

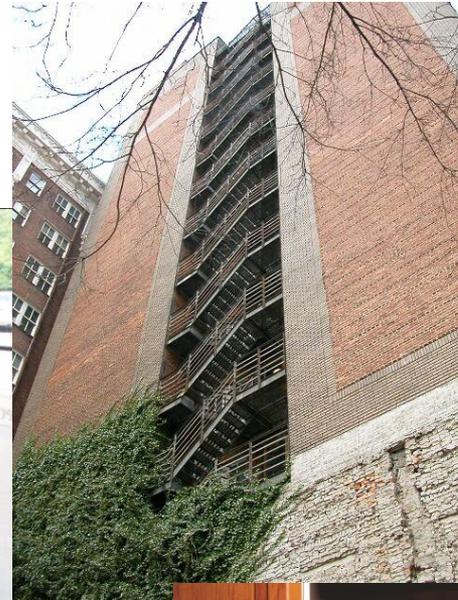


Exits include doors to the outside, enclosed exit stairways, or horizontal exits

Drawing courtesy of Access Board

# Accessible Exit

Exit Door

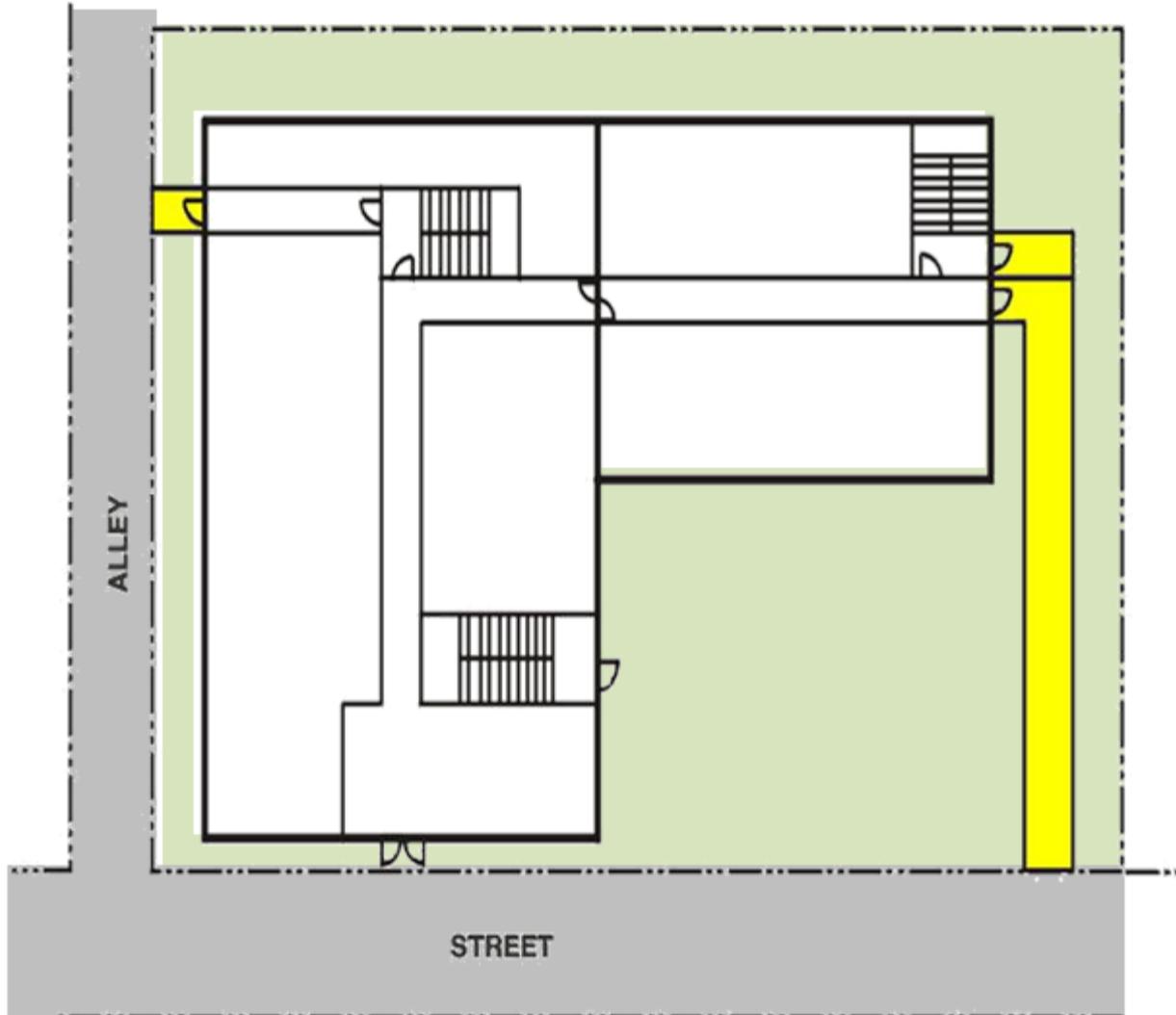


Horizontal Exit



Elevator with standby power

# MOE: Exit Discharge



The path from an exit to a public way (i.e., street or alley)

Drawing courtesy of Access Board

# Accessible Exit Discharge



# Accessible Means of Egress

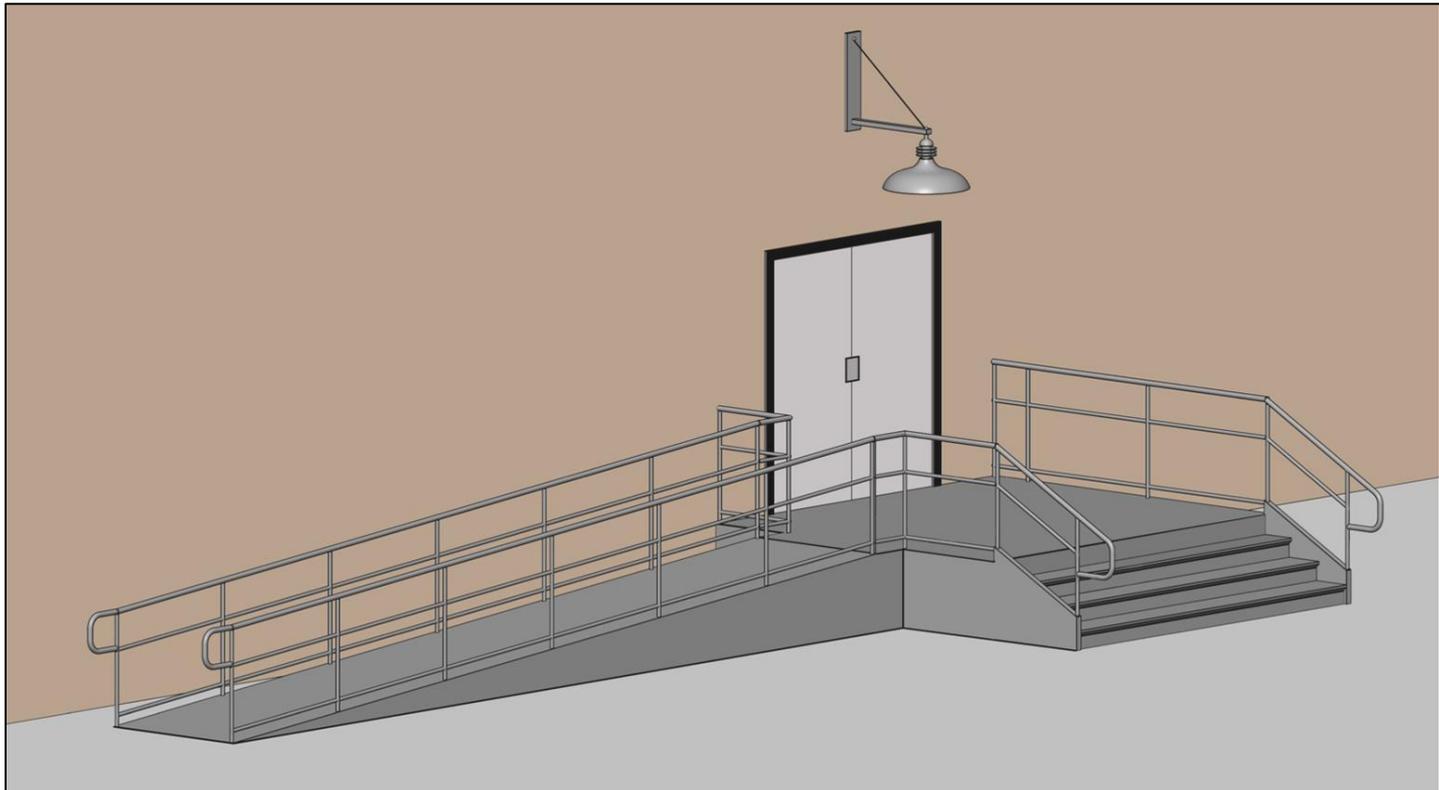
# Accessible MOE

An accessible means of egress is:

A continuous and unobstructed accessible route of egress travel from any accessible point in a building or facility to a public way.

# Accessible MOE

Allow for self evacuation when possible



Drawing courtesy of Access Board

# Accessible MOE

- Assisted rescue when necessary
- Defend in place (i.e., hospitals, jails)
- Assisted evacuation at stairways
- Assisted evacuation at elevators with standby power



# AMOE: Minimum Number

Minimum number of AMOE required:

1 - where 1 MOE required

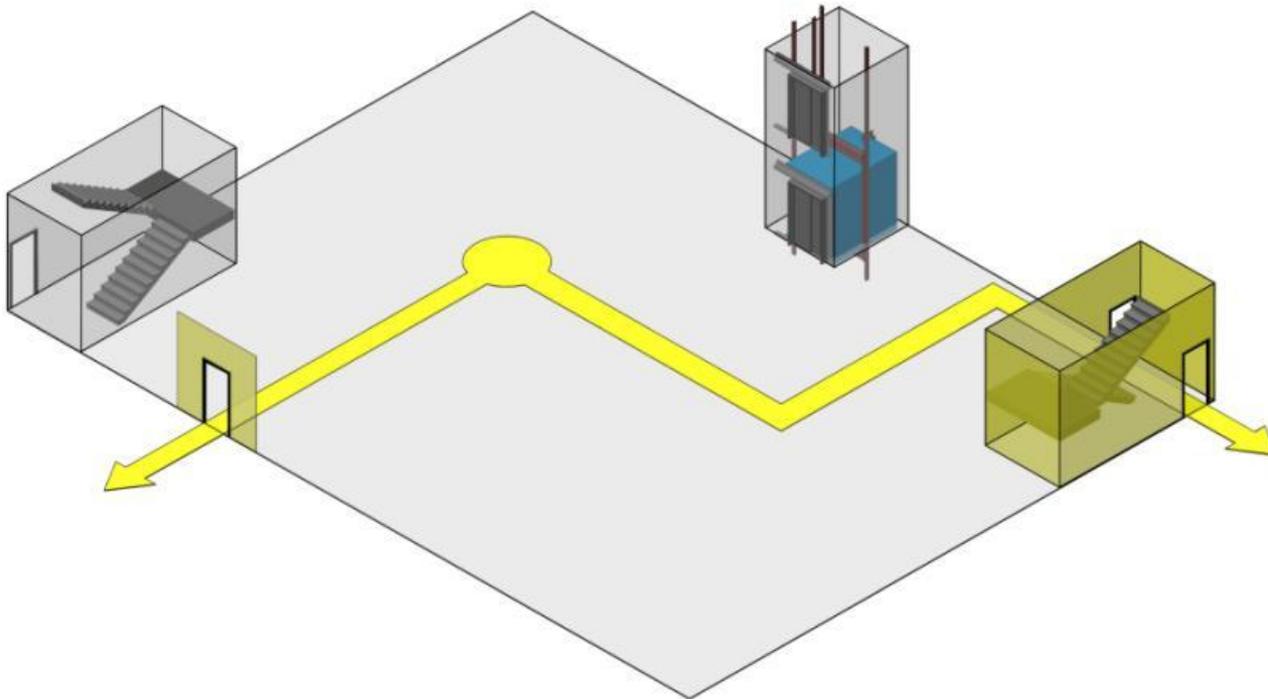
2 - if more than 1 MOE required

Exceptions:

- Existing facilities
- Areas not required to be accessible

# MOE: Minimum Number

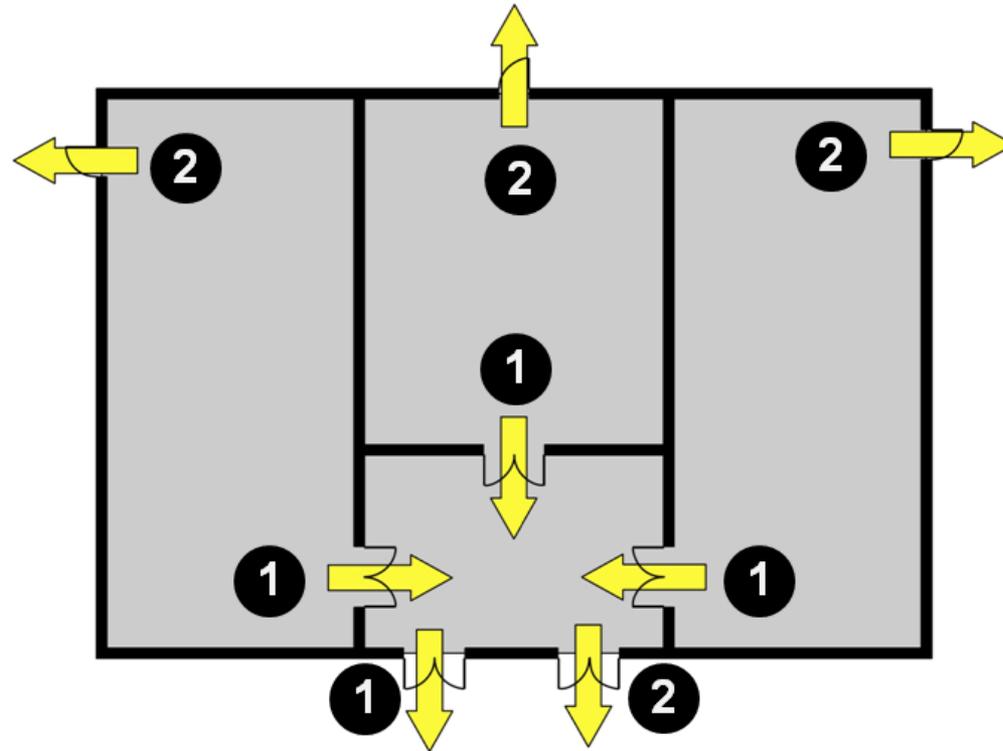
IBC requires 2 or more MOE in most facilities with few exceptions



Drawing courtesy of Access Board

# MOE: Minimum Number

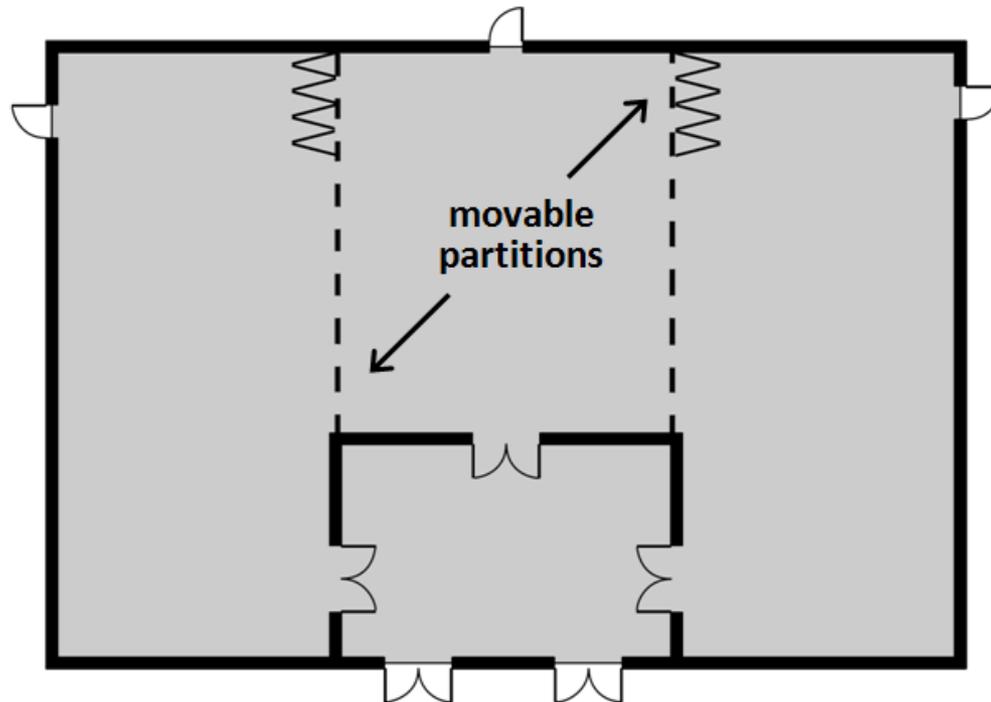
MOE required from each space and room



Drawing courtesy of Access Board

# MOE: Minimum Number

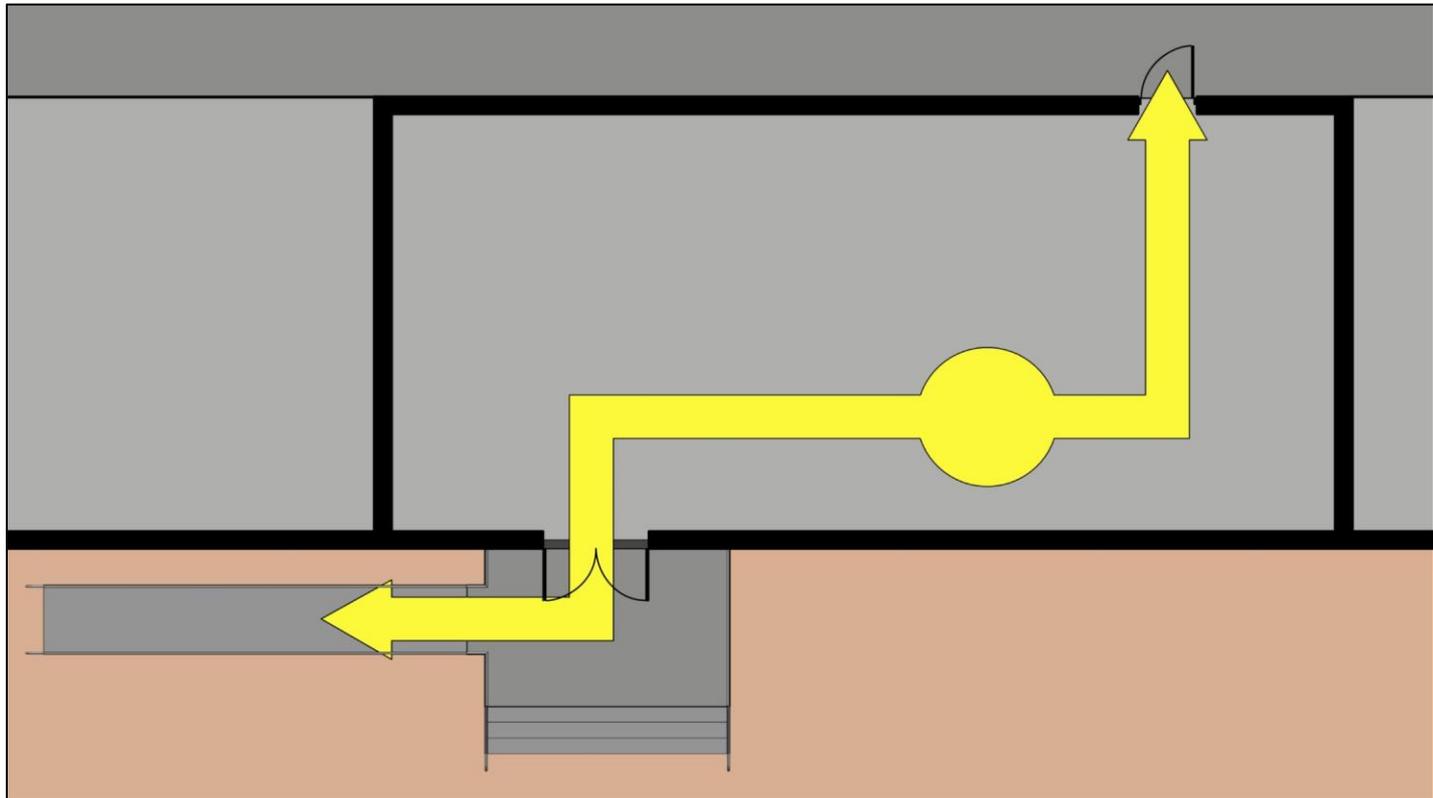
Required MOE must be maintained under all conditions, including temporary divisions of space



Drawing courtesy of Access Board

# MOE: Minimum Number

At least 2 MOE required

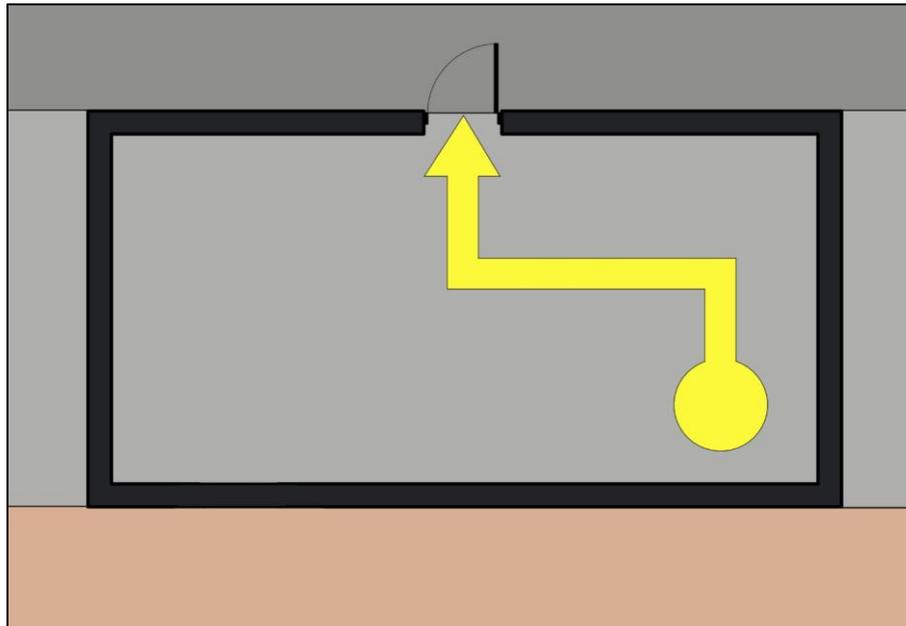


Drawing courtesy of Access Board

# Example: 1 MOE/AMOE

1 MOE & 1 AMOE allowed under these conditions:

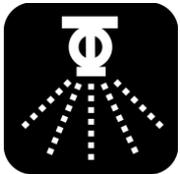
- mercantile occupancy; and
- 49 or fewer occupants; and
- 75' max. travel distance from farthest point



Drawing courtesy of Access Board

# Exit Discharge

- Accessible route to a public way or
- Interior area of refuge or
- Exterior area for assisted rescue



*No exceptions for sprinklered buildings*

# Exit Discharge

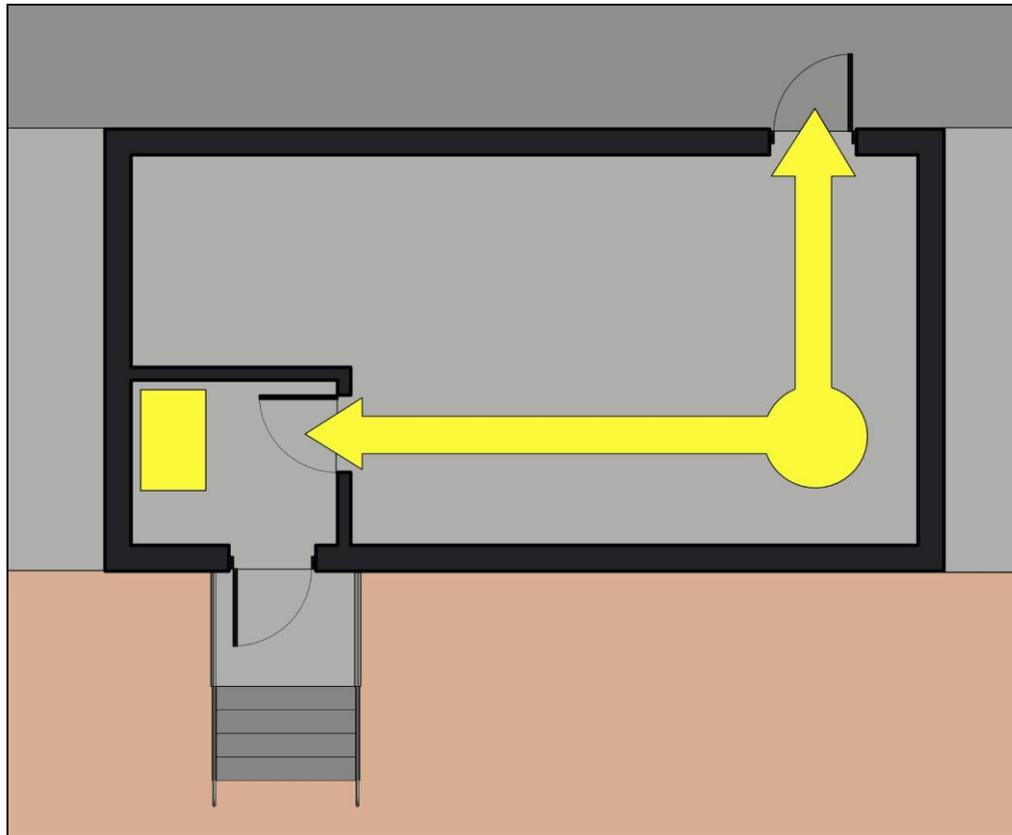
Accessible route to a public way



Drawing courtesy of Access Board

# Exit Discharge

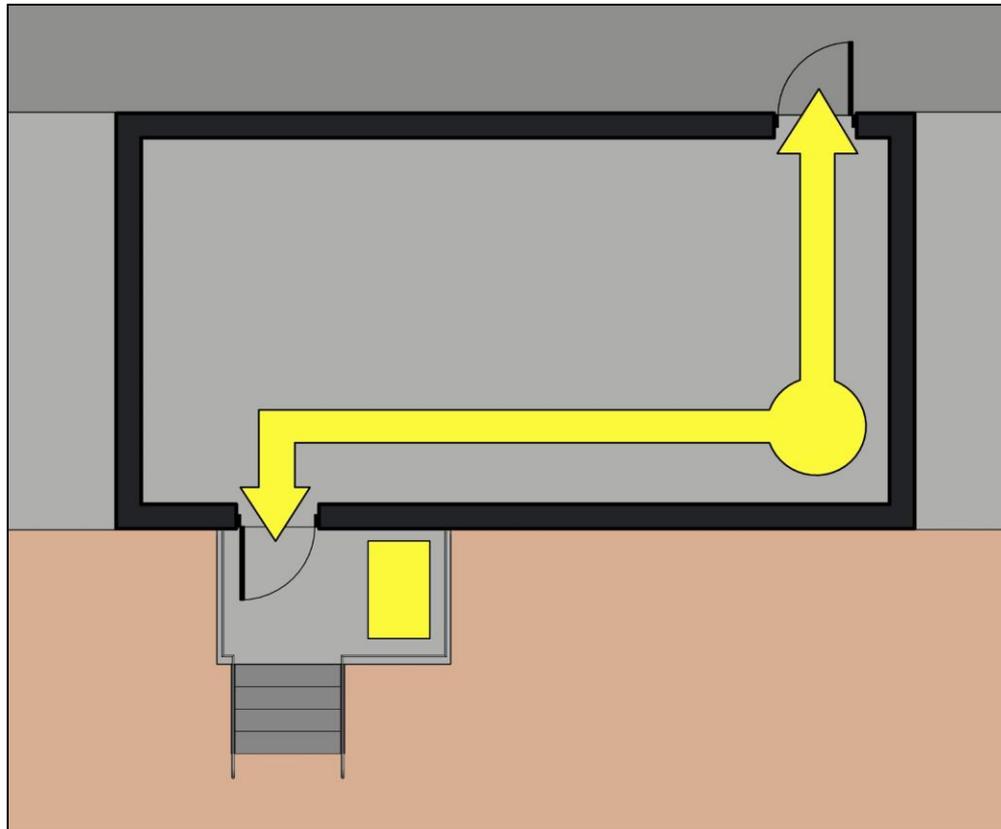
## Interior Area of Refuge



Drawing courtesy of Access Board

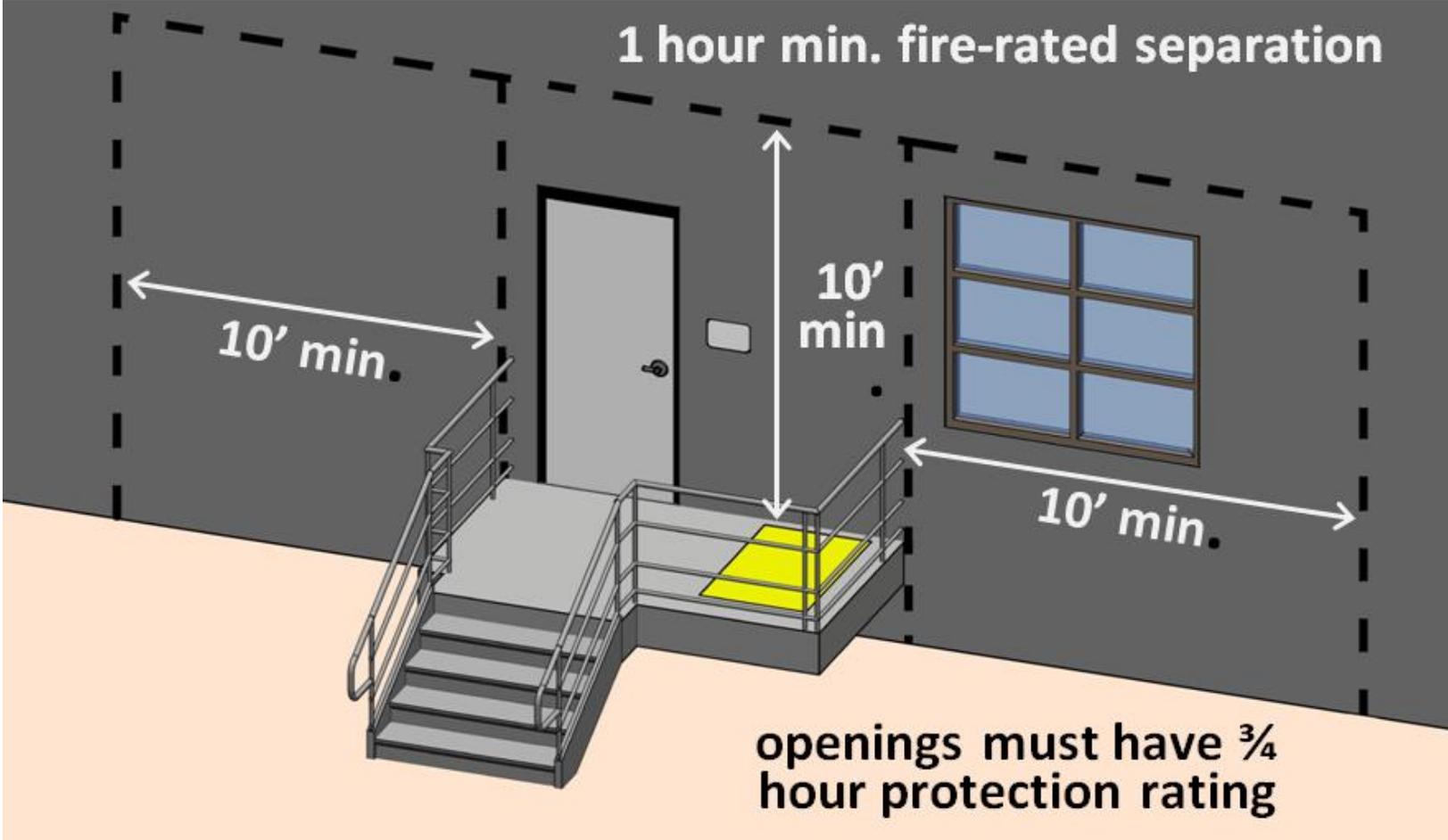
# Exit Discharge

Exterior Area for Assisted Rescue



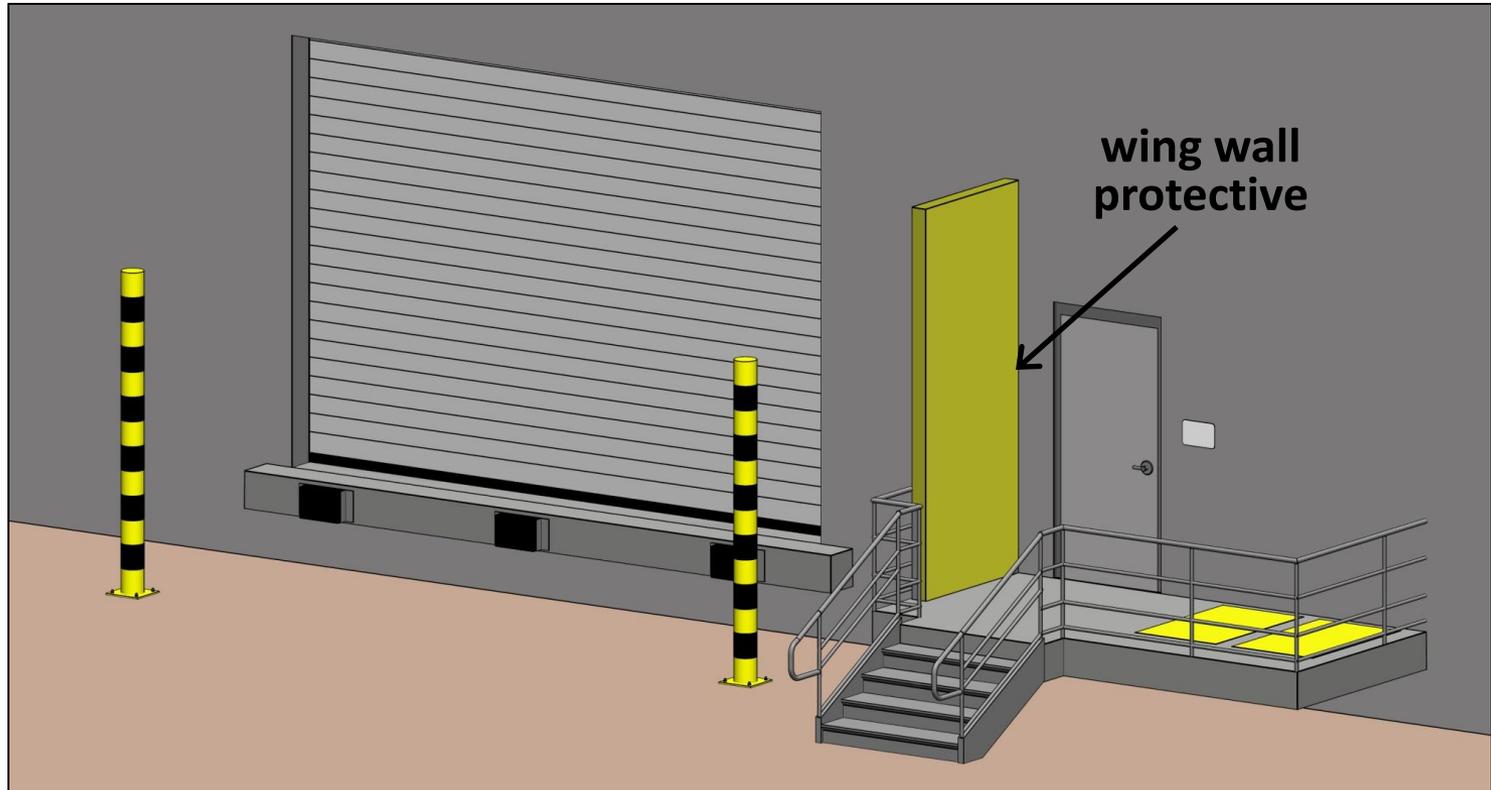
Drawing courtesy of Access Board

# Exterior Area for Assisted Rescue



Drawing courtesy of Access Board

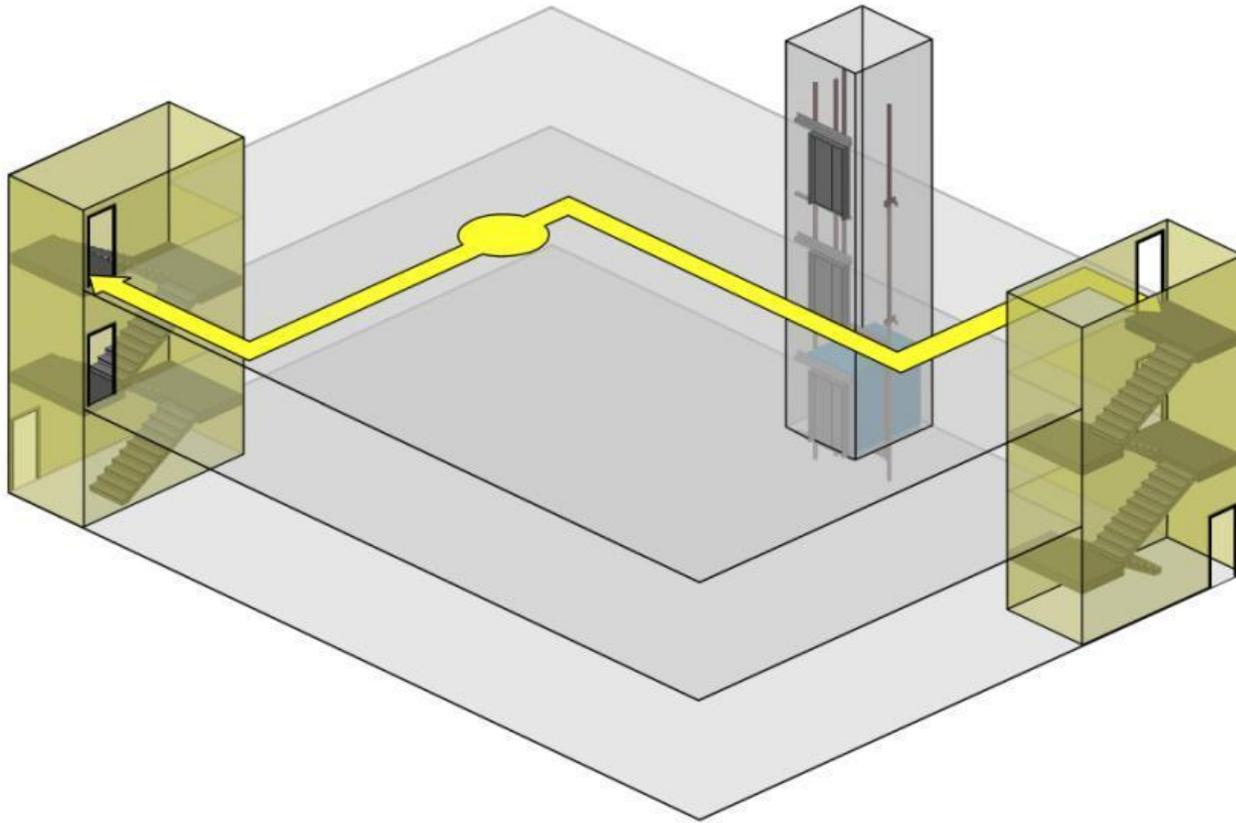
# Exterior Area for Assisted Rescue



2012 IBC: New provision for alternative protection from opening on one side

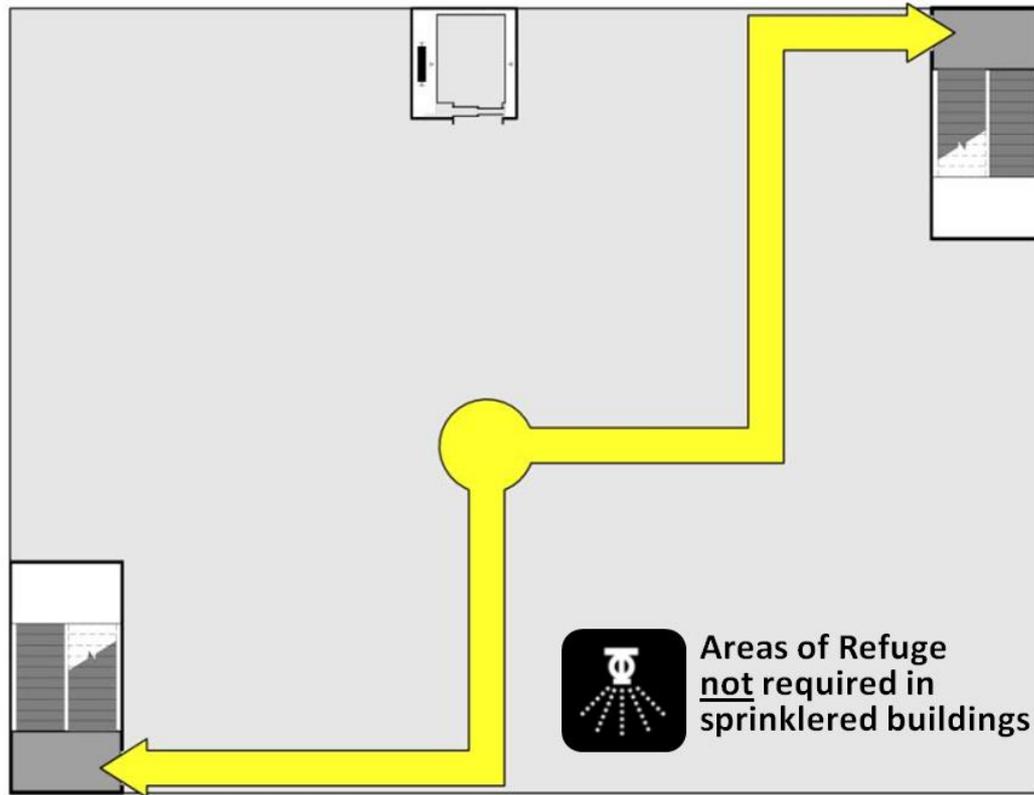
Drawing courtesy of Access Board

# Exit Access: Upper Floors



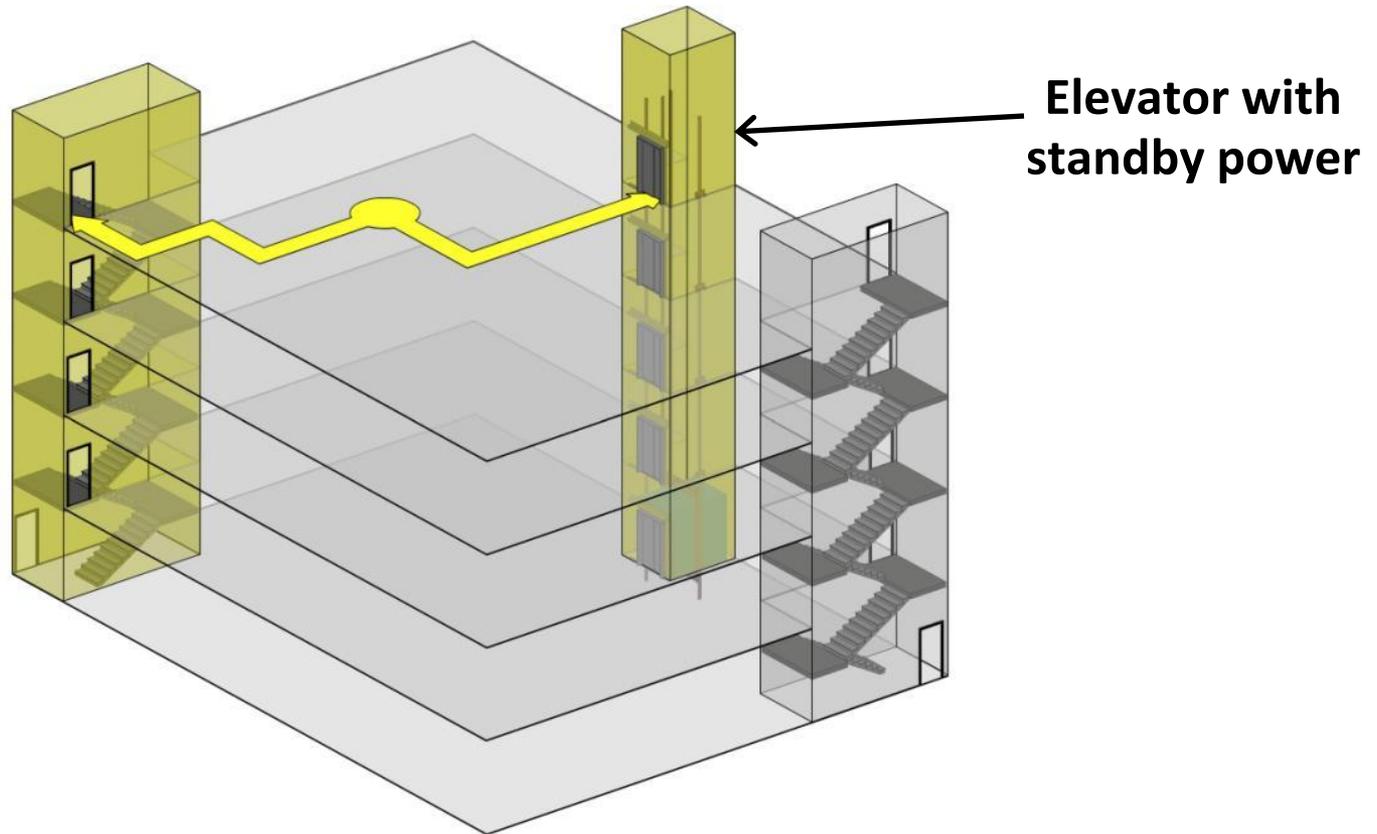
Drawing courtesy of Access Board

# Exit Access: Upper Floors



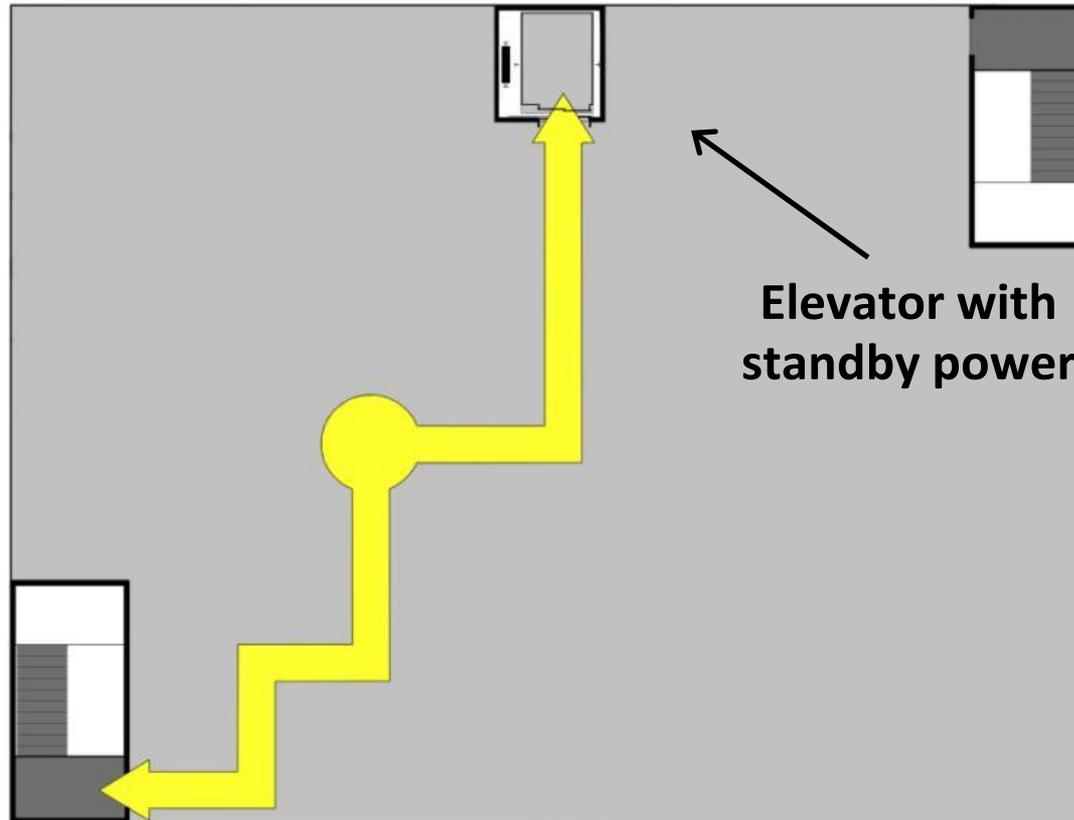
AMOE on floors above or below level of exit discharge connect to exit stairs

# Elevator with Standby Power



Required in buildings 5 stories or higher

# Elevator with Standby Power

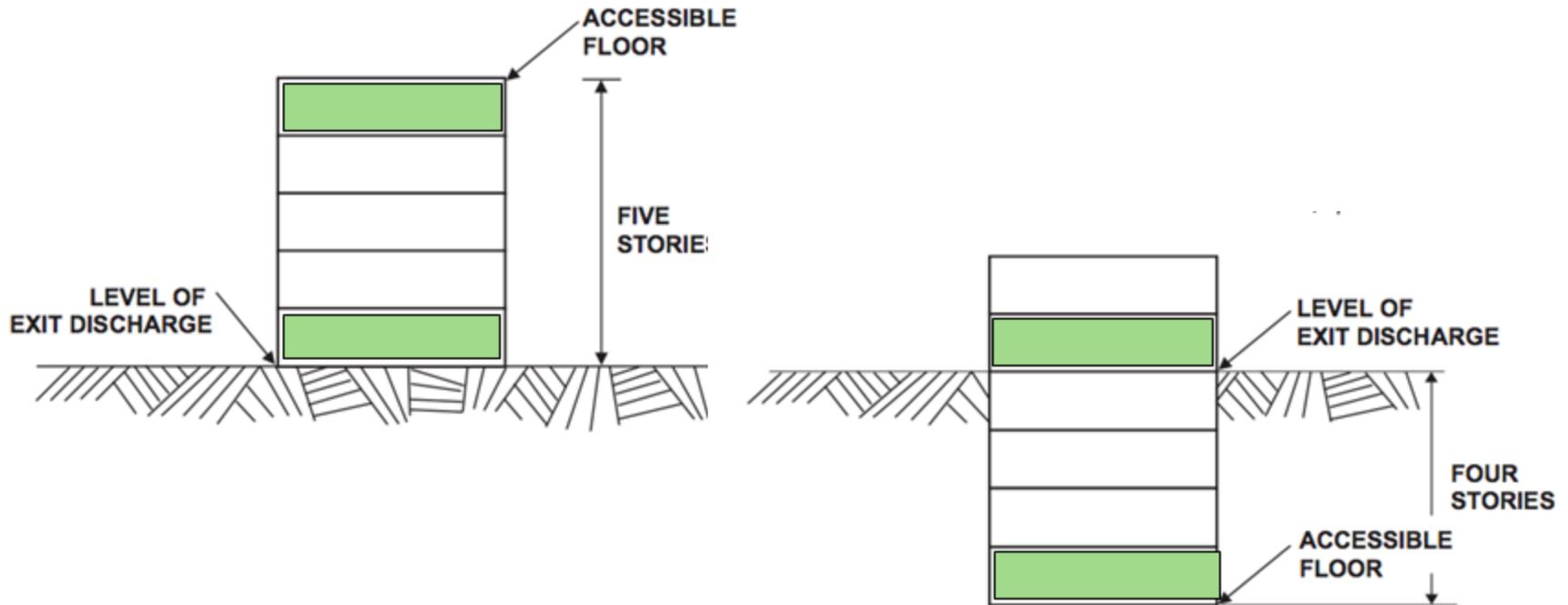


Counts as 1 of 2 accessible MOE

Drawing courtesy of Access Board

# Elevator with Standby Power

Required in buildings with 4 or more stories above or below the level of exit discharge

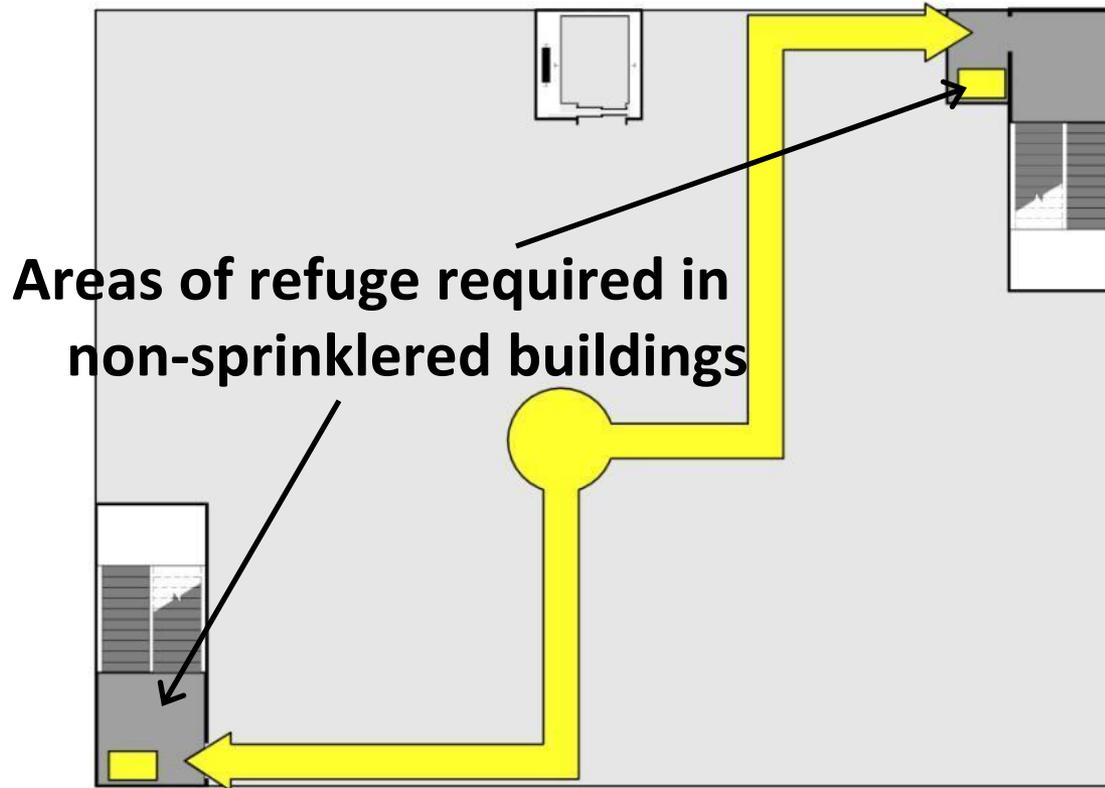


# Elevator with Standby Power

Exceptions for standby power:

- Sprinklered buildings with horizontal exits
- Ramps from each level

# Exit Access: Upper Floors

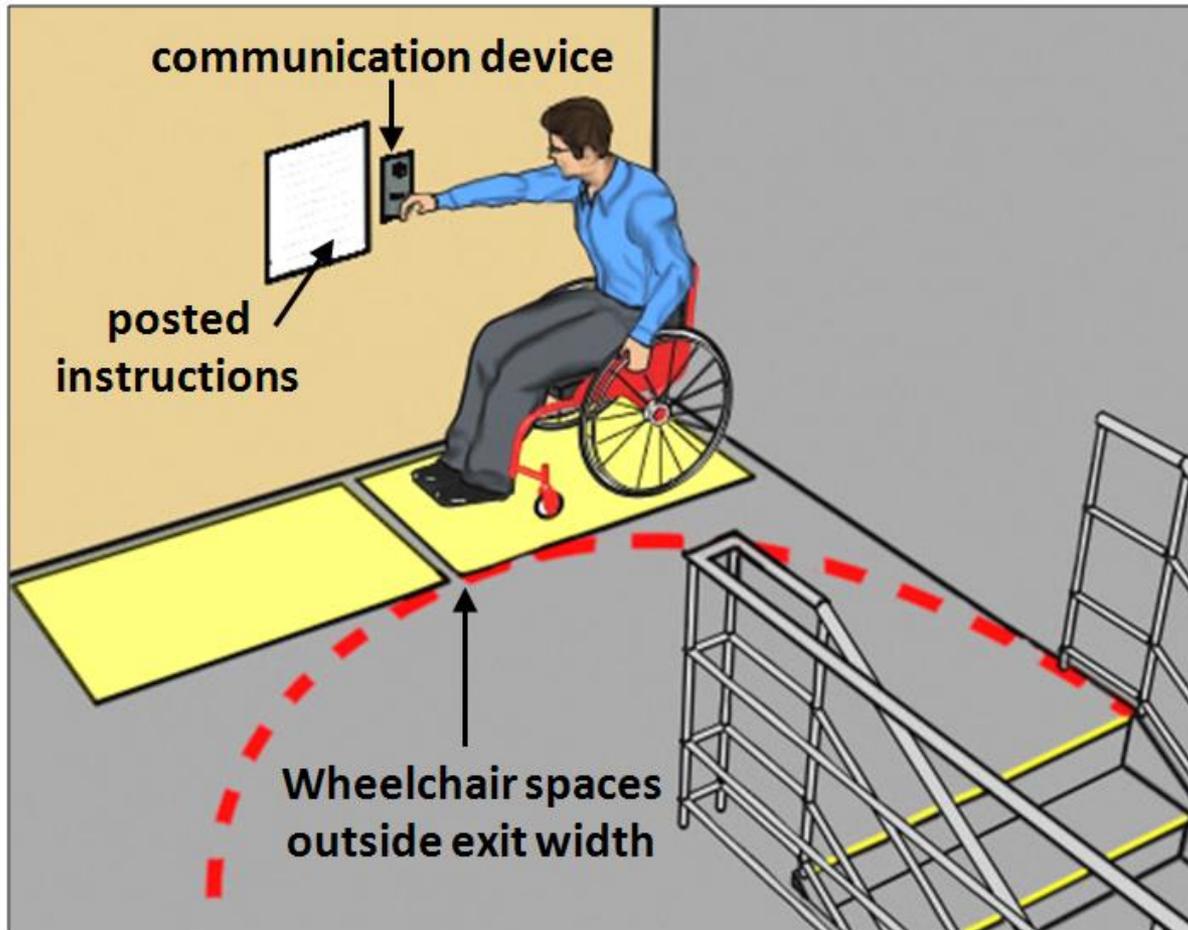


Drawing courtesy of Access Board

# Areas of Refuge

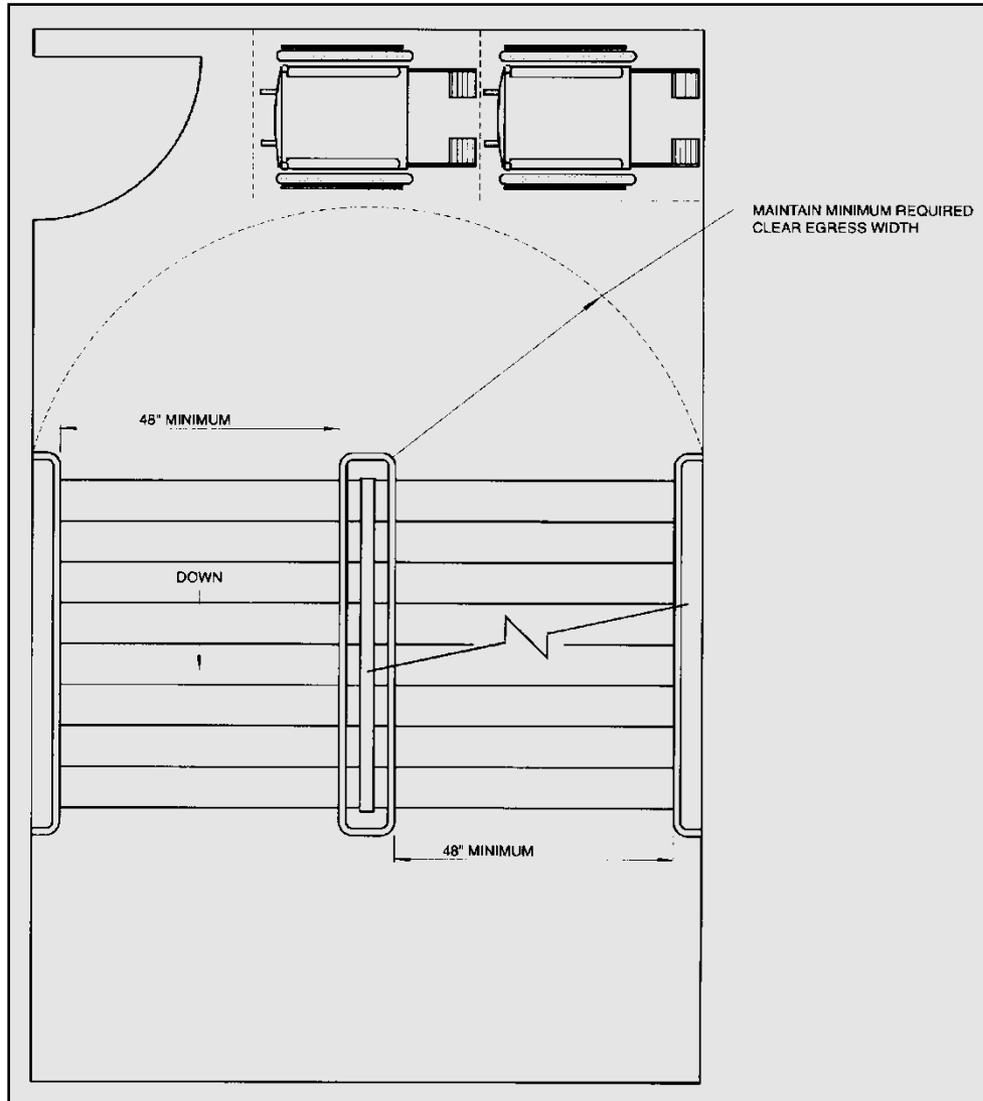
- on accessible route
- separated by a smoke barrier
- direct access to exit stairway, elevator with standby power
- 48" min. stairway width
- 30" x 48" space (1 for every 200 occupants) located outside general MOE path
- two-way communication system
- identification and instructional signage
- alternative: horizontal exit

# Areas of Refuge

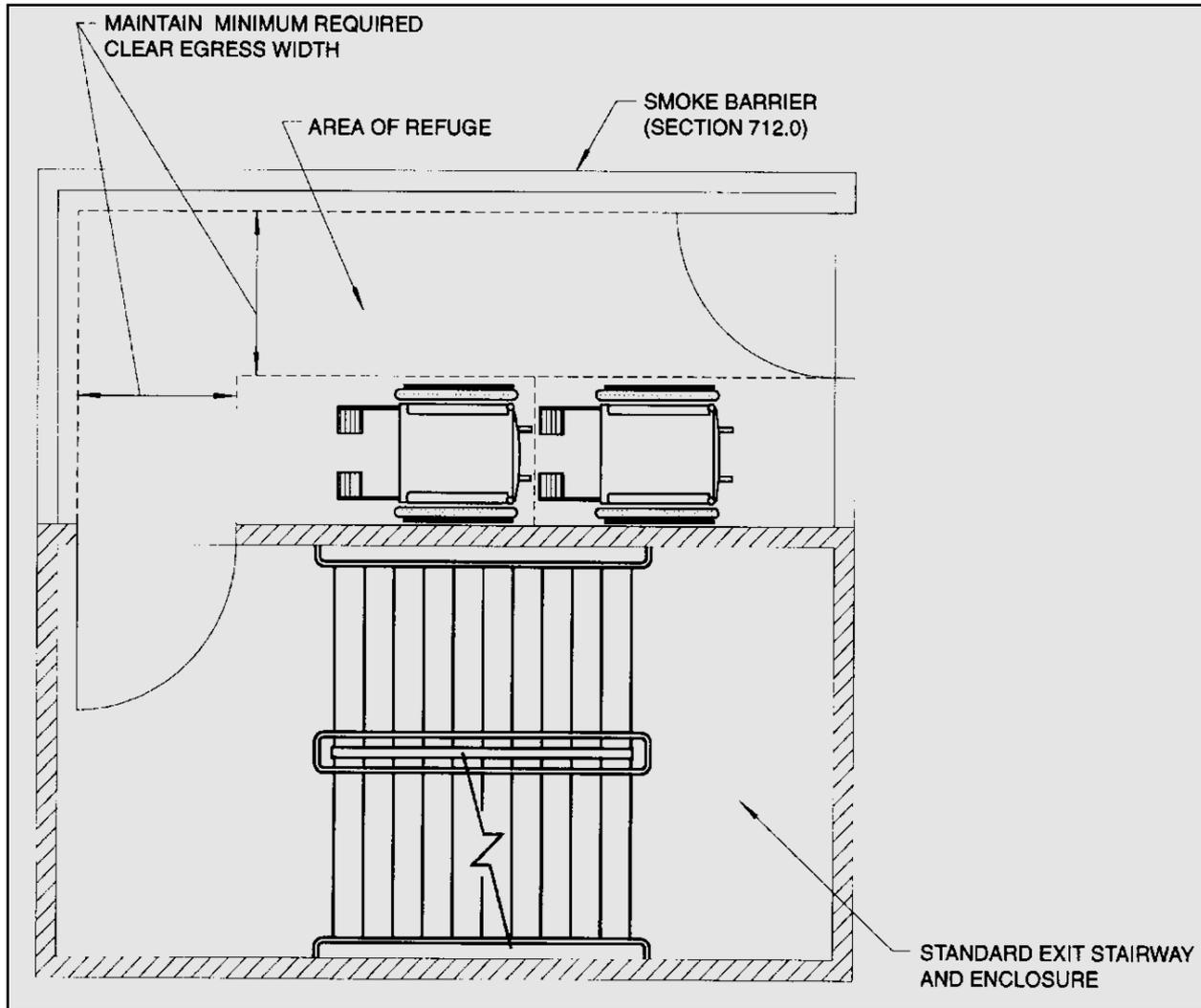


Drawing courtesy of Access Board

# Areas of Refuge



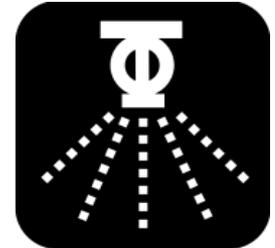
# Areas of Refuge



# Areas of Refuge

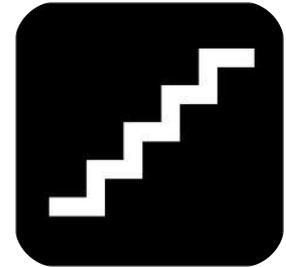
Not required in:

- buildings fully equipped with an automatic sprinkler system
- open parking garages
- open exit access stairways between stories



# Stairway Width (48" min)

Stairway width 48" min. (measured between handrails) not required:



- in buildings fully equipped with an automatic sprinkler system
- where horizontal exits are provided

# New Technology

2009 & 2012

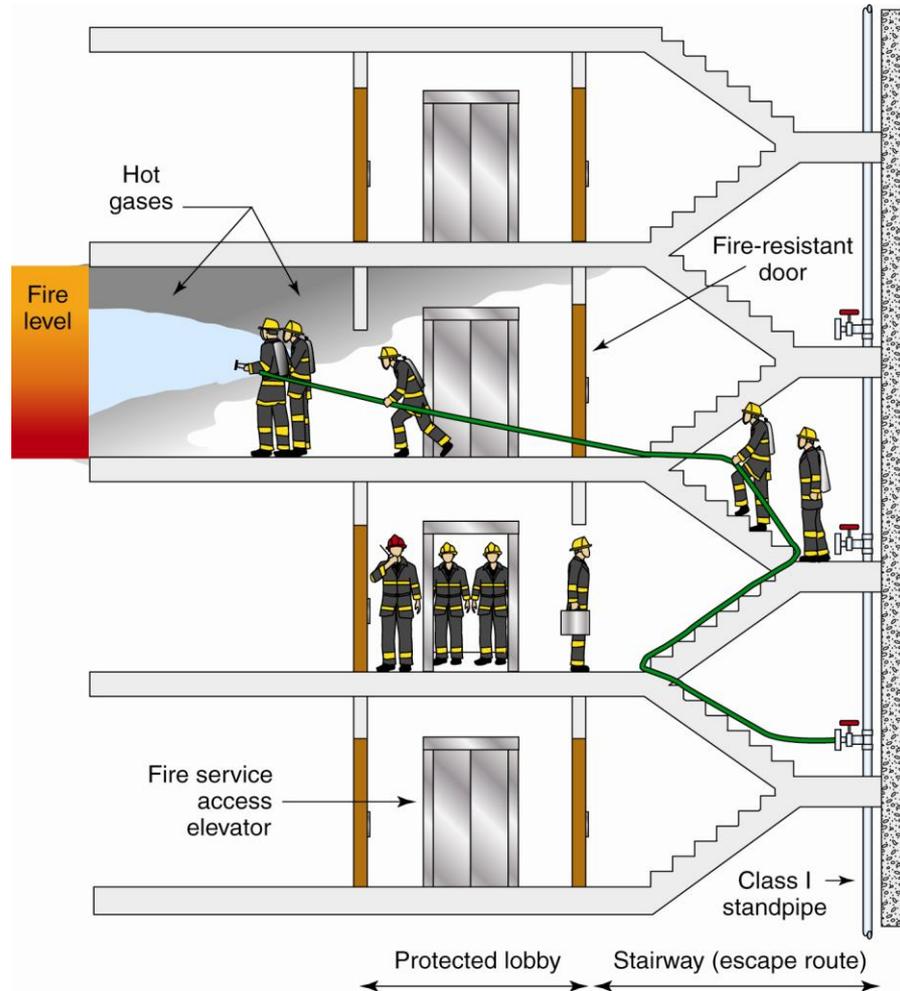
International Building Code

# Fire Service Access

## Elevators

- Required in buildings with floor >120 ft. above fire department vehicle access
- Must open into a fire service access elevator lobby and have direct access to an exit enclosure
- Numerous requirements: lobby protection, minimum lobby size, standby power, monitoring of elevator, protection of wiring, etc.

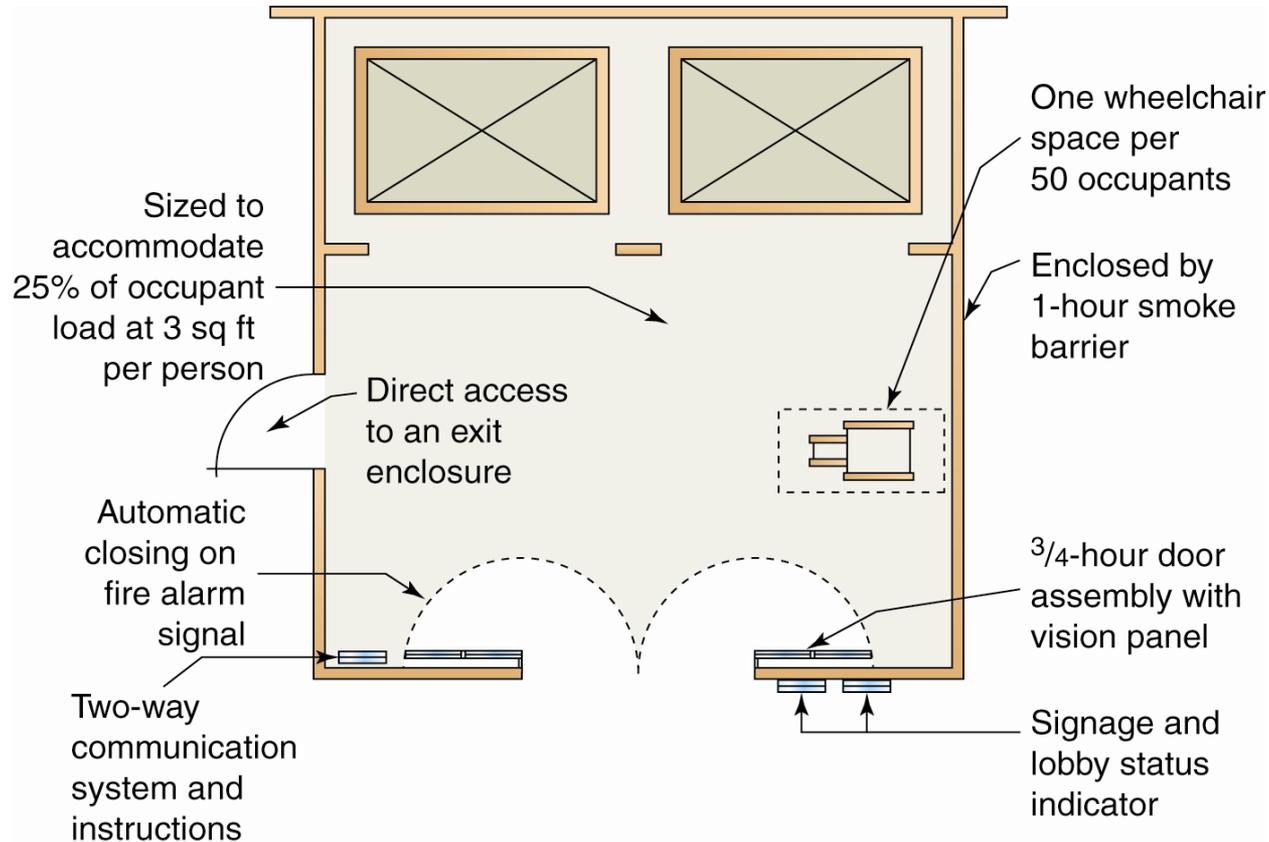
# Fire Service Access Elevators



# Occupant Evacuation Elevators

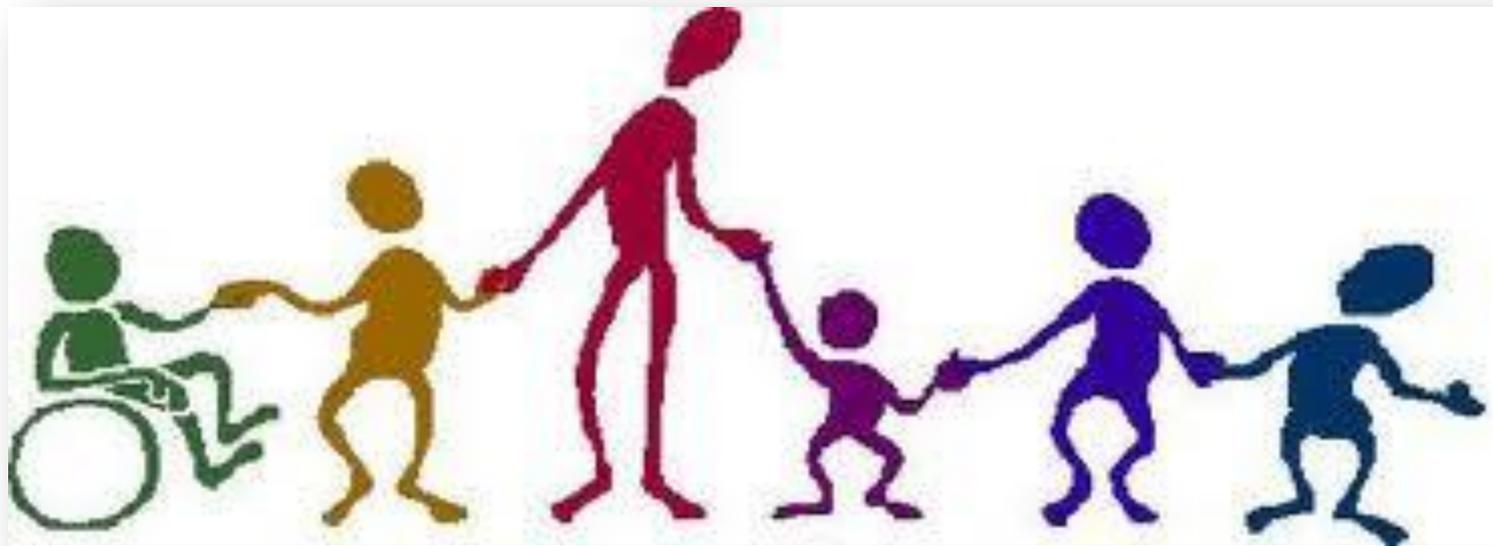
- Used for occupant self evacuation prior to emergency recall
- Must open into an elevator lobby and have direct access to an exit stairway
- Numerous requirements: lobby protection, minimum lobby size, elevator status indicators in lobby, standby power, monitoring of elevators, protection of wiring, etc.

# Occupant Evacuation Elevators



## Occupant Evacuation Elevator Lobby

# Questions?



# Technical Assistance

- ICC and A117.1 – ICC, (888)422-7233; [www.iccsafe.org](http://www.iccsafe.org).
- ADA – Access Board, 800-872-2253(v), 800-993-2822(TTY), [www.access-board.gov](http://www.access-board.gov) or email at [ta@access-board.gov](mailto:ta@access-board.gov)
- ADA – ADA Technical Assistance Centers (DBTAC) (800)949-4232; [www.adata.org](http://www.adata.org)
- Fair Housing – Fair Housing Accessibility First, (888)341-7781; [www.fairhousingfirst.org](http://www.fairhousingfirst.org).

Thank you for attending.