Small Single-Stairway Apartment Buildings Have Strong Safety Record

A synopsis of a new report shows revised building codes could encourage construction, boost supply of lower-cost homes

Overview

Policymakers could increase the supply of multifamily housing in their states and localities by revising outdated building codes that require more than one stairway in small apartment buildings. If enough states and cities enacted this simple change, it could reduce the nationwide shortage of multifamily housing.

A first-ever analysis of fire death rates in modern four-to-six-story buildings with only one stairway shows that allowing these buildings to have only one staircase does not put residents at greater risk: Single-stairway buildings as tall as six stories are at least as safe as other types of housing.

And allowing the construction of such buildings could provide much-needed housing, including homes for people with modest incomes.

The United States faces a shortage of 4 million to 7 million homes, with the problem particularly acute in areas near jobs and commerce.[1] This shortage has contributed to housing affordability challenges across the country, with rents and prices near all-time highs.[2] Building more housing—especially apartments and smaller homes—would improve affordability. Small- and medium-sized apartment buildings with two to 19 units tend to have the most affordable rents across urban, suburban, and rural areas, serving renters with more modest incomes.[3] Research shows that the public supports allowing more apartment buildings, especially near transit hubs, job centers, offices, stores, and restaurants.[4] Such housing can also revitalize main streets by adding customers and expanding the potential workforce for nearby stores and restaurants.

Despite the benefits of small- and medium-sized apartment buildings, which make up 40% of the rental stock in the United States today, the U.S. builds few new ones.[5] Only 21% of all housing units built since 2000 in the U.S. have been in apartment buildings with two to 19 units, in part because of building code regulations: rules that govern construction and focus on safety, separate from land-use regulations like zoning. Virtually all modern building codes in the U.S. require two stairways in buildings above three stories tall, making small apartment buildings four to six stories tall prohibitively expensive to construct.[6] To build a four-to-six-story apartment building with a dual stairway, developers must often assemble several smaller plots of land and combine them into one large lot to fit a dual-stair building; as a result, construction takes longer and costs more.

Current U.S. building codes in all but three major cities (New York City, Seattle, and Honolulu) stipulate that apartment buildings four to six stories must have two stairways.[7] However, model codes written by the National Fire Protection Association (NFPA) allow small apartment buildings up to four stories tall to be served by a single stairway; Vermont, Georgia, and Puerto Rico have adopted the NFPA rules. (Puerto Rico allows the same four stories, in a slightly different way.)[8]

The two-stairway requirement makes it especially difficult to build apartments or condominiums on small or irregularly shaped pieces of land in already built-up areas (known as infill lots), which are often the main type of land available for development (or close to jobs, commerce, and schools) in expensive U.S. cities and towns.[9] The same regulations mean that four-to-six-story apartment buildings in most of the U.S. must have a large amount of occupiable floor space, also known as the floor plate, to efficiently accommodate two stairways and a corridor connecting them, which limits both design choices and the building's aesthetic appeal. The mandate in dual-stair buildings for a central corridor on every floor means that most apartments have windows on just one side, limiting ventilation and light and resulting in small units that are less hospitable to families with children.

The International Building Code (IBC), the U.S.-written model building code adopted in most of the country, does not allow single-stairway buildings above three stories.[10] Safety concerns have led fire services (local departments and personnel, marshals, and other fire officials) in many cases to support keeping these current building code provisions.[11] Fire safety professionals often express concern about having only one staircase available, both to evacuate residents and to use for firefighter operations; about smoke entering and accumulating in the single stairwell; and about increased reliance on window or balcony rescues, among other safety issues.

Fears about the safety of single-stair buildings were well founded before the inclusion of modern safety features, such as sprinklers, in building codes. But in today's world, the rules requiring two stairways in buildings taller than three floors may actually increase fire risk by discouraging the construction of new multifamily housing, which has other safety measures in addition to sprinklers, such as self-closing doors and fire-rated walls (walls that are designed and constructed to resist fire penetration for a given amount of time, such as one hour).

Close examination by The Pew Charitable Trusts and the Center for Building in North America finds no evidence of safety risks for single-stairway buildings with sprinklers. From 2012 to 2024, fire death rates in modern single-stairway four-to-six-story apartment buildings in New York City were no different from those in other residential buildings; not one death in which the exit (or lack of a second exit) played a role was recorded in a modern four-to-six-story single-stair building in Seattle or New York City during that same 12-year period. Research from the Netherlands—where single-stairway buildings taller than three stories are common—also confirms that these buildings are safe.

Single-stairway four-to-six-story buildings with relatively small floor plates cost 6% to 13% less to construct than similar dual-stairway buildings. They can also fit on smaller infill lots, potentially increasing the supply of apartments in high-opportunity urban and suburban neighborhoods. And to the degree that these modern buildings replace older, riskier buildings, or enable residents to move out of older housing, single-stairway apartments will actually increase fire safety.

This report presents the findings of the first-ever analysis of fire death rates in modern single-stairway buildings, examines their potential benefits and risks, and provides relevant international comparisons. It also highlights recent legislative and regulatory efforts to consider and implement changes to building codes that govern the construction of four-to-six-story apartment buildings.

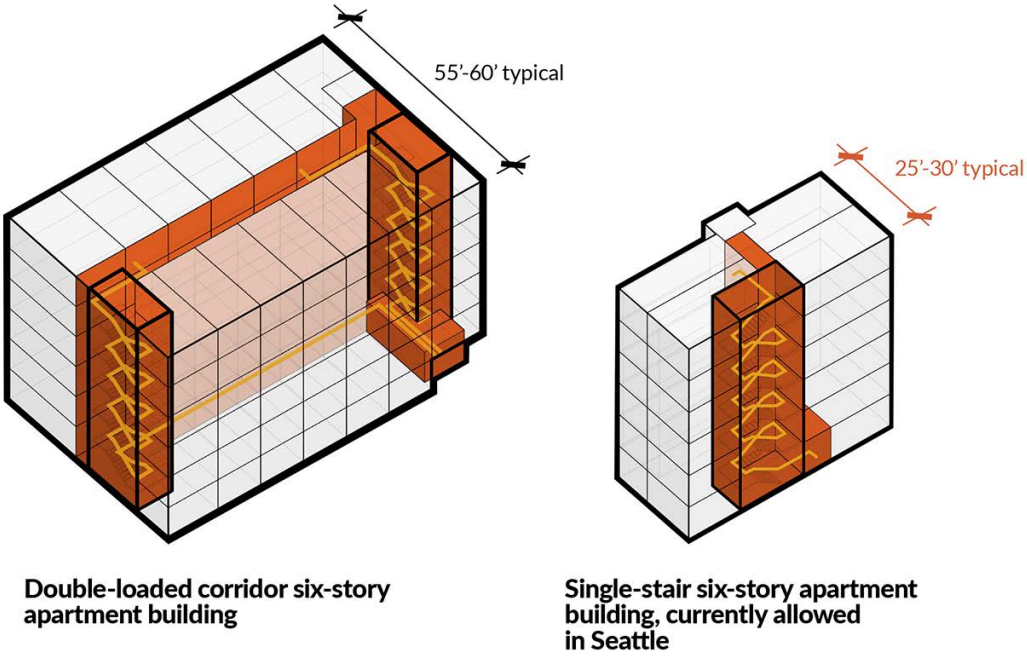
Key findings

- In New York City, the overall rate of fire deaths in its 4,440 modern single-stair buildings since 2012 was the same as in other residential buildings.
- We were able to find a total of four fire-related deaths in New York City and Seattle's modern single-stairway buildings from 2012 to 2024. The lack of a second stairway did not play a role in any of those fatalities.
- In the Netherlands, where single-stairway construction is common in four- and five-story buildings, the fire death rate in those buildings is on par with the fire-related death rate in other types of residential buildings. Overall, residential fire-related death rates in the Netherlands are one-third those of the U.S.
- If sprinklers do not function, there are significant risks associated with smoke spreading in the long, horizontal corridors of dual-stairway buildings that have become standard in the U.S. and Canada. Single-stairway designs, which do not have long corridors, mitigate this problem.
- For a four-to-six-story building on a small lot, the typical cost of building a second stairway and connecting the two via a central corridor on every level is equal to approximately 6%-13% of the total construction costs. The additional stairway and corridor consume around 7% of the building's floor area. The second stairway adds significant cost, which can mean the difference between a project being financially feasible or not.
- Sprinklers, which are mandatory in virtually all new U.S. apartment buildings—both inside units and in the main public areas—have been shown to reduce residential fire fatalities sharply.[12]
- Single-stairway code reforms have some political momentum: As of fall 2024 at least 11 states and five cities have enacted laws or amended regulations to explore or allow single-stairway designs for four-to-six-story buildings. Most of that legislative and regulatory activity occurred in 2023 or 2024.
- If building codes were revised to allow single-stairway construction in four-to-six-story residential buildings, the new rules could include additional measures to enhance safety, such as limits on floor area, limits on distances to an exit, and smoke-control systems. These measures would be in addition to existing requirements for sprinklers and standpipes (separate pipes that supply water to firefighters inside a building).
- Allowing single-stairway four-to-six-story buildings could stimulate the construction of badly needed new housing, especially in already-developed neighborhoods near public transportation and commercial areas. A study of the Boston area estimated that such a building code change had the potential to create 130,000 new homes simply by developing the vacant parcels within walking distance of transit.[13]

Figure 1

Building Codes Limit Small Apartment Building Design in Much of the U.S.

Single-stair design is allowed in 3-story buildings, but 4-to-6-story buildings must have two staircases and a corridor



Source: SAR+ Architects

Conclusion

Single-stairway, four-to-six-story apartment buildings are one promising way to provide much-needed new housing in U.S. cities and towns of all sizes. States such as Connecticut and Tennessee have recently enacted legislation to allow such buildings. States such as Virginia and Minnesota are studying the issue.

Single-stairway four-to-six-story buildings have the potential to increase multifamily housing supply and decrease construction costs. They have design and ventilation benefits, and they would work well for infill development on small lots in cities that don't have a lot of land for development. This report's first-ever analysis of 347 fires involving 468 deaths over a 12-year period in New York City demonstrated that fire fatality rates were no higher in four-to-six-story single-stair buildings than in other types of residential buildings in New York. Dutch research confirms that similarly sized single-stairway buildings are at least as safe as dual-stairway buildings. Many countries with lower rates of fire deaths than the U.S. allow single-stairway apartment buildings six stories and higher.

Specifically, single-stairway buildings are at least as safe as dual-staircase buildings when they are constructed with modern fire-safe materials and systems, such as sprinklers, smoke detectors, and fire-rated assemblies; are limited in height (high-rise buildings would continue to have two staircases); have a limited floor plate, with restrictions on total floor area, unit count, or travel distances to exits; and have a protected stairway, including self-closing doors and a smoke-control system.

Three U.S. cities already allow apartment buildings up to six stories to be served by a single stairway. Two states and Puerto Rico allow single-stairway buildings up to four stories, and eight more have enacted laws that either legalize single-stair buildings up to six stories or call for research on raising height limits. And the International Building Code is moving toward prescriptive language to allow up to four stories. Jurisdictions that are considering changes could learn from these domestic experiences and code sections, and from jurisdictions abroad, where most midrise apartment buildings (and many high-rises) have only a single exit stairway. A conservative approach might limit single-stairway buildings to midrise heights; limit floor area or unit counts as well as travel distances; protect stairways and exits through existing requirements for sprinklers, standpipes, enclosure, and compartmentation; add new requirements for stairway smoke-control systems; and restrict stairways to noncombustible materials.

The suggested model code provisions in this report address many of the typical concerns about the safety of single-stairway four-to-six-story apartment buildings. Many experts have called for additional research. This report provides one method: comparing fire fatalities in single-stairway and other buildings within a jurisdiction. It might be difficult, however, to take this approach further. Fire data quality varies greatly: National Fire Incident Reporting System data is incomplete; the United States Fire Administration's media accounts require intensive manual effort to identify buildings and probably degrade in quality outside major media markets; and few jurisdictions have property data as good as New York City's. In Seattle and Honolulu, identifying specific single-stairway buildings is difficult. Some stakeholders have called for extensive fire simulation and modeling. Research from the Netherlands shows that buildings with a double-loaded corridor and two stairways may have issues with smoke propagation, especially when burning plastic is involved. But Dutch simulations found that single-stair buildings with self-closing doors can perform quite well. Similar simulations and experiments can be done in the U.S., but they can be expensive, especially if a wide range of scenarios are modeled.

Ultimately, there is a trade-off in the regulatory process between cost and safety of any type of building. Cost determines how many buildings can be built and of what size. New code provisions are not retroactive—they do nothing to improve existing buildings. Adding safety provisions will often increase construction costs and may render some projects unviable for financial or spatial reasons. As a result, requirements that discourage new building may have a paradoxical effect on fire safety, as people instead continue to live in older buildings that are more vulnerable to fire risk, because they were usually built without modern fire-rated materials, compartmentation, and active fire protection features. Revising construction codes to allow for single stairways in four-to-six-story apartment buildings should prioritize life safety by including relevant active and passive fire protection strategies. The experience of New York City indicates that safety, housing supply, and affordability can all be improved simultaneously by enabling single-stair construction with proven fire safety measures.

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Access the full report by visiting pewtrusts.org/housingpolicy or scanning the QR code.

Endnotes

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