



Home Office

Evacuation Guidelines for Fire and Rescue Services during Fire Emergencies

February 2024



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Introduction

This document sets out 9 national guidelines to the FRS intended to support operational guidance and operational practices during a full or partial evacuation from high rise residential buildings. These guidelines arise from recommendation 33.22a from the Grenfell Tower Inquiry (Phase 1), which was “That the government develop national guidelines for carrying out partial or total evacuations of high-rise residential buildings, such guidelines to include the means of protecting fire exit routes and procedures for evacuating persons who are unable to use the stairs in an emergency, or who may require assistance (such as disabled people, those with cognitive impairment, older people and young children).”

The guidelines derive predominantly from recent research. This includes the research recommended by the Technical Steering Group which convened in advance of the Grenfell Phase 1 report publication:

- Evacuation from fire in high-rise residential buildings: ‘A rapid evidence review’, published November 2022;
- the University of Central Lancashire’s live evacuation exercises in a high-rise building, for which the Home Office has produced a summary of the findings;
- Human behaviour and public confidence strand, ‘Information sharing and support among residents in response to fire incidents in high-rise residential buildings’ by University of Edinburgh, published in June 2023¹.

In addition, two of the guidelines draw on information from stakeholders in connection with the 2021 PEEPs consultation and the subsequent EEIS consultation.

Each guideline includes a headline finding, and an evidence section providing further information and, where available, links to published research and more detailed information available at this time. FRSs, and the National Fire Chief Council (NFCC), will wish to consider how to draw on these guidelines and the more detailed information to support operational guidance and local operational procedures.

The Home Office commissioned the University of Central Lancashire (UCLan) to carry out live testing of evacuation scenarios. The Home Office has developed a summary from the evidence and findings from the SAFE research, which supports the drafting of guidelines 1-3 and 5.

The Home Office has carried out public consultations on Personal Emergency Evacuation Plans, in 2021 and 2022, and a related consultation titled Emergency Evacuation Sharing Plus in 2022. The evidence and findings from these supported the drafting of guidelines 6 and 7.

Guideline 9 draws on the published research by OFR, and their consortium, that was commissioned by DLUHC. The research paper, “Information sharing and support among residents in response to fire incidents in high-rise residential buildings”, was published in June 2023. This research was part of two workstreams commissioned by DLUHC.

¹ Research was commissioned to OFR Consultants who then commissioned the University of Edinburgh as the lead authors of this paper.

Evacuation Guidelines for Fire and Rescue Services during Fire Emergencies

DLUHC commissioned one workstream on an evacuation modelling study to examine the comparative performance of building design features on total evacuation time in high rise residential buildings. The workstream forming the basis of guideline 9 was the review of evidence on human behaviour during a fire, which sought to understand public confidence in the stay put evacuation strategy.

Terminology: The guidelines use the term 'vulnerable people' to refer individuals who have any condition that would affect their ability to evacuate in the event of a fire and would include, for example, those with hearing, sight and cognitive impairments, and some elderly or very young people.

Evacuation Guidelines

Guideline 1: Building height (timing of evacuation)

Fire and Rescue Services should be aware that the total evacuation time in the stairwell should not be derived from travel distance alone. Doubling the building height does not necessarily double the total evacuation time.

Evidence base:

Stair movement is an important consideration in evacuation. It can be affected by individual abilities/vulnerabilities and the conditions faced on the stair – influenced by the actions of others and the stair configuration itself, including the distances that need to be traversed.

The understanding of the movement of residents in a building is particularly important when considering how long it will take to simultaneously evacuate a building. Simultaneous evacuation maximises the demand on the available stair capacity – placing more of a burden on stair movement. The UCLan SAFE analysis therefore focused on simultaneous evacuation to more precisely explore the stair movement component.

It should be noted in a real event, pre-evacuation time (often termed pre-movement time), may be a considerable proportion of the whole evacuation time, depending on the circumstances. Other factors may also affect the evacuation times across different number of floors. The Rapid Evidence review noted studies that found that the pre-evacuation time could be the same or longer than the evacuation movement time and can contribute to substantial increases in overall evacuation time. The review found that there were various factors that impacted the average times for people to evacuate a residential building, such as residents searching for more information, or getting belongings together – both of which might prolong the pre-evacuation time.

Guideline 2: Staircases (timing of evacuation)

There is a benefit of having an unobstructed staircase for the sole use of evacuation in a building during a fire incident. When there are two staircases present, using one staircase for firefighter activities and equipment and one solely for evacuation may provide an advantage in terms of total stairwell transit time.²

Evidence base:

The Home Office summary of the UCLan report showed that in a two-staircase building, using the 2nd staircase solely for firefighters decreased evacuation time by up to 53%.

Table 1: Single staircase v two staircases

Test	Description	Total evacuation time (mins, over 10 floors)
1-1	A full evacuation using an evacuation alert system for a single stair evacuation, firefighters were present for this scenario.	19 min 15 secs
4-2	Two staircases (firefighters using second staircase) full evacuation using an evacuation alert system, firefighters were present for this scenario.	9 min 2 secs

Table shows data from Home Office summary, demonstrating the difference of evacuation times with a single staircase and then using a second staircase used solely by firefighters. The use of two staircases provided a quicker evacuation total time during the live tests when compared to the single staircase live trials. The data does not consider pre-evacuation time during the evacuation.

As previously outlined, the evacuation evidence review found that pre-evacuation times can have a large effect on overall evaluation times, and evidence from the UCLan research suggests congestion can cause reduced movement speeds. Different pre-evacuation times between residents may affect levels of congestion. However, as this has not been tested, we are unable to comment on any potential impact. Other factors influencing congestion include slower moving residents, who in future may increase as a proportion of total residents due to age demographic shifts.

² This might be particularly true if the resident population includes those with mobility impairments who also make use of the single stair reducing the overall stair movement - even more so if they require assistance.

Guideline 3: Evacuation Alert Systems v door-knocking

Where an evacuation alert system is present, using this to initiate evacuation can significantly reduce total evacuation time, when compared to relying on door-knocking alone. Fire and Rescue Services should also be aware of the development of alternative methods and tools to assist in communicating with occupants during a fire.

Evidence base:

The live experiment conducted by UCLan observed that using an Evacuation Alert System reduced total stairwell transit time when compared to door-knocking alone: Table 2 uses their data. These live trials did not consider pre-movement time.

British Standard write that the RP should engage with the FRS to familiarise with the equipment once it has been installed so that any use can be planned ahead of an incident.

Table 2: Evacuation Alert System vs door knocking.

Test	Description	Total evacuation time (mins over 10 floors)
1-1	A full evacuation using an evacuation alert system for a single stair evacuation.	19 min 15 secs
2-2	A full evacuation using door knocking, without an Evacuation Alert System for a single stair evacuation	28 mins, 38 sec

The table shows data from the Home Office summary showing the evacuation time difference of using an evacuation alert system compared to manual door-knocking.

Examples of **alternative methods** to assist in an evacuation of a building include drones and loudspeakers:

Many FRSs have **drones**, used for a variety of operational situations, and it has been suggested that they could be used to support evacuation, albeit with potential limitations for example due to poor weather conditions. Currently, we are not aware of any FRS which has a drone-led evacuation support system in live operation.

Merseyside FRS have also started to trial the use of portable loudspeaker systems deployed on fire and rescue vehicles since early 2023. The FRS can use the loudspeaker in an evacuation to send live updates or can play pre-recorded messages in different languages which can be targeted to specific floors in a building. Home Office will work with Merseyside FRS to assess its benefits and any limitations.

Guideline 4: Emerging evacuation methods for residents

The FRS should be aware of literature on refuge points (temporary waiting spaces) and evacuation lifts, noted in the Rapid Evidence Review, ‘introduction of new modes of evacuation (different type of movement included in evacuation procedure)’. Such literature can provide an insight to research on alternative methods to assist residents with limited mobility in evacuating a high-rise building.

Evidence base:

The Rapid Evidence Review has found from international research around evacuation lifts that they have the potential to be used effectively during an emergency. There is evidence to suggest that evacuation lifts can reduce the overall evacuation time in a high-rise building, and also make evacuation possible for some residents (e.g. wheelchair users with severe movement impairments) who might otherwise have to remain in the building. The review concludes that further research, particularly UK based research on the use of evacuation lifts would provide more insight to their effectiveness and use.

The rapid evidence review has also examined existing research on the use of refuge points (temporary waiting spaces) in residential buildings. The research indicates that refuge points may be a useful tool in evacuation of a high-rise residential building, particularly in providing a safe area for individuals who are not able to reach a place of ultimate safety.

Guideline 5: Evacuation movement and vulnerable residents

Residents may evacuate at different speeds down the stairs, and those with vulnerabilities may evacuate more slowly, extending their evacuation time and causing congestion (particularly if using a device and/or requiring assistance). However, an FRS should not assume that all residents with vulnerabilities will be impacted in the same way.

Means of escape routes should remain protected and clear of smoke/heat so that all residents can evacuate should they choose to or are instructed to do so (including those who are reliant on the FRS to undertake their evacuation).

Evidence base:

Live UCLan trials (reported in the Home Office summary) found that vulnerable residents using crutches or evacuation chairs were typically slower in evacuating down the stairs than other residents. The UCLan live trials observed that a resident's speed when evacuating with a small child was not impeded. The live trials also observed a disinclination of other residents to move past a slower-moving vulnerable person, potentially hampering free movement and causing a level of congestion.

BS EN 81-76 (the design and guidance for evacuation of persons with disabilities using lifts) recommends that (without further information such as from the secure information box in a building) it should be assumed that 10% of the building population have some form of disability and may be unable to use stairs. There is further research that supports that those with vulnerabilities may evacuate at slower speeds.³

Blocks of flats are designed with provisions in mind to support a stay put evacuation strategy, based on the principle that the fire will be contained in the flat of origin which will keep common escape routes maintained relatively free of smoke and heat. As provisioned in Approved Document B⁴, sufficient protection to common means of escape routes is necessary to allow occupants, some who may require assistance, to escape should they choose to or are aided to do so by the FRS. The standard of protection for common means of escape needs to be of a higher standard than other areas in the building as an escape route will need to remain available for a longer period of time.

³ This is detailed in M. Spearpoint and H. A. MacLennan, '*The effect of an ageing and less fit population on the ability of people to egress buildings*' and K. E. Boyce, T. J. Shields, and G. W. H. Silcock, '*Toward the characterization of building occupancies for fire safety engineering: Capabilities of disabled people moving horizontally and on an Incline*'.

⁴ Approved Document B, Volume 1: Dwellings, 2019 edition incorporating 2020 and 2022 amendments – for use in England [Approved Document B \(fire safety\) volume 1: Dwellings, 2019 edition incorporating 2020 and 2022 amendments \(publishing.service.gov.uk\)](https://www.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/824447/Approved-Doc-B-Volume-1-2019-edition-incorporating-2020-and-2022-amendments.pdf)

Guideline 6: Undertaking evacuations of vulnerable residents

FRSs should be aware that when they attend an incident in a residential building, vulnerable residents will generally not have an evacuation plan in place and therefore FRS are likely to find that vulnerable residents will be reliant on the firefighters to undertake their evacuation if required.

Evidence base:

Home Office, through the 2021 and 2022 public consultations [EEPs consultation 2021, EEIS+ consultation 2022], and the call for evidence in the 2022 consultation, found no evidence that RPs have been able to broadly implement workplace-type PEEPs that are practical, proportionate, or safe, in a way that allows a person to evacuate a building unassisted, in a residential setting.

There is no evidence that staff employed in residential buildings, for example Waking Watch or concierges, are contracted to provide or tasked with providing physical support to vulnerable residents evacuating during a fire.

There is evidence⁵ (Steve Gwynne's Modelling and influencing human behaviour in fire⁶) that people are typically more altruistic than expected during an evacuation – be it avoiding hindering others or actively providing assistance.

Home Office - Personal Emergency Evacuation Plans Consultation from 382 responses and Emergency Evacuation Sharing Plus (EEIS) Consultation from 142 responses.

⁵ Templeton.A, Nash.C, Lewis.L, Gwynne.S, Spearpoint.M, 'Information sharing and support among residents in response to fire incidents in high-rise residential buildings' 2023.

⁶ Gwynne.S, 'Modelling and influencing human behaviour in fire' 2013.

Guideline 7: Information on vulnerable residents

There is evidence that some building owners/managers (Responsible Persons) share information on their buildings and residents with their local FRS, either in a hard format or digitally. FRSs should be aware of and open to receiving information on vulnerable residents to support their rescue and evacuation.

Evidence base:

In the event that a Responsible Person (RP) for a high-rise residential building does not provide any such information, the FRS should consider encouraging them to do so.

Provided the vulnerable resident (or their legal guardian) gives their consent, it is recommended that the shared information would be:

- (a) The resident's flat number
- (b) The resident's floor number
- (c) An indication of the nature/degree of the resident's impairment
- (d) Whether or not the resident has a plan in place to evacuate the building in the event of a fire without direct FRS support

Such information will need to be kept up to date by the Responsible Person, and it is recommended that the FRS discusses with the RP what is reasonable and achievable in this respect and how the data is best shared. It has been suggested that the RP update information when a resident takes up residence, annually, and if a change is specifically notified by the resident.

FRSs not currently receiving information digitally should consider how they can move to accepting electronic information in the future. Any information processing (including, but not limited to collection, recording, organisation, storage, alteration, retrieval, consultation, use, disclosure, sharing, restriction or destruction) should be carried out strictly in accordance with the provisions of the Data Protection Act 1998 and UK General Data Protection Regulation.

Evidence base:

A wide range of stakeholders expressed their views on information sharing in the 2021 Personal Emergency Evacuation Plans consultation, the 2022 Emergency Evacuation Information Sharing Plus consultation and the stakeholder engagement sessions accompanying these consultations. The government response to the 2021 consultation has been published at [Personal Emergency Evacuation Plans - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/consultations/personal-emergency-evacuation-plans), and notes the different views expressed by stakeholders on information sharing. There is a strong case for collecting this type of information digitally because it is easier and quicker to update than physical information. As noted in the 2021 response, this should, however, be balanced against the capabilities of the individual FRS to accept and manage information digitally, whilst maintaining compliance with data protection law.

Guideline 8: Evacuees' Behaviour

Human behaviour research shows that people may engage in protective actions before they initiate movement towards safety. This can include preparing themselves for evacuation (e.g. get dressed, secure the property, collecting others) and preparing others. The extent of the delay experienced will be influenced by their situation (e.g. depending on time of incident), their perception of the incident (e.g. given the extent and type of information available), the presence of (and responsibility for) children/elderly who might take longer to respond, those with movement impairments, etc. in addition, when evacuees move off as part of their evacuation they may not move directly to a place of safety; instead they might communicate with others, provide assistance, seek information – all of which might delay movement to a place of safety.

The FRS should be aware of such possible delays. It should also not be assumed that residents will automatically be aware of what to do or follow signage in place and may need clear instructions to support their understanding of the incident and the required response.

Evidence base:

The Rapid Evidence Review looked at existing literature, models, and case studies on evacuees' behaviour. It identified that residents may be reluctant to evacuate when engaged in day-to-day activities such as watching television or bathing.

Furthermore, residents may delay response if they receive ambiguous fire cues and would search for more information before deciding to evacuate. This includes underestimating the risk posed by the incident faced or that it is under control when it is not due to previous experiences of small-scale fires and false alarms. The Review also noted literature which suggested that residents will be more likely to evacuate on orders from firefighters or building staff in comparison from other types of cues.

Such instructions (in person or via notification systems) would benefit from including information regarding the actions required, when these actions need to be performed, the location of the incident, the severity of the fire and its potential consequences (why an action is required), as it would enhance situational awareness. This source of the information (e.g. FRS) would enhance the credibility of the information provided and then further encourage response.⁷

⁷ See Kuligowski, ED and Omori, H, General Guidance on Emergency Communication Strategies for Buildings, 2nd Edition, NIST Technical Note 1827, <http://dx.doi.org/10.6028/NIST.TN.1827>, National Institute of Standards and Technology, US Dept. of Commerce, 2014.

Guideline 9: Information sharing amongst residents

Information is critical for resident response, may arrive from multiple sources, be ambiguous and vary across the building. Residents will tend to seek and share information with others, including through social media, when they first become aware of a potential fire. The FRS should consider how this may impact people's behaviour and if this is an opportunity for them to engage with residents.

Evidence base:

In the OFR research paper - [Information sharing and support among residents in response to fire incidents in high-rise residential buildings - ScienceDirect](#), the outcome of semi-structured focus groups with residents is summarised providing information on how residents may think and behave in a fire related incident in a high-rise residential building.

Residents will seek information where their awareness of the situation is insufficient for them to understand the situation faced and identify a response. If a resident is unsure about what is happening in the event of a fire, they may seek information from familiar people and/or familiar sources (including social media) to establish the level of threat, rather than await formal instruction from the FRS.

Findings of this research include how pre-existing relationships amongst residents influence trust and expectations of help, as well as reasoning on why residents may not help others in the event of a fire.

