

Designing for crowd behaviour

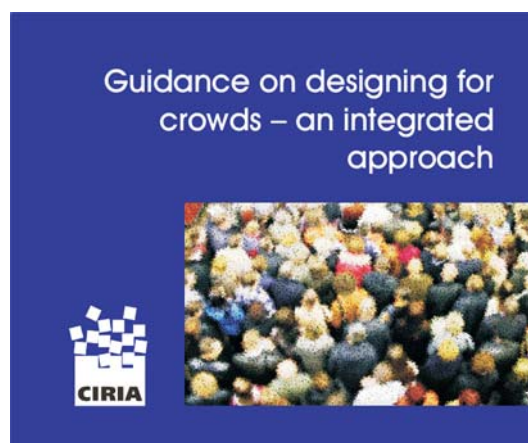
Background and aims

As the population density increases, more and more venues and events will be developed that are intended to attract crowds. This naturally focuses attention on the design and management of the venues concerned to ensure that those attending are safe and comfortable, and can move without risk or difficulty. The transport sector, including railways, has a particularly important role to play in taking people to and from large events, and both stations and train services can be adversely affected by unexpected fluctuations in demand when proper planning has not been effective. Members of the Construction Industry Research and Information Association (CIRIA), which includes RSSB, Network Rail, and Transport for London, decided to produce a guide to good practice in the area of crowd management, and RSSB co-funded this activity and its publication costs as part of the DfT-funded rail industry research programme. The principal client group for this work was Operations Focus Group.

Method

A group of experts in the field, and representatives of the project funders, reviewed existing literature and practice, and examined case studies to gather it into a coherent narrative. Previous research managed by RSSB was reviewed and referenced. There is a

considerable range of regulation and guidance relating to user comfort and crowd safety. It is available through many organisations and on different websites and is difficult to capture in one place. Much of it is formulated with specific types of venue or building in mind, reflecting the safety aspects and user expectations of the particular environment concerned. The resulting narrative was developed into a generic guide, which can be used by those designing new buildings and systems; upgrading or changing existing facilities; or managing places such as retail centres, religious and sporting venues, theatres and concert halls, and transport hubs such as railway stations or airports..



The sponsors of the work included RSSB, Transport for London, and several core members of CIRIA. The steering group comprised these funders plus

representatives of the Department of Culture and Local Government, the Football Licensing Authority, the Health and Safety Executive, the Metropolitan Police, Movement Strategies, the National Association of Disabled [Football] Supporters, Ove Arup and Partners, and the Olympic Delivery Authority (ODA). Case studies were provided by the ODA covering the planned Olympic Park at Stratford, London, and by AvonAngliA Crowd Management, relating to the Millennium Stadium and adjacent transport facilities in Cardiff.

Findings

The guide includes information useful to designers and managers of buildings and events, including railway stations. It explains what is considered to be good practice; how to enhance user experience; and how to minimise the risk of crowd incidents and accidents. The advice applies to any place where crowds are expected, such as music venues, theatres, railway stations and shopping malls; or where crowds may gather, such as at Hogmanay or for public events or religious festivals. The advice builds on the environment-specific guidance and regulation to describe common challenges and approaches to making sure that crowd experience and safety are addressed in the design process and management practices.

Key messages were:

1. Designing for crowds requires an integrated approach, which means designing for operation and not just for compliance with codes.
- 2) This requires input from operations (or technical representatives of the operator if they are not yet appointed) and other key stakeholders, such as disability groups and user representation groups.

- 3) It also means taking into consideration areas around a venue (including transport systems) and considering the issues in a wide, whole-life context.
- 4) All decisions should be people centric.

The guide includes sections on:

- Who should read the guide
- The benefits of a design that effectively integrates operational issues
- Lessons learned from accidents
- Beyond compliance - a holistic approach
- Achieving operational integration during design
- Crowd safety
- Sensitivity testing, operational scenarios, and contingency planning
- Dealing with the terrorism threat
- Design integration guidelines
- Questions for clients
- Case studies

The report included a tool which had previously been developed for RSSB-managed research project T161 *Managing large events and perturbations at stations*.

The chart in Figure 1 demonstrates how the managers of a venue, such as a station, can determine how soon remedial action should be taken to prevent a crowd problem developing.

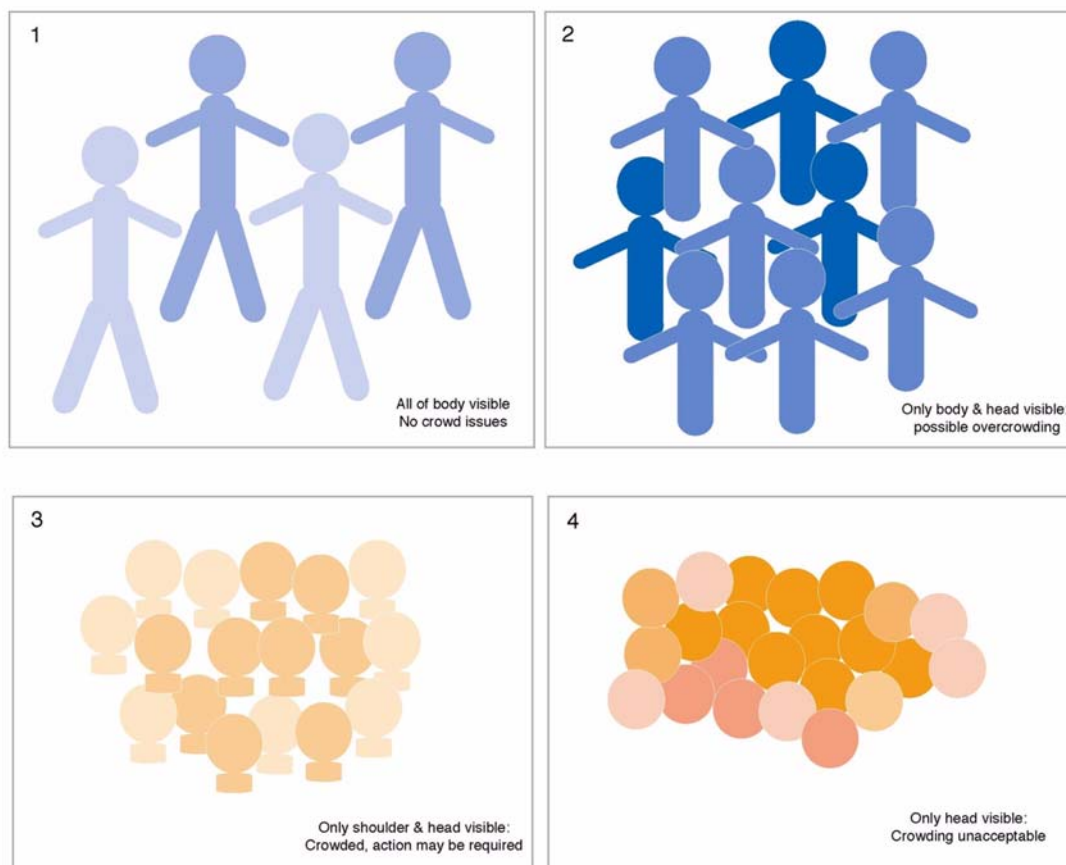


Figure 1: Visual guides for venue managers to determine levels of crowding.

There is also a comprehensive list of reference material including a section on where to get help and further advice, and several RSSB research publications:

- T161 - Managing large events and perturbations at stations
- T307 - Health and safety effects of crowding
- T321 - Research into signage and wayfinding at stations
- T605 - Management of on-train crowding

Copies of the guide

The guide is published as report C675 (ISBN: 978-0-86017-675-6) and hard copies may be purchased from CIRIA at Classic House, 174-180 Old Street,

London EC1V 9BP or via email at enquiries@ciria.org. It is also available to rail industry users as a PDF document at <http://www.ciria.org/downloads/01/c675.pdf>.

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