



This document is a voluntary standard, produced by RSSB at the request of the industry. Duty holders may choose to mandate it through internal instructions / procedures or contract conditions.

Published by:

**RSSB
Block 2
Angel Square
1 Torrens Street
London
EC1V 1NY**

**© Copyright 2011
Rail Safety and Standards Board Limited**

RIS

RIS-7701-INS

Rail Industry Standard for Automatic Ticket Gates at Stations

**Issue One March 2011
Rail Industry Standard**



Documents

Document Sharing Hub

Issue Record

Issue	Date	Comments
One	5 March 2011	Original document Replaces mandatory requirements from GI/RT7015 and guidance from GI/GN7515

Superseded or replaced documents

The following Railway Group documents are superseded or replaced, either in whole or in part as indicated:

Superseded or replaced documents	Sections superseded	Date when sections are superseded
GI/RT7015 issue one February 2003 Automatic Ticket Gates at Stations	All sections	4 June 2011
GI/GN7515 issue one February 2003 Guidance on Automatic Ticket Gates at Stations	All sections	5 March 2011

GI/RT7015 ceases to be in force and is withdrawn as of 4 June 2011.

GI/GN7515 is withdrawn as of 5 March 2011.

Supply

The authoritative version of this document is available at www.rgsonline.co.uk.
Uncontrolled copies of this document can be obtained from Communications, RSSB,
Block 2, Angel Square, 1 Torrens Street, London, EC1V 1NY, telephone 020 3142 5400 or
e-mail enquirydesk@rssb.co.uk. Other Standards and associated documents can also be
viewed at www.rgsonline.co.uk.

Contents

Section	Description	Page
Part 1	Introduction	4
1.1	Purpose of this document	4
1.2	Application of this document	4
1.3	Health and safety responsibilities	4
1.4	Copyright	5
1.5	Approval and authorisation of this document	5
Part 2	Planning for Automatic Ticket Gate Installations	6
2.1	Planning	6
2.2	Passenger flow capacity	6
2.3	Overcrowding and congestion	10
2.4	Emergencies	12
2.5	Determining the number of ATGs	13
2.6	Signage at ATGs	14
Part 3	Design of Automatic Ticket Gates	15
3.1	Preventing injury to passengers	15
3.2	Gate opening facility	15
3.3	Minimum walkway width	16
3.4	ATG control unit	16
3.5	Gate 'push-through' facility	16
3.6	Displays on ATGs	16
3.7	Ticket checking parameters	17
3.8	Maintenance considerations	17
Part 4	Installation, Commissioning and Initial Operation	18
4.1	Installation and commissioning of ATGs	18
4.2	Notifying passengers of ATG installation	18
4.3	Review of ATG operation	19
Part 5	Requirements for Operation and Management	21
5.1	Monitoring of ATGs	21
5.2	Methods of monitoring	21
5.3	Overcrowding and congestion	22
5.4	Emergency arrangements	22
Definitions		24
References		27

Rail Industry Standard for Automatic Ticket Gates at Stations

Part 1 Introduction

1.1 Purpose of this document

- 1.1.1 This document provides a voluntary standard on automatic ticket gates (ATGs) at stations, for the infrastructure managers responsible for managing and operating stations, to use if they so choose.
- 1.1.2 This document has been adapted from previous mandatory requirements set out in GI/RT7015 and guidance contained in GI/GN7515. The document has also been supplemented with information from the Network Rail Managed Stations Manual – Safe Installation and Management of ATGs, and London Underground Limited Good Practice Guide ‘Station Planning Standards and Guidelines’ (SPSG).
- 1.1.3 The document is set out in the form of standard requirements followed by guidance notes. Guidance notes are marked by a grey bar in the margin with the letters GN and sequential numbering, to differentiate them from the standard requirements to which they relate.
- 1.1.4 The document has four parts that contain requirements and guidance relating to different stages in the life cycle of an automatic ticket gate (ATG) installation project, and is set out as follows:

Part 2 relates to the planning of station layouts to accommodate ATGs, determining the numbers and types of gates to be provided, and the associated signage to be used.

Part 3 relates to the design of ATGs as pieces of equipment, and to the requirements for maintenance.

Part 4 relates to the installation and commissioning of ATGs, and the arrangements to be made for their initial operation and periodic review.

Part 5 relates to the ongoing, day-to-day operation and management of ATG installations.

1.2 Application of this document

- 1.2.1 Rail Industry Standards are not mandatory unless or until an infrastructure manager or a railway undertaking specifies all or part of them in company procedures or contract conditions. Where this is the case the infrastructure manager or the railway undertaking will specify the nature and extent of application.
- 1.2.2 Specific compliance requirements and dates have therefore not been specified since these will be the subject of the internal procedures or contract conditions of the companies which choose to adopt this standard.
- 1.2.3 Railway Group Standard GI/RT7016 sets out mandatory requirements for station infrastructure. Rail Industry Standard RIS-7700-INS sets out voluntary requirements for station infrastructure. The requirements set out in GI/RT7016 and RIS-7700-INS have not been duplicated in this document.

1.3 Health and safety responsibilities

- 1.3.1 Users of documents published by Rail Safety and Standards Board (RSSB) are reminded of the need to consider their own responsibilities to ensure health and safety at work and their own duties under health and safety legislation. RSSB does not warrant that compliance with all or any documents published by RSSB is sufficient in itself to ensure safe systems of work or operation or to satisfy such responsibilities or duties.

Rail Industry Standard for Automatic Ticket Gates at Stations

1.4 Copyright

- 1.4.1 Copyright in the Railway Group documents is owned by Rail Safety and Standards Board Limited. All rights are hereby reserved. No Railway Group document (in whole or in part) may be reproduced, stored in a retrieval system, or transmitted, in any form or means, without the prior written permission of Rail Safety and Standards Board Limited, or as expressly permitted by law.
- 1.4.2 RSSB members are granted copyright licence in accordance with the Constitution Agreement relating to Rail Safety and Standards Board Limited.
- 1.4.3 In circumstances where Rail Safety and Standards Board Limited has granted a particular person or organisation permission to copy extracts from Railway Group documents, Rail Safety and Standards Board Limited accepts no responsibility for, and excludes all liability in connection with, the use of such extracts, or any claims arising therefrom. This disclaimer applies to all forms of media in which extracts from Railway Group documents may be reproduced.

1.5 Approval and authorisation of this document

- 1.5.1 The content of this document was approved by Infrastructure Standards Committee on 11 January 2011.
- 1.5.2 This document was authorised by RSSB on 27 January 2011.

Part 2 Planning for Automatic Ticket Gate Installations

2.1 Planning

- 2.1.1 When planning for automatic ticket gate (ATG) installations, it is necessary to consider the impact they may have on the safe and efficient operation of stations.
- 2.1.2 Planning ATG installations shall, as a minimum, take account of the requirements for:
 - a) Passenger flow capacity, see 2.2.
 - b) Overcrowding and congestion, see 2.3.
 - c) Emergencies, see 2.4.
 - d) Determining the number of ATGs, see 2.5.
 - e) Signage at ATGs, see 2.6.
- 2.1.3 These requirements are set out in more detail in the following sections.

2.2 Passenger flow capacity

2.2.1 Determination of passenger flow capacity

- 2.2.1.1 The passenger flow capacity shall be based on consideration of the required 'Levels of Service' at the station.

GN1 Guidance on 'Levels of Service' is given in the SPSG.

- 2.2.1.2 When determining passenger flow capacity the following passenger flow conditions shall be considered:
 - a) 'Normal peak passenger flow' and 'worst case scenario' conditions.
 - b) Maximum capacity of ATGs under 'normal peak passenger flow' conditions.
 - c) Maximum capacity of ATGs under 'worst case scenario' conditions.

GN2 The minimum design capacity for gatelines should be appropriate for 'normal peak passenger flow' conditions.

2.2.2 Determination of minimum clearance between ATGs and obstructions

- 2.2.2.1 Passenger flow capacity shall be determined on the basis of the minimum available clearance between ATGs and obstructions.
- 2.2.2.2 In determining the minimum available clearance between ATGs and obstructions, account shall be taken of the relative position of:
 - a) Adjacent passageways.
 - b) Overbridges.
 - c) Subways.
 - d) Escalators.
 - e) Stairways.
 - f) Lifts.
 - g) Retail outlets.

- h) Station buildings.
- i) Other points of access or egress.

GN3 GI/RT7016 sets out general requirements for:

- a) The location of supports and barriers (which includes ATGs) relative to the platform edge.
- b) The location of structures at terminal stations (which includes ATG control and excess fare facilities).

GN4 Where relevant, a minimum clearance of 12 m and a clear space of at least 150 m² should be provided between the exit of any escalator, stairway, adjacent passageway or lift and the location of the ATGs, unless a diversionary route is available for use in the event of overcrowding and congestion. The clearance should have a passenger flow rate at least that of the combined flow rate of the escalator, stairway, adjacent passageway or lift, as appropriate. Consideration should be given to the position of customer information screens and displays that may cause passengers to obstruct the space either side of the gateline.

2.2.3 Passenger flow analysis

- 2.2.3.1 A passenger flow analysis shall be undertaken to establish, under both 'normal peak passenger flow' and 'worst case scenario' conditions the following:
 - a) The number and layout of ATGs required at each entrance and exit in order to avoid overcrowding and congestion at the station, taking account of existing station evacuation scenarios.
 - b) The effect of the ATGs on passenger flows including crossflows.
- 2.2.3.2 A remit shall be formulated for a passenger flow analysis to be undertaken. The passenger counts and subsequent analysis shall be evaluated over a minimum of two days of normal station operations. The information required for the passenger flow analysis shall include as a minimum, the total number of passengers, bicycles, pushchairs, wheelchairs, dogs, large items of luggage; service disruptions and weather conditions.
- 2.2.3.3 The passenger flow analysis shall be undertaken using simple passenger counts or an approved passenger flow modelling technique, as appropriate. For passenger flow modelling and calculation of passenger density levels, the JJ Fruin, or other accepted methodology shall be used, both for the current station conditions and with the proposed ATGs installed.
- 2.2.3.4 The passenger flow analysis shall be modelled for 'normal peak passenger flows' in the morning and evening periods and, when specified, at other times where local conditions may generate greater peak passenger flows (for example regular special events, local tourist attractions).

GN5 Counts are generally best undertaken on a Tuesday, Wednesday or Thursday, between the hours of 06.00 to 20.00, to provide an estimate of passenger numbers more representative of a typical day.

GN6 At stations where the passenger profile differs significantly between different times of the day or week (for example commuters, shoppers, passengers with prams, significant numbers of young children), consideration should be given as to whether a passenger flow analysis should be undertaken at times where the passenger profile is known to be different to that which is experienced under both 'normal peak passenger flow' and 'worst case scenario' conditions. This is because the passenger flow analysis carried out at such times could affect the design of the gateline, for example the need for an additional auxiliary gate.

GN7 Entry and exit flows should be determined separately.

Rail Industry Standard for Automatic Ticket Gates at Stations

GN8 Consideration should be given to extending the passenger flow analysis to known quieter periods of the day or week. This may be necessary in certain circumstances, for example in order to determine whether alternative monitoring arrangements, as set out in 5.2, should be applied at these quieter times, or for determining the appropriate configuration of the ATGs to cope with lower passenger flows.

GN9 Counts should not normally be undertaken during peak holiday periods or bank holidays, unless tourist attractions located close to a station create passenger flows equal to or greater than 'normal peak passenger flows'.

GN10 If train service disruption occurs on one of the days that the passenger flow analysis is being undertaken, consideration should be given as to whether or not the data is representative of 'normal peak passenger flows' experienced at the station. However, passenger flow analysis data collected on days of service disruption may provide valuable information when considering the number of ATGs to install, to prevent overcrowding and congestion during 'worst case scenario' conditions.

2.2.3.5 The passenger flow analysis shall establish whether the introduction of ATGs at existing stations will result in overcrowding and congestion or affect emergency evacuation arrangements, see 2.3 and 2.4.

2.2.3.6 The passenger flow model shall also include a passenger growth forecast (including alterations to service patterns) for the life of the ATGs. This should normally be taken as 20 years unless otherwise agreed.

GN11 In determining the number of ATGs to be installed under 'normal peak passenger flow' and 'worst case scenario' conditions, the passenger flow numbers should be adjusted to take into account expected changes in demand as a result of passenger growth over the required life of the ATGs. The passenger flow analysis should also consider the impacts as a result of:

- a) Any expected timetable or service changes.
- b) Major infrastructure changes (for example, platform lengthening to accommodate longer trains).
- c) The need for additional gate provision to reduce the costs of installation in future years.

2.2.3.7 The passenger flow analysis shall also take into consideration:

- a) The peak passenger flow rates ('normal and worst case scenario') taken as the number of passengers for each five minute time segment in the peak, in all directions.
- b) The location of crossing / conflicting flows and overcrowding trigger points.
- c) A comparison of both the 'normal peak passenger flow' and the 'worst case scenario' (for example, caused by the arrival of a crush loaded train, assumed on fire, plus passengers normally expected to be waiting to board and alight the next arriving train at the same platform, and where relevant, at an adjacent platform).
- d) For the crush loaded train on fire scenario an assumption that staff would immediately put the ATGs into the emergency open mode.
- e) An assessment of the passenger flow capacity based on the 'worst case scenario' of coincident arrival of trains on all available platforms, taking account of the track and signalling constraints for the station, for situations where the gateline serves multiple platform locations.

Rail Industry Standard for Automatic Ticket Gates at Stations

- f) An assessment of the maximum passenger flow capacity through the ATGs, taking into account the passenger profile likely to use the station and the incompatibility of some ticket types with the gateline ticket checking parameters, see 3.7.
- g) Any downward adjustment of the average gateline capacity for stations with a high proportion of leisure travellers and infrequent users, who are likely to require additional time to use the equipment.
- h) Identification of site-specific hazards and requirements, taking account of daily variations in flow directions and rates for all design situations.
- i) The maximum waiting time for passengers for the 'normal peak passenger flow' and 'worst case scenario' conditions.

2.2.4 Determination of the number of people unable to use ATGs

- 2.2.4.1 An assessment shall be made of the number of passengers unable to use ATGs at the station, and the number and location of auxiliary gate(s) to be provided to avoid unnecessary overcrowding and congestion at ATGs and auxiliary gate(s).
- 2.2.4.2 The assessment of the number of passengers unable to use ATGs in normal operation shall take account of:
 - a) Passengers in wheelchairs or electric scooters and other passengers with reduced mobility.
 - b) Passengers with prams, pushchairs, bicycles, large items of luggage or platform luggage trolleys.
 - c) Passengers with young children.
 - d) Passengers with dogs (or other large pets).
 - e) Passengers who have an incompatible valid ticket.
 - f) Passengers who have no valid ticket.
 - g) Passengers who are using another type of document (for example a 'Permit to Travel') giving them authority to travel.
 - h) Passenger growth forecasts (see 2.2.3.6).

- GN12 The passenger flow analysis should determine the approximate percentage of passengers unable to use ATGs and who will require the provision of auxiliary gate(s).
- GN13 The passenger flow analysis might identify that a large percentage of passengers at some stations require the use of auxiliary gate(s). This may, for example, be the result of a large percentage of passengers with incompatible tickets, luggage or passengers with reduced mobility. In these circumstances, more than one auxiliary gate may need to be provided.
- GN14 In addition to the passenger flow analysis, infrastructure managers responsible for stations should have data on the approximate number of passengers with tickets that are not compatible with ATGs at a particular station.
- GN15 If there are more than 10% of passengers with incompatible tickets, careful consideration should be given to the control measures that will need to be put in place to adequately mitigate the risks of overcrowding and congestion.
- GN16 For passengers with no tickets, or other types of permitted travel document, an assessment should be undertaken to determine what provision should be made for excess fare facilities and where these facilities should be located, so as to manage the risk of overcrowding and congestion.