RIS

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Rail Industry Standard for Automatic Ticket Gates at Stations

Issue One March 2011

Rail Industry Standard

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Superseded or replaced documents

The following Railway Group documents are superseded or replaced, either in whole or in part as indicated:

Superseded or replaced documents	Sections superseded	Date when sections are superseded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GI/RT7015 ceases to be in force and is withdrawn as of 4 June 2011.

GI/GN7515 is withdrawn as of 5 March 2011.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

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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.

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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 m^2 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.

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.

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.

2.2.5 Worst case scenario

2.2.5.1 The impact of the 'worst case scenario' on the planned ATG installation shall be determined.

GN17 A passenger flow analysis should be undertaken to determine whether there would be sufficient ATGs to cater for the maximum number of trains (of maximum possible length) that could arrive coincidentally at the station and discharge all of their passengers with the ATGs in operational mode (see GN39).

GN18 The maximum queuing time should be determined from the passenger flow analysis, taking account of the safety implications arising due to the footfall, location and layout, at a particular station.

GN19 At stations where the passenger flow analysis determines that there would not be enough ATGs, additional control measures relevant to this analysis, such as those identified in 2.3.3, should be considered.

2.3 Overcrowding and congestion

2.3.1 Arrangements for managing passenger flow

2.3.1.1 Arrangements for managing passenger flows to prevent overcrowding and congestion shall be determined on the basis of the passenger flow capacity established in accordance with the requirements in 2.2.

2.3.2 Managing overcrowding and congestion

2.3.2.1 When carrying out the passenger flow analysis (see 2.2.3) consideration shall be given to the effects of:

a) Overcrowding and congestion.

b) Crossflows.

c) Overcrowding trigger points.

GN20 At platforms where passengers have to wait to pass through ATGs and are close to the platform edge, the speed of approaching trains may be a risk to passengers. Similarly, overcrowding and congestion on platform areas could inhibit the safe boarding and alighting from trains at the platform. Guidance on establishing the minimum usable width of platforms to prevent overcrowding and congestion is given in GI/GN7616.

GN21 The requirements of GI/RT7016 apply when considering the required clearance from the platform edge for protection of passengers and their belongings from the aerodynamic effects of passing trains.

2.3.2.2 Overcrowding and congestion levels shall be considered in terms of passenger density levels.

GN22 Further information on passenger density levels for the purpose of space planning at stations and the concept of acceptable standards for defined 'Levels of Service' at a station, is given in SPSG.

2.3.3 Additional controls for overcrowding and congestion

2.3.3.1 Where it is not reasonably practicable to prevent overcrowding and congestion for all passenger flow conditions through design in accordance with the requirements set out in 2.3.1, consideration shall be given to suitable additional control measures.

GN23 The following additional control measures should be considered:

a) Configuring ATGs to reduce crossflows.

b) Using ATGs to prevent passengers entering overcrowded and congested areas, including platforms.

c) Locating ATGs so that any crossflows occur in 'open areas' rather than 'confined areas'.

d) Introducing one-way systems.

e) Providing customer information systems.

f) Providing queuing barriers.

g) Providing platform barriers to segregate passengers waiting on platforms from those passing to / from the gateline(s).

h) Widening of passageways or doorways.

i) Improving signage.

j) Relocating excess fare facilities.

k) Relocating entrances into and exits out of the station, to and from station concourse areas, station retail outlets or other premises on the station.

l) Relocating passenger display information.

m) Relocating platform furniture or train dispatch equipment.

n) Providing CCTV.

o) Preventing advertising material being placed on ATGs that could cause passengers to pause.

p) Leaving all the ATGs in the open position.

2.3.4 Passenger flow and non-availability of ATGs

2.3.4.1 The impact of overcrowding and congestion on passenger flow, caused by the non-availability of ATGs on the planned ATG installation, shall be determined.

GN24 An assessment should be undertaken to determine what action needs to be taken in the event of one or more ATGs becoming defective and remaining in the closed position.

GN25 The implications for overcrowding and congestion in the event of a person collapsing within the vicinity of the ATGs should be considered.

GN26 The passenger flow will vary depending on the time of day and therefore the control measures should be applied in such a way as to take account of this. At times when pedestrian flow is light and the non-availability of one or a combination of ATGs would not adversely affect passenger flow, altering the display to indicate 'no access' may be sufficient.

GN27 At times when passenger flow would be adversely affected, it may be necessary to consider the following to reduce any increase in overcrowding and congestion:

a) Reconfiguring ATGs.

b) Use of the auxiliary gate by some passengers (for example contra-peak flows).

c) Leaving all of the remaining functioning ATGs in the open position.

2.4 Emergencies

2.4.1 Provision for emergency situations

2.4.1.1 An emergency open facility shall be provided (see 3.2.3).

2.4.2 Location of emergency open facility

2.4.2.1 An assessment of the passenger flow capacity shall be carried out in accordance with 2.2 to determine the optimum location of the emergency open facility, and the requirements for operation and management of the gateline (see 5.3).

GN28 In determining the optimum location(s) for the emergency open facility, the following should be considered:

a) The normal position of the person responsible for monitoring the ATGs in relation to the proposed location of the emergency open facility.

b) The furthest distance that the person responsible for monitoring the ATGs might be from the emergency open facility whilst carrying out their duties.

c) The provision of more than one emergency open facility, for example where the ATGs are being monitored from the gateline itself.

GN29 Emergency open facilities can be provided in:

a) An ATG control room.

b) A station control room.

c) A nearby ticket office.

d) At the gateline itself.

2.4.3 Requirements for integrating the ATGs and auxiliary gate(s) with the fire alarm

2.4.3.1 At stations where a fire alarm system is installed, all ATGs and manually operated auxiliary gates, shall be designed to open automatically in the event of a fire alarm being activated.

2.4.3.2 All gates shall then remain open until the fire alarm system is reset and the person(s) responsible for monitoring the operation of the ATGs is permitted to reactivate them.

2.4.4 Requirements in the event of a power failure

2.4.4.1 All ATGs and manually operated auxiliary gate(s) shall be designed to open automatically in the event of a power failure.

2.4.4.2 All gates shall then remain open until the fault has been rectified and the person(s) responsible for monitoring the operation of the ATGs is permitted to reactivate them.

2.4.4.3 A gate ‘push-through’ facility shall be provided in case the emergency open facility fails to be activated in the event of a power failure (see 3.5).

2.4.5 Evacuation times

2.4.5.1 Where new ATGs are to be installed or modification to existing ATGs is planned the time that it would take to carry out an emergency evacuation of the station shall not be increased.

GN30 The assessment of the effect that the installation of ATGs has on passenger flow capacity in an emergency, should include the following:

a) A comparison between the time that it currently takes to carry out an emergency evacuation of the station, against the time it is anticipated it would take with the ATGs and auxiliary gates placed in the emergency open position.

b) Passenger flow rates through ATGs and auxiliary gates placed in the open position should be determined from a passenger flow analysis or the results of an emergency evacuation exercise, where available. For preliminary assessments, passenger flow rates of 50 passengers per minute through ATGs and 60 passengers per minute through auxiliary gates, may be assumed.

c) A comparison of emergency passenger flow rates, as a result of the need to evacuate a crush loaded train of the maximum length of formation (assumed on fire), over and above the typically 'normal peak passenger flows' that would be expected to arrive at the station at peak time. The assessment of passenger flow capacity should assume that ATGs have been placed in the emergency open position, and take into account the number of other people who are required to leave the station as a result of the emergency, for example station staff.

GN31 The requirements for reporting on incidents of excessive passenger overcrowding and congestion at a station, are set out in GE/RT8047.

2.4.6 Access for emergency services

2.4.6.1 An assessment shall be undertaken of the access requirements for the emergency services (including any vehicular access if applicable at the station concerned) to platforms and other affected areas of the station.

GN32 Provision of a vehicle gate would enable emergency vehicles to have continued access to platforms. Where such provision is not practicable an assessment should be undertaken to determine an alternative means of access, such as a revised rendezvous point for emergency vehicles.

GN33 The involvement of the emergency services in the development and revision of access arrangement proposals is recommended.

2.5 Determining the number of ATGs

2.5.1 Determining the number of ATGs required

2.5.1.1 A maximum passenger flow rate of 25 people per minute for each ATG shall be used to determine the number of ATGs required.

GN34 For ATGs already installed a passenger flow rate of 25 passengers per minute for each ATG has been recognised as best practice. This is an average figure which allows for gates not used to the design maximum and takes account of the additional time that new card readers require for the smartcard technology. Passenger flow rates of higher than 25 passengers per minute have been measured at stations during peak times when all passengers have had compatible tickets and are carrying no more than a single item such as a briefcase. The use of a passenger flow rate higher than 25 passengers per minute for determining the number of ATGs, should be subject to the assessment of local factors (for example smartcard readers).

GN35 The highest recorded passenger flow count data collected over the days on which the passenger counts were taken, should be used to calculate the number of ATGs.

GN36 In determining the number of ATGs to be installed the following should be considered:

a) Installation of sufficient ATGs compatible with the parameters set by the infrastructure manager responsible for that particular station, see GN39.

b) Calculate the ATG passenger flow rate figures in each direction at peak passenger flow times based on the following information:

i) The proposed number of ATGs configured for each direction at peak passenger flow times.

ii) The highest recorded passenger flow.

iii) The passenger flow rate figure for each ATG used in the passenger flow analysis.

c) Allowance for ATGs that may be out of service.

GN37 The number of ATGs required should be rounded upwards.

2.5.1.2 All ATGs shall be reversible to provide for peak flows in each direction.

GN38 ATGs provided to cater for 'normal peak passenger flows' in one direction during parts of the day can then be reversed to cater for 'normal peak passenger flow' in the opposite direction at other times of the day. Provision of reversible ATGs will reduce the space that has to be provided to install the required number of ATGs to cater for 'normal peak passenger flow'.

GN39 A methodology for calculating the gateline requirements is provided in the SPSG.

GN40 A figure of 20 passengers a minute should be assumed for manual checking of tickets at an auxiliary gate. A figure of 10 passengers a minute should be used if all passengers were assumed, for example, to have bicycles, pushchairs or wheelchairs.

2.6 Signage at ATGs

2.6.1 Signage shall be adequate to assist passengers to locate ATGs and to understand their intended use.

GN41 Each ATG should have either an illuminated green arrow or red cross displayed, to indicate availability. The use of high-level indicators of gate direction should be considered to assist passengers where there is limited advanced visibility of the gateline configuration.

GN42 Suitable signage, incorporating pictograms, should be provided so that passengers are aware of the auxiliary gate(s) and their intended use. The most suitable location for signage should be determined so that passengers who knowingly need to use the auxiliary gate(s) are directed towards it in advance of reaching the main gateline in order to reduce the likelihood of overcrowding and congestion.

Part 3 Design of Automatic Ticket Gates

3.1 Preventing injury to passengers

3.1.1 The design of the ATGs shall enable passengers to pass through without injury (including injury caused by electric shock).

GN43 The design of the ATGs should enable passengers to pass through the gate paddles without injury arising from:

a) Closing on passengers which would result in fingers or limbs becoming trapped.

b) Coming into contact with the heads of small children.

c) Damage to clothing or property.

GN44 The gate sensors provided within the ATG mechanism should ensure that, when an ATG has been opened there is sufficient time to enable a person to pass safely through the ATG without being trapped in the gate paddles. The sensors should also detect that the area swept by an ATG is clear before the gate paddles can open. This should not apply if the emergency open facility is activated.

GN45 In the event that a passenger becomes trapped in the gate paddles, they should not experience a contact force from the gate paddles of greater than 0.49 kN in the direction of entry to the 'paid side' of the station or 0.39 kN in the exit direction from the 'paid side' of the station.

GN46 If the gate sensors detect that a person is trapped then an alarm should be activated to alert staff.

GN47 The ATGs should be designed so that only smooth and soft surfaces are used, and that there are no sharp edges or corners. The colour of the gate paddles and surface texture should contrast with the ATG equipment.

GN48 The ATGs should be designed so that there are no exposed cables.

3.2 Gate opening facility

3.2.1 An individual gate opening facility shall be provided to enable the person responsible for monitoring the ATGs to open an individual ATG without affecting the operation of the remaining ATGs in the gateline.

3.2.2 Manually operated auxiliary gates shall be designed to open in the event of equipment failure and shall also be designed to:

a) Open to a minimum of 90° relative to the closed position.

b) 'Latch' open.

c) Be self-closing.

3.2.3 In an emergency, the gate opening facility shall be designed to enable:

a) All ATGs and auxiliary gate(s) to be opened in a single action.

b) Specific gateline(s) to be opened independently at stations where more than one gateline is provided.

c) Emergency opening (see 2.4.4) to be carried out independently from the normal gate opening.

3.3 Minimum walkway width

3.3.1 The minimum walkway width for ATGs shall be compatible with the requirements for passenger flow, control of overcrowding and congestion and provision for emergencies.

GN49 'Accessible Train and Station Design for Disabled People: A Code of Practice' published by the Department for Transport (DfT), provides minimum requirements for the width of ATGs and auxiliary gates.

GN50 Where reasonably practicable, a width of 620 mm should be adopted as best practice. If a width narrower than 600 mm is proposed, the proposal should be justified at the technical approval stage and recorded.

GN51 Auxiliary gates should be designed to be a minimum of 900 mm wide to enable passengers in wheelchairs to pass through.

GN52 Consideration should be given to installing an auxiliary gate(s) to operate in 'commuter mode' with single gate paddle opening and 'wide opening mode', for passengers with special needs. Both modes should be reversible.

3.4 ATG control unit

3.4.1 An ATG control unit shall be provided to enable ATGs to be configured to suit the varying passenger flows that are experienced at different times of the day and week.

3.4.2 The location of the ATG control unit shall be determined at the planning stage.

3.5 Gate 'push-through' facility

3.5.1 In an emergency passengers shall be able to 'push-through' the ATG or auxiliary gate facility.

GN53 Although the term 'push-through' has been used in this document, some stations have installed ATGs where the gate design consists of rotating glass doors. Where this type of ATG is used the ATGs are opened in an emergency by pushing the glass doors aside.

GN54 Regardless of the design of the particular ATG selected the method for 'push-through' should be indicated, and the force applied by a person pushing through a gate should not be more than 0.5 kN.

GN55 ATGs should be equipped with an alarm that activates when a passenger uses the 'push-through' facility.

3.6 Displays on ATGs

3.6.1 ATGs shall have a display to indicate to passengers:

a) Whether the ATG is available for entry or exit.

b) Where to put the ticket and in what direction.

c) Where to touch a smartcard (Oystercard for example).

d) Whether the ticket has been accepted or rejected.

GN56 The following displays have been incorporated into ATG installations and should continue to be used:

Instruction	Display
ATG available for use	Green arrow
ATG not available for use	Red cross
ATG not available for use	'No entry'
ATG not available for use	'No exit'
Ticket accepted	'Take ticket'
Ticket rejected	'Seek assistance'

GN57 Consideration should be given to the need for additional display data such as stored value, or ticket expiry warnings, and an alarm for rejected tickets or use of child tickets.

GN58 The effect of direct sunlight upon ATG displays should be considered. Remedial measures may be necessary to enable passengers to see the display clearly.

3.7 Ticket checking parameters

3.7.1 The ticket logic for ATGs installed at a station shall encompass known journey combinations that can reasonably be expected to be made from, to or through, the station.

3.7.2 The ATG ticket checking parameter pro-formas shall be independently checked to confirm that they have been completed accurately prior to manufacture.

GN59 Ticket checking parameters are a set of conditions that need to be satisfied for an ATG to open. ATGs rely on the encoded information contained within the magnetic strip on the back of the ticket or the chip on an electronic ticket / smartcard (for example Oystercard). Tickets not accepted because of absent or incorrect checking parameters increase the potential for overcrowding and congestion.

3.8 Maintenance considerations

3.8.1 The requirements for maintenance shall be considered in the design of ATGs and auxiliary gate(s).

GN60 A design of ATGs and auxiliary gate(s) that permits modular replacement should be considered so that in the event of a defect it can be rectified speedily.

GN61 The requirements for carrying out maintenance and renewal of ATGs should take account of the need to minimise the impact on the operation of ATGs during maintenance and renewal.

Part 4 Installation, Commissioning and Initial Operation

4.1 Installation and commissioning of ATGs

4.1.1 The installation and commissioning of ATGs shall be carried out at times that do not inhibit passenger flows through the station or increase overcrowding and congestion at the station.

4.1.2 During the commissioning period when ATGs are not being tested they shall be left in the open position, except when they are located in a station area not currently used by passengers.

4.1.3 After installation ATGs are to be kept locked in the open position until they are in full working order and connected with the station fire alarm system, where provided.

GN62 The use of dummy gates prior to installation or modification(s) to familiarise passengers with the ATGs should be considered.

GN63 The arrangements set out in the station management plan for carrying out maintenance and renewals at stations, and for the management of contractors on stations, should be complied with during installation and commissioning of ATGs.

4.2 Notifying passengers of ATG installation

4.2.1 Action shall be taken to minimise passenger uncertainty in the period immediately before and after bringing ATGs into service. This action shall include the provision of advance publicity related to the ATG installation or modification.

GN64 Methods of advance publicity related to ATG installation that should be considered include:

a) Displaying posters and giving handouts to passengers.

b) Making announcements at the station and on platforms.

c) Arranging for announcements to be made on trains.

GN65 In the period prior to the commencement of operation of the ATGs, consideration should be given to the benefits of having a staffed gateline for a number of days to assist people in becoming used to ticket checks and to reduce the initial number of passengers without tickets.

GN66 During the first few days of operation passengers unfamiliarity will result in slower passenger flow rates, creating the potential for overcrowding and congestion. The following additional controls should be considered as part of notifying passengers and to address the results of testing the equipment, and the subsequent need to refine its operation in the light of experience gained during the first few days and weeks of operation:

a) Announcements to be made on arriving trains warning of the need to have tickets ready for the ATGs.

b) Announcements to be made on station platforms as trains arrive warning of the need to have tickets ready for the ATGs.

c) British Transport Police presence to deter staff assaults.

d) Additional excess fare facilities (for example staff equipped with portable ticket issuing machines).

e) Additional staff presence at gatelines or in ticket offices to assist and guide passengers.

f) Enhanced CCTV monitoring of initial operations.

g) Conflict management training for gateline and ticket office staff.

h) Setting gates to accept all tickets for the first few days regardless of validity.

4.3 Review of ATG operation

4.3.1 Initial reviews of ATG operation shall be carried out after bringing the ATGs into service, to ensure that the balance of passenger flow on entry and exit gates throughout weekdays and at weekends, is adjusted in line with actual demand that is experienced.

4.3.2 The initial review shall be undertaken at a time that is appropriate for the passenger flows at the station but not later than two months, and again at six months after bringing the ATGs into service. The review shall include all relevant parties.

GN67 The review should, for example, include details of:

a) The percentage of passengers unable to use ATGs.

b) Any overcrowding and congestion problems.

c) Any modifications proposed as a result of the trial.

d) Any specific incidents / accidents.

GN68 The results of the review should be compared with the assumptions made when planning the installation of ATGs.

GN69 Periodic reviews of the controls for ATGs should be undertaken to establish whether the controls need to be evaluated.

4.3.3 Following the initial reviews of ATG operation, an annual assessment of the ATG installation at the station shall be carried out to determine whether the number of ATGs and auxiliary gate(s) installed remains sufficient.

GN70 Statistics on levels of ATG usage and types of passenger (for example passengers with reduced mobility, bicycles, incompatible tickets, usage by tenants and contractors) should be recorded to inform the annual review of ATG adequacy.

4.3.4 The annual assessment of the ATG installation shall be carried out with a similar scope to the initial reviews set out in 4.3.1 and 4.3.2.

4.3.5 Where the number of gates is found to be insufficient, action shall be taken to mitigate the increased risk within an appropriate timescale.

4.3.6 The annual assessments of the ATG installation shall be recorded and retained.

4.3.7 An additional assessment of the ATG installation shall be carried out if:

a) An increase in overcrowding and congestion between assessments indicates a need to undertake an additional assessment of the number of ATGs provided.

Or

b) An investigation following an incident, accident or other emergency recommends a similar assessment.

GN71 There are various methods that can be used when undertaking an assessment to establish that sufficient ATGs are provided at a station to manage changes in passenger flows from one year to the next. These include:

a) A passenger flow analysis.

b) A review of automatically recorded ticket data on ATG passenger flow rate.

c) Observation at the gateline during peak passenger flow times by trained and competent persons.

d) Reports from station staff responsible for monitoring the ATGs on the available capacity and utilisation of ATGs.

e) Any recorded incidents of general overcrowding and congestion at peak passenger flow times.

f) The selection of data gathering methods for assessment should consider the accuracy and objectivity provided by each method.

GN72 When undertaking an assessment consideration should also be given to the number and nature of complaints received in respect of the operation of the gateline.

Part 5 Requirements for Operation and Management

5.1 Monitoring of ATGs

5.1.1 Gatelines shall be continuously monitored when they are in use to ensure that immediate assistance to passengers can be provided, having regard to other duties which staff may be expected to perform.

5.1.2 The minimum number of staff required at any particular time shall be established on the basis of an assessment of the risks attributable to the passenger flow rates experienced at different times of the day and for different days of the week.

5.1.3 If at anytime it is not possible to monitor a gateline, or to provide the minimum number of staff required for monitoring, the gatelines or individual ATGs and auxiliary gates, shall be left in the open position.

GN73 'Accessible Train Station Design for Disabled People: A Code of Practice', gives guidance on staffing of ticket barriers and gates.

5.2 Methods of monitoring

5.2.1 Criteria for determining the method of monitoring

5.2.1.1 Determination of the method of monitoring the ATGs in service shall include consideration of the following:

a) The number of gatelines and the number of ATGs within each gateline (some stations may require the installation of a supplementary ATG control room).

b) The number of manually operated auxiliary gates in use.

c) Passenger flow numbers at different times of the day and / or on different days of the week.

d) The position of the ticket office in relation to the ATGs.

e) The percentage of passengers who will have to use the auxiliary gate(s). This should include consideration of the number of passengers whose tickets will be incompatible, passengers with reduced mobility and those with luggage, bicycles or other large items of luggage.

f) The roles and responsibilities of the person(s) monitoring the ATGs from an ATG control room, where provided, and the time available to those person(s) to deal with the expected numbers of passengers who will need to use the auxiliary gate(s).

g) The time it would take for a person overseeing the ATGs from an ATG control room, where provided, to deal with a problem at the ATGs.

h) The time required to evacuate the station.

GN74 Three methods have been identified for continuous monitoring of gatelines. In order of effectiveness, these are:

a) A person positioned at the gateline.

b) A person positioned remotely from the gateline but who can directly oversee the gateline.

c) A person positioned remotely from the gateline but who can directly oversee the gateline with visual aids (for example CCTV) and who can communicate with passengers (and vice versa) at the gateline (using for example an intercom facility).

GN75 Where remote monitoring is justified on the basis of consideration of the risks, infrastructure managers responsible for stations may want to consider use of the following facilities to support the method of monitoring they wish to adopt:

a) An intercom facility to enable passengers to speak with staff monitoring the ATG and vice versa. This should ideally have a video facility so that passengers and staff can see each other and the passenger's ticket can be displayed to staff monitoring the ATGs.

b) A 'seek assistance' or 'help point' facility for passengers to attract the attention of staff monitoring the ATGs.

c) Signage on the action to be taken by passengers if they are not able to use the ATGs.

GN76 When considering remote monitoring, the needs of passengers with reduced mobility, particularly those who are blind and / or deaf, should be addressed.

5.3 Overcrowding and congestion

5.3.1 Requirements for the management of overcrowding and congestion at the gateline shall be considered.

5.3.2 If staff become aware that there is a potential for congestion that may lead to overcrowding, then they shall position themselves close to the emergency opening switch so that they can activate this if required.

GN77 Control measures that should be considered for management of the gateline are:

a) Automatic announcements requesting passengers to vacate the area of the ATGs.

b) Emptying the ATG ticket hoppers regularly.

c) The use of ATGs to prevent passengers entering platforms whilst trains are prepared for service.

d) Additional staffing of the gateline.

e) Announcements to encourage passengers with, for example, incompatible tickets and luggage to use the auxiliary gate(s).

f) The definition of a distance beyond which standing or slow moving crowds should require staff to set the gateline to emergency open mode to improve flows.

5.4 Emergency arrangements

5.4.1 A station incident response plan describing control measures for the management of passenger safety on either side of the gateline, or at the gateline itself, and the response times for dealing with emergencies (for example evacuation and people trapped in the gateline), shall be provided. Arrangements for control of crowds at special events (for example major sporting events) shall be taken into account in the plan.

5.4.2 In the event of an emergency the person responsible for management of the gateline shall:

a) Issue instructions to open ATGs.

b) Advise gateline staff on whether ATGs are available for entry or exit.

c) Advise gateline staff to leave ATGs in the 'open' position if it is considered that ATGs cannot be adequately monitored.

d) Advise when the ATGs are to be closed following evacuation of the station.

e) Provide instructions for gateline staff dealing with particular types of incident (for example where a person is trapped in the gateline).

5.4.3 The emergency open facility shall be tested daily.

5.4.4 Station incident response plans (including those for crowd control) shall be reviewed and revised as necessary to reflect the installation of new ATGs or the modification of existing ATGs. The review shall include provision for the use of ATGs to control access to station areas affected by overcrowding and congestion in an emergency.

GN78 The requirements for reporting on incidents of undue passenger congestion at a station are set out in GE/RT8047.

Definitions

Accident

An unplanned, uncontrolled and unintended event, giving rise to death, ill health, injury or other loss.

ATG control room

A facility provided to permit an appropriate level of control over the operation of the ATGs, including a clear view of the gateline. It is permissible for the ATG control facility to be located within a room provided for other control functions (control of station operations for example).

ATG control unit

A facility provided to enable individual ATGs to be configured and tested.

Automatic ticket gate (ATG)

A power-operated gate between the paid and unpaid areas of the station, which opens to permit an authorised station user to pass through when a valid ticket, smartcard or gate pass is either inserted into the gate or scanned by a reader on the gate.

Auxiliary gate

A wide gate facility installed as part of the gateline which is provided for authorised station users who are unable to use the ATGs (for example due to reduced mobility, the carrying of large items, being accompanied by children or dogs or being in possession of an incompatible ticket) and designed so that it is either:

a) Opened by the person responsible for monitoring the ATGs to enable it to be opened and closed manually.

Or

b) Operated in the same manner as defined above for an ATG.

Congestion

The condition where, excessive passenger numbers in some areas of the station, results in delay for passengers waiting to pass through ATGs.

Crossflows

The condition where the scope for congestion is enhanced by intersecting passenger flows.

Dummy gates

Temporary structures that are provided to protect work being done as part of the installation of or modification to ATGs, such as floor fixings, and to eliminate tripping hazards while work is in progress.

Gateline

A line of ATGs and auxiliary gate(s) provided to control access to and egress from a station.

Gate paddles

Protruding arms which are placed to control access to and egress from a station and which are opened with a valid ticket, smartcard or gate pass.

Incident

An unplanned and uncontrolled event which under different circumstances may have resulted in an accident.

Modifications to ATGs

Modifications to ATGs includes:

a) A change in the number of ATGs or auxiliary gates provided.

b) Repositioning or removal of the ATGs.

c) A change in the arrangements for monitoring the ATGs.

d) A change in the relative position of existing or planned station facilities or passenger information equipment and / or notices within the vicinity of the ATGs.

e) Introduction of smartcard technology or other changes to software.

Monitoring of ATGs

Monitoring of ATGs includes:

a) Observing passengers as they pass through ATGs.

b) Taking appropriate action to assist passengers to pass through the ATGs or auxiliary gate(s).

c) Opening, closing or re-configuring the direction of ATGs in response to changing passenger flows.

d) Taking appropriate action to open ATGs in the event of an emergency either on the station or at the ATGs.

e) Taking appropriate action when faults occur with the ATGs or auxiliary gate(s).

Normal peak passenger flow

For the purpose of this document the ‘normal peak passenger flow’ is between the hours of 06.00 to 20.00 at a station which is representative of a typical day.

Overcrowding

The condition where excessive passenger numbers results in unacceptable delays for passengers waiting to pass through ATGs.

Overcrowding trigger point

A point in the station where congestion can result in unacceptable delays for passengers waiting to pass through ATGs potentially leading to overcrowding.

Passenger profile

The variation of passenger types that use the gateline at a station in respect of, for example, age and mobility.

Station control room

A facility provided to permit an appropriate level of control over the operation of the station.

Ticket

A card, slip of paper or document, issued by a railway undertaking that permits the bearer to travel by train.

Worst case scenario

For the purpose of this document, a 'worst case scenario' includes:

a) Unplanned events such as train service disruptions and emergencies.

b) Excessive numbers of passengers (for example due to unplanned closure of adjoining stations).

c) Known planned events such as sporting occasions, fairs, carnivals, demonstrations.

Or

d) Planned engineering work requiring replacement road transport.

References

The Catalogue of Railway Group Standards and the Railway Group Standards DVD give the current issue number and status of documents published by RSSB. This information is also available from www.rgsonline.co.uk.

RGSC 01	Railway Group Standards Code
RGSC 02	The Standards Manual

Documents referenced in the text

Railway Group Standards	
GE/RT8047	Reporting of Safety Related Information
GI/RT7016	Interface between Station Platforms, Track and Trains
RSSB documents	
GI/GN7616	Guidance on Station Platform Geometry
RIS-7700-INS	Rail Industry Standard for Station Infrastructure
Other References	
LUL G-371A	Good Practice Guide 'Station Planning Standards and Guidelines' – Strategy & Service Development Modelling & Performance London Underground Limited, November 2005
	Accessible Train Station Design for Disabled People: A Code of Practice, Department for Transport and Transport Scotland, September 2010
NR/L3/OCS/044-C-26	Managed Stations Manual - Safe Installation and Management of ATGs, August 2008

Other relevant documents

RSSB documents	
GI/GN7520	Guidance on Lighting of Railway Premises
Other References	
BS 8300:2009	Design of buildings and their approaches to meet the needs of disabled people - Code of practice
BS 5588-8:1999	Fire precautions in the design, construction and use of buildings – Part 8: Code of practice for means of escape for disabled people
2005 asp 5	Fire (Scotland) Act 2005
SI 2006 No. 456	The Fire Safety (Scotland) Regulations 2006
SI 2005 No. 1541	The Regulatory Reform (Fire Safety) Order 2005
PRM TSI	Persons with Reduced Mobility TSI, Decision 2008/164/EC (OJ L64, 7.3.2008, p.72)