Association of Train Operating Companies

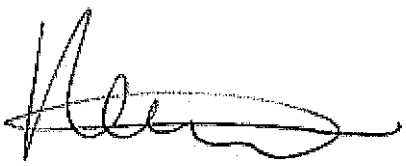
ATOC/GN022
Issue 1
December 2014

ATOC Guidance Note – Safe Management of Pushchairs and Wheelchairs on Station Platforms

Synopsis

This Guidance Note provides advice to Station Facility Owners on identifying and mitigating the risks of wheeled vehicles, i.e. pushchairs and wheelchairs, rolling away if left unattended on platforms.

Authorised by



Tom Joyner
Chair, ATOC Safety Forum

Contents

Part A

Issue Record

This Guidance Note will be updated when necessary by distribution of a complete replacement.

Issue	Date	Comments
One	December 2014	Original document

Responsibilities

Copies of this Guidance Note should be distributed by ATOC members to persons responsible for ensuring compliance with the appropriate Railway Group Standards.

Explanatory note

ATOC produces ATOC Guidance Notes for the information of its members. ATOC is not a regulatory body and compliance with ATOC Guidance Notes is not mandatory.

ATOC Guidance Notes are intended to reflect good practice. ATOC members are recommended to evaluate the guidance against their own arrangements in a structured and systematic way. Some parts of the guidance may not be appropriate to their operations. It is recommended that this process of evaluation and any subsequent decision to adopt (or not to adopt) elements of the guidance should be documented.

Guidance Note status

This document is not intended to create legally binding obligations between railway undertakings and should be binding in honour only.

Supply

Copies of this Guidance Note may be obtained from the ATOC members' web site.

Part B

1. Context

Two accidents occurred during 2013 in which wheeled vehicles rolled off a station platform and onto the track. The first, at Southend Central, involved a wheelchair and the second, at Whyteleafe, a pushchair. In both cases the vehicles were temporarily left unattended by the person in charge of them without the brake having first been applied. The occupant of the wheelchair suffered serious injuries from the fall while the mother of the infant occupant of the pushchair was badly shaken. Had trains been involved, the consequences could clearly have been much more serious and in the second case the pushchair only narrowly missed coming into contact with the conductor rail.

The RAIB conducted a joint investigation into the two incidents. Its report[1] makes four recommendations. The first is directed at Station Facility Owners (SFOs) and concerns processes for managing the risk of wheelchairs and pushchairs rolling onto the track. The second is directed at Network Rail and calls on it, in association with ATOC, RSSB and the DfT, to arrange work to determine when a platform slope towards the railway becomes a significant hazard and how the risk might be mitigated. The third is directed at ATOC and states that:

> *As an interim measure, pending the outcome of the research identified in recommendation 2, the Association of Train Operating Companies should, in consultation with passenger groups including those representing the interest of disabled passengers, review the findings of this report and seek to understand the ways in which the risk of wheelchairs and pushchairs rolling onto the track can be more effectively managed by operators. This review should include consideration of:*
>
> - *locations where passengers may need to remove both their hands from a pushchair or wheelchair because of the nature of another task to be performed (eg at a ticket machine or shop/kiosk);*
> - *reference to any existing good practice in this area; and*
> - *measures that could most effectively influence the behaviour of passengers using wheelchairs and pushchairs on station platforms*
>
> *The output of the review should be consolidated into suitable guidance for train operators.*

The fourth recommendation calls on Network Rail, SFOs and RSSB to improve the investigation and recording of roll-off incidents and the way in which data is shared.

[1] http://www.raib.gov.uk/publications/investigation_reports/reports_2014/report172014.cfm, published August 2014

This Guidance Note focuses primarily on the third of these recommendations, though this does involve some overlap with the first recommendation. The starting points for its content are the output from a working group convened specially to consider the recommendation, and actions and initiatives identified by c2c and Southern as the SFOs of Southend Central and Whyteleafe, supplemented by other examples of good practice taken from the wider TOC community.

2. Purpose

The purpose of this Guidance Note is to provide SFO with recommendations in respect of factors to be taken into account when assessing the risk of wheeled vehicles rolling onto the track, along with good practice examples of how such risks may be reduced or mitigated. In so doing, it also contributes towards compliance with recommendation 3 from the RAIB investigation into the accidents at Southend Central and Whyteleafe.

3. Definitions

Definitions used within this Guidance Note are:

Station Facility Owner (SFO)

The party who operates a station.

Wheeled vehicle

Prams, pushchairs, wheelchairs and similar unpowered vehicles used to transport young children or persons of reduced mobility.
Note that for simplicity this Guidance Note does not generally differentiate between pushchairs and wheelchairs. In broad terms the risks and many of the mitigations are common to both, however the ease with which mitigations can be implemented may differ significantly. For example, journeys involving use of wheelchairs are likely to be booked in advance whereas pushchairs/prams users are far more likely to be present on a turn up and go basis. With suitable training, staff are thus well placed to be proactive in providing support and guidance in the case of the former but are more likely to need to be reactive in the case of the latter.

4. Scope and nature of risk

In common with many platforms built in the 19th and early 20th centuries, those at both Southend Central and Whyteleafe sloped towards the track. This was intended to assist with drainage of rain water. While the slope was a contributory factor in both cases, it should be noted that it is but one of a variety of potential causes of movement in a free-rolling wheeled vehicle. Others include wind, turbulence from passing trains, movement on the part of the occupant of the vehicle, or being knocked by passersby, luggage, other wheeled vehicles, etc.

In all such cases, the ability of the vehicle to roll away is dependent on its having been left unattended, if only momentarily, without the brake having first been applied. This in itself is likely to be a consequence of the person in charge of the vehicle being insufficiently aware of the hazard, compounded by the possibility of them being distracted.

It follows that management of the overall risk by SFOs comprises two components:

1. Identification of risks, including what can be done to eliminate or reduce them. Such risks include i) those related to the physical characteristics of the platform and the type of trains passing through it; ii) those related to how the platform is laid out and used; and iii) potential causes of distraction for persons in charge of wheeled vehicles.

2. Raising the awareness of such risks and how they can be avoided or reduced, both on the part of the station users and staff.

Additional measures - such as a more general campaign to influence the behaviour of pushchair and wheelchair users when on or about the railway by alerting them to simple measures they can take to minimise associated risks, and seeking to influence the future design of such wheeled vehicles so as to include some form of brake that is applied automatically if the vehicle is left unattended - are outside the scope of this document.

Under the Health and Safety at Work Act 1974, both passengers and transport undertakings have responsibility for safe behaviour within the station environment and both need to ensure that additional risk is not imported into the system by their behaviours or actions. As part of this, SFOs should recognise that the support needs of occasional travellers may be quite different from those of frequent travellers and target them accordingly.

5. Methodology for assessing risk

SFOs vary considerably in the number of platforms for which they are responsible. A major challenge for many of them is how to undertake an assessment which is sufficient to identify significant risks without it being unduly onerous and disproportionate to the overall risk.

The methodology advocated in this Guidance Note is for an initial simple survey to be undertaken which is quick, low cost and relatively easy to resource (i.e. does not require specialist knowledge). The objective of this should be to create, through use of a basic scoring system (which may be as simple as 'high/medium/low') a ranked list of those locations seen to have potentially significant risks which can then be assessed in greater detail.

6. Identification of risks related to the physical characteristics of the platform

6.1 Slope

SFOs should identify those platforms or parts of platforms in regular use by passengers that slope towards the track sufficiently to represent a significant hazard. Recommendation 2 from the RAIB's Rail Accident Report into the accidents at Southend and Whyteleafe calls on Network Rail, in consultation with the Association of Train Operating Companies, RSSB and the Department for Transport, to arrange for work to be undertaken to determine when this is the case, including specifically at what point a slope towards the railway makes it more likely than not that a wheelchair or pushchair without brakes applied would roll away, taking account of modern designs of such equipment[2]. In advance of the results from this research, attention is drawn to the following clauses from Railway Group Standard GI/RT7016 - Interface between Station Platforms, Track and Trains (Issue Five, March 2014):

11.1.3 Platform cross fall

11.1.3.1 For new platforms and alterations (as defined) to platforms, the surfacing shall be constructed to provide a fall away from the rear edge of the platform coper or platform edge if there is no separate platform coper.

11.1.3.2 If provided, copers for new or altered platforms shall be nominally level from the platform edge to the rear of the coper.

11.1.3.3 The fall shall be at a nominal gradient of 1:50 (within the limits 1:80 to 1:40).

Measurements of platform slope may be obtained through one or more of the following:

1. Network Rail – for some stations, Network Rail has a full set of survey data available for platforms.

2. Undertaking initial simple surveys – various methods for assessing slopes are available and suitable to be used on station platforms. These range from a simple visual inspection through to use of dedicated apps of various complexity available from the internet. It is suggested that these initial measurements should be taken at 2 or 3 points along each platform unless there is an obvious change of gradient.

3. Undertaking more detailed surveys – where an initial simple survey indicates that there may be a significant risk, a more detailed survey should be undertaken. It is recommended that measurements should be taken every 10 metres and also at points where there is a change in platform construction or an obvious change of gradient.

[2] The RAIB Investigation Report states '*Initial testing undertaken by University College London has shown that a vehicle such as a wheelchair or pushchair without its brakes applied can start to move on its own on a gradient of 1 in 28 (3.5%). Those tests were limited in scope and could not replicate all of the possible factors that might determine whether a vehicle without brakes would move or not, such as the ground surface conditions, orientation of the leading wheels and the weight of the occupant. The tests did not include gradients shallower than 1 in 28 (3.5%), so it is possible that this does not represent the shallowest gradient on which vehicles without brakes applied could roll*.'

Ideally measurements at different points along the platform should be linked to passenger footfall as this may be helpful in quantifying the overall risk. Network Rail is known to have this information for certain stations while reviewing platform CCTV images may also provide an insight into passenger behaviour.

Consideration should also be given to slopes along rather than across the platform – it should be noted that in the case of the Whyteleafe accident, the pushchair initially began to roll parallel to the platform edge before turning 90° in response to the slope towards the track.

In addition, localised platform 'humps', i.e. raised sections of platform aligned with the stopping point of specific train doors as an aid to the boarding and alighting of disabled passengers, are being considered for a number of stations (though in practice these are only an option on platforms served exclusively by a single type of rolling stock). Clearly these create locally steep gradients.

6.2 Exposure to strong winds

Local knowledge should be used to identify any platforms particularly prone to strong winds. These are likely to be those in exposed areas – such as on bridges or viaducts – though there may be other local features that cause a wind tunnel effect, such as the presence of tall buildings.

6.3 Exposure to excessive turbulence caused by trains

Platforms, or parts of them, may be subject to excessive wind turbulence caused by trains in the following circumstances:

1. Trains passing through without stopping. Both the speed of and type of passing trains should be considered – a freight train, particularly one conveying containers, tends to cause more turbulence at 50 mph than does an aerodynamic high speed passenger service passing at 125 mph.

2. Presence of tunnels. Even stopping services are likely to push a considerable volume of air ahead of them when emerging from tunnels or alongside platforms sited underground.

3. Presence of bridges. Bridges located midway along platforms may also have a similar effect to tunnels locally.

6.4 Width

Narrow platforms present a greater potential risk because passengers are obliged to stand or pass closer to the platform edge than would otherwise be the case.

6.5 Surface

The nature of the platform surface – particularly how smooth it is – will determine how much force is required (from whatever source) to cause an unbraked wheeled vehicle to start to move and to continue any movement once started.

6.6 Platform work

Care should be taken to ensure that in the event of any platform work being planned/ undertaken, for example to improve drainage or surfaces, every opportunity is taken to reduce risks and that as an absolute minimum there is no overall increase in risk.

7. Identification of risks related to use of platform

As noted, an unbraked wheeled vehicle may be set in motion as the result of being knocked into by other people, their luggage or other wheeled vehicles. The risks of this happening increase in line with the number of passenger movements at the particular location. It follows that areas adjacent to doorways, ticket gates, stairways, entrances/exits from footbridges and subways and close to information screens are likely to present the greatest risk.

8. Identification of potential sources of distraction for persons in charge of wheeled vehicles

There are many potential sources of distraction on and around platforms for persons in charge of wheeled vehicles and indeed passengers more generally. This may be divided into those specific to the locality, i.e. attributes of the physical environment, and those that are generic and typically associated with types of passenger and their behaviour.

8.1 Locality-specific sources of distraction

The most obvious sources of distraction which are specific to an individual platform or area on a platform and which may lead a person in charge of a wheeled vehicle to leave the vehicle unattended without applying the brake include:

- ticket vending machines;
- help points;
- staff rooms;
- ticket gates;
- electronic ticket validators (including Oyster card);
- customer information screens;
- induction loops;
- departure posters;
- timetable information points;
- catering outlets;
- kiosks;
- vending machines (e.g. for snacks, drinks, etc.);
- seats;
- stairs/escalators; and
- lifts.

It should be noted that all of these are also sources of distraction to other passengers, who may in consequence be more likely accidentally to knock themselves or their luggage into wheeled vehicles.

It is recommended that a simple visual inspection of all platforms should be undertaken with the objective of identifying those which appear to have a significant risk or risks present. This should not need to involve staff with any specific health and safety training or competence but be based on a 'common sense' assessment of risks. Consideration should be given to drawing up a simple scoring matrix for completion by the person undertaking the survey, both to act as a prompt sheet and as a means of prioritising those locations where a more detailed assessment by a competent member of staff may be warranted.

8.2 Generic sources of distraction

These include:

- station announcements,
- mobile phones, iPads and other hand held electronic devices;
- children and dogs; and
- other passengers.

9. Risk management

The risks identified above may be broadly broken down into engineering (the physical attributes of the platform), operations (the use of the platform along with the platform 'fittings'), and human factor related (the propensity for distraction).

9.1 Engineering related risks

In many cases removal or even reduction of engineering related risks is likely to be prohibitively expensive so the focus should be on seeking to improve situational awareness on the part of persons in charge of wheeled vehicles such that they are alert to the risks – see section 10 below.

An exception to this is where refurbishment/rebuilding of the platform is planned, in which case the opportunity should be taken to eliminate such risks to the extent that this is possible.

One option that may be worth considering is use of tactile strips parallel with platform edges to arrest the movement of a free rolling wheeled vehicle. However, the effectiveness of these – particularly for many modern designs of pushchair which typically have large diameter wheels – is unproven while they may also act as an unacceptable impediment to wheelchair users attempting to board/alight from a train and potentially as a more general trip hazard.

9.2 Operations related risks/sources of distraction

In many cases it may be possible to influence how a platform is used, or to relocate sources of distraction or reduce their consequences. As an example of the latter, while it may not be practicable to relocate a ticket vending machine completely, it may be possible to adjust its angle such that the user, instead of having their back towards an accompanying wheeled vehicle and/or the platform edge, retains these within their field of vision.

Where operations related risks cannot be eliminated or significantly reduced, the focus should again be on seeking to influence passenger behaviour – see section 10 below.

10. Influencing passenger behaviour

Where it is not possible to eliminate or significantly reduce risks the focus should be on influencing the behaviour of persons in charge of wheeled vehicles.

This may be by means of discouraging them from remaining in more hazardous areas, or by positively encouraging them to move to areas of low risk, or through more generally alerting them to the hazards in order that they take suitable risk mitigation measures themselves. Two key examples of these are not leaving a wheeled vehicle unattended at all in higher risk areas (for example close to the platform edge) and always applying the brake before leaving one unattended in other areas.

Examples of how behaviour might be influenced include:

- staff giving proactive advice/guidance (see also section 11 below);
- using signage to indicate 'safer' areas (see example 1 in appendix);
- using signage to highlight particular risks (see example 4 in appendix);
- highlighting 'high risk' and 'safer' areas of platforms by means of platform markings (see example 2 in appendix);
- using posters to highlight risks and/or encourage use of 'safer' areas (see example 3 in appendix);
- using CIS to highlight risks and/or encourage use of 'safer' areas;
- making announcements highlighting risks – on train, on platform, on concourse, in lifts;
- providing guidance on risks specific to users of wheelchairs and pushchairs on company websites and promotional material; and
- using any/all of the above to encourage persons in charge of wheeled vehicles always to position them parallel to the platform edge.

More general raising of awareness of persons in charge of wheeled vehicles to the particular risks associated with rail travel, for example through use of targeted public education campaigns, is outside the scope of this document.

11. Educating staff

The attention of staff – particularly platform staff but also those in ticket offices - should be drawn to the particular risks faced by persons in charge of wheeled vehicles, including the particular risks of potentially poor situational awareness and of becoming distracted. This may be achieved by one or more of the following:

- internal safety briefs/bulletins;
- as a specific theme on safety days;
- by referencing in company newsletters or on internal websites;
- encouraging platform staff and those responsible for monitoring platform CCTV images to be alert to the actions and behaviour of persons in charge of wheeled vehicles and offer suitable advice/guidance;

- encouraging full reporting of incidents involving wheeled vehicles, including 'close calls';
- updating guidance for those undertaking accident investigations specifically to consider the presence of platform slopes and other hazards identified in this document as potential contributory factors when carrying out such investigations; and
- sharing learning points from such incidents (both within and between organisations with SFO responsibilities, for example through the ATOC Safety Forum, the RSSB People on Trains & Stations Risk Group, Opsweb or the RSSB RED publication).

Staff should be aware that they may themselves be a source of distraction to persons in charge of wheeled vehicles – this was a factor in the case of the Southend accident.

12. Other risks relating to pushchairs

In addition to roll away incidents such as that which occurred at Whyteleafe, other major causes of accidents involving pushchairs include children falling out during boarding/alighting as a result of not having been strapped in, and overbalancing (i.e. tipping) as a result of the chair being overloaded, e.g. with shopping. It is recommended that any advice on the safe management of such vehicles provided to either passengers or staff highlights these risks alongside those of rolling away.

13. References

RAIB Rail Accident Report 17/2014 - Accidents involving a wheelchair rolling onto the track at Southend Central, 28 August 2013; and a pushchair rolling onto the track at Whyteleafe, 18 September 2013, published August 2014 and available at:

http://www.raib.gov.uk/publications/investigation_reports/reports_2014/report172014.cfm

Railway Group Standard GO/RT7016 – Interface between Station Platforms, Track and Trains, in particular Part 3 – Other requirements for safety of passengers boarding or alighting from trains. Available from:

http://www.rgsonline.co.uk/default.aspx

The Sydney Trains (Australia) website provides advice to those travelling with 'prams and strollers', including a safety video. It can be accessed via:

http://www.sydneytrains.info/travelling_with/safety_and_education/children

The City of Edmonton (Canada) also includes comprehensive advice for users with strollers using the Edmonton Transit System, available at:

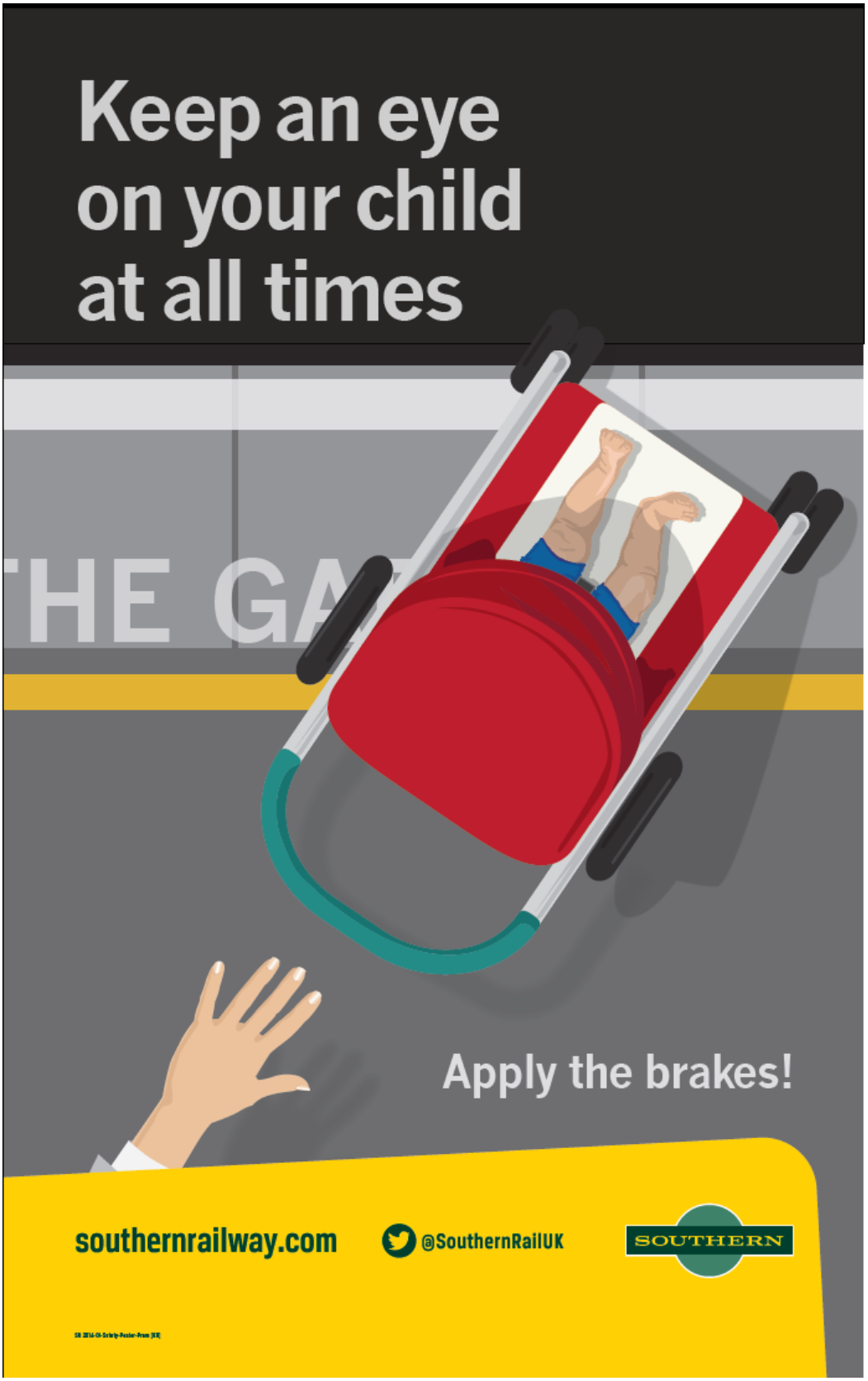
http://www.edmonton.ca/transportation/ets/riding_ets/strollers-on-ets.aspx

APPENDIX A – Examples of signage, posters, etc.

Example 1 – General advice on need to apply brakes on wheeled vehicles

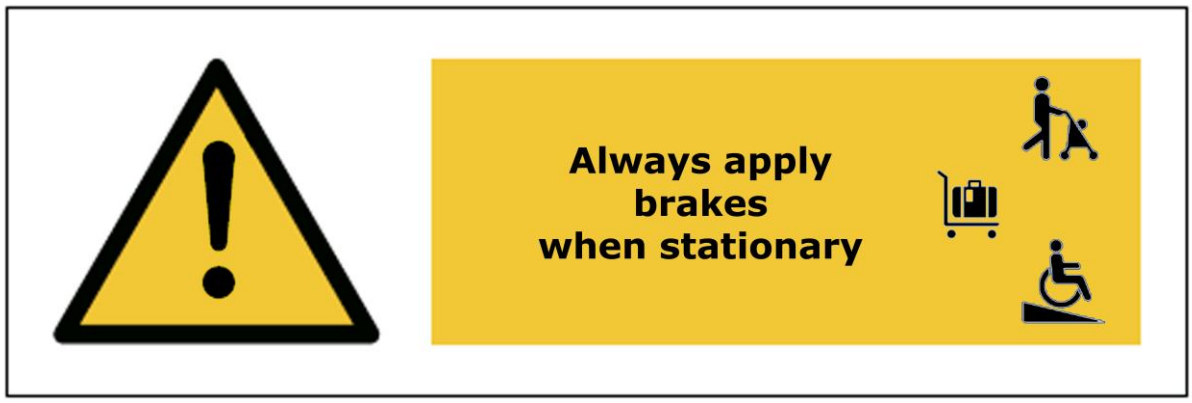
Example 1A - Sign providing such generic advice being used by First ScotRail in station entrance areas (and reproduced here courtesy of First ScotRail):

Example 1B - Poster encouraging safe behaviour by those in charge of pushchairs (courtesy of Southern):



Example 2 – Platform signage

Example 2A – Sign encouraging use of brakes on wheeled vehicles being used by First ScotRail on platforms (and reproduced here courtesy of First ScotRail):



Example 2B - Signage highlighting a platform slope hazard (courtesy of First ScotRail):

Example 2C – Sign indicating 'safer area' for parking of pushchairs and wheelchairs (courtesy of c2c):

Example 3 – Platform markings

Example 3A – Platform marking indicating 'safer area' for parking of pushchairs and wheelchairs (courtesy of c2c):

APPENDIX B – Example risk assessment (courtesy of c2c)

Note: The following is provided for information as a (slightly modified) example of the approach used by one railway undertaking (c2c). It is not suggested that this constitutes best practice, nor that the approach used by c2c – which has a relatively small total number of platforms for which it is the SFO – is appropriate for other railway undertakings.

More generally, it is recommended that railway undertakings seek to work jointly with Network Rail in respect of such risk assessments.

PART 1 - Platform Cross Fall Survey: Working Instructions

Equipment Required:

- Inclinometer
- 1m non-metallic true straight edge such as a nylon spirit level
- Measuring wheel
- Full PPE (excluding gloves and eye protection)

Pre-survey

- Calibrate the inclinometer at the start of each day

Methodology

1. Surveyors are required to record the cross falls of all the platforms at the named station.
2. Readings are to be taken at 10m intervals, intervals to be determined by use of the measuring wheel.
3. Start at the top of the ramp at the London end. If this is not known, use the most northerly end. Refer to the start point as 0m.
4. Readings are to be taken perpendicularly to the tracks starting at the inside edge of the coper/yellow line. Where a coper does not exist, take readings from the inside of the platform edge/yellow line. Never extend the straight edge over the edge of the coper/edge of the platform/yellow line.
5. The requirement is to record the fall direction and steepness over the first 3m of platform. If the platform is an island platform and less than 6m wide, record to the half-way point. Make a note of this in the comments column of the record form.
6. Where obstructions prevent 3m width readings or 10m length readings, take the nearest accessible reading and make a note of this in the comments column of the record form.
7. To record the inclination, lay down the straight edge perpendicular to the track and slide it over the three metres to determine the most representative inclination then lay the inclinometer on the edge.
8. Record the inclination at each 10m interval noting its % fall and whether it falls towards or away from the track. Appropriate ATRIUM Code to be entered (with the agreement of Network Rail).

9. Enter any other comments you feel necessary into the comments column (e.g. snow covering, material type, irregular/rough surfacing, etc.).
10. Appropriate F factor values to be inputted (with the agreement of Network Rail).
11. Input the survey findings within ATRIUM (see below), QA to be completed and the report will be submitted to the client.

Safety Notes

- Be wary when using or carrying the 1m straight edge, its length could make handling cumbersome. Be aware of people and equipment around you.
- Taking upwards of 50 readings per station (for stations with 2 or more platforms) will involve repetitive bending, the risks of which will be similar to manual handling. Please refer to your manual handling training, bend and lift correctly.
- No surveyors or measuring equipment should be within 1.25m of the platform edge whilst undertaking this work.
- No person or equipment should be within 2.75m of live OHLE, including feeds and returns.
- Secure the measuring wheel and other equipment safely while working on the platform (particularly avoid the measuring wheel being blown away by the wind)

ATRIUM Inputting Mechanism

1) Download Visual Proforma and Suspend Canopy, Footbridge and Train Shed Blocks
2) Create a Survey called e.g. Battle Station - Visual Platform Slopes 0813/14 Part 01 (survey period, year and survey 01)
3) Within the Platform block, leave the rest of the defects and photos as they are. Add the platform slope survey data under “platform surfaces” as follows;

    a. If the slope is towards the track F1, F2 as 0 and F3 to F6 as 5. Introduce a Code - this will make it easier for Network Rail to sort against the defect (limits of the slope, limit to raise OPHD form and Code to be agreed with Network Rail).
    b. If the slope is towards landside (or level surface) then F1, F2 as 5 and F3 to F6 as 1(to be agreed with Network Rail).
    c. For the above cases, i.e. for (a) & (b) the Record Form below will be uploaded as a photo in JPG format (as for uploading a photograph) and referenced within the report.
    d. Based on the above approach:
        i. We will not be losing the platform slope survey info
        ii. Extract report will be clean & tidy
        iii. Particular JPG file can be passed on to the contractor for the remedial work

Platform Cross Fall Survey Record Form				
Station name:			**Date:**	
Surveyor:				
PL01 00 01	**Inclination %**	**TOWARDS TRACK (Code)**	**AWAY FROM TRACK OR LEVEL (Code)**	**Comments**
0m				
10m				
20m				
30m				
40m				
50m				
60m				
70m				
80m				
90m				
100m				
110m				
120m				
130m				
140m				
150m				
160m				
170m				
180m				
190m				
200m				
210m				
220m				
230m				
240m				
250m				

PART 2 - Platform Cross Fall Survey: Risk Assessment Matrix

1. Introduction

Investigation of a recent incident involving a child's pushchair which, having been left temporarily unattended, rolled to the edge of and then fell from the platform, determined that a significant contributory factor was the gradient of platform cross fall, which sloped towards the track.

2. Purpose

To reduce the risk of further similar incidents, a process is required to identify increased risk platforms, undertake a risk assessment and develop an action to reduce risks of further incidents on platforms.

3. GI/RT7016 Requirements

Section 11.1.3 within Part 3 of Railway Group Standard GI/RT7016 – Interface between Station Platforms, Track and Trains sets out the nominal cross fall gradient, i.e.

11.1.3 Platform cross fall

11.1.3.1 For new platforms and alterations (as defined) to platforms, the surfacing shall be constructed to provide a fall away from the rear edge of the platform coper or platform edge if there is no separate platform coper.

11.1.3.2 If provided, copers for new or altered platforms shall be nominally level from the platform edge to the rear of the coper.

11.1.3.3 The fall shall be at a nominal gradient of 1:50 (within the limits 1:80 to 1:40).

4. Risk Matrix

	Cross Fall away from Coper Edge 1:80 to Level	Cross Fall to Coper Edge From Level to 1:80	Cross Fall to Coper Edge 1:80 to 1:50	Cross Fall to Coper Edge 1:50 to 1:40	Cross Fall to Coper Edge Greater than 1:40
Category E-F Low Footfall	1	1	2	3	4
Category C-D Medium Footfall	1	2	3	4	5
Category A-B High Footfall	2	3	4	5	5

Risk Factor; 1 = Low, 5 = High

Increased Risk Factor for the following:

1. Where Ticket or Vending Machines are located on platform
2. For platforms exposed to high winds or island platforms subject to aerodynamic effects.

Example: Category C Station Cross Fall 1:60 to rail, with ticket machine on platform and exposed to wind = 3 + 1 + 1 = 5

5. Action Plan

Risk Factor	Action Plan
1	Provide warning signs Record cross fall for future renewals
2-3	Provide warning signs, public announcements Consider relocating ticket/vending machines Record cross fall for future renewals
4	Provide warning signs, public announcements Consider relocating ticket/vending machines Consider resurfacing or rebuilding of platform, where possible
5 or greater	Consider relocating ticket/vending machines Consider resurfacing or rebuilding of platform, where possible

Note: It may not be possible to rebuild platforms due to:

- existing track gradient;
- different track gradients on either sides of island platforms; or
- other existing infrastructure constraints e.g. bridges or buildings.

6. Measuring Cross Fall

The following approach should be taken to identify stations and platforms with increased risk Cross Falls:

Preliminary desk study

1. Identify all stations where CIV/28 Incidents have been recorded, or TOC/passenger reports and complaints have been received.
2. Request TOC to identify and record platform cross fall.
3. List all stations identified in the “Access for All” project.

4. List any other stations close to hospitals, care homes or schools that may have higher numbers of wheelchair or push chair usage.

Site visit

5. From the station list identified above, undertake a preliminary survey, at random points identified by visual inspection.
6. Test method in 7 may be used to record actual cross fall values.

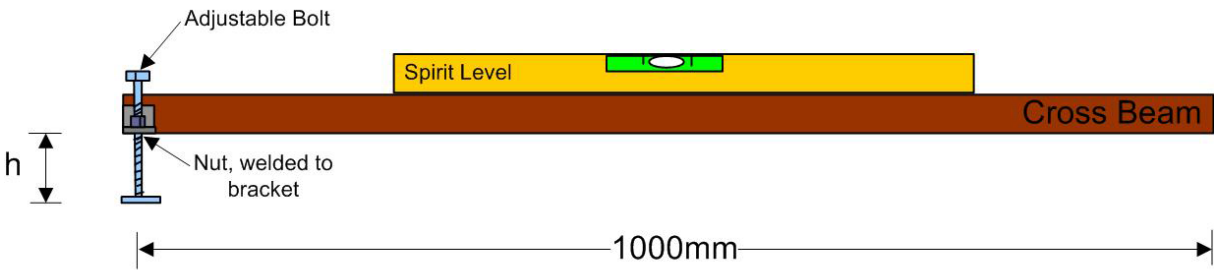
Detail Inspection

7. Where increased risk platforms are indentified or suspected and there is a clear need for further detailed investigation, carry out a detail survey using the test method in 7.
8. Obvious changes of cross fall should be recorded:
    a) where platforms have been extended;
    b) where platforms have been partially renewed/resurfaced; or
    c) where new ticket or vending machines have been installed.

    Note: Platforms often have the coper level, and cross fall on the rear surface (see 3 above)
9. Fall along the length of platform should also be recorded.

7. Test Method

Accurate values may be obtained by using Total Station, Engineers Level, Laser Level Survey or the test apparatus as follows:



Crossfall:
1:20 h = 50mm
1:40 h = 25mm
1:80 h = 12.5mm