Rail Accident Investigation Branch

Lessons learnt from the investigation of accidents at the PTI

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RAIB

Ladbroke Grove, Oct 1999 – Cause: SPAD
Outcome: head on collision (130 mph)
31 fatalities, > 500 injuries

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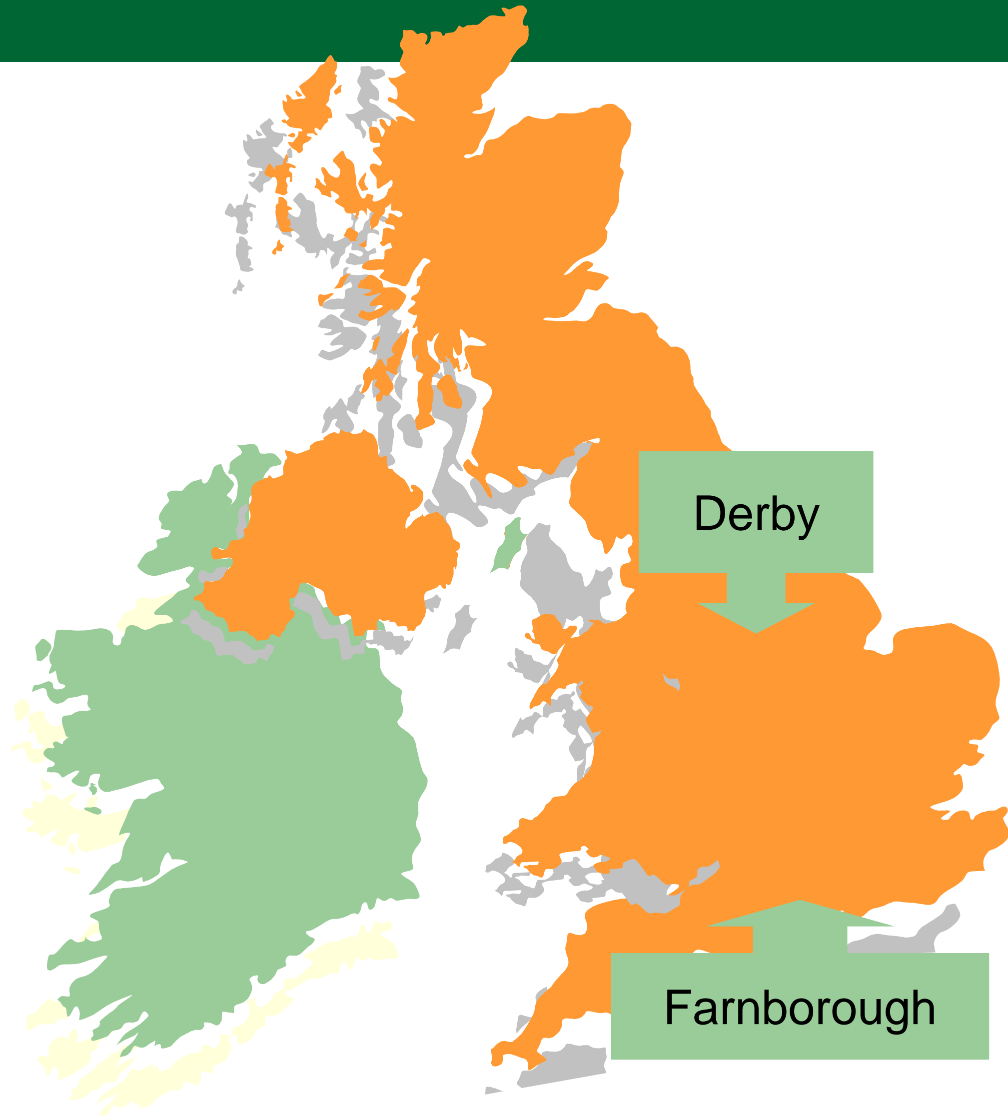
Why was the RAIB established?

- The public inquiry into the 1999 Ladbroke Grove accident recommended that an independent organisation should be established to investigate rail accidents
  - This should be independent of government, safety regulators, police and all industry parties
- UK legislation:
  - Railways and Transport Safety Act 2003
  - Railways (Accident Investigation and Reporting) Regulations 2005
    - Guidance for the use of the Regulations is published by the RAIB (www.raib.gov.uk)
- The Railway Safety Directive (2004)

RAIB’s scope includes: Mainline, metros, trams and heritage rail

RAIB's operation



Platform train interface (PTI) risk

- There are 3 billion platform train interface interactions every year
- The total level of harm (measured in fatalities and weighted injuries, FWI) to passengers/public for 2015/16:

On trains and in stations	**52.1**
On the platform edge (PTI)	**13.6** (includes 6 fatalities)
- during boarding and alighting	**5.9** (no fatalities)
- due to trapping in doors	**1.0** (no fatalities)

- The year 2015 saw three serious accidents in which passengers were trapped in doors and then dragged (Clapham South on LUL, West Wickham and Hayes & Harlington). In two of these accidents the passenger fell under the train and was seriously injured
- The overall level of harm at the PTI increased by 48% in 2015/16 compared with the previous year

What PTI incidents does the RAIB investigate?

Investigations since Oct 2005;

National rail network	9
LUL	3
Metro	1
Tram	1

Of the 9 investigations on the national rail network;

- 8 related to train dispatch

Of the 8 train dispatch investigations;

- 4 were dispatched by drivers (incl. 3 trap and drag)
- 2 were dispatched by platform staff (incl. 1 trap and drag)
- 2 were dispatched by conductors (incl. 1 trap and drag)

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RAIB PTI investigations since Oct 2005

2006	**Huntingdon**	*Trap and drag*
2007	**Tooting Broadway (LUL)**	*Trap and drag*
2011	**Brentwood**	*Train dispatched with person in platform edge gap*
2011	**Kings Cross**	*Trap and drag*
2011	**James Street**	*Train dispatched with person leaning against train*
2012	**Jarrow - Tyne and Wear**	*Trap and drag*
2012	**Charing Cross**	*Person fell in platform edge after RA given*
2013	**Newcastle Central**	*Trap and drag*
2013	**Southend & Whyteleafe**	*Wheelchair and pushchair rolled onto track*
2014	**Holborn (LUL)**	*Trap and drag*
March 2015	**Clapham South (LUL)**	*Trap, drag and fell down gap*
April 2015	**West Wickham**	*Trap, drag and fell down gap*
July 2015	**Hayes & Harlington**	Trap and drag

Important learning
- for passengers

The PTI can be dangerous. Special care is always needed:

- slow down and step carefully
- good behaviour on crowded platforms
- any obstruction of the doors can be dangerous
- alcohol and drugs can exacerbate the risk

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Important learning
- for passengers

Train doors do **not** behave like lift doors

- they may not re-open when obstructed
- they have higher closing forces
- they may not detect small objects like hands, fingers, straps, scarfs
- it can be harder to extract trapped objects
- …..and much harder when the train starts moving

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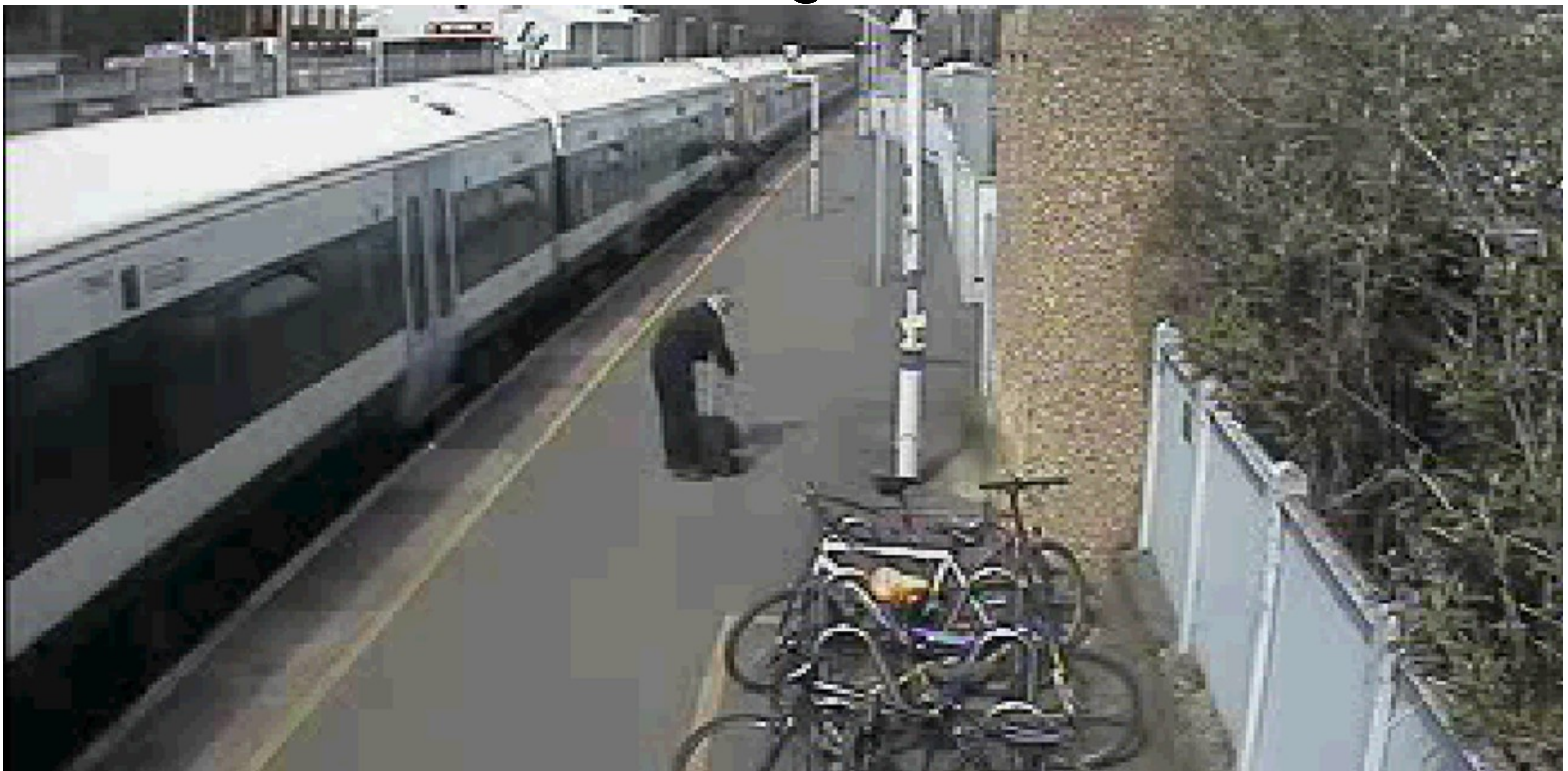
Important learning
- for dispatchers (drivers, conductors, platform staff)

- ❑ Allow sufficient time for passengers to leave the train before closing doors [West Wickham 03/2016]



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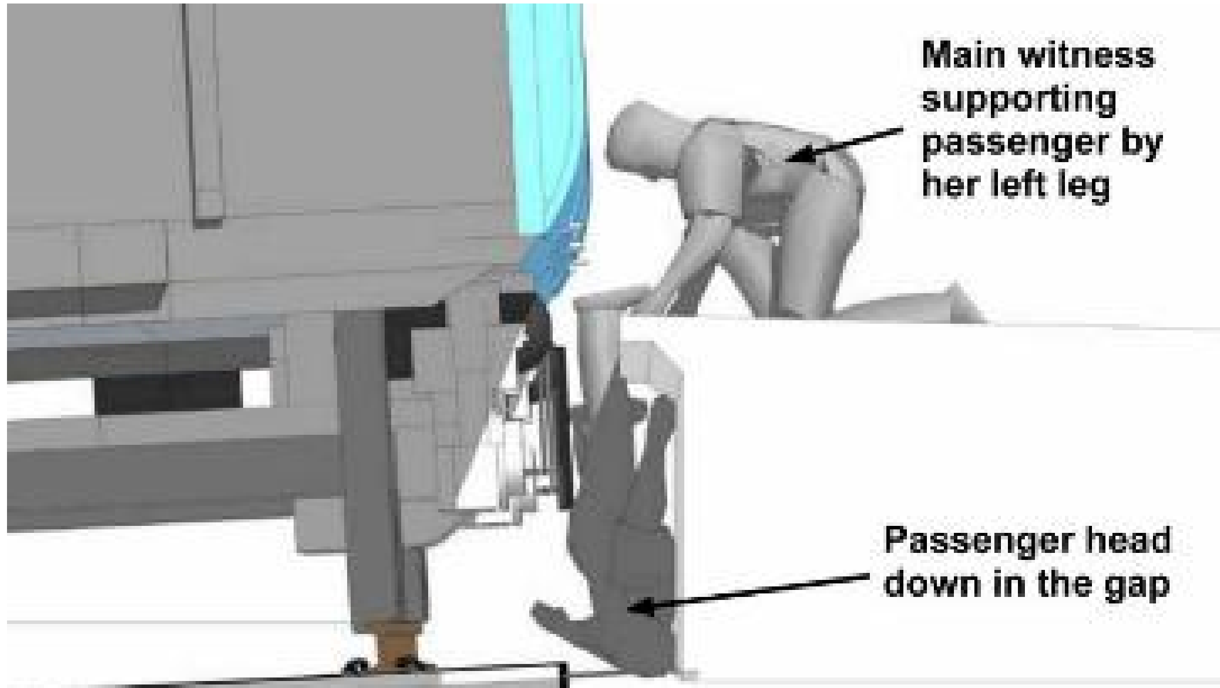
Important learning
- for dispatchers (drivers, conductors, platform staff)

- Where practicable, observe the doors as they close (looking for anything unusual) [Brentwood 19/2011; West Wickham 03/2016; Hayes & Harlington]



Important learning
- for dispatchers (drivers, conductors, platform staff)

- Remembering that door interlock can still be obtained with a hand, or other small object, trapped between the door's leaves [Newcastle Central 19/2014; Holborn 22/2014; West Wickham 03/2016; Hayes & Harlington]

Important learning
- for dispatchers (drivers, conductors, platform staff)

- Undertake an adequate final safety check after doors are closed [Brentwood 19/2011; Kings Cross 09/2012; Jarrow 26/2012; Newcastle Central 19/2014; West Wickham 03/2016; Hayes & Harlington]

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Important learning
- for fleet engineers and rolling stock owners

- The need for a review of design of certain types of door control systems to prevent doors being opened by passengers after the driver has initiated the closure sequence [West Wickham 03/2016]

Important learning
- for fleet engineers and rolling stock owners

- The need to better understand the design of sensitive edge obstruction detection systems
[Newcastle Central 19/2014]

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Important learning
- for fleet engineers and rolling stock owners

- ❑ The need to ensure reliable operation of door detection systems [Jarrow (T&W Metro) 26/2012]

Important learning
- for station managers and train operators

- Risk assessment of train dispatch arrangements, particularly when platforms are crowded, and the identification of suitable risk control measures (eg altered camera positions) [Brentwood 19/2011, Newcastle Central 19/2014 Clapham South (LUL) 04/2016]

Important learning
- potential improvements in the design of the PTI

- Adapting trains and/or platforms to reduce the platform edge gap [James St 22/2012; Charing Cross 10/2013]

Class 508 in 2011

1906 stock (in 1955)

Important learning
- potential improvements in the design of the PTI

- Ways of enabling dispatchers to stop trains quickly in an emergency (including after the signal to start has been given) [James St 22/2012; Charing Cross 10/2013]

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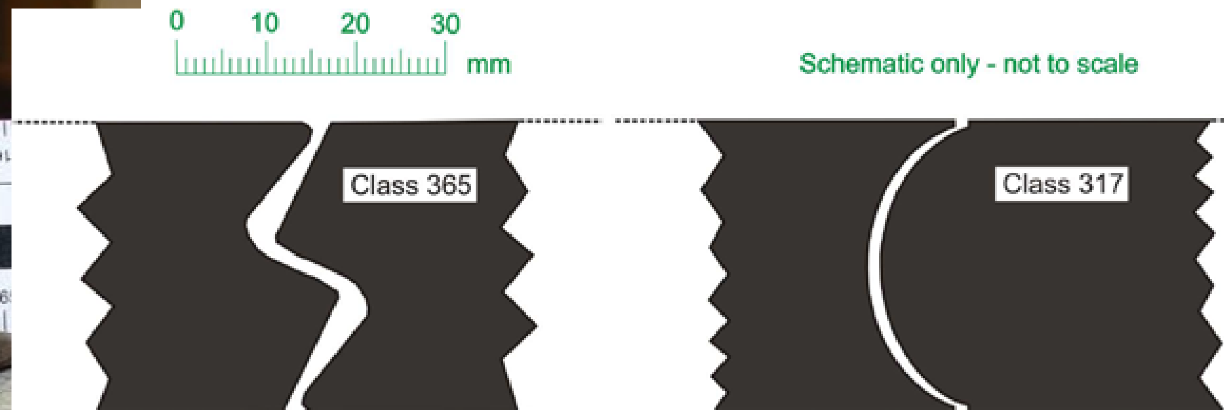
Important learning
- potential improvements in the design of trains

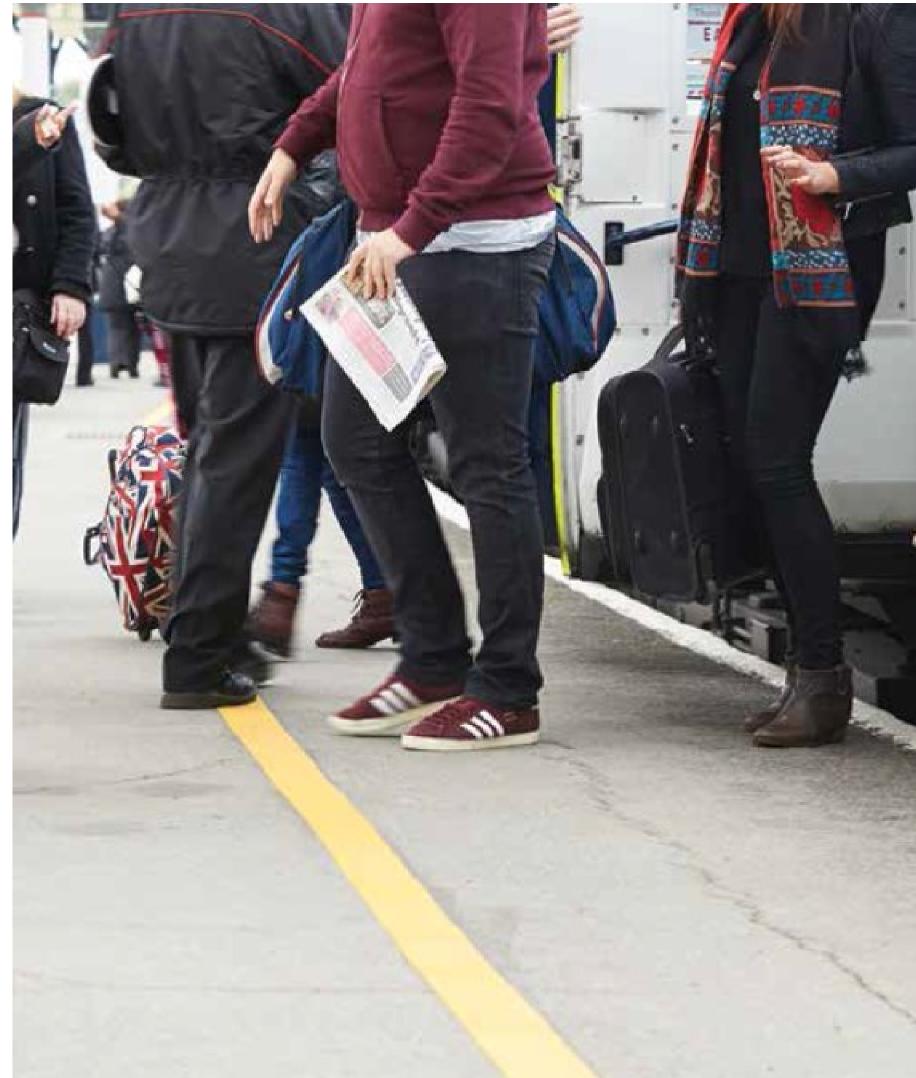
- Minimisation of force needed to extract an object from between door leaves
  - Forces applied by doors and locking devices
  - Design of seals

  [Huntingdon 11/2007, Kings Cross 09/2012; Hayes & Harlington]



Important learning
- for the entire industry

- improved information on door trapping incidents;
- strategies to manage over-crowding
- continuation of the work of the PTI risk strategy group
- **how to engage the public on PTI safety**



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Thank you for your attention