

# Overcrowding on the railways

## A health and safety issue?

**Presentation to HSC  
Railway Industry Advisory Committee  
Birmingham October 2003**

**John Cartledge**

*Safety Policy Adviser, Rail Passengers Council  
Deputy Director, London Transport Users Committee*



# Overcrowding on the railways

## A health and safety issue?

- Is there public concern?
- How great is the risk?
- What did the inquiries find?
- What is the official position?
- Is that the end of the matter?
- Where do we go from here?



# Health & Safety Executive

## Public dialogue on train protection (2003)

***“In all of the workshops where the participants were users of the railways, the issue of overcrowding arose spontaneously and was perceived by many as a serious safety issue. Although it was particularly important to all the commuter groups, the occasional users still noticed overcrowding on particular routes and at certain times.”***



# Health & Safety Executive

## Public dialogue on train protection (2003)

***“You seriously worry about heart attacks.  
Crowded like sardines - it’s inhuman.  
If the train derails we’d be squashed to  
death - no chance.”***

**(Woman commuter, Birmingham)**



# RSSB passenger surveys 2003

*Most-reported “incidents and accidents” were*

- **Collisions**
- **Derailments**
- **Landslides**
- **Falls from trains**
- **Overcrowding**



# “Train crush was cause of near crash”

***“... the underlying fact is that there were so many people crammed into four cars, adding extra weight onto the cars, and therefore a jolt going round a bend would be highly exaggerated and might have caused an extremely bad accident.”***

**(Mr A S, Ely, Evening Standard, 5/9/03)**



# Overcrowding on bank holiday train

***“... in an overcrowded train seated passengers will find themselves providing a cushion for those standing, with a concomitant increase in the risk of head to head clashes.***

***“... by failing to prevent overcrowding, First Group put me at increased risk of being head-butted by a standing passenger.***



# Overcrowding on bank holiday train

***The train company's letter does not deal "with the concerns which I raised about how a train would be evacuated safely, particularly of disabled, elderly or child passengers, in a situation where every last bit of aisle and inter-carriage space is taken up with standing passengers and baggage."***

**(Ms J C, Islington, 5/8/03)**



# RSSB Railway risk model 2003

## *Composition of total railway risk (measured in equivalent fatalities)*

<b>Collisions</b>	<b>9.7%</b>
<b>Derailments</b>	<b>4.6%</b>
<b>Falls from trains</b>	<b>2.1%</b>
<b>Landslides</b>	<b>0.3%</b>
<b>Overcrowding</b>	<b>0.1%</b>
<b><i>[Trespass]</i></b>	<b><i>48.2%</i></b>



# RSSB Railway risk model 2003

## *Composition of total passenger risk (measured in equivalent fatalities)*

<b>Collisions</b>	<b>7.1%</b>
<b>Derailments</b>	<b>4.6%</b>
<b>Falls from trains</b>	<b>3.1%</b>
<b>Landslides</b>	<b>0.4%</b>
<b>Overcrowding</b>	<b>0.6%</b>
<b><i>[Slips, trips, falls</i></b>	<b><i>65.2%</i></b>

# Clapham Junction Accident Inquiry (Hidden Report 1989)

***“... the severity of injury, or the risk of fatality, was no greater for standing than seated passengers”***

***“... the fact is inescapable that the higher the number of passengers on a train, the higher the number of casualties is likely to be in absolute terms”***

***“... BR shall ensure that overall train loading criteria are achieved.”***



# **Cannon Street Accident Inquiry report (1991)**

***“I do not believe there are any safety grounds for prohibiting passengers from standing on a train”***

***“... care needs to be exercised in the way standing passengers are conveyed”***

***“... BR should examine what measures, both on-board trains and at stations, can be introduced to distribute passengers more evenly along the train.”***



# **Cannon Street Accident Inquiry report (1991)**

***“... the interior design of the train must provide adequate hand holds. Greater care is required in the design to avoid hard or sharp edges which will cause injury.”***

***“... further consideration needs to be given to the way in which luggage is contained.”***

***“I do not believe that the provision of seat belts is a practicable solution.”***



# **Ladbroke Grove Accident Inquiry (Cullen Part 1 Report 2001)**

***Train company “considering the possibility of  
dissuading passengers from moving forward in  
train before arrival”***

***“safety benefits of seat belts open to question”***

***“seated passengers already at less risk than those  
obliged to stand (or who chose to do so)”***



# Implications of overcrowding on railways (Bottomley Report for HSE 1999)

***“... injuries can be sustained at any speed of impact ...  
whether standing or sitting, facing either direction”***

***“For collisions occurring at higher speeds, serious injuries  
can be sustained by both seated and standing  
passengers ... There is no evidence to suggest a  
difference in severity.”***

***“At lower speeds ... seated passengers would be at less  
risk of serious injury ... if they had sufficient warning ...”***



# Implications of overcrowding on railways (Bottomley Report for HSE 1999)

***“... may be a cushioning effect ... likely that whatever protection this offers may be offset by an increase in ... head-to-head collisions.”***

***“... severe chest injuries leading to asphyxiation are a real possibility in heavily overcrowded situations, but there is no evidence to suggest the degree of overcrowding experienced on trains ever reaches the densities witnessed in extreme circumstances.”***



# Implications of overcrowding on railways (Bottomley Report for HSE 1999)

***“requiring all passengers to have seats and to remain in them would be impossible to implement and police”***

***“If the excess passengers are removed and put on an extra train, there might be an increased risk to the total population of rail passengers simply due to the addition of the extra trains required to deal with the excess passengers.”***



# Victoria line incident (July 2001)

**4000 people trapped in three trains in small bore tunnel, without ventilation, for up to 90 minutes**

**17 taken to hospital suffering effects of heat exhaustion**

**Demand for air conditioning on Underground, but this is ineffective where already fitted on main line trains when power interrupted**



# The SRA position

**Unlike aircraft or buses, there is no legal limit to the number of people who can be carried on a train**

**There is no practicable means of preventing people from boarding a crowded train if they choose, or of compelling them to leave**

**Published capacity targets (PIXCs) are for service planning purposes only, and unenforceable as actual ceilings on numbers carried**



# The HSE position

**Passengers' concerns about overcrowding are the most common complaint received by HSE**

**Trains are built to operate safely at and above the maximum passenger loads which it is physically possible to accommodate**

**Passenger loading does not affect stability, braking performance or structural strength, and doors are designed to withstand crush loading**

**In general overcrowding relates to passenger comfort and well-being, rather than safety**



# The HSE position

**HSE does have concerns about overcrowding in emergency evacuation, on platforms and stations, on underground routes in hot weather, and in incidents where luggage blocks aisles and doors**

**These are matters on which HSE publishes guidance, and which operators are required to show that they have suitable management procedures for controlling, as part of their safety cases**

**HSE does not believe that there is sufficient evidence or grounds for introducing new legislation to control overcrowding because of health and safety risks**



# **Institute of Directors Business Comment (January 2001)**

***“The Government has stated that train overcrowding is not a health and safety consideration; rather one of comfort. What do you think of this view?”***

<b>Strongly agree</b>	<b>2%</b>
<b>Agree</b>	<b>10%</b>
<b>Don't know / no reply</b>	<b>8%</b>
<b>Disagree</b>	<b>30%</b>
<b>Strongly disagree</b>	<b>50%</b>

***“We urge the Government to reconsider this policy.”***



# **“Railway misery really hits home”**

***“What I would like to see addressed is not just the aspects of delayed trains and packed carriages that you detailed, but also how this impacts more deeply on people’s lives ... We know that stress in the workplace is a recognised condition. How much stress is added to the average day when you ... discover that your train ... has only four carriages when eight could easily be filled, and you’ll have to stand all the way home? What is the cumulative impact on your health when this happens week in week out?”***

**(Ms L W, Hitchin, Evening Standard, 18/10/01)**



# **“Is commuting killing you?”**

***“What is it, besides safety issues, that causes us to be so uneasy about the experience of travelling to work? And are our concerns justified?”***

***“Commuters are exposed to more viruses and bugs when they travel on trains and tubes ... Sleep problems, tiredness, anxiety, stomach ulcers, backache and high blood pressure are also typical symptoms of commuters ... Commuting is known to cause increased levels of stress ... There is evidence that commuting 90 minutes a day dramatically increases your chances of heart problems.”***

**(Joanna Parfitt, The Independent on Sunday, 21/11/99)**



# International Stress Awareness Day 2000

***“Research recently commissioned by the International Stress Management Association UK ... reveals that 70% of UK adults have experienced stress in the workplace.”***

***When asked ‘what situations/activities do you find stressful?’, workers replied :***

<b>Rush hour travel</b>	<b>45%</b>
<b>Work</b>	<b>34%</b>
<b>Managing home/work balance</b>	<b>31%</b>
<b>Children’s future</b>	<b>31%</b>
<b>Financial planning</b>	<b>29%</b>
<b>Paying household bills</b>	<b>26%</b>
<b>Shopping</b>	<b>26%</b>



# **“Official : commuting is bad for you”**

***“Millions of rail passengers are suffering chronic health problems as a result of travelling on grossly overcrowded carriages, and their plight has prompted the first official investigation into ‘cattle truck’ train syndrome.***

***“The cumulative impact of journeys on crowded trains is feared to be inducing high blood pressure, chronic anxiety and even fatal heart conditions.***



# **“Official : commuting is bad for you”**

***“The government-funded Rail Passenger Council is to launch an investigation of the adverse health effects of using the UK rail network.***

***“Researchers will measure the heart rate, blood pressure and other possible symptoms such as muscular tension, to assess the effects of repeatedly enduring overcrowded carriages.***

***“A University of Nottingham study urged the train companies to ‘accept overcrowding as a possible threat to health’”***

**(Mark Townsend, The Observer, 12 January 2003)**



# Rail Passenger Stress & Health

## University of Nottingham for RPC (2002)

*“High-density situations can be perceived of as crowded when passengers feel a lack of control over events, when those events are unpredictable and uncertain, and possibly where there is a sense of time urgency.*

*Perceptions of crowding are usually associated with the experience of stress and that experience may be made worse by design features that give rise to discomfort. These effects appear to be tied into perceptions of risk to personal safety and security.”*



# **Rail Passenger Stress & Health**

## **University of Nottingham for RPC (2002)**

***“To this extent, the perception of crowdedness matters to the individual threatening the quality of their travel experience and the quality of their lives. Do they matter beyond this? In so far as such threats may alter people’s travel behaviour and lead them to prefer other means of transport than rail, they matter to rail organisations.*”**

***Do such threats affect the health of rail users? The evidence is not strong enough to reach a conclusion other than more research is required in this important area.”***



# **Risks arising from crowding on the railway**

## **RSSB research proposal (2003)**

*Project steering group*

**Rail Safety and Standards Board**

**Rail Passengers Council**

**Corporation of London**

**Transport for London**

**Connex South Eastern**

**Virgin Trains**

**Health & Safety Executive (?)**



# Risks arising from crowding on the railway

## RSSB research proposal (2003)

***“Crowding on the railway continues to be a major source of concern to passengers, as evidenced by complaints to operators, users’ groups and regulatory bodies. It is often alleged to give rise to risks to the health and/or safety of those affected. RSSB wishes to examine the issue to ascertain if, when and where crowding exacerbates the risks unavoidably encountered in the course of rail travel. We are interested in identifying the nature of this problem and to have methodologies to assess its incidence and magnitude.*”**



# Risks arising from crowding on the railway

## RSSB research proposal (2003)

***'As the subject appears to have attracted little detailed study hitherto, RSSB has decided to invite leading consultants and experts to identify the manner and circumstances in which they consider that crowding may have a material effect on the health and/or safety of rail passengers, and how they would seek to evaluate the consequential risk. The scope of the study is the health and/or safety effects (whether physical, physiological or psychological) of crowding, on trains and/or on stations, on the national rail network in Britain. This may be in normal conditions, and/or when operations are perturbed, and/or in the event of accidents.'***



# Risks arising from crowding on the railway

## RSSB research proposal (2003)

***“Within these boundaries, we do not wish to limit the scope for research proposals at this stage. What we are seeking is an outline of the ways and circumstances in which you consider that crowding may cause (or accentuate) risk to passengers to a significant degree, and the means that you would propose to use to assess this.”***



# Overcrowding on the railways

## A health and safety issue?

**Your thoughts and comments, please!**

