1. Purpose of paper

1.1 This paper provides an overview of public safety risk and how it is being managed.

2. Key points

2.1 In 2010/11, trespass fatalities were at an all time low of 25, which is around half of the average for the previous nine years. This good news story has not continued. From April to July 2011/12 the trespass figure is much higher than for the same period in 2010/11. It is likely that the total for 2011/12 will return to the higher levels seen prior to 2010/11.

2.2 The total number of suicides and suspected suicides in 2010/11 was 209 which is an improvement on the previous two years but is generally in line with the average of the previous nine years. The number for this fiscal year so far is similar to previous years.

2.3 In 2010/11, level crossing fatalities were much reduced from the average for previous years, as were the number of collisions between trains and road vehicles at level crossings. It is however too early to tell if 2011/12 will continue in this way.

2.4 Recorded vandalism has fallen by 42% since 2001/02. Within this figure, however, cable theft continues to increase in line with current trends in copper prices. In 2010/11 cable theft caused around 360,000 minutes (6,000 hours) delay to passenger services, valued at £12.1m; direct costs such as recovery and repair bring the total cost to around £16.5m.

2.5 A detailed look at public risks and safety trends is attached at Appendix 1 and a snapshot view of some of the ways in which sources of public risk are being tackled is attached at Appendix 2.

3. Public risk in context

3.1 Based on SRMv7, risk to members of the public on Network Rail managed infrastructure equates to 61.7 fatalities and weighted injuries (FWI) per year (excluding suicide). This comprises 44% of the total FWI risk of 140.9.

3.2 Cross-industry safety groups facilitated by RSSB meet regularly to address public risk, led by the parent group the Community Safety Steering Group (CSSG). The National Suicide Prevention Group (NSPG) and the Road-Rail Interface Safety Group (RRISG) report to CSSG. These groups are focussed on understanding the risk from inappropriate public behaviour and sharing
good practice that will help to manage the risk. They are supported by regional and local groups.

4. Trespass

4.1 From 1 April to the end of July, there were 18 fatalities involving members of the public trespassing. This compares with four up to the same period of the last fiscal year.

4.2 Trespass fatalities are dominated by males in the younger age groups. Over the last ten years males have accounted for 88% of all trespass fatalities. The peak age for trespass fatalities are the later teens and earlier twenties.

4.3 The motivation for trespass, which is a new analysis produced for the 2010/11 Annual Safety Performance Report, shows that where a known reason can be identified the most common motivation (37%) for trespass appears to be taking a short cut. The combined percentage of those involved in thrill-seeking behaviour, such as train surfing and bravado, equates to 20% of the total. Other reasons include retrieving property, walking dogs, fare evasion and committing criminal damage including cable theft.

4.4 Over the past ten years, the greatest number of trespasser fatalities occurs on a Saturday. This is true of all of the age groupings. The 16 to 30 age group trespass predominantly in the very late evening and very early morning. April and December are the months with the highest number of trespass fatalities, with May and June having the lowest. The summer months of July, August and September are when more of the under-16 fatalities have taken place.

5. Suicide

5.1 The total number of suicides/suspected suicides up to the end of July 2011/12 was 74 which compares to 76 recorded in the same period for 2010/11.

5.2 The most up to date statistics show that the level of suicides in Great Britain (all methods) increased in 2009/10. This is in line with the discussion in the 2010 board paper about the correlation between periods of economic downturn and the effect on suicides. The insolvency lag seems to be having a continued effect on suicides as the economy returns to a better state. The level of railway suicides as a percentage of the national total has remained fairly constant recently at around 4%.

5.3 In January 2010, Network Rail launched a £5 million programme of investment with the Samaritans, ‘Tackling Suicides on the Railways’, aimed at reducing rail suicide by 20% by 2015. Over the course of the year good progress has been made in the training of rail staff, communications through a publicity campaign, and an outreach programme involving Samaritans volunteers targeting priority stations.

5.4 The research project ‘Improving suicide prevention measures on the rail network in Great Britain’ (T845) has been commissioned in support of the above programme. Deliverables completed to date include: literature review, statistical analysis, qualitative research and process mapping of suicide events. A key part of the research is to evaluate the effects of the programme. The evaluation of year one shows that the programme is broadly welcomed and supported, whilst noting challenges including logistical, organisational and cultural issues; some myth busting has been required towards preventative
measures for suicide. Despite these issues, successes have already been achieved across the three elements of the programme.

6. **Road-rail interface**

6.1 At the end of 2010/11, level crossing fatalities were also much reduced from the average for previous years, as were the number of collisions between trains and road vehicles at level crossings. In the first four months of 2011/12 there have been two fatalities at level crossings, one pedestrian struck on an automatic half barrier (AHB) crossing and a motorcyclist who skidded on the approach to an AHB crossing and struck the side of a train. This compares with two pedestrian fatalities up to the same period of last fiscal year.

6.2 At the end of July there were two collisions at level crossings, both of which involved the road vehicles colliding with the side of trains (the motorcyclist mentioned above and a camper van that attempted to weave the lowering barriers). There is some evidence that the underlying rate of collisions at level crossings has reduced over the past ten years. Because the number of accidents that occurs each year is relatively small it is difficult to distinguish trends from statistical fluctuations. However, grouping the decade into two five-year periods shows a significant reduction in the number of collisions from the period 2001/02 to 2005/06 (89) to the period 2006/07 to 2010/11 (61). To date 2011/12 is on par with the lower levels of 2010/11.

6.3 Network Rail and British Transport Police (BTP) have been working hard in the area of level crossing safety and their safety campaign ‘Don't run the risk’ has been successful in creating awareness and reducing misuse at level crossings. The number of near misses at level crossings between trains and road vehicles, an indicator for the underlying level of risk from collisions, has been decreasing since 2004/05. This is not the case for pedestrian near misses, which is a cause for concern although perhaps the industry has become better at reporting cases of near misses. A number of research projects have been published which help in understanding these trends.

6.4 The number of incursions that occur away from level crossings (through fences, access points and bridges) has been decreasing over the years. NR is identifying high risk sites and putting mitigation measures in place, following a protocol written in 2003 after Great Heck (2001) and set out in the DfT guidance on Managing the obstruction of the railway by road vehicles.

6.5 Trends in the number of bridge strikes (lower in the last three years than previously, though increasing over the past year or so) have led to discussions about whether the economic climate has played a part. This correlation is speculative and revolves around changes in road freight traffic. Research project T854 ‘Reducing the number and impact of vehicle strikes on railway underline bridges’ commenced in May 2010 and will seek to understand such matters. It will also look at the effectiveness of mitigation measures and provide recommendations for improvement, all with the aim of reducing the number and severity of incidents and the consequent delays and cost.

6.6 Network Rail has recently centralised responsibility for level crossing management under a separate asset area in National Operations. The work involves three key programmes:
1. A one year programme to enhance risk management processes and tools, training and staff competence levels, and data quality.

2. A three year programme to reduce the level crossing system risk by 25%. This will be achieved by physical works projects and a programme of closures and innovation.

3. A proposal for a five year programme plan for CP5, to reduce the level crossing contribution to system risk by a further 50%.

6.7 BTP is educating local communities and raising awareness of level crossing risks. BTP supported NR on International Level Crossing Awareness Day on 9 June, when over 40 countries organised activities to promote safety at level crossings. The first BTP dedicated mobile enforcement camera vehicle which went live in January 2011 in London South and is proving successful. The van is fitted with automatic number plate recognition and can check vehicle owner details, insurance and MOT certification. Fixed Penalty Notices and licence points are given and in some cases these can be removed if the offenders agree to go on a course highlighting the dangers of running lights at level crossings. So far, there have been 1200 prosecutions since the introduction of the van.

7. Vandalism

7.1 Vandalism overall has fallen by 42% since 2001/02. However, within this trend, cable theft has increased. There is a strong correlation between copper price and metal theft which has long been recognised, though even when the copper price is high, cable theft decreases in the colder months. In 2010/11, £12.1m was lost in delay costs through cable theft and vandalism, and another £6.8m due to other theft and vandalism. This does not include the associated costs of recovery, repair etc.

7.2 BTP is addressing cable theft with a dedicated task force and has increased patrols which are intelligence led. There are extra funds from NR to assign more officers, a partnership with the serious organised crime agency (SOCA) and communications with external non-rail partners.

7.3 Other initiatives include making use of the NR helicopter and hidden CCTV cameras. Trembler alarms and other devices are used to protect the cable. The introduction of a new type of cable that is easier to identify and harder to steal has also helped, as has better housekeeping at depots and lineside to prevent thefts from occurring. This is tied in with fast response teams to get trains on the move as quickly as possible to reduce the impact of cable theft.

7.4 As a result of analysing the hot spot areas and routing of crimes BTP has managed to reduce crime and catch offenders in key hotspot areas. Following these arrests the number of crimes reduced within the hotspot area and results analysis confirmed that a fall in crime and lack of displacement of crimes placed elsewhere.

8. Recommendations

8.1 The directors are invited to **CONSIDER** and **DISCUSS** the key points identified in this paper.
Appendix 1 – detailed look at public risks and safety trends

Public risk profile

The risk to members of the public based on SRMv7 equates to 61.7 FWI per year. The FWI risk from all sources (excluding suicide) on the railway is estimated to be 140.9 FWI per year; 37% of which occurs to passengers, 19% to the workforce, and 44% to members of the public. The fatality risk from all sources (excluding suicide) on the railway is estimated to be 70.7 fatalities per year; of which 15% occurs to passengers, 6% occurs to the workforce, and 79% occurs to members of the public.

Chart 1 shows the overall risk, with public risk split between the various groups within the public risk area. Trespassers contribute the most at 79% of the public risk followed by risk at the road-rail interface, such as level crossings, with a combined percentage of 16% (road vehicles 6% and pedestrians 10%). The 2% of non-trespass (non-RRI) risk includes members of the public who are on railway property but are not passengers (examples include those using stations to meet and see off passengers). Third party and assaults make up the remaining 3% and include those affected by railway operations such as train accidents.

Most public risk is fatality risk partly because non-fatal injuries to the public are less likely to be reported to rail companies and partly because the hazards that account for most of the risk (such as being struck by a train) are likely to result in a fatality.

The total number of public fatalities for 2010/11 was much lower than in previous years. Trespass figures were the lowest on record, and level crossing fatalities were also very low. This is illustrated in Chart 2, which however also shows that this good news story has not continued into the first four months of 2011/12.

Trespass

In Chart 2, the trespass figure for this year to date is already three times higher than that recorded in the same period of last year. The predicted total for the current fiscal year is estimated to be around 63 FWI if the current trend continues which is around the same level as seen in previous years.
Trespass by age and gender

Trespass fatalities are dominated by males in the younger age groups as shown in Chart 3.

Source: SMIS for trespass data; Office for National Statistics for population data (estimates covers years 2001 to 2009).
• Males make up just less than 50% of the population, but they account for 88% of trespass fatalities over the past ten years.

**Trespass by motivation**

Chart 4 is a new piece of analysis that was published in the 2010/11 ASPR. It shows the main reasons behind why people trespass on the railways.

<table>
<thead>
<tr>
<th>Reason identified</th>
<th>Reason not identified</th>
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<tbody>
<tr>
<td>Assault (pushed)</td>
<td>1%</td>
</tr>
<tr>
<td>Bravado</td>
<td>12%</td>
</tr>
<tr>
<td>Carelessness</td>
<td>11%</td>
</tr>
<tr>
<td>Dog-walking/retrieving</td>
<td>3%</td>
</tr>
<tr>
<td>Escaping pursuit</td>
<td>5%</td>
</tr>
<tr>
<td>Fare evasion</td>
<td>7%</td>
</tr>
<tr>
<td>Mental state</td>
<td>5%</td>
</tr>
<tr>
<td>Retriving property</td>
<td>5%</td>
</tr>
<tr>
<td>Criminal damage / graffiti / cable theft</td>
<td>6%</td>
</tr>
</tbody>
</table>

• In those events where the motivation has been identified, the most common reason is for the purpose of taking shortcuts (37%)

• Other categories include a means to an end such as retrieving items off the line (5%), walking dogs (3%), fare evasion (7%) and committing criminal damage or graffiti (6%).

• A significant proportion of injuries are to people who participate in thrill seeking behaviour like train surfing (8%) and bravado (12%).

• The latest such phenomenon is ‘planking’, a craze for taking photos of people lying down in unusual places and then posting them on the web. This featured recently in the media when a 14-year-old boy was charged with trespassing on the railway. He appeared at York Youth Court on July 5 in connection with a photo he posted on Facebook\(^1\). He was given a four-month referral order.

**Trespass by time of day, week and year**

To better understand when people trespass the following section looks at the time of the day, day of the week and month of the year that they occur.

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Trespass by time of day
Chart 5 looks at the number of trespass fatalities by time of day and age group.

Chart 5. Trespass fatalities by time of day and age, 2001/02 to 2010/11

- The majority of the under-16 fatalities have occurred in the late afternoon to early evening. During term times, this would form the after-school hours.
- The 16 to 30 age group predominates in the very late evening and very early morning, which is the time after many pubs and bars are closing.
- Fatalities involving older adults have a small peak in the pre-morning rush hour period, and another peak around the early evening. A notable number also occur around midnight, similar to younger adults.

Trespass by day of the week and month of the year
Chart 6 looks at trespass by the day of the week and Chart 7 by month of the year.

- Over the past ten years, the greatest number of trespasser fatalities has occurred on a Saturday. This is true of all of the age groupings, where age was known.
- The lowest number of trespass fatalities occur on a Wednesday and a smaller proportion of these are to those aged 16-30 when compared with the proportions on all other days.
April and December are the months with the highest number of total trespass fatalities, with May and June having the lowest.

The summer months of July, August and September are when more of the under-16 fatalities have occurred. The occurrence of school holidays may be a factor.

For the 16-30 age group, December has recorded the most fatalities.

**Suicide/suspected suicide**

The number of suicides/suspected suicides in 2010/11 was 209 which is better than the previous two years but generally in line with the average of the previous nine years. The number for this fiscal year is expected to be similar – possibly somewhat higher than last year (see Chart 8).

- In January 2010, Network Rail launched a £5 million programme of investment with the Samaritans aimed at reducing rail suicide by 20% by 2015. Whilst it is too early to say if this work contributed to the reduction in suicides from 233 to 209 in 2010/11, it is still an encouraging figure.
The 2019/10 national suicide figure is provisional and is taken from ONS\(^2\) show that the national suicides have also increased in 2009/10 which is in line with the increase in railway suicides.

The Network Rail/Samaritans programme mentioned above is known as ‘Tackling Suicides on the Railway’ and addresses both prevention and postvention, through three main elements which are described in Table 1. The programme is delivered through an industry’s National Suicide Prevention Group (NSPG).

The NSPG also work to implement ‘engineering solutions’ such as fencing off fast lines and installing CCTV at specific locations. Additionally 600 fatality screens have been purchased and are being distributed across the Network, with the aim of reducing shock and trauma to passengers and members of the public following a fatality. Whilst these ‘engineering solutions’ are not explicitly included in the Network Rail / Samaritans programme, they are complementary activities.

<table>
<thead>
<tr>
<th>Programme Component</th>
<th>Status</th>
<th>Objective</th>
</tr>
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<tbody>
<tr>
<td>Training: ‘Managing Suicidal Contacts’</td>
<td>Between the course beginning in April 2010 and the end of June 2011, 110 courses had been run, with 1,086 rail staff trained.</td>
<td>This one day course focuses on the benefits of a short conversation with someone who may be experiencing suicidal feelings and the techniques required to minimise not only the immediate risk, but also reduce the risk of the person returning at a later point. Samaritans courses are not about turning staff in counsellors but instead about developing their skills and confidence to respond to a distressed person at the initial point of contact, before making a sensitive referral to BTP, Samaritans or other appropriate support services.</td>
</tr>
<tr>
<td>Communications / Publicity Campaign: ‘Men on the ropes’</td>
<td>The first campaign was launched at events at Waterloo, Cardiff, Glasgow and Dublin stations in September 2010. By June 2011, the campaign image had appeared at 121 GB mainline priority locations, 54% of the total. As at February 2011, the campaign had been covered in 72 print articles including a double page spread in the Sun, 115 broadcast items, including a piece on Sky News and 44 online pieces. The equivalent advertising value of this coverage is estimated by Samaritans to be over £500,000. In total, it is estimated that there have been almost six million opportunities to see the campaign image.</td>
<td>A communications campaign to encourage more at-risk people to call Samaritans’ 24/7 helpline service and to contribute towards a reduction in suicide on the railways amongst the target group.</td>
</tr>
</tbody>
</table>

\(^2\) The 2009/10 national suicide statistics are provisional and were taken from the Office for National Statistics (ONS).
### Outreach Services:

- ‘Emotional support outside the branch (ESOB)’
- ‘Suicide Response Service (SRS)’

By June 2011, 225 locations were involved in the project. Each location was ascribed to a Samaritans branch, most often the nearest branch.

The outreach element of the programme was the last to be rolled out, initially going live in 25% of priority locations and branches (all in the London area) on 1st January 2011. This covered 12 London branches and 65 railway stations.

The intention has been for this element to be rolled out to all stations in branches involved in the programme in three further ways, so that by August 2011, 100% of priority locations will be available on the service.

To enable all Samaritans branches to provide an emotional support service outside of the branch environment. This entails Samaritans volunteers providing face to face emotional support at identified rail locations. The provision of this service by Samaritans is not designed to replace any of the existing Network Rail processes relating to customer care or remove any duty of care which they may have.

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CSSG has recently been shown the new HM Government consultation document on a proposed suicide prevention strategy for England, titled, ‘Consultation on preventing suicide in England: A cross-government outcomes strategy to save lives’.

The group has been asked to comment on the paper and the closing date for the consultation is on the 11 October 2011. Consultation responses will inform the final strategy which will be available early in 2012.

The document features important thinking about:

- High risk groups
- Mental health
- Reducing access to means (including rail)
- Better support
- Media
- Research and data collection
- Making it happen

CSSG agreed this is both important and timely. NSPG was able to contribute to the section on railway suicide before the consultation draft was issues, and will be responding to the consultation on behalf of the rail industry including the BTP.

The research project ‘Improving suicide prevention measures on the rail network in Great Britain’ (T845) has been commissioned in support of the Tackling Suicides on the Railway programme. It is managed by RSSB and guided by a cross-industry steering group. T845 has two key aims: ‘improving knowledge’ and ‘evaluating initiatives’. The project began in June 2010 and is due to be completed in October 2013. However, the industry will not have to wait until then for outputs. Summary reports on each task are being provided at intervals throughout the project to the cross-industry programme team. Deliverables completed to date include: literature review, statistical analysis (including multi-level modelling), qualitative research and

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process mapping of suicide events, evaluation of year one of the programme and the annual report for 2010/2011.

The key findings from the annual report and the evaluation of year one of the programme are that the programme and its three elements of work have been broadly welcomed and supported by both Samaritans staff and volunteers and by the rail industry at both strategic or organisational levels. However, each element has been adversely affected both by logistical and organisational issues and the attitude of the rail industry towards suicide. The key areas highlighted to be focused on to improve the effectiveness of the programme include: communications (internal and external to the NSPG and programme team), partnership working across industry and myth busting about the possibilities of preventing railway suicide.

Despite this, there have been successes on all three elements of the programme, with the campaign image displayed at over half of the priority locations, over 1,000 rail staff trained in managing suicidal contacts and the roll out of the outreach element of the programme across 75% of priority locations. In addition, the programme has prompted both the BTP third party reporting system and a new training course of drivers dealing with the aftermath of a suicide incident. It is hoped that data will continue to be gathered on the programme to support its continued development and operation.

**Road-rail interface risks**

**Fatalities at level crossings**

The number of fatalities occurring on level crossings decreased to four in 2010/11 which is the lowest recorded in recent years. Two of the deceased were walking dogs, one was being pursued by the police and one was jogging with headphones.

- This improvement does appear favourable but it is probably too early to conclude whether the trend is significant and whether this will continue into 2011/12. Up to the end of July 2011, one pedestrian was struck on a level crossing and a motorcyclist slid on the approach to a crossing and struck the side of a train. This is the same number of fatalities recorded up the end of July 2010/11.
Road vehicle collisions and incursions

Chart 10 shows the number of road vehicle incursions on Network Rail managed infrastructure over the last ten years.

- The total incursions that occur away from level crossings has been decreasing over the years. This type of incursion (through fences, access points and bridges) is been managed by NR to ensure that high risk sites are being identified and mitigation measures put in place. The protocol was written in 2003 after Great Heck occurred in 2001 and is detailed in the guidance on Managing the obstruction of the railway by road vehicles.4

- There is some evidence that the underlying rate of collisions at level crossings has reduced over the past ten years. Because the number of accidents that occurs each year is relatively small it is difficult to distinguish trends from ‘statistical fluctuations’. However, grouping the decade into two five-year periods shows a significant reduction in the number of collisions from the period 2001/02 to 2005/6 (89) to the period 2006/07 to 2010/11 (61).

**Trends in bridge strikes**

Bridge strikes are managed by the bridge strike prevention group at NR and discussed at the RRISG. Chart 11 shows that after a peak in bridge strikes in 2007/08 there was a large decrease in 2009/10 and a gradual increase over the 2010/11 fiscal year.

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The R&D project T854 *Reducing the number and impact of vehicle strikes on railway underline bridges* begun in May 2010 looks at the effectiveness of interactive road signs, and seeks to identify bridges that are suitable for such installations; with recommendations for improvements where necessary. The consequences of these strikes are wide-ranging and include disruption to road and rail transport systems, damage to infrastructure and risk to railway and road users.

Through improved understanding of why bridge strikes occur and integration of human factors principles into the design of measures to reduce bridge strikes, numbers and severity of bridge strikes could be reduced. This project will deliver a comprehensive study of bridge strikes through a detailed review of research projects, incidents, current legislation, surveys with key stakeholders and review of measures for mitigating bridge strikes.

Improved guidance for reducing bridge strikes will then be produced. All work will be undertaken by subject matter experts with input from human factors specialists as necessary. Improvements to the understanding of the causes of bridge strikes and of methods aimed at preventing them offer the opportunity to significantly reduce the numbers and severity of bridge strikes reducing costly service delays, infrastructure damage and the risk to railway and road users. The current phase (Phase 2) of this project is due to complete by the end of April 2012, however, further work is expected (as Phase 3) if the findings of the current phase recommends it and is also requested by the key stakeholder Network Rail.

**Other industry level crossing developments**

The ORR has published its revised guidance on level crossings in August *Railway Safety Principles and Guidance, Part 2, Section E (RSPG 2E) Guidance on level crossings*. The document is a guide for managers, designers and operators and
provides general guidance on the safe management, operation, modification and use of Britain’s level crossings.

Network Rail is currently centralising governance and the responsibility for level crossing management under a separate asset area under National Operations. The work involves three key programs to address and improve safety risks at level crossings.

1. A one year programme to enhance current risk management processes and tools, training and staff competence levels, and to enhance data quality; this equates to 17 major workstreams.

2. A three year programme covering the remainder of CP4 to reduce the level crossing contribution to system risk by 25%. This includes a number of physical works projects, each rolled out across hundreds of locations. Combining these with a systematic programme of closures and innovation will yield significant risk reductions, as well as safety, performance, operational expenditure and reputational benefits.

3. A proposal for a five year programme plan for CP5, to reduce the level crossing contribution to system risk by a further 50%. This includes:
   - Closures
   - Continuation of implementing user based solutions at crossings in long sections
   - Continuation of enforcement initiatives (NR / BTP)
   - Technology to improve user behaviour
   - Campaigns and education initiatives
   - To reduce the population of AHB crossings

A Network Rail internal communications campaign, led by Sir David Higgins, commenced on 9 June at the Annual International Level Crossing Awareness Day. BTP supported Network Rail at various locations around the country by taking high visibility patrols at crossings throughout the day as part of an education and enforcement initiative informing level crossing users of the dangers they can pose if used incorrectly.

**BTP level crossing enforcement**

BTP is preparing a project team at force headquarters to manage level crossing enforcement. Their plan is to use enforcement at level crossings to educate users and punish those who break the rules with points deducted from their licences. The first dedicated mobile enforcement vehicle went live at the beginning of the year in London South and is proving extremely successful. BTP will be rolling out more vehicles across the network this year whilst developing the fixed red light camera solution for public road crossings. The van mounted mobile camera, with Automatic number plate recognition can also connect to computers to check vehicle owner details, insurance and MOT certificate. There have been 1200 prosecutions since January 2011, resulting from use of the camera van.
**Vandalism**

**Vandalism trends on or near the line**

Vandalism risk in the SRM is measured by train accident risk where the potential for a train derailment can occur when objects are placed on the tracks. People who suffer personal injury when involved in these criminal acts are considered in the trespass statistics. The CSSG are interested in the trends in the numbers of vandalism events so they know where to focus their attention. This enables the various members of the group help reduce the number of vandalism events and prevent these crimes from taking place.

**Chart 12. Trends in vandalism risks**

- Recorded vandalism is seasonal with peaks in April approximately twice the level seen in December.
- Total reported vandalism has fallen by 42% since 2001/02. However, the ‘other vandalism’ category, which includes cable theft (and metal theft generally), has been increasing over the period shown.

**Trends in metal theft**

As Chart 12 above shows the overall number of vandalism events has decreased over time, the trends in cable/metal theft have been gradually increasing. Metal theft causes a huge amount of damage and operational delay and costs to the national railway. It has long been recognised that increases in copper price lead to increase in the occurrence of theft from the railway. Analysts predict that the price of copper will continue to increase over the next 12 months.

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Chart 13 shows the incidence of metal theft over the last four years up to the end of July 2011. The chart includes all theft of metal including theft of catalytic converters, damage to signal and telecommunication equipment and burglary from other railway premises as well as cable theft.

**Chart 13. Incidents of metal theft and trends in copper price**

<table>
<thead>
<tr>
<th>Reported metal theft incidents</th>
<th>Price of copper per tonne</th>
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</thead>
<tbody>
<tr>
<td>Apr 07</td>
<td>£0</td>
</tr>
<tr>
<td>May 07</td>
<td>£2,000</td>
</tr>
<tr>
<td>Jun 07</td>
<td>£4,000</td>
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<tr>
<td>Jul 07</td>
<td>£6,000</td>
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<tr>
<td>Aug 07</td>
<td>£8,000</td>
</tr>
<tr>
<td>Sep 07</td>
<td>£10,000</td>
</tr>
<tr>
<td>Oct 07</td>
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<td>Nov 07</td>
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<tr>
<td>Mar 09</td>
<td>£2,000</td>
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<tr>
<td>Apr 09</td>
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<tr>
<td>May 09</td>
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<tr>
<td>Jun 09</td>
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<td>Jul 09</td>
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<td>Nov 09</td>
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<td>Jan 10</td>
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<td>Feb 10</td>
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<td>Jan 11</td>
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<tr>
<td>Feb 11</td>
<td>£4,000</td>
</tr>
<tr>
<td>Mar 11</td>
<td>£2,000</td>
</tr>
</tbody>
</table>

Sources: BTP for data on incidents of metal theft; London Metal Exchange for data on copper prices

**Trends in copper theft by month and area**

The following Chart 14 shows the number of cable thefts my monthly average. The data is for the period 2006-2010.

- There are more than twice as many cable thefts in the summer months as there are in the winter months from October to March.
- The data shows that even when copper price is high, cable theft decreases in the colder months.

**Chart 14. Trends in cable theft by month 2006-2010**

Source: BTP
Chart 15 shows the last four fiscal years by BTP area.

**Chart 15. Incidences of metal theft by BTP mainline areas**

Network Rail and BTP initiatives to reduce cable theft

Network Rail reported that in 2010/11, an estimated £16.5m\(^6\) was lost nationwide through cable theft which includes 360,000 minutes delays to passenger services. BTP have recorded more than 3,000 crimes and made 900 arrests. This is being addressed through a number of initiatives:

- Dedicated BTP task force, increased patrols, intelligence led policing. Priority second only to terrorism.
- Network Rail has recently funded extra, dedicated officers.
- Partnership working with the Serious Organised Crime Agency (SOCA).
- National intelligence cell with members from BTP, Network Rail and soon external non-rail partners.
- Use of the Network Rail helicopter, CCTV, forensic marking, trembler alarms and other devices to protect the cable.
- Fast response teams to get trains on the move as quickly as possible.
- Introduction of new type of cable that is easier to identify and harder to steal.
- Use of approved scrap yards for disposals of used materials.

The BTP have joined forces with Network Rail and set up a national operation as a strategic response to cable theft, now known as Operation Leopard. The operation involves a number of elements:

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\(^6\) This figure differs from costs shown in Chart 17 as it includes the cost of resources, man power and materials.
Proactive enforcement using covert and overt police action.
Education and enforcement with scrap dealers.
Better housekeeping and security at depots and lineside.

In the later part of 2010, BTP purchased Map Info software which maps crimes and hotspots. As a direct result of effective geographical hot spotting and routing of crimes BTP has reduced crime and caught offenders in key hotspot areas.

Recently BTP have mapped hotspots for NR delay minutes against BTP hotspots for disruption to identify similar and differing hotspots. BTP has developed a suite of products being used across the force at a local and national level to inform resourcing and prioritisation decisions and make efficiency savings.

Chart 16 shows a geographical analysis of metal theft highlighted a key hotspots in the London South area (highlighted in red). The purple colouring on the map shows the distance (drive time) a vehicle can travel from a BTP station in 30 minutes.

Chart 16. Visualisation of metal theft hot spots with mapping to BTP stations

Once analysed patrols were directed and trends were monitored. Through regular contact with the analytical team in briefings the officers were directed daily.

Outcome:

- Two prominent offenders arrested by patrols in the hotspot. A positive DNA hit received.
- Further two offenders arrested (a known cable thief and known scrap metal dealer).
• Following arrests crime reduced within the hotspot area and results analysis confirmed the fall in crime and lack of displacement elsewhere.

**TRUST delay analysis**

Delays and costs arising from public behaviour\(^7\) and other events collected by Network Rail and assigned a financial value through a process agreed by Network Rail and train operators. The information is kept in the Network Rail TRUST database system.

In 2010/11, the total estimated cost from all causes was in the region of £900m. The cost associated with public behaviour was estimated to be around £70m.

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**Chart 17. Delay and cancellation costs from areas outside industry control, 2010/11**

- **Fatalities & injuries due to being struck by train (all causes except at LX)**: £17.8m
- **LX and other road-rail interface (includes fatalities due to being struck by train)**: £7.9m
- **Other theft/vandalism**: £6.8m
- **Cable theft/vandalism**: £12.1m
- **Trespass-related (includes electrocution fatalities but not those struck by train)**: £11.7m
- **Other external causes**: £14.1m
- **Other external causes**: £14.1m

Source: TRUST

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• Of the events types shown, fatalities/injuries due to being struck by a train result in the greatest cost, at £17.8m. Of these, the majority are suicide or trespass related.

• Cable theft/vandalism and other theft/vandalism account for £18.9m when combined. The figures do not include other associated costs, such as repair and replacement.

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**Chart 18. Delay/cancellation costs by month, 2010/11**

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\(^7\) The analysis in this section will also include any similar injuries/events involving passengers.
Appendix 2 ‘Snapshot view’ of some of the ways in which sources of public risk are being tackled.

<table>
<thead>
<tr>
<th>Risk from</th>
<th>Main types of event</th>
<th>Fatal</th>
<th>FWT</th>
<th>RSSB actions to support industry</th>
<th>Industry co-operative actions</th>
<th>Duty holder actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crime</td>
<td>Trespasser struck by train or electric current</td>
<td>0.01 0.01</td>
<td>0.01</td>
<td>Published research projects: T042a: Evaluation handbook for route crime and other initiatives; T053: Trespass and vandalism cost modeling.</td>
<td>Industry groups looking a similar risk to passengers, eg Operations Focus Group (OFG), will also address same risks to members of the public.</td>
<td>General improvements made to CCTV systems across a number of stations; general management and maintenance of systems also upgraded. Rail enforcement officers given direct access to the BTP radio network, enabling them to contact BTP immediately when necessary; TOCs, Network Rail and BTP use a variety of staffing measures including security guards, rail enforcement officers, special constables and police community support officers.</td>
</tr>
<tr>
<td></td>
<td>Assaults, threats and verbal abuse</td>
<td>0.03 0.03</td>
<td>0.03</td>
<td>RSSB manages the annual Community Safety Forum, Newsletter and Resource Centre website and annually produces a DVD with ‘Key incident’ clips from the Rail Franchise Quality Assurance system.</td>
<td>Police crime detection and surveillance toolkits and potential good practice outside the railway industry.</td>
<td>Improved police crime detection and surveillance toolkits and potential good practice outside the railway industry.</td>
</tr>
<tr>
<td>Road vehicle</td>
<td>Road collision with road vehicle at level crossing; road vehicle incursion at level crossing and bridge strikes</td>
<td>0.03 0.03</td>
<td>0.03</td>
<td>Published research projects: T157a: The best fencing materials for levels – Phase 1. T157b: Safer surfaces to walk on - reducing the risk of slipping.</td>
<td>Personal,third-party and non-trespass-related casualties at level crossings and at level crossing, incursions and bridge strikes.</td>
<td>Network Rail risk assessment of crossings through the Level Crossing Risk Model.</td>
</tr>
<tr>
<td></td>
<td>Pedestrian struck by train at (footpath) level crossing</td>
<td>0.12 0.12</td>
<td>0.12</td>
<td>Network Rail working with BTP and CPS, providing evidence to prepare Impact Statements for courts.</td>
<td>Non-trespass related injuries at crossings at railway stations and T650 Improving safety and accessibility at level crossings for all published.</td>
<td>Network Rail has centralised level crossing management into a single system considered as a separate asset. There are programmes to the end of CP5 to reduce the risk, in addition to local level crossing issues will be pursued with landowners.</td>
</tr>
<tr>
<td></td>
<td>Non-trespass related slips, trips and falls at stations</td>
<td>0.03 0.03</td>
<td>0.03</td>
<td>Published research projects: T157a: The best fencing materials for levels – Phase 1. T157b: Safer surfaces to walk on - reducing the risk of slipping.</td>
<td>Personal,third-party and non-trespass-related casualties at level crossings and at level crossing, incursions and bridge strikes.</td>
<td>Network Rail has centralised level crossing management into a single system considered as a separate asset. There are programmes to the end of CP5 to reduce the risk, in addition to local level crossing issues will be pursued with landowners.</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>0.43 0.43</td>
<td>0.43</td>
<td>Published research projects: T157a: The best fencing materials for levels – Phase 1. T157b: Safer surfaces to walk on - reducing the risk of slipping.</td>
<td>Personal,third-party and non-trespass-related casualties at level crossings and at level crossing, incursions and bridge strikes.</td>
<td>Network Rail has centralised level crossing management into a single system considered as a separate asset. There are programmes to the end of CP5 to reduce the risk, in addition to local level crossing issues will be pursued with landowners.</td>
</tr>
<tr>
<td>Engineering</td>
<td>Rolling stock</td>
<td>Tram crew</td>
<td>0.13 0.13</td>
<td>No research specifically addressing public risk.</td>
<td>Included in association of passenger safety teams, ensuring good practice and local initiatives within.</td>
<td>Covered by individual duty holder actions aimed at reducing passenger risk at stations.</td>
</tr>
<tr>
<td></td>
<td>Track worker</td>
<td>Third party injury from accidents</td>
<td>0.01 0.01</td>
<td>No research specifically addressing public risk.</td>
<td>Included in association of passenger safety teams, ensuring good practice and local initiatives within.</td>
<td>Covered by individual duty holder actions aimed at reducing passenger risk at stations.</td>
</tr>
<tr>
<td></td>
<td>Signal</td>
<td>Third party injury from accidents</td>
<td>0.25 0.25</td>
<td>No research specifically addressing public risk.</td>
<td>Included in association of passenger safety teams, ensuring good practice and local initiatives within.</td>
<td>Covered by individual duty holder actions aimed at reducing passenger risk at stations.</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>0.59 0.59</td>
<td>0.59</td>
<td>Included in association of passenger safety teams, ensuring good practice and local initiatives within.</td>
<td>Included in association of passenger safety teams, ensuring good practice and local initiatives within.</td>
<td>Covered by individual duty holder actions aimed at reducing passenger risk at stations.</td>
</tr>
<tr>
<td>Public</td>
<td>Suicide</td>
<td>Suicide, suspected or attempted suicide</td>
<td>0.21 0.21</td>
<td>Project T464: Improving suicide prevention measures on the rail network in Greater Britain in progress.</td>
<td>Public behaviour of staff and customers at stations associated with the workplace. Provided by Network Rail to suicide prevention organizations.</td>
<td>Working with Samaritans to train rail staff to recognise behaviour that might lead to suicide. Network Rail’s cross-industry National Suicide Prevention Group addresses suicide prevention replacing the previous suicide group set up by BTP and RSSB.</td>
</tr>
</tbody>
</table>

* Third party risk also has the potential to arise from the workability away from the main railway, for example road traffic accidents whilst driving between sites. This is not covered by the SMR.