

Rail Accident Report



**Road vehicle incursion and subsequent
collision with a train at Stowmarket Road,
30 November 2011**

Report 25/2012
November 2012

This investigation was carried out in accordance with:

- the Railway Safety Directive 2004/49/EC;
- the Railways and Transport Safety Act 2003; and
- the Railways (Accident Investigation and Reporting) Regulations 2005.

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Road vehicle incursion and subsequent collision with a train at Stowmarket Road, 30 November 2011

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Summary

At about 19:36 hrs on Thursday 30 November 2011 a car that was being driven on the B1113 Stowmarket Road, towards the village of Old Newton in Suffolk, left the carriageway and passed through the wire fence onto the railway line north of Stowmarket.

The driver of the car was injured, but was able to escape to a place of safety, and reported the accident to Suffolk Police. A short time later the car was struck by the 18:43 hrs Cambridge to Ipswich train. Fortunately the train did not derail and neither passengers nor members of the train crew were physically injured.

The immediate cause of the accident on the highway was that the driver of the car lost control of his vehicle. The subsequent collision with the train occurred because the car came to rest in a position where it was obstructing the railway line and there was insufficient time to stop the train.

Suffolk County Council had undertaken a risk assessment in 2005 and assessed the risk of road vehicle incursion at the location where the accident occurred. It had not implemented steps to control the risk of incursion. Network Rail was also aware of the risk at the location, but had no process in place to monitor the actions of local highway authorities to address the risk of road vehicle incursions and had assumed that Suffolk County Council was taking suitable actions.

A number of underlying factors were identified which showed Network Rail's awareness of road vehicle incursion incident sites was limited, and the joint risk management process adopted by Network Rail and Suffolk County Council in 2003 (following the fatal train accident at Great Heck in 2001) had not been completed. As a consequence, the investigation identified that there were nine locations within Suffolk where action to reduce RVI risk had still to be taken. Network Rail has identified over 200 sites on the national rail network where action has still to be taken to reduce the risk of road vehicle incursion.

It was also found that the Department for Transport's (DfT) monitoring of the progress to mitigate the risk at known sites with significant road vehicle incursion risk was not effective, nor did it emphasise to local highway authorities and Network Rail the requirement to complete such works. The RAIB considers that regulatory oversight by the Health and Safety Executive (HSE) and Office of Rail Regulation (ORR) of works to address the risk of road vehicle incursion was affected by a lack of clarity as to which body has enforcement powers to require local highway authorities to take action.

The RAIB has made two recommendations to Suffolk County Council. These cover:

- the need for an independent review of the actions it has taken since the accident to address the deficiencies in its process for the management of road vehicle incursion risk; and
- the need to improve the flow of information to parish and district councils and the police on related matters.

The RAIB has made two recommendations to Network Rail. These cover:

- a review of the current data on road vehicle incursion sites; and
- improvements to the way road vehicle incursion risk is monitored.

The RAIB has made one recommendation to the ORR and HSE. This covers the need to clarify which body has regulatory and enforcement responsibility relating to the management of road vehicle incursion risk.

The RAIB has made four recommendations to the Department for Transport. These cover:

- the need to monitor progress with the implementation of risk mitigation measures at road vehicle incursion sites;
- establishment of a mechanism for the lessons learnt from this investigation to be disseminated to other local highway authorities;
- improving the exchange of information that is relevant to the risk of road vehicle incursion; and
- gathering intelligence on high risk road vehicle incursion locations as an input to emergency planning.

Introduction

Preface

- 1 The purpose of a Rail Accident Investigation Branch (RAIB) investigation is to improve railway safety by preventing future railway accidents or by mitigating their consequences. It is not the purpose of such an investigation to establish blame of liability.
- 2 Accordingly, it is inappropriate that RAIB reports should be used to assign fault or blame, or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.
- 3 This RAIB investigation has resulted in recommendations being made to the railway industry and other parties. The process that applies to the management of recommendations made by the RAIB is explained on the RAIB website¹.

Key definitions

- 4 Metric units are used throughout this report, except for speed and locations which are given in imperial units, in accordance with normal road and railway practice.
- 5 The terms 'up' and 'down' in this report are relative to the direction of travel; the line between Norwich and Ipswich is designated the up line. The terms 'left' and 'right' are relative to the direction of motor vehicle travel.
- 6 The report contains abbreviations and technical terms (shown in *italics* the first time they appear in the report). These are explained in appendices A and B.

¹ http://www.raib.gov.uk/about_us.

The accident

Summary of the accident

- 7 At about 19:36 hrs on Thursday 30 November 2011, a car being driven on the B1113 Stowmarket Road towards the village of Old Newton in Suffolk left the carriageway, travelled over a verge and passed through the wire fence at the railway boundary. The vehicle came to rest foul of the railway track on the *up line* near to Lancaster footpath crossing (north of Stowmarket on the line between Norwich and London Liverpool Street (figure1)).
- 8 Although the driver of the car was injured during the accident, he was able to escape to a place of safety, and reported the accident to Suffolk Police. A short time later the car was struck by train 2W29, the 18:43 hrs service from Cambridge to Ipswich. The train did not derail, but oil pipes were damaged which required the engines to be shut down. The passengers were evacuated from the train by 21:23 hrs, with the assistance of local emergency services. No passengers or members of the train crew were physically injured.

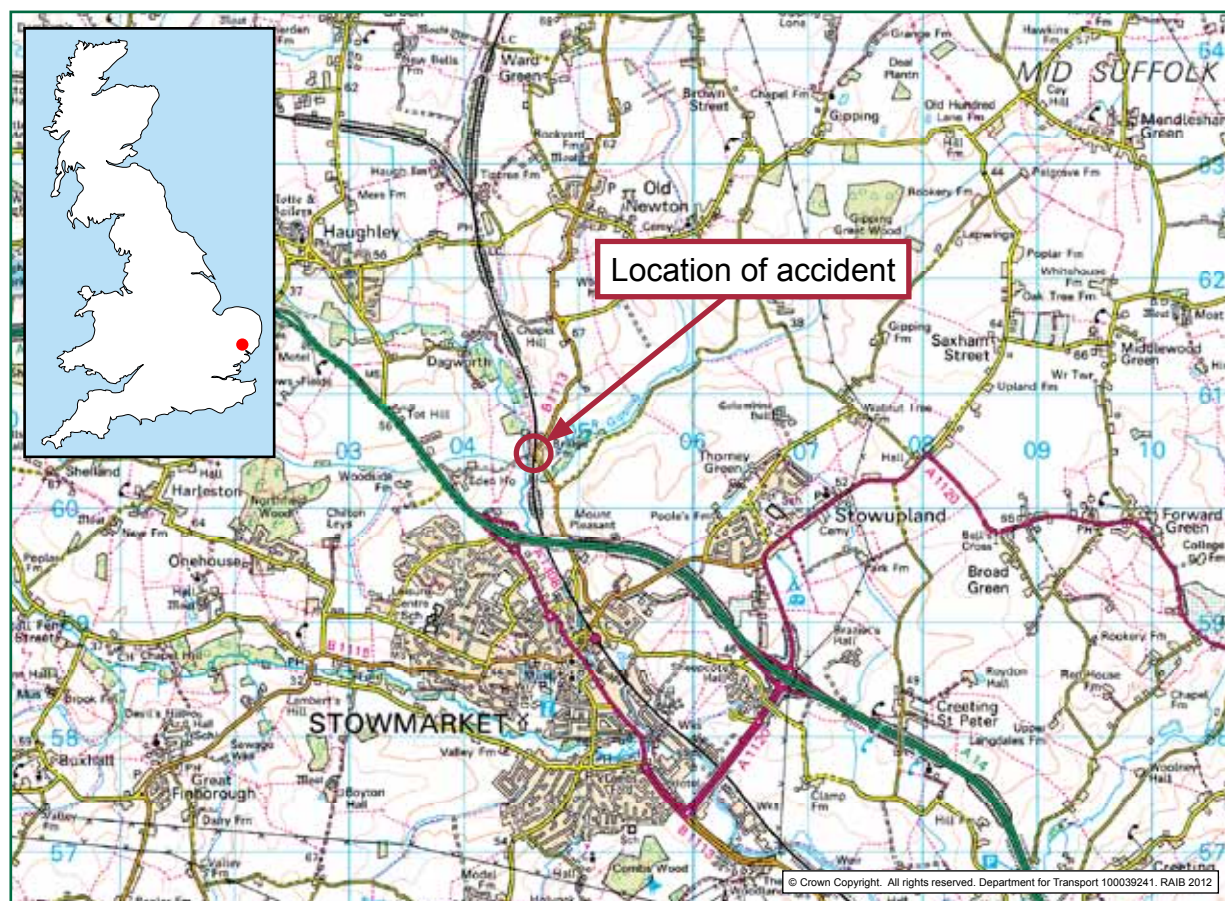


Figure 1: Extract from Ordnance Survey map showing location of accident

Context

Location

Railway

- 9 The railway at this location has two tracks. The maximum permitted speed is 100 mph (161 km/h). The railway boundary fence comprises posts and seven wires.
- 10 The signalling in the area is controlled by Colchester signal box and train operations are supervised by Network Rail's Anglia route control, which is located in London.
- 11 The location of the incident was at 81 miles 57 chains measured from London Liverpool Street, between Stowmarket station and Haughley Junction (figure 2).

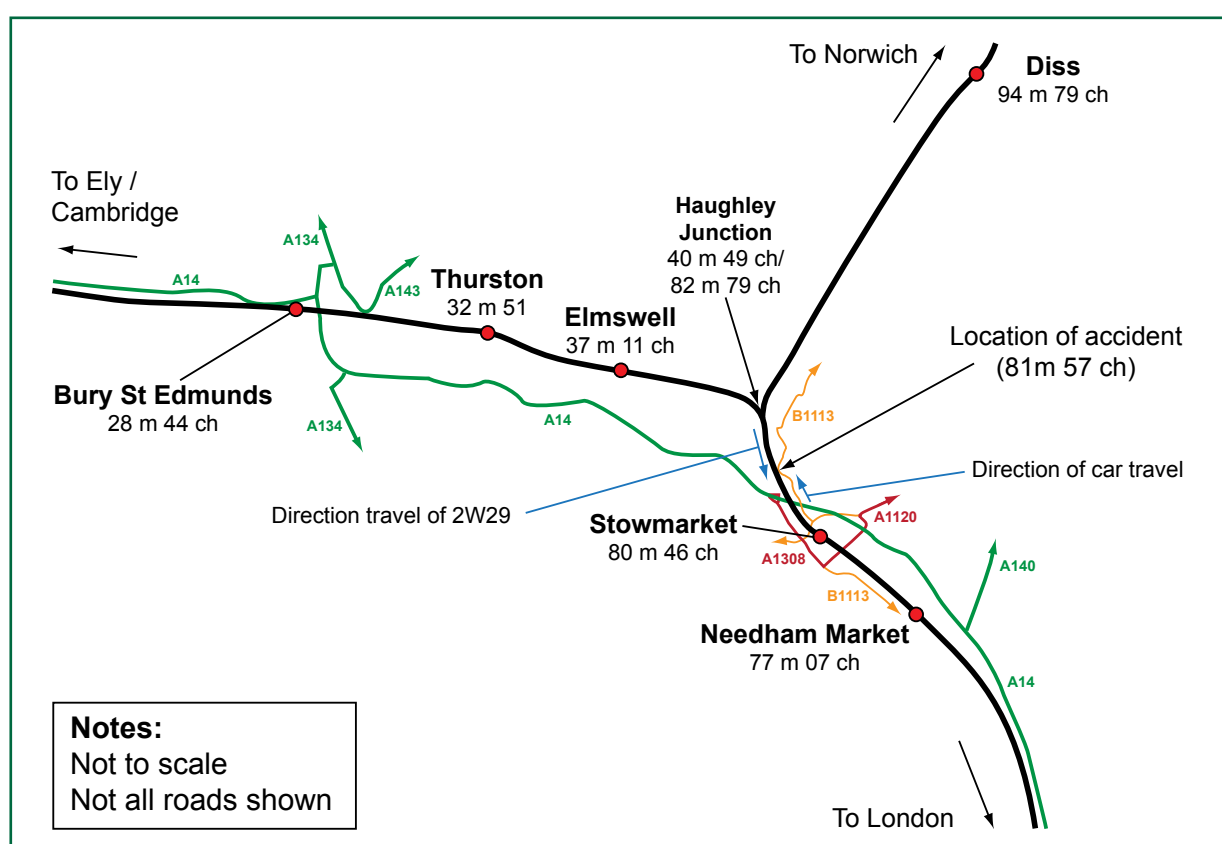


Figure 2: Track diagram

Highway

- 12 The B1113 road runs from Ipswich to Finningham via Stowmarket. The national speed limit for single carriageway roads of 60 mph (96 km/h) applies on the section of road through the area where the accident occurred.
- 13 On the approach to the site of the accident, the road passes through Stowupland road junction and curves left at a sharp bend (figure 3a). It then dips down on a 1 in 17 gradient (5.8 %) (figure 3b), before rising on the approach to a right-hand bend (figure 3c), where Stowmarket Road becomes Newton Road on the approach to the site of the accident (figure 3d). The road then runs parallel to the railway's boundary fence.

- 14 The highway at the location where the vehicle left the road has a soft verge to the left with a rising one metre high earth *bund* towards the boundary fence. The land then descends relatively steeply towards the cess and railway track.



Figures 3a and 3b: (left) Image showing left-hand bend on the Stowmarket Road leading to the downward gradient shown in figure 3b (right)



Figures 3c and 3d: (left) Image showing right-hand bend on the Stowmarket Road (LGV park entrance on right) leading to right-hand 'kiss bend' shown in figure 3d (right) where the road runs parallel to the railway

Organisations involved

- 15 Train 2W29 was operated by National Express East Anglia (NXEA)², who employed the train driver and guard.
- 16 Network Rail owns and maintains the infrastructure including the boundary fencing, and employs the signallers and track maintenance staff. It also employs the *mobile operations managers* and *asset management engineers* who were responsible for data collection and Road Vehicle Incursion (RVI) assessments (paragraph 39) at the location.
- 17 Suffolk County Council (SCC) in its capacity as the local highway authority is responsible for the inspection and maintenance of the B1113 road.

² Abellio, trading as Greater Anglia, took over the franchise from National Express East Anglia in February 2012.

- 18 Suffolk Constabulary (from this point forward referred to as ‘the police’) attends incidents and accidents reported on the highway. The police record data on all road traffic accidents which involve personal injury³. The police road traffic enforcement and road safety management unit works in liaison with SCC with the objective of reducing fatalities and serious injuries in road traffic accidents. Officers from the British Transport Police (BTP) attend reported accidents on the railway infrastructure.
- 19 The DfT is responsible for auditing and monitoring measures taken to address the risk arising from road vehicle incursions onto the railway (paragraph 38).
- 20 All parties referred to in paragraphs 15 to 19 freely co-operated with the investigation.

Train involved

- 21 The train involved in the accident was a two-car Class 170 diesel multiple unit.
- 22 The RAIB examined the train and the on-train data recorder (OTDR). The design, condition and operation of the train were not causal factors in the accident.

People involved

The car driver

- 23 The motorist was a 38 year-old man who lived locally. He had frequently driven on the B1113.

Network Rail’s Mobile Operations Manager

- 24 The mobile operations manager who attended vehicle incursion incidents at this location in 2010 and 2011 joined Railtrack⁴ in 1998 as a signaller. He was appointed as a mobile operations manager based at Stowmarket in 2001.

Network Rail’s Asset Management Engineer (Structures) - 2005 to 2009

- 25 The engineer who was involved in road vehicle incursion risk assessments from 2004 to 2009 joined British Rail in 1988, and entered the Railtrack civil engineering structures department in 2000.

Network Rail’s Route Asset Manager (Structures) – 2009 to 2011

- 26 The route asset manager (structures) was a qualified civil engineer, joining Network Rail in 2002. He was appointed first as a route structures engineer in 2005, and then became route asset manager in 2009, with responsibility for the asset management staff in the Anglia route.

Network Rail’s Assistant Asset Management Engineer (Structures)

- 27 The assistant asset management engineer joined Network Rail in 2005 as a renewals engineer. In 2008 he was appointed as the assistant asset management engineer for the Anglia route.

³ Local highway authorities and police have a duty under Section 39(3) of the Road Traffic Act 1988 to study road traffic accidents and to take such measures as they consider appropriate to prevent them.

⁴ Railtrack was the predecessor of Network Rail, and was the national rail infrastructure owner until 2002.

Suffolk County Council's (SCC) Engineers

- 28 From 2005 to 2012, three engineers within SCC's highway and safety engineering departments had responsibility for assessment and management of improvement projects at the Stowmarket Road location at different times.

Engineer 1

Engineer 1 had worked as a civil engineer for SCC for 30 years. He participated in road vehicle incursion risk assessments at the site where the incursion occurred jointly with Network Rail staff in 2005 and 2009 (paragraphs 57 to 64).

Engineer 2

Engineer 2 joined SCC in 2003 from college. In 2004 he joined the road safety engineering team. Engineer 2 handed over responsibility for road vehicle incursion issues (including a project to address the risk at the accident site) to engineer 3 in November 2011.

Engineer 3

Engineer 3 took over the project in November 2011 and project managed the installation of a barrier at the incursion site in January 2012 (after the accident) (paragraph 69).

External circumstances

- 29 The weather at the time of the accident was damp following rain during the day. It was dark, and the rural location has no street lighting. This may have contributed to the cause of the accident (paragraph 51).

The sequence of events

- 30 The motorist left his home south of Stowmarket at approximately 19:15 hrs to travel to Old Newton. At approximately 19:34 hrs, as he negotiated the right-hand bend adjacent to the railway, he felt the front and then rear of the car slide towards the left of the road. He attempted to rectify the skid and bring the car under control but was unable to do so. The vehicle hit the nearside verge and rolled over, turning lengthwise through 180 degrees, becoming airborne as it travelled backwards through the boundary fence, coming to rest upright with the rear of the vehicle foul of the railway line (figures 4a and 4b).
- 31 At approximately the same time train 2W29 left Elmswell station, around 4.5 miles (7 km) from the accident site.
- 32 Although the car driver had suffered a spinal injury, he was able to escape from the vehicle to a place of safety. He called the emergency services (19:36 hrs) to report that his vehicle was on the railway line. This call was handled by a police operator. The call was cut off at 19:37 hrs and the RAIB has not been able to establish the reasons for this. As a result of the initial information received from the motorist, the police operator believed that the location of the incident was in the Stowupland area, on or near a level crossing. The police operator attempted to contact the motorist but the call was diverted to voicemail.



Figure 4a: (left) Image showing the direction of travel of the vehicle and image 4b (right) showing the accident scene from the railway side with motor vehicle in the background and associated debris in the foreground.

- 33 Shortly before 19:38 hrs the injured motorist contacted the emergency services again. Because of his injuries, the motorist was unable to continue his conversation with the police operator, and a witness who had stopped her vehicle after the accident came to the assistance of the injured motorist, took over the phone call and provided further details of the location to the police operator (at around 19:40 hrs).
- 34 The police immediately contacted Network Rail's Anglia route control to pass on details of the accident. The route controller contacted Colchester signal box and was speaking to the signaller in an attempt to identify where the incursion had occurred (a level crossing location had been given as the accident site), when the witness reported to the police operator that there was a train approaching, and she then saw train 2W29 collide with the vehicle at around 19:41 hrs. The train propelled the car and debris about 300 metres along the track.
- 35 At 19:43 hrs the driver of train 2W29 made an emergency call to the Colchester signaller to report the incident and request the attendance of all emergency services. Railway staff and emergency services attended the scene of the accident. The train was declared a failure by the train driver due to a damaged pipe which required the engines to be shut down, and it was therefore necessary to evacuate the 24 passengers.
- 36 Both lines were reopened for normal rail services shortly before 23:00 hrs.

The investigation

Sources of evidence

37 The following sources of evidence were used:

- witness statements;
- weather reports;
- observations at the site;
- data from the train's on-train data recorder;
- guidance and company standards issued by Network Rail;
- Network Rail's level crossing file;
- a review of previous reported occurrences at the nearby level crossing, (none of which were relevant to this accident);
- guidance issued by the DfT, Rail Safety and Standards Board (RSSB) and Office of Rail Regulation (ORR); and
- a review of previous RAIB investigations that had relevance to this accident.

Key facts and analysis

Background information

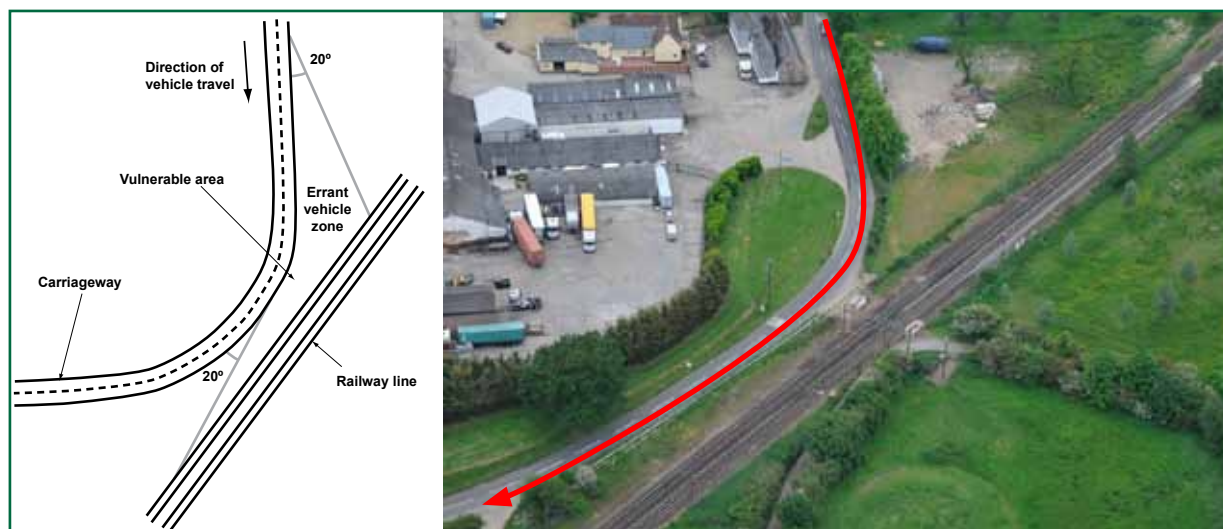
The road vehicle incursion risk assessment process

- 38 In February 2001, an accident occurred at Great Heck in North Yorkshire when a road vehicle entered onto the railway and was struck by a passenger train, which subsequently derailed and then collided with a freight train. Ten people were killed. In response to the accident, a Health and Safety Commission (HSC) working group in consultation with the DfT recommended that guidance and a protocol for managing the risk of accidental obstruction of the railway by road vehicles be developed (paragraphs 103 to 104). The DfT protocol, published in February 2003, provided railway infrastructure managers and local highway authorities with a method for calculating a 'Road Vehicle Incursion' (RVI) risk score for bridges and 'neighbouring' sites running over or adjacent to railways (figures 5a to 5c).



Figure 5a: The Great Heck accident (left); 5b (above right) DfT guidance document; and 5c (bottom right) traffic advisory leaflet sent to all local authorities in 2003. Both documents outlined the process and requirements for RVI assessments.

- 39 The RVI process requires an engineer undertaking an initial risk assessment and data gathering exercise at possible road vehicle incursion sites to consider 14 factors, including road alignment, volume of traffic, data on any previous accidents and the speeds and types of trains. Each factor is then given a score to produce a combined total. The scoring system is used as a tool to identify high risk sites, to provide input to a cost benefit analysis for possible risk mitigation measures and to apportion budgets for mitigation works. The DfT protocol requires assessment of sites where the highway passes over or runs parallel to the railway. This includes locations where the highway approaches close to the railway for only a short distance (known as a '*kiss bend*' (figures 6a and 6b)).



Figures 6a and 6b: Diagram of typical '*kiss*' bend (left) and aerial view of the B1113 Stowmarket Road '*kiss*' bend location (right) (image courtesy of Suffolk Police air support unit)

- 40 In April 2003, Network Rail introduced a guidance note that effectively 'mirrored' the DfT guidance document. Network Rail also began a manual search programme mapping all potential sites that might be at risk from road vehicle incursions and arranged for its own staff to undertake an initial risk assessment at each site. In some cases, the first assessments were jointly undertaken with an engineer from the relevant local highway authority.
- 41 The guidance note and the DfT protocol required that assessments that were only undertaken by Network Rail staff and scored 90⁵ or above had to be reassessed with the relevant local highway authority within six months of the initial assessment. The protocol established that the highway authority would lead any project to mitigate the risk if an assessment identified that the required measures were highway-related, such as traffic calming measures, improvements to signage, road markings or the installation of barriers. The railway infrastructure owner (usually Network Rail) would lead projects where the mitigation works were to be applied to the railway infrastructure.

⁵ As a guide, scores of 100 or more are considered to be significant (in relative terms). The document gives an indicative amount of £30K to £200K to be spent to reduce the risk of road vehicle incursions at locations which score 105 or over (3% of sites nationally). The guidance also states that local highway authorities should at least consider the practicability of improvements for locations which have scored 70 or more.

- 42 The DfT document also outlined the financial process to enable the costs associated with risk mitigation to be shared between the local highway authority and Network Rail (normally split 50/50). The DfT recognised the financial implications and allocated £16 million to local highway authorities for this purpose. Network Rail earmarked a similar sum from its own finances (paragraphs 73 to 74).
- 43 The protocol recommended that the railway and local highway authorities undertake a joint evaluation of risk at each location every three years to review the effectiveness of any mitigation measures that had been installed (paragraph 82).

The history of incidents at this location

- 44 Information from local residents suggests that before 2009, one or two road incidents or accidents per month (many of which did not result in injury and were not reported to police) were occurring in the vicinity of the site where the incursion occurred on 30 November 2011. They raised their concerns with Old Newton Parish Council (paragraph 65). Suffolk police road safety management unit had recorded 21 road traffic collisions relating to the B1113 Stowmarket to Old Newton road since 2007, three of the accidents occurring at the location where the incursion occurred in 2011.
- 45 SCC had recorded four previous accidents involving injuries in the vicinity of the location where the accident happened on 30 November 2011. These were recorded on a tool known as the 'Accsmap' database⁶. The circumstances of these accidents were:
 - a vehicle left the road at the location on 24 August 2008;
 - a vehicle driver lost control on the bend on 30 October 2008;
 - a motorcycle overtaking a vehicle on the bend was struck by the vehicle as it turned right into the driveway of cottages near the location on 21 September 2009; and
 - a vehicle crashed onto the verge in an attempt to avoid another vehicle negotiating the bend and driving too close to the centre line on 24 November 2009.
- 46 In addition, on 27 January 2010, a motorist travelling from Stowmarket to Old Newton failed to negotiate the right-hand bend and crashed through the railway fence in circumstances that were nearly identical to the accident on 30 November 2011 (figures 7a and 7b). However, on this occasion the car did not foul the railway line. The motorist did not require hospital treatment and the police took no further action. The BTP was not made aware of the accident. As there were no injuries, the data was neither passed to the police road safety management unit nor discussed with engineers within SCC's road safety team (paragraphs 85 to 89).

⁶ Local authorities and police are required to provide injury accident data to the Home Office and Department for Transport using the STATS 19 form to identify locations and potential 'hot spots'.



Figures 7a and 7b: Images of the accident on 27 January 2010, at the same location as the accident on 30 November 2011

Identification of the immediate cause⁷

- 47 After leaving the highway, the car came to rest in a position where it was obstructing the railway line.**
- 48 The vehicle, having left the highway, went through the boundary fence and travelled a further 10 metres, coming to rest foul of the up line. It was dark at the scene. The driver of the approaching train initially observed lights which he assumed were Network Rail staff working near the track. He sounded his horn as a warning and then realised that the lights were from a road vehicle, which was fouling the line. He immediately applied the train's emergency brakes while the train was travelling at 54 mph (86 km/h). Seconds later the train collided with the car at a speed of 50 mph (80 km/h).

Identification of causal factors⁸

The actions of the car driver

- 49 The driver of the car was unable to control his vehicle and prevent it from leaving the road and obstructing the railway. This was a causal factor.**
- 50 The motorist stated that his car was travelling at approximately 40 to 45 mph (64 to 72 km/h) as he approached the bend where the accident occurred (within the speed limit of 60 mph (96 km/h) that applies on the road). He was an experienced driver, had regularly used the B1113 and was familiar with the topography and layout of the road at this location. He lost control of the vehicle as he negotiated the bend on the approach to the railway.
- 51 The police officer attending the accident reported that road conditions were damp from the rain that had fallen during the day, and there was evidence of contamination (fuel/oil/mud) on the surface of the road in the vicinity of the centre of the carriageway just beyond the bend (figure 8). The RAIB has not investigated the cause of this road traffic accident and no accident investigation or survey was undertaken by Suffolk police. The source of the contamination is unknown, but it was treated with sand by Network Rail staff after the accident. No police action was taken in respect of the motorist.

⁷ The condition, event or behaviour that directly resulted in the occurrence.

⁸ Any condition, event or behaviour that was necessary for the occurrence. Avoiding or eliminating any one of these factors would have prevented it happening.



Figure 8: Image of the accident scene the following day (01/12/11) showing area of contamination (circled in red) on the road

The train could not be stopped before it reached the incursion site

52 There was insufficient time to stop the train before the collision occurred. This was a causal factor.

- 53 Train 2W29 left Elmswell station at 19:35 hrs. The motorist made an initial call to the emergency services at 19:36 hrs but this call was terminated prematurely and it was not until around 19:40 hrs that the police were able to establish sufficient information to identify the approximate location of the car (paragraph 33).
- 54 The police recognised the serious nature of the incident and made contact with Network Rail route control, resulting in a three-way conversation involving the person who had come to the assistance of the injured car driver, the police operator and Network Rail's route controller. The route controller contacted the signaller at Colchester and was in conversation with him when the witness reported to the police operator that a train was approaching. A few seconds later (around 19:42 hrs) she reported that the train had collided with the vehicle.
- 55 Given the initial delay in the police operator being able to establish an accurate location of the accident and Network Rail only becoming aware of the accident around two minutes before the collision occurred, it was not possible for Network Rail's controller to identify the accident site in time to broadcast a stop message to all trains in the area and prevent the collision.

The actions of Suffolk County Council

- 56 **Suffolk County Council had not implemented steps to control the risk of incursion at the location where the accident occurred. This was a causal factor.**
- 57 The initial risk assessment of the Stowmarket Road kiss bend was undertaken by Network Rail alone in December 2004. The site was given a score of 107, which placed it in the highest 3% of locations nationally. As mandated by the RVI procedure (paragraph 40), Network Rail contacted SCC and arranged a joint risk assessment at the site, which was undertaken on 28 August 2005 and resulted in an agreed score of 105. The mitigation that was identified was to install barriers on the highway to contain vehicles that would otherwise leave the road and approach the boundary fence. Network Rail and SCC agreed that, as stipulated in the protocol (paragraph 40), SCC would lead on the project. Documentary evidence shows that Network Rail requested the SCC engineer to consider both short and long-term measures, and to provide an update on the progress of the project.
- 58 During the following three years SCC took no action, and there was no engagement between SCC and Network Rail until May 2009 when the DfT (in co-operation with Network Rail) sent letters to the chief executive officers of county councils with details of known high risk locations and requesting a response. This included the site on the B1113 Stowmarket Road.
- 59 SCC's engineer 1 again reviewed the site and made a proposal to install barriers. This work was included within SCC's budget for 2009/2010 and a site survey was arranged and completed in 2009. The survey identified that the road was sub-optimal in width and alignment and identified a number of options for the installation of barriers.
- 60 At the time of the submission of the proposal referred to in paragraph 59, the RAIB identified that SCC managers and engineers:
- used an established SCC methodology for the prioritisation of road safety funding and considered that other ('road only') sites where casualties had occurred were a higher priority than the Stowmarket Road site. SCC considered this site to be a lower risk because it believed that there had been no recorded accidents or incidents at the location in the period 2006 to 2009;
 - mistakenly believed SCC would have to meet all costs of the mitigation works and were unaware that 50% of the costs could be met by Network Rail (although SCC states that it is unlikely that this knowledge would have had an impact on its allocation of funding given the strong emphasis on prioritisation according to the casualty history of sites); and
 - had not identified the change of use of the adjacent local industrial site (figure 9) from an abattoir to a business park in December 2006 and its possible effect on the volume and type of road traffic or on the score that had been obtained in previous risk assessments.

- 61 The cost of the installation of the barriers was estimated at between £45,000 and £86,000. SCC considered that the cost was disproportionate to the potential benefit, and so the business case was rejected. The decision was guided by the factors described in paragraph 60, and in particular, the competing demands of (road only) sites seen to be a higher risk elsewhere in the county.
- 62 Although the business case for barriers was rejected, it would have still been possible for SCC to implement low cost mitigation measures (such as chevrons and/or additional road markings) at any time in the period from 2005 to 2011. There is no evidence to show that any low cost mitigation measures were considered.
- 63 In 2009, Network Rail's newly-appointed Assistant Asset Management Engineer set about making contact with all councils within his portfolio, including SCC engineer 1. An additional RVI assessment was arranged and undertaken on 18 November 2009. No additional factors were identified, and the previously agreed score of 105 remained unchanged. Network Rail and SCC engineers did not identify any increase in road traffic, and the SCC engineer confirmed that because a business case had been rejected (paragraph 61), there was no finance available for risk mitigation. The Network Rail engineer reiterated the need for mitigation to be considered by SCC and requested that if no finance was available for the installation of the safety barriers, SCC should again consider low cost measures as proposed in the previous assessment in 2005.
- 64 SCC engineer 1 took no further action after this additional assessment, and responsibility for incursion sites was passed to a junior SCC engineer (engineer 2) in June 2010⁹. Engineer 2 was not comprehensively briefed by his predecessor on the history of the barrier project, or the process for RVI assessment and mitigation or on SCC's obligation to complete the work at Stowmarket Road in accordance with the DfT guidance document. Engineer 2 was provided with a file containing a drawing of the location, but correspondence relating to the three previous risk assessments, contact details for Network Rail, the business case prepared and rejected in 2009 and the letters sent by DfT and ORR were not included.
- 65 During the early part of 2010 local residents who had witnessed regular road traffic incidents occurring at the same location where the accident was to occur in November 2011 raised their safety concerns with Old Newton Parish Council, requesting that it take action. They claimed that incidents were happening frequently, with vehicles travelling in both directions leaving the road on the bend and coming to rest in the nearby fields or hedgerows. The Parish Council shared these concerns with the district and county council representatives and the police.
- 66 Engineer 2 received this intelligence and completed a road sign and surface assessment. However, for reasons the RAIB has not been able to establish, this assessment was not undertaken at the location reported by the residents, but at a nearby location on the same stretch of road where there had also been known reports of vehicles leaving the road (figures 10a and 10b). Chevron markers were installed and road markings were improved at this other location but no work was undertaken at the location originally reported by the local residents.

⁹ Witness evidence shows SCC engineers were not briefed on the DfT / ORR letters sent in 2009.



Figure 9: Aerial view of the B1113 Stowmarket Road 'kiss bend' location showing the business park (top left of the image) (image courtesy of Suffolk Police Constabulary air support unit)



Figures 10a and 10b (inset): Image of location where road vehicle incursions were reported (bottom yellow areas) and inset image showing the incorrect location (red circled area)

- 67 Between June and October 2010 engineer 2 reviewed his portfolio of work, including the incursion site. He undertook preliminary enquiries relating to access rights and land ownership issues for the lay-by adjacent to the footpath crossing over the railway at the location. Although there were no legal issues identified that would have prevented installation of a safety barrier, the project was deemed to be a low priority and another six months elapsed before engineer 2 wrote to local residents in April 2011 informing them of the proposal to install a barrier on the kiss bend.
- 68 In August 2011, unaware that the location had previously been surveyed, engineer 2 visited the location with another SCC engineer to survey the site and discuss the proposal to install barriers. He did not consider whether low cost measures could be progressed to mitigate the risk to the railway (road marking/ signage) pending the installation of barriers.
- 69 Engineer 2 contacted Network Rail outlining the proposal to install safety barriers. However, once again no immediate action was taken. Engineer 2 moved to another department in October 2011 and briefed his replacement, engineer 3. Engineer 3 questioned why the project to install barriers had not been completed, and engineer 2 explained that it was low priority work. Engineer 3 therefore prioritised other work until she was made aware of the accident on 30 November 2011 and the full history of incidents and accidents at the location.
- 70 The SCC engineers were unaware of the previous history of the accidents that had occurred at the location and in particular the road vehicle incursion that had occurred on 27 January 2010 (paragraph 46) and, until they were notified by Network Rail, had not identified that the accident on 30 November 2011 related to the Stowmarket Road RVI site as identified by the RVI project. Had engineer 2 known about the history of incidents and accidents at the correct location and been able to recognise and appreciate the risk it posed to the railway, it is possible that he would have prioritised the installation of the safety barriers.
- 71 SCC Engineers (1 and 2) had not been made aware of a letter sent to the County's Chief Executive Officer (CEO) in May 2009 by the DfT requiring SCC to re-engage with Network Rail and report what actions had been taken or proposed at known high risk locations. A letter from the CEO to the DfT was drafted which explained that SCC had one outstanding neighbouring site classified as high risk (with a score of 105 – this was the site at which the accident occurred on 30 November 2011). The letter reported that the work required at the location had been included in SCC's 2009 to 2010 financial budget. Although the letter was drafted, there was no evidence of it being sent by SCC or received by the DfT. There was no further contact between SCC and the DfT on this issue until July 2010.
- 72 During the RAIB's investigation, SCC's engineering safety department reported that it was unable to locate files and paperwork relating to the Stowmarket RVI barrier project. They believed this to be attributable to the reorganisation within SCC during 2011 and 2012 and possibly to the method of indexing which may have resulted in the loss or destruction of relevant paperwork. The lack of both paperwork and knowledge of the RVI process resulted in a loss of corporate memory, the poor handovers that took place between the engineers involved, and their ignorance of the history of mitigation proposals at this site.

- 73 The RAIB has considered if there are any underlying reasons that may have contributed to the lack of action by SCC between 2005 and the end of 2011. In 2002, SCC signed an extended Public Service Agreement with the DfT, which included financial incentives for local authorities to achieve certain targets. One of the targets was to reduce the number of people killed or seriously injured in road accidents in Suffolk, and this was to be measured by the submission of accident data. The following year, the DfT allocated a budget of £16 million to finance the RVI mitigation measures. This was to be shared between all local authorities. In addition to the funding from the DfT, Suffolk County Council could also draw upon its highways maintenance budget (on average, this amounted to between £14.7 and £16.1 million per year since 2005).
- 74 The RAIB has been unable to establish which local highway authorities received a share of the £16 million. The DfT advises that this may have been partly attributable to changes in team personnel and a re-organisation of divisions within the organisation between 2009 and 2011. DfT staff were unable to locate records to show if finance was requested or provided to local highway authorities to address RVI risk. The DfT was also unable to identify if it had 'ring fenced' a dedicated budget when the protocol and guidance was published and briefed to the highway authorities in 2003. However witness evidence shows that in 2008 the DfT had identified that there was a risk that local authorities may cite a lack of funding as a reason for not taking actions to mitigate the risk at RVI locations, leading to requests from local authorities to the DfT for further funding. The DfT believed that the RVI work should be achievable within local highway authorities' current funding, particularly given the sharing of financial costs with Network Rail. Network Rail had ring-fenced its allocated budget and provided the RAIB with the financial details (paragraphs 99 and 100).
- 75 Witness evidence indicates that the Public Service Agreement targets for reducing the numbers of people killed and injured on the County's roads, and financial incentives that could be obtained by SCC as a result of meeting those targets may have affected the focus of SCC and its staff. Conversely, as SCC had no process of management oversight or supervision of the progress of the RVI programme it did not:
- prioritise, consider or implement any low cost measures to mitigate the risk at the location; or
 - identify that the barrier project had stalled.

The actions of Network Rail

- 76 Network Rail had no process in place to monitor the actions of local highway authorities after RVI risk assessments and assumed that Suffolk County Council was taking action to address the risk of vehicle incursion identified in 2005. This was a causal factor.**
- 77 Network Rail's guidance note NR/GN/CIV/00012 'Road Vehicle Incursions: Risk assessment of bridges and neighbouring sites' outlines the process in relation to the management of RVI risk. The risk ranking tools within the guidance note were designed in conjunction with local highway authorities and included:
- the process to be followed;
 - how to apply the risk ranking tools;

- how to prioritise sites;
 - who needs to be involved;
 - how to interpret the results and identify high risk sites; and
 - how to assess high risk sites and identify cost effective measures.
- 78 The guidance does not specifically require the monitoring, audit and review of outstanding RVI locations that have been risk assessed unless Network Rail becomes aware of a change in circumstances at or in the vicinity of the site with the potential to adversely affect the risk (examples given are changes that may affect the nature and volume of road traffic flows and characteristics or significant changes in rail traffic or speed). However, the guidance does suggest that a six-yearly reassessment of neighbouring sites should be considered to verify that the original risk ranking is still valid.
- 79 Between 2005 and 2008 Network Rail assumed that SCC was making progress with the installation of a barrier, or considering short term mitigation such as road marking or signage. In fact, SCC had taken no action (paragraph 58).
- 80 In February 2010 Network Rail's assistant asset engineer, having attended the joint assessment in November 2009 (paragraph 63), consulted with the company's RVI 'champion' (a manager selected to support projects and provide expert advice on a particular area of work). He reported that in his opinion the existing post and seven wire fencing was inadequate and would not prevent a vehicle from fouling the line. He proposed the installation of palisade fencing at the location. An additional fencing inspection was completed by Network Rail's maintenance engineer who assessed the fencing against the requirements of Network Rail standard NR/L2/TRK/5100, which does not include road vehicle incursions within its scope (see paragraphs 93 to 97). Consequently, he found that the fence was in good order and met the company's requirements to protect Network Rail's infrastructure from trespass or vandalism. Network Rail considers that the legal responsibility to manage risk originating from the highway under the Health and Safety at Work Act lies with the highway authority (paragraphs 108 to 119). The proposal to improve the quality of the fencing was therefore declined and no action was taken.
- 81 The assistant asset engineer accepted the explanation not to change the type of fencing and he did not progress his proposal any further or re-engage with SCC. He was unaware of the road vehicle incursion in January 2010 (paragraph 46) and continued to assume SCC was making progress with the road improvement works.

Underlying factors¹⁰

Network Rail's knowledge of road vehicle incursion sites

82 Network Rail's knowledge of road vehicle incursion incidents at sites other than bridges was limited. This was an underlying factor.

Background

- 83 In 2002 Railtrack's structures department was given the responsibility for managing the risk associated with incursions onto the railway from bridges and structures. The structures department was also given the additional task of managing the risk of incursions from parallel 'neighbouring' sites. The structures department undertook a manual search to identify neighbouring sites and engage with local authorities.
- 84 A reorganisation of Network Rail in 2007 introduced three new departments: operations; maintenance; and asset management. Within the operations department, the roles of Operational Risk Advisors and Operational Risk Control Co-ordinators were introduced to manage level crossings, signal assessment, trespass and vandalism and to interface with local authorities and police forces through 'road rail partnership groups', although there was not such a group for each local highway authority. The 'off-track' division of the maintenance department managed boundary fencing inspections. The structures division of the asset management department retained responsibility for managing the risk from incursions at bridges and neighbouring sites. All three departments therefore had an interest and involvement in elements of road vehicle incursion risk. The following paragraphs will show that gaps in communication and lack of awareness of each other's responsibilities resulted in key information not being shared.

Operations

- 85 Part of the role of Network Rail's mobile operations managers is to attend accidents and incidents. The mobile operations manager who attended the accident in January 2010 (paragraph 46) at the Stowmarket Road 'kiss bend' completed a summary report. The report was sent to the team responsible for entering data onto the industry's safety management information system (SMIS)¹¹. The RAIB has been unable to establish whether the report was sent to, or received by, any other department or team within Network Rail.
- 86 The mobile operations manager's report identified that he was aware that the accident in January 2010 was not the first instance of vehicles leaving the road at this location. He knew this from speaking with local maintenance staff and train drivers. He recommended that safety barriers should be installed as a matter of urgency as he considered that there was a high risk of an incursion.

¹⁰ Any factors associated with the overall management systems, organisational arrangements or the regulatory structure.

¹¹ The railway industry's national database for the recording of safety related events that occur on the main line rail network, the Safety Management Information System (SMIS), was developed in 1997. It is managed by RSSB and its use is mandatory for Network Rail and train operators.

- 87 Confusion existed in Network Rail over the purpose of the mobile operations manager's report and who should have been notified of its contents. Some believed the report was required as part of the mobile operations manager's personal development, while others believed it was required as part of the role (in fact, neither was the case and there is no company standard or requirement for such a report to be submitted). Some Network Rail staff believed that road vehicle incursions were within the remit of the operations department because that department represented Network Rail at the road/rail partnership schemes. There was little recognition within other departments of Network Rail that the asset management (structures) department had responsibility for managing the risk of vehicle incursions.
- 88 The mobile operations manager who had attended the accident in January 2010 was not contacted by any department in Network Rail regarding the information in his report, although this may be because no department other than the SMIS team were aware of its contents (paragraph 85). The incident in January 2010 and evidence of the previous incidents resulting in damage to the fence and the verge by road vehicles were thus not identified as precursors to possible future incursion events. Had the mobile operations manager's report been seen or acted upon by the asset management team, one result might have been engagement with SCC engineers to prioritise the installation of the barriers and prevent a recurrence.
- 89 Data that is entered into SMIS¹² cannot be attributed to a specific mileage or map co-ordinate. It therefore has to be associated with a specific location which is already included on SMIS, such as a station or level crossing.
- 90 RVI incidents are recorded by Network Rail and included on its log of daily events. However, at the time of the January 2010 accident (paragraph 46) there was no specific heading under which incursion events could be recorded on the log; they were included variously under other headings such as a bridge strike, collision (if a train struck a vehicle), near miss (if a train did not strike a vehicle) or under the 'miscellaneous' section. This lack of clarity then extended to the recording of the incident on SMIS; incursion events were sometimes wrongly classified as level crossing incidents if there was a level crossing close to the incident because of the inability to ascribe events to a specific location.
- 91 Level crossing incidents fell within the remit of Network Rail's operations team. If the operations team identified a reported 'level crossing incident' that was, in fact, a vehicle incursion, they mistakenly assumed that the asset management team were identifying RVI incidents and took no action. Operations staff, during their training, had not been briefed on the company guidance on the RVI process or DfT protocol.

¹² Network Rail's company standards NR/L3/RMVP/047 'Train Operations Manual', and NR/L3/OCS/041 'Operations Manual' outlines responsibilities for the reporting of defects and safety related incidents. The SMIS software requires a specific location detail (level crossing / footpath).

Asset management

- 92 Witness interviews with Network Rail engineers showed that the asset management team had missed incidents recorded on Network Rail national and route logs and therefore had no knowledge of the incidents in January 2010 (which had been classified as a 'miscellaneous' event) and November 2011 (which had been classified as a collision). Asset management staff were not required to attend monthly safety meetings when road vehicle incursion incidents were discussed. This may have been the result of asset management staff focusing their attention on the management of bridge structures. The ORR had issued Network Rail with improvement notices relating to compliance with examination and management of structures in March 2010 and May 2011. Had communication between the operating and asset management teams on RVI issues been more effective, it is possible that the information and intelligence that was missed would have been identified or shared and the issues, omissions and anomalies outlined in the previous paragraphs would have been avoided.

Maintenance

- 93 The off-track team within Network Rail's maintenance department is responsible for the inspection and management of vegetation and boundary fencing. Network Rail's fencing standard (NR/L2/TRK/5100) specifies the process for assessing the risk at Network Rail's boundaries in the context of the adjacent environment and land use, and the actions to be taken. However, the standard focuses on unauthorised access and the launching of projectiles; road vehicle incursions are not within its scope.
- 94 Section 5.5 of the standard states that additional inspections shall take place at locations where there are reports of any of the following:
- breach of the boundary resulting in trespass or vandalism;
 - livestock incursion; and
 - damage to boundary measures (such that their effectiveness is compromised).
- 95 Additional inspections normally take place in response to a report. Reports may be received from sources such as track patrollers and the local community. Additional inspections are undertaken at sites of particular risk, for example where there is evidence of ongoing trespass or damage. There is no evidence to show that any report had been completed in relation to the January 2010 incursion incident (paragraph 46) and vehicle incursion was not identified as the reason for the repair on the track maintenance database because 'damage resulting from vehicles leaving the highway' is not included on the boundary inspection form. There was evidence of fencing repairs being completed on two occasions at the location up to and including the January 2010 incident. However, there was nothing in Network Rail's process to require the maintenance department to notify the asset management department that boundary damage may have originated from a vehicle leaving the highway.

- 96 During 2007, an operational risk control co-ordinator and asset management engineer had separately identified that capturing this information would fill the 'intelligence gap'. Both members of staff considered that it was good practice to capture information relating to the repair of a fence that had resulted from RVI damage, and from mobile operations managers attending incidents. Independently of each other, they engaged with Anglia operations and maintenance staff to produce a bespoke form. There is no evidence of the process being adopted or the form being used. However, the subject was considered as part of the work review of Network Rail's RVI guidance note (NR/GN/CIV/00012) during 2010 (paragraph 101).
- 97 Had a process existed to capture and share intelligence on incursion events, the structures department would have been made aware of the maintenance database information and incidents up to and including the January 2010 incursion. This might have triggered engagement with SCC to discuss the information and expedite the programme for risk mitigation at this location, before the accident in November 2011.

Monitoring of the RVI process

- 98 The RVI process initially adopted by Network Rail and highways authorities (including SCC) in 2003 had not been completed with the result that there were many sites where action to reduce RVI risk had not been taken. This was an underlying factor.**

Network Rail

- 99 At the time of the RVI project's launch in 2003, Network Rail envisaged that it would review the RVI protocol in 2006 and expected that the project would be completed with all assessments and mitigation work completed by March 2007. However, due to the limited resources that were allocated to undertake the initial risk assessment and the need to engage with numerous local authorities (Anglia Route has 586 locations spread over 22 local authorities) the national programme became protracted. It is currently envisaged that the RVI improvement works will not be completed until 2016 (Network Rail has £7 million remaining from the £16 million budget allocated to match the funding earmarked by the DfT for highway authorities).
- 100 Network Rail had actively engaged with some local highway authorities, but had no means of dealing with those that had a large number of outstanding high risk locations and were not willing to engage. Other delays occurred because the finance available to local highway authorities for mitigating incursion risk had not been 'ring fenced' by the DfT or the local highway authorities and was being spent on other projects. Witness evidence and current data on known outstanding sites shows that Network Rail's engagement with some local highway authorities stalled as some authorities did not have road/rail partnership schemes and some local highway authorities reported that they did not have specific finance to undertake work which they, for the most part, considered to be a lower priority.
- 101 The reorganisation of Network Rail and the absence of managed communications between the various departments involved in different aspects of the vehicle incursion issue (paragraph 84) resulted in accident and precursor intelligence being missed. The RAIB also found that key people such as some mobile operations managers and members of the off-track team had no awareness of the RVI process.

Suffolk County Council

- 102 From the time that the joint risk assessment with Network Rail at the Stowmarket Road site was undertaken in 2005, it was a further six and a half years before the identified mitigation was put in place (and that was only done following the collision in November 2011). SCC engineers had not been briefed during 2008 and 2009 about the requirement to take action on outstanding sites, and their awareness of the DfT document protocol (paragraph 58) was poor. Newly appointed or relocated staff did not receive briefings on the RVI process resulting in delays while they acquired the relevant knowledge. SCC lost sight of the requirement to complete the RVI project and had no process to monitor and review new and existing locations to ensure the work was completed.

Department for Transport

- 103 The DfT's monitoring of the progress of the RVI project was not effective and it did not emphasise to local highway authorities and Network Rail the requirement to complete it. This was an underlying factor.**

- 104 After the Great Heck accident in 2001 (paragraph 38), a working group comprising the Highways Agency, Transport Research Laboratory (TRL) and Health and Safety Commission (HSC) looked at the circumstances of other RVI incidents. The subsequent research and reports produced 19 separate recommendations to the Government. Given the DfT's role in relation to road and rail transport, the HSC report recommended that the DfT undertake the management of the recommendations from the two reports. As a result, the DfT published a report, 'Managing the accidental obstruction of the railway by road vehicles' on 25 February 2003. RVI assessments on the motorway and trunk roads network were completed and action taken by the relevant national trunk road authority (for example, the Highways Agency in England). All other roads came under the responsibility of the designated local highway authorities (road authorities in Scotland): in the case of this accident, Suffolk County Council. After several years of discussion between 2004 and 2008, a number of local highway authorities had still not made progress on incursion locations recognised as high risk, but the DfT did not actively manage progress in addressing RVI risk.
- 105 In January 2008 the DfT (UK Bridges Board) sent letters to a number of county councils outlining the importance of the RVI project and asking for an update on the RVI process.
- 106 As a result of the limited progress that was reported back, and other serious incidents that had occurred (paragraphs 133 to 139), the DfT (Regional and Local Transport Delivery Directorate) again sent letters in May 2009 to the local highway authorities with known and outstanding high risk sites, requesting that they provide a response back to the DfT. Network Rail and the DfT engaged the ORR to review and discuss the options that were available for those local highway authorities that had taken no action (paragraph 110). This resulted in additional letters being sent from the DfT to local highway authorities in October and November 2009 reiterating the message and requesting those in England to supply the DfT with data and action plans to address the high risk RVI locations. The same letters were copied to the Scottish Executive and Welsh Assembly. Follow up letters were sent by the ORR in May 2010 after recommendations from the RAIB's investigation into the road vehicle incursion at North Rode were published (paragraph 132).

107 SCC responded to the DfT in July 2010, reporting it had 63 locations with a score greater than or equal to 90, and one parallel site with a score of 105 (this was the site where the incursion occurred). In July 2010 the DfT reported that six local highway authorities had a combined total of 44 outstanding locations with a score of 100 or more and 79 locations with a score of 90 or more which required the local highway authorities to engage with Network Rail and create an action plan to mitigate the risk. Six local authorities did not respond to the request for information. In October 2010, the DfT requested a report from Network Rail to establish RVI locations to cross reference against the progress reported by local authorities. At the time of this report (October 2012) Network Rail's data shows that there are currently 377 known neighbouring sites with a risk score of 95 or above (9 locations are within Suffolk County Council's area). Of this total, there are 4 sites where mitigation is deemed not to be practicable and 214 locations where no mitigation is in place. Network Rail also reported that new neighbouring sites are still being identified (paragraphs 123 to 125), and it is still attempting to correlate the data since the reorganisation of Network Rail in 2011. Network Rail states that it cannot guarantee the absolute accuracy of the data supplied to the RAIB.

Regulatory oversight

108 Regulatory oversight of the RVI process has been limited. This has in part been affected by a lack of clarity as to which body has enforcement powers to require local highways authorities to take action. This was an underlying factor.

109 The 2003 HSC report (paragraph 104) identified that a protocol was necessary for managing the RVI process and that the local highway authorities and railway infrastructure controllers were independently legally responsible for assessing the risk and providing mitigation measures to prevent accidental road vehicle incursions.

110 The Health and Safety at Work Act 1974 (HSWA) imposes a general duty on employers to protect the health and safety of their employees and also of others affected by their operations. The Management of Health and Safety at Work Regulations 1999 require employers (eg railway infrastructure owners) to assess risk to employees and anyone else potentially affected by the conduct of the employer's activities. The employer must take any reasonably practicable steps to reduce the risk.

111 The ORR (formerly Her Majesty's Railway Inspectorate) has monitored Network Rail's progress in applying the protocol and risk assessment process across Great Britain. The reviews included consideration of the co-operation Network Rail received from local highway authorities in carrying out joint risk assessments, and implementing a programme of appropriate improvements. In April 2006 Her Majesty's Railway Inspectorate transferred from the HSE and merged with the Office of Rail Regulation. A Memorandum of Understanding (MoU) was agreed which outlined how the two regulatory bodies would work together. Where necessary, the circumstances of individual incidents are discussed to ensure the appropriate authority enforces the HSWA law.

112 However, there has been an acknowledged difference of opinion between the ORR and the HSE as to which body is responsible for regulatory compliance and enforcement relating to road vehicle incursions from the highway onto the railway.

- 113 Responsibilities for enforcement are defined in the Health and Safety (Enforcing Authority for Railways and Other Guided Transport Systems) Regulations (2008) (EARR). These state that the ORR is the relevant statutory authority for activities that relate to the operation of a railway system. The ORR understood the definition of 'operation of a railway' not to include enforcement of measures applied outside the railway boundary to protect trains from external sources (eg the incursion by a road vehicle onto the railway).
- 114 The MoU between the two bodies outlines the allocation of enforcement responsibilities from the EARR legislation and states that the ORR would deliver the enforcement responsibilities (formerly delivered within HSE by HMRI), unless there are overriding reasons otherwise. It establishes the principle that wherever possible there should be a single enforcing authority for rail industry duty holders and stakeholders, particularly avoiding circumstances where HSE and ORR both enforce at the same location. The enforcing authority should be determined on the basis of the nature of the activity which is being carried out, and should take account of the relevant expertise available within the organisations (highways and railways).
- 115 The MoU provides guidance that the enforcing authority is established on the basis of the operation that creates the risk, not on where the effects of the risk may be felt. This suggests that the HSE would be the enforcing authority for a risk which originates from the highway onto the railway, leaving the ORR as the enforcing authority where a risk is part of a railway operation, even where an incident has consequences outside the railway.
- 116 The 2003 HSC report had identified that there were conflicting legal opinions on whether a local highway authority had a legal duty to comply with the Health and Safety at Work Act in respect of its management of highways or whether its legal obligations relate to compliance with the Highways Act 1980. Section 41 of the Highways Act requires local highway authorities to maintain the highway to ensure the safe passage of road users.
- 117 In 2010, the ORR and the HSE requested clarity from their legal departments on how the HSWA applied to local highway authorities who were failing to mitigate the risk from road vehicle incursion from the highway onto the railway, and which body was responsible for ensuring that any relevant requirements of the HSWA were applied.
- 118 At the time of this report this issue has not been resolved to both organisations' satisfaction. The HSC report (2003) identified that the DfT should manage the project and the apportioning of responsibility and costs of improvements made at locations identified as high risk. The DfT has not, to date, engaged with the HSE or implemented any discussion between the HSE and ORR in consultation with Network Rail to discuss the outstanding issues¹³, and no enforcement by the HSE has ever taken place in relation to local highway authorities who have not taken action at high risk RVI locations. In a similar fashion the ORR has not taken any action in relation to the adequacy of fencing at the railway boundary. This lack of legal clarity is likely to have contributed to the limited progress that has been made since the RVI project started in 2004.

¹³ Status at April 2012 - 214 known parallel sites without mitigation installed or considered.

- 119 The Law Commission and Scottish Law Commission (referred to in this report as the ‘Law Commissions’) are currently conducting a joint review of the law relating to level crossings. The RAIB understands that the Commissions have identified a lack of clarity in the split in enforcement responsibilities between the ORR and HSE in relation to road-rail incursions. As a result the Commissions are considering whether to recommend:
- a power for ORR and HSE to allocate responsibility between themselves where appropriate; and
 - the clarification of the Health and Safety (Enforcing Authority for Railways and Other Guided Transport Systems) Regulations 2006.
- 120 The Law Commissions hope to publish their report together with a draft Bill and Regulations in the spring of 2013, after which Ministers will decide whether to implement the recommendations.

Observations¹⁴

Civil Contingencies Act 2004

- 121 The Civil Contingencies Act 2004 places a legal requirement on government bodies and the emergency services to plan and prepare for foreseeable emergencies, including railway accidents, and to issue guidance to the local authority and other ‘responders’ on how they should plan for emergencies in their locality. Although such guidance has been issued, the risk of vehicle incursion onto the railway is not specifically addressed.
- 122 The RAIB found that the high risk RVI locations in Suffolk had not been shared with BTP, other police forces or the fire and rescue services. For this reason, the possibility of an event at such a location could not have been taken into account in local emergency response planning.

Data gathering

- 123 Recommendations 2 and 3 in the 2002 HSC report (paragraph 38) required that more and better data should be collected about the accidental incursion of road vehicles onto the railway. The British Transport Police recorded data about road/rail incidents from April 2003 until 2006 when the RSSB’s Safety Management Information System became a repository for such data.
- 124 The RAIB understands that the Association of Chief Police Officers (Road Crime), in partnership with the DfT, has developed a police computer system that is capable of capturing non-injury related road accident and incident data. The location and co-ordinates of such incidents (including vehicle incursions) could be captured, allowing other stakeholders (local highway authorities and Network Rail) to view specific data or use the information in conjunction with their own systems. This may provide the opportunity for stakeholders to identify new and existing areas of RVI risk, to collect and share intelligence and to identify precursor events.

¹⁴ An element discovered as part of the investigation that did not have a direct or indirect effect on the outcome of the accident but does deserve scrutiny.

125 During the investigation the RAIB identified three other incidents where a vehicle incursion had occurred, but the location had not been assessed (figure 11) or recorded on the Network Rail database for known RVI sites. The RAIB considers that potential problems at some of these locations could not have been foreseen. However new mapping technology (eg Google Earth / Street View / DfT / ACPO crash database) is available, which may allow Network Rail or the local highway authorities to identify locations which pose a risk to the railway (paragraph 143).



Figure 11: Image showing a road vehicle incursion incident at a previously unidentified RVI location that occurred in Ipswich in November 2010

Vegetation management

126 Track maintenance staff are also responsible for management of lineside vegetation. Network Rail standard NR/L2/TRK/5201, section 8.9, states that vegetation can be used as a barrier to incursion providing that it does not obstruct lines of sight (for signals or related equipment) or positions of safety. The RVI risk assessment process recognises that the presence of vegetation can lower the probability of a vehicle that has left the highway reaching the railway line. However, the cutting down of vegetation is a measure sometimes employed to assist in the prevention of railhead contamination caused by autumn leaf fall, or to eliminate obstructions to the sighting of, for example, a signal. There is no process for the structures department to be informed that as a result of the 'natural' barrier being removed or cut down, the incursion risk may have altered and that a reassessment of the site may be necessary.

Road safety

127 The RAIB observed vehicles travelling on the approach road to, and negotiating the kiss bend at the Stowmarket Road location. These observations showed that some motor vehicles were travelling at 40 to 50 mph (64 to 80 km/h). Although such speeds are permissible at this location (paragraph 12) there is a danger of drivers losing control of their vehicles in circumstances similar to those where accidents and incidents referred to in this report have occurred. Vehicles were negotiating the bend close to the left side verge or over the centre line. Two large goods vehicles were also seen to travel at speeds of 45 to 50 mph causing the vehicles to straddle or negotiate the kiss bend on the opposite carriageway (figure 12). The RAIB has informed the police and SCC road safety team of its concerns about how vehicles were negotiating the bend.



Figure 12: Image of a large goods vehicle negotiating the right-hand bend after the installation of the safety barrier (Feb 2012)

Previous occurrences of a similar character

128 Other road vehicle incursion accidents have been investigated by the RAIB. Although the causal factors of these accidents were different from those of this accident, some of the recommendations and safety lessons are relevant.

Copmanthorpe: RVI from a cul-de-sac (Report 33/2007)

- 129 On 25 September 2006 a passenger train struck a car at Copmanthorpe, south of York. The train was travelling at approximately 100 mph (161 km/h). The car driver was fatally injured.
- 130 The car had been driven off the end of a road through a fenced boundary and onto the railway. A level crossing had existed at this location before it was closed and the road became a cul-de-sac.
- 131 It was not possible for the RAIB to establish with certainty if the local council's and Network Rail's omission of a risk assessment at the former crossing location was contributory to the accident. No recommendations relevant to the Stowmarket Road accident were made.

North Rode: RVI from private land (RAIB report 33/2009)

- 132 On 18 December 2008 a southbound passenger train running between Macclesfield and Congleton, Cheshire, struck an unoccupied car that had rolled from private land (a car park) through a fence, down an embankment and onto the railway.
- 133 There were no recommendations directly relevant to the causes of the Stowmarket Road accident. However the Network Rail and DfT response to the North Rode recommendations highlighted issues concerning the implementation of the RVI process. Network Rail reported that it was assessing its infrastructure in accordance with the published DfT protocol and was continuing to work with local highway authorities to secure agreed solutions and completion dates.
- 134 The DfT reported that it was working with the ORR to clarify responsibility for the management of vehicle incursion risk from public roads and enforcement responsibilities at the road-rail boundary. The DfT also stated that it was continuing to work with Network Rail who had reported that a small number of local highway authorities had made little to no progress in assessing, identifying and improving high risk sites. The DfT reported that it had liaised with the Scottish and Welsh Assembly Governments and local highway authorities to complete improvements at high risk road and highway sites.

Broken Cross: RVI from a location adjacent to a bridge parapet (Bulletin 3/2010)

- 135 On 22 September 2009 a passenger train collided with a car which had left the highway in the vicinity of a bridge at Broken Cross, near Salisbury, Wiltshire and rolled onto the railway line.
- 136 Learning points from the bulletin identified the need for:
- a review of the initial RVI risk assessment and proposals for mitigation measures after three years;
 - consideration of all reasonably foreseeable mechanisms by which road vehicles could reach the railway; and
 - the use of any new intelligence on near misses, road traffic accidents and damage to highway structures which might indicate an increased risk of vehicles leaving the road.

Oxshott: RVI through a bridge parapet (Report 13/2011)

- 137 On 5 November 2010 a lorry fell from a road bridge onto the railway at Oxshott, Surrey. The vehicle struck the roof of a passing train. The rear three carriages of the train were damaged and the rear carriage derailed. One passenger was seriously injured, and five other passengers received minor injuries.
- 138 The RAIB observed that the county council's RVI assessment did not consider whether any low cost (short term) measures would benefit the site and made a recommendation to Surrey County Council to address the omission. This issue was also found at Stowmarket Road (paragraph 62).

Network Rail's review of its RVI risk assessment process following the previous accidents

- 139 In response to the accidents referred to above, Network Rail commenced a review of its RVI guidance note (NR/GN/CIV/00012). The review identified gaps in the sharing of RVI intelligence between Network Rail departments. However, the review was stopped and the lessons learnt were not implemented by Network Rail, for reasons that the RAIB has not been able to establish. As problems with sharing intelligence were also found in the Stowmarket Road investigation (paragraphs 85 to 97), the RAIB has made a recommendation to address the issue (Recommendation 2).

Summary of conclusions

Immediate cause

140 After leaving the highway, the car came to rest in a position where it was obstructing the railway line (**paragraph 47**).

Causal factors

141 The causal factors were:

- a. The driver of the car was unable to control his vehicle and prevent it from leaving the road and obstructing the railway (**paragraph 49, no recommendation**);
- b. There was insufficient time to stop the train before the collision occurred (**paragraph 52, no recommendation**);
- c. Suffolk County Council had not implemented steps to control the risk of incursion at the location where the accident occurred (**paragraphs 56, 65, 66 and 124, see paragraphs 153b, 153e, 153g, 153i and 154a to 154c and Recommendations 1 and 4**);
- d. Network Rail had no process in place to monitor the actions of local highway authorities after RVI risk assessments and assumed that Suffolk County Council was taking action to address the risk of vehicle incursion identified in 2005 (**paragraph 76, Recommendation 2**).

Underlying factors

142 The underlying factors were:

- a. Network Rail's knowledge of road vehicle incursion incidents at sites other than bridges was limited (**paragraphs 82 and 125, Recommendations 2 and 3**);
- b. The RVI process initially adopted by Network Rail and highways authorities (including SCC) in 2003 had not been completed with the result that there were many sites where action to reduce RVI risk had not been taken (**paragraph 98, Recommendations 5, 6, 7 and 8**);
- c. The DfT's monitoring of the progress of the RVI project was not effective and it did not emphasise to highway authorities and Network Rail the requirement to complete it (**paragraph 103, Recommendations 6, 7, and 8**); and
- d. Regulatory oversight of the RVI process has been limited. This has in part been affected by a lack of clarity as to which body has enforcement powers to require local highway authorities to take action (**paragraph 108, Recommendation 5**).

Observations

- 143 The locations of high risk RVI sites had not been shared with other organisations (police / fire and rescue services). For this reason, the possibility of an event at such a location could not have been taken into account in local emergency response planning (**paragraphs 121 and 122, see paragraphs 150 and 151 and Recommendation 9**).
- 144 During the investigation the RAIB identified other incidents where a vehicle incursion had occurred but had not been identified and was not recorded on Network Rail's tracker database. Evidence shows that some incursion points could not have been foreseen at the time. However new mapping technology (eg Google Earth / Street View / DfT / ACPO crash database) is now available which may allow locations which pose a threat of incursion to the railway to be identified (**paragraphs 123 to 125, Recommendations 2, 3 and 8**).
- 145 There is no process for Network Rail's structures department to be made aware that the incursion risk may have been altered as a result of vegetation being removed or managed (**paragraph 126, Recommendation 2**).
- 146 The RAIB has informed the police and SCC road safety team of its concerns about how vehicles are negotiating the kiss bend on the Stowmarket Road (**paragraph 127, see paragraph 153f**).

Actions reported as already taken or in progress relevant to this report

Network Rail

147 Network Rail has reported the following:

- a. If an RVI incident has taken place it now requires an asset manager (structures) to attend the local route safety meetings with the operational risk team to discuss safety of the line issues (paragraph 142a).
- b. A data analyst is currently compiling a route specific RVI database, which will be supplied to the DfT for the purpose of providing an accurate status of all known high risk incursion locations within Great Britain and to enable the RVI 'project' to be completed (paragraph 142a).
- c. From 27 February 2012, it introduced a specific category for RVI incidents within the national control centre log to highlight not only that an incursion has occurred, but also to improve the accuracy with which the location can be identified (paragraphs 142a and 142b).

Suffolk Police

148 Suffolk Constabulary has reported that it has briefed all operational staff on the RVI process to ensure all incidents involving motor vehicles which may result in incursion or near misses in the proximity of the railway boundary are notified to the road safety management unit, who will liaise with the relevant local highway authority (paragraph 121).

Cabinet Office

149 The Government Local Resilience Forums comprise emergency services, local authorities and other stakeholders (responders) within each area. The forums co-ordinate planning to deal with potential emergencies of local and national significance within the respective areas. Guidance is provided to the forums on risk assessment. The guidance identifies the risk of a railway accident occurring and allocates an owner of the risk (DfT). The guidance gives details on the likely consequences of the risk, but no information on the plausible sources (RVI or bridge strikes) is included.

150 As highlighted by previous incidents (Great Heck/North Rode) the level of risk from outstanding RVI locations could prove a significant challenge to Local Resilience Forums, but is unlikely to prompt a national response.

151 The Cabinet Office has stated it will be commissioning the DfT and Local Resilience Forums to update the local risk assessment guidance documents in the autumn of 2012, at which point the RVI locations which have been assessed by Network Rail and the local highway authorities and scored as high risk, but which have yet to receive risk reduction work, may be added (paragraph 121).

Law Commissions

152 The RAIB understands that the Law Commissions are in the process of drafting a report on the law relating to level crossings. The Commissions have identified a lack of clarity and understanding over whether ORR or HSE has responsibility for the enforcement of breaches of health and safety legislation where vehicle incursions from the highway onto the railway occur and are considering how to address the issue (paragraph 119). The Law Commissions intend to publish their report in the Spring of 2013, together with a draft Bill and Regulations. If the recommendations are made and accepted by the Lord Chancellor and Secretary of State for Transport they are likely to be implemented some time after 2014.

Suffolk County Council

153 Suffolk CC has reported that it has:

- a. installed a barrier at the location where the accident occurred to prevent further incursions onto the railway;
- b. agreed a common internal procedure for undertaking and reviewing risk assessments at known RVI sites and reviewing all sites where road and rail run parallel to each other to ensure that all such sites have been identified;
- c. contacted DfT to review the list of incursion sites relevant to the county to ensure all locations within the county are known;
- d. sought to involve the police and Network Rail in agreeing new processes with a view to ensuring that information about incidents and changes in rail operations are fed into the risk assessment process;
- e. put processes in place for relevant information from highway inspectors and other highway staff about these sites to be entered into the risk assessment;
- f. reviewed the measures taken at the B1113 site and considered whether any further measures should be put in place to further reduce the risk taking account of the findings of this investigation (figure 12);
- g. introduced a temporary speed restriction at the location pending a further safety evaluation survey;
- h. discussed internally the lessons learnt from the RAIB investigation regarding the management of documents and other records and modified SCC procedures accordingly; and
- i. ensured that records are properly indexed and archived for the purposes of reassessment and review of such locations.

Actions reported that address factors which otherwise would have resulted in a RAIB recommendation

154 Suffolk County Council has reported that it has:

- a. created and implemented a process to enable all RVI locations to be identified, monitored and reviewed to ensure long-term or short-term mitigation measures are considered and if necessary, implemented (paragraphs 141c and 142b);
- b. developed a database to ensure that information related to RVI locations and associated documents are maintained and secured to enable staff to view historical documents in an effective manner (paragraphs 141c and 142b); and
- c. implemented a briefing programme to ensure that all relevant and newly appointed staff are made aware of the DfT guidance and, if necessary, trained in the process (paragraphs 141c and 142b).

Recommendations

155 The following recommendations are made¹⁵:

- 1 *The purpose of this recommendation is for Suffolk County Council to validate, and where necessary improve, the way it manages all risk from road vehicle incursions.*

Suffolk County Council (SCC) should commission an independent review of the actions it has taken following the accident in order to assess their completeness and effectiveness. In particular this should address the following areas (paragraph 141c):

- The processes that are in place to ensure all road vehicle incursion locations are identified, assessed (possibly making use of recent internet tools (such as Google Earth / Street View)), acted upon (including consideration of low-cost mitigation measures as well as more expensive options), monitored and periodically reviewed. If actions are identified, SCC should develop and implement a time-bound programme that will be shared with DfT and Network Rail and progress reported to those bodies. This process should be documented and supervised by senior SCC management.
- Staff are trained and procedures in place for undertaking and reviewing risk assessments of road vehicle incursion locations.
- Data management systems (Accsmap and SCC Indexing system) and associated documents are in place to ensure that all data relating to injury and non-injury accidents at road vehicle incursion locations can be captured and identified for analysis and review.
- Processes are in place to ensure that information about road vehicle incursion incidents is shared between all interested parties.

continued

¹⁵ Those identified in the recommendations, have a general and ongoing obligation to comply with health and safety legislation and need to take these recommendations into account in ensuring the safety of their employees and others.

Additionally, for the purposes of regulation 12(1) of the Railways (Accident Investigation and Reporting) Regulations 2005:

- Recommendations 1 and 4 are addressed to Suffolk County Council;
- Recommendations 2 and 3 are addressed to the Office of Rail Regulation;
- Recommendation 5 is addressed to the Office of Rail Regulation and the Health & Safety Executive;
- Recommendations 6 to 9 are addressed to the Department for Transport;

to enable them to carry out their duties under regulation 12(2) to:

- (a) ensure that recommendations are duly considered and where appropriate acted upon; and
- (b) report back to RAIB details of any implementation measures, or the reasons why no implementation measures are being taken.

Copies of both the regulations and the accompanying guidance notes (paragraphs 167 to 171) can be found on RAIB's website www.raib.gov.uk.

- Processes are in place to ensure that staff are aware of the Department for Transport guidance on the road vehicle incursion and risk assessment process.

Any areas for further improvement should be implemented. Progress with the implementation of identified risk mitigation measures should be reported to DfT and notified to Network Rail.

- 2 *The purpose of this recommendation is for Network Rail to improve the way in which it manages the risk from road vehicle incursions.*

Network Rail should review, and take actions to improve, the effectiveness of its processes for managing the risk from road vehicle incursions. Factors for consideration should include:

- the exchange and management of information between different departments within Network Rail;
- the profile of RVI within relevant working groups including those involving external parties;
- the effectiveness of communications with bodies outside of Network Rail including arrangements for the reporting of all incursion incidents to local highway authorities and police forces; and
- arrangements for managing the relationship with local highway authorities and the monitoring of actions taken following assessments of road vehicle incursion risk (paragraphs 139, 141d, 142a, 144 and 145).

- 3 *The purpose of this recommendation is for Network Rail to validate its existing list of locations with significant RVI risk.*

Network Rail should review its current data on road vehicle incursion sites, possibly making use of recent internet tools (eg Google Earth / Street View), to determine whether its knowledge of all current road vehicle incursion locations is complete and to assess any that had not previously been considered (paragraph 142a and 144).

- 4 *The purpose of this recommendation is to improve the flow of information to key parties in the county of Suffolk.*

Suffolk County Council should brief parish and district councils, and Suffolk Constabulary on possible vehicle incursion locations to encourage the reporting of road traffic concerns at or near such places. The way in which this information is managed should be captured within a SCC procedure (paragraph 141c).

continued

- 5 *The purpose of this recommendation is to clarify which body has regulatory and enforcement responsibility concerning highway authorities' implementation of measures to reduce road vehicle incursion risk. Any changes to the existing arrangements will need to be reflected in amendments to the Memorandum of Understanding and will take into account relevant findings in the final report of the Law Commissions on level crossings and any subsequent changes to legislation.*

The Office of Rail Regulation and the Health and Safety Executive should jointly review their current Memorandum of Understanding and amend it as necessary to define clearly the responsibilities of each party in relation to enforcing actions to mitigate the risk arising from road vehicle incursions onto the railway. The revised Memorandum of Understanding should take into account the findings of the Law Commissions on level crossings, when published, and include:

- a clear definition of the circumstances under which each party takes responsibility for enforcement; and
- a mechanism for resolving disputes over enforcement responsibility.

The Health and Safety Executive and the Office of Rail Regulation should jointly define a time-bound programme for the development and implementation of the review and consider actions that should be taken in the interim period if an amendment to current legislation is required to achieve the desired outcome (paragraph 142d).

- 6 *The purpose of this recommendation is for the DfT to improve its intelligence on the number and status of road vehicle incursion sites.*

DfT should undertake a review of all outstanding road vehicle incursion sites and establish a regime to continuously monitor progress with the implementation of the required risk mitigation measures (paragraphs 142b and 142c).

continued

- 7 *The purpose of this recommendation is for the lessons learnt from this investigation to be disseminated to local highway authorities.*

DfT should implement a programme and forum to disseminate the key findings of this report to all local highway authorities. In particular, highway authorities should be reminded of the need to:

- ensure that time-bound programmes of action are taken to mitigate risk at known high risk road vehicle incursion locations;
- reliably capture all data on all road accidents that have occurred near the railway boundary;
- engage with Network Rail, British Transport Police and local police road safety units to ensure that there are processes in place to share intelligence relating to known or new road vehicle incursion locations; and
- ensure that all current and new staff are aware of the procedures relating to the risk from road vehicle incursion sites (paragraphs 142b and 142c).

- 8 *The purpose of this recommendation is to achieve better co-ordination between databases so that relevant intelligence is shared.*

DfT should, in consultation with ACPO, undertake a review of existing data systems (eg Accsmap/Crash system/National Resilience Extranet) to improve the ways in which data relevant to the risk of vehicle incursions can be exchanged and shared with interested parties such as Network Rail, highways authorities and the police (paragraphs 142b, 142c and 144).

- 9 *The purpose of this recommendation is to achieve better exchange of data between Local Resilience forum 'responders' so that relevant intelligence on outstanding high risk locations is shared.*

The DfT should, in consultation with the Civil Contingencies Secretariat (Resilience, Capabilities and Risks) and Local Resilience Forums incorporate into the local risk assessment guidance the need to consider the potential for serious accidents at high-risk road vehicle incursion locations (particularly those where mitigation measures have yet to be implemented) (paragraph 143).

Appendices

Appendix A - Glossary of abbreviations and acronyms

BTP	British Transport Police
DfT	Department for Transport
EARR	Enforcing Authority for Railways and Other Guided Transport Systems Regulations
HSC	Health and Safety Commission
HSE	Health and Safety Executive
HSWA	Health and Safety at Work Act
MoU	Memorandum of Understanding
ORR	Office of Rail Regulation
RAIB	Rail Accident Investigation Branch
RVI	Road Vehicle Incursion
SCC	Suffolk County Council
SMIS	Safety Management Information System

Appendix B - Glossary of terms

All definitions marked with an asterisk, thus (*), have been taken from Ellis's British Railway Engineering Encyclopaedia © Iain Ellis. www.iainellis.com.

Asset management engineer	Engineer responsible for assessment of road vehicle incursion sites.
Bund	A wall of earth or soil.
Cess	The area or walkway next to the railway track.
Down line	The line used by trains running in a direction from London.*
Kiss bend	A location where a highway for a short distance runs parallel to a boundary (railway).
Mobile operations manager	Network Rail manager who will attend accident and incidents to manage the return of the railway infrastructure.
Up line	The line used by trains running in a direction towards London.*

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