

Safer Crossings

CP4-CP5 special edition
Issue 4 April 2014

An update for national, international industry stakeholders and employees about Network Rail's National Level Crossing Safety Improvement Programme

Closures programme: CP4 'wins'



Seamer Carr Farm crossing – before closure

Collaboration culminates in 800+ closures

To achieve risk mitigation through level crossing closures, the Office of Rail Regulation (ORR), the independent safety and economic regulator for Britain's railways, set Network Rail an initial target to close 150 of more than 7,500 level crossings in (Control Period) CP4, between April 2009 and March 2014.

The Head of Level Crossings reviewed this target with the ORR and a stretch target of 750 closures was set – with the safety improvement programme aiming to reduce level crossing risk by over 25 per cent by March 2014.

From this target rose a phenomenal success delivered by the Liability Negotiations National Level Crossing Closure Team. "With our remit constantly evolving, by the end of CP4, we legally closed over 800 level crossings," said Jerry Greenwood, Head of Liability Negotiation. "This is more than 10 per cent of our total level crossing population removed and risk eliminated in just one control period."

Operational expenditure benefits are over £200m based on whole life costs, as well as the removal of speed restrictions and other operational issues – and all for about £20m investment in total.

Darren Furness, Head of Level Crossings said: **"We've also surpassed our safety risk reduction target – achieving a 30.9 per cent reduction and we will continue this drive and commitment through CP5 with a new set of targets."**

The majority of crossings that were closed were on private land. To meet the closure challenge involved full and detailed research, investigations and complex negotiations with landowners, their professional advisers and local authorities.

"Closing a level crossing is not always an easy process, and we often need the support of land owners, local authorities and users. I look to their continued support as we look to improve safety and modernise the rail network for the future," said Jerry Greenwood.



Seamer Carr Farm crossing – before closure

Dear Reader,

As we move from the last five year control period (CP4) into the next, this is a time for reflection and for looking forward to the challenges ahead.

For the first time, Network Rail set itself a very challenging risk reduction target of 25 per cent for level crossings. This target was exceeded, with a risk reduction of 30.9 per cent achieved. We closed over 800 crossings, improved sighting at a further 1,100 crossings, installed spoken audible warnings for second train approaching, fitted barriers at automatic open crossings and introduced a fleet of mobile safety vehicles operated by the British Transport Police.

We also improved our business capability to manage risk through the creation of 100+ dedicated level crossing managers. We modernised our processes with mobile working apps and integrated our IT systems.

Looking forward into CP5, there is still a lot more to do. Working closely with the ORR, Network Rail is seeking to achieve more than 25 per cent risk reduction through targeted level crossing closures. We will develop a long term level crossing strategy to tackle legacy issues and modernise the level crossing estate, with a greater focus on innovation.

Darren Furness,
Head of Level Crossings



Reducing risk

Closures programme (continued...)

The first year of closures

In the first year of CP4, the closures team focussed on the crossings which could be closed relatively quickly – and at low cost. The team also investigated those crossings which no longer had any private rights – and which could legally be removed from the network without payment, for example, through severance of land ownership over the railway. This early focus on quick-wins resulted in the instruction of solicitors on 218 closure transactions in the first year – and completed 380 closures.

The second year of closures

After the initial first 12 months of CP4, the team widened the net to progress more complex closures.

Still looking at quick buy-outs, occupation crossings were considered. More legal issues arose; multiple users and users claiming to own land or have rights which they could not substantiate. Each new problem introduced delays in achieving closure and raised costs. Crossings with multiple users cannot be closed unless all the users agree to terms and each separate transaction with each user must be progressed simultaneously. If one user aborts, the whole deal can fail and that leads to breakdown in relations with the other parties who still want to proceed but will no longer receive their financial compensation. Multiple users regularly fell out between themselves over their perceived hierarchy. A user who accesses a much higher acreage of land from



Seamer Carr Farm crossing - after closure

the crossing may want their compensation increased by the same factor than the minor user; but a minor user considers that they are just as important as their potential use may be the same. Closure was only achieved when all parties signed the release.

Jerry said: "There were even a couple of closures where one of the signatories died prior to completion. Where there is no will you have to await probate. When land ownership is left to trustees it is also common for them to disagree and again, the transaction fails."

The third year of closures

By the third year, the majority of quick-hit opportunities had been identified and progressed. By this stage, more complex cases involving diversionary routes, new roadways, land purchase and land exchanges became more common. Complexities such as the building of the road, easements and rights of way, compensation and loss, as well as any planning or highway consent if the road connects with a public highway, also needed to be considered.



Seamer Carr Farm crossing - during closure

Closure of public footpaths and bridleways introduced different issues as well as unexpected time delays. It's not just a matter of stopping up the path leading over a railway, or a simple diversion to another bridge or highway. Finding an alternative diversion is the easy part; securing it is time-consuming. **"Even with the support of a local authority there are user groups, local users and affected landowners who need to be considered and their concerns pacified,"** said Jerry.

"Once the proposal for public consultation is open, we may receive no objections, or objections which can be resolved easily. Serious objections will likely lead to a public inquiry, with no guarantee that the closure will be obtained. For example, in the case of providing a bridge, as there is no readily available diversion, objections received could range from the design of the bridge, ramps for the mobility impaired versus steps and the unsightly 'blot on the landscape'. Sometimes, there's even the argument that we should provide for wheelchair users, horse riders and cyclists at rural locations where a public footpath crosses ploughed fields!"



Seamer Carr Farm crossing - after closure

Reducing risk

CYCLISTS
DISMOUNT

Outstanding contribution



Diversion of a canalside public footpath with bridge culvert construction involving substantial fencing, drainage works and vegetation clearance



Canalside diversion under construction

At the onset, initial compensation payments were relatively low. By the 400th closure in September 2010, compensation payments had notably started to rise. **Even Network Rail's transparency policy, which makes available the All Level Crossing Risk Model (ALCRM) scores, introduced an unwelcome twist to negotiations.** Some agents began to use this data to identify high risk crossings – and marketing this information to artificially raise the bar for compensation payments.

This posed major problems because higher risk crossings were being targeted where realistic levels of compensation were already being offered. "We've actively walked away from a couple of deals valued on this basis, to try and stop a precedent being set," said Jerry, "but it is difficult!"

The Moors Gorse user-worked crossing with bridle and cycle way, a route priority closure due to the high number of near misses with cyclists, was the 700th closure. The crossing was being used by up to 3,000 cyclists each event weekend after new mountain bike trials were opened in the forest, scheduling events over the railway without consultation with Network Rail. This closure received TV coverage for its replacement with a £1.5m bridle bridge.



Canalside 300 metre public footpath



'Outstanding contribution' award

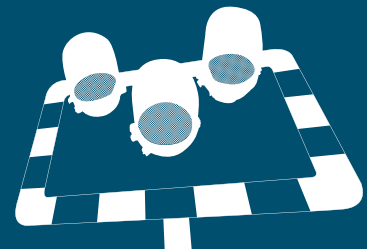
At the eleventh annual You Make the Difference awards held in London, November 2013, recognition came for the National Level Crossing Closures team when they picked up the 'Outstanding Contribution' award. A panel of 60 employee judges selected the original award shortlist from more than 850 nominations. The winners from each category were then chosen by seven external, independent judges. The 'Outstanding Contribution' award, however, was the only award category set aside to be voted for solely by Network Rail employees.

The CP4 closure programme was a success. "It delivered much more than was originally perceived. An amazing collaborative team approach was developed. **There will never be another project that closes more than 800 crossings in such a short period of time.** We will continue this drive and commitment through CP5, with the new targets that have been set," said Darren.

Jerry adds: "This incredible figure is the direct result of an innovative team of amazing workers banding together to improve rail safety for everyone."



Looking ahead



Risk adjusted closure: CP5 target

CP5: Maximum reduction in level crossing system risk

Level crossing risk was significantly reduced in Control Period 4. The total risk reduction achieved was 30.9 per cent. This compares favourably to the CP4 target of 25 per cent and is a further risk reduction within the period. [See **Table 1: Level Crossing Risk Indicator Model** which shows the *National report for period 13*]

Network Rail will now build upon this CP4 success and plans to target more than 25 per cent reduction in level crossing risk in Control Period 5 (CP5), with CP5 covering 1 April 2014 to 31 March 2019. The baseline will again be measured using Network Rail's level crossing risk reduction model (ALCRM).

Following the Office of Rail Regulation's (ORR) final determination on our strategic business plans and how much it thinks Network Rail needs to deliver in CP5, we have a level crossing ring-fenced fund of £99m to help achieve the maximum reduction in risk of accidents at level crossings. This fund will be retained and managed centrally and used across the level crossing portfolio in England, Scotland and Wales. A further £10m ring-fenced fund has been provided to facilitate level crossing closures in Scotland.

The expectation is to target investment where we can achieve the highest Benefit-to-Cost ratio (BCR). **"We have compared all intervention options to establish which would provide the greatest benefit, and the anticipated cost associated,"** said Head of Level Crossings, Darren Furness.

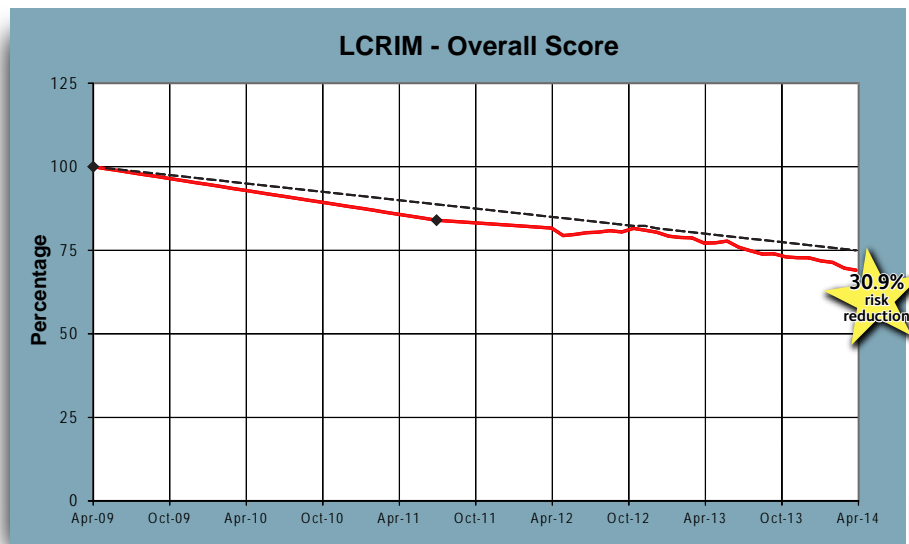


Table 1: LCRIM chart showing level crossing risk reduction achieved since April 2009

"From this we are able to confirm that closing higher risk passive crossings, which represent 96 per cent of all crossings in the highest risk band (A1-C3) for closure, prioritised by greatest BCR, using a variety of methods, would provide this optimum benefit." [See **Table 2**]

In building on the significant achievements in CP4, Network Rail has gained far greater experience and expertise in planning and delivering the national risk reduction programme for level crossings.

Kris Alexander, Programme Sponsor, Level Crossing Safety Enhancements (National Sponsorship Team), said: **"We will invest the £99m over the next five years to reduce serious or fatal accidents at level crossings by more than 25 per cent.** This will build on the £131m invested since 2010 which has helped to close almost 800 crossings across Britain. We anticipate that we may be able to close an equally high number of crossings – possibly up to 500 – through a range of measures from building ramped or stepped bridges through to diversion of footpaths.

"The risk reduction to be achieved by using the ring-fenced level crossing fund is in addition to reducing risk so far as is reasonably practicable through, for example, routine risk assessment, the renewals and enhancements programmes, or the introduction of red light enforcement cameras, and train detectors to remove the need for whistle boards and cameras to gather data about level crossing use," said Kris. "It's also in addition to closing crossings through existing, planned schemes and other funding sources."

Routes will be more responsible and accountable for managing and delivering the closures. Jen Lowther, Programme Manager, said: **"In consultation and collaboration with our Level Crossing Managers, we will continue to challenge and optimise value for money, to provide scope, assurance and continuous improvement towards our benefits realisation targets."**

Individual Risk	Collective Risk													Total
	1	2	3	4	5	6	7	8	9	10	11	12	13	
A			2	6	1	20	5							34
B	5	17	16	149	59	89	65	170	25	2	1		1	599
C	4	56	89	250	142	572	181	338	337	471	11			2451
D		6	24	90	65	260	210	178	79	450	222	87		1671
E			4	6	3	9	4	15	5	5	14	23		88
F				1		7	3	12	6	6	1	23		59
G				1	1	2		2		1		4		11
H					1	1		2				1		5
I				1		2		1				1		5
J							2							2
L						4	1	3	1	1				10
M				5	4	6		1	1	1		8	427	453
Total	9	79	135	509	276	972	471	722	454	937	249	147	428	5388

Table 2: Count of passive crossings by risk category*

*data source ALCRM 15 April 2014

Looking ahead

Assurance, options and initiatives

Development Team provides assurance

“As part of the National Level Crossing Team, the Development Team aid transparency, undertaking the assurance role, giving the Office of Rail Regulation (ORR) visibility of the National CP5 Level Crossing workbank,” said Andy Watson, Programme Manager for the National Level Crossing Development Team.

The team undertakes three major work streams:

1) National Assurance

In our National Assurance role, as well as the Route teams, we work with the ORR, to provide visibility of progress and status updates to the CP5 Level Crossing Renewal Programme of the planned 475 crossing renewals or closures.

2) Level Crossing Option Selection

We work with Route teams to identify closure or the best renewal option for the specific crossing. GRIP 1–3 enables Routes to select the best renewal option that improves safety, is within the renewals budget and provides evidence to support option selection for the ORR. “We start at the point of closure being the preferred first choice, and work through the hierarchy to establish the best option for that specific crossing,” said Andy.

Our Option Selection studies start with vehicular and pedestrian census investigations, leading into topographical surveys and suitability reports to support Suitable and Sufficient Risk Assessments (SSRA). These are all used with Whole Life Cost Modelling to establish the feasibility of options leading to the selected option.



Temporary Wig-Wag development with potential savings in the region of £9m

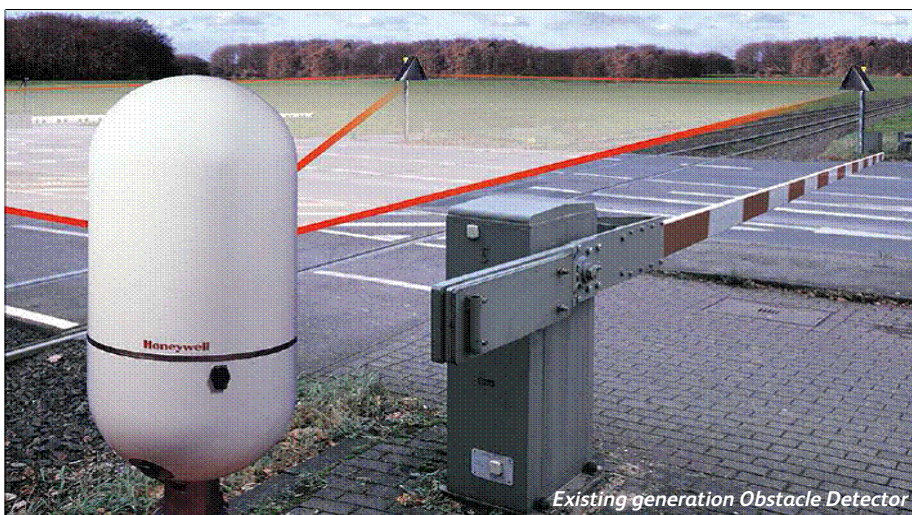
This is concluded with the Option Selection Report, which, along with the investigations, demonstrates to the ORR that level crossing risk is being identified, mitigated and managed, with documented evidence to support each selection with critical SSRAs and Common Safety Method verification in place. Andy said, “Our investigations and studies have already identified six public road crossings within CP5 for closure, which will need short diversionary roads to enable local communities to go about their business in an even safer environment.”

3) Safety Initiatives – bringing innovation and new products to the industry

This work stream incorporates the development of new initiatives up to Product Acceptance to improve safety and realise efficiencies during CP5 and beyond.



A currently manned full barrier

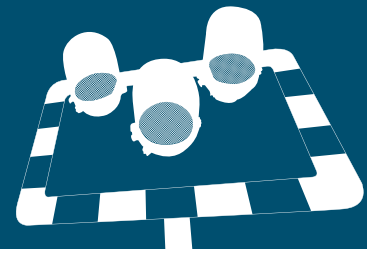


Existing generation Obstacle Detector

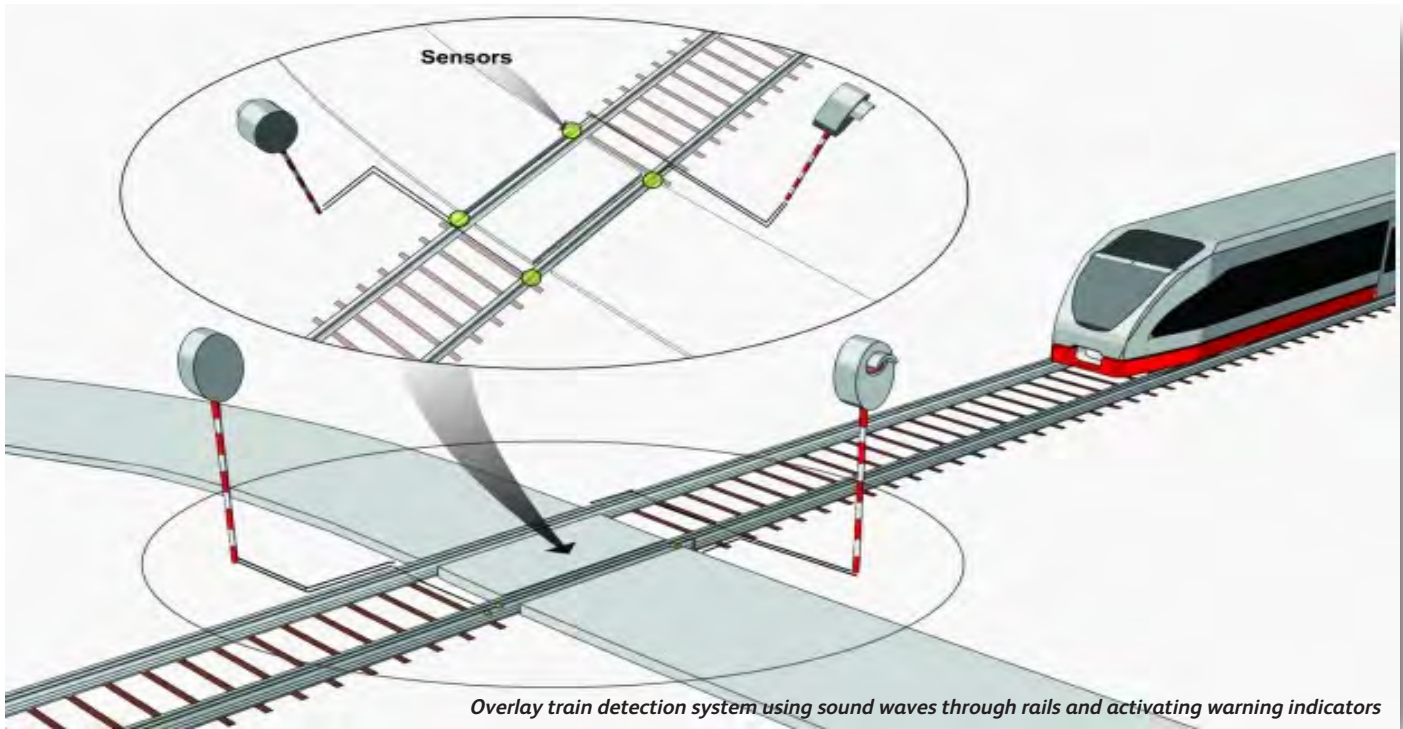
Current initiatives include the ‘next generation’ Obstacle Detector, Programmable Logic Controllers, Automatic Full Barrier Crossing type and the introduction of Temporary RTLs (Wig-Wags).

“We work with a wide variety of stakeholders to establish the product system acceptance criteria and system requirement specification, managing the process through to the supply market, development and trials leading to Product Acceptance,” said Andy.

Innovations



Overlay train detection technology



Driving forward innovation

Over the last few years and certainly moving into this control period, Network Rail is focusing resource and investment in driving forward innovation at level crossings and especially its unprotected locations.

Historically, the rail industry has used heavily engineered technology which is time consuming and costly to develop, often requiring integration with the signalling system and subsequently meaning often, there is no business case to take it forward.

“Our rail network is in a key transition period, moving away from the heavy engineering practices of the Victorian railway era and aligning ourselves with other pioneering industries. This allows us to develop safer technology both quickly; and which is more cost effective,” said Carl Duranthon, Sponsor, Level Crossing Technology and Innovation Portfolio.

A great example of innovation being developed currently is overlay train detection technology. “This is driven from our concern that the network has a significant number of locations where whistleboards are not an effective method of providing level crossing pedestrian users with an adequate warning of approaching trains – and therefore enabling users to make a judgement of whether it is safe to cross.

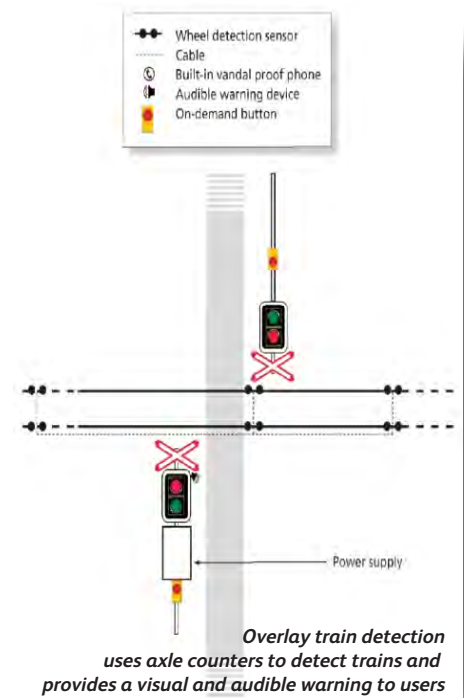
“We also have many locations where signallers are not able to determine the proximity of trains to level crossings in long signal sections. This results in long waiting times affecting user behaviour and users traversing crossings without requesting permission to do so,” said Carl.

The overlay train detection technology project aims to identify, develop and implement new low cost technologies that do not interface with the signalling equipment; and which are able to detect trains approaching level crossings, to provide level crossing users with warning signs indicating when it is safe to cross.

Suppliers of new technology within the European market have expressed an interest to provide solutions that are able to solve these key business problems. A number of technologies have been selected and are being trialled.

Carl said: **“It is important that the systems and equipment we develop today are modular, have very low failure rates, are interoperable and are able to interface with technology of the future. With all of these components, we will be able to improve safety and enhance performance further than we have ever done before.”**

The project aim is to achieve product acceptance by July 2014; and then to start rolling these



systems out across the network enhancing safety at many locations. This project is just one aspect of a wider level crossing development and innovation portfolio during CP5.

In partnership

Working with suppliers

Red light safety cameras

Over the last few years, we have been working with suppliers to develop a system capable of capturing details of vehicles that pass through active level crossing warning lights. When this happens, the British Transport Police (BTP) will use the details to either offer the driver re-training and education, or look to pursue a formal prosecution.

The system is scheduled to be formally switched on in September 2014. In addition to evidence retrieval systems and a back office, the cameras need to receive approval from the Secretary of State for Transport (HOTA – Home Office Type Approval).

We are currently testing the equipment at a number of crossings. The initial outputs have been very encouraging. The image shown [opposite] highlights the quality of image the system is capable of generating to later be used by the BTP.

Kris Alexander, Programme Sponsor, Level Crossing Safety Enhancements (National Sponsorship Team) said: **“Over the next few months, we will be installing the system at 28 crossings across England, Wales and Scotland.** We have also identified a further 123 crossings where we think system installation would make a difference – when we have learned more about the system from its operation at the initial 28 crossings.”



Quality of image generated by the cameras (registration plate has been modified intentionally)

ILCAD 2014: ‘Professional drivers’



United in level crossing awareness

Co-ordinated by the UIC-International Union of Railways, the 6th edition of International Level Crossing Awareness Day (ILCAD) will take place on 3 June 2014 in many countries around the world, with bigger or smaller campaigns.

The 2014 press conference together with a round table on level crossing safety with experts from different sectors, will be hosted by the Portuguese railways in Lisbon, Portugal.

The target audience this year are professional drivers (such as school buses, coaches, taxis, minivans, tractors, HGVs, emergency vehicles etc). All activity is on a purely collaborative basis to help the railway community to reduce this level of operational risk that we face at the interface with the road sector.

“ILCAD 2013 was celebrated in 45 countries. This year’s international theme unites us all in educating and raising further awareness to professional drivers who use level crossings,” said Kerryanne Delbridge, Communications Manager for the National Level Crossing Safety Awareness Programme. “The theme’s slogan is ‘ILCAD 2014 – the most important stop of the day’. **During the week of 3 June, our 100 Level Crossing Managers across England, Scotland and Wales will focus on meeting with and educating large groups of a variety of different types of professional drivers with a range of suitable safety messages, specifically tailored for them.”**

Robert Havercroft, Level Crossing Manager (Malton) for Network Rail LNE & EM, said: “For ILCAD 2014, I have arranged to visit Nestlé’s distribution centre at York. It is actually located next to one of our high risk AHBs (Bootham),

which has been the subject of two incidents involving HGVs in the last 12 months; this will be the second visit I have made to meet with their drivers.”

Tracy Eastlake, Level Crossing Manager, South East Route, said: **“Many car drivers often don’t realise that going through amber lights at level crossings is a road traffic offence. An amber light, just like a red light, also means ‘stop’ at a level crossing, which is different to the process of amber lights at traffic lights.**

“Professional drivers are also at risk of prosecution, and some lose their jobs as a result of road traffic offences at level crossings. The introduction of automatic number plate recognition (ANPR) cameras is a possibility for roll out on all level crossings in the future. This will further increase the likelihood of drivers being prosecuted and receiving points and fines.

“So some of our key messages for ILCAD 2014 will be to concentrate on professional drivers, particularly of large vehicles, to educate about the light sequence at crossings; that amber means ‘stop’ and to advise of the potential dangers of running amber/red lights at crossings.”

For more information on this and past ILCAD campaigns, please visit the website: www.ilcad.org

Level crossing user guidance

New! Improved level crossing user guidance

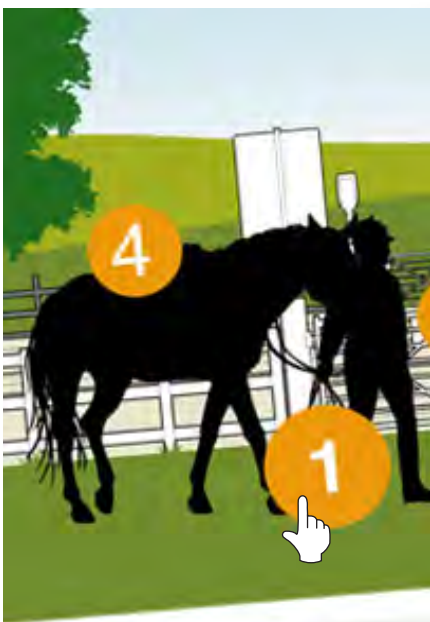
The National Level Crossing Safety Improvement Programme has worked with the Office of Rail Regulation and the Heritage Railway Association to produce an improved user guidance on level crossings.

We've taken a new approach based on the user, rather than the type of level crossing. Each crossing is unique, and these interactive guides aimed to help inform drivers, pedestrians, cyclists and horse riders on the potential dangers of each level crossing they may face.

The user guides cover the potential dangers, such as distractions when using a crossing, and understanding the safety warnings.

Along with downloadable PDFs, the interactive user guides are available on the Network Rail website now.

www.networkrail.co.uk/level-crossings



Level crossings for cyclists

As cyclists we need to:

- Consider dismounting – especially when you're about to cross the tracks diagonally
- Follow signs and instructions
- Check both ways before crossing – if there is a train coming, don't cross
- Remain stationary until all the warnings stop
- Check that our exit is clear before crossing



Gates

- We may need to open the gates ourselves although some are operated by railway staff.
- We must make sure that there is no train coming before and immediately after opening the gates.
- We must make sure that all gates are closed after using a crossing.
- If we are crossing in a group we must make sure there is enough time and space for everyone to cross safely.

Share your views...

We invite your contributions for future issues of Safer Crossings. If you have any level crossings results, issues or innovations which are shaping your particular part of the world, please share these with us, along with a supporting image or photo, if possible.

The next issue of Safer Crossings will be published in **September 2014**. The deadline for receipt of copy is **8 August 2014**.

Please email contributions to: nationallevelcrossingteam@networkrail.co.uk