By Email : [redacted]

Network Rail
Freedom of Information
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8th June 2018

Dear [redacted]

Information request

Reference number: FOI2018/0602 & FOI2018/00603

Thank you for your emails of 16th May 2018, in which you requested the following information:

FOI201800602

Please may I request the following Level Crossing Narrative Risk Assessment's

1. *Yapton Automatic Half Barrier (AHB) Level Crossing*
2. *Woodgate MCB-CCTV Level Crossing*
3. *Woodhorn AHB Level Crossing*
4. *Park Lane Occupational Crossing*
5. *Decoy Farm Occupational Crossing*
6. *Lake Lane Occupational Crossing*

And

FOI201800603

Please may I request the following Level Crossing Narrative Risk Assessment:

7. *Kemps Farm Crossing*
8. *Southerham User Worked Crossing (UWC)*
9. *Asheham No.1 UWC*
10. *Itford UWC*
11. *Stoor UWC*
12. *Durham Farm UWC*
13. *Tarring Neville No.1 UWC*
14. *Tarring Neville No. 2 UWC*
15. *Parsons UWC*
16. *Tide Mills UWC*
17. *Courthouse Farm UWC*

I have processed your requests under the terms of the Freedom of Information Act 2000 (FOIA). I confirm we hold the information you have requested. I have combined the requests into one response for your convenience.

Please see attached the latest risk assessments as requested labelled *"FOI201800602.zip"* and *"FOI201800603.zip".*

I have withheld the names, phone numbers and email addresses of members of staff from each of these documents under section 40(2) of the FOIA. This exemption allows us to withhold information in circumstances where its disclosure would breach the data protection principles set out at s.35 of the Data Protection Act 2018 and Article 5 of the General Data Protection Regulations. In this instance disclosure would breach the first principle that mandates that data must be processed fairly and lawfully. Here staff members' names, phone numbers and email addresses would clearly make them identifiable and since they would have had no expectation that their personal details would be publicly disclosed through the FOIA, I am satisfied that to do so would be an unfair processing of their personal information.

You will also note that I have removed a small amount of information regarding a number of incidents at these level crossings under section 38(1) of FOIA. This part of the FOIA permits public authorities to withhold information in circumstances where to disclose it would endanger the health and safety of any individual. It is my belief that disclosing the detail about the incidents would have the potential to increase the risk of further incidents at the same or similar locations. Section 38 is a qualified exemption which means that we need to consider whether disclosure of the information should be disclosed by weighing up the public interest.

Whilst there is public interest in being open and transparent as a public authority this needs to be set against the serious adverse effect on public health that releasing the information would potentially cause. We are only withholding a small amount of the information you have requested and I am of the view that the public interest in

openness and transparency is largely already satisfied. In consequence, we believe the strongest public interest lies in protecting the detail surrounding the incidents. I am therefore withholding this under Section 38(1) of FOIA. Any section of the documents attached which has been redacted in black contains a combination of personal data (s.40) and information the release of which would endanger health and safety (s.38).

I hope that the information I have provided is useful. If you have any enquiries about this response, please contact me in the first instance at FOI@networkrail.co.uk or on 01908 782405. Details of your appeal rights are below.

Please remember to quote the reference number at the top of this letter in all future communications.

Yours sincerely

Joanne West
Senior Information Officer

Appeal Rights

If you are unhappy with the way your request has been handled and wish to make a complaint or request a review of our decision, please write to the Head of FOI at Network Rail, Freedom of Information, The Quadrant, Elder Gate, Milton Keynes, MK9 1EN, or by email at foi@networkrail.co.uk. Your request must be submitted within 40 working days of receipt of this letter. If you are not content with the outcome of the internal review, you have the right to apply directly to the Information Commissioner for a decision. The Information Commissioner can be contacted at:

Information Commissioner's Office
Wycliffe House
Water Lane
Wilmslow
Cheshire SK9 5AF

Web: ***www.networkrail.co.uk/foi***

NARRATIVE RISK ASSESSMENT – PASSIVE TEMPLATE FINAL v2.0

PASSIVE LEVEL CROSSING RISK ASSESSMENT

1. LEVEL CROSSING OVERVIEW AND ENVIRONMENT

1.1 LEVEL CROSSING OVERVIEW

This is a risk assessment for Tidemills level crossing.

Crossing details	
Name	Tidemills
Type	UWCT
Crossing status	Occupation
Overall crossing status	Open
Route name	Sussex
Engineers Line Reference	STS, 57m, 38ch
OS grid reference	TQ461004
Number of lines crossed	1
Line speed (mph)	70
Electrification	DC
Signal box	Newhaven Harbour

Risk assessment details	
Name of assessor	[redacted]
Post	Level Crossing Manager
Date completed	08/06/2016
Next due date	08/09/2018
Email address	[redacted]@networkrail.co.uk
Phone number	[redacted]

ALCRM risk score	
Individual risk	C
Collective risk	9
FWI	0.000008136

1.2 INFORMATION SOURCES

The table below shows the stakeholder consultation that was undertaken as part of the risk assessment.

Consulted	Attended site
Authorised user	No

Stakeholder consultation and attendance notes:

The reference sources used during the risk assessment included:

- Occurance log, Census, Other (Sussex events log), CCIL, GI Portal, SMIS.

1.3 ENVIRONMENT

Up side crossing approach **Down side crossing approach**

Tidemills level crossing provides Access to worksite / leisure area from facility.

It is an occupation level crossing. There are no stations visible at the level crossing.

At Tidemills level crossing the orientation of the road/path from the north is 60°; the orientation of the railway from the north to the up line in the up direction is 300°. Low horizon can result in sun glare; sun glare is not a known issue.

There are no planned or apparent developments near the crossing which may lead to a change or increase in use or risk.

Site visit general observations:

NA

2. LEVEL CROSSING USAGE

2.1 RAIL

The train service over Tidemills level crossing consists of passenger trains. There are 86 trains per day. The highest permissible line speed of trains is 70mph. Trains are timetabled to run for 20 hours per day.

Assessor's notes:

Single Track bi directional at this location

2.2 USER CENSUS DATA

An estimated census has been used. The census was estimated on 08/06/2016 by TP. The census applies to 100% of the year.

The census taken on the day is as follows:

Cars	FEW
Vans / small lorries	NO
Buses	NO
HGVs	NO
Pedal / motor cyclists	NO
Pedestrians	NO
Tractors / farm vehicles	NO
Horses / riders	NO
Animals on the hoof	NO

Available information indicates that the crossing does not have a high proportion of vulnerable users.

Vulnerable user observations:

Available information indicates that the crossing does not have a high number of irregular users.

Irregular user observations:

Information gathered indicates that Tidemills level crossing does not have a high number of users during the night or at dusk.

Site visit night / dusk user observations:

Assessor's general census notes:

Low levels of ambient lighting only available, deck lights are to be installed in the pedestrian walkway. The UWC section is never used just kept as an emergency access by the port authority. This crossing is a short distance from the beach on the up side and visibility can be reduced due sea fog. audible noises can be reduced due location prone to high winds. covtec has been installed to mimic the WB at the FP although WBs are not required as sighting is compliant. The WBs have been left in situ as an additional warning due high usage of foot peds140404 UWC gates ripped out and used as fire wood 250307 phones vandalised 140707 vehicle hit gates and damaged beyond repair 271008 nuisance calls 240710 phone left off hook 230810 train reports gates left open 290810 vandalised phones 200913 phantom and abusive calls to signaller 181215 UWC gates removed from hinges and on groundNo vehicles recorded here for 7 days. Port authority are only user and do not use this crossing. They will not give up rights in case of future requirement. Therefore the census recorded no usage at all. For the sake of this RA few will be recorded otherwise if 0 is entered ALCRM classes the crossing as closed which it is not.

2.3 USER CENSUS RESULTS

ALCRM calculates usage of the crossing to be 0 road vehicles and 0 pedestrians and cyclists per day.

3. RISK OF USE

3.1 SIGHTING AND TRAVERSE

At Tidemills level crossing, the decision point and traverse lengths are calculated as:

	Decision point (m)	Traverse length (m)	Measured from
Up side	3	7.2	3m from the nearest running rail
Down side	3	7.2	3m from the nearest running rail

Timber decking is provided over the level crossing. The decking is considered to be wide enough for all users of the crossing. It is fitted with a non slip surface.

The traverse times are calculated as:

	Traverse time (s)
Pedestrians	6
Vehicles	12

The current census has not identified a high proportion of vulnerable users. Therefore, the pedestrian traverse time has not been increased.

Assessor's traverse time notes:

Sighting distance traverse calculator used. Crossing is on a skew and the skew distance has been measured on the most direct route across gate to gate.

Sighting was measured by the following means:

- Using known references
- Using Range Finder

Sighting, measured in metres, at Tidemills level crossing is recorded as:

All distances are recorded in metres	Minimum sighting distance required	Measured sighting distance	Sighting distance measured to	Is sighting compliant?	If deficient, is sighting distance mitigated?	Notes on deficient sighting time mitigations
Up side looking toward up direction train approach	373	932	Bishopstone over bridge	Yes	YES	Telephones
Up side looking toward down direction train approach	373	471	Back of covtec post	Yes	YES	Telephones
Down side looking toward up direction train approach	373	932	Bishopstone over bridge	Yes	YES	Telephones
Down side looking toward down direction train approach	373	471	Back of covtec post	Yes	YES	Telephones

Sighting restrictions are recorded as follows:

	Up Direction	Down Direction
Nothing; vanishing point	NO	YES
Track curvature	YES	NO
Permanent structure (building/wall etc)	NO	NO
Signage or crossing equipment	NO	NO
Vegetation	NO	NO

Bad weather on the day of visit	NO	NO
Other	NO	NO

There are known obstructions that could make it difficult for users to see approaching trains. There are known issues with foliage, fog or other issues that might impair visibility of the crossing, crossing equipment or approaching trains.

Actions to improve sighting have been identified.

Assessor's improving sighting and decision point notes

Foliage kept a minimum in growing season. MST in place for the crossing itself and track side veg is reactive.

The visual evaluation of the vertical profile of the road indicates that it does not create a risk of vehicles getting stuck on the crossing.

Assessor's risk of vehicle getting stuck notes:

Assessor's general sighting and traverse notes:

The old Bishopstone station platforms remain partially on both sides, the up side one has vegetation which grows on it and can cause sighting issues if not regularly cut back and maintained.

3.2 EVALUATION OF MITIGATIONS

Tidemills level crossing is provided with whistle boards.

	Line Speed	Distance to whistle board*	Whistle board warning provided (s)	Is the whistle board warning < or > traverse ? (s)	Whistle board compliance with 400m maximum (m)	Is the train horn clearly audible at the crossing?	Comments on audibility and whistle board position
Up line	70	352	10.19	4.19	N/A		
Down line	70	338	9.78	3.78	N/A		

The percentage of users who use the crossing during the night time quiet period, between 2300 and 0700, is estimated as 1%.

Assessor's notes on whistle board suitability as a risk control

WBs are not required as sighting is compliant but have been left in situ as an additional warning with COVTEC due high numbers of users at the FP

Tidemills level crossing is provided with telephones.

	Comments
Telephone visibility and clarity of instructional signage	Good, clearly visible to users

Telephone usage	There is little or no vehicle use at this crossing by the user, the Port Authority. Occasionally peds ring the signaller.
Telephone discipline	Users are ALWAYS known to use the telephone to ask for permission to cross. The level of telephone usage has been confirmed with the controlling signal box
Long signal section *(Is the Signaller able to determine where trains are with reasonable accuracy; do users have to wait an excessive time for permission to cross?)*	
Signal panel ergonomics	

Assessor's notes on telephone suitability as a risk control

The telephone is considered a suitable method of risk control at this location, there is little or no use of the UWC therefore upgrading to another risk mitigation is not viable at this time.

3.3 CROSSING APPROACHES

The signs at Tidemills level crossing are located on the direct route a user would take over the level crossing, They are positioned so that they are clearly visible to users taking a direct route over the level crossing. The visibility of the signs is reduced at night or at dusk.
The road surface (including gradient is present) at Tidemills level crossing is unlikely to impact on the ability of a vehicle to stop at the level crossing.

There are no known issues with ice, mud, loose material or flood water.

Assessor's notes:

Sea fog and foliage issues track side on the up side only can affect sighting if not kept in check.

There are adjacent sources of light or noise that could affect a users' ability to see or hear approaching trains.

Assessor's general crossing approach notes:

Low levels of ambient lighting only available, deck lights are to be installed in the pedestrian walkway. The UWC section is never used just kept as an emergency access by the port authority. This crossing is a short distance from the beach on the up side and visibility can be reduced due sea fog. Audible warnings can be reduced due the location which is prone to high winds. Covtec has been installed to mimic the WB at the FP although WBs are not required as sighting is compliant. The WBs have been left in situ as an additional warning due high usage of foot peds

3.4 AT THE CROSSING – ANOTHER TRAIN COMING RISK

The likelihood of a second train approaching does not exist at this crossing as it is a single track line

Assessor's another train coming notes:

[Free text]

3.5 INCIDENT HISTORY

A level crossing safety event has been known to occur at Tidemills level crossing in the last twelve months.

Assessor's incident history notes:

Incidents related to the UWC section of the crossing: 140404 UWC gates ripped out and used as fire wood 250307 phones vandalised 140707 vehicle hit gates and damaged beyond repair 271008 nuisance calls 240710 phone left off hook 230810 train reports gates left open 290810 vandalised phones 200913 phantom and abusive calls to signaller 181215 UWC gates removed from hinges and on ground.

Telephone discipline

See section 3.2

Gate discipline (including barriers)

Reports indicate that the gates are ALWAYS CLOSED.

Assessor's notes on operational disruptions:

Gates are always left closed, one instance reported open in 2010 but next train confirmed gates were closed.

4. ALCRM CALCULATED RISK

*Tidemills **level crossing ALCRM results***

Key risk drivers: ALCRM calculates that the following key risk drivers influence the risk at this crossing:

- Frequent trains

Assessor's key risk drivers notes

[Free text]

Safety risk				
Compared to other crossings the safety risk for this crossing is	**Individual risk**		**Collective risk**	
	C		**9**	
	Individual risk (fraction)	**Individual risk (numeric)**		
Car	1 in 4907	0.000203779	0.000006433	
Van / small lorries	0	0	0	
HGV	0	0	0	
Bus	0	0	0	
Tractor / farm vehicle	0	0	0	
Cyclist / Motor cyclist	0	0	0	
Pedestrian	0	0	0	
				Derailment contribution
Passengers			0.000000209	97.887298793
Staff			0.000001494	1.52314386
Total			0.000008136	2.788273013
Collision frequencies	**Train / user**	**User equipment**	**Other**	
Vehicle	0.000010813	0.000036371	0	
Pedestrian	0.000000582	0	0.000000724	
Collision risk	**Train / user**	**User equipment**	**Other**	
Vehicle	0.000006433	0	0	
Pedestrian	0	0	0	

5. OPTION ASSESSMENT AND CONCLUSIONS

5.1 OPTIONS EVALUATED

The options evaluated to mitigate the risks at Tidemills crossing include:

Option	Term[1]	ALCRM risk score	ALCRM FWI	Safety Benefit	Cost	Benefit Cost Ratio	Status	Comments
Closure via diversion of release of legal rights	long	M13	0				complete	No suitable diversion and user will not give up rights even though they do not use this crossing in case of future requirement
MSL	long	C9	0.000008127				complete	Not viable for funding due lack of use by user

NOTES
Network Rail always evaluates the need for short[1] and long term risk control solutions. An example of level crossing risk management might be; a short term risk control of a temporary speed restriction with the long term solution being closure of the level crossing and its replacement with a bridge.
[1] Includes interim

CBA gives an indication of overall business benefit. It is used to support, not override, structured expert judgement when deciding which option(s) to progress. CBA might not be needed in all cases, e.g. standard maintenance tasks or low cost solutions (less than £5k).

The following CBA criteria are used as a support to decision making:

a. benefit to cost ratio is ≥ 1: positive safety and business benefit established;
b. benefit to cost ratio is between 0.99 and 0.5: reasonable safety and business benefit established where costs are not grossly disproportionate against the safety benefit; and

c. benefit to cost ratio is between 0.49 and 0.0: weak safety and business benefit established.

5.2 CONCLUSIONS

Assessor's notes:

Crossing Location

Tidemills is a combined footpath and user work crossing, a hybrid, which is located on STS at 57m 38ch and consists of 2 metal DDA compliant slam shut kissing gates with 2 metal locked user work crossing split gates which open outwards away from the running line.
The crossing is located within the South Downs National Park and the footpath (FP) is noted as number Seaford 30A which passes over the railway line. The UWC/FP crossing lies between Denton and Seaford with the busy A259 on the North side and the sea on the South side.
The FP provides access to the popular Tidemills beach and access for the many dog walkers that frequent this area – this applies to all year round.
The UWC section of the crossing provides access across the Railway for the sole user, Newhaven Port Authority.
The derelict village of Tidemills and its redundant station platform are on the up side and is a known tourist attraction for historians and geologists.
Tidemills is within agriculturally farmed and walking field areas with Bishopstone station visible in the down direction.
The approach roads on both sides are privately owned and maintained by the Newhaven Port Authority

Aerial photos showing location of the crossing

Crossing description:

Tidemills is a combined footpath and user work crossing, also known as a hybrid, which consists of 2 metal DDA compliant kissing gates with 2 metal locked user work crossing gates.

The user work section of the crossing has 2 metal split access gates, which are the same on both sides and are padlocked out of use to anyone other than the sole user with chains and abloy padlocks.

The rights for the user work part of the crossing are owned by Newhaven Port Authority - they do not currently use the crossing to traverse the line as they have other more relevant access nearer to the port itself. They have been approached for closure of the user worked section but will not release access in case it is needed for future use.

Tidemills train track is on a bidirectional single line with speeds of 70mph in both directions.

The up and the down approaches both consist of a level tarmac road which doesn't have a separate paving area for pedestrians and is maintained by the Port Authority on a private basis. There is an unmade up section of road on the down side where there is room for approximately 10-12 cars to park. The main pedestrian car park is at the bottom of the access road on the down side at the entrance from the A259.

Up side crossing approach

The decision point is the same on both sides at 3m which is measured from the nearest running line back and the 7.2m traverse length for the crossing is measured on the skew which is the direct preferred travelling route for a vehicle.

The pedestrian walking route is further highlighted and encouraged by the installation of yellow high viz anti slip matting which covers the timber crossing deck and encourages separation from the vehicle traverse section of the crossing. The vehicle section of the crossing does not have any additional anti slip installed as it is not required.

The traverse route is gate to gate and there are no steps or encumbrances for the user to negotiate once the decision has been made to cross. The approach roads are level and of a good gradient and quality.

The normal compliant signs are in place – the “stop look listen” , electrification of track and do not trespass are situated on both sides. There is a further sign which applies to the user work part of the crossing giving instruction to vehicle users.
There are additional “keep dogs on lead” signs – one on each side as this is a prolific dog walking site and there have been cases of dogs getting trackside.

There are 2 telephones in place for vehicle users requiring permission to cross, one on each side of the crossing which are clearly marked up with required signage. They are direct connect telephones so that the user only has to pick up the receiver to be connected to the relevant signal box which is currently Newhaven Harbour – there is an alternative telephone number clearly marked should the telephone fail. The telephones are historically in place for when the authorised user included a tenant farmer and he traversed with farm machinery, this is now not the case and as mentioned previously the Port Authority are the sole authorised user now.

Sighting is compliant for the current vehicle usage, cars/4x4’s only as stated by the Port Authority, with the speed of 70 mph on both up side and down side requiring a minimum required sighting of 373m.

Up side up direction trains approaching sighting is 932m
Up side down direction trains approaching sighting is 471m

Down side up direction trains approaching sighting is 932m
Down side down direction trains approaching sighting is 471m
Down side down direction trains approaching sighting is 471m

The traverse, distance calculator was used to reach the traverse time required and the higher Sighting was calculated using the sighting, distance, traverse calculator with a speed of 70mph: line speed x crossing length recorded on the skew 7.2m = 12 seconds required crossing time and 373m minimum required sighting distance.

The sighting is limited in the down direction by track gradient/disappearing and the sighting is limited in the up direction by track curve and the old station platforms at Tidemills. Vegetation grows on the platforms during the warmer months and needs frequent cut back.

There are whistle boards historically installed at this location relevant to the footpath section. They are situated on the up side at 338m and down side at 352m. They were installed because sighting was not sufficient on the up side down trains approaching direction (looking towards Newhaven) due to the old Tidemills platforms and earth mounds left over but a lot of work has been done to improve the sighting deficiency which means the whistle boards have not been required for some time.

The decision was taken to retain the whistle boards for the following reasons:
1. historically locals are used to hearing the whistle boards being sounded to warn of approaching trains
2. the area is prone to sea fog and visibility can be greatly reduced at times therefore whistle boards still have their use at this location
3. the area is prone to adverse weather conditions due to its location and strong winds are often present making the approach of trains difficult to hear.

On the negative side the weather conditions can also apply to the audibility of the whistle from the train where the sound can be carried away on the wind and not heard. Ship and fog horns could also be mistaken for a train whistle on occasion. COVTEC has recently been installed at this location to mimic the whistle board at the crossing for footpath users, does not apply to the UWC section of the crossing.

Photos here of both sides looking across the crossing, taken on a skew angle as the most direct route across the crossing for a vehicle user.

The crossing is protected by a chain link boundary fence line which encompasses the metal user work gates and the kissing gate accesses.

The crossing surface itself consists of suspended wood timbers which are in good condition and currently no wear is visible for need to replace.

There is no lighting in place and only low levels of ambient lighting exist, solar deck lighting is to be installed on the footpath section of the crossing and will further segregate that section if used at night encouraging pedestrian users to stick to that part of the crossing.

Trespass guarding is provided on both ends of the crossing at the required minimum distance of 2.6m which applies to all points on the crossing. The conductor rail is cut back further than the required minimum of 3m distance away from the crossing surface in both directions.

Crossing use

A 7 day census was carried out with a squirrel camera and recorded “0” use by vehicles as expected. For this end an estimated census was recorded as “few” within ALCRM as recording a “0” figure would deem the crossing to be closed and this is not the case. Usage was confirmed with the signaller who also recorded “0” in the last 12 months.

Crossing risk

This is a planned risk assessment with an ALCRM risk score generated of C9 – the FWI score is 0.000008136.

The following options have been considered and assessed for risk reduction at this crossing:

1. **Closure via diversion or legal release of user rights**

This is the preferred option and would generate an ALCRM score of M13 and a FWI reduction score of 0.

2. **Add MSL**

This option would allow the user to make a decision to cross solely on the light system which would provide a visible red green traffic light. This generates an ALCRM score of C9 and a FWI reduction score of 0.000008127.

Conclusion

1. **Closure via diversion or legal release of user rights**

This option is not possible as the Port Authority will not release their user rights even though they do not currently use this access in case of any future requirement to use it.

2. **Add MSL**

This option is not financially viable due to low/non-existent current use by the authorised user.

The UWC section of this crossing will remain “as is” currently. This will be re assessed should there be any changes in usage by the authorised user.

ANNEX A – ADDITIONAL PHOTOGRAPHS

Description:

Description:

Description:

Description:

Description:

Description:

ANNEX B – HAZARD IDENTIFICATION AND RISK CONTROLS

The table below is intended for use by risk assessors when identifying hazards and risk control solutions. It is not an exhaustive list or presented in a hierarchical order.

	Hazard	Control
Road vehicle and train collision risk	Examples at the crossing include: • insufficient sighting and / or train warning for all vehicle types; known to be exacerbated by the driving position, e.g. tractor • level crossing equipment and signage is not conspicuous or optimally positioned • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • high volume of unfamiliar users, e.g. irregular visitors, migrant workers • known user complacency leading to high levels of indiscipline, e.g. failure to use telephone, gates left open • type of vehicle unsuitable for crossing; - large, low, slow making access or egress difficult and / or vehicle is too heavy for crossing surface - risk of grounding and / or the severity of the gradient adversely affects ability to traverse • poor decking panel alignment / position on skewed crossing • where telephones are provided, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • high chance of a second train coming • high line speed and / or high frequency of trains • unsuitable crossing type for location, train service, line speed and vehicle types	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs • engaging with signalling engineers to optimise strike in times • upgrading of asset to a higher form of protection • downgrading of crossing by removing vehicle access rights • optimising sighting lines and / or providing enhanced user based warning system, e.g. MSL • re-profiling of crossing surface • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • widening access gates and / or improving the crossing surface construction material • realigning or installing additional decking panels to accommodate all vehicle types • implementing train speed restriction or providing crossing attendant
Pedestrian and train collision risk	Examples include: • insufficient sighting and / or train warning • ineffective whistle boards; warning inaudible, insufficient warning	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs

	Hazard	Control
	time provided, known high usage between 23:00 and 07:00 • high chance of a second train coming • high line speed and / or high frequency of trains • level crossing equipment and signage is not conspicuous or optimally positioned • location and position of level crossing gates mean that users have their backs to approaching trains when they access the level crossing, i.e. users are initially unsighted to trains approaching from their side of the crossing • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • surface condition or lack of decking contribute to slip trip risk • known high level of use during darkness • increased likelihood of user error, e.g. crossing is at station • free wicket gates might result in user error • high volume of unfamiliar users, e.g. irregular visitors / ramblers, equestrians • complacency leading to high levels of indiscipline, e.g. users are known to rely on knowledge of timetable • high level of use by vulnerable people • where telephones are provided i.e. bridleways, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • unsuitable crossing type for location, train service, line speed and user groups • high usage by cyclists • degree of skew over crossing increases traverse time and users' exposure to trains • crossing layout encourages users not to cross at the designed decision point; egress route unclear especially during darkness	• upgrading of asset to a higher form of protection • optimising sighting lines, e.g. de-vegetation programme, repositioning of equipment or removal of redundant railway assets • implementing train speed restriction or providing crossing attendant • providing enhanced user based warning system, e.g. MSL • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • installing guide fencing and / or handrails to encourage users to look for approaching trains, read signage or cross at the designed decision point • re-design of crossing approach so that users arrive at the crossing as close to a 90° angle as possible • installing lighting sources • engaging with signalling engineers to optimise strike in times • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • providing cyclist dismount signs and / or chicanes • straightening of crossing deck

	Hazard	Control
	schools, local amenities or other attractions are known to contribute towards user error	
Pedestrian and road vehicle collision risk	Examples include: • a single gate is provided for pedestrian and vehicle users where there is a high likelihood that both user groups will traverse at the same time • the position of pedestrian gate forces / encourages pedestrian users to traverse diagonally across the roadway • road / footpath inadequately separated; footpath not clearly defined • condition of footpath surface increases the likelihood of users slipping / tripping into the path of vehicles	Controls can include: • providing separate pedestrian gates • clearly defining the footpath; renew markings • positioning pedestrian gates on the same side of the crossing • improving footpath crossing surface so it is devoid of potholes, excessive flangeway gaps and is evenly laid • improving crossing surface, e.g. holdfast, strail, non-slip surface
Personal injury	Examples include: • skewed crossing with large flangeway gaps results in cyclist, mobility scooter, pushchair or wheelchair user being unseated • condition of footpath surface increases the likelihood of users slipping / tripping • degraded gate mechanism or level crossing equipment • barrier mechanism unguarded / inadequately protected	Controls can include: • improving fence lines • reducing flangeway gaps and straightening where possible • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • straighten / realign gate posts • fully guarding barrier mechanisms

ANNEX C – ALCRM RISK SCORE EXPLANATION

ALCRM provides an estimate of both the individual and collective risks at a level crossing.

The individual and collective risk is expressed in Fatalities and Weighted Injuries (FWI). The following values help to explain this:

- **1** = 1 fatality per year or 10 major injuries or 200 minor RIDDOR events or 1000 minor non-RIDDOR events
- **0.1** = 20 minor RIDDOR events or 100 minor non-RIDDOR events
- **0.005** = 5 minor non-RIDDOR events

INDIVIDUAL RISK

This is the annualised probability of fatality to a 'regular user'. *NOTE: A regular user is taken as a person making a daily return trip over the crossing; assumed 500 traverses per year.*

Individual risk:

- Applies only to crossing users. It is not used for train staff and passengers
- Does not increase with the number of users.
- Is presented as a simplified ranking:
    - Allocates individual risk into rankings A to M
      (A is highest, L is lowest, and M is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
    - Allows comparison of individual risk to average users across any crossings on the network

Individual Risk Ranking	Upper Value (Probability)	Lower Value (Probability)	Upper Value (FWI)	Lower Value (FW)
A	1 in 1	Greater than 1 in 1,000	1	0.001000000
B	1 in 1,000	1 in 5,000	0.001000000	0.000200000
C	1 in 5,000	1 in 25,000	0.000200000	0.000040000
D	1 in 25,000	1 in 125,000	0.000040000	0.000008000
E	1 in 125,000	1 in 250,000	0.000008000	0.000004000
F	1 in 250,000	1 in 500,000	0.000004000	0.000002000
G	1 in 500,000	1 in 1,000,000	0.000002000	0.000001000
H	1 in 1,000,000	1 in 2,000,000	0.000001000	0.000000500
I	1 in 2,000,000	1 in 4,000,000	0.000000500	0.000000250
J	1 in 4,000,000	1 in 10,000,000	0.000000250	0.000000100
K	1 in 10,000,000	1 in 20,000,000	0.000000100	0.000000050
L	Less than 1 in 20,000,000	Greater than 0	0.000000050	Greater than 0
M	0	0	0	0

COLLECTIVE RISK
This is the total risk for the crossing and includes the risk to users (pedestrian and vehicle), train staff and passengers.

Collective risk:

- Is presented as a simplified ranking:
  - Allocates collective risk into rankings 1 to 13
    (1 is highest, 12 is lowest, and 13 is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Can easily compare collective risk between any two crossings on the network

Collective Risk Ranking	Upper Value (FWI)	Lower Value (FW)
1	Theoretically infinite	Greater than 5.00E-02
2	0.050000000	0.010000000
3	0.010000000	0.005000000
4	0.005000000	0.001000000
5	0.001000000	0.000500000
6	0.000500000	0.000100000
7	0.000100000	0.000050000
8	0.000050000	0.000010000
9	0.000010000	0.000005000
10	0.000005000	0.000001000
11	0.000001000	0.000000500
12	0.0000005	0
13	0.00E+00	0.00E+00

NARRATIVE RISK ASSESSMENT – PASSIVE TEMPLATE FINAL v2.0

PASSIVE LEVEL CROSSING RISK ASSESSMENT

1. LEVEL CROSSING OVERVIEW AND ENVIRONMENT

1.1 LEVEL CROSSING OVERVIEW

This is a risk assessment for Tarring Neville No.2 level crossing.

Crossing details	
Name	Tarring Neville No.2
Type	UWCT
Crossing status	Occupation
Overall crossing status	Open
Route name	Sussex
Engineers Line Reference	STS, 54m, 71ch
OS grid reference	TQ439034
Number of lines crossed	2
Line speed (mph)	70
Electrification	Yes,
Signal box	Newhaven town

Risk assessment details	
Name of assessor	[redacted]
Post	Level Crossing Manager
Date completed	23/05/2016
Next due date	23/08/2018
Email address	[redacted]@networkrail.co.uk
Phone number	[redacted]

ALCRM risk score	
Individual risk	B
Collective risk	8
FWI	0.000014389

1.2 INFORMATION SOURCES

The table below shows the stakeholder consultation that was undertaken as part of the risk assessment.

Consulted	Attended site
Authorised user	No

Stakeholder consultation and attendance notes:

The reference sources used during the risk assessment included:

- Occurrence log, Census, Other (Sussex events log), CCIL, GI Portal, SMIS.

1.3 ENVIRONMENT

Up side crossing approach **Down side crossing approach**

Tarring Neville No.2 level crossing provides field to field access.

It is an occupation level crossing. There are no stations visible at the level crossing.

At Tarring Neville No.2 level crossing the orientation of the road/path from the north is 40°; the orientation of the railway from the north to the up line in the up direction is 320°. Low horizon can result in sun glare; sun glare is not a known issue.

There are no planned or apparent developments near the crossing which may lead to a change or increase in use or risk.

Site visit general observations:

2. LEVEL CROSSING USAGE

2.1 RAIL

The train service over Tarring Neville No.2 level crossing consists of passenger and freight trains. There are 90 trains per day. The highest permissible line speed of trains is 70mph. Trains are timetabled to run for 20 hours per day.

Assessor's notes:

2.2 USER CENSUS DATA

An estimated census has been used. The census was estimated on 23/05/2016 by [redacted] The census applies to 100% of the year.

The census taken on the day is as follows:

Cars	0
Vans / small lorries	0
Buses	0
HGVs	0
Pedal / motor cyclists	0
Pedestrians	0
Tractors / farm vehicles	1
Horses / riders	0
Animals on the hoof	0

Available information indicates that the crossing does not have a high proportion of vulnerable users.

Vulnerable user observations:

Available information indicates that the crossing does not have a high number of irregular users.

Irregular user observations:

Information gathered indicates that Tarring Neville No.2 level crossing does not have a high number of users during the night or at dusk.

Site visit night / dusk user observations:

Assessor's general census notes:

Nothing found on camera which was in situ for 4 days, 23-26/05/16. Spoken with tenant farmer and he traverses approx. 4 times a year with a 4x4. The other 2 AU's Glynde estates and the EA cross approx. once a year but have not used the crossing in the last 12 months. Usage confirmed with signaller. Because no usage was found estimation has had to be used.

2.3 USER CENSUS RESULTS

ALCRM calculates usage of the crossing to be 0 road vehicles and 0 pedestrians and cyclists per day.

3. RISK OF USE

3.1 SIGHTING AND TRAVERSE

At Tarring Neville No.2 level crossing, the decision point and traverse lengths are calculated as:

	Decision point (m)	Traverse length (m)	Measured from
Up side	3	9.9	Just inside wing fencing
Down side	3	9.9	Just inside wing fencing

Timber decking is provided over the level crossing. The decking is considered to be wide enough for all users of the crossing. It is fitted with a non slip surface.

The traverse times are calculated as:

	Traverse time (s)
Pedestrians	9
Vehicles	14

The current census has not identified a high proportion of vulnerable users. Therefore, the pedestrian traverse time has not been increased.

Assessor's traverse time notes:

Sighting distance traverse calculator used

Sighting was measured by the following means:

- Using Range Finder

Sighting, measured in metres, at Tarring Neville No.2 level crossing is recorded as:

All distances are recorded in metres	Minimum sighting distance required	Measured sighting distance	Sighting distance measured to	Is sighting compliant?	If deficient, is sighting distance mitigated?	Notes on deficient sighting time mitigations
Up side looking toward up direction train approach	435	200	1st sight train	No	YES	
Up side looking toward down direction train approach	435	320	Just beyond TN1 1st sight train	No	YES	Telephones
Down side looking toward up direction train approach	435	457	Back of csr board	Yes	YES	Telephones
Down side looking toward down direction train approach	435	424	Beyond TN1	No	YES	Telephones

Sighting restrictions are recorded as follows:

	Up Direction	Down Direction
Nothing; vanishing point	NO	NO
Track curvature	YES	YES
Permanent structure (building/wall etc)	NO	YES
Signage or crossing equipment	NO	NO
Vegetation	NO	NO
Bad weather on the day of visit	NO	NO
Other	NO	NO

There are known obstructions that could make it difficult for users to see approaching trains. There are no known issues with foliage, fog or other issues that might impair visibility of the crossing, crossing equipment or approaching trains.

Actions to improve sighting have not been identified.

Assessor's improving sighting and decision point notes

Unable to move TP hut

The visual evaluation of the vertical profile of the road indicates that it does not create a risk of vehicles getting stuck on the crossing.

Assessor's risk of vehicle getting stuck notes:

Assessor's general sighting and traverse notes:

3.2 EVALUATION OF MITIGATIONS

Tarring Neville No.2 level crossing is provided with telephones.

	Comments
Telephone visibility and clarity of instructional signage	Visibility of telephones and signage is good.
Telephone usage	
Telephone discipline	Users are ALWAYS known to use the telephone to ask for permission to cross. The level of telephone usage has been confirmed with the controlling signal box
Long signal section *(Is the Signaller able to determine where trains are with reasonable accuracy; do users have to wait an excessive time for permission to cross?)*	
Signal panel ergonomics	

Assessor's notes on telephone suitability as a risk control

3.3 CROSSING APPROACHES

The signs at Tarring Neville No.2 level crossing are located on the direct route a user would take over the level crossing, they are not positioned so that they are clearly visible to users taking a direct route over the level crossing. The visibility of the signs is reduced at night or at dusk.

The road surface (including gradient is present) at Tarring Neville No.2 level crossing could impact on the ability of a vehicle to stop at the level crossing.

There are no known issues with ice, mud, loose material or flood water.

Assessor's notes:

There are no adjacent sources of light or noise that could affect a users' ability to see or hear approaching trains.

Assessor's general crossing approach notes:

Low levels of ambient lighting available. Off track have been asked to move the signage above the fence line as obscured on foot and in lower vehicles.

3.4 AT THE CROSSING – ANOTHER TRAIN COMING RISK

Trains are occasionally known to pass each other at this crossing.

Assessor's another train coming notes:

[Free text]

3.5 INCIDENT HISTORY

A level crossing safety event has not been known to occur at Tarring Neville No.2 level crossing in the last twelve months.

Assessor's incident history notes:

040614 cow knocked phone off hook

Telephone discipline

See section 3.2

Gate discipline (including barriers)

Reports indicate that the gates are ALWAYS CLOSED.

Assessor's notes on operational disruptions:

4. ALCRM CALCULATED RISK

Tarring Neville No.2 ***level crossing ALCRM results***

Key risk drivers: ALCRM calculates that the following key risk drivers influence the risk at this crossing:

- Frequent trains
- Low sighting

Assessor's key risk drivers notes

[Free text]

Safety risk				
Compared to other crossings the safety risk for this crossing is	**Individual risk**		**Collective risk**	
	B		**8**	
	Individual risk (fraction)	**Individual risk (numeric)**		
Car	1 in 4681	0.000213615	0.000006733	
Van / small lorries	0	0	0	
HGV	0	0	0	
Bus	0	0	0	
Tractor / farm vehicle	0	0	0	
Cyclist / Motor cyclist	0	0	0	
Pedestrian	1 in 4274	0.000233964	0.000005902	
				Derailment contribution
Passengers			0.000000163	97.29688507
Staff			0.000001591	1.162722428
Total			0.000014389	1.230526702
Collision frequencies	**Train / user**	**User equipment**	**Other**	
Vehicle	0.000011315	0.000036371	0	
Pedestrian	0.0000072	0	0.000002535	
Collision risk	**Train / user**	**User equipment**	**Other**	
Vehicle	0.000006733	0	0	
Pedestrian	0.000005846	0	0.000000056	

5. OPTION ASSESSMENT AND CONCLUSIONS

5.1 OPTIONS EVALUATED

The options evaluated to mitigate the risks at Tarring Neville No.2 crossing include:

Option	Term[1]	ALCRM risk score	ALCRM FWI	Safety Benefit	Cost	Benefit Cost Ratio	Status	Comments
Add yellow anti slip to further define the surface	long	B8	0.000013957				Complete	Defining surface for all users
Closure via diversion or give up of rights	long	M13	0				Complete	Closure via diversion but no suitable location and user not willing to give up legal rights

NOTES
Network Rail always evaluates the need for short[1] and long term risk control solutions. An example of level crossing risk management might be; a short term risk control of a temporary speed restriction with the long term solution being closure of the level crossing and its replacement with a bridge.
[1] Includes interim

CBA gives an indication of overall business benefit. It is used to support, not override, structured expert judgement when deciding which option(s) to progress. CBA might not be needed in all cases, e.g. standard maintenance tasks or low cost solutions (less than £5k).

The following CBA criteria are used as a support to decision making:

a. benefit to cost ratio is ≥ 1: positive safety and business benefit established;
b. benefit to cost ratio is between 0.99 and 0.5: reasonable safety and business benefit established where costs are not grossly disproportionate against the safety benefit; and
c. benefit to cost ratio is between 0.49 and 0.0: weak safety and business benefit established.

5.2 CONCLUSIONS

Assessor's notes:

Crossing Location

Tarring Neville No.2 is a user work crossing (UWCt) with telephones which is located on ELR STS at 54m 71ch.

The crossing is situated and accessed via fields only through a farmers gate which spurs off of the busy A26 Newhaven to Beddingham Road which if continued joins the A27 Eastbourne – Lewes road.

The land on the up and the down sides is farmed with grazing for sheep and cattle.

The crossing lies within the South Downs National Park.

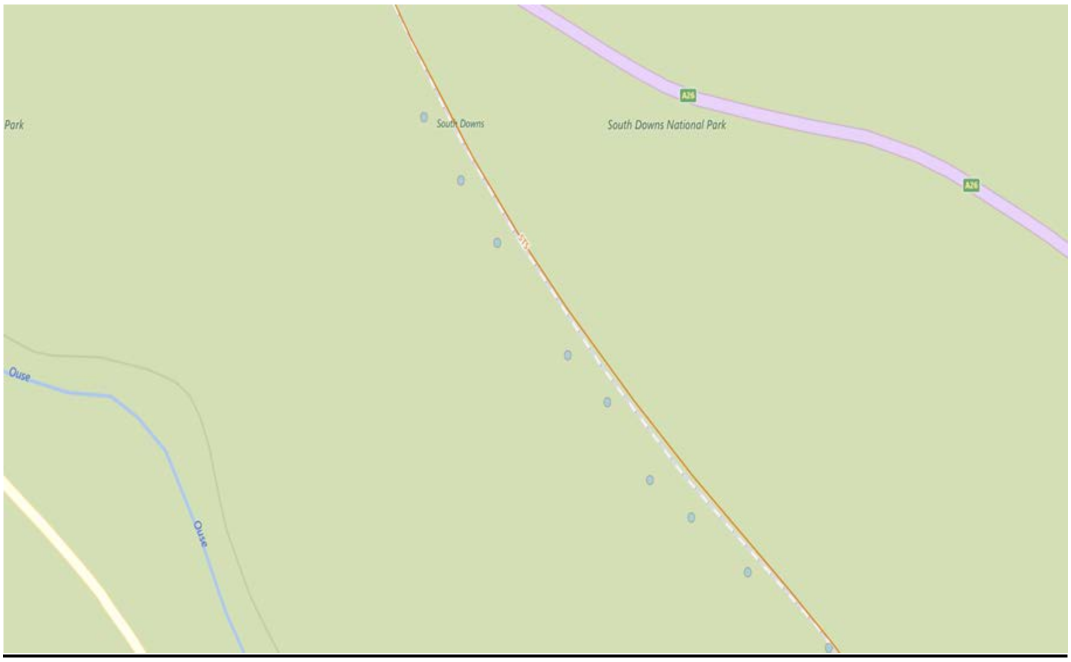
Piddenhoe TP hut is clearly visible in the down direction and Tarring Neville No.1 UWCt and Durham Farm UWCt is visible in the up direction.

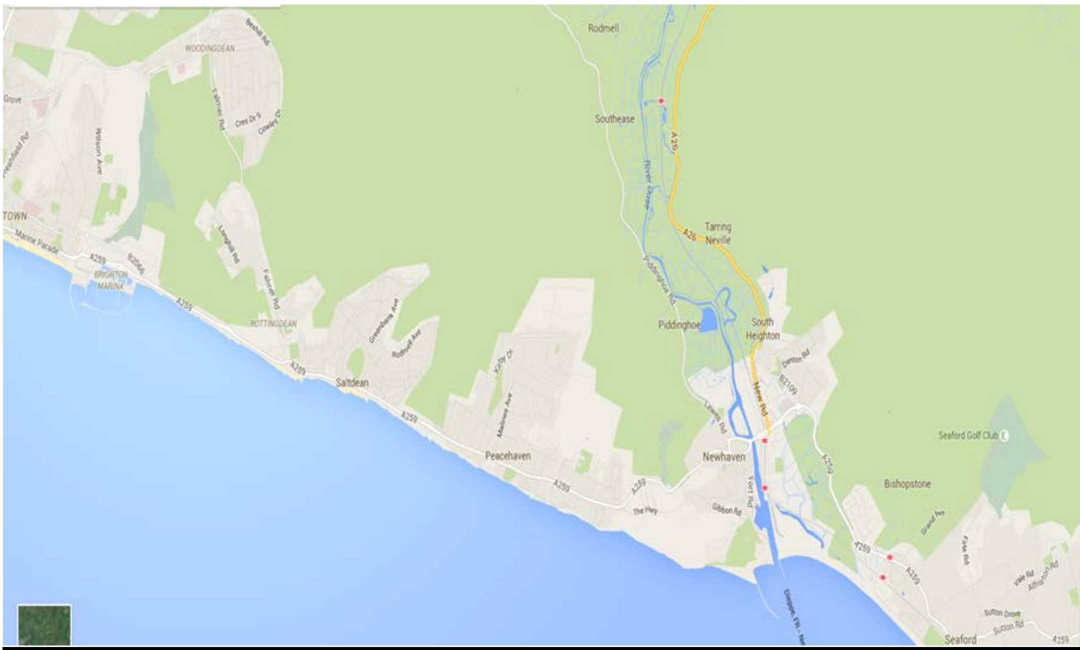
The incinerator is also visible in the down direction which burns waste for the immediate area up to Brighton. The freight "ash train" passes over the crossing 4 times a day collecting waste.

The Port of Newhaven is also close by and has a Cross Channel Ferry service that runs twice a day

The Seaford branch line is sometimes prone to winter fog and sea mist.

Maps of crossing location


South Downs
South Downs National Park
A26
Ouse
Park


Rodmell
Southease
River Ouse
A26
Tarring Neville
Piddinghoe
South Heighton
Newhaven
Seaford Golf Club
Bishopstone
Seaford
Peacehaven
Saltdean
ROTTINGDEAN
WOODINGDEAN
BRIGHTON MARINA
Marine Parade
A259

Crossing description

Tarring Neville No.2 is a UWCt which consists of a wooden deck crossing with a locked metal farm gate on either side of the railway secured with an abloy key which the users have a copy for. The gates open outwards away from the running rail of the railway.

The user rights for the crossing belong to the land owner, Glynde Estates, who allow access to long term tenant farmers and the Environment Agency who need access to the river bank on the up side of the crossing.

There is an up line and a down line and the maximum speed is 70mph in both directions.

The down side approach, once turned off of the A26, is from farmers' fields which are muddy and impassable in winter months when the ground is wet and boggy.

There is dense vegetation and ditches filled with water separating the fields.

Once through the railway boundary vehicle gates the approaches are of ballast, rough ground and grass.

There is no advance warning signage for the crossing until you are at the crossing.

The up and down side approach is of a field type which can get muddy and boggy in winter months.
Once through the railway boundary vehicle gates the approaches are of ballast, rough ground and grass.
Both approaches are steeped up to the crossing surface.

The crossing and boundary fences are made up of chain link and wooden posts which are all in good condition currently.

The decision point is 3m for vehicles.
The 3m point for vehicles is measured from the nearest running line back to a 3m distance.
Any pedestrians wishing to travel across on foot the decision point (DP) is 2m and also measured from the nearest running rail making the DP at the edge of the wing fencing.

The traverse length of the crossing for vehicles is 9m which is measured on the most direct

traverse route across the crossing.

There are telephones present, one either side which are direct connect and non-illuminated.

There is the normal compliant signage here for the UWC section instructing users to call the signaller for permission to cross with low, low, heavy loads or animals. Electrification and do not trespass signage is present for all users as is Samaritan signage.

Tarring Neville No.2 train track has an up and a down road and the maximum speed here is 70mph. The track is powered by conductor rail DC750.

Sighting is non-compliant for vehicles, which is calculated on the longest vehicle used to cross over with a 4x4 and with a speed of 70 mph on both up and down roads requiring a minimum of 435m.
The sighting is also non-compliant for pedestrians requiring a distance of 280m and agreement has been sought and signed for with users to call the signaller if traversing on foot for permission to cross via the telephones in situ.
Once a year the environment agency may cross with an excavator to dig out the river bank but a line block or holding of signals at danger between a gap in the train service is sought for this infrequent occurrence.

UP-UP 1st sight train 200
UP-DN just beyond TN1 – 1st sight train 320
DN-UP back of CSR board 457
DN-DN beyond TN1 424

The sighting is limited in both up and down directions by track curve and a solid building structure in the down direction on the up side.

The traverse, distance calculator was used to reach the traverse time required and the speed of 70mph taken:
70mph line speed x crossing length recorded 9.9m x = 14 seconds required crossing time and 435m minimum required sighting distance

There is no lighting in place and only low levels of ambient lighting exist from the nearby A26 road lights.

Trespass guarding is provided on both ends of the crossing at the required minimum distance of 2.6m which applies to all points on the crossing. The conductor rail is cut back further than the required minimum of 3m distance away from the crossing surface in both directions.

Up side looking across crossing

Down side looking across crossing

View from above of Tarring Neville 2

Crossing Usage

A 4 day census was taken with a squirrel camera, 23-26/05/16, it recorded 0 traverse during that time.
Having spoken with land owner he states he traverses approximately 4 times a year with a 4x4. The other 2 AU's Glynde Estates and the EA cross approximately once a year but have not used the crossing in the last 12 months. Usage confirmed with signaller. As no usage was found an estimation of “few” has had to be used within ALCRM to register otherwise the ALCRM records the crossing as closed if “0” is entered.
The EA traverse only when works are needed at the river bank for excavation.

There is no misuse recorded at this crossing other than 040614 where a cow knocked the phone from its cradle.

Crossing Risk

This is a planned risk assessment with an ALCRM risk score generated of B8 – Yellow with a FWI of 0.000014389.

The following options have been considered and assessed for risk reduction at this crossing:

1. **Add yellow anti slip to further define the surface**

This would further define the crossing surface for all users. This would generate an ALCRM score of B8 and a FWI score of 0.000013957.

2. **Closure via diversion or give up user rights**

This would permanently close the crossing and generate an ALCRM score of M13 and a FWI score of 0.

Conclusion

1. **Add yellow anti slip to further define the surface**

This would further define the level crossing surface for all users but current use does not require this to be implemented but can be looked at again if required.

2. **Closure via diversion or give up user rights**

Closure via diversion or giving up the user rights is currently not an option. There is no nearby suitable diversion given no other access roads and there are ditches that separate the fields on both sides. The users will not give up rights either on this basis.

In conclusion this crossing will remain “as is” and will be re assessed at next due risk assessment or before should the need occur.

ANNEX A – ADDITIONAL PHOTOGRAPHS

Description:

Description:

Description:

Description:

Description:

Description:

ANNEX B – HAZARD IDENTIFICATION AND RISK CONTROLS

The table below is intended for use by risk assessors when identifying hazards and risk control solutions. It is not an exhaustive list or presented in a hierarchical order.

	Hazard	Control
Road vehicle and train collision risk	Examples at the crossing include: • insufficient sighting and / or train warning for all vehicle types; known to be exacerbated by the driving position, e.g. tractor • level crossing equipment and signage is not conspicuous or optimally positioned • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • high volume of unfamiliar users, e.g. irregular visitors, migrant workers • known user complacency leading to high levels of indiscipline, e.g. failure to use telephone, gates left open • type of vehicle unsuitable for crossing; - large, low, slow making access or egress difficult and / or vehicle is too heavy for crossing surface - risk of grounding and / or the severity of the gradient adversely affects ability to traverse • poor decking panel alignment / position on skewed crossing • where telephones are provided, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • high chance of a second train coming • high line speed and / or high frequency of trains • unsuitable crossing type for location, train service, line speed and vehicle types	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs • engaging with signalling engineers to optimise strike in times • upgrading of asset to a higher form of protection • downgrading of crossing by removing vehicle access rights • optimising sighting lines and / or providing enhanced user based warning system, e.g. MSL • re-profiling of crossing surface • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • widening access gates and / or improving the crossing surface construction material • realigning or installing additional decking panels to accommodate all vehicle types • implementing train speed restriction or providing crossing attendant
Pedestrian and train collision risk	Examples include: • insufficient sighting and / or train warning • ineffective whistle boards; warning inaudible, insufficient warning	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs

	Hazard	Control
	time provided, known high usage between 23:00 and 07:00 • high chance of a second train coming • high line speed and / or high frequency of trains • level crossing equipment and signage is not conspicuous or optimally positioned • location and position of level crossing gates mean that users have their backs to approaching trains when they access the level crossing, i.e. users are initially unsighted to trains approaching from their side of the crossing • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • surface condition or lack of decking contribute to slip trip risk • known high level of use during darkness • increased likelihood of user error, e.g. crossing is at station • free wicket gates might result in user error • high volume of unfamiliar users, e.g. irregular visitors / ramblers, equestrians • complacency leading to high levels of indiscipline, e.g. users are known to rely on knowledge of timetable • high level of use by vulnerable people • where telephones are provided i.e. bridleways, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • unsuitable crossing type for location, train service, line speed and user groups • high usage by cyclists • degree of skew over crossing increases traverse time and users' exposure to trains • crossing layout encourages users not to cross at the designed decision point; egress route unclear especially during darkness	• upgrading of asset to a higher form of protection • optimising sighting lines, e.g. de-vegetation programme, repositioning of equipment or removal of redundant railway assets • implementing train speed restriction or providing crossing attendant • providing enhanced user based warning system, e.g. MSL • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • installing guide fencing and / or handrails to encourage users to look for approaching trains, read signage or cross at the designed decision point • re-design of crossing approach so that users arrive at the crossing as close to a 90° angle as possible • installing lighting sources • engaging with signalling engineers to optimise strike in times • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • providing cyclist dismount signs and / or chicanes • straightening of crossing deck

	Hazard	Control
	schools, local amenities or other attractions are known to contribute towards user error	
Pedestrian and road vehicle collision risk	Examples include: • a single gate is provided for pedestrian and vehicle users where there is a high likelihood that both user groups will traverse at the same time • the position of pedestrian gate forces / encourages pedestrian users to traverse diagonally across the roadway • road / footpath inadequately separated; footpath not clearly defined • condition of footpath surface increases the likelihood of users slipping / tripping into the path of vehicles	Controls can include: • providing separate pedestrian gates • clearly defining the footpath; renew markings • positioning pedestrian gates on the same side of the crossing • improving footpath crossing surface so it is devoid of potholes, excessive flangeway gaps and is evenly laid • improving crossing surface, e.g. holdfast, strail, non-slip surface
Personal injury	Examples include: • skewed crossing with large flangeway gaps results in cyclist, mobility scooter, pushchair or wheelchair user being unseated • condition of footpath surface increases the likelihood of users slipping / tripping • degraded gate mechanism or level crossing equipment • barrier mechanism unguarded / inadequately protected	Controls can include: • improving fence lines • reducing flangeway gaps and straightening where possible • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • straighten / realign gate posts • fully guarding barrier mechanisms

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- Is presented as a simplified ranking:
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Individual Risk Ranking	Upper Value (Probability)	Lower Value (Probability)	Upper Value (FWI)	Lower Value (FW)
A	1 in 1	Greater than 1 in 1,000	1	0.001000000
B	1 in 1,000	1 in 5,000	0.001000000	0.000200000
C	1 in 5,000	1 in 25,000	0.000200000	0.000040000
D	1 in 25,000	1 in 125,000	0.000040000	0.000008000
E	1 in 125,000	1 in 250,000	0.000008000	0.000004000
F	1 in 250,000	1 in 500,000	0.000004000	0.000002000
G	1 in 500,000	1 in 1,000,000	0.000002000	0.000001000
H	1 in 1,000,000	1 in 2,000,000	0.000001000	0.000000500
I	1 in 2,000,000	1 in 4,000,000	0.000000500	0.000000250
J	1 in 4,000,000	1 in 10,000,000	0.000000250	0.000000100
K	1 in 10,000,000	1 in 20,000,000	0.000000100	0.000000050
L	Less than 1 in 20,000,000	Greater than 0	0.000000050	Greater than 0
M	0	0	0	0

COLLECTIVE RISK
This is the total risk for the crossing and includes the risk to users (pedestrian and vehicle), train staff and passengers.

Collective risk:

- Is presented as a simplified ranking:
  - Allocates collective risk into rankings 1 to 13
    (1 is highest, 12 is lowest, and 13 is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Can easily compare collective risk between any two crossings on the network

Collective Risk Ranking	Upper Value (FWI)	Lower Value (FW)
1	Theoretically infinite	Greater than 5.00E-02
2	0.050000000	0.010000000
3	0.010000000	0.005000000
4	0.005000000	0.001000000
5	0.001000000	0.000500000
6	0.000500000	0.000100000
7	0.000100000	0.000050000
8	0.000050000	0.000010000
9	0.000010000	0.000005000
10	0.000005000	0.000001000
11	0.000001000	0.000000500
12	0.0000005	0
13	0.00E+00	0.00E+00

NARRATIVE RISK ASSESSMENT – PASSIVE TEMPLATE FINAL v2.0

PASSIVE LEVEL CROSSING RISK ASSESSMENT

1. LEVEL CROSSING OVERVIEW AND ENVIRONMENT

1.1 LEVEL CROSSING OVERVIEW

This is a risk assessment for Tarring Neville No.1 level crossing.

Crossing details	
Name	Tarring Neville No.1
Type	UWCT
Crossing status	Occupation
Overall crossing status	Open
Route name	Sussex
Engineers Line Reference	STS, 54m, 56ch
OS grid reference	TQ436037
Number of lines crossed	2
Line speed (mph)	70
Electrification	Yes,
Signal box	Newhaven Town

Risk assessment details	
Name of assessor	[redacted]
Post	Level Crossing Manager
Date completed	25/05/2016
Next due date	25/08/2018
Email address	[redacted]@networkrail.co.uk
Phone number	[redacted]

ALCRM risk score	
Individual risk	C
Collective risk	6
FWI	0.000132459

1.2 INFORMATION SOURCES

The table below shows the stakeholder consultation that was undertaken as part of the risk assessment.

Consulted	Attended site
Authorised user	No

Stakeholder consultation and attendance notes:

The reference sources used during the risk assessment included:

- Occurrence log, Census, Other (Sussex events log), CCIL, GI Portal, SMIS.

1.3 ENVIRONMENT

Up side crossing approach **Down side crossing approach**

Tarring Neville No.1 level crossing provides track to field access.

It is an occupation level crossing. There are no stations visible at the level crossing.

At Tarring Neville No.1 level crossing the orientation of the road/path from the north is 20°; the orientation of the railway from the north to the up line in the up direction is 320°. Low horizon can result in sun glare; sun glare is not a known issue.

There are no planned or apparent developments near the crossing which may lead to a change or increase in use or risk.

Site visit general observations:

2. LEVEL CROSSING USAGE

2.1 RAIL

The train service over Tarring Neville No.1 level crossing consists of passenger and freight trains. There are 90 trains per day. The highest permissible line speed of trains is 70mph. Trains are timetabled to run for 20 hours per day.

Assessor's notes:

2.2 USER CENSUS DATA

A 24 hour census was carried out on 23/05/2016 by [redacted] The census applies to 100% of the year.

The census taken on the day is as follows:

Cars	0
Vans / small lorries	0
Buses	0
HGVs	0
Pedal / motor cyclists	0
Pedestrians	0
Tractors / farm vehicles	1
Horses / riders	0
Animals on the hoof	0

Available information indicates that the crossing does not have a high proportion of vulnerable users.

Vulnerable user observations:

Available information indicates that the crossing does not have a high number of irregular users.

Irregular user observations:

Information gathered indicates that Tarring Neville No.1 level crossing does not have a high number of users during the night or at dusk.

Site visit night / dusk user observations:

Assessor's general census notes:

24 hour with a squirrel camera shows 1 traverse with a quad bike - confirmed usage with user stating quad bike traverse daily but goes in at Parsons UWC further down the line and comes out at TN1. This user also takes a 4x4 occasionally and a tractor trailer to transport animals and feed on occasion. For this reason the longest traverse time has been taken for tractor trailer. The other users Glynde Estates and EA only cross once a year on average. Confirmed usage with signaller.

2.3 USER CENSUS RESULTS

ALCRM calculates usage of the crossing to be 1 road vehicles and 0 pedestrians and cyclists per day.

3. RISK OF USE

3.1 SIGHTING AND TRAVERSE

At Tarring Neville No.1 level crossing, the decision point and traverse lengths are calculated as:

	Decision point (m)	Traverse length (m)	Measured from
Up side	3	11	Edge of Wing fencing
Down side	3	11	Edge of wing fencing

Timber decking is provided over the level crossing. The decking is considered to be wide enough for all users of the crossing. It is fitted with a non slip surface.

The traverse times are calculated as:

	Traverse time (s)
Pedestrians	10
Vehicles	33

The current census has not identified a high proportion of vulnerable users. Therefore, the pedestrian traverse time has not been increased.

Assessor's traverse time notes:

Sighting distance traverse calculator used

Sighting was measured by the following means:

- Using known references
- Using Range Finder

Sighting, measured in metres, at Tarring Neville No.1 level crossing is recorded as:

All distances are recorded in metres	Minimum sighting distance required	Measured sighting distance	Sighting distance measured to	Is sighting compliant?	If deficient, is sighting distance mitigated?	Notes on deficient sighting time mitigations
Up side looking toward up direction train approach	1026	500	Piddenhoe TP hut	No	YES	Telephones
Up side looking toward down direction train approach	1026	390	Track curve	No	YES	Telephones
Down side looking toward up direction train approach	1026	603	Track curve	No	YES	Telephones
Down side looking toward down direction train approach	1026	294	Track curve	No	YES	Telephones

Sighting restrictions are recorded as follows:

	Up Direction	Down Direction
Nothing; vanishing point	NO	NO
Track curvature	YES	YES
Permanent structure (building/wall etc)	NO	NO
Signage or crossing equipment	NO	NO
Vegetation	NO	NO
Bad weather on the day of visit	NO	NO
Other	NO	NO

There are known obstructions that could make it difficult for users to see approaching trains. There are no known issues with foliage, fog or other issues that might impair visibility of the crossing, crossing equipment or approaching trains.

Actions to improve sighting have not been identified.

Assessor's improving sighting and decision point notes

TP hut in the down direction limits sighting but unable to move this.

The visual evaluation of the vertical profile of the road indicates that it does not create a risk of vehicles getting stuck on the crossing.

Assessor's risk of vehicle getting stuck notes:

Assessor's general sighting and traverse notes:

3.2 EVALUATION OF MITIGATIONS

Tarring Neville No.1 level crossing is provided with telephones.

	Comments
Telephone visibility and clarity of instructional signage	Good visibility of all signage etc
Telephone usage	
Telephone discipline	Users are ALWAYS known to use the telephone to ask for permission to cross. The level of telephone usage has been confirmed with the controlling signal box
Long signal section *(Is the Signaller able to determine where trains are with reasonable accuracy; do users have to wait an excessive time for permission to cross?)*	
Signal panel ergonomics	

Assessor's notes on telephone suitability as a risk control

Telephones are a suitable risk mitigation for this location and level of usage

3.3 CROSSING APPROACHES

The signs at Tarring Neville No.1 level crossing are located on the direct route a user would take over the level crossing. They are positioned so that they are clearly visible to users taking a direct route over the level crossing. The visibility of the signs is reduced at night or at dusk.

The road surface (including gradient is present) at Tarring Neville No.1 level crossing could impact on the ability of a vehicle to stop at the level crossing.

There are no known issues with ice, mud, loose material or flood water.

Assessor's notes:

There are no adjacent sources of light or noise that could affect a users' ability to see or hear approaching trains.

Assessor's general crossing approach notes:

Low levels of ambient lighting for visibility of signage

3.4 AT THE CROSSING – ANOTHER TRAIN COMING RISK

Trains are occasionally known to pass each other at this crossing.

Assessor's another train coming notes:

[Free text]

3.5 INCIDENT HISTORY

A level crossing safety event has not been known to occur at Tarring Neville No.1 level crossing in the last twelve months.

Assessor's incident history notes:

290611 user failed to call back

Telephone discipline

See section 3.2

Gate discipline (including barriers)

Reports indicate that the gates are ALWAYS CLOSED.

Assessor's notes on operational disruptions:

4. ALCRM CALCULATED RISK

Tarring Neville No.1 ***level crossing ALCRM results***

Key risk drivers: ALCRM calculates that the following key risk drivers influence the risk at this crossing:

- Frequent trains
- Low sighting

Assessor's key risk drivers notes

[Free text]

Safety risk				
Compared to other crossings the safety risk for this crossing is	**Individual risk**		**Collective risk**	
	C		**6**	
	Individual risk (fraction)	**Individual risk (numeric)**		
Car	0	0	0	
Van / small lorries	0	0	0	
HGV	0	0	0	
Bus	0	0	0	
Tractor / farm vehicle	1 in 10538	0.000094886	0.000067411	
Cyclist / Motor cyclist	0	0	0	
Pedestrian	0	0	0	
				Derailment contribution
Passengers			0.000037957	76.059236678
Staff			0.000027091	12.434189095
Total			0.000132459	24.338235125
Collision frequencies	**Train / user**	**User equipment**	**Other**	
Vehicle	0.000343936	0.001105496	0	
Pedestrian	0.000019168	0	0.000022011	
Collision risk	**Train / user**	**User equipment**	**Other**	
Vehicle	0.000067411	0	0	
Pedestrian	0	0	0	

5. OPTION ASSESSMENT AND CONCLUSIONS

5.1 OPTIONS EVALUATED

The options evaluated to mitigate the risks at Tarring Neville No.1 crossing include:

Option	Term[1]	ALCRM risk score	ALCRM FWI	Safety Benefit	Cost	Benefit Cost Ratio	Status	Comments
Widen crossing for larger tractor	long	C6	0.000112591				complete	This is not a problem currently unless farmer decides to upgrade tractor
Straighten Skew	long	C6	0.000125836				complete	This could alleviate issues with approach for larger vehicles and reduce the traverse time for all users
Add yellow anti slip to further define the surface	long	C6	0.000128486				complete	Defining surface for all users
Close via diversion or give up rights	Long	M13	0				complete	Closure via diversion but no suitable location

NOTES
Network Rail always evaluates the need for short[1] and long term risk control solutions. An example of level crossing risk management might be; a short term risk control of a temporary speed restriction with the long term solution being closure of the level crossing and its replacement with a bridge.
[1] Includes interim

CBA gives an indication of overall business benefit. It is used to support, not override, structured expert judgement when deciding which option(s) to progress. CBA might not be needed in all cases, e.g. standard maintenance tasks or low cost solutions (less than £5k).

The following CBA criteria are used as a support to decision making:

a. benefit to cost ratio is ≥ 1: positive safety and business benefit established;

b. benefit to cost ratio is between 0.99 and 0.5: reasonable safety and business benefit established where costs are not grossly disproportionate against the safety benefit; and
c. benefit to cost ratio is between 0.49 and 0.0: weak safety and business benefit established.

5.2 CONCLUSIONS

Assessor's notes:

Crossing Location

Tarring Neville No.1 is a user work crossing (UWCt) with telephones which is located on ELR STS at 55m 56ch.

The crossing is situated and accessed via a private unnamed, unmade up track which spurs off of the busy A26 Newhaven to Beddingham Road where it joins the A27 Eastbourne – Lewes.

The land on the up and the down sides is farmed with grazing for sheep and cattle.

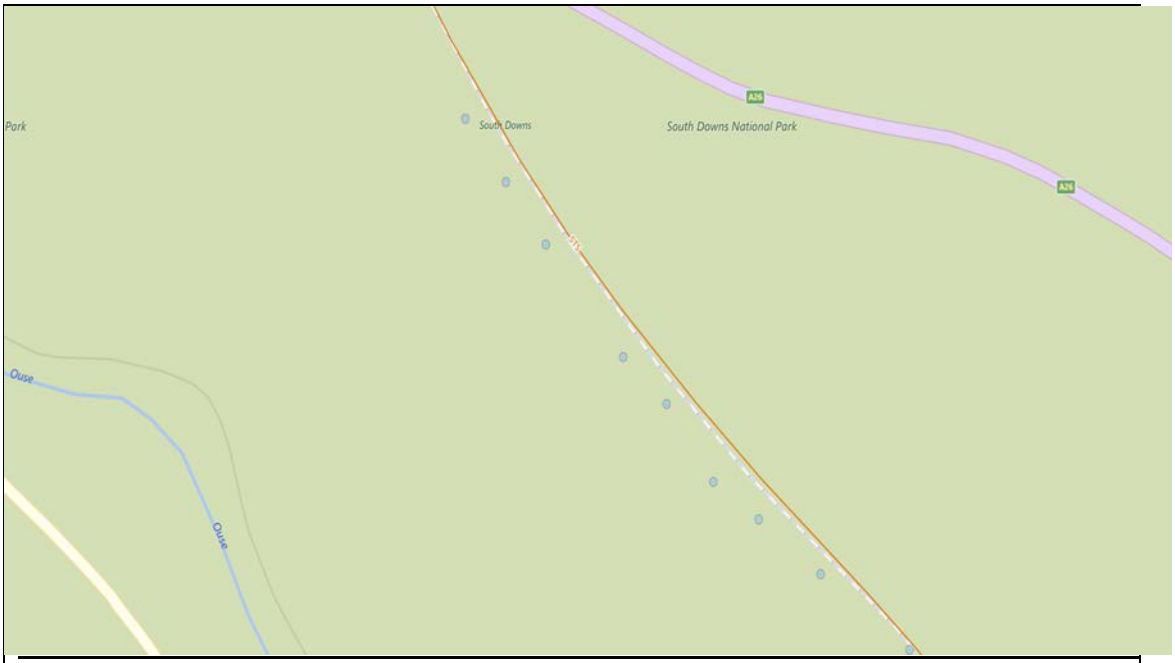
The crossing lies within the South Downs National Park.

Tarring Neville No.2 UWCt and Piddenhoe TP hut is clearly visible in the down direction and Durham Farm UWCt is visible in the up direction.

The incinerator is visible in the down direction which burns waste for the immediate area up to Brighton. The freight "ash train" passes over the crossing 4 times a day collecting waste.

The Port of Newhaven is also close by and has a Cross Channel Ferry service that runs twice a day

The Seaford branch line is sometimes prone to winter fog and sea mist.



Crossing description

Tarring Neville No.1 is a UWCt which consists of a wooden deck crossing with a locked metal farm gate on either side of the railway secured with an abloy key which the users have a copy for. The gates open outwards away from the running rail of the railway.

The user rights for the crossing belong to the land owner, Glynde Estates, who allow access to long term tenant farmers and the Environment Agency who need access to the river bank on the up side of the crossing.

There is an up line and a down line and the maximum speed is 70mph in both directions.

The down side approach, once turned off of the A26, is from an unnamed, narrow, private track which consists of a rough mud and ballasted surface with no paved areas for pedestrians to walk upon, The track is deeply rutted from farm tyres and is prone to mud and

water in winter months making access for normal vehicles difficult. The track is only wide enough for one vehicle and there is no turning room to come back so the user must either reverse up or reverse back the entire length of the track. There are ditches and dense vegetation either side of the track.

Once through the railway boundary vehicle gates the approaches are of ballast, rough ground and grass.

There is no advance warning signage for the crossing until you are at the crossing.

The up side approach is of a field type which can get muddy and boggy in winter months. Once through the railway boundary vehicle gates the approaches are of ballast, rough ground and grass.

The crossing and boundary fences are made up of chain link and wooden posts which are all in good condition currently.

The decision point is 3m for vehicles.
The 3m point for vehicles is measured from the nearest running line back to a 3m distance. Any pedestrians wishing to travel across on foot the decision point (DP) is 2m and also measured from the nearest running rail making the DP at the edge of the wing fencing.

The traverse length of the crossing for vehicles is 11m which is measured on the skew angle of the crossing on the most direct traverse route.

There are telephones present, one either side which are direct connect and non-illuminated..

There is the normal compliant signage here for the UWC section instructing users to call the signaller for permission to cross with low, low, heavy loads or animals. Electrification and do not trespass signage is present for all users as is Samaritan signage.

Tarring Neville No.1 train track has an up and a down road and the maximum speed here is 70mph. The track is powered by conductor rail DC750.

Sighting is non-compliant for vehicles, which is calculated on the longest vehicle used to cross over, tractor trailer, with a speed of 70 mph on both up and down roads requiring a minimum of 1026m.
The sighting is compliant for pedestrians requiring a distance of 311m.

UP-UP beyond Piddenhoe TP hut 518
UP-DN track curve 372
DN-UP track curve 603
DN-DN track curve 294

The sighting is limited in both up and down directions by track curve.

The traverse, distance calculator was used to reach the traverse time required and the speed of 70mph taken:
70mph line speed x crossing length recorded 11m x = 33 seconds required crossing time and 1026m minimum required sighting distance

There is no lighting in place and only low levels of ambient lighting exist from the nearby A26 road lights.

Trespass guarding is provided on both ends of the crossing at the required minimum distance of 2.6m which applies to all points on the crossing. The conductor rail is cut back further than the required minimum of 3m distance away from the crossing surface in both directions.

Upside looking across crossing

Down side looking across crossing

Crossing Usage

A 24hr census was taken with a squirrel camera and recorded 1 traverse during that time, a tenant farmer coming back (he entered via another crossing.
This particular tenant farmer is known to cross over once every day mostly with a quad bike but can be a tractor trailer when delivering feed to the sheep.

The EA traverse only when works are needed at the river bank by means of excavation and this is estimated to be once a year. The same frequency is known for the land owner, Glynde Estates and their Land Agent.

Crossing Risk

This is a planned risk assessment with an ALCRM risk score generated of C6 – Yellow with a FWI of. 0.000132459.

The following options have been considered and assessed for risk reduction at this crossing:

1. **Widen crossing for larger tractor**

This would accommodate a larger tractor which the users may buy in the future, they have commented in the past that the skew makes it more difficult to accommodate their current machinery but have not mentioned this for a while when asked for feedback. This would generate an ALCRM score of C6 and a FWI score of 0.000112591.

1. **Straighten Skew**

This would alleviate a past comment about occasional difficulty accommodating tractors etc. This would also reduce the traverse time if the crossing was straightened reducing the required minimum sighting further down. This would generate an ALCRM score of C6 and a FWI score of 0.000125836**.**

2. **Add yellow anti slip to further define the surface**

This would further define the crossing surface for all users. This would generate an ALCRM score of C6 and a FWI score of 0.000128486.

3. **Closure via diversion or give up user rights**

This would permanently close the crossing and generate an ALCRM score of M13 and a FWI score of 0.

Conclusion

1. **Widen crossing for larger tractor**

This option is currently not financially viable as tractors are still able to traverse given their current size. If possibility of tractor being upgraded in size this option will be revisited but straightening the skew may be the first option and resolve the issue if required.

2. **Straighten Skew**

This may alleviate the tractor size issue if required and would reduce the required sighting time as the traverse time would be shorter. Again, this option is a possibility should it be required in the future. The NLCT were looking at crossings with a skew for straightening and Tarring Neville No.1 was submitted to the national list.

3. **Add yellow anti slip to further define the surface**

This would further define the level crossing surface for all users but current use does not require this to be implemented but can be looked at again if required.

4. **Closure via diversion or give up user rights**

Closure via diversion or giving up the user rights is currently not an option. There is no nearby suitable diversion given no other access roads and the ditches that separate the fields on both sides. The user will not give up rights either on this basis.

In conclusion this crossing will remain “as is” and will be re assessed at next due risk assessment or before should the need occur.

ANNEX A – ADDITIONAL PHOTOGRAPHS

Description:

Description:

Description:

Description:

Description:

Description:

ANNEX B – HAZARD IDENTIFICATION AND RISK CONTROLS

The table below is intended for use by risk assessors when identifying hazards and risk control solutions. It is not an exhaustive list or presented in a hierarchical order.

	Hazard	Control
Road vehicle and train collision risk	Examples at the crossing include: • insufficient sighting and / or train warning for all vehicle types; known to be exacerbated by the driving position, e.g. tractor • level crossing equipment and signage is not conspicuous or optimally positioned • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • high volume of unfamiliar users, e.g. irregular visitors, migrant workers • known user complacency leading to high levels of indiscipline, e.g. failure to use telephone, gates left open • type of vehicle unsuitable for crossing; - large, low, slow making access or egress difficult and / or vehicle is too heavy for crossing surface - risk of grounding and / or the severity of the gradient adversely affects ability to traverse • poor decking panel alignment / position on skewed crossing • where telephones are provided, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • high chance of a second train coming • high line speed and / or high frequency of trains • unsuitable crossing type for location, train service, line speed and vehicle types	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs • engaging with signalling engineers to optimise strike in times • upgrading of asset to a higher form of protection • downgrading of crossing by removing vehicle access rights • optimising sighting lines and / or providing enhanced user based warning system, e.g. MSL • re-profiling of crossing surface • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • widening access gates and / or improving the crossing surface construction material • realigning or installing additional decking panels to accommodate all vehicle types • implementing train speed restriction or providing crossing attendant
Pedestrian and train collision risk	Examples include: • insufficient sighting and / or train warning • ineffective whistle boards; warning inaudible, insufficient warning	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs

	Hazard	Control
	time provided, known high usage between 23:00 and 07:00 • high chance of a second train coming • high line speed and / or high frequency of trains • level crossing equipment and signage is not conspicuous or optimally positioned • location and position of level crossing gates mean that users have their backs to approaching trains when they access the level crossing, i.e. users are initially unsighted to trains approaching from their side of the crossing • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • surface condition or lack of decking contribute to slip trip risk • known high level of use during darkness • increased likelihood of user error, e.g. crossing is at station • free wicket gates might result in user error • high volume of unfamiliar users, e.g. irregular visitors / ramblers, equestrians • complacency leading to high levels of indiscipline, e.g. users are known to rely on knowledge of timetable • high level of use by vulnerable people • where telephones are provided i.e. bridleways, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • unsuitable crossing type for location, train service, line speed and user groups • high usage by cyclists • degree of skew over crossing increases traverse time and users' exposure to trains • crossing layout encourages users not to cross at the designed decision point; egress route unclear especially during darkness	• upgrading of asset to a higher form of protection • optimising sighting lines, e.g. de-vegetation programme, repositioning of equipment or removal of redundant railway assets • implementing train speed restriction or providing crossing attendant • providing enhanced user based warning system, e.g. MSL • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • installing guide fencing and / or handrails to encourage users to look for approaching trains, read signage or cross at the designed decision point • re-design of crossing approach so that users arrive at the crossing as close to a 90° angle as possible • installing lighting sources • engaging with signalling engineers to optimise strike in times • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • providing cyclist dismount signs and / or chicanes • straightening of crossing deck

	Hazard	Control
	schools, local amenities or other attractions are known to contribute towards user error	
Pedestrian and road vehicle collision risk	Examples include: • a single gate is provided for pedestrian and vehicle users where there is a high likelihood that both user groups will traverse at the same time • the position of pedestrian gate forces / encourages pedestrian users to traverse diagonally across the roadway • road / footpath inadequately separated; footpath not clearly defined • condition of footpath surface increases the likelihood of users slipping / tripping into the path of vehicles	Controls can include: • providing separate pedestrian gates • clearly defining the footpath; renew markings • positioning pedestrian gates on the same side of the crossing • improving footpath crossing surface so it is devoid of potholes, excessive flangeway gaps and is evenly laid • improving crossing surface, e.g. holdfast, strail, non-slip surface
Personal injury	Examples include: • skewed crossing with large flangeway gaps results in cyclist, mobility scooter, pushchair or wheelchair user being unseated • condition of footpath surface increases the likelihood of users slipping / tripping • degraded gate mechanism or level crossing equipment • barrier mechanism unguarded / inadequately protected	Controls can include: • improving fence lines • reducing flangeway gaps and straightening where possible • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • straighten / realign gate posts • fully guarding barrier mechanisms

ANNEX C – ALCRM RISK SCORE EXPLANATION

ALCRM provides an estimate of both the individual and collective risks at a level crossing.

The individual and collective risk is expressed in Fatalities and Weighted Injuries (FWI). The following values help to explain this:

- **1** = 1 fatality per year or 10 major injuries or 200 minor RIDDOR events or 1000 minor non-RIDDOR events
- **0.1** = 20 minor RIDDOR events or 100 minor non-RIDDOR events
- **0.005** = 5 minor non-RIDDOR events

INDIVIDUAL RISK

This is the annualised probability of fatality to a 'regular user'. *NOTE: A regular user is taken as a person making a daily return trip over the crossing; assumed 500 traverses per year.*

Individual risk:

- Applies only to crossing users. It is not used for train staff and passengers
- Does not increase with the number of users.
- Is presented as a simplified ranking:
    - Allocates individual risk into rankings A to M
      (A is highest, L is lowest, and M is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
    - Allows comparison of individual risk to average users across any crossings on the network

Individual Risk Ranking	Upper Value (Probability)	Lower Value (Probability)	Upper Value (FWI)	Lower Value (FW)
A	1 in 1	Greater than 1 in 1,000	1	0.001000000
B	1 in 1,000	1 in 5,000	0.001000000	0.000200000
C	1 in 5,000	1 in 25,000	0.000200000	0.000040000
D	1 in 25,000	1 in 125,000	0.000040000	0.000008000
E	1 in 125,000	1 in 250,000	0.000008000	0.000004000
F	1 in 250,000	1 in 500,000	0.000004000	0.000002000
G	1 in 500,000	1 in 1,000,000	0.000002000	0.000001000
H	1 in 1,000,000	1 in 2,000,000	0.000001000	0.000000500
I	1 in 2,000,000	1 in 4,000,000	0.000000500	0.000000250
J	1 in 4,000,000	1 in 10,000,000	0.000000250	0.000000100
K	1 in 10,000,000	1 in 20,000,000	0.000000100	0.000000050
L	Less than 1 in 20,000,000	Greater than 0	0.000000050	Greater than 0
M	0	0	0	0

COLLECTIVE RISK

This is the total risk for the crossing and includes the risk to users (pedestrian and vehicle), train staff and passengers.

Collective risk:

- Is presented as a simplified ranking:
  - Allocates collective risk into rankings 1 to 13
    (1 is highest, 12 is lowest, and 13 is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Can easily compare collective risk between any two crossings on the network

Collective Risk Ranking	Upper Value (FWI)	Lower Value (FW)
1	Theoretically infinite	Greater than 5.00E-02
2	0.050000000	0.010000000
3	0.010000000	0.005000000
4	0.005000000	0.001000000
5	0.001000000	0.000500000
6	0.000500000	0.000100000
7	0.000100000	0.000050000
8	0.000050000	0.000010000
9	0.000010000	0.000005000
10	0.000005000	0.000001000
11	0.000001000	0.000000500
12	0.0000005	0
13	0.00E+00	0.00E+00

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PASSIVE LEVEL CROSSING RISK ASSESSMENT

1. LEVEL CROSSING OVERVIEW AND ENVIRONMENT

1.1 LEVEL CROSSING OVERVIEW

This is a risk assessment for Stoor level crossing.

Crossing details	
Name	Stoor
Type	UWCT
Crossing status	Occupation
Overall crossing status	Open
Route name	Sussex
Engineers Line Reference	STS, 54m, 16ch
OS grid reference	TQ432043
Number of lines crossed	2
Line speed (mph)	70
Electrification	DC
Signal box	Newhaven Town

Risk assessment details	
Name of assessor	[redacted]
Post	Level Crossing Manager
Date completed	27/09/2017
Next due date	27/12/2019
Email address	[redacted]@networkrail.co.uk
Phone number	[redacted]

ALCRM risk score	
Individual risk	B
Collective risk	6
FWI	0.000148882

1.2 INFORMATION SOURCES

The table below shows the stakeholder consultation that was undertaken as part of the risk assessment.

Consulted	Attended site
Authorised user	No

Stakeholder consultation and attendance notes:

Nothing further to add

The reference sources used during the risk assessment included:

- Occurrence log, Census, Other (Sussex events log), CCIL, GI Portal, SMIS.

1.3 ENVIRONMENT

Up side crossing approach **Down side crossing approach**

Stoor level crossing provides track to field access.

It is an occupation level crossing. There are no stations visible at the level crossing.

At Stoor level crossing the orientation of the road/path from the north is 280°; the orientation of the railway from the north to the up line in the up direction is 340°. Low horizon can result in sun glare; sun glare is not a known issue.

There are no planned or apparent developments near the crossing which may lead to a change or increase in use or risk.

Site visit general observations:

Nothing further to add

2. LEVEL CROSSING USAGE

2.1 RAIL

The train service over Stoor level crossing consists of passenger and freight trains. There are 90 trains per day. The highest permissible line speed of trains is 70mph. Trains are timetabled to run for 24 hours per day.

Assessor's notes:

See assessors notes for usage

2.2 USER CENSUS DATA

A 24 hour census was carried out on 27/09/2017 by [redacted] The census applies to 100% of the year.

The census taken on the day is as follows:

Cars	0
Vans / small lorries	0
Buses	0
HGVs	0
Pedal / motor cyclists	0
Pedestrians	1
Tractors / farm vehicles	0
Horses / riders	0
Animals on the hoof	0

Available information indicates that the crossing does not have a high proportion of vulnerable users.

Vulnerable user observations:

Nothing further to add

Available information indicates that the crossing does not have a high number of irregular users.

Irregular user observations:

Nothing further to add

Information gathered indicates that Stoor level crossing does not have a high number of users during the night or at dusk.

Site visit night / dusk user observations:

There is no evidence of any night time use at this location therefore 1% is estimated as night time use cannot be discounted. Usage is generally low in the day time at this FP.

Assessor's general census notes:

Full 7 day census conducted with a squirrel camera. Recorded 180917-240917. 180917 1 ped. 190917 0 use. 200917 0 use. 210917 1ped. 220917 0 use. 230927 1ped. 240917 0 use.

2.3 USER CENSUS RESULTS

ALCRM calculates usage of the crossing to be 0 road vehicles and 1 pedestrians and cyclists per day.

3. RISK OF USE

3.1 SIGHTING AND TRAVERSE

At Stoor level crossing, the decision point and traverse lengths are calculated as:

	Decision point (m)	Traverse length (m)	Measured from
Up side	3	10.5	3m from the nearest running rail
Down side	3	10.5	3m from the nearest running rail

Timber decking is provided over the level crossing. The decking is considered to be wide enough for all users of the crossing. It is fitted with a non slip surface.

The traverse times are calculated as:

	Traverse time (s)
Pedestrians	8
Vehicles	32

The current census has not identified a high proportion of vulnerable users. Therefore, the pedestrian traverse time has not been increased.

Assessor's traverse time notes:

Distance sighting traverse calculator used.

Sighting was measured by the following means:

- Using Range Finder
- Using a marker at a known distance

Sighting, measured in metres, at Stoor level crossing is recorded as:

All distances are recorded in metres	Minimum sighting distance required	Measured sighting distance	Sighting distance measured to	Is sighting compliant?	If deficient, is sighting distance mitigated?	Notes on deficient sighting time mitigations
Up side looking toward up direction train approach	995	502	20m approx beyond Durham farm	No	YES	Telephones
Up side looking toward down direction train approach	995	364	Track curve	No	YES	Telephones
Down side looking toward up direction train approach	995	482	Durham farm wing fencing	No	YES	Telephones
Down side looking toward down direction train approach	995	292	Track curve/loc box Lineside	No	YES	Telephones

Sighting restrictions are recorded as follows:

	Up Direction	Down Direction
Nothing; vanishing point	NO	NO
Track curvature	YES	YES
Permanent structure (building/wall etc)	NO	NO
Signage or crossing equipment	NO	NO
Vegetation	NO	NO
Bad weather on the day of visit	NO	NO
Other	NO	NO

There are no known obstructions that could make it difficult for users to see approaching trains. There are known issues with foliage, fog or other issues that might impair visibility of the crossing, crossing equipment or approaching trains.

Actions to improve sighting have been identified.

Assessor's improving sighting and decision point notes

MST in place within Ellipse for at the crossing and trackside sighting once a year. Anything else is reactive and faulted accordingly.

The visual evaluation of the vertical profile of the road indicates that it does not create a risk of vehicles getting stuck on the crossing.

Assessor's risk of vehicle getting stuck notes:

Nothing further to add

Assessor's general sighting and traverse notes:

See assessors notes for further information

3.2 EVALUATION OF MITIGATIONS

Stoor level crossing is provided with whistle boards.

	Line Speed	Distance to whistle board*	Whistle board warning provided (s)	Is the whistle board warning < or > traverse ? (s)	Whistle board compliance with 400m maximum (m)	Is the train horn clearly audible at the crossing?	Comments on audibility and whistle board position
Up line	70	332	9.61	1.61	N/A	Y	WB's are in the correct position and clearly audible
Down line	70	332	9.61	1.61	N/A	Y	WB's are in the correct position and clearly audible

The percentage of users who use the crossing during the night time quiet period, between 2300 and 0700, is estimated as 1%.

Assessor's notes on whistle board suitability as a risk control

Sighting for pedestrian's is currently compliant after a huge veg cut back programme this year. WB's to remain in place as veg growth is fast in season and not always reached in time.

Stoor level crossing is provided with telephones.

	Comments
Telephone visibility and clarity of instructional signage	Telephone are visible on both sides and signed accordingly
Telephone usage	Telephones are used by vehicle users
Telephone discipline	Users are ALWAYS known to use the telephone to ask for permission to cross. The level of telephone usage has been confirmed with the controlling signal box
Long signal section *(Is the Signaller able to determine where trains are with reasonable accuracy; do users have to wait an excessive time for permission to cross?)*	

Signal panel ergonomics	

Assessor's notes on telephone suitability as a risk control

Telephones are a suitable risk control at this location given the current level of use is low and there are no incidents to report.

3.3 CROSSING APPROACHES

The signs at Stoor level crossing are located on the direct route a user would take over the level crossing, they are positioned so that they are clearly visible to users taking a direct route over the level crossing. The visibility of the signs is reduced at night or at dusk.

The road surface (including gradient is present) at Stoor level crossing is unlikely to impact on the ability of a vehicle to stop at the level crossing.

There are known issues with ice, mud, loose material or flood water. These known issues might impair visibility of the crossing, crossing equipment, including signage or the visibility of trains. They might also affect the ability of a vehicle to stop at the level crossing.

Assessor's notes:

The crossing is a short distance from the busy A26 but the location is shielded by dense foliage and trees which muffles the sound of the traffic and therefore does not affect the crossing at this location. Re visibility of the signage at night see NRA for assessor notes/lighting assessment. Track side foliage grows out and limits sighting. There is a MST in place in Ellipse for an annual cut back at the crossing and for sighting. Anything more than this is reactive and faulted accordingly. Mud could be an issue in the winter months on the approaches as it's a rough track to field traverse. Once inside the gates the approaches are of a tarmac hard standing quality.

There are no adjacent sources of light or noise that could affect a users' ability to see or hear approaching trains.

Assessor's general crossing approach notes:

The crossing is a short distance from the busy A26 but the location is shielded by dense foliage and trees which muffles the sound of the traffic and therefore does not affect the crossing at this location. Re visibility of the signage at night see NRA for assessor notes/lighting assessment.

3.4 AT THE CROSSING – ANOTHER TRAIN COMING RISK

Trains are sometimes known to pass each other at this crossing.

Assessor's another train coming notes:

Nothing further to add

3.5 INCIDENT HISTORY

A level crossing safety event has not been known to occur at Stoor level crossing in the last twelve months.

Assessor's incident history notes:

There are no recorded incidents of misuse since 2013. The 2 incidents in 2013 were for users failing to put the phone back and failing to call back after traverse.

Telephone discipline

See section 3.2

Gate discipline (including barriers)

Reports indicate that the gates are ALWAYS CLOSED.

Assessor's notes on operational disruptions:

If abuse does occur this may cause delay to trains as may stop to check the crossing.

4. ALCRM CALCULATED RISK

*Stoor **level crossing ALCRM results***

Key risk drivers: ALCRM calculates that the following key risk drivers influence the risk at this crossing:

- Frequent trains
- Low sighting

Assessor's key risk drivers notes

See relevant section for comments

Safety risk				
Compared to other crossings the safety risk for this crossing is	**Individual risk**		**Collective risk**	
	B		**6**	
	Individual risk (fraction)	**Individual risk (numeric)**		
Car	0	0	0	
Van / small lorries	0	0	0	
HGV	0	0	0	
Bus	0	0	0	
Tractor / farm vehicle	0	0	0	
Cyclist / Motor cyclist	0	0	0	
Pedestrian	1 in 4933	0.00020271	0.000147978	
				Derailment contribution
Passengers			0	0
Staff			0.000000904	0
Total			0.000148882	0
Collision frequencies	**Train / user**	**User equipment**	**Other**	
Vehicle	0	0	0	
Pedestrian	0.000180748	0	0.000055027	
Collision risk	**Train / user**	**User equipment**	**Other**	
Vehicle	0	0	0	
Pedestrian	0.000146768	0	0.000001211	

5. OPTION ASSESSMENT AND CONCLUSIONS

5.1 OPTIONS EVALUATED

The options evaluated to mitigate the risks at Stoor crossing include:

Option	Term[1]	ALCRM risk score	ALCRM FWI	Safety Benefit	Cost	Benefit Cost Ratio	Status	Comments
yellow high vis anti slip and solar lighting for signage and deck	Long Term	C6	0.00012655				COMPLETE	This option would further define the crossing surface and the solar lighting would illuminate the deck and signage for all crossing users.
closure via bridging or diversion	Long Term	M13	0				COMPLETE	This option would completely eradicate the risk for all users
add COVTEC	Long Term	C6	0.000133994				COMPLETE	This would be an added mitigation for the vehicle users whilst opening gates and for all pedestrians using the FP

NOTES
Network Rail always evaluates the need for short[1] and long term risk control solutions. An example of level crossing risk management might be; a short term risk control of a temporary speed restriction with the long term solution being closure of the level crossing and its replacement with a bridge.
[1] Includes interim

CBA gives an indication of overall business benefit. It is used to support, not override, structured expert judgement when deciding which option(s) to progress. CBA might not be needed in all cases, e.g. standard maintenance tasks or low cost solutions (less than £5k).

The following CBA criteria are used as a support to decision making:

a. benefit to cost ratio is ≥ 1: positive safety and business benefit established;
b. benefit to cost ratio is between 0.99 and 0.5: reasonable safety and business benefit established where costs are not grossly disproportionate against the safety benefit; and
c. benefit to cost ratio is between 0.49 and 0.0: weak safety and business benefit established.

5.2 CONCLUSIONS

Assessor's notes:

Crossing location

Stoor is a combined footpath and user work crossing with a telephone (UWCt) which is located on the Seaford branch line from Lewes (ELR STS) at 54m 16ch.

Stoor crossing is also known as "Stock" crossing but is registered in ALCRM as Stoor and will be referred to as such for this narrative risk assessment.

The crossing is located just out of sight from the road approach down an unmade track shaded by trees on the busy A26 (down side) which is the main freight route to Newhaven Port and provides access from the A27 to the A26 and onwards to the A259 coast road.

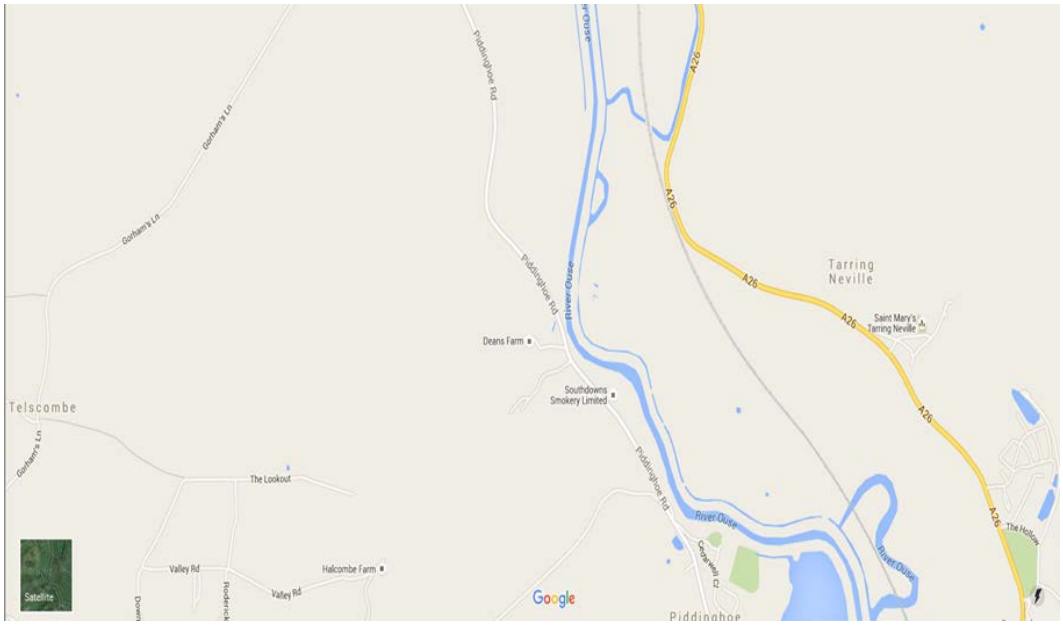
The footpath (FP) section of this crossing is listed as Tarring Neville 5 which passes over the railway line at this point and comes under the jurisdiction of ESCC.

The up side of the crossing is located near to the River Ouse and surrounding farm land.

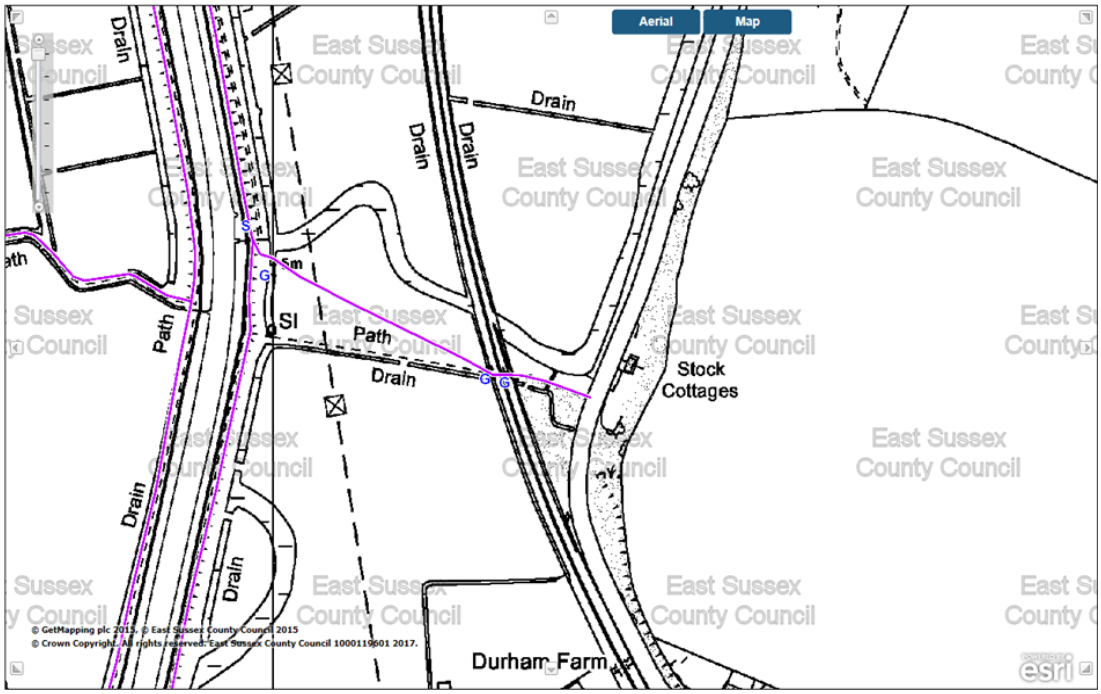
The UWCt provides access over the railway to Glynde Estates Land which is farmed by a tenant farmer for livestock grazing purposes.

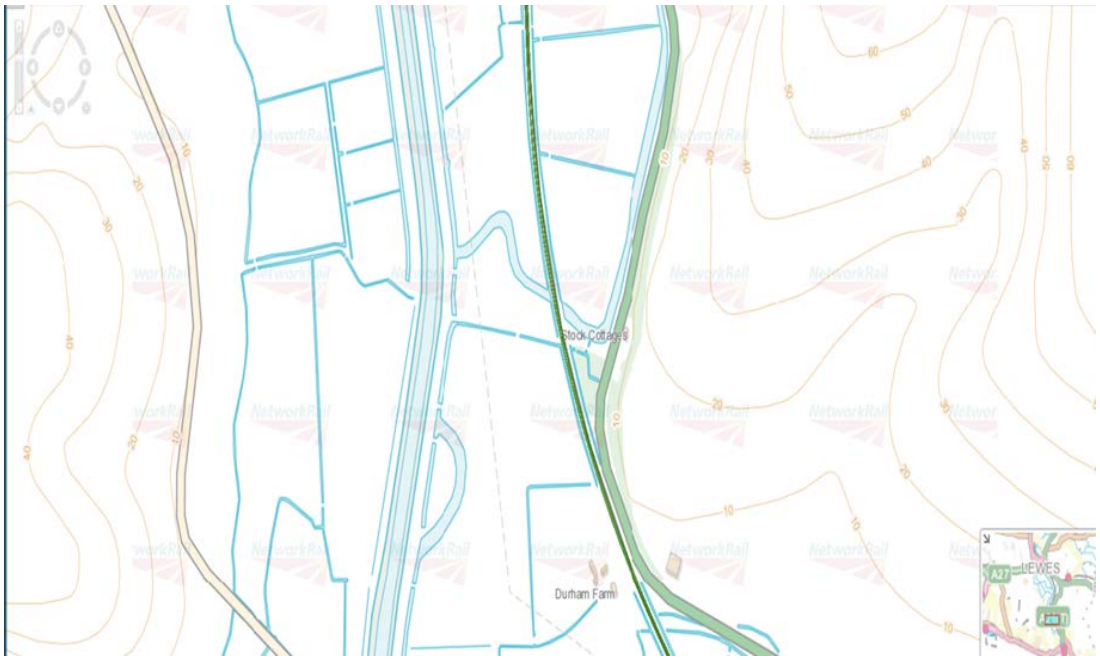
Durham Farm UWCt is located on the country end of the crossing and can be seen in the distance from both sides of Stoor crossing.

The down side view is obstructed by the track curve and vegetation but a recent vegetation cut back enables a view of Durham Farm crossing from both sides now.



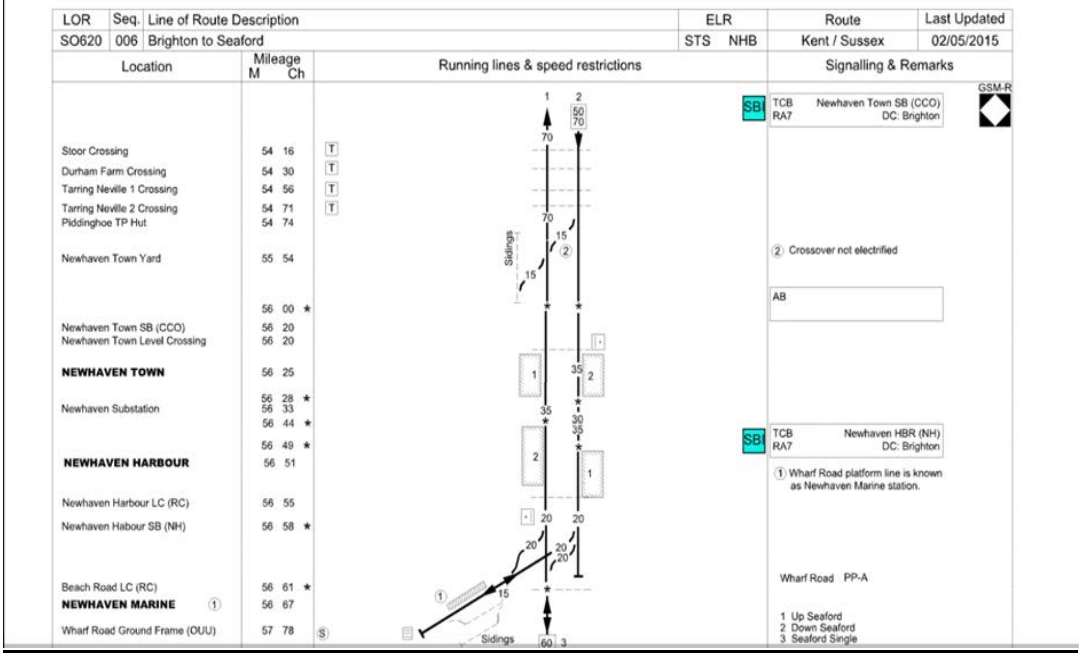

River Ouse
Piddinghoe Rd
A26


Aerial
Map
Drain
Path
Stock
Cottages
Durham Farm
East Sussex
County Council
© GetMapping plc 2015. © East Sussex County Council 2015
© Crown Copyright. All rights reserved. East Sussex County Council 100011961 2017.
esri


Durham Farm
LEWES
A27


Mud
SI
SP
COCK
Drain
Level Crossing
Stock
Cottages
Drain
Drain
Drain
EAST


EAST



Crossing description

Stoor crossing is a combined footpath and user work crossing which consists of 2 wooden wicket gates with attached heavy weights to close them, one on the up side and one on the down side for pedestrian access and 2 metal locked user work crossing gates which open outwards away from the running line for the user work section of the crossing.

The user rights for the crossing belong to the land owner, the Viscount Hampden, his land agent and the long term tenant farmer.

There is an up line and a down line and the maximum speed is 70mph in both directions.

The down side approach from the road consists of an unmade track surface which is prone to water and mud in the winter months and dense vegetation in the growing period, this can obstruct the UWC gates opening fully sometimes and is reported to the tenant farmer to maintain where appropriate.

The access for pedestrians is through the wooden weighted wicket gates which are self-closing.

Once through the railway boundary gates the surface is tarmacked up to the crossing surface on both sides of the railway. The tarmacked area for vehicles and pedestrians is not separated or marked out in any way.

The decision point is 3m for vehicles and 2m for pedestrians.
The 3m point for vehicles is measured from the nearest running line back.

The traverse length of the crossing for vehicles is 10.5m and 9.5m for pedestrians and is measured from the decision point (best view point – which is normally near the edge of the wing fencing) to 3 metres beyond the furthest running rail for vehicles and 2 metres beyond for pedestrians.

The crossing surface consists of wooden timber decking and both the pedestrian and the user work traverse routes are further assisted by anti slip matting installed in appropriate places.

Down to up side showing wooden deck and additional anti slip for users.

The traverse route for the UWC is gate to gate and there are no encumbrances for the user to negotiate once the decision has been made to cross.

The normal compliant signs are in place – the “stop look listen”, electrification of track and do not trespass are situated on both sides. There is a further sign which applies to the user work part of the crossing giving instruction to vehicle users on how to use the crossing safely.

There are 2 telephones in place for vehicle users, one on each side of the crossing which are clearly marked up with required signage.
They are direct connect telephones so that the user only has to pick up the receiver to be connected to the relevant signal box which is currently Newhaven Town - there is an alternative telephone number clearly marked should the telephone fail.

This crossing is due to be re-controlled to the Rail Operating Centre (ROC) approximately March 2019 – there are no planned upgrades to this crossing as part of the re signalling project.

Sighting is non compliant for road vehicles with a speed of 70 mph on both up and down roads requiring a minimum of 995m for vehicles and 249m for pedestrians.

Up side up direction trains approaching sighting is 502m for both vehicles and pedestrians
Up side down direction trains approaching sighting is 364m for pedestrians and vehicles
Down side up direction trains approaching sighting is 482m for both pedestrians and vehicles
Down side down direction trains approaching sighting is 292m for both pedestrians and vehicles.

The traverse, distance calculator was used to reach the traverse time required:
70mph line speed x crossing length of 10.5m for vehicles = 32 seconds required crossing time and 995m minimum required sighting distance. 70mph line speed x crossing length of 9.5 for pedestrians = 249m minimum required sighting for pedestrians on foot.

The sighting is limited in both up and down directions by track curve. Track side vegetation is problematic during the warmer months and needs frequent cut back. A hard cut back to the new required standard has enhanced the available sighting on the down side looking towards Newhaven (down side looking up direction trains approaching)

There are whistle boards (WB’s) installed at this location both situated at 332m to mitigate the prior lack of sighting for pedestrians. Again, sighting has improved here for pedestrians due the hard vegetation cut back for the new standard and this means that no view for pedestrians is now non compliant.
The WB’s will remain in place for this summer growing period and be monitored to see if they

can be removed in the future.

Proximity of the road and traffic noise does not compromise audibility of the whistle boards.

The Seaford branch line is sometimes prone to winter fog at this location.

Stoor – down side down trains approaching view

Stoor – down side up trains approaching view

Both approaches to the crossing surface, once inside the railway boundary are of a good quality underfoot and the crossing is protected by a chain link boundary fence line which encompasses both means of entry for vehicles and pedestrians.

The 2m and 3m decision points have level ground decision point to decision point with no encumbrances to be encountered by the user.

The crossing surface itself consists of suspended wood timbers and anti slip.

There is no lighting in place and only low levels of ambient lighting exist. See section on lighting assessment.

Trespass guarding is provided on both ends of the crossing. The conductor rail is non-compliant on 2 of the 4 corners and requires cut back and is currently guarded because of this. The up side London end and down side country end are non-compliant to the minimum of 3m distance away from the crossing surface and is on the routes funding spreadsheet for cut back.

Future developments in area

There are currently no known significant developments planned in the vicinity of Stoor at this time which would affect or change the usage of this level crossing.

Crossing usage

There are 4 booked freight trains on this line during a 24 hr period which serves the siding near to Newhaven Town signal box for the incinerator waste.

The line speed is 70mph on both lines.

This crossing is in a semi-rural setting and little used.

A full 7 day census was conducted with a squirrel camera, this recorded 180917-240917.
180917 1 ped. 190917 0 use. 200917 0 use. 210917 1ped. 220917 0 use. 230927 1ped. 240917 0 use.
There were 3 pedestrians and 0 vehicles recorded during this time.

ALCRM calculates usage of the crossing to be 0 road vehicles and 1 pedestrian and cyclists per day, this is reflected within the scoring system based on the census information taken.

There is no evidence of any night time use at this location therefore 1% is estimated as night time use cannot be discounted. Usage is generally low in general at this crossing.

The signaller was consulted with regard to vehicle use and confirmed the following requests to cross in 2017.

160217 – 1 digger
100517 – 4 vehicles – 3 cars and 1 tractor
120517 – 1 tractor

Lighting assessment

The national level crossing team requested a survey of lighting at passive crossings reachable on foot in 2016.

Similar crossings showed that during night time there was extremely little or no ambient lighting to have sight of signage or the crossing deck itself without some additional form of lighting.

This crossing was assessed 190117 and showed almost zero visibility of LC deck and signage with no ambient lighting at all.

The assessor used a mobile phone torch to identify walking route, signage and LC deck.

Following this assessment it was recommended that solar deck lights are installed for the users and some form of lighting to identify the signage.

The results have been forwarded to the national level crossing team and further instruction is awaited.

An option has been submitted for solar lighting for the deck and signage should funding become available for this via the route.

Crossing abuse

There are few documented incidents at this low use level crossing.

The SMIS (Network Rails safety event register) register has been used for data collection for abuse.

There are no recorded incidents of misuse since 2013. The 2 incidents in 2013 were for users failing to put the phone back and failing to call back after traverse.

Due to the very low levels of abuse – nothing since 2013 – and low use of this crossing in general, no additional measures to combat abuse have been put in place as not required.

Key risk drivers

- Frequent trains
- Low sighting

Frequent trains - passenger use and passenger need is increasing constantly so the number of trains is also likely to increase therefore the risk driver is likely to remain as a constant.

Low sighting – this can only be improved as per the track layout which is on curves in both directions. The recent enhancement to the vegetation chop back distances from the track has increased available sighting at this location, particularly on the down side looking up direction

trains.

Crossing risk

This is a planned risk assessment with an ALCRM risk score generated of B6 – Yellow with a FWI of 0.000148882.

The following options have been considered and assessed for risk reduction at this crossing:

1. **Add high vis yellow anti slip and solar lighting for deck and signage**

This option will further define the LC surface for all rail users and solar lighting will enable the users to see the warning signage and the deck clearly in dusk/night time conditions. Following the implementation of this option the ALCRM score would be C6 and a FWI reduction score of 0.00012655.

2. **Closure via diversion or bridging, giving up of user rights**

This option is the preferred one and would permanently close the crossing. Following the implementation of this option the crossing would be closed "M13" and a FWI reduction score of 0.

3. **Add COVTEC**

This option would be used in conjunction with the use of whistle boards as the fail safe and provide an additional audible warning for pedestrians at the crossing to warn of approaching trains. This is also advantageous with night time use at crossings where the whistle boards stop being used between the hours of 0001-0600hrs. This generates an ALCRM score of C6 and a FWI reduction score of 0.000133994.

Conclusion

1. **Add high vis yellow anti slip and solar lighting for deck and signage**

The yellow anti slip would further define the surface for all rail users coupled with solar lighting for both deck and signage making this a reasonably cheap option with some benefit.

2. **Closure via diversion or bridging, giving up of user rights**

This is the preferred option but not financially viable at this point due to low usage/FWI score. The crossing cannot be closed via diversion as there is no suitable diversion therefore authorised users will not give up their rights over the railway.

3. **Add COVTEC**

There is currently a national project to install COVTEC at foot crossings with whistle boards in situ and particularly where night time use is evident as the use of whistle boards stops between the hours of 0001-0600 hrs.

Recommendation's

Options 1 and 3 are the preferred options here and the RLCM will be asked to consider carrying these options forward to panel for consideration.

ANNEX A – ADDITIONAL PHOTOGRAPHS

Description:

Description:

Description:

Description:

Description:

Description:

ANNEX B – HAZARD IDENTIFICATION AND RISK CONTROLS

The table below is intended for use by risk assessors when identifying hazards and risk control solutions. It is not an exhaustive list or presented in a hierarchical order.

	Hazard	Control
Road vehicle and train collision risk	Examples at the crossing include: • insufficient sighting and / or train warning for all vehicle types; known to be exacerbated by the driving position, e.g. tractor • level crossing equipment and signage is not conspicuous or optimally positioned • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • high volume of unfamiliar users, e.g. irregular visitors, migrant workers • known user complacency leading to high levels of indiscipline, e.g. failure to use telephone, gates left open • type of vehicle unsuitable for crossing; - large, low, slow making access or egress difficult and / or vehicle is too heavy for crossing surface - risk of grounding and / or the severity of the gradient adversely affects ability to traverse • poor decking panel alignment / position on skewed crossing • where telephones are provided, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • high chance of a second train coming • high line speed and / or high frequency of trains • unsuitable crossing type for location, train service, line speed and vehicle types	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs • engaging with signalling engineers to optimise strike in times • upgrading of asset to a higher form of protection • downgrading of crossing by removing vehicle access rights • optimising sighting lines and / or providing enhanced user based warning system, e.g. MSL • re-profiling of crossing surface • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • widening access gates and / or improving the crossing surface construction material • realigning or installing additional decking panels to accommodate all vehicle types • implementing train speed restriction or providing crossing attendant
Pedestrian and train collision risk	Examples include: • insufficient sighting and / or train warning • ineffective whistle boards; warning inaudible, insufficient warning	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs

	Hazard	Control
	time provided, known high usage between 23:00 and 07:00 • high chance of a second train coming • high line speed and / or high frequency of trains • level crossing equipment and signage is not conspicuous or optimally positioned • location and position of level crossing gates mean that users have their backs to approaching trains when they access the level crossing, i.e. users are initially unsighted to trains approaching from their side of the crossing • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • surface condition or lack of decking contribute to slip trip risk • known high level of use during darkness • increased likelihood of user error, e.g. crossing is at station • free wicket gates might result in user error • high volume of unfamiliar users, e.g. irregular visitors / ramblers, equestrians • complacency leading to high levels of indiscipline, e.g. users are known to rely on knowledge of timetable • high level of use by vulnerable people • where telephones are provided i.e. bridleways, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • unsuitable crossing type for location, train service, line speed and user groups • high usage by cyclists • degree of skew over crossing increases traverse time and users' exposure to trains • crossing layout encourages users not to cross at the designed decision point; egress route unclear especially during darkness	• upgrading of asset to a higher form of protection • optimising sighting lines, e.g. de-vegetation programme, repositioning of equipment or removal of redundant railway assets • implementing train speed restriction or providing crossing attendant • providing enhanced user based warning system, e.g. MSL • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • installing guide fencing and / or handrails to encourage users to look for approaching trains, read signage or cross at the designed decision point • re-design of crossing approach so that users arrive at the crossing as close to a 90° angle as possible • installing lighting sources • engaging with signalling engineers to optimise strike in times • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • providing cyclist dismount signs and / or chicanes • straightening of crossing deck

	Hazard	Control
	schools, local amenities or other attractions are known to contribute towards user error	
Pedestrian and road vehicle collision risk	Examples include: • a single gate is provided for pedestrian and vehicle users where there is a high likelihood that both user groups will traverse at the same time • the position of pedestrian gate forces / encourages pedestrian users to traverse diagonally across the roadway • road / footpath inadequately separated; footpath not clearly defined • condition of footpath surface increases the likelihood of users slipping / tripping into the path of vehicles	Controls can include: • providing separate pedestrian gates • clearly defining the footpath; renew markings • positioning pedestrian gates on the same side of the crossing • improving footpath crossing surface so it is devoid of potholes, excessive flangeway gaps and is evenly laid • improving crossing surface, e.g. holdfast, strail, non-slip surface
Personal injury	Examples include: • skewed crossing with large flangeway gaps results in cyclist, mobility scooter, pushchair or wheelchair user being unseated • condition of footpath surface increases the likelihood of users slipping / tripping • degraded gate mechanism or level crossing equipment • barrier mechanism unguarded / inadequately protected	Controls can include: • improving fence lines • reducing flangeway gaps and straightening where possible • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • straighten / realign gate posts • fully guarding barrier mechanisms

ANNEX C – ALCRM RISK SCORE EXPLANATION

ALCRM provides an estimate of both the individual and collective risks at a level crossing.

The individual and collective risk is expressed in Fatalities and Weighted Injuries (FWI). The following values help to explain this:

- **1** = 1 fatality per year or 10 major injuries or 200 minor RIDDOR events or 1000 minor non-RIDDOR events
- **0.1** = 20 minor RIDDOR events or 100 minor non-RIDDOR events
- **0.005** = 5 minor non-RIDDOR events

INDIVIDUAL RISK

This is the annualised probability of fatality to a 'regular user'. *NOTE: A regular user is taken as a person making a daily return trip over the crossing; assumed 500 traverses per year.*

Individual risk:

- Applies only to crossing users. It is not used for train staff and passengers
- Does not increase with the number of users.
- Is presented as a simplified ranking:
  - Allocates individual risk into rankings A to M
    (A is highest, L is lowest, and M is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Allows comparison of individual risk to average users across any crossings on the network

Individual Risk Ranking	Upper Value (Probability)	Lower Value (Probability)	Upper Value (FWI)	Lower Value (FW)
A	1 in 1	Greater than 1 in 1,000	1	0.001000000
B	1 in 1,000	1 in 5,000	0.001000000	0.000200000
C	1 in 5,000	1 in 25,000	0.000200000	0.000040000
D	1 in 25,000	1 in 125,000	0.000040000	0.000008000
E	1 in 125,000	1 in 250,000	0.000008000	0.000004000
F	1 in 250,000	1 in 500,000	0.000004000	0.000002000
G	1 in 500,000	1 in 1,000,000	0.000002000	0.000001000
H	1 in 1,000,000	1 in 2,000,000	0.000001000	0.000000500
I	1 in 2,000,000	1 in 4,000,000	0.000000500	0.000000250
J	1 in 4,000,000	1 in 10,000,000	0.000000250	0.000000100
K	1 in 10,000,000	1 in 20,000,000	0.000000100	0.000000050
L	Less than 1 in 20,000,000	Greater than 0	0.000000050	Greater than 0
M	0	0	0	0

COLLECTIVE RISK

This is the total risk for the crossing and includes the risk to users (pedestrian and vehicle), train staff and passengers.

Collective risk:

- Is presented as a simplified ranking:
  - Allocates collective risk into rankings 1 to 13
    (1 is highest, 12 is lowest, and 13 is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Can easily compare collective risk between any two crossings on the network

Collective Risk Ranking	Upper Value (FWI)	Lower Value (FW)
1	Theoretically infinite	Greater than 5.00E-02
2	0.050000000	0.010000000
3	0.010000000	0.005000000
4	0.005000000	0.001000000
5	0.001000000	0.000500000
6	0.000500000	0.000100000
7	0.000100000	0.000050000
8	0.000050000	0.000010000
9	0.000010000	0.000005000
10	0.000005000	0.000001000
11	0.000001000	0.000000500
12	0.0000005	0
13	0.00E+00	0.00E+00

NARRATIVE RISK ASSESSMENT – PASSIVE TEMPLATE FINAL v2.0

PASSIVE LEVEL CROSSING RISK ASSESSMENT

1. LEVEL CROSSING OVERVIEW AND ENVIRONMENT

1.1 LEVEL CROSSING OVERVIEW

This is a risk assessment for Southerham level crossing.

Crossing details	
Name	Southerham
Type	UWCT
Crossing status	Occupation
Overall crossing status	Open
Route name	Sussex
Engineers Line Reference	KJE2, 50m, 69ch
OS grid reference	TQ424092
Number of lines crossed	2
Line speed (mph)	60
Electrification	Yes DC
Signal box	Lewes

Risk assessment details	
Name of assessor	[redacted]
Post	Level Crossing Manager
Date completed	15/11/2017
Next due date	15/02/2020
Email address	[redacted]@networkrail.co.uk
Phone number	[redacted]

ALCRM risk score	
Individual risk	B
Collective risk	8
FWI	0.000029973

1.2 INFORMATION SOURCES

The table below shows the stakeholder consultation that was undertaken as part of the risk assessment.

Consulted	Attended site
Authorised user	No

Stakeholder consultation and attendance notes:

AU prefers to speak on telephone, seldom uses the crossing unless for large vehicles ie tractor

The reference sources used during the risk assessment included:

- Occurrence log, Census, Other (Sussex events), CCIL, GI Portal, SMIS.

1.3 ENVIRONMENT

Up side crossing approach **Down side crossing approach**

Southerham level crossing provides track to field access.

It is an occupation level crossing. There are no stations visible at the level crossing.

At Southerham level crossing the orientation of the road/path from the north is 320°; the orientation of the railway from the north to the up line in the up direction is 60°. Low horizon can result in sun glare; sun glare is not a known issue.

There are no planned or apparent developments near the crossing which may lead to a change or increase in use or risk.

Site visit general observations:

Nothing further to add

2. LEVEL CROSSING USAGE

2.1 RAIL

The train service over Southerham level crossing consists of passenger and freight trains. There are 238 trains per day The highest permissible line speed of trains is 60mph. Trains are timetabled to run for 24 hours per day.

Assessor's notes:

See usage section in assessors notes

2.2 USER CENSUS DATA

An estimated census has been used. The census was estimated on 15/11/2017 by TP. The census applies to 100% of the year.

The census taken on the day is as follows:

Cars	NO
Vans / small lorries	NO
Buses	NO

HGVs	NO
Pedal / motor cyclists	NO
Pedestrians	FEW
Tractors / farm vehicles	FEW
Horses / riders	NO
Animals on the hoof	NO

Available information indicates that the crossing does not have a high proportion of vulnerable users.

Vulnerable user observations:

Available information indicates that the crossing does not have a high number of irregular users.

Irregular user observations:

Information gathered indicates that Southerham level crossing does not have a high number of users during the night or at dusk.

Site visit night / dusk user observations:

See lighting assessment section

Assessor's general census notes:

A recent lighting and sign visibility in darkness survey was undertaken at similar crossings and the signs and deck were not visible in those conditions. Findings sent to NLCT at their request. There may be some ambient lighting from the A27 above but this cannot be validated at this time. A camera was put at the crossing for 7 days with no non NR users identified. Conversation with the user confirmed previous findings of user traversing with tractor and trailer approx twice a year to take sheep over and bring sheep back only. There is a cattle creep under the railway and unless there is high tidal water making passing impossible the farmer uses this means to get to his land.

2.3 USER CENSUS RESULTS

ALCRM calculates usage of the crossing to be 0 road vehicles and 0 pedestrians and cyclists per day.

3. RISK OF USE

3.1 SIGHTING AND TRAVERSE

At Southerham level crossing, the decision point and traverse lengths are calculated as:

	Decision point (m)	Traverse length (m)	Measured from
Up side	3	10	3m from nearest running rail
Down side	3	10	3m from nearest running rail

Timber decking is provided over the level crossing. The decking is considered to be wide enough for all users of the crossing. It is fitted with a non slip surface.

The traverse times are calculated as:

	Traverse time (s)

Pedestrians	9
Vehicles	31

The current census has not identified a high proportion of vulnerable users. Therefore, the pedestrian traverse time has not been increased.

Assessor's traverse time notes:

Distance traverse sighting calculator used

Sighting was measured by the following means:

- Using Range Finder

Sighting, measured in metres, at Southerham level crossing is recorded as:

All distances are recorded in metres	Minimum sighting distance required	Measured sighting distance	Sighting distance measured to	Is sighting compliant?	If deficient, is sighting distance mitigated?	Notes on deficient sighting time mitigations
Up side looking toward up direction train approach	826	350	Track curve	No	YES	Telephones
Up side looking toward down direction train approach	836	556	Track curve	No	YES	Telephones
Down side looking toward up direction train approach	826	172	Track curve	No	YES	Telephones
Down side looking toward down direction train approach	826	296	Track curve	No	YES	Telephones

Sighting restrictions are recorded as follows:

	Up Direction	Down Direction
Nothing; vanishing point	NO	NO
Track curvature	YES	YES
Permanent structure (building/wall etc)	NO	NO
Signage or crossing equipment	NO	NO
Vegetation	NO	NO
Bad weather on the day of visit	NO	NO
Other	NO	NO

There are known obstructions that could make it difficult for users to see approaching trains. There are known issues with foliage, fog or other issues that might impair visibility of the crossing, crossing equipment or approaching trains.

Actions to improve sighting have been identified.

Assessor's improving sighting and decision point notes

Waif in Ellipse system for vegetation at crossing in growing season for sighting. There is a solid barrier structure on the dn-dn side which can impair sighting.

The visual evaluation of the vertical profile of the road indicates that it does not create a risk of vehicles getting stuck on the crossing.

Assessor's risk of vehicle getting stuck notes:

There are crossing surface level changes in the middle 6ft of the crossing due track camber. This has been raised as a defect in the Off Track work bank since 2013

Assessor's general sighting and traverse notes:

3.2 EVALUATION OF MITIGATIONS

Southerham level crossing is provided with telephones.

	Comments
Telephone visibility and clarity of instructional signage	Satisfactory
Telephone usage	Confirmed with signaller although very low use from user – mainly from track workers
Telephone discipline	Users are ALWAYS known to use the telephone to ask for permission to cross. The level of telephone usage has been confirmed with the controlling signal box
Long signal section *(Is the Signaller able to determine where trains are with reasonable accuracy; do users have to wait an excessive time for permission to cross?)*	
Signal panel ergonomics	

Assessor's notes on telephone suitability as a risk control

Deemed a suitable control given the amount of use for this crossing which is minimal from the user, currently approximately twice a year.

3.3 CROSSING APPROACHES

The signs at Southerham level crossing are located on the direct route a user would take over the level crossing; they are positioned so that they are clearly visible to users taking a direct route over the level crossing. The visibility of the signs is reduced at night or at dusk.

The road surface (including gradient is present) at Southerham level crossing could impact on the ability of a vehicle to stop at the level crossing.

There are no known issues with ice, mud, loose material or flood water.

Assessor's notes:

Vegetation is a problem in growing season and there are waifs in the system for sighting and at the crossing once a year. Any other vegetation issues are reactive and dealt with accordingly. The new standard of 7m vegetation clearance from the rail assists greatly with sighting etc.

There are no adjacent sources of light or noise that could affect a users' ability to see or hear approaching trains.

Assessor's general crossing approach notes:

A recent lighting and sign visibility in darkness survey was undertaken at similar crossings and the signs and deck were not visible in those conditions. Findings sent to NLCT at their request. There may be some ambient lighting from the A27 above but this cannot be validated at this time.

3.4 AT THE CROSSING – ANOTHER TRAIN COMING RISK

Trains are sometimes known to pass each other at this crossing.

Assessor's another train coming notes:

Some ambient lighting in the area from the A27 road above and the adjacent town of Lewes

3.5 INCIDENT HISTORY

A level crossing safety event has not been known to occur at Southerham level crossing in the last twelve months.

Assessor's incident history notes:

There has been no documented abuse at this LC since 2003. 170800 kids playing with phones. 140602 the farmer failed to call back clear. 290103 gates vandalised. 070503 report by farmer that one of his animals was loose on the LC no further information. 190503 gate left open.

Telephone discipline

See section 3.2

Gate discipline (including barriers)

Reports indicate that the gates are ALWAYS CLOSED.

Assessor's notes on operational disruptions:

2 previous occasions 290103 and 190503. Nothing further for 15 years.

4. ALCRM CALCULATED RISK

*Southerham **level crossing ALCRM results***

Key risk drivers: ALCRM calculates that the following key risk drivers influence the risk at this crossing:

- Frequent trains
- Low sighting

Assessor's key risk drivers notes

See relevant section in assessors notes

Safety risk				
Compared to other crossings the safety risk for this crossing is	**Individual risk**		**Collective risk**	
	B		**8**	
	Individual risk (fraction)	**Individual risk (numeric)**		
Car	0	0	0	
Van / small lorries	0	0	0	
HGV	0	0	0	
Bus	0	0	0	
Tractor / farm vehicle	1 in 4535	0.000220463	0.00000508	
Cyclist / Motor cyclist	0	0	0	
Pedestrian	1 in 1621	0.000616675	0.000015533	
				Derailment contribution
Passengers			0.000006747	89.556338732
Staff			0.000002613	26.22756545
Total			0.000029973	22.445716044
Collision frequencies	**Train / user**	**User equipment**	**Other**	
Vehicle	0.00003024	0.000036371	0	
Pedestrian	0.000019061	0	0.000002535	
Collision risk	**Train / user**	**User equipment**	**Other**	
Vehicle	0.00000508	0	0	
Pedestrian	0.000015477	0	0.000000056	

5. OPTION ASSESSMENT AND CONCLUSIONS

5.1 OPTIONS EVALUATED

The options evaluated to mitigate the risks at Southerham crossing include:

Option	Term[1]	ALCRM risk score	ALCRM FWI	Safety Benefit	Cost	Benefit Cost Ratio	Status	Comments
Closure via diversion or give up legal rights	LONG	M13	0				Complete	This option would totally eradicate all risk at the LC for all users. User not willing to give up rights currently as alternative access (cattle creep) floods with tidal water necessitating occasional use of the UWCt by the farmer – this access is also used by NR as an access for track works and RRV's. Bridging/subway would be cost prohibitive for one farmer.

NOTES

Network Rail always evaluates the need for short[1] and long term risk control solutions. An example of level crossing risk management might be; a short term risk control of a temporary speed restriction with the long term solution being closure of the level crossing and its replacement with a bridge.

[1] Includes interim

CBA gives an indication of overall business benefit. It is used to support, not override, structured expert judgement when deciding which option(s) to progress. CBA might not be needed in all cases, e.g. standard maintenance tasks or low cost solutions (less than £5k).

The following CBA criteria are used as a support to decision making:

a. benefit to cost ratio is ≥ 1: positive safety and business benefit established;
b. benefit to cost ratio is between 0.99 and 0.5: reasonable safety and business benefit established where costs are not grossly disproportionate against the safety benefit; and
c. benefit to cost ratio is between 0.49 and 0.0: weak safety and business benefit established.

5.2 CONCLUSIONS

Assessor's notes:

Crossing location

Southerham is a user works crossing with telephone (UWCt) which is located on ELR KJE2 at 50m 69ch.

The crossing is reached from the A26 which runs a short distance into Lewes just off of Southerham roundabout on the main A27 road.

To reach Southerham UWCt there is a requirement to enter locked palisade gates on the A26 initially and enter a private un named road owned by a container company. From here it is necessary to proceed up to Network Rails boundary palisade fence line at the end of the private road where there are 2 sets of padlocked gates on the down side (DS), one to the crossing and one to the pway lineside yard.

Southerham UWCt is also classed as a Road/Rail Vehicle (RRV) access point for Network Rail.

This crossing is heavily used for Network Rail access to the railway line, there is a complex diamond points system in the down direction which covers the Seaford line and the Eastbourne/Bexhill line.

The crossing itself is almost under the A27 road over rail bridge, see pictures.

The road on the up side is access for the tenant farmer and the land owner, Firle Estates, across the UWCt, this is made up of grass and mud only.

There is a cattle creep access under the railway approx 150m in the Lewes direction which the user prefers to use as it doesn't require permission to cross. This access to prone to tidal flooding due proximity to the River Ouse.

The River Ouse is located approximately 200m away in the Lewes direction and the railway traverses over at this point.

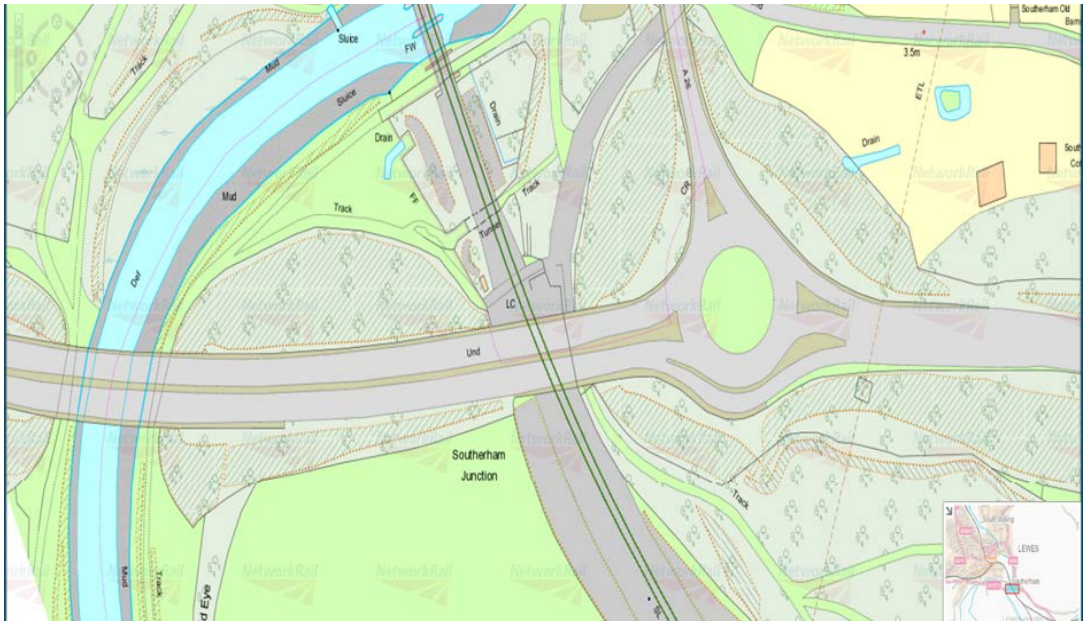
The crossing is situated within a secure boundary on both sides with high palisade metal fencing and 2 x double gated accesses.

There is a Network Rail (NR) maintenance yard inside the crossing in the down direction which is used for storage of rail and associated materials.

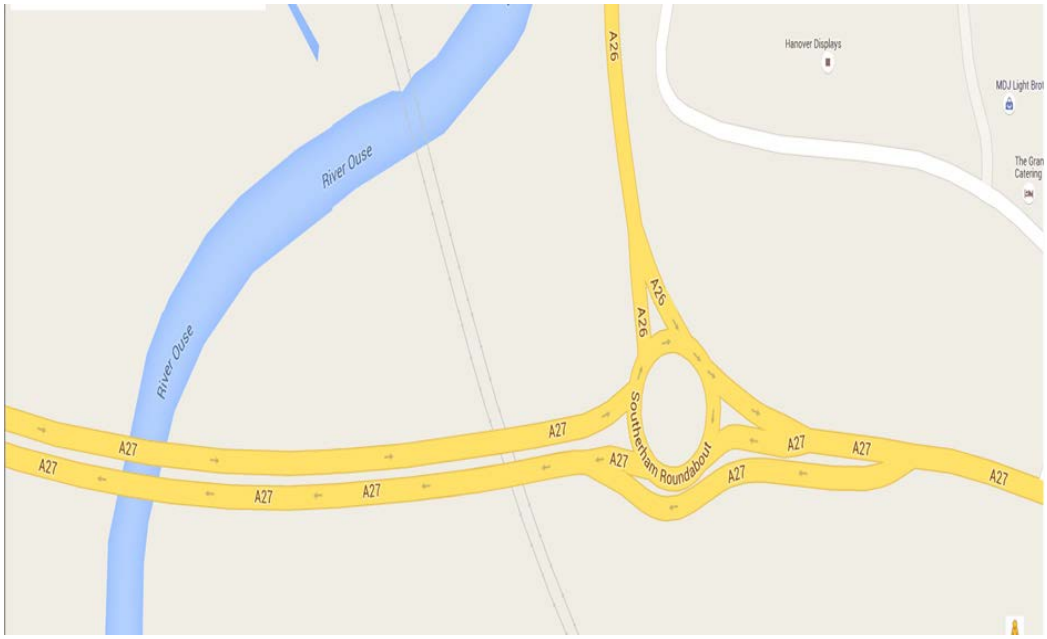
When at the crossing looking in the down direction towards Newhaven the A27 road over rail bridge is evident, looking in the up direction towards Lewes the track curve and vegetation is only visible.

There are no other footpaths or crossings close by.

Aerial views in various formats of Southerham UWC.




College
Sch
Machine Bottom
Elder's Tan
PEVENSEY LEV


River Ouse
River Ouse
A26
A26
A26
Hanover Displays
MDJ Light Brot
The Gran
Catering
Southerham Roundabout
A27
A27
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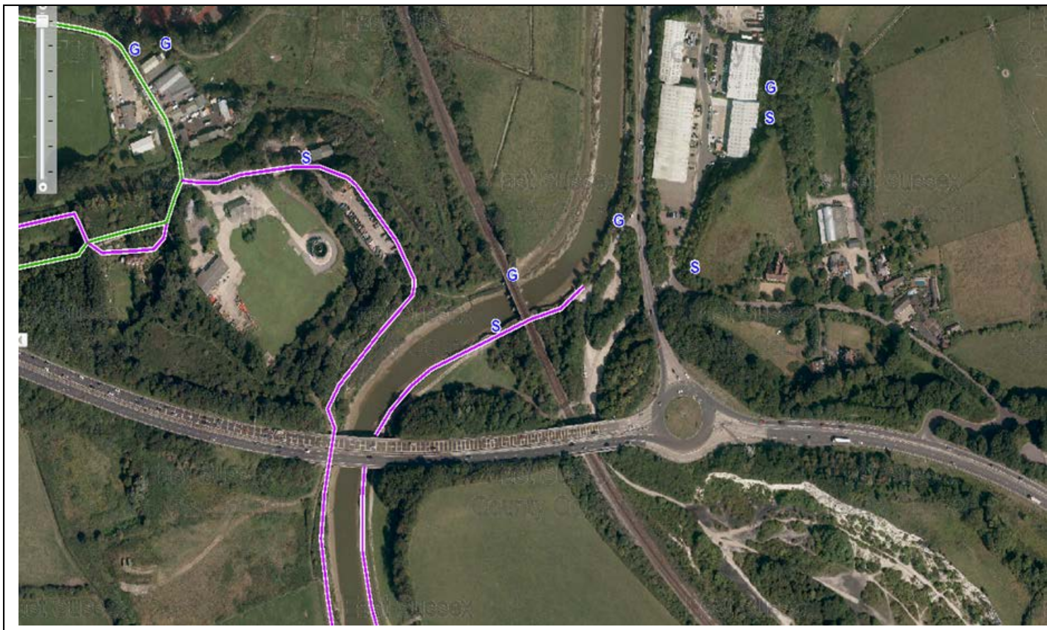
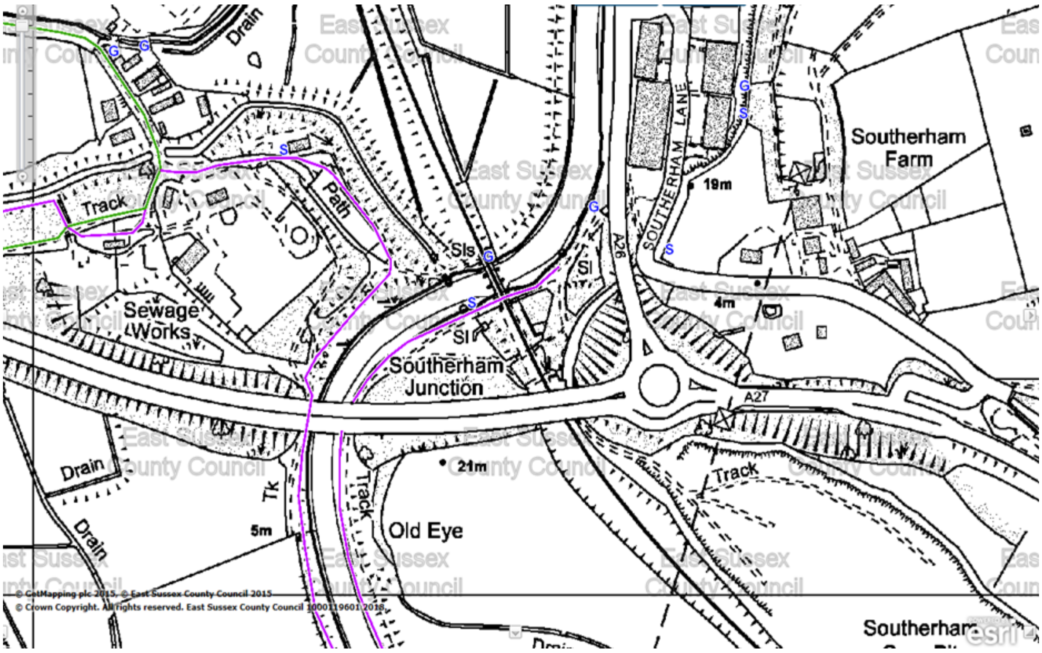
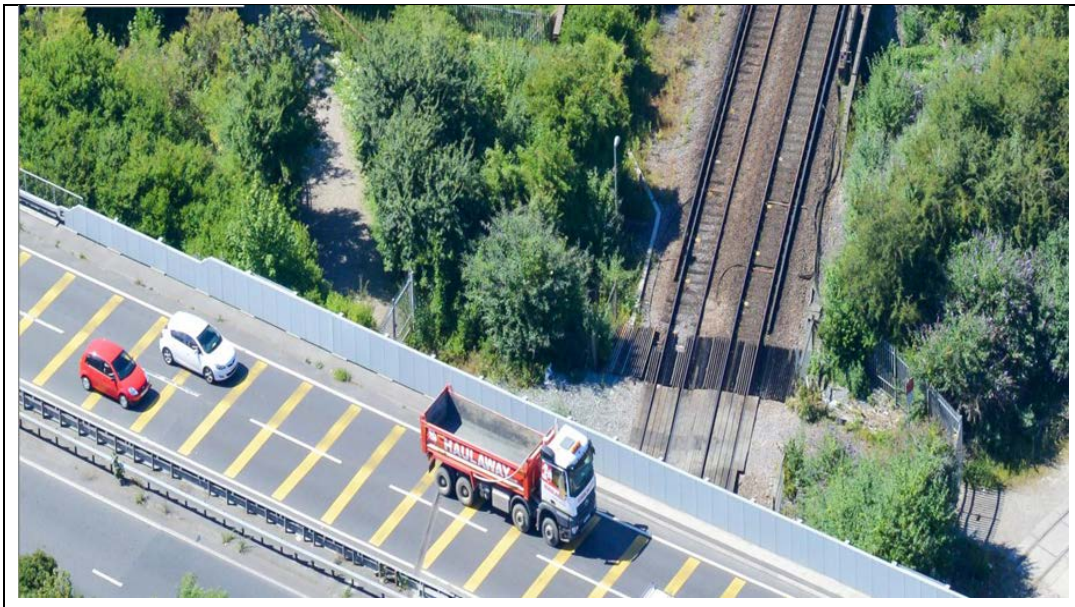
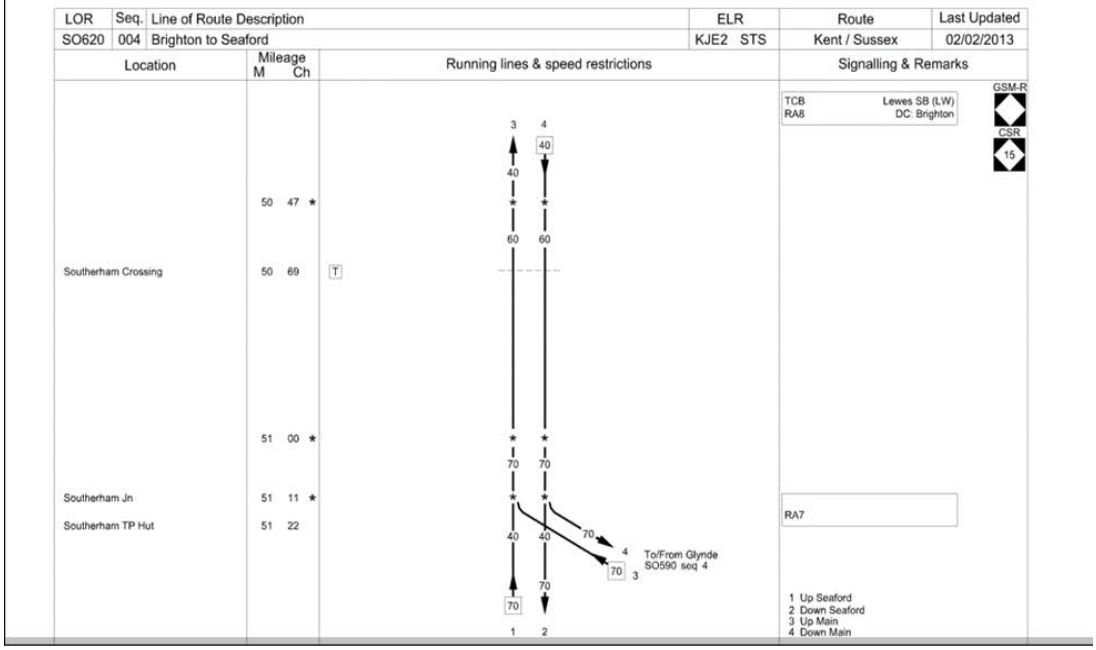




Southerham Farm
SOUTHERHAM LANE
19m
Track
Path
Sls
Sl
A26
Sewage Works
4m
Southerham Junction
A27
Drain
21m
Track
Tk
5m
Old Eye
Drain
Southerham


HAULAWAY



Crossing description

Southerham is a user worked crossing with telephones (UWCt) which consist of 2 double sided metal palisade gates on either side of the crossing which are padlocked shut when not in use.

The crossing road accesses are owned by Firle Estates and there is a tenant farmer on the land on the up side (US).

The track for Southerham is an up and a down road which separates further along the track in the down direction at Southerham junction for the Eastbourne line and the Seaford branch line. The train speed is 60 mph on both roads over the level crossing.

The up side approach is an un-made up road consisting of small grade stones, grass and dirt

and the down side is a hard concrete base.

The crossing surface is made of suspended timbers.

There is no pedestrian walkway over the UWC but anti slip is laid to assist pedestrians as timbers can be slippery when wet.

The decision point is 3m on both sides which is just at the edge of the wing fencing. The sighting for pedestrians is 9 seconds warning time and 240m minimum distance required and vehicles 31 seconds and 826m minimum distance required.

The sighting is limited in both directions by track curve.

The traverse, distance calculator was used to reach the traverse time required:
60mph line speed x crossing length recorded 10m required 826m minimum distance for vehicles - The longest vehicle calculation has been taken to account for farm tractor/trailers used at this location.

Actual measured sighting is:
UP-UP track curve 310
UP-DN 40 mph speed board 440
DN-UP track curve 190
DN-DN track curve 290

The non-compliant sighting is mitigated by telephones, one on either side of the crossing placed outside the waiting areas, fully visible and signed as such.
They are direct connect telephones so that the user only has to pick up the receiver to be connected to the relevant signal box which is currently Lewes – there is an alternative telephone number clearly marked should the telephone fail.

The traverse route is gate to gate and there is undulation of the timber crossing in the middle section due the cant of the track which does cause surface level changes mid crossing.

The normal compliant signs are in place – the “stop look listen” for on foot users, electrification of track and do not trespass is situated on both sides. There is further signage which applies to the vehicles using the crossing giving instruction how to cross.

Vegetation is a problem in growing season due to the many buddleia tree systems growing in and around the crossing area and further down the track.
There is a MST in place for the crossing vegetation to be cut back in spring time, thereafter it’s reactive for both the crossing and the track with regard to any sighting issues outside of this.

The boundary line is protected by palisade gates and fencing initially and then chain link with post fencing.

There is no lighting in place and only ambient levels of lighting exist from the road lighting and vehicles above.

Trespass guarding is provided on both ends of the crossing at the required minimum distance of 2.6m which applies to all points on the crossing.

The conductor rail is cut back further than the required minimum of 3m distance away from the crossing surface in both directions.

up side crossing approach

Down side crossing approach

View of maintenance yard looking in the down direction

Future developments in the area

There are currently no known developments in the area which would affect the level crossing at this time.

Crossing usage

A squirrel camera was deployed at this location for a period of 7 days, 151117 - 211117 and recorded zero traverses from the authorised user.
Some NR rail users were recorded but not valid for use in this census.

Conversation with the user confirmed previous discussions of user traversing with trailer and tractor approx twice a year to take sheep over and bring them back.

There is a cattle creep under the railway and unless there is high tidal water covering the route the farmer uses this means to get to and from the land.

The land on the US is grassed and only used for grazing now instead of crops.

An estimated traverse count was used as per above 0 reading and “few” was recorded – this relates to the “all level crossing risk model” (ALCRM) where 0 can’t be recorded as this closes the crossing – therefore it is recorded as “few”.

Confirmation re usage with the signaller reveals that only 2 traverses have been recorded in 2017 – 220917 and 151117 both with a tractor trailer. This validates the user’s comments.

There are 234 passenger trains and 4 scheduled freight trains passing over this crossing in a 24hr period.

The permissible line speed over the crossing is 60 mph.

Lighting assessment

A lighting and sign visibility check during darkness was undertaken at passive crossings

reachable on foot in 2016/2017 – this was requested by the National Level Crossing Team (NLCT).

Similar crossings were checked and the signage and deck were found to be not visible to the naked eye without assistance from other means ie torch light etc. The findings were sent to the NLCT and further updates are pending.

This crossing was not assessed as it was not able to be safely reached on foot as an individual working alone (IWA) during darkness.
There may be some ambient lighting from the A27 but this cannot be validated at this time.

Crossing abuse

There has been no documented abuse at this LC since 2003.

170800 kids playing with phones.
140602 farmer failed to call back clear.
290103 gates vandalised.
070503 report by farmer that one of his animals was loose on the LC no further information.
190503 gate left open.

There has been, however, evidence of trespass within the vicinity as there are visible signs of graffiti on the over bridge of which some of the structure is lineside and on railway property. It is not known how the railway is being accessed for misuse and nothing has been picked up on the census camera.

There is evidence of a dirt bike run alongside the track on the DS although due vegetation it is not visible and not trackside – the approach via the concrete road is private but bikers ignore this and find a way to access the route. The container company have moved a metal skip over the access entrance but the bikers have worn a path away around it. This does not affect the railway boundary or trespass onto the track.

Key risk drivers

- **low sighting time**
- **frequent trains**

Low sighting – due to the track curves limiting the sighting this cannot be enhanced without substantial works to change the line of the track. There is an MST in Ellipse for vegetation cut backs at the crossing and for sighting once a year in growing season, all other sighting issues are reactionary and picked up at either risk assessment or inspection visits. The current standard for cut back to 7m from the running rail will greatly assist with vegetation issues affecting sighting.

Frequent trains - passenger use and passenger need is increasing constantly so the number of trains is also likely to increase therefore the risk driver is likely to remain as a constant.

Crossing risk

This is a planned risk assessment with an ALCRM risk score generated of B8 – the FWI score is 0.000029973.

The following options have been considered and assessed for risk reduction at this crossing:

1. **Closure**

If closure was achieved 100% risk reduction would be achieved and the FWI would be 0.

Conclusion

1. **Closure**

This option is unrealistic as there is no suitable diversion other than the cattle creep and this becomes unpassable on occasion due tidal water from the adjacent River Ouse. There is also the problem of vehicle size as the cattle creep passes under the railway and is height restrictive.

Recommendations

The crossing should remain “as is” for this current assessment and be re assessed at the next scheduled date of 150220.

ANNEX A – ADDITIONAL PHOTOGRAPHS

Description:

Description:

Description:

Description:

Description:

Description:

ANNEX B – HAZARD IDENTIFICATION AND RISK CONTROLS

The table below is intended for use by risk assessors when identifying hazards and risk control solutions. It is not an exhaustive list or presented in a hierarchical order.

	Hazard	Control
Road vehicle and train collision risk	Examples at the crossing include: • insufficient sighting and / or train warning for all vehicle types; known to be exacerbated by the driving position, e.g. tractor • level crossing equipment and signage is not conspicuous or optimally positioned • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • high volume of unfamiliar users, e.g. irregular visitors, migrant workers • known user complacency leading to high levels of indiscipline, e.g. failure to use telephone, gates left open • type of vehicle unsuitable for crossing; - large, low, slow making access or egress difficult and / or vehicle is too heavy for crossing surface - risk of grounding and / or the severity of the gradient adversely affects ability to traverse • poor decking panel alignment / position on skewed crossing • where telephones are provided, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • high chance of a second train coming • high line speed and / or high frequency of trains • unsuitable crossing type for location, train service, line speed and vehicle types	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs • engaging with signalling engineers to optimise strike in times • upgrading of asset to a higher form of protection • downgrading of crossing by removing vehicle access rights • optimising sighting lines and / or providing enhanced user based warning system, e.g. MSL • re-profiling of crossing surface • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • widening access gates and / or improving the crossing surface construction material • realigning or installing additional decking panels to accommodate all vehicle types • implementing train speed restriction or providing crossing attendant
Pedestrian and train collision risk	Examples include: • insufficient sighting and / or train warning • ineffective whistle boards; warning inaudible, insufficient warning	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs

	Hazard	Control
	time provided, known high usage between 23:00 and 07:00 • high chance of a second train coming • high line speed and / or high frequency of trains • level crossing equipment and signage is not conspicuous or optimally positioned • location and position of level crossing gates mean that users have their backs to approaching trains when they access the level crossing, i.e. users are initially unsighted to trains approaching from their side of the crossing • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • surface condition or lack of decking contribute to slip trip risk • known high level of use during darkness • increased likelihood of user error, e.g. crossing is at station • free wicket gates might result in user error • high volume of unfamiliar users, e.g. irregular visitors / ramblers, equestrians • complacency leading to high levels of indiscipline, e.g. users are known to rely on knowledge of timetable • high level of use by vulnerable people • where telephones are provided i.e. bridleways, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • unsuitable crossing type for location, train service, line speed and user groups • high usage by cyclists • degree of skew over crossing increases traverse time and users' exposure to trains • crossing layout encourages users not to cross at the designed decision point; egress route unclear especially during darkness	• upgrading of asset to a higher form of protection • optimising sighting lines, e.g. de-vegetation programme, repositioning of equipment or removal of redundant railway assets • implementing train speed restriction or providing crossing attendant • providing enhanced user based warning system, e.g. MSL • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • installing guide fencing and / or handrails to encourage users to look for approaching trains, read signage or cross at the designed decision point • re-design of crossing approach so that users arrive at the crossing as close to a 90° angle as possible • installing lighting sources • engaging with signalling engineers to optimise strike in times • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • providing cyclist dismount signs and / or chicanes • straightening of crossing deck

	Hazard	Control
	schools, local amenities or other attractions are known to contribute towards user error	
Pedestrian and road vehicle collision risk	Examples include: • a single gate is provided for pedestrian and vehicle users where there is a high likelihood that both user groups will traverse at the same time • the position of pedestrian gate forces / encourages pedestrian users to traverse diagonally across the roadway • road / footpath inadequately separated; footpath not clearly defined • condition of footpath surface increases the likelihood of users slipping / tripping into the path of vehicles	Controls can include: • providing separate pedestrian gates • clearly defining the footpath; renew markings • positioning pedestrian gates on the same side of the crossing • improving footpath crossing surface so it is devoid of potholes, excessive flangeway gaps and is evenly laid • improving crossing surface, e.g. holdfast, strail, non-slip surface
Personal injury	Examples include: • skewed crossing with large flangeway gaps results in cyclist, mobility scooter, pushchair or wheelchair user being unseated • condition of footpath surface increases the likelihood of users slipping / tripping • degraded gate mechanism or level crossing equipment • barrier mechanism unguarded / inadequately protected	Controls can include: • improving fence lines • reducing flangeway gaps and straightening where possible • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • straighten / realign gate posts • fully guarding barrier mechanisms

ANNEX C – ALCRM RISK SCORE EXPLANATION

ALCRM provides an estimate of both the individual and collective risks at a level crossing.

The individual and collective risk is expressed in Fatalities and Weighted Injuries (FWI). The following values help to explain this:

- **1** = 1 fatality per year or 10 major injuries or 200 minor RIDDOR events or 1000 minor non-RIDDOR events
- **0.1** = 20 minor RIDDOR events or 100 minor non-RIDDOR events
- **0.005** = 5 minor non-RIDDOR events

INDIVIDUAL RISK

This is the annualised probability of fatality to a 'regular user'. *NOTE: A regular user is taken as a person making a daily return trip over the crossing; assumed 500 traverses per year.*

Individual risk:

- Applies only to crossing users. It is not used for train staff and passengers
- Does not increase with the number of users.
- Is presented as a simplified ranking:
    - Allocates individual risk into rankings A to M
      (A is highest, L is lowest, and M is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
    - Allows comparison of individual risk to average users across any crossings on the network

Individual Risk Ranking	Upper Value (Probability)	Lower Value (Probability)	Upper Value (FWI)	Lower Value (FW)
A	1 in 1	Greater than 1 in 1,000	1	0.001000000
B	1 in 1,000	1 in 5,000	0.001000000	0.000200000
C	1 in 5,000	1 in 25,000	0.000200000	0.000040000
D	1 in 25,000	1 in 125,000	0.000040000	0.000008000
E	1 in 125,000	1 in 250,000	0.000008000	0.000004000
F	1 in 250,000	1 in 500,000	0.000004000	0.000002000
G	1 in 500,000	1 in 1,000,000	0.000002000	0.000001000
H	1 in 1,000,000	1 in 2,000,000	0.000001000	0.000000500
I	1 in 2,000,000	1 in 4,000,000	0.000000500	0.000000250
J	1 in 4,000,000	1 in 10,000,000	0.000000250	0.000000100
K	1 in 10,000,000	1 in 20,000,000	0.000000100	0.000000050
L	Less than 1 in 20,000,000	Greater than 0	0.000000050	Greater than 0
M	0	0	0	0

COLLECTIVE RISK
This is the total risk for the crossing and includes the risk to users (pedestrian and vehicle), train staff and passengers.

Collective risk:

- Is presented as a simplified ranking:
  - Allocates collective risk into rankings 1 to 13
    (1 is highest, 12 is lowest, and 13 is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Can easily compare collective risk between any two crossings on the network

Collective Risk Ranking	Upper Value (FWI)	Lower Value (FW)
1	Theoretically infinite	Greater than 5.00E-02
2	0.050000000	0.010000000
3	0.010000000	0.005000000
4	0.005000000	0.001000000
5	0.001000000	0.000500000
6	0.000500000	0.000100000
7	0.000100000	0.000050000
8	0.000050000	0.000010000
9	0.000010000	0.000005000
10	0.000005000	0.000001000
11	0.000001000	0.000000500
12	0.0000005	0
13	0.00E+00	0.00E+00

NARRATIVE RISK ASSESSMENT – PASSIVE TEMPLATE FINAL v2.0

PASSIVE LEVEL CROSSING RISK ASSESSMENT

1. LEVEL CROSSING OVERVIEW AND ENVIRONMENT

1.1 LEVEL CROSSING OVERVIEW

This is a risk assessment for Parsons level crossing.

Crossing details	
Name	Parsons
Type	User work crossing (UWC)
Crossing status	Occupation
Overall crossing status	Open
Route name	Sussex
Engineers Line Reference	STS, 55m, 55ch
OS grid reference	TQ446024
Number of lines crossed	2
Line speed (mph)	70
Electrification	DC
Signal box	Newhaven Town

Risk assessment details	
Name of assessor	[redacted]
Post	Level Crossing Manager
Date completed	19/07/2017
Next due date	19/10/2019
Email address	[redacted]@networkrail.co.uk
Phone number	[redacted]

ALCRM risk score	
Individual risk	B
Collective risk	3
FWI	0.005857693

1.2 INFORMATION SOURCES

The table below shows the stakeholder consultation that was undertaken as part of the risk assessment.

Consulted	Attended site
Authorised user	No
Highway local	No

Stakeholder consultation and attendance notes:

Nothing further to add

The reference sources used during the risk assessment included:

- Occurrence log, Census, CCIL, GI Portal, SMIS.

1.3 ENVIRONMENT

Up side crossing approach **Down side crossing approach**

Parsons level crossing provides track to field access.

It is an occupation level crossing. There are no stations visible at the level crossing.

At Parsons level crossing the orientation of the road/path from the north is 240°; the orientation of the railway from the north to the up line in the up direction is 320°. Low horizon can result in sun glare; sun glare is not a known issue.

There are no planned or apparent developments near the crossing which may lead to a change or increase in use or risk.

Site visit general observations:

Busy industrial park on the down side (DS) of the crossing ranging from a breakers yard/body repairs to wooden pallet site. The road approach is always full of cars and fork lift/towing is often in operation. There are no paved areas for pedestrians. The DS approach to the crossing is down a private road which has several industrial units, one of which is a breakers yard for cars both sides of the road are always full of parked cars during working hours. The approach road on the DS is tarmac and of good quality, there is no road on the Up side just field track type access. ESCC have bought the land and are allowing the environment agency access to the river bank, this means they are bringing large vehicles over the crossing ie river bank dredgers and excavators. ESCC are bringing over tree planting and grass cutting machines which are on low loaders. The tenant sheep farmer uses a quad bike or tractor trailer to traverse therefore longest vehicle type used for risk assessment (RA) purposes.

2. LEVEL CROSSING USAGE

2.1 RAIL

The train service over Parsons level crossing consists of passenger and freight trains. There are 90 trains per day. The highest permissible line speed of trains is 70mph. Trains are timetabled to run for 24 hours per day.

Assessor's notes:

Nothing further to add

2.2 USER CENSUS DATA

A 24 hour census was carried out on 19/07/2017 by [redacted] The census applies to 100% of the year.

The census taken on the day is as follows:

Cars	1
Vans / small lorries	0
Buses	0
HGVs	0
Pedal / motor cyclists	1
Pedestrians	11
Tractors / farm vehicles	0
Horses / riders	0
Animals on the hoof	0

Available information indicates that the crossing does not have a high proportion of vulnerable users.

Vulnerable user observations:

Nothing further to add

Available information indicates that the crossing does not have a high number of irregular users.

Irregular user observations:

Nothing further to add

Parsons level crossing has both private vehicular and private pedestrian access gates to the crossing. The proportion of pedestrian users using the entry/exit gates is estimated to be:

- Footpath gates/stiles 0%
- UWC vehicular gates 0%

Information gathered indicates that Parsons level crossing does not have a high number of users during the night or at dusk.

Site visit night / dusk user observations:

The national level crossing team (NLCT) requested a night time visibility survey in 2016 – this showed that there is ambient lighting from industrial units on the down side (DS) which have security lighting attached to the exterior and the incinerator and the siding on the up side (US). There are signals visible in both directions and the looking down direction signal does obliterate the track to some degree with glare which may cause difficulty in observing an approaching train. This signal could also be confused as train lamps. This would be rated as a glare index 3 on the scale provided.

Assessor's general census notes:

6 day census with a squirrel camera

2.3 USER CENSUS RESULTS

ALCRM calculates usage of the crossing to be 1 road vehicles and 12 pedestrians and cyclists per day.

3. RISK OF USE

3.1 SIGHTING AND TRAVERSE

At Parsons level crossing, the decision point and traverse lengths are calculated as:

	Decision point (m)	Traverse length (m)	Measured from
Up side	3	10	3 m back from the nearest running rail
Down side	3	10	3 m back from the nearest running rail

Rubber decking is provided over the level crossing. The decking is considered to be wide enough for all users of the crossing. It is fitted with a non slip surface.

The traverse times are calculated as:

	Traverse time (s)
Pedestrians	8
Vehicles	31

The current census has not identified a high proportion of vulnerable users. Therefore, the pedestrian traverse time has not been increased.

Assessor's traverse time notes:

Distance, traverse, sighting calculator used

Sighting was measured by the following means:

- Using Range Finder
- Using a marker at a known distance
- Using known references

Sighting, measured in metres, at Parsons level crossing is recorded as:

All distances are recorded in metres	Minimum sighting distance required	Measured sighting distance	Sighting distance measured to	Is sighting compliant?	If deficient, is sighting distance mitigated?	Notes on deficient sighting time mitigations
Up side looking toward up direction train approach	963	863	Road over rail bridge	No	NO	Telephones required at this location this has been progressed and funding approved. Users are asked to use their own mobiles currently.
Up side looking toward down direction train approach	963	525	Sign in cess	No	NO	Telephones required at this location this has been progressed and funding approved. Users are asked to use their own mobiles currently to get permission to cross with a vehicle.
Down side looking toward up direction train approach	963	863	Road over rail bridge	No	NO	Telephones required at this location this has been progressed and funding approved. Users are asked to use their own mobiles currently to get permission to cross with a vehicle.
Down side looking toward down direction train approach	963	483	Fixed line structure	No	NO	Telephones required at this location this has been progressed and funding approved.

						Users are asked to use their own mobiles currently to get permission to cross with a vehicle.

Sighting restrictions are recorded as follows:

	Up Direction	Down Direction
Nothing; vanishing point	NO	NO
Track curvature	YES	YES
Permanent structure (building/wall etc)	NO	YES
Signage or crossing equipment	NO	NO
Vegetation	NO	NO
Bad weather on the day of visit	NO	NO
Other	NO	NO

There are no known obstructions that could make it difficult for users to see approaching trains. There are known issues with foliage, fog or other issues that might impair visibility of the crossing, crossing equipment or approaching trains.

Actions to improve sighting have been identified.

Assessor's improving sighting and decision point notes

MST at the crossing for veg growth and sighting once a year. Anything else is reactionary.

The visual evaluation of the vertical profile of the road indicates that it does not create a risk of vehicles getting stuck on the crossing.

Assessor's risk of vehicle getting stuck notes:

The crossing is strail units giving good adhesion for vehicles.

Assessor's general sighting and traverse notes:

See notes for crossing in dusk/darkness.

3.2 EVALUATION OF MITIGATIONS

3.3 CROSSING APPROACHES

The signs at Parsons level crossing are located on the direct route a user would take over the level crossing; they are positioned so that they are clearly visible to users taking a direct route over the level crossing. The visibility of the signs is reduced at night or at dusk.
The road surface (including gradient is present) at Parsons level crossing could impact on the ability of a vehicle to stop at the level crossing.

There are known issues with ice, mud, loose material or flood water. These known issues might impair visibility of the crossing, crossing equipment, including signage or the visibility of trains. They might also affect the ability of a vehicle to stop
There are adjacent sources of light or noise that could affect a users' ability to see or hear approaching trains.

Assessor's general crossing approach notes:

Recent lighting survey at night indicates that signals can be mistaken for approaching trains and glare from them can blot out actual train headlights

3.4 AT THE CROSSING – ANOTHER TRAIN COMING RISK

Trains are sometimes known to pass each other at this crossing.

Assessor's another train coming notes:

Nothing further to add

3.5 INCIDENT HISTORY

A level crossing safety event has not been known to occur at Parsons level crossing in the last twelve months.

Assessor's incident history notes:

050116 signaller reported user crossed and was late in reporting clear of crossing. 191009 lorry driver failed to call back, 2 trains cautioned. All other incidents were sheep on the line related.

Gate discipline (including barriers)

Reports indicate that the gates are ALWAYS CLOSED.

Assessor's notes on operational disruptions:

Nothing further to add

4. ALCRM CALCULATED RISK

*Parsons **level crossing ALCRM results***

Key risk drivers: ALCRM calculates that the following key risk drivers influence the risk at this crossing:

- Frequent trains
- Large number users
- Low sighting

Assessor's key risk drivers notes

Nothing further to add in this section – see assessors notes for relevant comments

Safety risk				
Compared to other crossings the safety risk for this crossing is	**Individual risk**		**Collective risk**	
	B		**3**	
	Individual risk (fraction)	**Individual risk (numeric)**		
Car	1 in 887	0.001126758	0.00087835	
Van / small lorries	0	0	0	
HGV	0	0	0	
Bus	0	0	0	
Tractor / farm vehicle	0	0	0	
Cyclist / Motor cyclist	1 in 2480	0.000403071	0.000294242	
Pedestrian	1 in 1901	0.000525965	0.004413623	
				Derailment contribution
Passengers			0.000037906	98.48391806
Staff			0.000233572	1.864875525
Total			0.005857693	0.711660683
Collision frequencies	**Train / user**	**User equipment**	**Other**	
Vehicle	0.001476219	0.000502008	0	
Pedestrian	0.005749146	0	0.001798099	
Collision risk	**Train / user**	**User equipment**	**Other**	
Vehicle	0.00087835	0	0	
Pedestrian	0.004668307	0	0.000039558	

5. OPTION ASSESSMENT AND CONCLUSIONS

5.1 OPTIONS EVALUATED

The options evaluated to mitigate the risks at Parsons crossing include:

Option	Term[1]	ALCRM risk score	ALCRM FWI	Safety Benefit	Cost	Benefit Cost Ratio	Status	Comments
add telephones	Long Term	B4	0.002185338				COMPLETE	This option would make the crossing compliant as telephones are required for moving animals and large vehicles. The funding is available for this and it is with the project team and the RLCM for implementation.
closure via diverson or bridging	Long Term	M13	0				COMPLETE	This option would remove the risk completely but there is no suitable close by diversion and bridging would not be an option as there is insufficient land. The up side is on south downs national park territory and it unlikely that they would approve a bridge.
add MSL for both vehicles and peds	Long Term	C5	0.000548221				COMPLETE	MSL's were optioned for but discounted as not suitable at this location.

NOTES
Network Rail always evaluates the need for short[1] and long term risk control solutions. An example of level crossing risk management might be; a short term risk control of a temporary speed restriction with the long term solution being closure of the level crossing and its replacement with a bridge.
[1] Includes interim

CBA gives an indication of overall business benefit. It is used to support, not override, structured expert judgement when deciding which option(s) to progress. CBA might not be needed in all cases, e.g. standard maintenance tasks or low cost solutions (less than £5k).

The following CBA criteria are used as a support to decision making:

a. benefit to cost ratio is ≥ 1: positive safety and business benefit established;
b. benefit to cost ratio is between 0.99 and 0.5: reasonable safety and business benefit established where costs are not grossly disproportionate against the safety benefit; and
c. benefit to cost ratio is between 0.49 and 0.0: weak safety and business benefit established.

5.2 CONCLUSIONS

Assessor's notes:

Crossing location

Parsons is a combined user work crossing (UWC) and footpath (FP) which is located on ELR STS at 55m 56ch. Combined FP's and UWC's are also known as Hybrids.

Parsons UWC consists of standard metal gates, 1 on the up side and 1 on the down side which are locked with a railway abloy padlock.

Parsons FP was originally known as New Road FP and traversed the railway at 55m 58ch but was officially closed and extinguished when the Ash siding was built for the Incinerator on the up side 3 years ago.

New Road FP was re named Parsons FP, the entrance to the FP remains in the same location but is deviated 2 ch/40m up to where Parsons UWC traverses the railway.

The crossing is situated and accessed via a private unnamed no through road which spurs off of the busy A26 New Road which is an industrial area including car sales, storage units and a pallet yard.

The private road leading to Parsons UWC houses several industrial units which have a busy breakers yard and HGV parcel delivery point.

There is no pedestrian walkway or signage leading up to the UWC on this road and users must negotiate HGV's and parked vehicles on both sides of the road to reach the crossing either in a vehicle or on foot.

The land over the stile on the up side belongs to ESCC and is partially tenant farmed with grazing for sheep, it is also the gateway to the start of the South Downs National Park from Newhaven.

ESCC have planted many trees on the land on the US in consultation with Network Rail after they aquired ownership from a farmer.

ESCC allow access to the Environment Agency on occasion should they need to attend to the River Ouse riverbank and this is solely via the UWC element of the crossing.

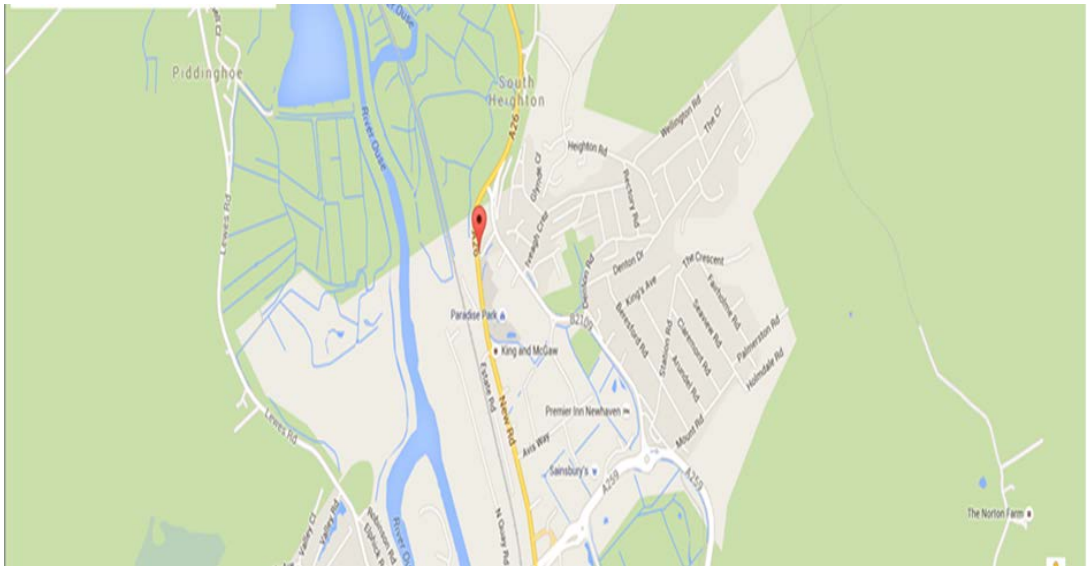
Also clearly visible is the incinerator on the up side which burns waste for the of Newhaven is also close by and has a Cross Channel Ferry service that runs twice a day bringing a lot of HGV freight traffic to the area, this all uses the A26 for ingress and egress to the area.

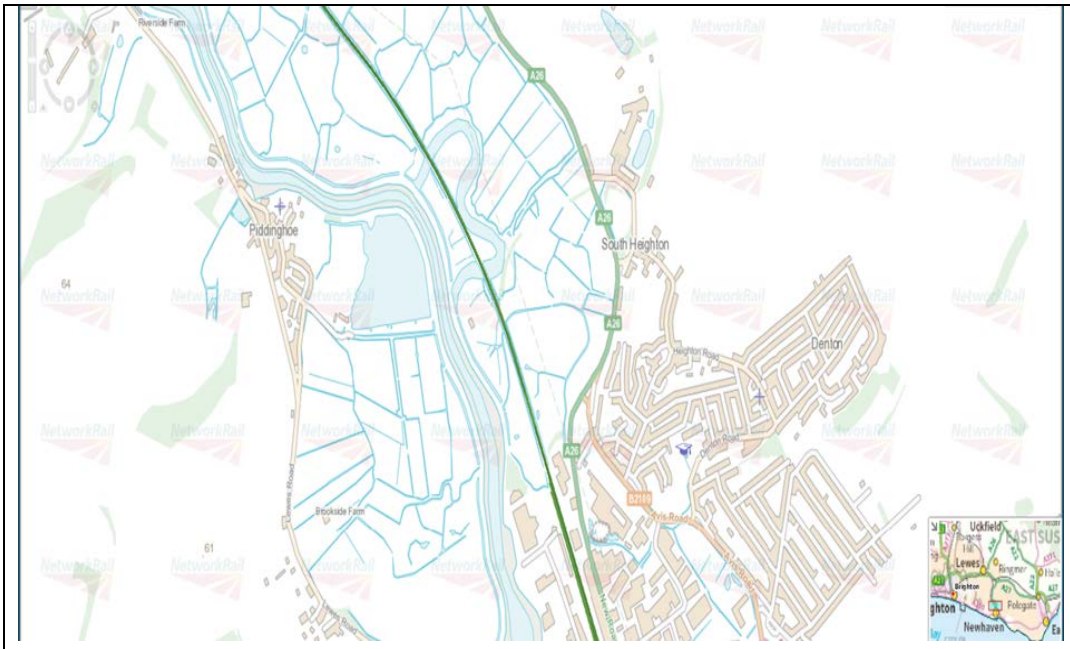
The road over rail bridge is visible in the looking down direction – this carries road traffic over Newhaven Town LC in an attempt to ease congestion in the area, this has achieved only some relief as the area has continued to grow and expand after the bridge was built. The water bridge near Newhaven Town crossing also opens daily to allow ships to pass through and this causes delay and traffic build up on all roads which includes the A26.

The adjacent hybrid FP over the railway provides an officially documented walking route called "Newhaven 24" and connects with the South Downs walking routes at Itford level crossing further along the riverbank in the up direction.

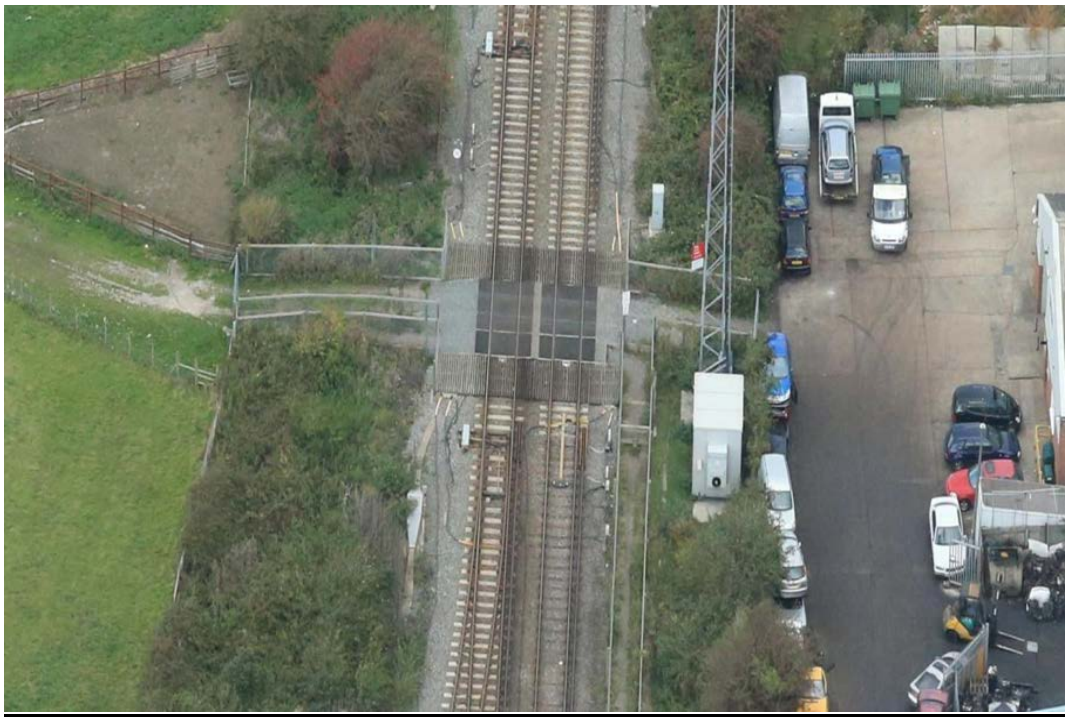
The Seaford branch line is sometimes prone to winter fog and sea mist.

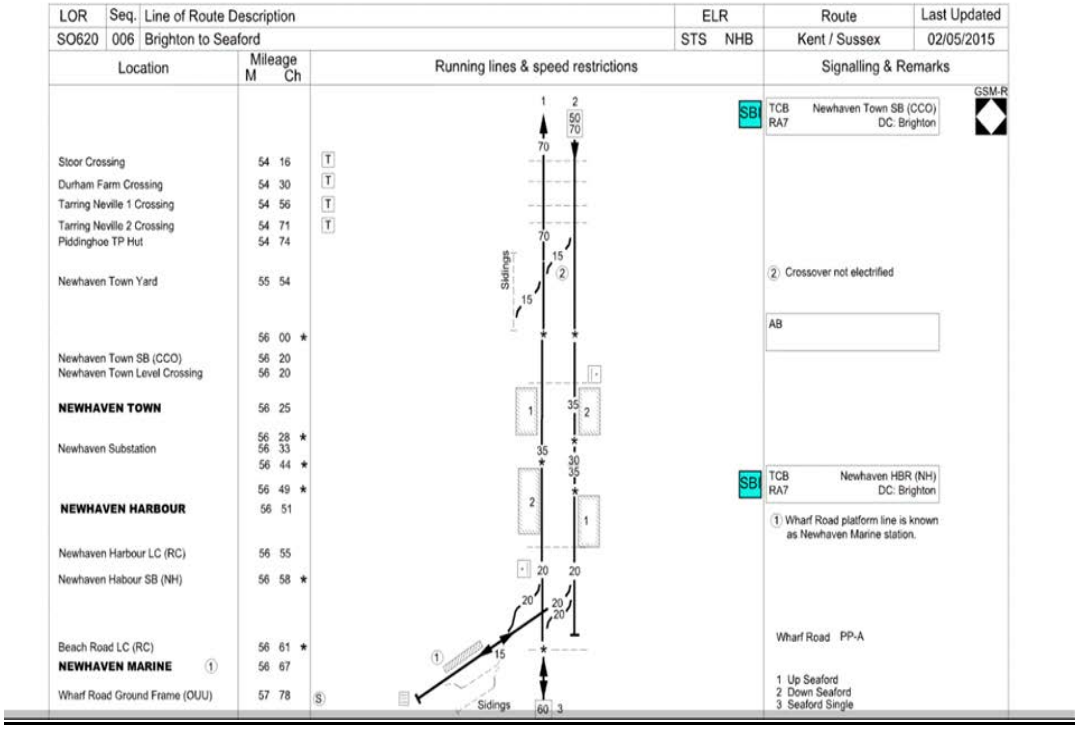
Aerial shots of the crossing




Riverside Farm
Piddinghoe
South Heighton
Denton
Brookside Farm
A26
A27
Uckfield
Lewes
Brighton
Polegate
Newhaven


A26(T)
NEWHAVEN
Arlington





Crossing description

Parsons crossing is a combined footpath and user work crossing which consists of 3 wooden stiles for the FP section, 2 on the down side and 1 on the up side and 2 metal locked user work crossing gates which open outwards away from the running line for the user work section of the crossing.

The user rights for the crossing belong to the land owner, East Sussex County Council, who allow access to a tenant farmer and the Environment Agency who need access to the river bank on the up side of the crossing.

The down side approach is from an unnamed, private road consisting of a tarmac surface with no paved areas for pedestrians to walk upon, cars and pedestrians share the same space.

The up side approach is of a field type which can get muddy and boggy in winter months.

During business opening hours there are cars normally parked on both sides of the road as there is a breaker's yard in this location. There is also a HGV parcel delivery point and vehicles are often waiting here to swipe in.

Once through the railway boundary vehicle gates both approaches are of semi compacted stone. There is an old rail line and some timbers running through the waiting area on the US.

The pedestrian and vehicle areas are segregated on the approaches by fence posts and chain link all in good condition.

The crossing surface is made of pedestrail for pedestrians and inostrail for vehicles with some closely compacted type 1 in the cess and 6ft areas. This is a fairly new surface which was installed 4 years ago at the time of deviation for the FP to enable the combining of both crossings.

The decision point is 3m for vehicles and 2m for pedestrians. The 3m point for vehicles is measured from the nearest running line back to a 3m distance and 2m for pedestrians.

The traverse length of the crossing for vehicles is 10 m and 9m for pedestrians.

There are no telephones present and funding has been approved for the installation of these as sighting is deficient in all directions for vehicles therefore the crossing is currently non-compliant.

Users must currently use their own mobiles to contact the signaller and obtain permission to cross where instructed.

Sighting is compliant for the FP section of the crossing and users cross on their own authority as instructed by “stop look listen” signage only.

There is the normal compliant signage here for the UWC section instructing users to call the signaller for permission to cross with low, low, heavy loads or animals. Electrification and do not trespass signage is present for all users as is Samaritan signage.

Parsons train track has an up and a down road and the maximum speed here is 70mph. The track is powered by conductor rail DC750.

This site was also chosen as a POGO site but was de-scoped due unsuitability - concern was raised about the accessibility to everyone in the vicinity as it was on a busy industrial site, this was accepted as a valid point.

Sighting is non compliant for vehicles with a speed of 70 mph on both up and down roads requiring a minimum of 963m and compliant for pedestrians requiring a distance of 249m.

UP-UP road bridge sighting is 863m
UP-DN sign in cess sighting is 525m
DN-UP road bridge sighting is 863m
DN-DN fixed line structure sighting is 483m

The sighting is limited in both up and down directions by track curve.

The traverse, distance calculator was used to reach the traverse time required and the speed of 70mph taken:
70mph line speed x crossing length recorded 9m for pedestrians x = 8 seconds required crossing time and 249m minimum required sighting distance
70mph line speed x crossing length of 10m for vehicles = 31 seconds required crossing time and 963m minimum required sighting distance.

There is no lighting in place and only low levels of ambient lighting exist from surrounding businesses including the incinerator and the nearby A26 road lights. See lighting asessement section for further comments.

Trespass guarding is provided on both ends of the crossing at the required minimum distance of 2.6m which applies to all points on the crossing. The conductor rail is cut back further than the required minimum of 3m distance away from the crossing surface in both directions.

Inostrail and pedestrail view of crossing – down side looking across to the incinerator on the up side.

Approach on the down side from google street maps

Future developments in area

There are currently no known significant developments planned in the vicinity of Parsons at this time which would affect or change the usage of this level crossing (LC). Planning has been sought for the harbour for an aggregate company which would significantly increase HGV's on the A26 passing the turn off for this LC but it would not affect the usage.

Crossing usage

A 7 day census was taken with a squirrel camera which recorded 1 vehicle on average per day, 11 pedestrians per day on average and 1 cyclist on average per day.

The tenant farmer usually goes over with a 4x4 or a quad bike daily and returns via South Ease/Itford but can traverse with a tractor trailer when delivering feed to the sheep as required.

The contractor for ESCC goes over to cut grass and to manage the trees normally with a flatbed as required but usually 2/3 times a year.

ESCC also allow the EA (environment agency) to traverse when works are needed at the river bank by means of excavation with diggers etc.

There are booked freight trains on this line during a 24 hr period, these totals 4 traverses over the LC.

The permissible line speed is 70mph on both lines, this is also the same speed for the maximum permissible line speed.

The British Transport Police (BTP) tasking vehicle is not deemed a necessary risk mitigation at this LC due low abuse and usage.

ALCRM calculates usage of the crossing to be 1 vehicle user per day and 12 pedestrian and cyclist users per day at the FP and this is reflected within the scoring system based on the census taken over 7 days.

This crossing is in a semi-rural setting with business units at the crossing on one side only with the US surrounded by farming and grazing land with the River Ouse in close proximity. The incinerator is located on the US but is fenced off and not accessible by vehicle or on foot.

The FP section of the crossing attracts cyclists who carry their bikes over the stiles trying to access the South Downs National Park trails – they also encounter stiles along the river bank on their way to these as far as Southease.

Lighting assessment

A lighting assessment was conducted in darkness 141216 at the request of the NLCT monitoring passive crossings at night.

There is some ambient lighting from industrial units on the DS which have security lighting attached to the exterior and the incinerator and the siding on the us.

There are signals visible in both directions and the looking down direction signal does obliterate the track to some degree with glare which may cause difficulty in observing an approaching train. This signal could also be confused as train lamps. This would be rated as a glare index 3 on the scale provided from NLCT.

Crossing abuse

There is little documented abuse at this location:

050116 signaller reported user crossed and was late in reporting clear of crossing. 191009 lorry driver failed to call back, 2 trains cautioned.
All other incidents were sheep on the line related.

Key risk drivers

- Large Numbers of users
- Low Sighting Time
- Frequent Trains

Large numbers of users – vehicle use is constant with an average of 1 per day which would not be deemed as a large number. ALCRM is taking into account FP users as well which although is recorded as 11 on average this would also not be deemed as a large daily number. ALCRM compares other comparable crossings nationally to achieve its findings.

Low sighting time for certain vehicles is an issue at this location - funding has been approved for telephones to be installed as a mitigation and is currently being dealt with by projects and the RLCM. Users are instructed to use their own telephones to call the signaller until further notice and have been briefed as such.

Frequent trains - passenger use and passenger need is increasing constantly so the number of trains is also likely to increase therefore the risk driver is likely to remain as a constant.

Crossing risk

This is a planned risk assessment with an ALCRM risk score generated of B3 – Yellow with a FWI of 0.005857693.

The following options have been considered and assessed for risk reduction at this crossing:

1. **Closure via diverson or bridging**

This option is the preferred one and would permanently close the crossing. Following the implementation of this option the crossing would be closed "M13" and a FWI reduction score of 0.

2. **add MSL for both vehicles and pedestrians**

This option would provide a visible red green traffic light system to enable all users to make the decision to cross or not. This generates an ALCRM score of C5 and a FWI reduction score of 0.000548221.

3. **add telephones**

This option has been approved and funding is secured. The project and the RLCM is currently discussing the best way forward for progression. This generates an ALCRM score of B4 and a FWI reduction of 0.002185338.

Conclusion

1. **Closure via diversion or bridging**

There is insufficient space for a road bridge at the crossing and is cost prohibitive versus usage at this location, this would be the same for an underpass. The South Downs National Park would also be very likely to object. Therefore this option is discounted at this time.

2. **add MSL for both vehicles and pedestrians**

This option was submitted as part of a National project and discounted as not suitable by the NLCT.

3. **add telephones**

This is the recommended option and will be progressed by the RLCM and the project.

Recommendation

Telephones are to be installed at this location to make the crossing compliant for vehicle users. The project and the RLCM are in discussions re progression at this time.

ANNEX A – ADDITIONAL PHOTOGRAPHS

Description:

Description:

Description:

Description:

Description:

Description:

ANNEX B – HAZARD IDENTIFICATION AND RISK CONTROLS

The table below is intended for use by risk assessors when identifying hazards and risk control solutions. It is not an exhaustive list or presented in a hierarchical order.

	Hazard	Control
Road vehicle and train collision risk	Examples at the crossing include: • insufficient sighting and / or train warning for all vehicle types; known to be exacerbated by the driving position, e.g. tractor • level crossing equipment and signage is not conspicuous or optimally positioned • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • high volume of unfamiliar users, e.g. irregular visitors, migrant workers • known user complacency leading to high levels of indiscipline, e.g. failure to use telephone, gates left open • type of vehicle unsuitable for crossing; - large, low, slow making access or egress difficult and / or vehicle is too heavy for crossing surface - risk of grounding and / or the severity of the gradient adversely affects ability to traverse • poor decking panel alignment / position on skewed crossing • where telephones are provided, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • high chance of a second train coming • high line speed and / or high frequency of trains • unsuitable crossing type for location, train service, line speed and vehicle types	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs • engaging with signalling engineers to optimise strike in times • upgrading of asset to a higher form of protection • downgrading of crossing by removing vehicle access rights • optimising sighting lines and / or providing enhanced user based warning system, e.g. MSL • re-profiling of crossing surface • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • widening access gates and / or improving the crossing surface construction material • realigning or installing additional decking panels to accommodate all vehicle types • implementing train speed restriction or providing crossing attendant
Pedestrian and train collision risk	Examples include: • insufficient sighting and / or train warning • ineffective whistle boards; warning inaudible, insufficient warning	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs

	Hazard	Control
	time provided, known high usage between 23:00 and 07:00 • high chance of a second train coming • high line speed and / or high frequency of trains • level crossing equipment and signage is not conspicuous or optimally positioned • location and position of level crossing gates mean that users have their backs to approaching trains when they access the level crossing, i.e. users are initially unsighted to trains approaching from their side of the crossing • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • surface condition or lack of decking contribute to slip trip risk • known high level of use during darkness • increased likelihood of user error, e.g. crossing is at station • free wicket gates might result in user error • high volume of unfamiliar users, e.g. irregular visitors / ramblers, equestrians • complacency leading to high levels of indiscipline, e.g. users are known to rely on knowledge of timetable • high level of use by vulnerable people • where telephones are provided i.e. bridleways, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • unsuitable crossing type for location, train service, line speed and user groups • high usage by cyclists • degree of skew over crossing increases traverse time and users' exposure to trains • crossing layout encourages users not to cross at the designed decision point; egress route unclear especially during darkness	• upgrading of asset to a higher form of protection • optimising sighting lines, e.g. de-vegetation programme, repositioning of equipment or removal of redundant railway assets • implementing train speed restriction or providing crossing attendant • providing enhanced user based warning system, e.g. MSL • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • installing guide fencing and / or handrails to encourage users to look for approaching trains, read signage or cross at the designed decision point • re-design of crossing approach so that users arrive at the crossing as close to a 90° angle as possible • installing lighting sources • engaging with signalling engineers to optimise strike in times • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • providing cyclist dismount signs and / or chicanes • straightening of crossing deck

	Hazard	Control
	schools, local amenities or other attractions are known to contribute towards user error	
Pedestrian and road vehicle collision risk	Examples include: • a single gate is provided for pedestrian and vehicle users where there is a high likelihood that both user groups will traverse at the same time • the position of pedestrian gate forces / encourages pedestrian users to traverse diagonally across the roadway • road / footpath inadequately separated; footpath not clearly defined • condition of footpath surface increases the likelihood of users slipping / tripping into the path of vehicles	Controls can include: • providing separate pedestrian gates • clearly defining the footpath; renew markings • positioning pedestrian gates on the same side of the crossing • improving footpath crossing surface so it is devoid of potholes, excessive flangeway gaps and is evenly laid • improving crossing surface, e.g. holdfast, strail, non-slip surface
Personal injury	Examples include: • skewed crossing with large flangeway gaps results in cyclist, mobility scooter, pushchair or wheelchair user being unseated • condition of footpath surface increases the likelihood of users slipping / tripping • degraded gate mechanism or level crossing equipment • barrier mechanism unguarded / inadequately protected	Controls can include: • improving fence lines • reducing flangeway gaps and straightening where possible • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • straighten / realign gate posts • fully guarding barrier mechanisms

ANNEX C – ALCRM RISK SCORE EXPLANATION

ALCRM provides an estimate of both the individual and collective risks at a level crossing.

The individual and collective risk is expressed in Fatalities and Weighted Injuries (FWI). The following values help to explain this:

- **1** = 1 fatality per year or 10 major injuries or 200 minor RIDDOR events or 1000 minor non-RIDDOR events
- **0.1** = 20 minor RIDDOR events or 100 minor non-RIDDOR events
- **0.005** = 5 minor non-RIDDOR events

INDIVIDUAL RISK

This is the annualised probability of fatality to a 'regular user'. *NOTE: A regular user is taken as a person making a daily return trip over the crossing; assumed 500 traverses per year.*

Individual risk:

- Applies only to crossing users. It is not used for train staff and passengers
- Does not increase with the number of users.
- Is presented as a simplified ranking:
    - Allocates individual risk into rankings A to M
      (A is highest, L is lowest, and M is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
    - Allows comparison of individual risk to average users across any crossings on the network

Individual Risk Ranking	Upper Value (Probability)	Lower Value (Probability)	Upper Value (FWI)	Lower Value (FW)
A	1 in 1	Greater than 1 in 1,000	1	0.001000000
B	1 in 1,000	1 in 5,000	0.001000000	0.000200000
C	1 in 5,000	1 in 25,000	0.000200000	0.000040000
D	1 in 25,000	1 in 125,000	0.000040000	0.000008000
E	1 in 125,000	1 in 250,000	0.000008000	0.000004000
F	1 in 250,000	1 in 500,000	0.000004000	0.000002000
G	1 in 500,000	1 in 1,000,000	0.000002000	0.000001000
H	1 in 1,000,000	1 in 2,000,000	0.000001000	0.000000500
I	1 in 2,000,000	1 in 4,000,000	0.000000500	0.000000250
J	1 in 4,000,000	1 in 10,000,000	0.000000250	0.000000100
K	1 in 10,000,000	1 in 20,000,000	0.000000100	0.000000050
L	Less than 1 in 20,000,000	Greater than 0	0.000000050	Greater than 0
M	0	0	0	0

COLLECTIVE RISK
This is the total risk for the crossing and includes the risk to users (pedestrian and vehicle), train staff and passengers.

Collective risk:

- Is presented as a simplified ranking:
  - Allocates collective risk into rankings 1 to 13
    (1 is highest, 12 is lowest, and 13 is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Can easily compare collective risk between any two crossings on the network

Collective Risk Ranking	Upper Value (FWI)	Lower Value (FW)
1	Theoretically infinite	Greater than 5.00E-02
2	0.050000000	0.010000000
3	0.010000000	0.005000000
4	0.005000000	0.001000000
5	0.001000000	0.000500000
6	0.000500000	0.000100000
7	0.000100000	0.000050000
8	0.000050000	0.000010000
9	0.000010000	0.000005000
10	0.000005000	0.000001000
11	0.000001000	0.000000500
12	0.0000005	0
13	0.00E+00	0.00E+00

NARRATIVE RISK ASSESSMENT – PASSIVE TEMPLATE FINAL v2.0

PASSIVE LEVEL CROSSING RISK ASSESSMENT

1. LEVEL CROSSING OVERVIEW AND ENVIRONMENT

1.1 LEVEL CROSSING OVERVIEW

This is a risk assessment for Kemps level crossing.

Crossing details	
Name	Kemps
Type	UWCT
Crossing status	Occupation
Overall crossing status	Open
Route name	Sussex
Engineers Line Reference	KJE1, 46m, 8ch
OS grid reference	TQ387150
Number of lines crossed	2
Line speed (mph)	90
Electrification	DC
Signal box	Lewes

Risk assessment details	
Name of assessor	[redacted]
Post	Level Crossing Manager
Date completed	05/09/2017
Next due date	05/12/2019
Email address	[redacted]@networkrail.co.uk
Phone number	[redacted]

ALCRM risk score	
Individual risk	B
Collective risk	8
FWI	0.000043002

1.2 INFORMATION SOURCES

The table below shows the stakeholder consultation that was undertaken as part of the risk assessment.

Consulted	Attended site
Authorised user	No

Stakeholder consultation and attendance notes:

Spoke with elderly AU on telephone

The reference sources used during the risk assessment included:

- Occurrence log, Census, Other (Sussex events log and visivi.com. See relevant sections for info.), CCIL, GI Portal, SMIS.

1.3 ENVIRONMENT

Up side crossing approach **Down side crossing approach**

Kemps level crossing provides track to field access.

It is an occupation level crossing. There are no stations visible at the level crossing.

At Kemps level crossing the orientation of the road/path from the north is 220°; the orientation of the railway from the north to the up line in the up direction is 170°. Low horizon can result in sun glare; sun glare is not a known issue.

There are no planned or apparent developments near the crossing which may lead to a change or increase in use or risk.

Site visit general observations:

Nothing further to add

2. LEVEL CROSSING USAGE

2.1 RAIL

The train service over Kemps level crossing consists of passenger and freight trains. There are 78 trains per day. The highest permissible line speed of trains is 90mph. Trains are timetabled to run for 24 hours per day.

Assessor's notes:

74 passenger trains and 4 freight trains

2.2 USER CENSUS DATA

An estimated census has been used. The census was estimated on 05/09/2017 by TP. The census applies to 100% of the year.

The census taken on the day is as follows:

Cars	FEW

Vans / small lorries	FEW
Buses	NO
HGVs	FEW
Pedal / motor cyclists	NO
Pedestrians	FEW
Tractors / farm vehicles	FEW
Horses / riders	NO
Animals on the hoof	NO

Available information indicates that the crossing does not have a high proportion of vulnerable users.

Vulnerable user observations:

Nothing further to add

Available information indicates that the crossing does not have a high number of irregular users.

Irregular user observations:

Only irregular users are weight restricted vehicles visiting the elderly AU on the US – normal access is via Spooners bridge in the down direction which has a weight on it. Typical weight restricted vehicles are coal delivery, ambulance, fire brigade.

Information gathered indicates that Kemps level crossing does not have a high number of users during the night or at dusk.

Site visit night / dusk user observations:

Nothing further to add

Assessor's general census notes:

Recent sign check in darkness showed that there is hardly any ambient lighting and crossing deck and signage not visible at night. See assessor's notes on lighting assessment. Findings sent to NLCT for consideration as part of a national enquiry about visibility at crossings during darkness. The main user has access via Spooner's bridge to get to her property. This is only used as a vehicle access to her property for a coal delivery and emergency vehicle access as there is a weight restriction on Spooner's bridge. The tenant farmer also uses this access 3-4 times a year - use confirmed with the signaller. Veg growth can be an issue but there is an MST in place at the crossing and for sighting once a year. Any other trackside vegetation issues are reactive. Approaches are very muddy in winter months. There is a wet bed on the country end of the crossing which can cause voiding to the ballast. This has been reported to PWAY for rectification. A camera was left in situ for 7 days recording 0 peds and vehicles due very low usage at this location. Therefore an estimated figure was put in as recording 0 in ALCRM will make the crossing closed. Confirmed with the user that she only uses the crossing for emergency vehicle access, an annual coal delivery and any large vehicles delivering that cannot weight bear on the close by bridge over railway called spooners. The tenant farmer only uses the crossing 3-4 times a year as well to take a weight restricted combine harvester over.

2.3 USER CENSUS RESULTS

ALCRM calculates usage of the crossing to be 0 road vehicles and 0 pedestrians and cyclists per day.

3. RISK OF USE

3.1 SIGHTING AND TRAVERSE

At Kemps level crossing, the decision point and traverse lengths are calculated as:

	Decision point (m)	Traverse length (m)	Measured from
Up side	3	10.3	Best view point
Down side	3	10.3	Best view point

Timber decking is provided over the level crossing. The decking is considered to be wide enough for all users of the crossing. It is fitted with a non slip surface.

The traverse times are calculated as:

	Traverse time (s)
Pedestrians	8
Vehicles	32

The current census has not identified a high proportion of vulnerable users. Therefore, the pedestrian traverse time has not been increased.

Assessor's traverse time notes:

Sighting traverse distance calculator used

Sighting was measured by the following means:

- Using known references
- Using Range Finder
- Using Wheel
- Using a marker at a known distance

Sighting, measured in metres, at Kemps level crossing is recorded as:

All distances are recorded in metres	Minimum sighting distance required	Measured sighting distance	Sighting distance measured to	Is sighting compliant?	If deficient, is sighting distance mitigated?	Notes on deficient sighting time mitigations
Up side looking toward up direction train approach	1279	327	Track curve	No	YES	Telephone
Up side looking toward down direction train approach	1279	735	Past T647 signal	No	YES	Telephone
Down side looking toward up direction train approach	1279	470	Back of tree on track curve	No	YES	Telephone
Down side looking toward down direction train approach	1279	744	East chiltington wing fencing	No	YES	Telephone

Sighting restrictions are recorded as follows:

	Up Direction	Down Direction
Nothing; vanishing point	NO	NO
Track curvature	YES	YES
Permanent structure (building/wall etc)	NO	NO
Signage or crossing equipment	NO	NO
Vegetation	NO	NO
Bad weather on the day of visit	NO	NO
Other	NO	NO

There are known obstructions that could make it difficult for users to see approaching trains. There are known issues with foliage, fog or other issues that might impair visibility of the crossing, crossing equipment or approaching trains.

Actions to improve sighting have been identified.

Assessor's improving sighting and decision point notes

MST within Ellipse in place annually for sighting and at the crossing

The visual evaluation of the vertical profile of the road indicates that it does not create a risk of vehicles getting stuck on the crossing.

Assessor's risk of vehicle getting stuck notes:

Nothing further to add

Assessor's general sighting and traverse notes:

Nothing further to add

3.2 EVALUATION OF MITIGATIONS

Kemps level crossing is provided with telephones.

	Comments
Telephone visibility and clarity of instructional signage	Telephones are visible and outside the waiting area – clear signage evident
Telephone usage	Confirmed with signaller - users call to cross where required
Telephone discipline	Users are ALWAYS known to use the telephone to ask for permission to cross. The level of telephone usage has been confirmed with the controlling signal box
Long signal section *(Is the Signaller able to determine where trains are with reasonable accuracy; do users have to wait an excessive time for permission to cross?)*	
Signal panel ergonomics	

Assessor's notes on telephone suitability as a risk control

This is a suitable risk control at this location. Use is low.

3.3 CROSSING APPROACHES

The signs at Kemps level crossing are located on the direct route a user would take over the level crossing, they are positioned so that they are clearly visible to users taking a direct route over the level crossing. The visibility of the signs is reduced at night or at dusk.

The road surface (including gradient is present) at Kemps level crossing could impact on the ability of a vehicle to stop at the level crossing.

There are known issues with ice, mud, loose material or flood water.

Assessor's notes:

A recent sign check in darkness showed that there is hardly any ambient lighting and crossing deck and signage not visible at night. See assessor's notes for lighting assessment. Findings sent to NLCT for consideration as part of a national enquiry about visibility at crossings during darkness. The main user has access via Spooners bridge to get to her property. This access is only used as a vehicle access to her property for a coal delivery and emergency vehicle access as there is a weight restriction on Spooners bridge. The tenant farmer also uses this access 3-4 times a year - use confirmed with the signaller. Veg growth can be an issue but there is an MST in place at the crossing and for sighting once a year. Any trackside issues are reactive. Approaches are very muddy in winter months. There is a wet bed on the country end of the crossing which can cause voiding to the ballast. This has been reported to PWAY for rectification.

There are no adjacent sources of light or noise that could affect a users' ability to see or hear approaching trains.

Assessor's general crossing approach notes:

Recent sign check in darkness showed that there is hardly any ambient lighting and crossing deck and signage not visible at night. See assessor's notes for lighting assessment. Findings sent to NLCT for consideration as part of a national enquiry about visibility at passive crossings during darkness.

3.4 AT THE CROSSING – ANOTHER TRAIN COMING RISK

Trains are sometimes known to pass each other at this crossing.

Assessor's another train coming notes:

Nothing further to add

3.5 INCIDENT HISTORY

A level crossing safety event has not been known to occur at Kemps level crossing in the last twelve months.

Assessor's incident history notes:

There are no safety incidents or abuse listed for Kemps UWCt – SMIS, CCIL and signallers log used to search for abuse.

Telephone discipline

See section 3.2

Gate discipline (including barriers)

Reports indicate that the gates are ALWAYS CLOSED.

Assessor's notes on operational disruptions:

Nothing further to add

4. ALCRM CALCULATED RISK

*Kemps **level crossing ALCRM results***

Key risk drivers: ALCRM calculates that the following key risk drivers influence the risk at this crossing:

- Frequent trains
- Low sighting

Assessor's key risk drivers notes

See assessor's notes for more information

Safety risk				
Compared to other crossings the safety risk for this crossing is	**Individual risk**		**Collective risk**	
	B		**8**	
	Individual risk (fraction)	**Individual risk (numeric)**		
Car	1 in 1121	0.000891948	0.000007417	
Van / small lorries	1 in 897	0.001114291	0.000007417	
HGV	1 in 2711	0.000368788	0.000002443	
Bus	0	0	0	
Tractor / farm vehicle	1 in 2711	0.000368788	0.000002443	
Cyclist / Motor cyclist	0	0	0	
Pedestrian	1 in 4351	0.000229791	0.000006509	
				Derailment contribution
Passengers			0.000010495	93.603915391
Staff			0.000006278	18.055418837
Total			0.000043002	25.480533564
Collision frequencies	**Train / user**	**User equipment**	**Other**	
Vehicle	0.000039227	0.000145483	0	
Pedestrian	0.000007888	0	0.000004707	
Collision risk	**Train / user**	**User equipment**	**Other**	
Vehicle	0.00001972	0	0	
Pedestrian	0.000006405	0	0.000000104	

5. OPTION ASSESSMENT AND CONCLUSIONS

5.1 OPTIONS EVALUATED

The options evaluated to mitigate the risks at Kemps crossing include:

Option	Term[1]	ALCRM risk score	ALCRM FWI	Safety Benefit	Cost	Benefit Cost Ratio	Status	Comments
add high vis yellow anti slip	Long Term	B8	0.000041712				COMPLETE	This further defines the LC surface for all users
gate interlocking with signalling	Long Term	B8	0.000021501				COMPLETE	This restricts the user from being able to cross when trains are on approach
closure via bridging diversion or user giving up legal rights	Long Term	M13	0				COMPLETE	This reduces risk by 100% to all users as a permanent closure of the crossing.
POGO	Long Term	B8	0.000038272				COMPLETE	This reduces the amount of traverse for the user to one from 5 for manual gates
Solar lighting for deck and signs	Long Term	B8	0.000041282				COMPLETE	This allows the users to better see signage and the deck surface in low lighting and darkness

NOTES
Network Rail always evaluates the need for short[1] and long term risk control solutions. An example of level crossing risk management might be; a short term risk control of a temporary speed restriction with the long term solution being closure of the level crossing and its replacement with a bridge.
[1] Includes interim

CBA gives an indication of overall business benefit. It is used to support, not override, structured expert judgement when deciding which option(s) to progress. CBA might not be needed in all cases, e.g. standard maintenance tasks or low cost solutions (less than £5k).

The following CBA criteria are used as a support to decision making:

a. benefit to cost ratio is ≥ 1: positive safety and business benefit established;
b. benefit to cost ratio is between 0.99 and 0.5: reasonable safety and business benefit established where costs are not grossly disproportionate against the safety benefit; and
c. Benefit to cost ratio is between 0.49 and 0.0: weak safety and business benefit established.

5.2 CONCLUSIONS

Assessor's notes:

Crossing Location

Kemps is a farm user works crossing with telephone (UWCt)

It is located on the ELR route KJE1 where it crosses the railway at 46m 08ch.

Spooner's weight restricted road bridge over railway is in sight looking in the down direction towards Lewes at 46m 15ch.

Looking towards Plumpton direction Whitehouse Farm Steps FP is evident in the distance at 45m 71ch.

The crossing is in-between Plumpton and Cooksbridge stations and the farm crossing provides level access for farmers to cross either on foot or with vehicles and livestock where applicable from track to field.

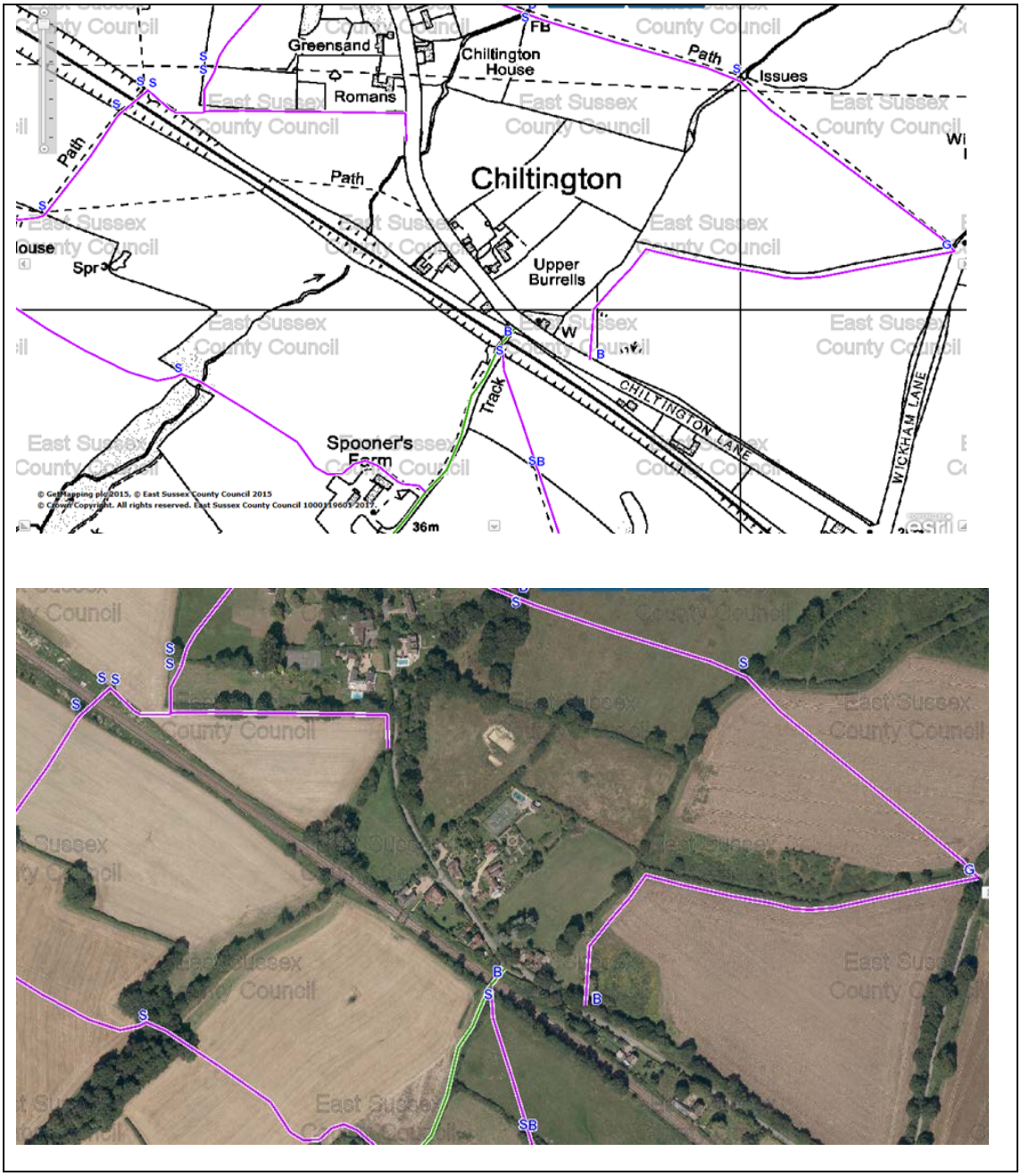
The crossing approaches are semi-rural with a private driveway track on the up side and a farmers' field on the down side which provides access to the field for a tenant farmer and access to the authorised users house at Spooner's Farm for overweight vehicles, ie coal delivery and emergency services who can't access the weight restricted bridge access.

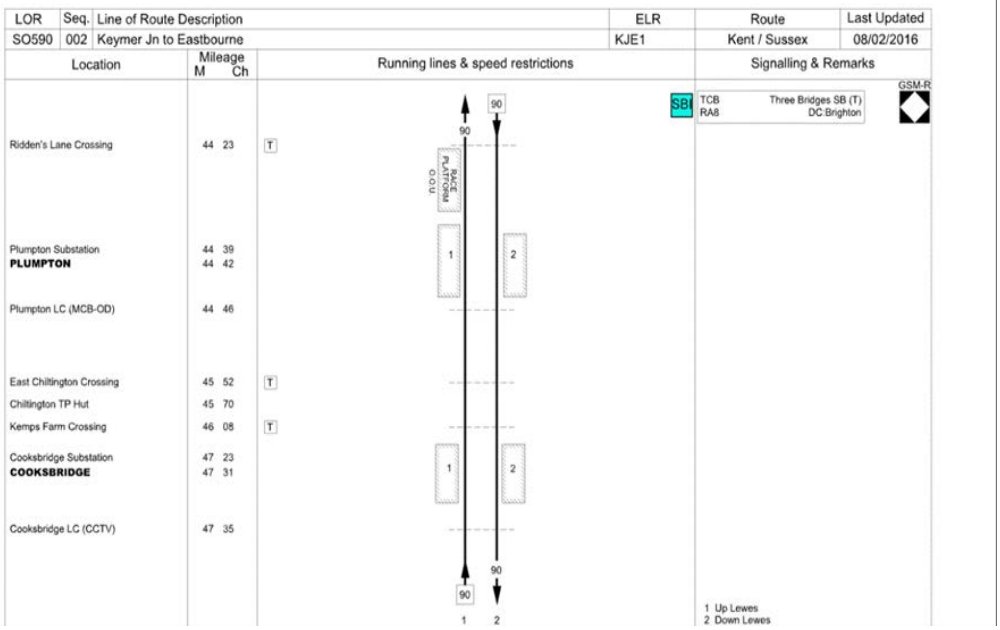
Both direction views are restricted by track curve.

The nearest main road is the A275 which is on the up side and runs from Lewes to Cooksbridge, the crossing runs off Chiltington Lane.

Location of Kemps UWCt


IMAN ROAD
ROMAN ROAD


Greensand
Romans
Chiltington House
FB
Path
Issues
Path
Path
Chiltington
Upper Burrells
Track
CHILTINGTON LANE
WICKHAM LANE
Spooner's Farm
36m
East Sussex County Council



Crossing Description

Kemps UWCt has an up and a down railway line where the maximum speed is set at 90mph on both side for trains. The average length of trains passing through here is 80 metres.

The UWC gates are metal and padlocked closed unless in use by the farmer to prevent egress onto the railway with unauthorised vehicles or pedestrians.

The up and down side approaches are rough field ground and of poor quality. Once through the railway boundary underfoot conditions are very similar with some ballast laid down directly prior to the crossing surface.

Chain link fencing and posts on either sides lead up to the decision point.

The approaches can be muddy and boggy in the winter months due to the nature of the terrain.

There is a wet bed on the up side country end and has caused voiding of the ballast in the past. This has been reported to PWAY for rectification

The decision point is the same on both sides at 3m for vehicles and 2m for pedestrians which is just at the wing fencing edge.

The crossing surface is a suspended timber deck.

Grey anti Slip covers the direct pedestrian walking route on the timber sections.

The traverse route has no step up encumbrances for the user to negotiate once the decision has been made to cross and is a level surface decision point to decision point.

The normal compliant signs are in place – the “stop look listen” , electrification of track and do not trespass are situated on both sides.
There are no Samaritan signs in situ at the FP.
The appropriate signage is in place for the UWCt giving instructions how to cross and how to call the signaller.

Phones are directly connected to the signaller when picked up and non-illuminated, they are correctly and clearly signed. They are located both sides of the crossing on poles in-between

the UWC and the FP so that the user may call the signaller before entering the railway boundary.

Traverse times are 32 seconds for vehicles, 8 seconds for pedestrians.

Sighting is compliant for pedestrians with the highest speed of 90mph taken on both sides requiring a minimum of 320m for pedestrians.
Sighting for vehicle crossings at the UWC section is non-compliant at a minimum of 1279m required for vehicles and requires the user to telephone before crossing every time for permission from the signaller.

Actual sighting is as follows for the UWCt section:

Up side up direction trains approaching sighting is track curve 327m
Up side down direction trains approaching just past signal T647 735m
Down side up direction trains approaching 1st sight train/track curve 470m
Down side down direction trains approaching 1st sight train/track curve 705m

The traverse, distance sighting calculator was used for calculations and the speed of 90mph taken only:
90mph line speed x crossing length recorded 10.3 m x 32 seconds required crossing time and 1279m minimum required sighting distance.

The sighting is limited in the both directions by track curve.

There are no whistle boards as they are not required.

There is no lighting in place and only very low levels of ambient lighting exist, see lighting assessment section notes.

Trespass guarding is provided on both ends of the crossing at the required minimum distance of 2.6m.

The conductor rail distances are compliant at a minimum of 3m away from the crossing surface in all directions.

Vegetation grows lineside and during the warmer months may require more frequent cut back particularly on the up side looking up and down direction. There are MST's in place within the Ellipse system for these to be dealt with once a year. Anything else is dealt with reactively and picked up within inspection and risk assessment visits.

Up side looking across crossing

down side looking across crossing

Future developments in the area

There are currently no known significant developments planned in the vicinity of Kemps at this time which would affect or change the usage of this level crossing (LC).

Crossing Usage

A census was completed with a wildlife camera 240817 – 310817 for a full 7 days. There were 0 traverses recorded over 7 days either with a vehicle or pedestrians therefore the census was estimated to “few” otherwise ALCRM will revert the crossing to closed.

ALCRM calculates usage of the crossing to be 0 pedestrians and vehicles per day and this is reflected within the scoring system based on census data taken and the estimate.

There are 74 passenger trains and 4 scheduled freight trains passing over this crossing in a 24hr period.

The permissible line speed is 90mph on both lines, this is also the same for the maximum permissible line speed.

This crossing is in a semi-rural setting and mostly surrounded by farming and grazing land with country type housing.

The authorised user (AU) states that she uses the crossing only for weight restricted access which cannot use Spooners Bridge ie coal delivery and emergency vehicles and the tenant farmer uses the crossing 3-4 times a year for weight restricted tractors and combine harvesters

This crossing is in a mostly rural setting with 1 residential property at the crossing and mostly surrounded by farming and grazing land, the road system surrounding the crossing area is country lanes.

Lighting assessment

The national level crossing team requested a survey of lighting at passive crossings reachable on foot in 2016.
This crossing had extremely little/no sighting of the crossing deck or signage without the aid

of another form of lighting,
There is a signal in the up direction which could be confused for a train by users.
An option has been submitted for solar lighting for the deck and signage.

Crossing abuse

There is no crossing abuse listed in SMIS for Kemps UWCt.

Key risk drivers

- Frequent trains
- Low sighting

Frequent trains - passenger use and passenger need is increasing constantly so the number of trains is also likely to increase therefore the risk driver is likely to remain as a constant.

Low sighting – due to the track curves limiting the sighting this cannot be enhanced without substantial works to change the line of the track. There is an MST in Ellipse for vegetation cut backs a the crossing and for sighting once a year in growing season, all other sighting issues are reactionary and picked up at either risk assessment or inspection visits.

Crossing Risk

This is a planned risk assessment with an ALCRM risk score generated of B8 – the FWI score is 0.000043002.

The following options have been considered and assessed for risk reduction at this crossing:

1. **Closure via bridging or diversion**

This would be the preferred option and following the implementation of this option the crossing would be closed “M13” and a FWI reduction score to “0”.

2. **High vis yellow anti slip and solar lights for the desk and signage**

This option will further define the LC surface for all rail users and solar lighting will enable the users to see the warning signage and the deck clearly in dusk/night time conditions. Following the implementation of this option the ALCRM score would be B8 and a FWI reduction score of 0.000041712 and 0.000041282 respectively.

3. **Interlock gate with signalling**

This option would lock the farming gates when trains were coming and not allow the user to cross until the train had passed. . Following the implementation of this option the ALCRM score would be B8 and a FWI reduction score of 0.000021501.

4. **POGO**

This option would allow the AU to traverse in one journey only and reduce the risk V 5 traverses with hand opened gates. . Following the implementation of this option the ALCRM score would be B8 and a FWI reduction score of 0.000038272.

Conclusion

1. **Closure via bridging or diversion**

This is a possible option for the future if funding becomes available. Usage is low which is an inhibitor but if the nearby Spooner’s road bridge over rail access were strengthened to allow HGV type vehicles the crossing could be permanently closed.

2. **High vis yellow anti slip and solar lights for the desk and signage**

The yellow anti slip would further define the surface for all rail users coupled with solar lighting for both deck and signage making this a reasonably cheap option with some benefit.

3. **Interlock gate with signalling**

This is a viable but costly option and usage V costs would be prohibitive at this location.

4. POGO

This is a viable but costly option and usage V costs would be prohibitive at this location.

Recommendations

All options could be considered at this location but cost V usage may be prohibitive. The preferred option is to put in a bridge and close the crossing permanently. Adding high viz yellow anti slip and putting in solar lighting for the deck and signs would have benefit for the FP section of the crossing. The RLCM will consider the options to carry forward.

ANNEX A – ADDITIONAL PHOTOGRAPHS

Description:

Description:

Description:

Description:

Description:

Description:

ANNEX B – HAZARD IDENTIFICATION AND RISK CONTROLS

The table below is intended for use by risk assessors when identifying hazards and risk control solutions. It is not an exhaustive list or presented in a hierarchical order.

	Hazard	Control
Road vehicle and train collision risk	Examples at the crossing include: • insufficient sighting and / or train warning for all vehicle types; known to be exacerbated by the driving position, e.g. tractor • level crossing equipment and signage is not conspicuous or optimally positioned • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • high volume of unfamiliar users, e.g. irregular visitors, migrant workers • known user complacency leading to high levels of indiscipline, e.g. failure to use telephone, gates left open • type of vehicle unsuitable for crossing; - large, low, slow making access or egress difficult and / or vehicle is too heavy for crossing surface - risk of grounding and / or the severity of the gradient adversely affects ability to traverse • poor decking panel alignment / position on skewed crossing • where telephones are provided, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • high chance of a second train coming • high line speed and / or high frequency of trains • unsuitable crossing type for location, train service, line speed and vehicle types	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs • engaging with signalling engineers to optimise strike in times • upgrading of asset to a higher form of protection • downgrading of crossing by removing vehicle access rights • optimising sighting lines and / or providing enhanced user based warning system, e.g. MSL • re-profiling of crossing surface • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • widening access gates and / or improving the crossing surface construction material • realigning or installing additional decking panels to accommodate all vehicle types • implementing train speed restriction or providing crossing attendant
Pedestrian and train collision risk	Examples include: • insufficient sighting and / or train warning • ineffective whistle boards; warning inaudible, insufficient warning	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs

	Hazard	Control
	time provided, known high usage between 23:00 and 07:00 • high chance of a second train coming • high line speed and / or high frequency of trains • level crossing equipment and signage is not conspicuous or optimally positioned • location and position of level crossing gates mean that users have their backs to approaching trains when they access the level crossing, i.e. users are initially unsighted to trains approaching from their side of the crossing • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • surface condition or lack of decking contribute to slip trip risk • known high level of use during darkness • increased likelihood of user error, e.g. crossing is at station • free wicket gates might result in user error • high volume of unfamiliar users, e.g. irregular visitors / ramblers, equestrians • complacency leading to high levels of indiscipline, e.g. users are known to rely on knowledge of timetable • high level of use by vulnerable people • where telephones are provided i.e. bridleways, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • unsuitable crossing type for location, train service, line speed and user groups • high usage by cyclists • degree of skew over crossing increases traverse time and users' exposure to trains • crossing layout encourages users not to cross at the designed decision point; egress route unclear especially during darkness	• upgrading of asset to a higher form of protection • optimising sighting lines, e.g. de-vegetation programme, repositioning of equipment or removal of redundant railway assets • implementing train speed restriction or providing crossing attendant • providing enhanced user based warning system, e.g. MSL • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • installing guide fencing and / or handrails to encourage users to look for approaching trains, read signage or cross at the designed decision point • re-design of crossing approach so that users arrive at the crossing as close to a 90° angle as possible • installing lighting sources • engaging with signalling engineers to optimise strike in times • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • providing cyclist dismount signs and / or chicanes • straightening of crossing deck

	Hazard	Control
	schools, local amenities or other attractions are known to contribute towards user error	
Pedestrian and road vehicle collision risk	Examples include: • a single gate is provided for pedestrian and vehicle users where there is a high likelihood that both user groups will traverse at the same time • the position of pedestrian gate forces / encourages pedestrian users to traverse diagonally across the roadway • road / footpath inadequately separated; footpath not clearly defined • condition of footpath surface increases the likelihood of users slipping / tripping into the path of vehicles	Controls can include: • providing separate pedestrian gates • clearly defining the footpath; renew markings • positioning pedestrian gates on the same side of the crossing • improving footpath crossing surface so it is devoid of potholes, excessive flangeway gaps and is evenly laid • improving crossing surface, e.g. holdfast, strail, non-slip surface
Personal injury	Examples include: • skewed crossing with large flangeway gaps results in cyclist, mobility scooter, pushchair or wheelchair user being unseated • condition of footpath surface increases the likelihood of users slipping / tripping • degraded gate mechanism or level crossing equipment • barrier mechanism unguarded / inadequately protected	Controls can include: • improving fence lines • reducing flangeway gaps and straightening where possible • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • straighten / realign gate posts • fully guarding barrier mechanisms

ANNEX C – ALCRM RISK SCORE EXPLANATION

ALCRM provides an estimate of both the individual and collective risks at a level crossing.

The individual and collective risk is expressed in Fatalities and Weighted Injuries (FWI). The following values help to explain this:

- **1** = 1 fatality per year or 10 major injuries or 200 minor RIDDOR events or 1000 minor non-RIDDOR events
- **0.1** = 20 minor RIDDOR events or 100 minor non-RIDDOR events
- **0.005** = 5 minor non-RIDDOR events

INDIVIDUAL RISK

This is the annualised probability of fatality to a 'regular user'. *NOTE: A regular user is taken as a person making a daily return trip over the crossing; assumed 500 traverses per year.*

Individual risk:

- Applies only to crossing users. It is not used for train staff and passengers
- Does not increase with the number of users.
- Is presented as a simplified ranking:
  - Allocates individual risk into rankings A to M
    (A is highest, L is lowest, and M is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Allows comparison of individual risk to average users across any crossings on the network

Individual Risk Ranking	Upper Value (Probability)	Lower Value (Probability)	Upper Value (FWI)	Lower Value (FW)
A	1 in 1	Greater than 1 in 1,000	1	0.001000000
B	1 in 1,000	1 in 5,000	0.001000000	0.000200000
C	1 in 5,000	1 in 25,000	0.000200000	0.000040000
D	1 in 25,000	1 in 125,000	0.000040000	0.000008000
E	1 in 125,000	1 in 250,000	0.000008000	0.000004000
F	1 in 250,000	1 in 500,000	0.000004000	0.000002000
G	1 in 500,000	1 in 1,000,000	0.000002000	0.000001000
H	1 in 1,000,000	1 in 2,000,000	0.000001000	0.000000500
I	1 in 2,000,000	1 in 4,000,000	0.000000500	0.000000250
J	1 in 4,000,000	1 in 10,000,000	0.000000250	0.000000100
K	1 in 10,000,000	1 in 20,000,000	0.000000100	0.000000050
L	Less than 1 in 20,000,000	Greater than 0	0.000000050	Greater than 0
M	0	0	0	0

COLLECTIVE RISK

This is the total risk for the crossing and includes the risk to users (pedestrian and vehicle), train staff and passengers.

Collective risk:

- Is presented as a simplified ranking:
  - Allocates collective risk into rankings 1 to 13
    (1 is highest, 12 is lowest, and 13 is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Can easily compare collective risk between any two crossings on the network

Collective Risk Ranking	Upper Value (FWI)	Lower Value (FW)
1	Theoretically infinite	Greater than 5.00E-02
2	0.050000000	0.010000000
3	0.010000000	0.005000000
4	0.005000000	0.001000000
5	0.001000000	0.000500000
6	0.000500000	0.000100000
7	0.000100000	0.000050000
8	0.000050000	0.000010000
9	0.000010000	0.000005000
10	0.000005000	0.000001000
11	0.000001000	0.000000500
12	0.0000005	0
13	0.00E+00	0.00E+00

NARRATIVE RISK ASSESSMENT – PASSIVE TEMPLATE FINAL v2.0

PASSIVE LEVEL CROSSING RISK ASSESSMENT

1. LEVEL CROSSING OVERVIEW AND ENVIRONMENT

1.1 LEVEL CROSSING OVERVIEW

This is a risk assessment for Itford level crossing.

Crossing details	
Name	Itford
Type	UWCBMSL
Crossing status	Private Estate
Overall crossing status	Open
Route name	Sussex
Engineers Line Reference	STS, 53m, 36ch
OS grid reference	TQ431055
Number of lines crossed	2
Line speed (mph)	60
Electrification	Yes, DC
Signal box	Lewes

Risk assessment details	
Name of assessor	[redacted]
Post	Level Crossing Manager
Date completed	05/10/2016
Next due date	05/01/2019
Email address	[redacted]@networkrail.co.uk
Phone number	[redacted]

ALCRM risk score	
Individual risk	C
Collective risk	3
FWI	0.006470405

1.2 INFORMATION SOURCES

The table below shows the stakeholder consultation that was undertaken as part of the risk assessment.

Consulted	Attended site
Authorised user	No

Stakeholder consultation and attendance notes:

All users recently spoken to due misuse of the barrier system to try and identify the user. This is currently in the hands of BTP. General conversation was had with all users re any issues arising. Users of the crossing are seen at every inspection and RA as this crossing is in constant use by farmers etc. There was a recent key re issue/change at this location to cut down on abuse/duplication of keys in circulation and use. An accurate key register is now in use.

The reference sources used during the risk assessment included:

- Occurance log, Census, Other (Sussex events log for misuse), CCIL, SMIS.

1.3 ENVIRONMENT

Up side crossing approach **Down side crossing approach**

Itford level crossing provides link between roads.

It is a private estate level crossing which is located on Unknown. The level crossing is at a station.

At Itford level crossing the orientation of the road/path from the north is 260°; the orientation of the railway from the north to the up line in the up direction is 20°. Low horizon can result in sun glare; sun glare is not a known issue.

There are no planned or apparent developments near the crossing which may lead to a change or increase in use or risk.

Site visit general observations:

There is a youth hostel (built April 2014) on the DS which encourages walkers and cyclists to the South Downs area and several annual cyclist races over the crossing. This only affects the FP section of the crossing. The UWC usage remains unchanged

2. LEVEL CROSSING USAGE

2.1 RAIL

The train service over Itford level crossing consists of passenger and freight trains. There are 86 trains per day. The highest permissible line speed of trains is 60mph. Trains are timetabled to run for 24 hours per day.

Assessor's notes:

2.2 USER CENSUS DATA

A 24 hour census was carried out on 04/10/2016 by [redacted] The census applies to 100% of the year.

The census taken on the day is as follows:

Cars	5
Vans / small lorries	7
Buses	0
HGVs	0
Pedal / motor cyclists	9
Pedestrians	49
Tractors / farm vehicles	5
Horses / riders	3
Animals on the hoof	0

Available information indicates that the crossing does not have a high proportion of vulnerable users.

Vulnerable user observations:

Available information indicates that the crossing does not have a high number of irregular users.

Irregular user observations:

Sat Navs do send vehicle users down to the crossing but there is no access unless you are an AU and key holder.

Information gathered indicates that Itford level crossing does not have a high number of users during the night or at dusk.

Site visit night / dusk user observations:

There is nighttime usage by the AUs but this is not high from census figures averaging 2 cars during dusk/nighttime over the 3 days. This is only an average and may be higher at other times depending on access/usage required.

Assessor's general census notes:

1990-2016 Barriers left up 22 times. nr miss vehicles tractor 2 times. near miss peds 6 times. suicide near crossing 1 time. cow killed on LC 1 time. allegation of WSF against MSL 9 times. vehicle on crossing as train approached not a near miss 4 times. trespass on track 1 time. MSL defective 4 times. Census with squirrel camera over 3 days, 04/10/16-06/10/16 inclu. AV taken for 24hrs. Peds 145~3=48.5 rounded up 49. Cyclists 22~3=7.3 rounded up 8. Cars 14~3=4.6 rounded up=5. Tractor/trailers 15~3=5. Vans 21~3=7. Quad bikes 3~3=1. Horses 7~3=2.33 rounded up =3.

2.3 USER CENSUS RESULTS

ALCRM calculates usage of the crossing to be 17 road vehicles and 58 pedestrians and cyclists per day.

3. RISK OF USE

3.1 SIGHTING AND TRAVERSE

At Itford level crossing, the decision point and traverse lengths are calculated as:

	Decision point (m)	Traverse length (m)	Measured from
Up side	3	10.7	MSL
Down side	3	10.7	MSL

Concrete decking is provided over the level crossing. The decking is considered to be wide enough for all users of the crossing. It is fitted with a non slip surface.

The traverse times are calculated as:

	Traverse time (s)
Pedestrians	9
Vehicles	32

The current census has not identified a high proportion of vulnerable users. Therefore, the pedestrian traverse time has not been increased.

Assessor's traverse time notes:

Sighting distance traverse calculator used

Sighting was measured by the following means:

- Using Range Finder

Sighting, measured in metres, at Itford level crossing is recorded as:

All distances are recorded in metres	Minimum sighting distance required	Measured sighting distance	Sighting distance measured to	Is sighting compliant?	If deficient, is sighting distance mitigated?	Notes on deficient sighting time mitigations
Up side looking toward up direction train approach	852	986	Just beyond track cabinet near curve	Yes	YES	MSL and phones
Up side looking toward down direction train approach	852	300	Track curve	No	YES	MSL and phones
Down side looking toward up direction train approach	852	198	1st sight train just outside the station	No	YES	MSL and phones
Down side looking toward down direction train approach	852	250	1st sight train on track curve	No	YES	MSL and phones

Sighting restrictions are recorded as follows:

	Up Direction	Down Direction
Nothing; vanishing point	NO	NO
Track curvature	YES	YES
Permanent structure (building/wall etc)	YES	NO
Signage or crossing equipment	NO	NO
Vegetation	NO	NO
Bad weather on the day of visit	NO	NO
Other	NO	NO

There are known obstructions that could make it difficult for users to see approaching trains. There are known issues with foliage, fog or other issues that might impair visibility of the crossing, crossing equipment or approaching trains.

Actions to improve sighting have been identified.

Assessor's improving sighting and decision point notes

The obstructions are a permanent structure, the station and track curves therefore unable to change this. There are MSTs in place for the vegetation issues around growing period.

The visual evaluation of the vertical profile of the road indicates that it does not create a risk of vehicles getting stuck on the crossing.

Assessor's risk of vehicle getting stuck notes:

Assessor's general sighting and traverse notes:

3.2 EVALUATION OF MITIGATIONS

Itford level crossing is provided with warning lights.

	Designed strike in time (Obtainable from RAM)	Is the observed warning time > the traverse time by at least 5s?	Are audible alarms provided?	Are the warning lights routinely ignored (e.g. at a station or due to excessive warning time)?	Comments on the visibility of warning lights (e.g. visible from all approaches) and audible alarms where fitted
Up line	40	yes	no	no	Lights are fully visible
Down line	40	yes			Lights are fully visible

Assessor's notes on warning light suitability as a risk control

This is a suitable risk control at this location. All users are aware of the correct usage and their responsibilities. A recent reminder letter was issued to all users stating usage and responsibilities.

3.3 CROSSING APPROACHES

The signs at Itford level crossing are located on the direct route a user would take over the level crossing, they are positioned so that they are clearly visible to users taking a direct route over the level crossing. The visibility of the signs is not reduced at night or at dusk.
The road surface (including gradient is present) at Itford level crossing is unlikely to impact on the ability of a vehicle to stop at the level crossing.

There are no known issues with ice, mud, loose material or flood water.

Assessor's notes:

Vegetation on the down - down is a problem and managed in growing season. There are MSTs in place for the sighting and the crossing itself on an annual basis. Anything else is reactive.

There are no adjacent sources of light or noise that could affect a users' ability to see or hear approaching trains.

Assessor's general crossing approach notes:

There is no direct lighting at the crossing but lighting at the directly adjacent station

3.4 AT THE CROSSING – ANOTHER TRAIN COMING RISK

Trains are sometimes known to pass each other at this crossing.

Assessor's another train coming notes:

3.5 INCIDENT HISTORY

A level crossing safety event has not been known to occur at Itford level crossing in the last twelve months.

Assessor's incident history notes:

1990-2016 Barriers left up 22 times. nr miss vehicles tractor 2 times. near miss peds 6 times. suicide near crossing 1 time. cow killed on LC 1 time. allegation of WSF against MSL 9 times. vehicle on crossing as train approached not a near miss 4 times. trespass on track 1 time. MSL defective 4 times

Gate discipline (including barriers)

Reports indicate that the gates are OCCASIONALLY LEFT OPEN. If gates are known to be left open, trains are cautioned.

Assessor's notes on operational disruptions:

Trains under caution until the gates and the crossing are checked fully operational. A recent reminder was sent to all authorised users re the correct use of barriers and the users responsibilities to sub users.

4. ALCRM CALCULATED RISK

Itford ***level crossing ALCRM results***

Key risk drivers: ALCRM calculates that the following key risk drivers influence the risk at this crossing:

- Gates open
- Frequent trains
- User misuses
- Low sighting
- Near station

Assessor's key risk drivers notes

[Free text]

Safety risk				
Compared to other crossings the safety risk for this crossing is	**Individual risk**		**Collective risk**	
	C		**3**	
	Individual risk (fraction)	**Individual risk (numeric)**		
Car	1 in 1510	0.0006619	0.000978966	
Van / small lorries	1 in 1684	0.000593681	0.001370553	
HGV	0	0	0	
Bus	0	0	0	
Tractor / farm vehicle	1 in 3627	0.000275677	0.000322483	
Cyclist / Motor cyclist	1 in 40277	0.000024828	0.000163117	
Pedestrian	1 in 21287	0.000046975	0.001904847	
				Derailment contribution
Passengers			0.0009618	95.320395088
Staff			0.000768638	13.917114686
Total			0.006470405	15.822255654
Collision frequencies	**Train / user**	**User equipment**	**Other**	
Vehicle	0.006526442	0.011963406	0	
Pedestrian	0.002479506	0	0.002482094	
Collision risk	**Train / user**	**User equipment**	**Other**	
Vehicle	0.002672002	0	0	
Pedestrian	0.002013359	0	0.000054606	

5. OPTION ASSESSMENT AND CONCLUSIONS

5.1 OPTIONS EVALUATED

The options evaluated to mitigate the risks at Itford crossing include:

Option	Term[1]	ALCRM risk score	ALCRM FWI	Safety Benefit	Cost	Benefit Cost Ratio	Status	Comments
add audible at LC for further advance warning for peds	Long Term						COMPLETE	This is a pedestrian option and does not affect vehicle users at this location.
closure via bridging or diversion	Long Term	M13	0				COMPLETE	This option would close the crossing completely and eradicate the risk totally. Not an option at this time as no suitable diversion available and no funding available for bridging.
straighten skew	Long Term	C3	0.006146885				COMPLETE	This would reduce the traverse time and possibly reduce the minimum sighting distance required
Add Cameras to monitor usage	Long Term						Not in ALCRM as no risk reduction	Currently unable to risk assess this option in ALCRM, this would be a publicised deterrent for both UWC and FP users. This would also assist with identifying vehicles and peds misusing the crossing.

NOTES
Network Rail always evaluates the need for short[1] and long term risk control solutions. An example of level crossing risk management might be; a short term risk control of a temporary speed restriction with the long term solution being closure of the level crossing and its replacement with a bridge.
[1] Includes interim

CBA gives an indication of overall business benefit. It is used to support, not override, structured expert judgement when deciding which option(s) to progress. CBA might not be needed in all cases, e.g. standard maintenance tasks or low cost solutions (less than £5k).

The following CBA criteria are used as a support to decision making:

a. benefit to cost ratio is ≥ 1: positive safety and business benefit established;
b. benefit to cost ratio is between 0.99 and 0.5: reasonable safety and business benefit established where costs are not grossly disproportionate against the safety benefit; and
c. benefit to cost ratio is between 0.49 and 0.0: weak safety and business benefit established.

5.2 CONCLUSIONS

Assessor's notes:

Crossing location

Itford UWC is a hybrid crossing which means it is both a footpath and a user work crossing for vehicles. The footpath section is also a bridleway.

The UWC section of the crossing is comprised of a single boom either side of the crossing which un operated closes the public highway to any unauthorised access.

It is located on the ELR route STS, Seaford Branch line where it crosses the railway at 53m 36ch over 2 lines.

The postcode is BN8 6JS.

The footpath number is Beddingham 6 Bridleway and forms part of the South Downs National park (SNDP) walking route therefore the crossing is located within an environmentally sensitive area. The crossing is also located adjacent to Lewes Brooks Site of special scientific interest (SSSI).

The footpath lies in-between Lewes and Newhaven and links up the SDNP walkways.

The crossing is located on a public road (South Downs Way) also known as the C667. The road is not a "through road" as it is closed by the locked user work barrier booms and is sign posted as such on both entrances to the crossing at the A26 access to the down side and the C7 access to the up side. The C667 is rarely maintained by Highways due low vehicle usage from no through road use and they have not erected any road or level crossing warning signage on either approach to the crossing.

The road approaches have no marked speed limits therefore the national limit applies of 60mph but this is highly unlikely to be achieved due the slow winding nature of the narrow roads and the requirement to operate the barriers by vehicle users before traverse.

There are no pavement areas assigned for pedestrians on either of the road approaches save grass verges with ditches and pedestrians share the road with vehicles.

The level crossing is at a Southease station which has a half hourly service but only 1 train an hour stopping outside of peak times.

The crossing also provides some authorised key access for authorised users only with farming/land requirements either side of the UWC between the A26 and the C7 and step free access over the crossing for pedestrians. There is a stepped footbridge at the station for access to platforms that the footpath users may also use if wishing to avoid the footpath crossing entirely.

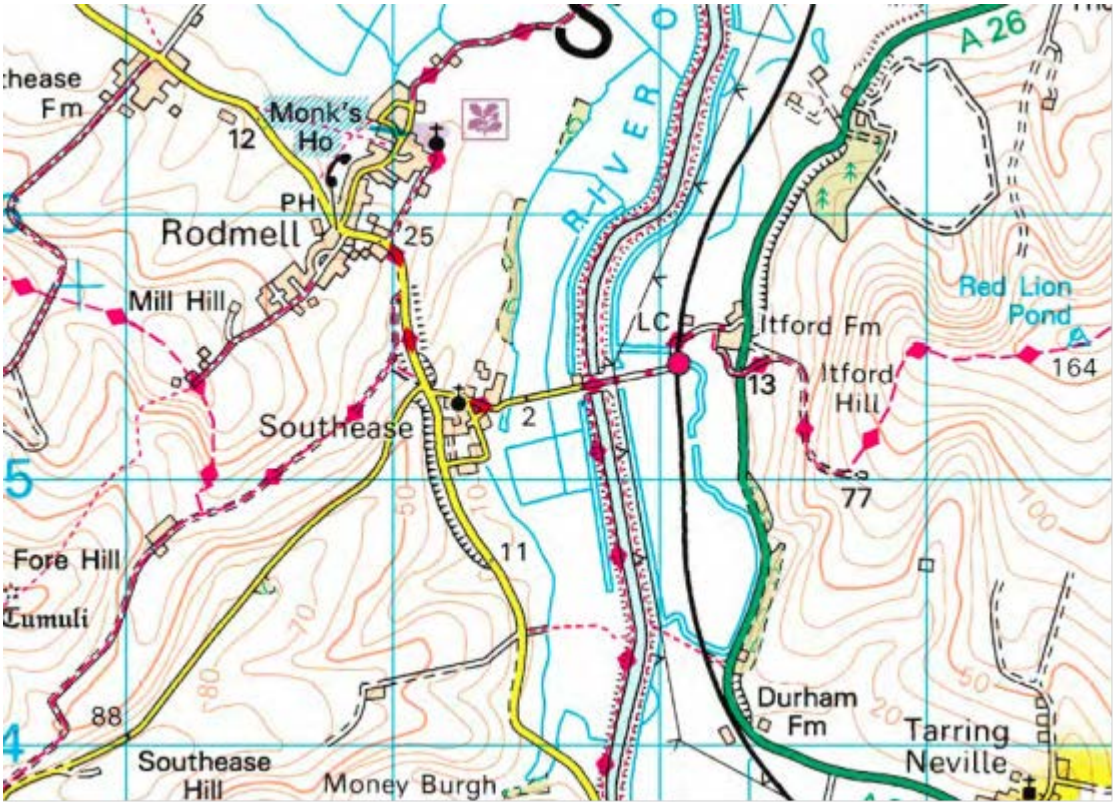
On the up side approach road, approx. 350m to the west of the crossing, there is a listed grade 2, iron gated weak bridge with a weight restriction of 2 tonnes – this is maintained by the environment agency. The bridge traverses the river Ouse. The bridge is listed as B0337 2T MGW.

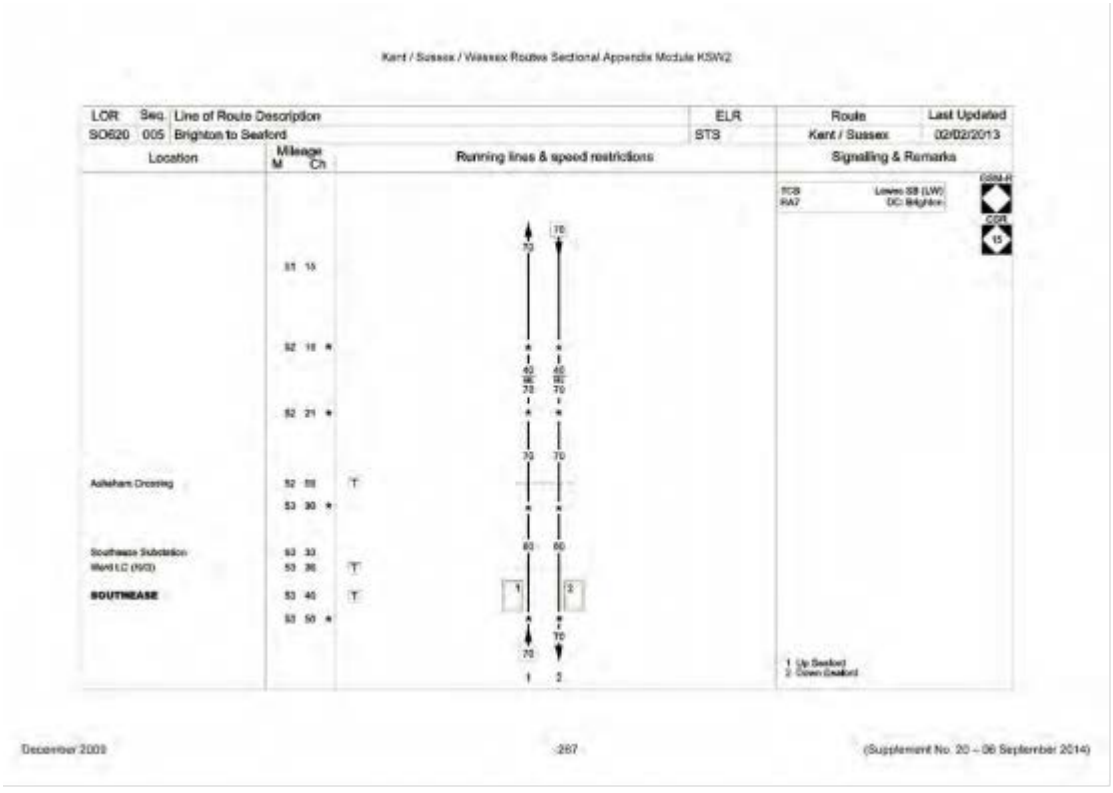
There is also the village of Southease on the up side beyond the bridge with a working farm. The immediate surroundings on the up side are rural and of grazing field type. There is a field entrance close to the crossing on the up side which if used may cause potential blocking back but this has never been seen in use.

On the DS are 2 residential properties, one being a working farm with grazing fields and a converted barn which now houses a Youth Hostel (opened April 2014) with approx 78 beds. Occupancy is currently estimated at 1500 beds a month in peak months but is growing year on year. The youth hostel promotes walking and cycling holidays across the South Downs

and this attracts many visitors to the area all year round.

Location of Itford Crossing




Kent / Sussex / Wessex Routes Sectional Appendix Module KSW2

LOR	Seq.	Line of Route Description	ELR	Route	Last Updated
SO620	005	Brighton to Seaford	STS	Kent / Sussex	02/02/2013

Location	Mileage M Ch	Running lines & speed restrictions	Signalling & Remarks
	51 15		
	52 18 *		
	52 21 *		
Ashcham Crossing	52 58 T		
	53 30 *		
Southease Substation	53 33		
Ward LC (NVD)	53 36 T		
SOUTHEASE	53 40 T		
	53 50 *		

1 Up Seaford
2 Down Seaford

December 2009 267 (Supplement No. 20 – 06 September 2014)

Crossing description

Itford UWC is located on the ELR route STS, Seaford Branch line where it crosses the railway at 53m 36ch over 2 lines. It has an up and a down road.
The crossing is under the control of Lewes signal box and the maximum line speed is set at 60mph in both directions for trains.

The average length of trains coming through here is 60 metres save for the freight train will travels down to Newhaven twice a day and back which measures 251m.

The public highway is closed to all users unless you are an unauthorised user. The road is closed with a full width road barrier of a metal reflective type which are the same on each side of the railway.

Both barriers are operated by the user on authority from the MSL which is situated either side of the crossing via the means of a controlled, personal issue key and key locks of which there are 2 on each side for entry and exit to the crossing.
The barriers are not interlocked with the signalling system and the key can operate and raise/close the barrier at any time, even on a RED light.

There is also a pedestrian/bridleway access gate either side of the crossing for users on foot.

The railway boundary is protected by chain link encompassing the bridleway gates and the user work key operated barriers.

The station of Southease is located directly adjacent to the crossing on the country end and comprises 2 platforms, an up and a down, with a stepped access for platforms over the top. There is no ticket office at this station as it is rural with a reduced stopping hourly service off peak.

The upside approach road is of a good quality tarmac which continues onto the crossing surface.
The downside approach road is of a lesser quality with unmade up sections and pot holes but as you near the crossing the quality improves.
There are currently no warning road signs provided by Highways and there is no lining to the roads provided by either highways or Off Track.

There was a lot of signage clutter at the crossing a few months ago but this has now been tidied up and moved or removed. The normal compliant signs are in place for MSL use, electrification of track and do not trespass which are situated on both sides.
There is compliance signage relating to the vehicle part of the crossing for the instruction for the key operation to operate the road barrier system.

Additional keep dogs on leads signs were put up here approx. 12 months ago, on each side of the pedestrian part of the crossing

The level crossing surface is metal framed polymer which has a rough antislip surface.
There are pedestrian walkway lines painted onto the surface to segregate vehicles V pedestrians and the down side section of the crossing the pedestrian and vehicle access is segregated for safety. There is neither room or requirement to do this on the up side of the crossing.

Sighting is recorded as per below with the speed of 60mph on the both sides:

Upside up direction trains approaching sighting is 962m
Upside down direction trains approaching sighting is 300m
Down side up direction trains approaching sighting is 198m
Down side down direction trains approaching sighting is 250m

The traverse, distance calculator was used to reach the traverse time required and the speed of 60mph taken:
60mph line speed x crossing length recorded 10.7m (the longest traverse distance) x 32 seconds required crossing time and 3 minimum required sighting distance = 852m minimum sighting required distance which is not achievable hence the MSLs are the authority to cross.

The sighting is limited in the looking up direction by track curve and the sighting in the down direction is limited by the station building and track curve.

Vegetation grows lineside and during the warmer months does require more frequent cut back particularly in the dn-dn direction. A recent cutback of hedging and trees in this direction has been instigated by a specialist team to try and enable more sighting on the track curve. This has improved sighting a little, however this is now fully mitigated by the use of MSL's for pedestrians as well as vehicle users.

Whistle boards are installed at this location at distances of 315m. These were recently pushed out at the request of the ORR to provide more warning time on the dn-dn side. Since MSL's have been moved to include usage by pedestrians as well the WB's are now not required as mitigation but have been left in situ as an added risk mitigation as regular users are used to hearing them.

There is no specific lighting in place at the crossing itself but there is some level of ambient lighting existing from the station platforms.

Trespass guarding is provided on all ends of the crossing at the required minimum distance of 2.6m There is additional trespass guarding on the ramp ends of the station platforms. This was installed as Southern were witnessing passengers walking off ramp ends straight onto the crossing and vice versa to catch trains. This has ceased the practice and no further reports or witnessed.

The MSL's are now in use for all users of the crossing and are available as the primary method of authority to cross on sight of them. The MSL and the gate will be left at 2m on the US as there is insufficient space to move it to 3m (bridleway decision point distance) as this is in conflict with the exit gate from the US station platform and would block the exit if moved. This did mean no change for the vehicle users other than the MSL being moved further toward the track to accommodate the pedestrian users.

The signalling department has erected a temporary camera which overlooks the crossing as there have been some reports of wrong side failures in the last 2 years. This is where the strike out for the train is a short distance from the crossing in the up direction and the front of the 3 car train hits this as the last carriage is going over the crossing. This is to standard and fully compliant. These cameras do not produce good enough quality footage to use for misuse There is an option for the LC team to provide cameras at this location and a quote has been received and submitted for consideration.

MSL position on up side

MSL position on down side

Example of one of the 4 key locks to open the crossing

Shows location of the 2 key locks on the up side

Slows location of the 2 key locks on the down side

Crossing usage

A 3 day census 04-061016 was carried out for the UWC section of the crossing which also recorded the FP usage and averaged for a 24hr period:
49 peds
3 horses
8 cyclists

5 cars
5 tractors
7 vans
1 quad bike

Usage of this crossing is all year round and may be higher when the farmers are traversing more for animal births etc. At the time of this census animals were still in the fields.

Crossing risk

This is a planned risk assessment with an ALCRM risk score generated of C3 – the FWI score is 0.006470405.

The following options have been considered and assessed for risk reduction at this crossing:

1. **closure via bridging or diversion**

This would be the preferred option and following the implementation of this option the crossing would be closed “M13” and a FWI reduction score to “0”.

2. **straighten skew**

This would reduce the traverse time and possibly reduce the minimum sighting distance required. This would enable a score of C3 and a FWI reduction of 0.006146885.

3. **Add Cameras to monitor usage**

Currently unable to risk assess this option in ALCRM, this would be a publicised deterrent for both UWC and FP users. This would also assist with identifying vehicles and peds misusing the crossing. As there is no option to assess in ALCRM there is no risk reduction percentage available or FWI reduction

Conclusion

1. **Closure via diversion or bridging**

There is currently no suitable diversion available and bridging is not currently available due funding restrictions. There is however, stepped access over the platforms/railway already in place should users require

2. **straighten skew**

This option would reduce the traverse time and possibly reduce the minimum sighting distance also. This option has been submitted under the minor works programme and is awaiting approval.

3. **Add Cameras to monitor usage**

This has been passed to the RLCM to progress at this location.

The UWCBMSL part of the crossing will remain “as is” currently. Minor work may be approved and this NRA will be updated at this time.

ANNEX A – ADDITIONAL PHOTOGRAPHS

Description:

Description:

Description:

Description:

Description:

Description:

ANNEX B – HAZARD IDENTIFICATION AND RISK CONTROLS

The table below is intended for use by risk assessors when identifying hazards and risk control solutions. It is not an exhaustive list or presented in a hierarchical order.

	Hazard	Control
Road vehicle and train collision risk	Examples at the crossing include: • insufficient sighting and / or train warning for all vehicle types; known to be exacerbated by the driving position, e.g. tractor • level crossing equipment and signage is not conspicuous or optimally positioned • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • high volume of unfamiliar users, e.g. irregular visitors, migrant workers • known user complacency leading to high levels of indiscipline, e.g. failure to use telephone, gates left open • type of vehicle unsuitable for crossing; - large, low, slow making access or egress difficult and / or vehicle is too heavy for crossing surface - risk of grounding and / or the severity of the gradient adversely affects ability to traverse • poor decking panel alignment / position on skewed crossing • where telephones are provided, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • high chance of a second train coming • high line speed and / or high frequency of trains • unsuitable crossing type for location, train service, line speed and vehicle types	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs • engaging with signalling engineers to optimise strike in times • upgrading of asset to a higher form of protection • downgrading of crossing by removing vehicle access rights • optimising sighting lines and / or providing enhanced user based warning system, e.g. MSL • re-profiling of crossing surface • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • widening access gates and / or improving the crossing surface construction material • realigning or installing additional decking panels to accommodate all vehicle types • implementing train speed restriction or providing crossing attendant
Pedestrian and train collision risk	Examples include: • insufficient sighting and / or train warning • ineffective whistle boards; warning inaudible, insufficient warning	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs

	Hazard	Control
	time provided, known high usage between 23:00 and 07:00 • high chance of a second train coming • high line speed and / or high frequency of trains • level crossing equipment and signage is not conspicuous or optimally positioned • location and position of level crossing gates mean that users have their backs to approaching trains when they access the level crossing, i.e. users are initially unsighted to trains approaching from their side of the crossing • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • surface condition or lack of decking contribute to slip trip risk • known high level of use during darkness • increased likelihood of user error, e.g. crossing is at station • free wicket gates might result in user error • high volume of unfamiliar users, e.g. irregular visitors / ramblers, equestrians • complacency leading to high levels of indiscipline, e.g. users are known to rely on knowledge of timetable • high level of use by vulnerable people • where telephones are provided i.e. bridleways, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • unsuitable crossing type for location, train service, line speed and user groups • high usage by cyclists • degree of skew over crossing increases traverse time and users' exposure to trains • crossing layout encourages users not to cross at the designed decision point; egress route unclear especially during darkness	• upgrading of asset to a higher form of protection • optimising sighting lines, e.g. de-vegetation programme, repositioning of equipment or removal of redundant railway assets • implementing train speed restriction or providing crossing attendant • providing enhanced user based warning system, e.g. MSL • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • installing guide fencing and / or handrails to encourage users to look for approaching trains, read signage or cross at the designed decision point • re-design of crossing approach so that users arrive at the crossing as close to a 90° angle as possible • installing lighting sources • engaging with signalling engineers to optimise strike in times • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • providing cyclist dismount signs and / or chicanes • straightening of crossing deck

	Hazard	Control
	schools, local amenities or other attractions are known to contribute towards user error	
Pedestrian and road vehicle collision risk	Examples include: • a single gate is provided for pedestrian and vehicle users where there is a high likelihood that both user groups will traverse at the same time • the position of pedestrian gate forces / encourages pedestrian users to traverse diagonally across the roadway • road / footpath inadequately separated; footpath not clearly defined • condition of footpath surface increases the likelihood of users slipping / tripping into the path of vehicles	Controls can include: • providing separate pedestrian gates • clearly defining the footpath; renew markings • positioning pedestrian gates on the same side of the crossing • improving footpath crossing surface so it is devoid of potholes, excessive flangeway gaps and is evenly laid • improving crossing surface, e.g. holdfast, strail, non-slip surface
Personal injury	Examples include: • skewed crossing with large flangeway gaps results in cyclist, mobility scooter, pushchair or wheelchair user being unseated • condition of footpath surface increases the likelihood of users slipping / tripping • degraded gate mechanism or level crossing equipment • barrier mechanism unguarded / inadequately protected	Controls can include: • improving fence lines • reducing flangeway gaps and straightening where possible • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • straighten / realign gate posts • fully guarding barrier mechanisms

ANNEX C – ALCRM RISK SCORE EXPLANATION

ALCRM provides an estimate of both the individual and collective risks at a level crossing.

The individual and collective risk is expressed in Fatalities and Weighted Injuries (FWI). The following values help to explain this:

- **1** = 1 fatality per year or 10 major injuries or 200 minor RIDDOR events or 1000 minor non-RIDDOR events
- **0.1** = 20 minor RIDDOR events or 100 minor non-RIDDOR events
- **0.005** = 5 minor non-RIDDOR events

INDIVIDUAL RISK

This is the annualised probability of fatality to a 'regular user'. *NOTE: A regular user is taken as a person making a daily return trip over the crossing; assumed 500 traverses per year.*

Individual risk:

- Applies only to crossing users. It is not used for train staff and passengers
- Does not increase with the number of users.
- Is presented as a simplified ranking:
    - Allocates individual risk into rankings A to M
      (A is highest, L is lowest, and M is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
    - Allows comparison of individual risk to average users across any crossings on the network

Individual Risk Ranking	Upper Value (Probability)	Lower Value (Probability)	Upper Value (FWI)	Lower Value (FW)
A	1 in 1	Greater than 1 in 1,000	1	0.001000000
B	1 in 1,000	1 in 5,000	0.001000000	0.000200000
C	1 in 5,000	1 in 25,000	0.000200000	0.000040000
D	1 in 25,000	1 in 125,000	0.000040000	0.000008000
E	1 in 125,000	1 in 250,000	0.000008000	0.000004000
F	1 in 250,000	1 in 500,000	0.000004000	0.000002000
G	1 in 500,000	1 in 1,000,000	0.000002000	0.000001000
H	1 in 1,000,000	1 in 2,000,000	0.000001000	0.000000500
I	1 in 2,000,000	1 in 4,000,000	0.000000500	0.000000250
J	1 in 4,000,000	1 in 10,000,000	0.000000250	0.000000100
K	1 in 10,000,000	1 in 20,000,000	0.000000100	0.000000050
L	Less than 1 in 20,000,000	Greater than 0	0.000000050	Greater than 0
M	0	0	0	0

COLLECTIVE RISK

This is the total risk for the crossing and includes the risk to users (pedestrian and vehicle), train staff and passengers.

Collective risk:

- Is presented as a simplified ranking:
  - Allocates collective risk into rankings 1 to 13 (1 is highest, 12 is lowest, and 13 is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Can easily compare collective risk between any two crossings on the network

Collective Risk Ranking	Upper Value (FWI)	Lower Value (FW)
1	Theoretically infinite	Greater than 5.00E-02
2	0.050000000	0.010000000
3	0.010000000	0.005000000
4	0.005000000	0.001000000
5	0.001000000	0.000500000
6	0.000500000	0.000100000
7	0.000100000	0.000050000
8	0.000050000	0.000010000
9	0.000010000	0.000005000
10	0.000005000	0.000001000
11	0.000001000	0.000000500
12	0.0000005	0
13	0.00E+00	0.00E+00

NARRATIVE RISK ASSESSMENT – PASSIVE TEMPLATE FINAL v2.0

PASSIVE LEVEL CROSSING RISK ASSESSMENT

1. LEVEL CROSSING OVERVIEW AND ENVIRONMENT

1.1 LEVEL CROSSING OVERVIEW

This is a risk assessment for Durham Farm level crossing.

Crossing details	
Name	Durham Farm
Type	UWCT
Crossing status	Accommodation
Overall crossing status	Open
Route name	Sussex
Engineers Line Reference	STS, 54m, 30ch
OS grid reference	TQ433041
Number of lines crossed	2
Line speed (mph)	70
Electrification	DC
Signal box	Newhaven Town

Risk assessment details	
Name of assessor	[redacted]
Post	Level Crossing Manager
Date completed	24/01/2017
Next due date	24/04/2019
Email address	[redacted]@networkrail.co.uk
Phone number	[redacted]

ALCRM risk score	
Individual risk	B
Collective risk	4
FWI	0.002081607

1.2 INFORMATION SOURCES

The table below shows the stakeholder consultation that was undertaken as part of the risk assessment.

Consulted	Attended site
Authorised user	No

Stakeholder consultation and attendance notes:

The reference sources used during the risk assessment included:

- Occurrence log, Other (Sussex events log), CCIL, GI Portal, SMIS.

1.3 ENVIRONMENT

Up side crossing approach **Down side crossing approach**

Durham Farm level crossing provides access to farm / house from public road.

It is an accommodation level crossing. There are no stations visible at the level crossing.

At Durham Farm level crossing the orientation of the road/path from the north is 50°; the orientation of the railway from the north to the up line in the up direction is 340°. Low horizon can result in sun glare; sun glare is not a known issue.

There are no planned or apparent developments near the crossing which may lead to a change or increase in use or risk.

Site visit general observations:

2. LEVEL CROSSING USAGE

2.1 RAIL

The train service over Durham Farm level crossing consists of passenger and freight trains. There are 90 trains per day. The highest permissible line speed of trains is 70mph. Trains are timetabled to run for 24 hours per day.

Assessor's notes:

2.2 USER CENSUS DATA

A 24 hour census was carried out on 24/01/2017 by [redacted] The census applies to 100% of the year.

The census taken on the day is as follows:

Cars	4
Vans / small lorries	0
Buses	0
HGVs	0
Pedal / motor cyclists	0
Pedestrians	6
Tractors / farm vehicles	0
Horses / riders	0
Animals on the hoof	0

Available information indicates that the crossing does not have a high proportion of vulnerable users.

Vulnerable user observations:

Available information indicates that the crossing does not have a high number of irregular users.

Irregular user observations:

Information gathered indicates that Durham Farm level crossing does not have a high number of users during the night or at dusk.

Site visit night / dusk user observations:

Assessor's general census notes:

camera footage for 4 days before camera failed - recorded 6 peds on average a day and 4 car traverses on average

2.3 USER CENSUS RESULTS

ALCRM calculates usage of the crossing to be 4 road vehicles and 6 pedestrians and cyclists per day.

3. RISK OF USE

3.1 SIGHTING AND TRAVERSE

At Durham Farm level crossing, the decision point and traverse lengths are calculated as:

	Decision point (m)	Traverse length (m)	Measured from
Up side	3	10	3m from nearest running rail
Down side	3	10	3m from nearest running rail

Timber decking is provided over the level crossing. The decking is considered to be wide enough for all users of the crossing. It is fitted with a non slip surface.

The traverse times are calculated as:

	Traverse time (s)
Pedestrians	9
Vehicles	14

The current census has not identified a high proportion of vulnerable users. Therefore, the pedestrian traverse time has not been increased.

Assessor's traverse time notes:

Sighting was measured by the following means:

- Using known references
- Using Range Finder

Sighting, measured in metres, at Durham Farm level crossing is recorded as:

All distances are recorded in metres	Minimum sighting distance required	Measured sighting distance	Sighting distance measured to	Is sighting compliant?	If deficient, is sighting distance mitigated?	Notes on deficient sighting time mitigations
Up side looking toward up direction train approach	435	360	Track curve	No	YES	WB and telephone
Up side looking toward down direction train approach	435	322	Stoor crossing	No	YES	WB and telephone
Down side looking toward up direction train approach	435	270	Track curve	No	YES	WB and telephone
Down side looking toward down direction train approach	435	322	Stoor wing fencing	No	YES	WB and telephone

Sighting restrictions are recorded as follows:

	Up Direction	Down Direction
Nothing; vanishing point	NO	NO
Track curvature	YES	YES
Permanent structure (building/wall etc)	NO	NO
Signage or crossing equipment	NO	NO
Vegetation	NO	NO
Bad weather on the day of visit	NO	NO
Other	NO	NO

There are no known obstructions that could make it difficult for users to see approaching trains. There value of field SIGHTING_OTHER_VIS_ISSUES is actually 'Null', I wasn't expecting that known issues with foliage, fog or other issues that might impair visibility of the crossing, crossing equipment or approaching trains.

Actions to improve sighting have been identified.

Assessor's improving sighting and decision point notes

MST in place for veg cut back at the crossing in growing season

The visual evaluation of the vertical profile of the road indicates that it does not create a risk of vehicles getting stuck on the crossing.

Assessor's risk of vehicle getting stuck notes:

Assessor's general sighting and traverse notes:

3.2 EVALUATION OF MITIGATIONS

Durham Farm level crossing is provided with whistle boards.

	Line Speed	Distance to whistle board*	Whistle board warning provided (s)	Is the whistle board warning < or > traverse ? (s)	Whistle board compliance with 400m maximum (m)	Is the train horn clearly audible at the crossing?	Comments on audibility and whistle board position
Up line	70	400	11.57	2.57	400	yes	WB's at optimum position and clearly heard
Down line	70	400	11.57	2.57	400	Yes	WB's at optimum position and clearly heard

The percentage of users who use the crossing during the night time quiet period, between 2300 and 0700, is estimated as 1%.

Assessor's notes on whistle board suitability as a risk control

WB's are left in situ for pedestrians using the crossing – telephones are there for the vehicle mitigation but peds can call for permission if required.

Durham Farm level crossing is provided with telephones.

	Comments
Telephone visibility and clarity of instructional signage	Good – telephones were moved to outside the gate area so not trackside when making calls to signaller for permission to cross as part of a national programme.
Telephone usage	Confirmed with signaller. Signaller is only aware of usage from user – any unauthorised traverse would have to be reported by trains and there is no recorded unauthorised traverse. Occasionally visitors forget to call back the signaller
Telephone discipline	Users are mostly always known to use the telephone to ask for permission to cross. The level of telephone usage has been confirmed with the controlling signal box
Long signal section *(Is the Signaller able to determine where trains are with reasonable accuracy; do users have to wait an excessive time for permission to cross?)*	
Signal panel ergonomics	

Assessor's notes on telephone suitability as a risk control

Telephones are deemed a suitable risk control for the users to take when seeking permission to cross currently. Telephones always used to call for permission, last 12 months recorded one user forgot to call back to confirm clear which is unusual, user states that this is visitors and they will reinforce the need to call back and confirm clear

3.3 CROSSING APPROACHES

The signs at Durham Farm level crossing are located on the direct route a user would take over the level crossing, the pedestrian signs on the down side are not positioned so that they are clearly visible to users taking a direct route over the level crossing. The visibility of the signsage is reduced at night or at dusk.

The road surface (including gradient is present) at Durham Farm level crossing is unlikely to impact on the ability of a vehicle to stop at the level crossing.

There are known issues with ice, mud, loose material or flood water. These known issues might impair visibility of the crossing, crossing equipment, including signage or the visibility of trains. They might also affect the ability of a vehicle to stop at the level crossing.

Assessor's notes:

The Ds pedestrian signage is situated on the vehicle side of the LC and works delivery have been requested to move it to the ped side of the crossing. The LCM recently undertook a lighting assessment in darkness and the signage and LC deck were not visible without aid of flashlight. It was recommended to MKLCT that signage lights and solar deck lighting be installed. Foliage LE direction can be a problem but there is a MST in place for veg cutback in growing season. Occasional fog can affect the area in winter months. Water pools in the LE corner of the tarmac approach on the DS, this has been included for rectification to works delivery and funding has been approved.

There are no adjacent sources of light or noise that could affect a users' ability to see or hear approaching trains.

Assessor's general crossing approach notes:

The busy A26 is adjacent to the ds of the crossing and traffic noise is loud when on the telephone, the telephone was moved further inwards as a result of this and no further issues have been reported by either user or the signaller.

3.4 AT THE CROSSING – ANOTHER TRAIN COMING RISK

Trains are sometimes known to pass each other at this crossing.

3.5 INCIDENT HISTORY

A level crossing safety event has been known to occur at Durham Farm level crossing in the last twelve months.

Assessor's incident history notes:

In the last 12 months recorded a user forgot to call back to confirm clear which is unusual, user states that this is visitors and they will reinforce the need to call back and confirm clear.

Telephone discipline

See section 3.2

Gate discipline (including barriers)

Reports indicate that the gates are ALWAYS CLOSED.

Assessor's notes on operational disruptions:

Trains will be cautioned until next train confirms crossing clear or until MOM arrives to do same

4. ALCRM CALCULATED RISK

*Durham Farm **level crossing ALCRM results***

Key risk drivers: ALCRM calculates that the following key risk drivers influence the risk at this crossing:

- Frequent trains
- Large number users
- Low sighting

Assessor's key risk drivers notes

[Free text]

Safety risk				
Compared to other crossings the safety risk for this crossing is	**Individual risk**		**Collective risk**	
	B		**4**	
	Individual risk (fraction)	**Individual risk (numeric)**		
Car	1 in 4681	0.000213627	0.000818568	
Van / small lorries	0	0	0	
HGV	0	0	0	
Bus	0	0	0	
Tractor / farm vehicle	0	0	0	
Cyclist / Motor cyclist	0	0	0	
Pedestrian	1 in 4332	0.000230821	0.001045418	
				Derailment contribution
Passengers			0.000021919	97.556563957
Staff			0.000195702	1.274899528
Total			0.002081607	1.147098646
Collision frequencies	**Train / user**	**User equipment**	**Other**	
Vehicle	0.001375744	0.004421984	0	
Pedestrian	0.00127613	0	0.000418202	
Collision risk	**Train / user**	**User equipment**	**Other**	
Vehicle	0.000818568	0	0	
Pedestrian	0.001036218	0	0.0000092	

5. OPTION ASSESSMENT AND CONCLUSIONS

5.1 OPTIONS EVALUATED

The options evaluated to mitigate the risks at Durham Farm crossing include:

Option	Term[1]	ALCRM risk score	ALCRM FWI	Safety Benefit	Cost	Benefit Cost Ratio	Status	Comments
solar deck lighting and sign lighting	Long Term	B4	0.001998342				COMPLETE	A national lighting assessment at crossings was undertaken and it was recommended by the LCM that some form of lighting was installed at this location – this may be able to be incorporated in the further improvements works. Funding will be sought via works delivery.
closure via bridging or diversion	Long Term	M13	0				COMPLETE	There was a project to put in a bridge at an adjacent crossing Stoor and put in an access road to Durham Farm which would have closed both crossings – this was not progressed due insufficient funding at this time.
add COVTEC for pedestrians (WB's already in situ)	Long Term	C4	0.001706917				COMPLETE	This crossing was de scoped under a national project for COVTEC as unsuitable location
Move Ds gate inwards to give more space for vehicles to wait off	Long term	B4	0.002039974				COMPLETE	These works were approved and installed in October 2016. Further works to improve the

road								crossing have also achieved funding and will be progressed in the next 6 months.

NOTES
Network Rail always evaluates the need for short[1] and long term risk control solutions. An example of level crossing risk management might be; a short term risk control of a temporary speed restriction with the long term solution being closure of the level crossing and its replacement with a bridge.
[1] Includes interim

CBA gives an indication of overall business benefit. It is used to support, not override, structured expert judgement when deciding which option(s) to progress. CBA might not be needed in all cases, e.g. standard maintenance tasks or low cost solutions (less than £5k).

The following CBA criteria are used as a support to decision making:

a. benefit to cost ratio is ≥ 1: positive safety and business benefit established;
b. benefit to cost ratio is between 0.99 and 0.5: reasonable safety and business benefit established where costs are not grossly disproportionate against the safety benefit; and
c. benefit to cost ratio is between 0.49 and 0.0: weak safety and business benefit established.

5.2 CONCLUSIONS

Assessor's notes:

Crossing location

Durham Farm is a user work crossing (UWC) which is located on ELR STS where it traverses the railway at at 54m 30ch.

The farm crossing only serves a residential property which is located on the up side.

The crossing is situated on and accessed via the adjacent A26 which runs between Beddingham and Newhaven and is classed as a trunk road. It carries traffic connecting with the A27 and also the A259 coast road towards Newhaven.

There is no signage leading up to the UWC.

The land is prone to flooding.

The only other authorised users other than the house owners are the landowner and the land agent, the latter 2 rarely, if ever traverse over the crossing.

Also clearly visible is the incinerator on the up side which burns waste for the immediate area up to Brighton – the "ash" freight train goes over the crossing 4 times a day.

The Port of Newhaven is also close by and has a Cross Channel Ferry service that runs twice a day bringing a lot of freight traffic to the area.

There are other UWCs and FP's in the vicinity and Stoor hybrid UWCt/FP is visible in the up direction and Tarring Neville No.1 is in the down direction.

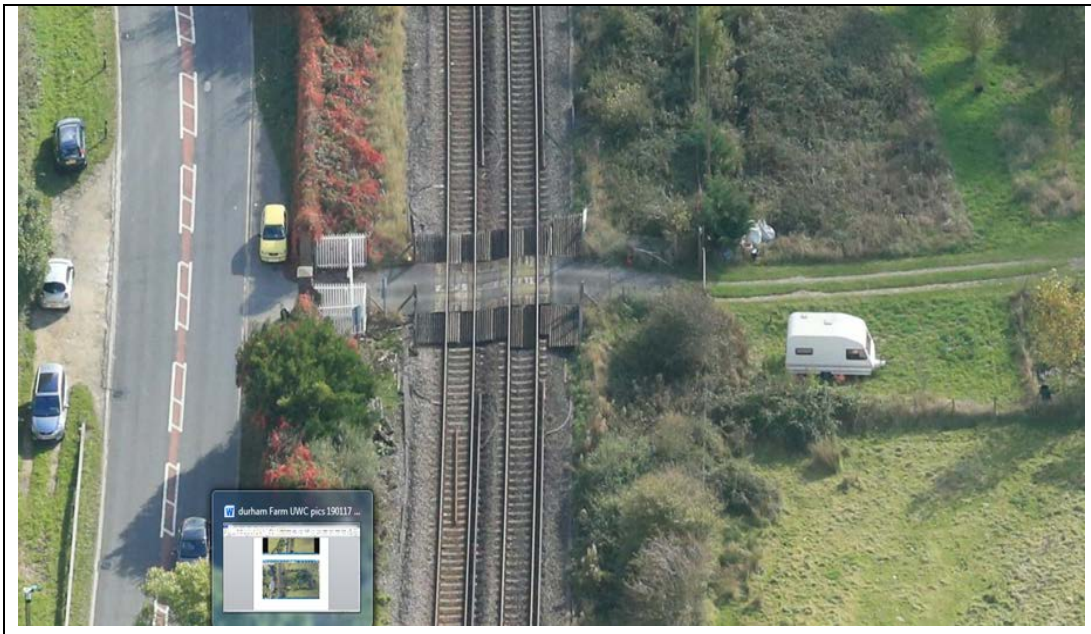
The surrounding area is mostly rural with several working farms using fields for grazing stock. There is a disused chalk pit not far on the A26.

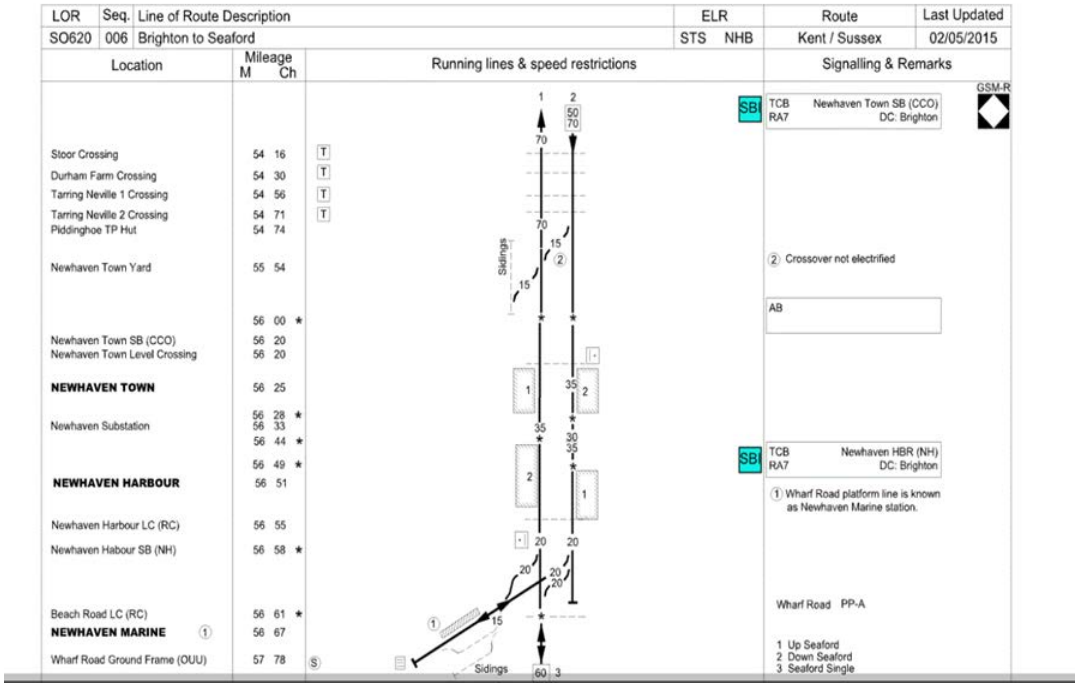
The Seaford branch line is sometimes prone to winter fog and sea mist.

Aerial views of the crossing


Level Crossing
Durham Farm
A26
Drain
Drain


A26
A26
A26
A26





LOR	Seq.	Line of Route Description	ELR	Route	Last Updated
SO620	006	Brighton to Seaford	STS NHB	Kent / Sussex	02/05/2015

Location	Mileage M Ch	Running lines & speed restrictions	Signalling & Remarks
			SB TCB RA7 Newhaven Town SB (CCO) DC: Brighton
Stoor Crossing	54 16	T	
Durham Farm Crossing	54 30	T	
Tarring Neville 1 Crossing	54 56	T	
Tarring Neville 2 Crossing	54 71	T	
Piddinghoe TP Hut	54 74		
Newhaven Town Yard	55 54		② Crossover not electrified
	56 00 ★		AB
Newhaven Town SB (CCO)	56 20		
Newhaven Town Level Crossing	56 20		
NEWHAVEN TOWN	56 25		
Newhaven Substation	56 28 ★ 56 33		
	56 44 ★		
	56 49 ★		SB TCB RA7 Newhaven HBR (NH) DC: Brighton
NEWHAVEN HARBOUR	56 51		① Wharf Road platform line is known as Newhaven Marine station.
Newhaven Harbour LC (RC)	56 55		
Newhaven Habour SB (NH)	56 58 ★		
Beach Road LC (RC)	56 61 ★		Wharf Road PP-A
NEWHAVEN MARINE ①	56 67		
Wharf Road Ground Frame (OUU)	57 78	Sidings	1 Up Seaford 2 Down Seaford 3 Seaford Single

Crossing description

Durham Farm crossing is a user work crossing which consists of a single metal farm gate on the up side with an adjacent wooden wicket gate for ease of pedestrian use. Both are kept locked, the pedestrian gate is bolted and the vehicle gate with a universal abloy padlock.

On the down side following recent improvements, there are 2 6ft tall palisade split gates protecting the railway line which are also locked with a universal abloy padlock. These gates open inwards to allow vehicles to pull off of the road safely to make a call to the signaller before obtaining permission to cross.
There is also a full length pedestrian gate which did allow on foot access before the recent modifications. This gate now only allows access to a post box and bin area.

There is an up line and a down line and the maximum speed is 70mph in both directions.

The down side approach is from the busy A26, there is a hard standing on the A26 opposite the crossing where the users tend to leave their vehicles in the day saving them repeatedly coming in and out of the crossing and having to obtain permission to cross via the telephones and the signaller at Newhaven Town signal box.

The upside approach is on their land and consists of unmade up and soft grass area which is often muddy and boggy in winter months.

Once through the gates both approaches are of a tarmacked quality on a gradient which are segregated on the approaches by fence posts and chain link all in good condition, the down side ones have recently been upgraded as part of the gate move.

The crossing surface is made up of suspended timbers with spaced anti slip which is in good condition. The cant of the track means that the crossing does undulate in the middle and is not a level traverse with some gradient to it. Funding has been approved for a full upgrade to the crossing surface and this will include the installation of pedestrail and omnistrail as a proprietary surface, this includes built in anti slip. This is expected to be installed in the next 6-8 months. The upgrade will also include pedestrian gates opposite each other on respective sides allowing users to traverse in a straight line rather than diagonally as it was before lengthening the traverse time and distance to cross.

Also following the upgrade of the crossing surface and associated equipment the crossing will become a hybrid – having both a UWCt and a FP element to it. These will be entered into Ellipse and ALCRM and require separate cyclical risk assessments and inspections.

The decision point is 3m for vehicles and 2m for pedestrians. The 3m point for vehicles is measured from the nearest running line back to a 3m distance and 2m for pedestrians.

The traverse length of the crossing for vehicles is 10 m and 9m for pedestrians.

There are telephones present to mitigate against deficient sighting for the vehicles - these are direct connect and non illuminated to the signaller at Newhaven Town signal box.

Whistle boards are in place for pedestrians who cross under their own authority as instructed by “stop look listen” signage, these are placed at the maximum and optimum distance of 400m.

There is the normal compliant signage here for the UWC section instructing users to call the signaller for permission to cross with low, low, heavy loads or animals. Electrification and do not trespass signage is present for all users.

Durham Farm train track has an up and a down road and the maximum speed here is 70mph. The track is powered by conductor rail DC750.

Sighting is non compliant for vehicles with a speed of 70 mph on both up and down roads requiring a minimum of 435m and compliant for pedestrians requiring a distance of 280m.

UP-UP track curve sighting is 360m
UP-DN Stoor crossing sighting is 370m
DN-UP Stoor crossing sighting is 270m
DN-DN fixed line structure sighting is 322m
.
The sighting is limited in both up and down directions by track curve.

The traverse, distance calculator was used to reach the traverse time required and the speed of 70mph taken:
Pedestrians
70mph line speed x crossing length recorded 9m x = 9 seconds required crossing time and 280m minimum required sighting distance
70mph line speed x crossing length of 10m for vehicles = 14 seconds required crossing time and 435m minimum required sighting distance.

There is no lighting in place and only low levels of ambient lighting exist from surrounding businesses including the incinerator and the nearby A26 road lights. Following a recent lighting assessment in darkness it is recommended that solar lighting on the deck and some form of signage lighting is installed at this location. This is optioned for. This assessment was a national lighting check for all crossings and findings have been sent back to NLCT for action.

Trespass guarding is provided on both ends of the crossing at the required minimum distance of 2.6m which applies to all points on the crossing. The conductor rail is cut back significantly further than the required minimum of 3m distance away from the crossing surface in both directions.

Up side across crossing

Down side across crossing

Crossing usage

A 7 day census was taken with a squirrel camera but the camera failed after 4 days – an average was taken from this and recorded 4 vehicle traverses and 6 pedestrian traverses per day.
The users both have electric cars and normally take their vehicles out in the morning and leave them on the hard standing on the A26 on the DS and then bring them back in during the evening for charging purposes.
They have visitors that come to the house but they nearly always leave their vehicles on the A26 and walk across on foot.
The usage was confirmed with the users.

Crossing risk

This is a planned risk assessment with an ALCRM risk score generated of B4 – Yellow - with a FWI of 0.002081607.

The following options have been considered and assessed for risk reduction at this crossing:

1. **Solar deck lighting and sign lighting**

This option would allow the user to clearly see the approaching signs and the crossing deck for traverse. Following the implementation of this option the ALCRM score would be B4 and a FWI reduction score of 0.001998342.

2. **Closure via bridging or diversion**

There was a project to put in a bridge at an adjacent crossing Stoor and put in an access road to Durham Farm which would have closed both crossings. Following the implementation of this option the ALCRM score would be M13 and a FWI reduction score of 0.

3. **add COVTEC for pedestrians (WB's already in situ)**

This crossing option would add an audible warning in addition to the already in situ whistle boards. . Following the implementation of this option the ALCRM score would be C4 and a FWI reduction score of 0.001706917.

4. **Move Ds gate inwards to give more space for vehicles to wait off road**

These works would allow the user to pull off of the busy adjacent road and safely allow for a telephone call to the signaller for permission to cross. Following the implementation of this option the ALCRM score would be B4 and a FWI reduction score of 0.002039974.

Conclusion

1. **Solar deck lighting and sign lighting**

This option has been forwarded to the RLCM for progression and could possibly be included in the level crossing surface upgrade.

2. **Closure via bridging or diversion**

This option has been discounted as the land purchase required for the access road from the land owner was not obtained via the agent.

3. **add COVTEC for pedestrians (WB's already in situ)**

This crossing was de scoped under a national project for COVTEC as unsuitable location.

4. **Move Ds gate inwards to give more space for vehicles to wait off road**

This option has been approved and has mostly been implemented. The decision has been made to upgrade the crossing surface an make the crossing a hybrid so further works will be implemented in the nxt 6-8 months

In conclusion – option 4 will be implemented and option 1 will try and be incorporated in the scheme if possible.

ANNEX A – ADDITIONAL PHOTOGRAPHS

Description:

Description:

Description:

Description:

Description:

Description:

ANNEX B – HAZARD IDENTIFICATION AND RISK CONTROLS

The table below is intended for use by risk assessors when identifying hazards and risk control solutions. It is not an exhaustive list or presented in a hierarchical order.

	Hazard	Control
Road vehicle and train collision risk	Examples at the crossing include: • insufficient sighting and / or train warning for all vehicle types; known to be exacerbated by the driving position, e.g. tractor • level crossing equipment and signage is not conspicuous or optimally positioned • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • high volume of unfamiliar users, e.g. irregular visitors, migrant workers • known user complacency leading to high levels of indiscipline, e.g. failure to use telephone, gates left open • type of vehicle unsuitable for crossing; - large, low, slow making access or egress difficult and / or vehicle is too heavy for crossing surface - risk of grounding and / or the severity of the gradient adversely affects ability to traverse • poor decking panel alignment / position on skewed crossing • where telephones are provided, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • high chance of a second train coming • high line speed and / or high frequency of trains • unsuitable crossing type for location, train service, line speed and vehicle types	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs • engaging with signalling engineers to optimise strike in times • upgrading of asset to a higher form of protection • downgrading of crossing by removing vehicle access rights • optimising sighting lines and / or providing enhanced user based warning system, e.g. MSL • re-profiling of crossing surface • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • widening access gates and / or improving the crossing surface construction material • realigning or installing additional decking panels to accommodate all vehicle types • implementing train speed restriction or providing crossing attendant
Pedestrian and train collision risk	Examples include: • insufficient sighting and / or train warning • ineffective whistle boards; warning inaudible, insufficient warning	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs

	Hazard	Control
	time provided, known high usage between 23:00 and 07:00 • high chance of a second train coming • high line speed and / or high frequency of trains • level crossing equipment and signage is not conspicuous or optimally positioned • location and position of level crossing gates mean that users have their backs to approaching trains when they access the level crossing, i.e. users are initially unsighted to trains approaching from their side of the crossing • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • surface condition or lack of decking contribute to slip trip risk • known high level of use during darkness • increased likelihood of user error, e.g. crossing is at station • free wicket gates might result in user error • high volume of unfamiliar users, e.g. irregular visitors / ramblers, equestrians • complacency leading to high levels of indiscipline, e.g. users are known to rely on knowledge of timetable • high level of use by vulnerable people • where telephones are provided i.e. bridleways, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • unsuitable crossing type for location, train service, line speed and user groups • high usage by cyclists • degree of skew over crossing increases traverse time and users' exposure to trains • crossing layout encourages users not to cross at the designed decision point; egress route unclear especially during darkness	• upgrading of asset to a higher form of protection • optimising sighting lines, e.g. de-vegetation programme, repositioning of equipment or removal of redundant railway assets • implementing train speed restriction or providing crossing attendant • providing enhanced user based warning system, e.g. MSL • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • installing guide fencing and / or handrails to encourage users to look for approaching trains, read signage or cross at the designed decision point • re-design of crossing approach so that users arrive at the crossing as close to a 90° angle as possible • installing lighting sources • engaging with signalling engineers to optimise strike in times • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • providing cyclist dismount signs and / or chicanes • straightening of crossing deck

	Hazard	Control
	schools, local amenities or other attractions are known to contribute towards user error	
Pedestrian and road vehicle collision risk	Examples include: • a single gate is provided for pedestrian and vehicle users where there is a high likelihood that both user groups will traverse at the same time • the position of pedestrian gate forces / encourages pedestrian users to traverse diagonally across the roadway • road / footpath inadequately separated; footpath not clearly defined • condition of footpath surface increases the likelihood of users slipping / tripping into the path of vehicles	Controls can include: • providing separate pedestrian gates • clearly defining the footpath; renew markings • positioning pedestrian gates on the same side of the crossing • improving footpath crossing surface so it is devoid of potholes, excessive flangeway gaps and is evenly laid • improving crossing surface, e.g. holdfast, strail, non-slip surface
Personal injury	Examples include: • skewed crossing with large flangeway gaps results in cyclist, mobility scooter, pushchair or wheelchair user being unseated • condition of footpath surface increases the likelihood of users slipping / tripping • degraded gate mechanism or level crossing equipment • barrier mechanism unguarded / inadequately protected	Controls can include: • improving fence lines • reducing flangeway gaps and straightening where possible • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • straighten / realign gate posts • fully guarding barrier mechanisms

ANNEX C – ALCRM RISK SCORE EXPLANATION

ALCRM provides an estimate of both the individual and collective risks at a level crossing.

The individual and collective risk is expressed in Fatalities and Weighted Injuries (FWI). The following values help to explain this:

- **1** = 1 fatality per year or 10 major injuries or 200 minor RIDDOR events or 1000 minor non-RIDDOR events
- **0.1** = 20 minor RIDDOR events or 100 minor non-RIDDOR events
- **0.005** = 5 minor non-RIDDOR events

INDIVIDUAL RISK

This is the annualised probability of fatality to a 'regular user'. *NOTE: A regular user is taken as a person making a daily return trip over the crossing; assumed 500 traverses per year.*

Individual risk:

- Applies only to crossing users. It is not used for train staff and passengers
- Does not increase with the number of users.
- Is presented as a simplified ranking:
    - Allocates individual risk into rankings A to M
      (A is highest, L is lowest, and M is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
    - Allows comparison of individual risk to average users across any crossings on the network

Individual Risk Ranking	Upper Value (Probability)	Lower Value (Probability)	Upper Value (FWI)	Lower Value (FW)
A	1 in 1	Greater than 1 in 1,000	1	0.001000000
B	1 in 1,000	1 in 5,000	0.001000000	0.000200000
C	1 in 5,000	1 in 25,000	0.000200000	0.000040000
D	1 in 25,000	1 in 125,000	0.000040000	0.000008000
E	1 in 125,000	1 in 250,000	0.000008000	0.000004000
F	1 in 250,000	1 in 500,000	0.000004000	0.000002000
G	1 in 500,000	1 in 1,000,000	0.000002000	0.000001000
H	1 in 1,000,000	1 in 2,000,000	0.000001000	0.000000500
I	1 in 2,000,000	1 in 4,000,000	0.000000500	0.000000250
J	1 in 4,000,000	1 in 10,000,000	0.000000250	0.000000100
K	1 in 10,000,000	1 in 20,000,000	0.000000100	0.000000050
L	Less than 1 in 20,000,000	Greater than 0	0.000000050	Greater than 0
M	0	0	0	0

COLLECTIVE RISK
This is the total risk for the crossing and includes the risk to users (pedestrian and vehicle), train staff and passengers.

Collective risk:

- Is presented as a simplified ranking:
  - Allocates collective risk into rankings 1 to 13
    (1 is highest, 12 is lowest, and 13 is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Can easily compare collective risk between any two crossings on the network

Collective Risk Ranking	Upper Value (FWI)	Lower Value (FW)
1	Theoretically infinite	Greater than 5.00E-02
2	0.050000000	0.010000000
3	0.010000000	0.005000000
4	0.005000000	0.001000000
5	0.001000000	0.000500000
6	0.000500000	0.000100000
7	0.000100000	0.000050000
8	0.000050000	0.000010000
9	0.000010000	0.000005000
10	0.000005000	0.000001000
11	0.000001000	0.000000500
12	0.0000005	0
13	0.00E+00	0.00E+00

NARRATIVE RISK ASSESSMENT – PASSIVE TEMPLATE FINAL v2.0

PASSIVE LEVEL CROSSING RISK ASSESSMENT

1. LEVEL CROSSING OVERVIEW AND ENVIRONMENT

1.1 LEVEL CROSSING OVERVIEW

This is a risk assessment for Courthouse Farm level crossing.

Crossing details	
Name	Courthouse Farm
Type	UWC
Crossing status	Occupation
Overall crossing status	Open
Route name	Sussex
Engineers Line Reference	STS, 52m, 3ch
OS grid reference	TQ436077
Number of lines crossed	2
Line speed (mph)	70
Electrification	DC
Signal box	Lewes

Risk assessment details	
Name of assessor	[redacted]
Post	Level Crossing Manager
Date completed	19/01/2017
Next due date	19/04/2018
Email address	[redacted]@networkrail.co.uk
Phone number	[redacted]

ALCRM risk score	
Individual risk	A
Collective risk	4
FWI	0.002045098

1.2 INFORMATION SOURCES

The table below shows the stakeholder consultation that was undertaken as part of the risk assessment.

Consulted	Attended site
Authorised user	No

Stakeholder consultation and attendance notes:

The reference sources used during the risk assessment included:

- Occurrence log, Other (Sussex events log), CCIL, GI Portal, SMIS.

1.3 ENVIRONMENT

Up side crossing approach **Down side crossing approach**

Courthouse Farm level crossing provides field to field access.

It is an occupation level crossing. There are no stations visible at the level crossing.

At Courthouse Farm level crossing the orientation of the road/path from the north is 80°; the orientation of the railway from the north to the up line in the up direction is 340°. Low horizon can result in sun glare; sun glare is not a known issue.

There are no planned or apparent developments near the crossing which may lead to a change or increase in use or risk.

Site visit general observations:

2. LEVEL CROSSING USAGE

2.1 RAIL

The train service over Courthouse Farm level crossing consists of passenger and freight trains. There are 90 trains per day. The highest permissible line speed of trains is 70mph. Trains are timetabled to run for 24 hours per day.

Assessor's notes:

2.2 USER CENSUS DATA

An estimated census has been used. The census was estimated on 19/01/2017 by [redacted] The census applies to 70% of the year.

The census taken on the day is as follows:

Cars	WEEKLY
Vans / small lorries	NO
Buses	NO
HGVs	NO
Pedal / motor cyclists	NO
Pedestrians	ONCE OR TWICE DAILY
Tractors / farm vehicles	ONCE OR TWICE DAILY
Horses / riders	NO
Animals on the hoof	WEEKLY

Available information indicates that the crossing does not have a high proportion of vulnerable users.

Vulnerable user observations:

Available information indicates that the crossing does not have a high number of irregular users.

Irregular user observations:

Courthouse Farm level crossing has both private vehicular and private pedestrian access gates to the crossing. The proportion of pedestrian users using the entry/exit gates is estimated to be:

- Footpath gates/stiles 0%
- UWC vehicular gates 0%

Information gathered indicates that Courthouse Farm level crossing does not have a high number of users during the night or at dusk.

Site visit night / dusk user observations:

Assessor's general census notes:

2 farmers that are brothers for the same farm use this crossing on same basis every year

Second user census

An estimated census has been used. The census was estimated on 08/02/2017 by TP. The census applies to 30% of the year.

The census taken on the day is as follows:

Cars	NO
Vans / small lorries	NO
Buses	NO
HGVs	NO
Pedal / motor cyclists	NO
Pedestrians	WEEKLY
Tractors / farm vehicles	FEW
Horses / riders	NO
Animals on the hoof	NO

Available information indicates that the crossing does not have a high proportion of vulnerable users.

Vulnerable user observations:

Available information indicates that the crossing does not have a high number of irregular users.

Irregular user observations:

If 'type' is UWC and 'Footpath gates/stiles %' or 'UWC vehicular gates %' are populated, include the following section:
Courthouse Farm level crossing has both private vehicular and private pedestrian access gates to the crossing. The proportion of pedestrian users using the entry/exit gates is estimated to be:

- 0%
- 0%

Courthouse Farm level crossing does not have a high number of users during the night or at dusk.

Site visit night / dusk user observations:

Assessor's general census notes:

2 farmers that are brothers for the same farm use this crossing on same basis every year

2.3 USER CENSUS RESULTS

ALCRM calculates usage of the crossing to be 2 road vehicles and 1 pedestrians and cyclists per day.

3. RISK OF USE

3.1 SIGHTING AND TRAVERSE

At Courthouse Farm level crossing, the decision point and traverse lengths are calculated as:

	Decision point (m)	Traverse length (m)	Measured from
Up side	3	10.1	Edge of wing fencing 3m from nearest running rail
Down side	3	10.1	Edge of wing fencing 3m from nearest running rail

Timber decking is provided over the level crossing. The decking is considered to be wide enough for all users of the crossing. It is fitted with a non slip surface.

The traverse times are calculated as:

	Traverse time (s)
Pedestrians	9
Vehicles	32

The current census has not identified a high proportion of vulnerable users. Therefore, the pedestrian traverse time has not been increased.

Assessor's traverse time notes:

Sighting distance traverse calculator used

Sighting was measured by the following means:

- Using Range Finder
- Using known references

Sighting, measured in metres, at Courthouse Farm level crossing is recorded as:

All distances are recorded in metres	Minimum sighting distance required	Measured sighting distance	Sighting distance measured to	Is sighting compliant?	If deficient, is sighting distance mitigated?	Notes on deficient sighting time mitigations
Up side looking toward up direction train approach	995	1110	Asheham LC	Yes		
Up side looking toward down direction train approach	995	1086	LW18	Yes		
Down side looking toward up direction train approach	995	1110	Asheham LC	Yes		
Down side looking toward down direction train approach	995	413	1st sight train	No	No telephone in situ, funding being sought. Users currently use their own mobiles to traverse with animals and slow,low heavy vehicles	

Sighting restrictions are recorded as follows:

	Up Direction	Down Direction
Nothing; vanishing point	NO	NO
Track curvature	NO	NO
Permanent structure (building/wall etc)	NO	NO
Signage or crossing equipment	NO	NO
Vegetation	YES	YES
Bad weather on the day of visit	NO	NO
Other	NO	NO

There are no known obstructions that could make it difficult for users to see approaching trains. There are known issues with foliage, fog or other issues that might impair visibility of the crossing, crossing equipment or approaching trains.

Actions to improve sighting have been identified.

Assessor's improving sighting and decision point notes

MST in place for veg clearance at the crossing during growing season. Reactive faulting for track side vegetation

The visual evaluation of the vertical profile of the road indicates that it does not create a risk of vehicles getting stuck on the crossing.

Assessor's risk of vehicle getting stuck notes:

Assessor's general sighting and traverse notes:

Sighting on the us in both directions often gets obscured by trackside vegetation on the curves. MST in place for crossing veg. Trackside veg is reactive. A specialist vegetation team has recently cut back to within 7 metres of the track and several hundreds of metres either side to try and keep sighting within its permissible limits.

3.2 EVALUATION OF MITIGATIONS

3.3 CROSSING APPROACHES

The signs at Courthouse Farm level crossing are located on the direct route a user would take over the level crossing, they are positioned so that they are clearly visible to users taking a direct route over the level crossing. The visibility of the signs is reduced at night or at dusk. The road surface (including gradient is present) at Courthouse Farm level crossing could impact on the ability of a vehicle to stop at the level crossing.

There are no known issues with ice, mud, loose material or flood water.

Assessor's notes:

Occasional winter fog and veg height in growing season, MST in place for the crossing and reactive for trackside during inspections

There are no adjacent sources of light or noise that could affect a users' ability to see or hear approaching trains.

Assessor's general crossing approach notes:

Very low levels of ambient lighting, recommend in options for solar deck and sign lighting

3.4 AT THE CROSSING – ANOTHER TRAIN COMING RISK

Trains are sometimes known to pass each other at this crossing.

Assessor's another train coming notes:

[Free text]

3.5 INCIDENT HISTORY

A level crossing safety event has not been known to occur at Courthouse Farm level crossing in the last twelve months.

Assessor's incident history notes:

There is no recorded misuse at this crossing

Gate discipline (including barriers)

Reports indicate that the gates are ALWAYS CLOSED.

Assessor's notes on operational disruptions:

4. ALCRM CALCULATED RISK

Courthouse Farm ***level crossing ALCRM results***

Key risk drivers: ALCRM calculates that the following key risk drivers influence the risk at this crossing:

- Frequent trains
- Large number users
- Low sighting

Assessor's key risk drivers notes

[Free text]

Safety risk				
Compared to other crossings the safety risk for this crossing is	**Individual risk**		**Collective risk**	
	A		**4**	
	Individual risk (fraction)	**Individual risk (numeric)**		
Car	1 in 76	0.013085803	0.000087923	
Van / small lorries	0	0	0	
HGV	0	0	0	
Bus	0	0	0	
Tractor / farm vehicle	1 in 1582	0.00063172	0.00040793	
Cyclist / Motor cyclist	0	0	0	
Pedestrian	1 in 1324	0.000754777	0.001089769	
				Derailment contribution
Passengers			0.000265306	79.251401616
Staff			0.00019417	12.634901494
Total			0.002045098	11.480699731
Collision frequencies	**Train / user**	**User equipment**	**Other**	
Vehicle	0.002229047	0.000758017	0	
Pedestrian	0.001319296	0	0.000840924	
Collision risk	**Train / user**	**User equipment**	**Other**	
Vehicle	0.000495853	0	0	
Pedestrian	0.001071269	0	0.0000185	

5. OPTION ASSESSMENT AND CONCLUSIONS

5.1 OPTIONS EVALUATED

The options evaluated to mitigate the risks at Courthouse Farm crossing include:

Option	Term[1]	ALCRM risk score	ALCRM FWI	Safety Benefit	Cost	Benefit Cost Ratio	Status	Comments
add telephones for user	Long Term	B6	0.000457999				COMPLETE	This is currently being pursued for funding via the RLCM as users currently use their own mobiles to obtain permission from the signaller where necessary
closure via release of legal rights or diversion	Long Term	M13	0				COMPLETE	This would cross the crossing and eradicate the risk. There is no suitable diversion therefore this option is not viable.
add solar lighting to deck/signs	Long Term	A4	0.002024647				COMPLETE	This option would help illuminate the crossing deck surface and signage in poor lighting conditions.

NOTES
Network Rail always evaluates the need for short[1] and long term risk control solutions. An example of level crossing risk management might be; a short term risk control of a temporary speed restriction with the long term solution being closure of the level crossing and its replacement with a bridge.
[1] Includes interim

CBA gives an indication of overall business benefit. It is used to support, not override, structured expert judgement when deciding which option(s) to progress. CBA might not be needed in all cases, e.g. standard maintenance tasks or low cost solutions (less than £5k).

The following CBA criteria are used as a support to decision making:

a. benefit to cost ratio is ≥ 1: positive safety and business benefit established;
b. benefit to cost ratio is between 0.99 and 0.5: reasonable safety and business benefit established where costs are not grossly disproportionate against the safety benefit; and
c. benefit to cost ratio is between 0.49 and 0.0: weak safety and business benefit established.

5.2 CONCLUSIONS

Assessor's notes:

Crossing location

Courthouse Farm is a user work crossing (UWC) which is located on ELR STS at 52m 03ch.

The crossing is situated in a rural area and allows access field to field. The fields on both the up side and the down side are used for grazing livestock, mainly cattle and sheep.

The crossing is accessed via a private unnamed road which spurs off of the busy A26 just prior to the A27 Beddingham roundabout.
It is then either a short drive across farmland/fields or a 20 minute walk if field conditions do not allow for vehicle traverse.

There is no pedestrian walkway or signage leading up to the UWC and access is via the fields only. In winter the access is on foot only as the fields are too muddy/wet for vehicles to traverse.

The unnamed road is also padlocked and gives access to the Environment agency as well. They have a waterworks for the river Ouse located here and the area is of environmental interest.

Other than Courthouse Farm the immediate area surrounding the farm consists of a few cottages and a church.

Southerham Junction, KJE2, is just visible in the up direction and the user can see where the line splits from ELR KJE2 to ELR STS towards Seaford and KJE3 towards Eastbourne.

Also clearly visible in the up direction is the busy trunk road, A27, towards Lewes.

In the down direction a rail over water bridge can be seen for the river Ouse – known locally as "Sound" bridge and also another UWC crossing called Asheham which is located off of a manure plant.

Courthouse Farm UWC is in between Southease station and Lewes station.

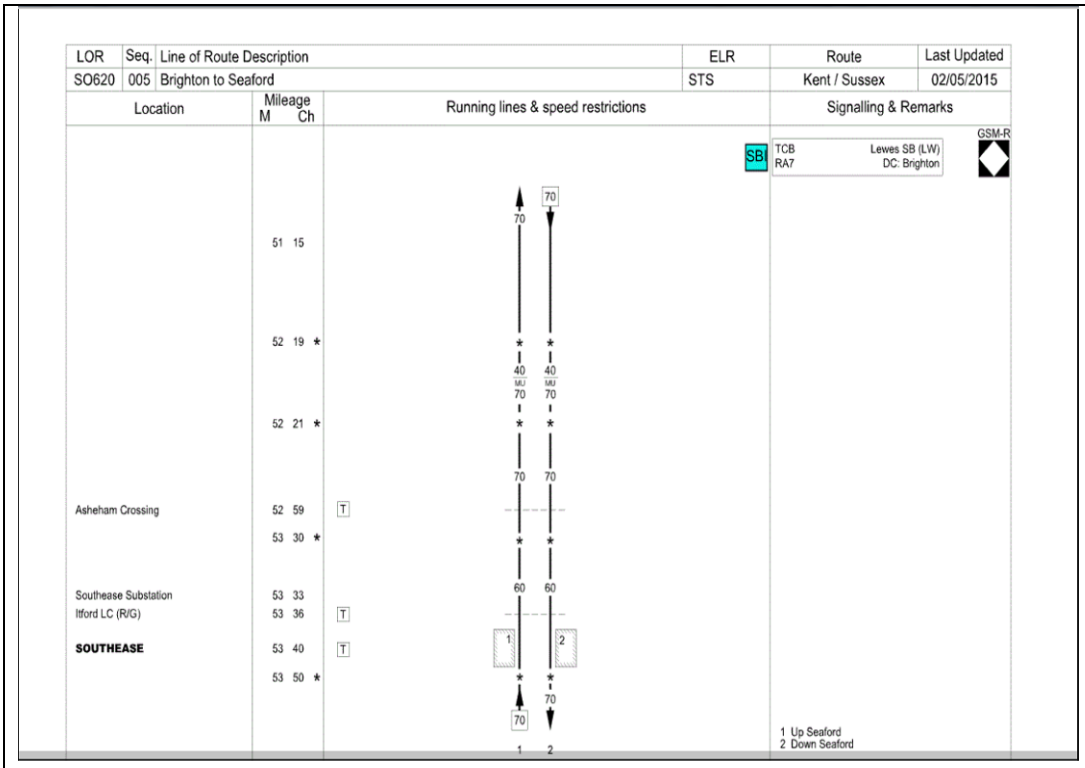
The Seaford branch line is sometimes prone to winter fog and sea mist.

Pictures of the crossing


South Downs National Park
South Downs
Ranscombe Hill
South Downs National Park
South Downs
Glynde
Ranscombe Lane
A27
A27
A26
Beddingham Place
Little Crewa
Ouse
Ouse
Ouse


Ouse
South Downs
South Downs National Park
Ouse


Lewes District
Uckfield



Crossing description

Courthouse Farm crossing is a user work crossing which consists 2 standard metal locked vehicle gates, one on the up side and one on the down side. They both open outwards away from the running line and are locked with a railway abloy padlock, the user holds a key for access.

The user rights for the crossing belong to the 2 brothers who farm the land. Occasional access is also granted to the Environment Agency to reach part of the river bank for the Ouse river which flows under the railway a little further away in the down direction.

There is an up line and a down line and the maximum speed is 70mph in both directions.

The track is powered by conductor rail DC750.

The up side and the down side approaches are of a field type and un made up which can get muddy and boggy in winter months. Both are slightly steeped in gradient but do not cause a problem as all vehicles using this crossing are of a farm type with either 4 wheel drive or appropriate tyres.

Once through the railway boundary vehicle gates the approaches are still of field type and just before the crossing surface semi compacted stone.

The vehicle areas are segregated on the approaches by concrete fence posts and chain link, also known as wing fencing which is all currently in good condition.

The crossing surface is made up of a suspended timber system edged with concrete troughing lids on the down side cess only.

The decision point is 3m for vehicles, this is measured from the nearest running line back to a 3m compliant distance which naturally sits very close to the edge of the wing fencing.

The traverse length of the crossing for vehicles is 10 m

The crossing deck is of a suitable width for the vehicles used for traverse at this crossing.

There are no telephones currently in situ and funding has been requested to install these. This is required for any low, slow, heavy moving vehicles and for the traverse of animals on the hoof.
Users must use their own mobiles to contact the signaller and obtain permission to cross as instructed.
Sighting is compliant for users to cross on foot on their own authority as instructed by “stop look listen” signage.

There is the normal compliant signage here for the UWC section instructing users to call the signaller for permission to cross with slow, low, heavy loads or animals.

Electrification and do not trespass signage is present for all users as is Samaritan signage.

This site was also chosen as a POGO site but was de-scoped due unsuitability.

Sighting is compliant for vehicles with a speed of 70 mph on both up and down roads requiring a minimum of 963m and compliant for pedestrians requiring a distance of 280m.

UP-UP Asheham LC sighting is 1110m
UP-DN LW18 signal sighting is 1086m
DN-UP Asheham LC sighting is 1110m
DN-DN LW18 signal available sighting is 1086m but often 413m as lineside vegetation can obscure this in growing season.

Off Track have employed a specialist team to cut back lineside vegetation to 995m and to 7m back from the track which should now make the sighting compliant for the next 12-18 months.

The sighting is limited in both up and down directions by track curve.

There is no lighting in place and only extremely low levels of ambient lighting exist during darkness and dull lighting in the day time. There is an option for solar deck lighting and some form of signage lighting to be installed.

Trespass guarding is provided on both ends of the crossing at the required minimum distance of 2.6m which applies to all points on the crossing. The conductor rail is cut back further than the required minimum of 3m distance away from the crossing surface in both directions.

Up side across crossing view

Down side across crossing view

Crossing usage

2 estimated censuses were taken in conjunction with discussion with both farmers.

Census 1 applies to usage April – October where the farmers traverse with 2 vehicles per day = 4 traverses, daily on foot = 2 traverses and weekly traverse with animals on the hoof which are generally cattle who are moved about field to field etc.

Census 2 applies to November – March usage ie Winter where there are no animals in the fields and the only use is the farmers checking the condition of the field and fencing on a weekly basis. Ie 1 ped = 2 traverse on foot.

There was no advantage in placing a camera at this location during the winter months to record 1 pedestrian for the entire week = 2 traverses.

Crossing risk

This is a planned risk assessment with an ALCRM risk score generated of A4 – Red with a FWI of 0.002045098.

The following options have been considered and assessed for risk reduction at this crossing:

1. **Add telephones**

This has been raised for funding as currently there are no telephones in place and the UWC is non-compliant. Following the implementation of this option the ALCRM score would be B6 and a FWI reduction score of 0.000457999.

2. **Closure via release of legal rights or diversion**

This option would totally eradicate the risk at this crossing. Following the implementation of this option the ALCRM score would be M13 and a FWI reduction score of 0.

3. **add solar lighting to deck/signs**

This option would help illuminate the deck, track and signage in darkness and poor lighting conditions. Following the implementation of this option the ALCRM score would be A4 and a FWI reduction score of 0.002024647.

Conclusion

1. **Add telephones**

This option is being progressed and will be implemented once funding has been secured.

2. **Closure via release of legal rights or diversion**

This is not a viable option as there is no reasonable diversion, closure is not an option as this is the sole means of land access.

3. **add solar lighting to deck/signs**

This has been recommended if funding can be made available and is documented in a works delivery file for funding.

ANNEX A – ADDITIONAL PHOTOGRAPHS

Description:

Description:

Description:

Description:

Description:

Description:

ANNEX B – HAZARD IDENTIFICATION AND RISK CONTROLS

The table below is intended for use by risk assessors when identifying hazards and risk control solutions. It is not an exhaustive list or presented in a hierarchical order.

	Hazard	Control
Road vehicle and train collision risk	Examples at the crossing include: • insufficient sighting and / or train warning for all vehicle types; known to be exacerbated by the driving position, e.g. tractor • level crossing equipment and signage is not conspicuous or optimally positioned • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • high volume of unfamiliar users, e.g. irregular visitors, migrant workers • known user complacency leading to high levels of indiscipline, e.g. failure to use telephone, gates left open • type of vehicle unsuitable for crossing; - large, low, slow making access or egress difficult and / or vehicle is too heavy for crossing surface - risk of grounding and / or the severity of the gradient adversely affects ability to traverse • poor decking panel alignment / position on skewed crossing • where telephones are provided, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • high chance of a second train coming • high line speed and / or high frequency of trains • unsuitable crossing type for location, train service, line speed and vehicle types	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs • engaging with signalling engineers to optimise strike in times • upgrading of asset to a higher form of protection • downgrading of crossing by removing vehicle access rights • optimising sighting lines and / or providing enhanced user based warning system, e.g. MSL • re-profiling of crossing surface • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • widening access gates and / or improving the crossing surface construction material • realigning or installing additional decking panels to accommodate all vehicle types • implementing train speed restriction or providing crossing attendant
Pedestrian and train collision risk	Examples include: • insufficient sighting and / or train warning • ineffective whistle boards; warning inaudible, insufficient warning	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs

	Hazard	Control
	time provided, known high usage between 23:00 and 07:00 • high chance of a second train coming • high line speed and / or high frequency of trains • level crossing equipment and signage is not conspicuous or optimally positioned • location and position of level crossing gates mean that users have their backs to approaching trains when they access the level crossing, i.e. users are initially unsighted to trains approaching from their side of the crossing • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • surface condition or lack of decking contribute to slip trip risk • known high level of use during darkness • increased likelihood of user error, e.g. crossing is at station • free wicket gates might result in user error • high volume of unfamiliar users, e.g. irregular visitors / ramblers, equestrians • complacency leading to high levels of indiscipline, e.g. users are known to rely on knowledge of timetable • high level of use by vulnerable people • where telephones are provided i.e. bridleways, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • unsuitable crossing type for location, train service, line speed and user groups • high usage by cyclists • degree of skew over crossing increases traverse time and users' exposure to trains • crossing layout encourages users not to cross at the designed decision point; egress route unclear especially during darkness	• upgrading of asset to a higher form of protection • optimising sighting lines, e.g. de-vegetation programme, repositioning of equipment or removal of redundant railway assets • implementing train speed restriction or providing crossing attendant • providing enhanced user based warning system, e.g. MSL • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • installing guide fencing and / or handrails to encourage users to look for approaching trains, read signage or cross at the designed decision point • re-design of crossing approach so that users arrive at the crossing as close to a 90° angle as possible • installing lighting sources • engaging with signalling engineers to optimise strike in times • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • providing cyclist dismount signs and / or chicanes • straightening of crossing deck

	Hazard	Control
	schools, local amenities or other attractions are known to contribute towards user error	
Pedestrian and road vehicle collision risk	Examples include: • a single gate is provided for pedestrian and vehicle users where there is a high likelihood that both user groups will traverse at the same time • the position of pedestrian gate forces / encourages pedestrian users to traverse diagonally across the roadway • road / footpath inadequately separated; footpath not clearly defined • condition of footpath surface increases the likelihood of users slipping / tripping into the path of vehicles	Controls can include: • providing separate pedestrian gates • clearly defining the footpath; renew markings • positioning pedestrian gates on the same side of the crossing • improving footpath crossing surface so it is devoid of potholes, excessive flangeway gaps and is evenly laid • improving crossing surface, e.g. holdfast, strail, non-slip surface
Personal injury	Examples include: • skewed crossing with large flangeway gaps results in cyclist, mobility scooter, pushchair or wheelchair user being unseated • condition of footpath surface increases the likelihood of users slipping / tripping • degraded gate mechanism or level crossing equipment • barrier mechanism unguarded / inadequately protected	Controls can include: • improving fence lines • reducing flangeway gaps and straightening where possible • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • straighten / realign gate posts • fully guarding barrier mechanisms

ANNEX C – ALCRM RISK SCORE EXPLANATION

ALCRM provides an estimate of both the individual and collective risks at a level crossing.

The individual and collective risk is expressed in Fatalities and Weighted Injuries (FWI). The following values help to explain this:

- **1** = 1 fatality per year or 10 major injuries or 200 minor RIDDOR events or 1000 minor non-RIDDOR events
- **0.1** = 20 minor RIDDOR events or 100 minor non-RIDDOR events
- **0.005** = 5 minor non-RIDDOR events

INDIVIDUAL RISK

This is the annualised probability of fatality to a 'regular user'. *NOTE: A regular user is taken as a person making a daily return trip over the crossing; assumed 500 traverses per year.*

Individual risk:

- Applies only to crossing users. It is not used for train staff and passengers
- Does not increase with the number of users.
- Is presented as a simplified ranking:
  - Allocates individual risk into rankings A to M
    (A is highest, L is lowest, and M is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Allows comparison of individual risk to average users across any crossings on the network

Individual Risk Ranking	Upper Value (Probability)	Lower Value (Probability)	Upper Value (FWI)	Lower Value (FW)
A	1 in 1	Greater than 1 in 1,000	1	0.001000000
B	1 in 1,000	1 in 5,000	0.001000000	0.000200000
C	1 in 5,000	1 in 25,000	0.000200000	0.000040000
D	1 in 25,000	1 in 125,000	0.000040000	0.000008000
E	1 in 125,000	1 in 250,000	0.000008000	0.000004000
F	1 in 250,000	1 in 500,000	0.000004000	0.000002000
G	1 in 500,000	1 in 1,000,000	0.000002000	0.000001000
H	1 in 1,000,000	1 in 2,000,000	0.000001000	0.000000500
I	1 in 2,000,000	1 in 4,000,000	0.000000500	0.000000250
J	1 in 4,000,000	1 in 10,000,000	0.000000250	0.000000100
K	1 in 10,000,000	1 in 20,000,000	0.000000100	0.000000050
L	Less than 1 in 20,000,000	Greater than 0	0.000000050	Greater than 0
M	0	0	0	0

COLLECTIVE RISK

This is the total risk for the crossing and includes the risk to users (pedestrian and vehicle), train staff and passengers.

Collective risk:

- Is presented as a simplified ranking:
  - Allocates collective risk into rankings 1 to 13
    (1 is highest, 12 is lowest, and 13 is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Can easily compare collective risk between any two crossings on the network

Collective Risk Ranking	Upper Value (FWI)	Lower Value (FW)
1	Theoretically infinite	Greater than 5.00E-02
2	0.050000000	0.010000000
3	0.010000000	0.005000000
4	0.005000000	0.001000000
5	0.001000000	0.000500000
6	0.000500000	0.000100000
7	0.000100000	0.000050000
8	0.000050000	0.000010000
9	0.000010000	0.000005000
10	0.000005000	0.000001000
11	0.000001000	0.000000500
12	0.0000005	0
13	0.00E+00	0.00E+00

NARRATIVE RISK ASSESSMENT – PASSIVE TEMPLATE FINAL v2.0

PASSIVE LEVEL CROSSING RISK ASSESSMENT

1. LEVEL CROSSING OVERVIEW AND ENVIRONMENT

1.1 LEVEL CROSSING OVERVIEW

This is a risk assessment for Asheham No.1 level crossing.

Crossing details	
Name	Asheham No.1
Type	UWCT
Crossing status	Occupation
Overall crossing status	Open
Route name	Sussex
Engineers Line Reference	STS, 52m, 59ch
OS grid reference	TQ435066
Number of lines crossed	2
Line speed (mph)	70
Electrification	DC
Signal box	Lewes

Risk assessment details	
Name of assessor	[redacted]
Post	Level Crossing Manager
Date completed	12/04/2017
Next due date	12/07/2019
Email address	[redacted]@networkrail.co.uk
Phone number	[redacted]

ALCRM risk score	
Individual risk	B
Collective risk	8
FWI	0.000014331

1.2 INFORMATION SOURCES

The table below shows the stakeholder consultation that was undertaken as part of the risk assessment.

Consulted	Attended site
Authorised user	No
Local business	No

Stakeholder consultation and attendance notes:

Viridor Waste Management is now the sole AU and was not available for meeting – telephone conversation held instead.

The reference sources used during the risk assessment included:

- Occurrence log, Census, CCIL, GI Portal, SMIS.

1.3 ENVIRONMENT

Up side crossing approach **Down side crossing approach**

Asheham No.1 level crossing provides track to field access.

It is an occupation level crossing. There are no stations visible at the level crossing.

At Asheham No.1 level crossing the orientation of the road/path from the north is 80°; the orientation of the railway from the north to the up line in the up direction is 180°. Low horizon can result in sun glare; sun glare is not a known issue.

There are no planned or apparent developments near the crossing which may lead to a change or increase in use or risk.

Site visit general observations:

Access to the crossing is via the Viridor manure plant which is located on the down side of the crossing.

2. LEVEL CROSSING USAGE

2.1 RAIL

The train service over Asheham No.1 level crossing consists of passenger and freight trains. There are 90 trains per day. The highest permissible line speed of trains is 70mph. Trains are timetabled to run for 24 hours per day.

Assessor's notes:

86 passenger trains and 4 freight trains = 90 trains.

2.2 USER CENSUS DATA

An estimated census has been used. The census was estimated on 12/04/2017 by [redacted] [redacted] The census applies to 100% of the year.

The census taken on the day is as follows:

Cars	FEW
Vans / small lorries	NO
Buses	NO
HGVs	NO
Pedal / motor cyclists	NO
Pedestrians	FEW
Tractors / farm vehicles	NO
Horses / riders	NO
Animals on the hoof	NO

Available information indicates that the crossing does not have a high proportion of vulnerable users.

Vulnerable user observations:

NA

Available information indicates that the crossing does not have a high number of irregular users.

Irregular user observations:

NA

Information gathered indicates that Asheham No.1 level crossing does not have a high number of users during the night or at dusk.

Site visit night / dusk user observations:

Assessor's general census notes:

There is a fertiliser recycling plant on the DS of the crossing which can generate noise if machinery is in use close to the crossing. The current AU owns the land on both sides of the crossing and only traverses 1-2 times a year. The noise from the plant has never been a reported issue. Update with the owner of the land on both sides of crossing reveals that the new tenant farmer has not been given rights over the LC therefore access is only used by the land owner Viridor Waste Management and they only require access once or twice a year on foot or with a 4x4 to inspect land. The tenant farmer is considering buying the land and if this is agreed it will also be without rights over the crossing. Viridor would then consider giving up the rights over the crossing to achieve a closure at this location.

2.3 USER CENSUS RESULTS

ALCRM calculates usage of the crossing to be 0 road vehicles and 0 pedestrians and cyclists per day.

3. RISK OF USE

3.1 SIGHTING AND TRAVERSE

At Asheham No.1 level crossing, the decision point and traverse lengths are calculated as:

	Decision point (m)	Traverse length (m)	Measured from
Up side	3	10	3 m from the nearest running line
Down side	3	10	3 m from the nearest running line

Timber decking is provided over the level crossing. The decking is considered to be wide enough for all users of the crossing. It is fitted with a non slip surface.

The traverse times are calculated as:

	Traverse time (s)
Pedestrians	8
Vehicles	14

The current census has not identified a high proportion of vulnerable users. Therefore, the pedestrian traverse time has not been increased.

Assessor's traverse time notes:

Sighting distance traverse calculator used

Sighting was measured by the following means:

- Using Range Finder

Sighting, measured in metres, at Asheham No.1 level crossing is recorded as:

All distances are recorded in metres	Minimum sighting distance required	Measured sighting distance	Sighting distance measured to	Is sighting compliant?	If deficient, is sighting distance mitigated?	Notes on deficient sighting time mitigations
Up side looking toward up direction train approach	435	241	Track curve	No	YES	
Up side looking toward down direction train approach	435	268	Track curve	No	YES	Vegetation on the up-dn can affect available sighting in growing season and is dealt with reactively by off track as it is reported
Down side looking toward up direction train approach	435	402	Track curve	No	YES	
Down side looking toward down direction train approach	435	410	Track curve	No	YES	Vegetation can affect available sighting trackside in this direction. This is dealt with reactively as it happens in growing season and dealt with via a waif to off track.

Sighting restrictions are recorded as follows:

	Up Direction	Down Direction
Nothing; vanishing point	NO	NO
Track curvature	YES	YES
Permanent structure (building/wall etc)	NO	NO
Signage or crossing equipment	NO	NO
Vegetation	NO	NO
Bad weather on the day of visit	NO	NO
Other	NO	NO

There are no known obstructions that could make it difficult for users to see approaching trains. There are known issues with foliage, fog or other issues that might impair visibility of the crossing, crossing equipment or approaching trains.

Actions to improve sighting have been identified.

Assessor's improving sighting and decision point notes

MST in place for vegetation at crossing. Track side vegetation is reactively dealt with by waif to Off Track.

The visual evaluation of the vertical profile of the road indicates that it does not create a risk of vehicles getting stuck on the crossing.

Assessor's risk of vehicle getting stuck notes:

Assessor's general sighting and traverse notes:

3.2 EVALUATION OF MITIGATIONS

Asheham No.1 level crossing is provided with telephones.

	Comments
Telephone visibility and clarity of instructional signage	Acceptable at this location
Telephone usage	Usage confirmed with signaller
Telephone discipline	Users are ALWAYS known to use the telephone to ask for permission to cross. The level of telephone usage has been confirmed with the controlling signal box
Long signal section *(Is the Signaller able to determine where trains are with reasonable accuracy; do users have to wait an excessive time for permission to cross?)*	
Signal panel ergonomics	

Assessor's notes on telephone suitability as a risk control

This is currently an acceptable risk control for this location - use is now extremely low with the land owner requiring use only 1-2 times a year for inspecting the land on the up side. Use of the crossing is controlled as access is via the manure plant and visitors must sign in and out with the agent before continuing to the crossing.

3.3 CROSSING APPROACHES

The signs at Asheham No.1 level crossing are located on the direct route a user would take over the level crossing, they are positioned so that they are clearly visible to users taking a direct route over the level crossing. The visibility of the signs is reduced at night or at dusk.
The road surface (including gradient is present) at Asheham No.1 level crossing could impact on the ability of a vehicle to stop at the level crossing.

There are known issues with ice, mud, loose material or flood water. These known issues might impair visibility of the crossing, crossing equipment, including signage or the visibility of trains. They might also affect the ability of a vehicle to stop at the level crossing.

Assessor's notes:

Foliage can be an issue in growing season. MST in place for the crossing and track vegetation is reactively dealt with. Can be very muddy on the approaches in winter time

There are no adjacent sources of light or noise that could affect a users' ability to see or hear approaching trains.

Assessor's general crossing approach notes:

There is a fertiliser plant on the DS of the crossing which can generate noise if close to the crossing. The current AU owns the land on both sides of the crossing and only traverses 1-2 times a year. The noise from the plant has never been a reported issue.

3.4 AT THE CROSSING – ANOTHER TRAIN COMING RISK

Trains are sometimes known to pass each other at this crossing.

Assessor's another train coming notes:

[Free text]

3.5 INCIDENT HISTORY

A level crossing safety event has not been known to occur at Asheham No.1 level crossing in the last twelve months.

Assessor's incident history notes:

140315 – 2 x youths crossed over in front of approaching train – not classed as a near miss. 020707 – user failed to call back after crossing.

Telephone discipline

See section 3.2

Gate discipline (including barriers)

Reports indicate that the gates are ALWAYS CLOSED.

Assessor's notes on operational disruptions:

4. ALCRM CALCULATED RISK

Asheham No.1 ***level crossing ALCRM results***

Key risk drivers: ALCRM calculates that the following key risk drivers influence the risk at this crossing:

- Frequent trains
- Low sighting

Assessor's key risk drivers notes

[Free text]

Safety risk				
Compared to other crossings the safety risk for this crossing is	**Individual risk**		**Collective risk**	
	B		**8**	
	Individual risk (fraction)	**Individual risk (numeric)**		
Car	1 in 4681	0.000213627	0.000006733	
Van / small lorries	0	0	0	
HGV	0	0	0	
Bus	0	0	0	
Tractor / farm vehicle	0	0	0	
Cyclist / Motor cyclist	0	0	0	
Pedestrian	1 in 4269	0.000234228	0.000005909	
				Derailment contribution
Passengers			0.000000106	95.831683828
Staff			0.000001585	0.745773633
Total			0.000014331	0.789109769
Collision frequencies	**Train / user**	**User equipment**	**Other**	
Vehicle	0.000011315	0.000036371	0	
Pedestrian	0.000007208	0	0.000002535	
Collision risk	**Train / user**	**User equipment**	**Other**	
Vehicle	0.000006733	0	0	
Pedestrian	0.000005853	0	0.000000056	

5. OPTION ASSESSMENT AND CONCLUSIONS

5.1 OPTIONS EVALUATED

The options evaluated to mitigate the risks at Asheham No.1 crossing include:

Option	Term[1]	ALCRM risk score	ALCRM FWI	Safety Benefit	Cost	Benefit Cost Ratio	Status	Comments
POGO	Long Term	B8	0.000012182				COMPLETE	This was considered and discounted by the NLCT considering a national project for POGO installation. The location was not deemed suitable.
high viz yellow anti slip	Long Term	B8	0.000013902				COMPLETE	This would further enhance and define the crossing surface for all users. Given that the usage is only 1-2 times a year and during the daytime to inspect field conditions it is probable that this would not currently be necessary or cost effective
solar lighting for deck and signage	Long Term	B8	0.000014188				COMPLETE	A recent lighting assessment survey at passive crossings showed that ambient lighting at this location is not sufficient to see the signage or the deck during darkness. It was recommended that some form of solar power be installed. Given that the usage is only 1-2 times a year and during the daytime to inspect field conditions it

								is probable that this would not currently be necessary or cost effective.
closure via diversion or give up user rights	Long Term	M13	0				COMPLETE	This is the preferred option which would eradicate all risk at this location over the railway line.

NOTES
Network Rail always evaluates the need for short[1] and long term risk control solutions. An example of level crossing risk management might be; a short term risk control of a temporary speed restriction with the long term solution being closure of the level crossing and its replacement with a bridge.
[1] Includes interim

CBA gives an indication of overall business benefit. It is used to support, not override, structured expert judgement when deciding which option(s) to progress. CBA might not be needed in all cases, e.g. standard maintenance tasks or low cost solutions (less than £5k).

The following CBA criteria are used as a support to decision making:

a. benefit to cost ratio is ≥ 1: positive safety and business benefit established;
b. benefit to cost ratio is between 0.99 and 0.5: reasonable safety and business benefit established where costs are not grossly disproportionate against the safety benefit; and
c. benefit to cost ratio is between 0.49 and 0.0: weak safety and business benefit established.

5.2 CONCLUSIONS

Assessor's notes:

Crossing location

Asheham No.1 is a user work crossing (UWCt) with telephones which is located on ELR STS at 52m 59ch.

The crossing is situated and accessed via a private, unnamed road leading from the busy trunk road A26 at Beddingham, this stretches from Newhaven – Beddingham.

It is made up of a concrete track with speed bumps leading up to a manure plant run by Viridor – the track leads you to the site office where users must sign in and out before being access to the level crossing.

All site traffic is limited to 5mph.

The site is protected by 2 large lockable gates which are closed between the hours of 1700-0700 hrs. The dual padlock system is accessible to Viridor and Network Rail employees only who may need to access the track outside of opening hours.

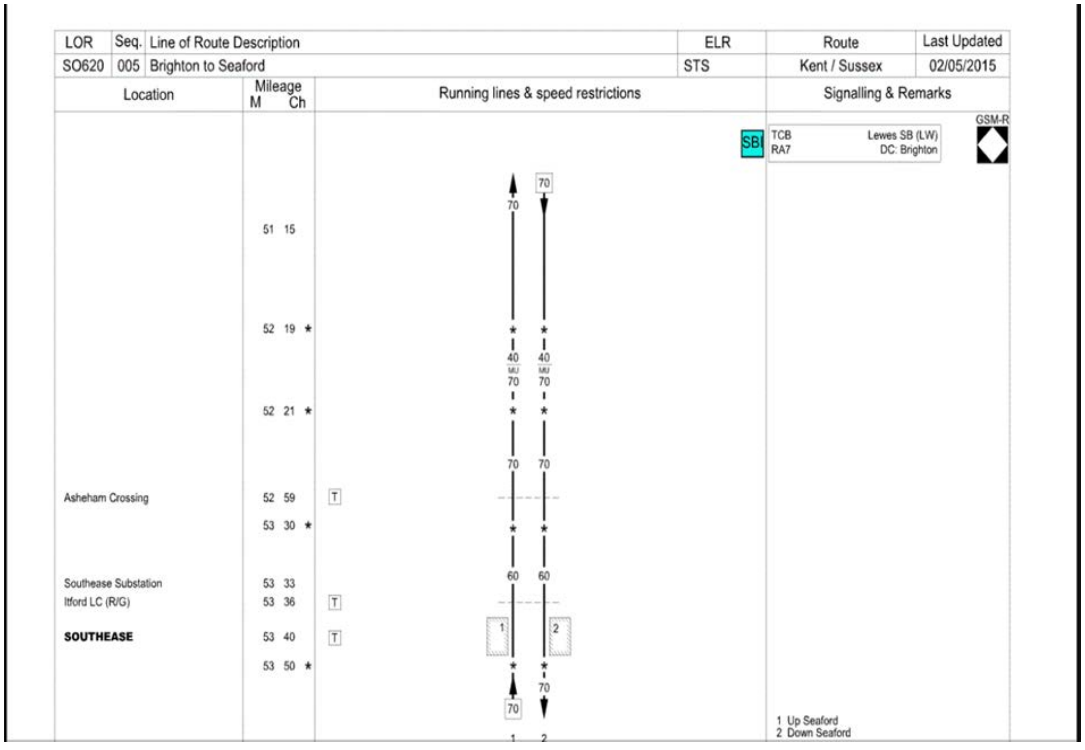
The current sole user is the land owner – Viridor Waste Management – the tenant farmer has no access through the plant and over the crossing, he uses other land on the up side to access the field.

The crossing provides access track – field.

The land on the up side is farmed with grazing for sheep and cattle, the land on the DS is solely the manure plant.

The crossing is rural and there is no footpath attached to it.

There are no stations visible at the crossing. Courthouse Farm UWC is visible in the far distance in the looking towards Lewes direction (up).



Crossing description

Asheham No.1 is a UWCt which consists of a wooden deck crossing with a locked metal farm gate on either side of the railway secured with an abloy key which the users have a copy for. The gates open outwards away from the running rail of the railway.

The user rights for the crossing belong to the land owner, Viridor Waste Management, who don't allow access to the current tenant farmer of the field on the up side.

There is an up line and a down line and the maximum speed is 70mph in both directions.

The down side approach is via the manure plant owned by Viridor.

It has an unmade up track through the plant and on the approach to the gates which consists of ground down bark vegetation and can be very muddy and wet in the winter. As the site speed limit is 5mph this does not pose a problem.

The upside field is normally used for grazing sheep and cows.

Once through the down side railway boundary vehicle gates the approach is made up of ballast, rough ground and grass and is fairly flat, the up side is made up of a graded tarmac area on a slope.

There is no advance warning signage for the crossing until you are at the crossing.

The crossing and immediate boundary fences are made up of chain link and concrete and wooden posts which are all currently in a fair condition.

The decision point is 3m for vehicles and 2m for pedestrians.

The 3m point for vehicles is measured from the nearest running line back to a 3m distance. Any pedestrians wishing to travel across on foot the decision point (DP) is 2m and also measured from the nearest running rail making the DP at the edge of the wing fencing.

The traverse length of the crossing for vehicles is 10m which is measured on the most direct traverse route across the crossing. The traverse distance ofr pedestrians is 9m.

There are telephones present, one either side which are direct connect and non-illuminated. They are easily visible to the user and signed as telephones.

There is the normal compliant signage here for the UWC section instructing users to call the signaller for permission to cross with low, low, heavy loads or animals. Electrification and do not trespass signage is present for all users as is Samaritan signage.
The normal stop look listen signage is in place for pedestrian users on foot.

Asheham No.1 train track has an up and a down road and the maximum speed here is 70mph. The track is powered by conductor rail DC750.

Sighting is non-compliant for vehicles, which is calculated on a car length 4x4 type and with a speed of 70 mph on both up and down roads requiring a minimum of 435m.
The sighting is non-compliant for pedestrians requiring a distance of 249m - pedestrians are also required to use the telephone. Viridor have been advised of this via E mail and a response from them has been received to say that they understand this requirement.

UP-UP track curve 241m
UP-DN track curve 268m
DN-UP track curve 402m
DN-DN grey loc box in distance on track curve 410m

The sighting is limited in both up and down directions by track curve.

The traverse, distance calculator was used to reach the traverse time required and the speed of 70mph taken:
70mph line speed x crossing length recorded 10m x = 14 seconds required crossing time and 435m minimum required sighting distance for vehicles
70mph line speed x crossing length recorded 9m x = 8 seconds required crossing time and 249m minimum required sighting distance for pedestrians.

There is no lighting in place and only extremely low levels of ambient lighting exist. A recent

lighting assessment was carried out and the crossing deck and signage was not visible to the user in darkness without the aid of additional lighting. A recommendation by the assessor was to install solar lighting for the decking and signage. This may not be viable cost wise as the usage is so low with 1-2 times a year traverse currently to only check the condition of the land.

Trespass guarding is provided on both ends of the crossing at the required minimum distance of 2.6m which applies to all points on the crossing. The conductor rail is cut back further than the required minimum of 3m distance away from the crossing surface in both directions.

Up side looking across crossing

Down side looking across crossing

Crossing usage

A 7 day census was taken with a squirrel camera, it recorded 0 traverses a day during that time which was confirmed with the signaller.
Therefore an estimated census has been recorded with “few” traverses for pedestrians and vehicles.

Having spoken with Viridor Estates manager he states traverse is only required once or twice a year to inspect the filed condition. The tenant farmer has been rented the field with no rights over the crossing as they do not want any users through the plant area.
The tenant farmer wishes to buy the field at some point and the land will be sold with no user rights over the crossing. Viridor will be happy to release user rights at this point and the crossing can be closed.

There are only 2 instances of abuse recorded at this location:
140315 – 2 x youths crossed over in front of approaching train – not classed as a near miss.
020707 – user failed to call back after crossing.

Crossing risk

1. **Closure via diversion or user rights given up**

This would permanently close the crossing and generate an ALCRM score of M13 and a FWI score of 0.

2. **Install yellow anti slip**

This would further define the crossing surface for all users. This would generate an ALCRM score of B8 and a FWI score of 00013902.

3. **Install solar lighting for signage and decking**

This would allow the user to clearly see the signage and deck surface in darkness and generate an ALCRM score of B8 and a FWI score of 0.000014188.

4. **POGO**

This option would allow the user to traverse in one action without the need to go back and close gates – this narrows the current traverse rate of 5 to 1. This would generate an ALCRM score of B8 and a FWI score of 0.000012182.

Conclusion

1. **Closure via diversion or user rights given up**

This is the preferred option and would eradicate all risk over the level crossing. Currently risk is vastly reduced as the rights owner only requires access to check the land 1-2 times a year either on foot or with a car 4x4 type vehicle. The tenant farmer has rented the field over the crossing with no access rights. He also wishes to buy the field at some point and this will also be without any access rights. Viridor would be happy for the crossing to close at this point.

2. **Install yellow anti slip**

This option would highlight the crossing surface for all users but given the current extremely low use this would be an expensive option therefore probably discounted at this stage.

3. **Install solar lighting for signage and decking**

Again given the extremely low use at this crossing and the likelyhood of land checking in darkness almost nil this option is not a cost effective one at this stage.

4. **POGO**

Again given the extremely low use at this crossing of 1-2 times a year currently this option is not a cost effective one at this stage and is to be discounted.

In conclusion usage has become extremely low recently due a change of tenant farmer and Viridor excluding access to them over the crossing therefore any new upgrades for 1-2 traverses a year is probably not cost effective. The deficient sighting is currently mitigated by

telephone and deemed to be an acceptable risk control at this location with this level of usage.
This will be re assessed as and when any changes occur.
Vegetation can affect sighting from the crossing – there is a MST in place for vegetation cut back at the crossing for sighting, trackside vegetation is reactive and dealt with accordingly as required throughout the year.

ANNEX A – ADDITIONAL PHOTOGRAPHS

Description:

Description:

Description:

Description:

Description:

Description:

ANNEX B – HAZARD IDENTIFICATION AND RISK CONTROLS

The table below is intended for use by risk assessors when identifying hazards and risk control solutions. It is not an exhaustive list or presented in a hierarchical order.

	Hazard	Control
Road vehicle and train collision risk	Examples at the crossing include: • insufficient sighting and / or train warning for all vehicle types; known to be exacerbated by the driving position, e.g. tractor • level crossing equipment and signage is not conspicuous or optimally positioned • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • high volume of unfamiliar users, e.g. irregular visitors, migrant workers • known user complacency leading to high levels of indiscipline, e.g. failure to use telephone, gates left open • type of vehicle unsuitable for crossing; - large, low, slow making access or egress difficult and / or vehicle is too heavy for crossing surface - risk of grounding and / or the severity of the gradient adversely affects ability to traverse • poor decking panel alignment / position on skewed crossing • where telephones are provided, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • high chance of a second train coming • high line speed and / or high frequency of trains • unsuitable crossing type for location, train service, line speed and vehicle types	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs • engaging with signalling engineers to optimise strike in times • upgrading of asset to a higher form of protection • downgrading of crossing by removing vehicle access rights • optimising sighting lines and / or providing enhanced user based warning system, e.g. MSL • re-profiling of crossing surface • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • widening access gates and / or improving the crossing surface construction material • realigning or installing additional decking panels to accommodate all vehicle types • implementing train speed restriction or providing crossing attendant
Pedestrian and train collision risk	Examples include: • insufficient sighting and / or train warning • ineffective whistle boards; warning inaudible, insufficient warning	Controls can include: • optimising the position of equipment and / or signs • removing redundant and / conflicting signs

	Hazard	Control
	time provided, known high usage between 23:00 and 07:00 • high chance of a second train coming • high line speed and / or high frequency of trains • level crossing equipment and signage is not conspicuous or optimally positioned • location and position of level crossing gates mean that users have their backs to approaching trains when they access the level crossing, i.e. users are initially unsighted to trains approaching from their side of the crossing • instructions for safe use might be misunderstood e.g. signage clutter detracts from key messages, conflicting information given • surface condition or lack of decking contribute to slip trip risk • known high level of use during darkness • increased likelihood of user error, e.g. crossing is at station • free wicket gates might result in user error • high volume of unfamiliar users, e.g. irregular visitors / ramblers, equestrians • complacency leading to high levels of indiscipline, e.g. users are known to rely on knowledge of timetable • high level of use by vulnerable people • where telephones are provided i.e. bridleways, users experience a long waiting time due to: - long signal section (Signaller unaware of exact train location) - high train frequency • insufficient or excessive strike in times at MSL crossings • unsuitable crossing type for location, train service, line speed and user groups • high usage by cyclists • degree of skew over crossing increases traverse time and users' exposure to trains • crossing layout encourages users not to cross at the designed decision point; egress route unclear especially during darkness	• upgrading of asset to a higher form of protection • optimising sighting lines, e.g. de-vegetation programme, repositioning of equipment or removal of redundant railway assets • implementing train speed restriction or providing crossing attendant • providing enhanced user based warning system, e.g. MSL • engaging with stakeholders / authorised users to reinforce safe crossing protocol, legal responsibilities and promote collaborative working • installing guide fencing and / or handrails to encourage users to look for approaching trains, read signage or cross at the designed decision point • re-design of crossing approach so that users arrive at the crossing as close to a 90° angle as possible • installing lighting sources • engaging with signalling engineers to optimise strike in times • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • providing cyclist dismount signs and / or chicanes • straightening of crossing deck

	Hazard	Control
	schools, local amenities or other attractions are known to contribute towards user error	
Pedestrian and road vehicle collision risk	Examples include: • a single gate is provided for pedestrian and vehicle users where there is a high likelihood that both user groups will traverse at the same time • the position of pedestrian gate forces / encourages pedestrian users to traverse diagonally across the roadway • road / footpath inadequately separated; footpath not clearly defined • condition of footpath surface increases the likelihood of users slipping / tripping into the path of vehicles	Controls can include: • providing separate pedestrian gates • clearly defining the footpath; renew markings • positioning pedestrian gates on the same side of the crossing • improving footpath crossing surface so it is devoid of potholes, excessive flangeway gaps and is evenly laid • improving crossing surface, e.g. holdfast, strail, non-slip surface
Personal injury	Examples include: • skewed crossing with large flangeway gaps results in cyclist, mobility scooter, pushchair or wheelchair user being unseated • condition of footpath surface increases the likelihood of users slipping / tripping • degraded gate mechanism or level crossing equipment • barrier mechanism unguarded / inadequately protected	Controls can include: • improving fence lines • reducing flangeway gaps and straightening where possible • providing decking or improving crossing surface, e.g. holdfast, strail, non-slip surface • straighten / realign gate posts • fully guarding barrier mechanisms

ANNEX C – ALCRM RISK SCORE EXPLANATION

ALCRM provides an estimate of both the individual and collective risks at a level crossing.

The individual and collective risk is expressed in Fatalities and Weighted Injuries (FWI). The following values help to explain this:

- **1** = 1 fatality per year or 10 major injuries or 200 minor RIDDOR events or 1000 minor non-RIDDOR events
- **0.1** = 20 minor RIDDOR events or 100 minor non-RIDDOR events
- **0.005** = 5 minor non-RIDDOR events

INDIVIDUAL RISK

This is the annualised probability of fatality to a 'regular user'. *NOTE: A regular user is taken as a person making a daily return trip over the crossing; assumed 500 traverses per year.*

Individual risk:

- Applies only to crossing users. It is not used for train staff and passengers
- Does not increase with the number of users.
- Is presented as a simplified ranking:
  - Allocates individual risk into rankings A to M
    (A is highest, L is lowest, and M is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Allows comparison of individual risk to average users across any crossings on the network

Individual Risk Ranking	Upper Value (Probability)	Lower Value (Probability)	Upper Value (FWI)	Lower Value (FW)
A	1 in 1	Greater than 1 in 1,000	1	0.001000000
B	1 in 1,000	1 in 5,000	0.001000000	0.000200000
C	1 in 5,000	1 in 25,000	0.000200000	0.000040000
D	1 in 25,000	1 in 125,000	0.000040000	0.000008000
E	1 in 125,000	1 in 250,000	0.000008000	0.000004000
F	1 in 250,000	1 in 500,000	0.000004000	0.000002000
G	1 in 500,000	1 in 1,000,000	0.000002000	0.000001000
H	1 in 1,000,000	1 in 2,000,000	0.000001000	0.000000500
I	1 in 2,000,000	1 in 4,000,000	0.000000500	0.000000250
J	1 in 4,000,000	1 in 10,000,000	0.000000250	0.000000100
K	1 in 10,000,000	1 in 20,000,000	0.000000100	0.000000050
L	Less than 1 in 20,000,000	Greater than 0	0.000000050	Greater than 0
M	0	0	0	0

COLLECTIVE RISK

This is the total risk for the crossing and includes the risk to users (pedestrian and vehicle), train staff and passengers.

Collective risk:

- Is presented as a simplified ranking:
  - Allocates collective risk into rankings 1 to 13
    (1 is highest, 12 is lowest, and 13 is 'zero risk' e.g. temporary closed, dormant or crossings on mothballed lines)
  - Can easily compare collective risk between any two crossings on the network

Collective Risk Ranking	Upper Value (FWI)	Lower Value (FW)
1	Theoretically infinite	Greater than 5.00E-02
2	0.050000000	0.010000000
3	0.010000000	0.005000000
4	0.005000000	0.001000000
5	0.001000000	0.000500000
6	0.000500000	0.000100000
7	0.000100000	0.000050000
8	0.000050000	0.000010000
9	0.000010000	0.000005000
10	0.000005000	0.000001000
11	0.000001000	0.000000500
12	0.0000005	0
13	0.00E+00	0.00E+00