



# Hatches Level Crossing Narrative Risk Assessment



April 2022

## 1 INTRODUCTION

- 1.1 Network Rail has a general duty, including under Part 1 of the Health and Safety at Work etc., Act 1974 and under section 117 of the Railways Act 1993, to secure the health, safety and welfare of its employees and to conduct its undertaking in a way which ensures, satisfactorily, that persons outside of its employment (i.e. those who interface with the operational railway) are not exposed to risks to their health or safety.
- 1.2 Network Rail also has a legal responsibility under the Management of Health and Safety at Work Regulations 1999. Section 3 focuses on the requirement for suitable and sufficient assessments of risk to health and safety of employees and others, in connection with its undertaking.
- 1.3 Network Rail is committed to reducing risk on the railway and has identified that one of the greatest risks to those who interface with the railway is at the site of level crossings. This is where vehicles and/or pedestrians may come into direct contact with train movements. With the support and oversight of the ORR, Network Rail is working to reduce this risk as much as reasonably practicable.
- 1.4 Network Rail has a responsibility to consider the suitability of options and mitigations, including those that provide for the warning of approaching trains and enable traversing within the required time. This document provides supporting safety information for the making of an informed risk assessment in the decision-making process in respect of the Hatches Bridleway crossing (the Crossing), and to recommend the most appropriate option(s) and mitigation(s) that satisfactorily reduces the risk to as low as reasonably practicable, ALARP, to Crossing users..
- 1.5 The crossing facilitates a public right of way (BW19) located in Frimley Green, a residential area of Frimley, Surrey. It lies approximately 0.8 miles south of Frimley Station (up direction) and 1.9 miles north of Ash Vale (down direction). It is located on a double track railway on the Ascot to Guildford line. Whistle boards are fitted at the Crossing due to the restrictive sighting of approaching trains and therefore being non-compliant within Network Rail standards.
- 1.6 Although whistle boards are normally installed at foot crossings where the sighting for approaching trains is restricted, the Office of Rail and Road (ORR) is now recommending replacing whistle boards as they are no longer considered an appropriate means of risk mitigation. Restricted sighting issues can include track curvature, a fixed structure, or even third-party vegetation that cannot be fully cutback to increase sighting. Track curvature is present at the Crossing.
- 1.7 The Stop-Look-Listen notices are in situ guiding the User on the correct method of use. To help address ORR concerns the whistle board warning is also supported by a Supplementary

Audible Warning Device which was installed in Dec 2015. These all provide the User with information regarding when it is safe to cross. Also, in addition there are cyclist dismount and please keep dogs on leads signs at the crossing.

## 2 DESCRIPTION OF THE SITE

### 2.1 Current Level Crossing Details

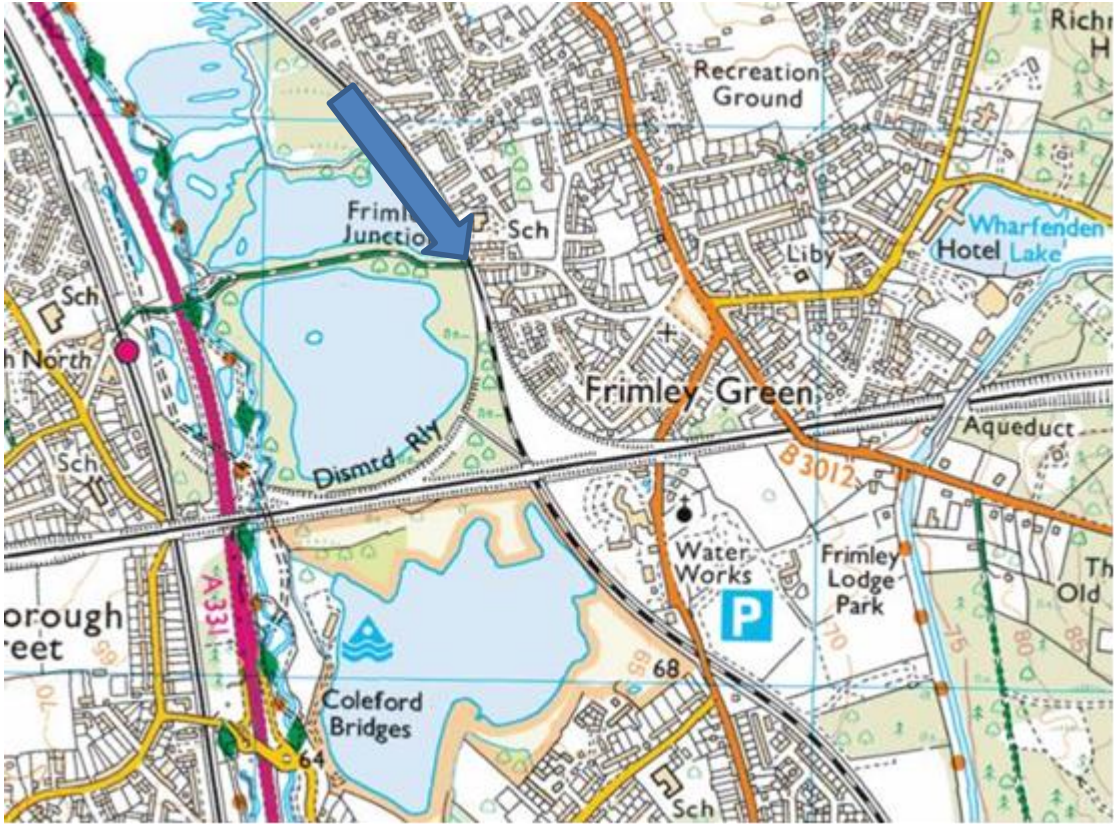
Crossing details	
<b>Name</b>	Hatches
<b>Type</b>	FPS
<b>Crossing status</b>	Public Footpath
<b>Overall crossing status</b>	Open
<b>Route name</b>	WESSEX
<b>Engineers Line Reference</b>	AVV
<b>OS grid reference</b>	SU883567
<b>Number of lines crossed</b>	2
<b>Line speed (mph)</b>	60
<b>Electrification</b>	750 DC
<b>Signal box</b>	Woking

### 2.2. Surrounding Environment

- 2.2.1 Hatches is a footpath crossing facilitating a public right of way (BW19) located in Frimley Green, a residential area of Frimley, Surrey. It lies approximately 0.8 miles south of Frimley Station (up direction) and 1.9 miles north of Ash Vale (down direction). It is located on a double track railway on the Ascot to Guildford line.
- 2.2.2 The crossing is surrounded by a residential estate to the east and private fishing lakes and wooded areas to the west. The crossing is well used by dog walkers, cyclists, commuters, and visitors to the fishing lakes. For the majority of users, their journey will continue along the footpath and over Farnborough North footpath crossing approximately 400m away on a parallel railway line (GTW2). The crossing at Farnborough North has Miniature Stop Lights (MSL) in situ and a crossing attendant.



2.2.3 The maps below show the location of the Crossing. Ordnance survey view and aerial view map:





### 2.3 Sectional Appendix

2.3.1 The Sectional Appendix describes the Crossing from the railway perspective. It shows that on the up line the speed is 60mph for passenger and freight trains. The down line is 60mph for passenger trains and 40mph for freight trains. The crossing sits just north of a junction where the two lines merge into one bi-directional line. The controlling signal box is Woking, and the 750 DC 3rd rail is controlled by Eastleigh electrical control office (ECO).

LOR	Seq.	Line of Route Description	ELR	Route	Last Updated
SW260	002	Ascot to Ash Vale Junction	AAV	Wessex	19/04/2022
Location	Mileage M	Ch	Running lines & speed restrictions		Signalling & Remarks
Camberley LC (CCTV) <b>CAMBERLEY</b>	35	17			GSM-R RA8 DC: Eastleigh Axle Counter Area Differential Speed Basingstoke ROC Ascot Workstation 3
	35	23 *			
	35	26 *			
	35	30			
<b>FRIMLEY</b>	36	01	Differential Speed Axle Counters Entrance Up Line Exit Down Line		TCB Woking ASC (WK) RA8 DC: Eastleigh Platform Lengths: Platform 1 - 92 metres (100.6 yards) Platform 2 - 92 metres (100.6 yards)
	36	00 *			
	37	48			
	38	36			
Frimley Crossing (The Hatches)	38	37 *	Differential Speed CTLP-_-WX-CTT-AVJN-40m 57ch UAV - Up Ash Vale DAV - Down Ash Vale		
	38	42 *			
	38	55 *			
	40	41 *			

## 2.4 The Crossing

- 2.4.1 The Crossing is a footpath crossing facilitating a public right of way (BW19) located in Frimley Green, a residential area of Frimley, Surrey. It lies approximately 0.8 miles south of Frimley Station (up direction) and 1.9 miles north of Ash Vale (down direction). It is located on a double track railway on the Ascot to Guildford line.
- 2.4.2 The gates at the crossing are set back, allowing the user to step inside but not be in the 'danger zone'. Moving the gates closer to the deck would therefore create a higher risk for users pushing a bike or a pram/buggy.
- 2.4.3 Both gates have metal mesh on them to discourage animals crossing. It should be noted that dogs on leads are also an encumbrance to their handlers which automatically places them at a higher risk.
- 2.4.4 There are signs on the gate encouraging cyclists to dismount, however regular instances have been witnessed and recorded of users struggling through the gates while still mounted and then continuing to cross. This creates an unnecessary distraction further raising the risk of a mounted cyclist not looking for approaching trains and crossing straight onto the deck in front of an approaching train.
- 2.4.5 Signage Stop, look, listen signs and Danger do not touch the live rail are located at the crossing on both sides beyond the gates and before the decision point. Signage is present to encourage dog owners to keep their animals on leads, but the signs have been vandalised in the past and the LCM replaces the signs when required.



- 2.4.6 Ground conditions continue to reflect the approaches and are fully tarmacked on both approaches.
- 2.4.7 The crossing deck is made of a rubberised material offering extra traction over the railway. Either side of the deck are fitted timber anti-trespass guards. The crossing has self-closing gates on both approaches, set at approximately 5m from the running rail, leading to rubberised decking with tarmac infills. With the deck being square to the rails, with

excellent approaches and deck, with no tripping or slipping hazard, displaying correct signage, WB and SAWD fitted, there are no other mitigations that can be employed to further mitigate residual risk.

- 2.4.8 In comparison to other crossings, accidental and deliberate misuse is unacceptably high and is a regularly reported issue.
- 2.4.9 The visibility of the signs is reduced at night or at dusk with only lights from surrounding residential housing and lamp post either side of the crossing gate to illuminate the area. There are no excessive adjacent sources of light or noise that could affect a user's ability to see or hear approaching trains.
- 2.4.10 Other safety warning signs are present to highlight the electrical current (Danger do not touch the live rail), and the consequence of trespass (£1,000 fines), plus a sign requesting 'Cyclists dismount'. Further signage comprises 'Please keep dogs on leads' are also in situ but have been known to be vandalised and are replaced on the LCM inspections.



## 2.5 Crossing status

- 2.5.1 The Crossing was originally a bridleway crossing with bridleway rights and in May 2013 Network Rail applied to Surrey County Council for a Temporary Regulation Order to stop up the bridleway rights over the crossing. The downgrade application was based on non-equestrian usage and a positive attempt to make cyclists dismount, which would then allow Network Rail to upgrade the crossing to meet footpath crossing standards. In June 2014 the local committee approved the application with a vote of 6 to 5.

## 2.6 Train movements

- 2.6.1 A total of 89 trains per day are timetabled over 20 hours at the crossing. This is made up of 86 South Western Railway passenger trains and 3 freight train. There was a future



proposal to increase the rail service in Dec 2020 Timetable, but this has not taken place to date and any proposed increase will be risk assessed once known.

- 2.6.2 Trains are accelerating and decelerating as they approach the Crossing thereby all affecting the warning time and introducing inconsistency, thereby further raising risk.

## 2.7 Sighting

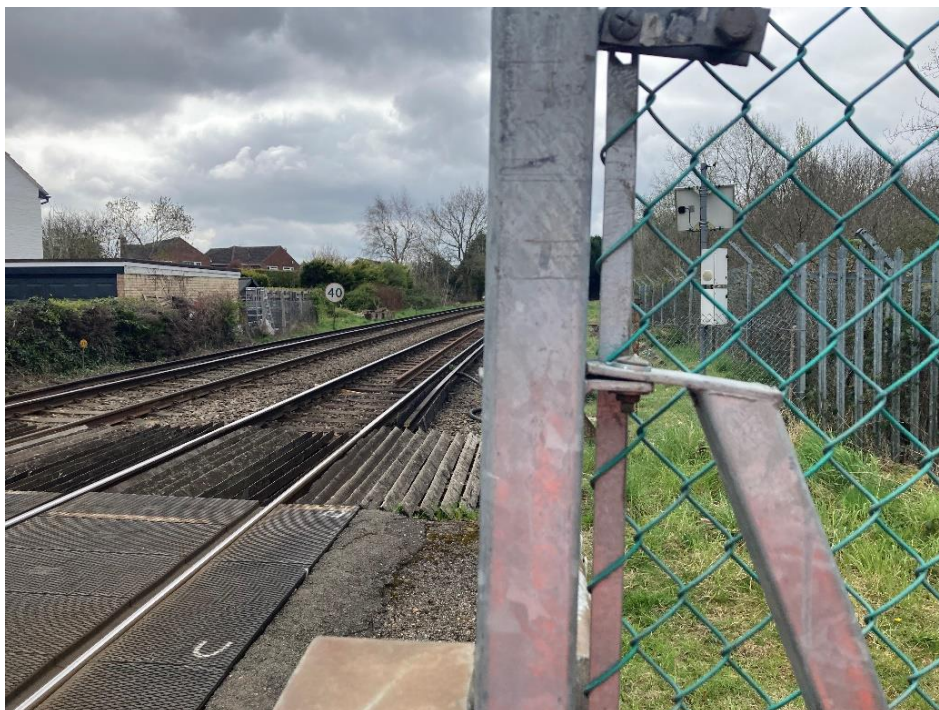
- 2.7.1 Sighting for approaching trains at the Crossing is non-compliant within Network Rail standards.
- 2.7.2 The recommended Decision Point for a foot crossing stands at a minimum of 2 metres from the nearest running rail. From this position a crossing user should be able to decide if it is safe to cross the line. The length of traverse is then calculated from this point until 2 metres past the furthest running rail.
- 2.7.3 At the Crossing there is a crossing traverse length of 9.0 metres, so providing a traverse time of 11.35 seconds for Users. The crossing traverse time includes an increase of 50% traverse time due to the identification of vulnerable users.
- 2.7.4 The upside decision points, looking at an up-direction train approach, is obscured at 2m by at the wing fencing and the railroad access point gate. This forces a user to enter the 'danger zone' and move to approximately 1.7m from the running rail in order to achieve clearer sighting. Consideration should be given to practicability of realigning the fencing. Although the decision point has been classed at 1.7m on the upside it has been calculated at 2 meters as above.
- 2.7.5 The sighting measurements taken from the Decision Point at the time of the assessment (by laser rangefinder) are set out in the table below. Sighting is non-compliant with the minimum required sighting in one direction for vulnerable/incumbent users, as mentioned above, this has been increased by 50%.

### Sighting measurement from the Decision Point

	Required Minimum Sighting for 11.35s traverse time	Ideal Sighting Distance	Measured Sighting	Actual Warning time	Measured from crossing to?

Upside looking towards Up direction train approach	254m	321	<b>225m</b>	10.05 s	Vegetation on downside
Upside looking towards Down direction train approach	254m	321	255m	11.42s	Vegetation on downside near sighting pole
Downside looking towards Up direction train approach	254m	321	326m	14.57s	Back of whistle board
Downside looking towards Down direction train approach	254m	321	292m	13.06s	Vegetation on downside curve

2.7.6 Upside, Up direction train approach at 2m Decision Point



2.7.7 Upside, Up direction train approach at 1.7m Decision Point



2.7.8 Upside, Down direction train approach at 2m Decision point



2.7.9 Upside, Down direction train approach at 1.7m Decision Point



2.7.10 Downside, Up direction train approach at 2m decision point



2.7.11 Downside, Down direction train approach at 2m decision point



2.7.12 There is a possibility of trains obscuring other trains at the Crossing. this phenomenon, known as ‘second train coming’ is where a User looks for approaching trains but due to the proximity of train on the first line, cannot see the train approaching on the other line. Although the crossing is double tracked, a nearby junction to single track reduces the likelihood of these types of events.

## 2.8 Crossing Usage

- 2.8.1 A motion sensor camera was deployed 5<sup>th</sup>-13<sup>th</sup> June 2021 by Nationwide data collection and then a 24-hour average was used over the period and then inputted into ALCRM.
- 2.8.2 The census was conducted in a period that the country was still recovering from the Coronavirus restrictions and the road map to normal times was still in place.
- 2.8.3 Even though there were still many restrictions in place due to the coronavirus the census clearly showed that the crossing was a very busy crossing and that there was slight increase in users at the crossing from previous risk assessments as far back as 2017.
- 2.8.4 Even though there was an increase in use, it was fairly consistent with the previous risk assessment which showed the daily usage to be 300 plus users daily for all previous risk assessments.
- 2.8.5 The figures recorded during the 9 days are shown below.

Date	Day	Direction	Elderly	Mobility impaired	People with prams	Cyclists	Encumbered	Wearing 'hoodies'	Dog walking (on lead)	Dog walking (off lead)	Children (accompanied by adults)	Children (unaccompanied alone)	Children (group)	Student (Lone)	Students (group)	Adult (group)	Adult Female (Lone)	
05 June 2021	Sat	East	0	0	2	64	5	14	14	3	7	0	0	0	0	0	97	26
05 June 2021	Sat	West	0	0	3	65	4	2	12	1	7	0	0	0	0	2	82	23
<b>05th June 2021 Total</b>			<b>0</b>	<b>0</b>	<b>5</b>	<b>129</b>	<b>9</b>	<b>16</b>	<b>26</b>	<b>4</b>	<b>14</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>179</b>	<b>49</b>	
06 June 2021	Sun	East	2	0	6	70	2	22	4	0	7	0	0	1	4	82	23	
06 June 2021	Sun	West	3	0	4	70	6	14	6	0	5	1	0	0	2	82	23	
<b>06th June 2021 Total</b>			<b>5</b>	<b>0</b>	<b>10</b>	<b>140</b>	<b>8</b>	<b>36</b>	<b>10</b>	<b>0</b>	<b>12</b>	<b>1</b>	<b>0</b>	<b>1</b>	<b>6</b>	<b>164</b>	<b>46</b>	
07 June 2021	Mon	East	1	0	4	56	2	20	10	0	0	0	1	4	58	21		
07 June 2021	Mon	West	0	0	4	51	2	14	10	0	2	0	0	2	0	63	18	
<b>07th June 2021 Total</b>			<b>1</b>	<b>0</b>	<b>8</b>	<b>107</b>	<b>4</b>	<b>34</b>	<b>20</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>3</b>	<b>4</b>	<b>121</b>	<b>39</b>	
08 June 2021	Tue	East	0	0	3	60	6	14	17	0	1	0	0	1	4	82	27	
08 June 2021	Tue	West	0	0	3	66	4	7	12	1	0	0	0	1	4	92	39	
<b>08th June 2021 Total</b>			<b>0</b>	<b>0</b>	<b>6</b>	<b>126</b>	<b>10</b>	<b>21</b>	<b>29</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>8</b>	<b>174</b>	<b>66</b>	
09 June 2021	Wed	East	0	0	0	65	12	15	10	0	0	0	2	0	0	87	19	
09 June 2021	Wed	West	1	0	0	82	5	10	8	1	0	0	2	2	0	65	23	
<b>09th June 2021 Total</b>			<b>1</b>	<b>0</b>	<b>0</b>	<b>147</b>	<b>17</b>	<b>25</b>	<b>18</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>	<b>0</b>	<b>152</b>	<b>42</b>	
10 June 2021	Thu	East	0	0	4	66	4	15	14	2	3	0	0	0	0	75	24	
10 June 2021	Thu	West	0	0	5	78	10	19	15	2	3	0	2	0	0	81	31	
<b>10th June 2021 Total</b>			<b>0</b>	<b>0</b>	<b>9</b>	<b>144</b>	<b>14</b>	<b>34</b>	<b>29</b>	<b>4</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>156</b>	<b>55</b>	
11 June 2021	Fri	East	2	0	2	52	9	13	7	0	2	0	0	1	4	70	23	
11 June 2021	Fri	West	1	0	2	81	5	6	4	0	5	0	0	0	0	66	24	
<b>11th June 2021 Total</b>			<b>3</b>	<b>0</b>	<b>4</b>	<b>133</b>	<b>14</b>	<b>19</b>	<b>11</b>	<b>0</b>	<b>7</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>136</b>	<b>47</b>	
12 June 2021	Sat	East	1	0	4	44	10	41	10	2	2	0	0	0	0	53	18	
12 June 2021	Sat	West	0	0	3	33	6	36	7	1	1	0	0	0	2	39	27	
<b>12th June 2021 Total</b>			<b>1</b>	<b>0</b>	<b>7</b>	<b>77</b>	<b>16</b>	<b>77</b>	<b>17</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>92</b>	<b>45</b>	
13 June 2021	Sun	East	1	0	2	38	2	42	15	0	4	0	0	1	0	39	15	
13 June 2021	Sun	West	1	0	1	37	2	38	10	1	2	0	0	0	0	26	12	
<b>13th June 2021 Total</b>			<b>2</b>	<b>0</b>	<b>3</b>	<b>75</b>	<b>4</b>	<b>80</b>	<b>25</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>65</b>	<b>27</b>	
<b>Grand Total</b>			<b>13</b>	<b>0</b>	<b>52</b>	<b>1078</b>	<b>96</b>	<b>342</b>	<b>185</b>	<b>14</b>	<b>51</b>	<b>1</b>	<b>6</b>	<b>9</b>	<b>26</b>	<b>1239</b>	<b>416</b>	

- 2.8.6 The type of user is mixed and appears to be made up of daily commuting, fishing persons, dog walkers, local and recreational walkers, family groups, cyclists, and joggers.
- 2.8.7 The types of vulnerable users are elderly, unaccompanied children, mobility impaired, people with prams, family groups with children, mounted cyclist, dogs walkers and dogs off leads and fishing persons with fishing kit trolleys.
- 2.8.8 Known deliberate misuse and accidental human error when crossing is at an unacceptable level at this crossing. Regular misuse is witnessed by the LCM when conducting inspection and the LCM regularly informs users of their misuse and offers advice on safe use of level crossings.
- 2.8.9 LCM often witnesses users riding bicycles over the Crossing. These were adults as well as school children, even though there are signs at the Crossing requesting cyclists to dismount when traversing over the Crossing.
- 2.8.10 Users jogging over the Crossing have been seen to be wearing headphones.
- 2.8.11 User wearing hoodies with hoods up with and without wearing headphones.
- 2.8.12 The Crossing has a history of misuse and individuals were captured during previous census taking “selfies” in the middle of the Crossing. This is not the only theme of misuse, with regular instances of runners not wanting to wait and therefore stepping into the paths of approaching trains.
- 2.8.13 Images shown below were captured at the time of the previous census.



2.8.14 It is thought the majority of users are regular users of the crossing.

2.8.15 Chart below shows the recorded census captured between 5<sup>th</sup> June – 13<sup>th</sup> June 2021

DATE	Pedestrians (including types listed to the right.)	Of which were		
		Cyclists	Dog walkers with dogs on leads	Dog walkers with dogs off leads
Sat 5 <sup>th</sup> Jun 21	433	129	26	4
Sun 6 <sup>th</sup> Jun 21	439	140	10	0
Mon 7 <sup>th</sup> Jun 21	343	107	20	0

Tue 8 <sup>th</sup> Jun 21	443	126	29	1
Wed 9 <sup>th</sup> Jun 21	409	147	18	1
Thurs 10 <sup>th</sup> Jun 21	453	144	29	4
Fri 11 <sup>th</sup> Jun 21	379	133	11	0
Sat 12 <sup>th</sup> Jun 21	340	77	17	3
Sun 13 <sup>th</sup> Jun 21	289	75	25	1
<b>Daily Totals</b>	<b>3528</b>	<b>1078</b>	<b>185</b>	<b>14</b>

## 2.9 Vulnerable use

- 2.9.1 The census data gathered at the Crossing shows a high percentage of vulnerable users. The types of vulnerable users regularly observed are elderly, unaccompanied children, mobility impaired, people with prams, family groups with children, mounted cyclist, dogs walkers and dogs off leads and fisherpersons with fishing kit trolleys.
- 2.9.2 There are many people traversing over the crossing walking their dogs, some with more than one dog and some walking dogs on extended leads.
- 2.9.3 Observations when at the crossing conducting inspections show that most dogs walkers do keep their dogs on their leads. 'Keep dogs on leads' signs are in situ to remind dog owners to keep their animals under control while using the crossing.
- 2.9.4 Perception with some users with dogs on lead is that they do not easily personally accept an assessed view that they are vulnerable users. However, the user will often remain distracted, watching or controlling their animals, and not appropriately focussing on traversing – in any event, they may be an encumbered user; for example, dog behaviour is unpredictable; the dog may itself become distracted, bark, or pull, when approached by other users approaching in the opposite direction (or by any other event). This in turn causes distraction to the user from properly watching out and listening for approaching trains, etc.
- 2.9.5 Users with multiple dogs further increases the difficulty to maintain adequate and safe control; and dogs off leads represent a much greater hazard to the user. If, for example, a dog strays onto the railway, their owners are more likely to try to follow or react to them, or focus on them, which increases the scope for hazardous distraction and risk, not only from trains, but also from slipping on the sleepers or tripping over the rails.
- 2.9.6 The Crossing has a high number of school children on route to and returning from school. Many of these school children traverse the Crossing with bicycles and have been recorded misusing the Crossing by not dismounting as requested by crossing signage.
- 2.9.7 There are also many persons jogging over the Crossing, many not removing headphones or ear pods. During inspections the Level Crossing Manager (LCM) has witnessed joggers running straight over the crossing without checking properly for approaching trains. The crossing is considered to have a higher than usual number of vulnerable users, including



school children, large groups, and encumbered users (i.e. Fishing persons with fishing kit on trolleys or carrying large bags). Evidence also shows that headphones are often worn by users.

- 2.9.8 The crossing was observed to have a high amount of usage during the night- time quiet period which is 00:00-06:00 where no warning of an approaching train is given, and which consisted of 97 users. The types of users within this period consisted of 31 Adults, 1 Dog walker (off lead), 31 Wearing ‘hoodies’, 6 Encumbered users, and 28 Cyclists. The supplementary audible warning device mitigates the usage during these hours.

## 2.10 Incident history [SMIS] (Safety Management Information System)

- 2.10.1 The Crossing has a long history of misuse and near misses. These incidents are cyclists and pedestrians traversing straight over the Crossing without looking for approaching trains and as mentioned several recorded near miss incidents.

Event Date	Short Description
05-Nov-21	<b>LC Misuse</b> - Person on pushbike attempted to cross Hatches foot crossing as 2N64 approached. No near miss.
16-Mar-20	<b>LC Near Miss</b> - 2N48 (SWR 15:30 Aldershot to Ascot) reported a near miss with a person running across Hatches crossing
24-Jun-19	<b>Deliberate misuse</b> - A male with a bicycle was going to across and came to a stand as train was approaching at Hatches Level Crossing.
18-Sep-18	<b>LC Near Miss</b> - 2N56 (SWR 17:00 Guildford to Ascot) had a near miss at Hatches crossing near Camberley with a person wearing headphones that had crossed in front of the approaching train
13-Sep-18	<b>Near miss</b> - 5N10 07:23 Aldershot - Ascot t Hatches level crossing, Frimley Green, with two individuals who crossed against the approaching train.
24-Apr-18	<b>Deliberate misuse</b> - 2N58 1839 - the driver came across someone crossing the footpath. Driver blew the horn and the person stepped back to a position of safety.
04-Oct-17	<b>Near miss</b> - 2N13 0845 - Youth with headphones went to walk over crossing and realised train presence and moved clear before driver could apply emergency brakes.
18-Sept-17	<b>Near miss</b> - 2N46 1430 - Driver stated that the female stepped out on to the crossing, the driver blew the horn and she stepped back of the crossing out of the way
11-Aug-17	<b>Near miss</b> – 1546 2N41 (1523 Ascot - Guildford) has reported a near miss at The Hatchers with two Cyclists. The cyclists were not moving quickly so the driver had to apply the emergency brake.
26-Jun-17	<b>LC Misuse</b> - 2N45 (1623 Ascot - Guildford) reported a man crossing over The Hatches foot crossing in front of his train. Nr Frimley Station.
18-May-17	<b>Near miss</b> - At 1715 2N47 1653 Ascot - Guildford reports a MOP ran across the front of their train. Driver applied emergency brakes and stopped short of person.

- 2.10.2 The recorded data shows that there are high numbers of deliberate misuse and accidental human error. In the years of 2017 and 2018 there were eight near misses. The misuse appears to tail off between 2019 and 2021 which could be due to the Corona-virus restrictions that were implemented in March 2020. These changed the way the Crossing

was being used, i.e. less commuters and school children and more people taking exercise locally.

- 2.10.3 Given that the Crossing has no permanent recording methods, in practice, these incidents will only be captured if witnessed by passing train drivers, railway staff or members of the public formally reporting. Experience shows that incidents of formal reporting is significantly less than the level of actual incidents which take place.
- 2.10.4 Evidence from site visits by the LCM also concur that unreported misuse takes place as this has been regularly witnessed during inspections and risk assessments.
- 2.10.5 Local residents informed the LCM that they had witnessed heavily encumbered people crossing to the fisheries using wire to hold the gates open on either side to aid their traverse. This has led to the gates being left open.

## **2.11 Unpredictable use at footpath crossings**

2.11.1 The recent pandemic in 2020 has led to changes in the levels of use at level crossings. These changes include:

- More people exploring local walking routes
- A shift from a standard working hours
- More people working remotely and not travelling into an office
- More dog walker

All of these issues have resulted in an increase in use of public footpaths and therefore more people using level crossings. This has been recognised nationally. It has resulted in many level crossings having an increased risk score.

- 2.11.2 The previous relatively stable, but small increase in use that was recorded over previous years now has become less predictable. The current increase in use is still being felt although not to the levels at the height of the pandemic.
- 2.11.3 The trend identified has been from an increase across the whole network, including remote, previously very low use sites, to now only increases at established sites within the footpath network such as the Crossing.
- 2.11.4 The LCM noted a change in type of user

## **2.12 Whistle Boards**

- 2.12.1 There are whistle boards installed at the Crossing as a key mitigation to combat the deficient sighting.
- 2.12.2 Whistle boards are installed at foot crossings that have sighting restrictions or deficiency issues for crossing users, this could include track curvature, invasive vegetation or

structures obscuring their view, sun blindness and excessive noise etc. Whistle boards (WB's) are limited by the following factors:

- They provide no warning during the Night-Time Quiet Period (NTQP) – 23:59pm – 06:00am.
- Their effectiveness may be compromised by ambient noise e.g. road traffic.
- Train drivers cannot be guaranteed to sound the train whistle upon every passage of a whistle board (human error).
- Further, a train driver may hit the horn in advance of reaching the WB whereas others may sound the horn much later. With variance in approaching speeds that gives an inconsistent warning time before the train comes into view.

2.12.3 The whistle board on the upside was re-sited in November 2014, as it had been calculated as being too close to the crossing, subsequently not providing adequate warning time. Following the re-siting to a location further away from the crossing required to provide the adequate warning, a member of the public contacted Network Rail and expressed concern that they could no longer hear trains sounding the horn at the Crossing. Following re-assessment, it was agreed that trains sounding at the upside whistle boards were barely audible, due to background noise and the new positioning further from the crossing. It was then agreed to trial the re-introduction of the two-tone whistle at this crossing triggered by having two whistle boards on one post as a visual reminder to drivers. However, after several weeks, complaints due to train horn noise were received from lineside neighbours on the downside (Frimley) approach, where the whistle board is adjacent to housing. Consequently, the double whistle board was removed on the downside but remains on the upside. This has led to a disparity in trains sounding their horns at whistle boards on the approach to this crossing.

2.12.4 It is recognised that whistle boards are not an effective mitigation. At this location, there is clearly an issue with their audibility, hence the positioning of the extra board. There is also confusion added by two other railway lines running in close proximity where other train horns can be sounded. This can also lead to complacency.

2.12.5 Whistle boards rely on the train driver reacting to the boards and sounding the horn. Failure to do so means that the crossing user is then reliant purely on sighting which is known to be deficient.

2.12.6 There is known use of the Crossing within the Night Time Quiet Period and users during this period will not receive the audible warning from the train horn.

2.12.7 In December 2015, a Supplementary Audible Warning Device was installed at the Crossing to mitigate against these issues. This provides a two-tone sound at the crossing itself and continues through the night-time period. It also mitigates the potential human factor issue where drivers may not sound at the whistle board.

## **2.13 Supplementary Audible Warning Device (SAWD)**

- 2.13.1 This device, as stated above, provides an audible warning at the Crossing to the user when a train is approaching.
- 2.13.2 The system is triggered by detectors placed on the approach to the Crossing that pick up the approaching train. These then relay a message to the equipment at the Crossing which then plays an audible warning, similar to a train horn, to warn the user of an approaching train.
- 2.13.3 SAWD is recognised as a cost-effective addition to the various mitigations available and has limitations due to its low safety rating.
- 2.13.4 It does sound throughout the NTQP and also mitigates against the human factors of a train driver omitting to sound their horn.
- 2.13.5 This system can only be deployed at sites where whistle boards are present due to its ability to fail and not provide a warning. This would mean that no audible warning was provided. In this situation, the whistle board would act as the back-up warning.

## **2.14 Vegetation**

- 2.14.1 Vegetation is an ongoing issue at the crossing. Regular inspections take place to assess the level of growth. Vegetation can limit sighting lines and reduce the available sighting of approaching trains. Cut-back is often actioned by the LCM or lineside inspectors as far as the boundary fence line, so as much as possible of the Crossing user's sighting remains.

## **2.15 Future local development**

- 2.15.1 The risk assessment of the Crossing incorporates a check of the local area to highlight any local increases in housing, and therefore use of the Crossing.
- 2.15.2 If noted prior to the development, negotiations can then take place with the developer to understand the likely impact on the Crossing and modelling can take place to see what the increase in use will do to the risk.
- 2.15.3 Currently, there is no known housing or commercial development plans in this area which may have an impact on the crossing.

Key factors that can affect the future use are:

- Local developments (e.g., opening schools, retail outlets, factories);
- Increasing pressures for new residential and commercial development;
- Increased number of people living in Britain (i.e. more crossing users);
- The requirement to run additional train services and convey more passengers;

2.15.4 Discovery of new developments is not always easy, and it tends to only be the larger developments that are offered to Network Rail as consultees resulting in increases in use only being highlighted at the next assessment.

**2.16 Adverse Weather**

2.16.1 During site visits the Level Crossing Manager has witnessed all types of weather conditions whilst carrying out inspections at Hatches crossing.

2.16.2 Network Rail have guidance documents for carrying out risk assessments at level / foot crossings: (LCG13) is guidance for sun glare and (LCG21) is a guidance for fog.

2.16.3 As with any foot crossing in the country, adverse weather can affect the crossing User’s safety when using the crossing, whether it is low sunlight, fog, or even heavy rain and/or high winds. It would be advisable for the Users to avoid using any crossing during these times.

2.16.4 Weather conditions tend to limit sighting, weather that be by low sunlight obscuring the approach of a train or fog and/or heavy rain reducing visibility.

2.16.5 Below is a graph from the nearest weather station (South Farnborough) to the Crossing highlighting recorded fog conditions at the crossing for the last 5-years.

**Level Crossing Weather Station Data Finder**  
(PC Version)

Date: 21/10/2021  
Issue: 1.0

Select Level Crossing: Hatches

Select or type level crossing name into above drop-down list to plot the monthly fog days from the nearest weather station.  
**NOTE:** If the above drop-down menu does not function on your computer, please use the 'Tablet' version of this form.

**Crossing Information**

Crossing Type: Public Footpath Crossing with Whistleboards

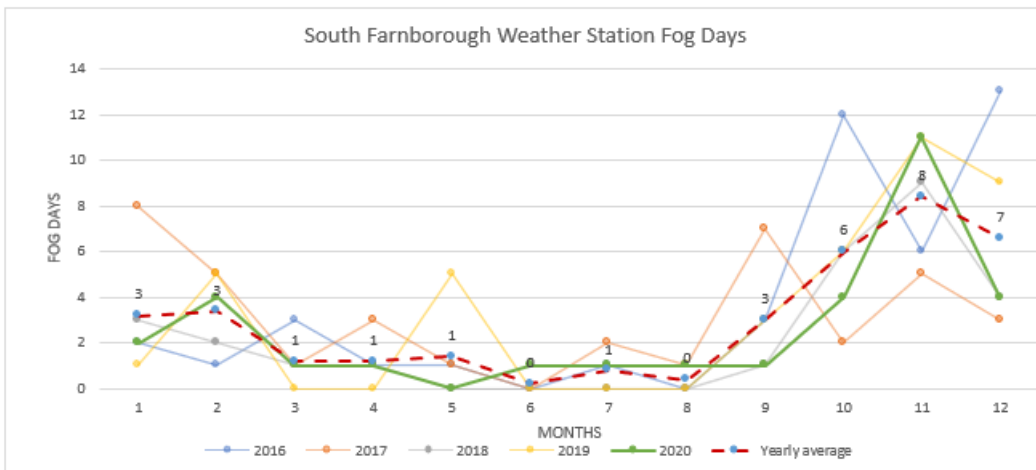
Location: Surrey Heath District (B)

ELR: AAV0 038 Miles 0938 Yards

**Weather Station**

Nearest Weather Station: South Farnborough

Distance to nearest weather station: 3.06km Data Accuracy: Adequate



South Farnborough Weather Station Fog Days

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
2016	2	1	3	1	1	0	1	0	3	12	6	13	43
2017	8	5	1	3	1	0	2	1	7	2	5	3	38
2018	3	2	1	1	0	0	0	0	1	6	9	4	27
2019	1	5	0	0	5	0	0	0	3	6	11	9	40
2020	2	4	1	1	0	1	1	1	1	4	11	4	31
Average	3	3	1	1	1	0	1	0	3	6	8	7	

2.16.6 The data shows that during the colder months of the year Hatches is more susceptible to fog days. It has been noted by the LCM that cold days with little to no wind can result in the area suffering from fog that can last for several hours, with particular build ups in the morning hours.



2.16.7 The above photograph taken from a census camera in January 2021 shows the Crossing in snowy weather. Although the snow has finished falling, the risk of slipping still remains. The number of footsteps indicate that Users continued to cross, and even tried to avoid the compacted snow by wandering onto the adjacent crossing surface.

2.16.8 The photograph also shows that low sunlight can often limit sighting of oncoming trains from the up direction. The direction and length of the shadow from the person shows that viewing of trains coming from the up direction could be impaired by low sun.

**2.17 Second train coming**

2.17.1 A common feature at locations with two or more lines of rails is that there is a high risk that ‘another train approaching’ the Crossing on the second set of rails can become fully obscured by a train that has just passed a user on the nearer line, and the user could then step out onto the deck to cross without seeing or hearing the ‘second train coming’.

2.17.2 The risk is that a user would observe the first train approaching and wait for it to pass without realising that another train is approaching on the far line. They would then step

out behind the first train and directly into the path of the second train which they would not see or hear, with the first train masking the view and sound of the second approaching train.

- 2.17.3 Train stock types that the TOCs normally run on this route includes Desiro 450 which run as 4 or 8 carriage trains, i.e. either 80 or 160 metres. Empty coaching stock can also run over this line, and this may be up to 12 coaches in length.
- 2.17.4 Freight operating companies have paths over the crossing. These trains can vary in length from an engine car to 200 metres plus train of carriages.
- 2.17.5 The length of these trains will severely restrict the sighting for another train coming on the other line after the train has passed over the Crossing.
- 2.17.6 Although the crossing is double tracked, there is a junction which reduces the lines down to a single track 201 metres away. This will reduce the number of events linked to the second train being obscured as the scenarios for trains passing here are small in number.

## **2.18 Train speeds**

- 2.18.1 The line speed is 60mph on both lines; however sighting distances have been calculated on the attainable line speed of 50mph, due to close proximity of 40 mph speed boards to the crossing. Attainable line speed has been verified by the Train Operating Company. It is understood that not all trains will be travelling so fast. Freight and passenger trains often travel at varying speeds and when a crossing is located near a station then stopping and non-stopping services will clearly travel at different speeds.
- 2.18.2 The variation in speed of trains, as at the location of the Crossing, separately introduces a distinct hazard in so far as there arises a difficulty for a crossing user to personally judge if there is enough time to cross if they can see a train in the distance approaching the Crossing.
- 2.18.3 The proximity of the junction and the 40 mph speed limit over it means that trains may be slowing or braking depending on their direction of travel.
- 2.18.4 It is not always the faster lines that have accidents recorded. The judging of speed of a train by a User may be compared to that of a road vehicle however, the two behave very differently, as a train driver does not have the ability to swerve or brake hard without sliding.

### 3 ALCRM (All Level Crossing Risk Model) results

3.1 The current risk assessment rating of the Crossing on ALCRM is **C2** with an FWI scoring of **0.023907399** based on data from the April 2022 assessment.

3.2 The ALCRM (All Level Crossing Risk Model) provides a prediction of risk which it classifies in the following ways:

Risk per traverse (identified by a letter A (high) to M (low), which defines the risk for a single traverse over the Crossing.

Collective risk (identified by a number 1(high) to 13 (low), which relates to the total risk generated by the crossing. This considers the overall risk of death and injury for crossing users, train crew and passengers.

3.3 This ranks the Crossing as high risk, placing it forth of 151 open footpath crossings on the Wessex route. The risk score is based on 392 pedestrians and cycle users and 89 trains per day.

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

- Does not stop look listen (30%)
- Railway cause: insufficient sighting (24%)
- Distracted / forced by dog (loss of control) (15%)
- Second train coming (10%)
- Tries to cross in front of train (9%)
- Slips, trips, falls or snagged on crossing (8%)
- Unaware of crossing (4%)

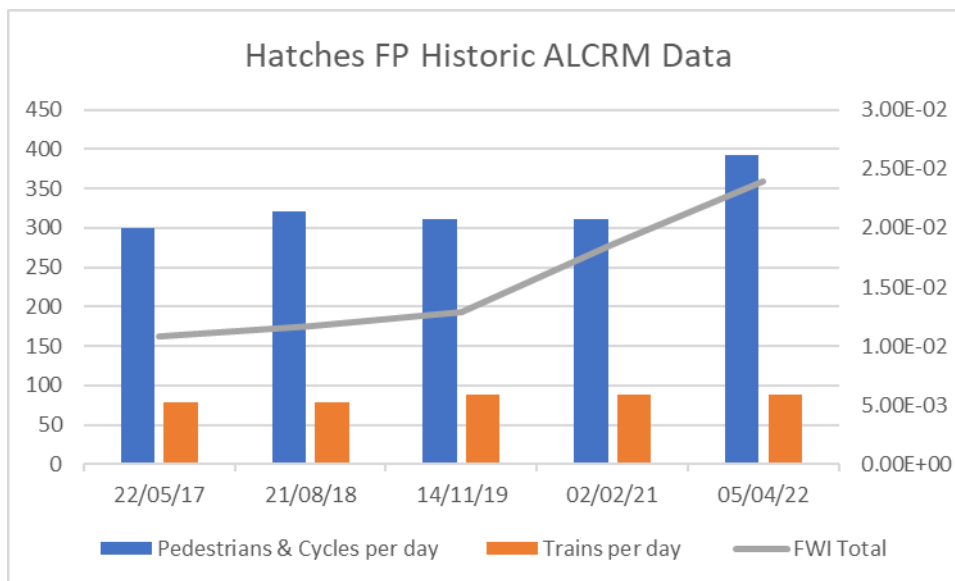
3.5 Four of the five risk drivers are dependent on user paying attention to signage and using the crossing correctly. So with human factors being a factor the risk involved are not always able to be mitigated completely. The one other factors Railway cause: insufficient sighting can be partially mitigated with regular vegetational removal on Network Rail land.



3.6 Details of which risks sum into the risk score are presented in the output table below. The main risk is to the crossing user, with a smaller percentage applied to train staff, namely the train driver.

	<b>Risk per Traverse (Letter)</b>	<b>Collective Risk (Number)</b>
<b>The calculated safety risk for this crossing is:</b>	<b>C</b>	<b>2</b>
	<b>Risk per Traverse (FWI)</b>	<b>Collective Risk (FWI)</b>
<b>Cars / car-based vans / quad bikes</b>	0	0
<b>Large vans / small lorries / large 4x4s</b>		0
<b>Buses / Coaches</b>	0	0
<b>HGVs</b>		0
<b>Tractors / large farm vehicles</b>		0
<b>Pedal / motor cyclists</b>		0.007272154
<b>Pedestrians</b>	0.000000166	0.016483548
<b>Horse Riders</b>		0
<b>Animal Herders</b>		0
<b>Vehicles user in pedestrian mode</b>		0
<b>Train Passengers</b>		0
<b>Train Staff</b>	0.000000005	0.000151697
<b>Derailment Risk</b>		0
<b>Weighted Average (Users)</b>	<b>0.000000166</b>	
<b>Total Risk</b>		<b>0.023907399</b>
	<b>Average Consequence</b>	0.6698
	<b>Collision Frequency</b>	0.035693339

3.7 The historic ALCRM data below shows a slight increase in FWI between 2017 and 2019 which is attributable to increases in train services and users per day. There is a steep increase between 2019 and 2022 which is attributable to increase in users per day and a change in the ALCRM algorithms more accurately reflecting risks at crossings.



3.8 Another contributory factor to the increase in risk is the change in the way the risk model, ALCRM, assigns risk. The changes made aligned the risk modelling more closely with the Safety Risk Model produced and updated by the Rail Standards and Safety Board (RSSB). The change saw the risk profile change scores both up and down, with most footpath crossings increasing their risk score while protected road crossings reducing their risk score. This change took place in April 2021.

3.9 Train usage figures have been retained from the previous 2019 – 2020 risk assessments due to the Train Operating Companies not currently running a full planned timetable due to the Coronavirus outbreak.

4 A total of 89 trains per day are timetabled over 20 hours at the crossing. This is made up of 86 passenger trains and 3 freight trains. There was a future proposal to increase the rail service in December 2020 Timetable, but this has not taken place to date and any proposed increase will be risk assessed once known.

## 5 OPTION ASSESSMENT

5.1 Each of the options hypothetically considered represent opportunities to eliminate or reduce risk. Options that achieve closure of the Crossing must always be the primary consideration, as in any hierarchy where the elimination of the risk is the most favoured option.

### 5.2 Cost Benefit Analysis (CBA)

5.2.1 This process allows each of the proposed options to be assessed for their 'value for money'. Any given safety mitigation must show that there is a sufficient safety reduction for the cost of the solution.

- 5.2.2 The Business Cost Ratio (BCR) is the value that is the output of the CBA. The ratio indicates whether there is a sufficient business case to proceed. If the BCR is equal or above 1.0 then there is a positive business case, but if it is less than 1.0 then there is not.
- 5.2.3 Prior to the incorporation of the GDF process (see below) there was a case to argue for those that scored between 0.5 and 1.0. it could be argued that the cost was not grossly disproportionate to the solution and therefore a justifiable option. The GDF process has provided a clearer decision-making tool.

### 5.3 Gross Disproportionality Factor (GDF)

- 5.3.1 The Office of Road and Rail (ORR) raised concerns that Network Rail's Cost Benefit Analysis (CBA) tool does not adequately account for gross disproportion as required to comply with health and safety law. The Health and Safety at Work Act 1974 places duties on Network rail to conduct its undertaking to ensure, so far as is reasonably practicable, that it does not expose level crossing users to risks to their health and safety. In doing so, Network Rail must consider the cost of implementing risk control measures (in terms of money, time and effort) against the reduction in risk those measures might achieve.
- 5.3.2 To provide structure and a consistent framework in determining whether an option is grossly disproportionate, Network Rail has developed Gross Disproportion Factors (GDF) that shall be applied to the CBA calculation. To be grossly disproportionate, the cost of implementation must significantly outweigh the risk to the user.
- 5.3.3 When determining the GDF through a series of questions, the highest GDF level achieved is the GDF applied, even if it is not the most recurrent.
- 5.3.4 The below table illustrates the range of suitable Gross Disproportion Factors that can be applied to the CBA result.

GDF Level	GDF Scale
Medium	1.5
High	2.5
Exceptional	6

- 5.3.5 If the CBA is multiplied by the relevant GDF scale and produces an answer greater than 1.0 then there is an acceptable business case.
- 5.3.6 The results of the GDF evaluation are available in Appendix 1. The CBA results and GDF scales are presented in the options table in the Cost Benefit Analysis section of the report.
- 5.3.7 For reference, the Crossing produced a high GDF level, resulting in a multiplying factor of 2.5 to the CBA results.

## 5.4 Closure via extinguishment

- 5.4.1 Closure of a crossing would always be the preferred option within Network Rail, as it separates the public from trains and is therefore the safest option.
- 5.4.2 Closure of the Crossing would fully eliminate the risk. The Crossing currently ranks as the fourth highest risk of Network Rail Wessex's footpath crossings, due to the high amount of passing trains and public usage, plus the levels of misuse and accidental events linked with the location.
- 5.4.3 This option has been rejected. Extinguishment of the right of way over the crossing without providing an alternative route is not an option due to the lack of suitable alternative routes over the railway within the vicinity of the crossing. It would require changing the route of the path to one that already existed but was as convenient as the one that was extinguished and currently, there is no suitable route.
- 5.4.4 The diversionary route highlighted in red below is 2.4 miles.

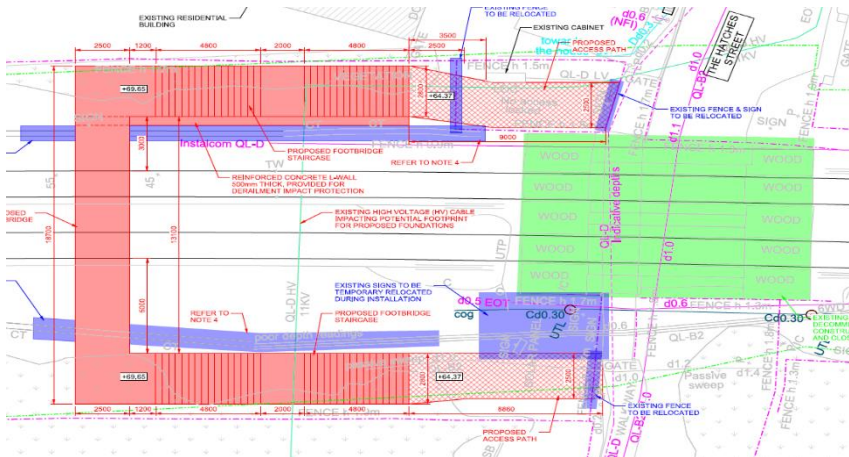


## 5.5 Closure by stepped footbridge

- 5.5.1 This option has also been rejected. It had been proposed that a stepped bridge be built at the current site of the Crossing.
- 5.5.2 However, with a known high number of vulnerable users who could not negotiate a stepped structure, this would not meet NRs PSED duty under the Equality Act 2010, for those with protected characteristics. The diversity and inclusion report highlighted that those with vulnerable characteristics would be disadvantaged by this option.

5.5.3 This option was also space constrained. The design proposed to use as much of Network Rail’s land as possible, but it would have been positioned very close to housing on the north-east corner of the Crossing, causing severe disruption and inconvenience to those residents.

5.5.4 The diagram below shows the proposal with the grey area on the top edge representing a residential property.



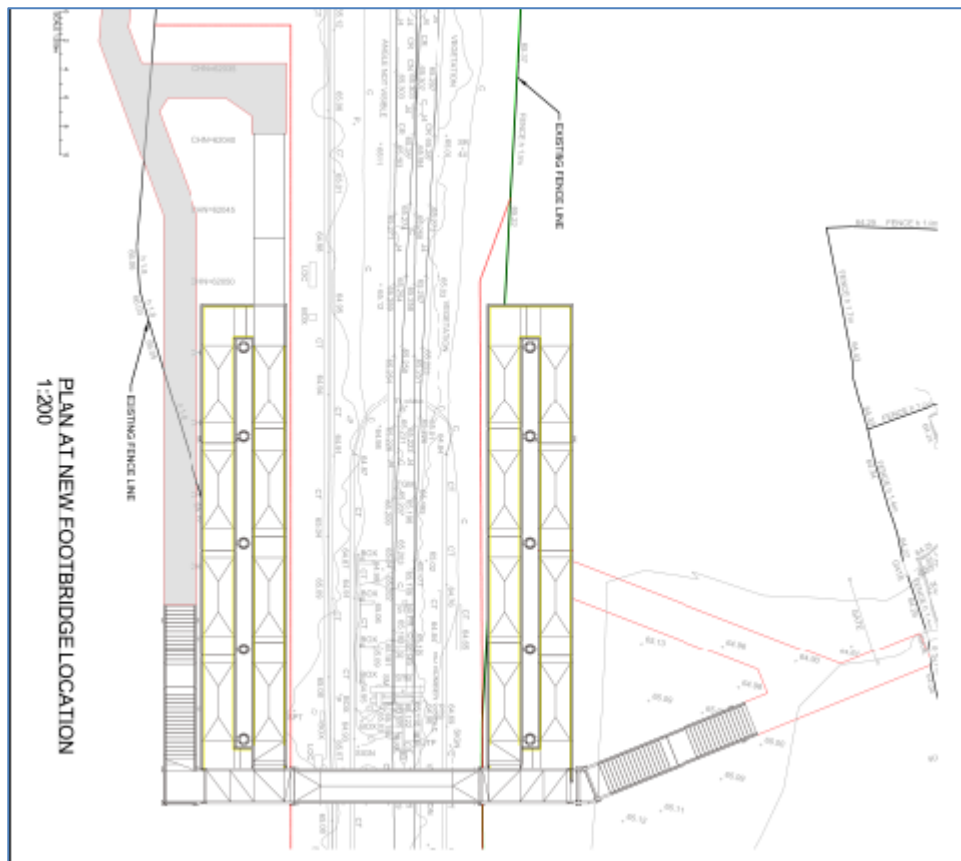
**5.6 Closure by provision of an underpass**

- 5.6.1 This option has been rejected.
- 5.6.2 The construction of an underpass at the location of the Crossing would have meant that the same spacial constraints that affected the stepped footbridge option would also be a factor. Those dwellings adjacent to the Crossing would require shoring up to stop them being undermined. It would also be likely that this option would necessitate compulsory purchase of 3rd party land.
- 5.6.3 The proximity to water would mean that the underpass would require drainage and probably pumping and is still likely to become a damp area.
- 5.6.4 Network Rail have found that underpasses are spaces that attract anti-social behaviour.
- 5.6.5 The cost of constructing an underpass would also be grossly disproportionate to the benefits gained and so was not considered appropriate spending of public money.

**5.7 Closure by diversion and provision of a new EA-compliant bridge**

5.7.1 This option has been recommended. An Equalities Act 2010 (EA) compliant bridge is proposed for an accessible bridge to be built to the south (approximately 200 metres) of the current crossing which would provide a suitable alternative route over the railway on a similar route to the previous path.

- 5.7.2 This will be a ramped and stepped structure built in accordance with British Standard gradients with steps available for the more able-bodied. By providing the ramps Network Rail then comply with the Equalities Act ethos of not reducing access but enhancing where possible. It would satisfy the diversity and inclusion report by preserving access for all.
- 5.7.3 This is reliant on the purchase of third-party land. A path would then be constructed linking back to the original pathway west side of the Crossing.
- 5.7.4 This option offers a way to remove the risk at the Crossing completely.
- 5.7.5 Applying the Gross Disproportionality Factor, there is a business case for this option.
- 5.7.6 The following two diagrams give an indication of the expected ramped and stepped structure that would be implemented as part of this proposal.





## 5.8 Installation of Miniature Stop Lights (IOMSL) Interfaced Overlay system.

- 5.8.1 Installation of MSL offers the next highest level of protection after closure at this location but it will not mitigate against deliberate misuse. User safety at the Crossing is dependent upon the user obeying the Red (stop), Green (go) light system to cross or not.
- 5.8.2 These systems require adherence and attention by crossing users; but can also lead to increased risk taking as the lights can be ignored by regular users, including children.
- 5.8.3 Historical evidence of misuse and trespass at the Crossing suggests that there is a significant likelihood these systems would be ignored and/or vandalised. This could be heavily influenced by extended waiting times due to the differential approach speeds of trains due to the junction. In addition, the sighting of oncoming trains is sufficient, and Users will be tempted to ignore the lights and rely on their own sighting. At other locations this human behaviour has resulted in fatalities.
- 5.8.4 The cost of a system that does not integrate with the signalling system but overlays it, would be approximately £270,000. The reduction in risk averted against the comparative spend means that this option does provide a positive business case, which is also increased by the GDF.
- 5.8.5 In the investigations into this option it was shown that the location of the crossing in relation to other railway infrastructure meant that this is not a viable option.
- 5.8.6 An overlay system is limited to those locations where there are simple track layouts. The proximity of the railway junction to the Crossing means that the detection of a train would not be possible with an overlay system. A signal is also within the 'stike-in' distance to the Crossing, although overlay systems are now available that can overcome this issue.
- 5.8.7 Although a business case can be made, this option is rejected as it does not reduce risk to ALARP.

## 5.9 Installation of Miniature Stop Lights (MSL) Integrated system

- 5.9.1 An Integrated MSL system that would link with the signalling system would likely cost in excess of £800,000. This is the design and installation price and does not consider the whole life costs of ongoing maintenance and renewals. The benefit of the integrated system (required where train signalling is located within the striking distance for the MSL) is that it provides a comparatively higher level of checks if the system fails.
- 5.9.2 An integrated MSL system would be able to overcome the complexities of the site, but it is likely that the unique design required for the location would increase the base price quoted here for comparison.
- 5.9.3 This MSL option does not pass a cost benefit analysis (CBA) or the GDF uplift, although it comes very close to the threshold.
- 5.9.4 This option is rejected as there is no business case and as it does not reduce risk to ALARP.

## 5.10 Crossing attendants and locked gates

- 5.10.1 The proposal of crossing attendant and locked gates similar to Farnborough North footpath crossing.
- 5.10.2 A crossing attendants would remain at the crossing for the duration of the planned train table service and would operate the gate so that they would lock for the approach of a train and would remain locked until the train has passed.
- 5.10.3 There would be a need for a welfare accommodation for the crossing attendants with means of seeing the crossing from the welfare accommodation to enable that no users are trapped within the crossing when the gates are activated.
- 5.10.4 A comprehensive signal and train location system would need to be installed in the welfare accommodation so that crossing attendant are able to actively understand when the next train is approaching and lock the gates in time for the approach of the train.
- 5.10.5 Additional third-party land would also need to be purchased to accommodate the welfare unit which would increase the cost of this option further.
- 5.10.6 Although having a crossing attendant at site it would reduce the risk at the crossing by 90% it is reliant of staff being on duty at the crossing which from experience has posed problems as it is found at Farnborough North footpath crossing.
- 5.10.7 There is high operational expenditure of providing an attendant which is in the reign of 150k a year and likely to increasing year on year.
- 5.10.8 Crossing attendant's do not remove the complete risk from the crossing and misuse still could remain at the crossing.
- 5.10.9 This option has been rejected based on high operation cost and the viability of purchasing of third-party land. This option would also be grossly disproportionate to the benefits gained and so was not considered appropriate spending of public money.



**5.11 Leave with only current mitigations**

5.11.1 Not a viable option as Network Rail is subject to the requirements of the Health and Safety at Work Act etc 1974 to reduce risk 'so far as is reasonably practicable' and a do nothing does not meet Network Rail obligation to reduce the risk at the crossing.

## 6 COST BENEFIT ANALYSIS

Option	Term <sup>1</sup>	ALCRM risk score	ALCRM FWI	Safety Benefit	Cost (£)*	Benefit Cost Ratio	BCR with GDF (2.5)	Status	Comments
Closure via extinguishment	Long	M13	00E+00	2.39E-02	100,000	10.23	25.57	REJECTED	No suitable alternative route across the railway.
Closure by diversion via an EA Bridge	Long	M13	0.00E+00	2.39E-02	2.4M	0.43	1.08	RECOMMENDED	Safety and business benefit does justify the cost of enhancement
MSL (overlay)	Long	D2	1.08E-02	1.31E-02	270,000	1.27	3.17	REJECTED	The site is too complex for this option
MSL (integrated)	Long	D2	1.08E-02	1.31E-02	800,000	0.38	0.95	REJECTED	Safety and business benefit does not justify the cost of enhancement.
Crossing attendants and locked gates	Medium		2.81E-03	2.11E-02	150,000	0.17	0.42	REJECTED	Not a viable long-term option
Leave as is	Long	C2	2.39E-02	0	0	N/A	N/A	REJECTED	Not a viable long-term option

## 7 CONCLUSION AND RECOMMENDATION

- 7.1 When carrying out a level crossing risk assessment in line with Network Rail and Office of Rail and Road (ORR) policy<sup>1</sup>, one must look to eliminate the hazard through the hierarchy of risk controls. Risk controls should, where practicable, be achieved through the elimination of level crossings in favour of bridges, underpasses, or diversions.
- 7.2 The risk assessment process provides evidence of the decision-making process on whether to invest in supplementary safety measures or, to pursue permanent closure of a crossing.
- 7.3 The current risk assessment score in the ALCRM is C2 with an FWI score of 0.023907399. This ranks the crossing as high risk. This score makes the Crossing the sixth-highest risk crossing out of the 299 crossings on the Wessex route. Clearly, this risk is not considered as tolerable or as low as is reasonably practicable. Leaving the Crossing in its current form has been rejected as an option.
- 7.4 Census information and evidence gathered from standard cyclical risk assessments at the Crossing indicates that it is used by a combination of vulnerable user types, including elderly, unaccompanied children, mobility impaired, people with prams, family groups with and without children and fisherpersons with fishing kit trolleys. These together with non-compliant sighting have had a significant impact on the risk scoring.
- 7.5 Closure via extinguishment is not considered a viable one due to lack of suitable alternative routes over the railway within the vicinity of the crossing.
- 7.6 If an MSL option was to be pursued, it would not eliminate the risk and the opportunity would remain for Users to deliberately misuse the Crossing.
- 7.7 Crossing attendants and locked gates has a high operational expenditure and the cost will increase each year and there still is an eliminate of users misuse the crossing.
- 7.8 The approved option, and one that Network Rail seek to pursue, is closure by the diversion onto an EA Bridge. This option shows a positive business case in the cost-benefit analysis, when applying the Gross Disproportionality Factor. Studies show that there is insufficient space to install such a structure at the Crossing so the proposal is to utilise the nearest available space to the south.
- 7.9 It is the conclusion of this risk assessment that closure remains the best option to eliminate the risk at this crossing, by the most applicable means necessary.


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<sup>1</sup> Principles for managing level crossing safety, Office of Rail and Road, June 2021

**8 APPROVALS**

Date of NRA Sign-off	21 <sup>st</sup> September 2022
Prepared By: Jamie Evers	Signature: Held on file
	Job Title: Level Crossing Manager
Approved By: Sam Pead (RLCM)	Signature: Held on File
	Job Title: Route Level Crossing Manager

Appendix 1 – GDF result

GDF question set tool to support level crossing cost benefit analysis					
 Version 1.1					
Crossing name		The Hatches			
ELR, m, ch	AAV 38, 35	Crossing type	FP		
Name of person completing this form		Sam Pead			
Date of completion	15/07/2022	GDF result	High		
Culpability - accounting for suicides, deliberate misuse and user errors					Comments
What is the level crossing incident history since the last risk assessment?	Suicide events only	0 - 5 incidents	6 - 25 incidents	>25 incidents	GDF Score
	Medium	Medium	High	Exceptional	Medium
Vulnerability - a greater responsibility exists for those less able to protect themselves					
Who uses the level crossing?	No vulnerable users identified	Vulnerable User CAT 1 <i>Cyclists and dog walkers only</i>	Vulnerable User CAT 2 <i>Those with protected characteristics, e.g., children, elderly, encumbered, disabled, parents with young children</i>		GDF Score
	Medium	Medium	High		High
Societal Aversion - addressing the absence of public appetite for credible mass casualty events					
What is the worst-case consequence in the most likely scenario for a single event involving a train	Event with the potential of a single specified injury to 5 specified injuries	Event with the potential of between 5 specified injuries and 2 fatalities	Event with the potential of between 2 and 10 fatalities	Event with the potential of greater than 10 fatalities or 10 FWI	GDF Score
	<i>Between 0.1 and 0.5 FWI</i>	<i>Between 0.5 and 2 FWI</i>	<i>Between 2 and 10 FWI</i>		
Uncertainty - how confident are we that we understand crossing usage correctly?					
Does the level crossing currently have a passive or active warning?	Active	Passive	GDF Score		
	Medium	High	High		
Does the local environment create uncertainty about how the crossing is used and by whom?	No	Yes	GDF Score		
	Medium	High	Medium		
Uncertainty for private level crossings					
Who uses the crossing?	Authorised users or regular, controlled users only		Irregular/unfamiliar users (delivery drivers etc.)		GDF Score
	Medium		High		High
Can we be certain about the types of vehicles that use the crossing?	Confirmed by census and other smart sources of information	Described and confirmed by authorised users	Unable to confirm through census or discussion with authorised users		GDF Score
	Medium	High	Exceptional		High
Uncertainty for public road level crossings					
What level of protection is provided at the crossing?	Full barrier	Half barrier <i>(or open crossing if line speed is equal to or less than 25mph)</i>	Open crossing <i>(if line speed is greater than 25mph)</i>		GDF Score
	Medium	High	Exceptional		High