TRANSPORT AND WORKS ACT 1992

TRANSPORT AND WORKS (INQUIRIES PROCEDURE) RULES 2004

THE NETWORK RAIL (CAMBRIDGE RE-SIGNALLING) ORDER

PROOF OF EVIDENCE – LEVEL CROSSINGS

STATEMENT OF JOHN PREST

15 March 2023

1. INTRODUCTION AND STATEMENT OF EXPERIENCE

1.1 I, John Prest, am the Route Level Crossing Manager (West Anglia) for Network Rail Anglia Route, based at Ely Network Operations Depot, Station Road, Ely, Cambridgeshire. Since joining Network Rail in 2011, I have worked in various roles within Anglia Route, including that of Level Crossing Manager (**LCM**) from 2013 to 2018, becoming a Route LCM in 2018.

1.2 I am responsible, so far as is relevant to this public inquiry, for the day-to-day safety and management of six LCMs who have separate portfolios of various types of level crossings comprised within the West Anglia Area of the Anglia Route. This includes a responsibility for the Narrative Risk Assessments carried out for, and Asset Inspections, of those six LCMs and the level crossings within their areas of control. In total, I am responsible for 332 level crossings within my portfolio of West Anglia.

1.3 My involvement in the scheme is in respect of the following seven level crossings which are proposed to be upgraded as part of the Project (as detailed below), as well as the works at Foxton level crossing, and are within my area of Level Crossing Management.

Name	**Post Code**	**Existing Level Crossing Type**	**SICA Renewal Date**	**ALCRM Score**		**Proposed Level Crossing Type**
				Individual Risk Per Traverse	Collective Risk	
Milton Fen	CB24 6AF	Automatic Half Barrier (**AHB**)	2021	D	2	Manually Controlled Barriers monitored by Obstacle Detection (**MCB-OD**)
Dimmock's Cote	CB6 3LJ	AHB	2023	E	2	MCB-OD
Six Mile Bottom	CB8 0UJ	AHB	2029	H	4	MCB-OD

Dullingham	CB8 9UT	Manned Gate (**MGH**)	2023	K	7	MCB-OD
Croxton	IP24 2RQ	AHB	2025	G	3	MCB-OD
Waterbeach	CB25 9HS	AHB	2021	D	2	MCB-OD
Meldreth	SG8 6XA	AHB	2029	D	2	Manually Controlled Barrier with Closed Circuit Television (**MCB-CCTV**)
Foxton (Hauxton Road Level Crossing)	CB22 5HJ	N/A – New REB only – no works to Foxton level crossing				

1.4 The scope of my Proof of Evidence covers the assessment by Anglia Route of Safety Risk at the relevant level crossings and the justification for the proposed upgrades. It therefore addresses the matters identified at paragraphs 2 and 3(a) of the Secretary of State's Statement of Matters.

1.5 In this Statement I set out:

a. the Project and the proposed level crossings upgrades;

b. risk of level crossings;

c. Network Rail's obligations regarding network safety and relevant legislation that applies to level crossings;

d. ORR and Network Rail National Policy on level crossings;

e. Network Rail's relevant level crossing standards and risk assessments;

f. the assessment of level crossing safety risk and fatality weighted injuries;

g. detailed description of the relevant level crossings;

h. current risk assessment of the crossings; and

i. responses to objections and representations received in relation to the Project.

2. PROJECT

2.1 Network Rail proposes the re-signalling of the Cambridge station interlocking area and the upgrade of seven level crossings (**Project**), as described in detail in Ms Heria's Proof of Evidence.

2.2 The proposed upgrades will improve the Fatality and Weighted Injury Score (**FWI**) for each crossing and Network Rail Anglia Route overall due to the total combined effects of the proposed upgrades. In addition, the upgrade will enable compliance with the Office of Rail and Road's (**ORR**) requirement to improve safety by moving away from automatic half-barrier crossings.

2.3 The upgrades will also improve the pedestrian environment (increased footway size and the introduction of tactile threshold paving) at each of the level crossings in line with the ORR Guidance.

2.4 The Project has identified the following programme and cost benefits of undertaking the proposed level crossings upgrades at the same time as the rest of the Project:

a. combined signalling upgrade as part of the wider Project reducing capital cost through increased engineering and construction synergies;

b. single source of agreed funding for the above; and

c. reduced impacts on train services, the surrounding road network and wider environment in terms of undertaking the proposed construction and signalling works (i.e. reduced need to undertake line or road closures at later dates).

2.5 These are considered in more detail in Ms Heria's Proof of Evidence.

2.6 The need and business case for the overall Project is also described in further detail in Ms Heria's Proof of Evidence.

3. THE RISK OF LEVEL CROSSINGS

3.1 Given the proposed level crossing upgrades, which form part of the Project, it is worth setting out the risks that level crossings can pose to users. Network Rail has identified that one of the greatest public risks on the railway arises in conjunction with the use of level crossings. This is the location at which the live railway has a direct interface with other movements (e.g.: pedestrians, vehicles and/or horse riders). Network Rail is continuing to work to eliminate such risk or to reduce it as much as is reasonably practicable.

3.2 Particular risks posed by the Automatic Half Barrier (**AHB**) crossings and Manned Gate (**MGH**) crossings are outlined below.

<u>Automatic Half Barrier Crossings</u>

3.3 I include below several photographs showing AHB crossings.

3.4 AHB crossings are initiated by approaching trains contacting a treadle located on the rail tracks some distance (which varies on each level crossing) from the level crossings. They are not in any way connected with signalling equipment.

3.5 The maximum rail line speed over AHB crossings is 100 miles per hour (160 km/hour) and only a maximum of two tracks can be crossed (i.e. AHBs cannot be installed on 3 or more running lines railway).

3.6 AHB crossings have two half-barriers that close the highway entrance lanes for vehicles or members of the public to the crossing, standard crossing road-lights and audible alarms. At the maximum rail line speed, the AHB crossing warning time is typically between 27 seconds to just over 30 seconds, from the amber light first showing (train contact the treadle mentioned above) to the train arriving at the crossings.

3.7 AHB crossings were originally designed for use on roads with infrequent or low traffic volumes and the first crossing of this type in the UK was installed in the town of Spath near Uttoxeter in Staffordshire and began operating on 5 February 1961. They are now considered to be a legacy type of level crossing and would not usually be considered suitable when a level crossing is being considered for upgrading as they are not integrated into the signalling system and, are therefore, considered to be less safe than the other types of crossing available today.

3.8 The main types of risks associated with AHB crossings are:

a. *barrier weaving* – where cars either deliberately or mistakenly enter the crossing from the open side to cross before a train arrives over the crossing. If this occurs at an urban location, it is more likely to be observed and reported. But is much harder to quantify at more remote locations and is, therefore, reliant upon members of the public or train drivers actually reporting observed incidents. This type of risk is considered to be one that carries a high degree of stress to both the crossing users who may well be very close to the train

if/when they circumvent the barriers, but also to the train passengers, as well as train drivers whose only recourse in these scenarios is to apply the emergency brake and hope they do not hit the vehicles or person weaving the barriers;

b. *blocking back over the crossing* – this is where vehicles are located or queued on the crossing once the crossing is activated. Again, once the crossing is activated by the treadle, the train is going over the crossing in less than 30 seconds and the train driver's only recourse in these scenarios is to apply the emergency brake and hope they do not hit the vehicle located on the crossing;

c. *pedestrians demonstrating poor behaviours at the crossing (either mistakenly or deliberately)* – members of the public have been frequently recorded ignoring or mistakenly using the open (non-barriered) side of the crossing once the crossing has been activated and a train is approaching.

Manned Gate Crossings

3.9 Manned Gate Crossings – otherwise known as "**MGH**" crossings (Manned Gate Hand-Operated Crossings) – are legacy crossings which are locally operated by a signaller or other railway staff. They consist of wooden or metal gates that close against road traffic and are usually operated by hand. When closed to road traffic, the gates are detected/locked and the protecting/signal(s) can be released by the crossing keeper/signaller.

3.10 MGH crossings no longer meet current safety standards and are being renewed with more modern barrier crossings, which remove the need for people and are, therefore, considered to be safer.

3.11 The main type of risks associated with MGH crossings are:

a. *staff risk* – a member or members of staff operating the crossings may be exposed to serious risk of injury by the road risk associated with the manual operation of gates to close a crossing – especially prevalent near station crossings where vehicles may well accelerate towards the crossing to avoid being held up for significant period of time by the gates being closed. Road layout and approach speeds – the crossing being located on a bend or curve can also exacerbate this risk, especially if no warning lights are present at the crossing. The risk can also be exacerbated by poor or bad weather as icy roads can cause skidding and limited visibility and can affect drivers' judgements of distance to the crossings;

b. *physical or verbal abuse towards members of staff* – there is also the risk of the crossing keepers experiencing physical or verbal abuse from members of the public or vehicle drivers when they are closing the gates – especially if the crossing is located near a train station and the person is in a hurry to catch the train and the gates closing means that person may well miss their train and have a significant period of waiting time thereafter;

c. *pedestrians' poor behaviours* – members of the public have on occasions been recorded scaling gates and using MGH crossings once a train is approaching.

3.12 Upgrading the crossings to a full barriered solution (either MCB-OD or MCB-CCTV), where there is the full closure of the highway on all four sides will address risks mentioned above by making incursion by members of the public less likely. Interlocking with signal protection or signaller intervention will ensure the train will only go over the crossings if they are clear of vehicles or people. Whereas provision of full visual road traffic lights and audible alarms (where they do not exist at the date of this Proof of Evidence and a member of staff is exposed

to significant road risk every time they shut the vehicular gates) will help seriously reduce risks to Network Rail's members of staff in accordance with Network Rail's obligations under the health and safety framework further described below.

4. RISK ASSESSMENT

4.1 Network Rail owns and operates the rail infrastructure in Great Britain (**Network**). Its purpose is to deliver a safe, reliable and efficient railway for Great Britain. The relevant health and safety framework can be described as follows.

4.2 The activities of Network Rail as network operator are regulated by the Office of Rail and Road (**ORR**), the independent safety and economic regulator for Britain's railway, by means of a network licence granted under section 8 of the Railways Act 1993. The Network licence requires Network Rail to secure the renewal and replacement of the Network, and the improvement, enhancement and development of the network, in each case in accordance with best practice and in a timely, economic and efficient manner so as to satisfy the reasonable requirements of persons providing services relating to railways and funders in respect of the quality and capability of the Network.

4.3 As the infrastructure manager, Network Rail is also under a duty as regards the safety of the Network, principally under The Railways and Other Guided Transport Systems (Safety) Regulations 2006 (**ROGS**). The ROGS implement the EU Railway Safety Directive (2004/49/EC) and require that any Infrastructure Manager or railway operator on the mainline railway must maintain a Safety Management System (**SMS**) and hold a safety certificate or authorisation indicating that the SMS has been accepted by the relevant safety authority, before being allowed to operate. I am advised that the ROGS are EU – derived domestic legislation which continue to have effect in accordance with section 2 of the European Union (Withdrawal) Act 2018.

4.4 The Health and Safety at Work etc. Act 1974 is the primary piece of legislation which requires the management and control of risks arising from works activities. While it does not specifically regulate level crossings, the effect of the duties it imposes (so far as relevant to my role and evidence) is to require railway duty holders to reduce the level of risk from their operations so far as is reasonably practicable. As explained above, level crossings present a particular challenge because they are at the interface between the railway and the highway and require a collaborative approach between those involved. It is essential that decisions and options for level crossing control measures are informed by a suitable and sufficient assessment of the risks involved at each particular type of level crossings.

4.5 Arrangements for managing risk at level crossings should follow the principles of prevention which are found in The Management of Health and Safety at Works Regulations 1999. These are:

a. elimination (i.e. the first consideration for all level crossings should be whether there are reasonably practicable alternatives to a level crossings; this is best considered at the design stage of a level crossing as part of a whole system approach);

b. engineering controls (e.g. a warning system);

c. administrative controls (e.g. signage);

d. reasonable practicability; and

e. gross disproportion judgement (this refers to the relationship between the amount spend and the attendant increase in safety; i.e. the safety value for money. Where the relationship between the two are grossly disproportionate, the expenditure will not be justifiable).

5. ORR AND NETWORK RAIL NATIONAL POLICY ON LEVEL CROSSINGS

5.1 The above legal framework is supplemented by the following policy context. Both national policy (set out by the ORR) and corporate policy (promulgated by Network Rail) are relevant. While both sets of policies dovetail in that they both generally seek to reduce risk, the detailed approach to risk assessment is largely set out in Network Rail policy.

Overall policy context: risk reduction

5.2 The ORR has published several documents which provide guidance as to how Network Rail should manage its level crossing portfolio. They emphasise that risk should be reduced through the design of a level crossing or through an alternative way of crossing the railway where this is reasonably practicable, and this drives Network Rail's own policies and thinking regarding level crossings.

5.3 A key element of Network Rail's policy on level crossings is also reflected in ORR's publication RSP7 published on 15 December 2011 **[JP1]** and also by the ORR's 15 June 2021 publication of Principles for Managing Level Crossing Safety **[JP2].** Both these publications help drive Network Rail's emphasis to a risk-based approach at level crossings and sets out principles and factors which should be considered in a Level Crossing Risk Assessment. RSP7 is intended to be fully withdrawn. However, it is still in place at the date of this Proof of Evidence and remains relevant.

5.4 The main purpose of the guidance is to inform the assessment and control of risks at a level crossing, recognising that every level crossing is different, and its individual circumstances need to be taken into account in the Risk Assessments. These principles are carried through to Network Rail's Narrative Risk Assessments (**NRA**) that every LCM completes for their individual level crossings.

5.5 Network Rail has a strategy for managing and reducing level crossing risk "Enhancing Level Crossing Safety 2019-2029" **[JP3]** The policy recognises that the only true way to eradicate risk is to close level crossings and that public safety must be at the forefront of decision-making. The policy also explains that it is Network Rail's legal duty to reduce risk:

"As part of our licence to operate and manage Britain's railway infrastructure [under s.8 of the Railways Act 1993], we have the legal duty to protect our passengers, the public and our workforce, and to reduce risk at out Level Crossings so far as is reasonably practicable".

5.6 The policy sets out Network Rail's overall approach to managing risk at level crossings, which can be summarised as follows:

a. Risk management: limiting/reducing the number of active open level crossings, continual risk reduction activities, risk-based prioritisation of efforts, undertaking of inspection and maintenance activities, on-going risk assessment regime, support for public education and awareness of level crossing safety.

b. Research and development: commitment to request, and participate in, research to reduce level crossing risk; to investigate and introduce new technology.

c. Co-operation with stakeholders: support for the British Transport Police and for the ORR in order to enforce adherence to level crossing and road traffic legislation, forming partnership with other organisations such as local highway authorities.

d. Learning and taking action: Network Rail will learn from others, from accidents/incidents/recommendations and take action, where considered necessary.

Detailed policy

5.7 As above, a key part of the legal obligations on Network Rail is to reduce risks from level crossings. Network Rail has developed its own company standards to determine those risks. The Network Rail Standards focus on Asset Management (which is a reflection of the actual condition of the level crossing, i.e. the asset on the ground) and Risk Management (which is a reflection of the overall safety of the Crossing, i.e. the risk profile of the asset). These standards enable Network Rail to meet its legal obligations and underpin the health and safety management of its level crossing estate.

5.8 There are two key documents governing the Risk Assessment process for level crossings:

a. NR/L2/XNG/001 Provision and risk management of level crossings **[JP4]**: a high-level document that sets out Network Rail's requirements to ensure a suitably robust and consistent process for assessing risk and determining the safety requirements for both existing and new level crossings.

b. NR/L3/XNG/308 Risk Assessing Level Crossings **[JP5]**: is a comparatively more detailed, process-specific document. This standard sets out the frequency of routine risk assessments, defines non-routine risk assessment triggers and details the complete assessment process. LCMs follow this compliance standard in order to satisfy the risk management of level crossings.

5.9 In addition to asset maintenance and condition standards, there are also engineering and design specifications, further to asset maintenance and condition standards that are integral to ensuring level crossing safety and Network Rail's approach to asset management. It is not however necessary to go into those for the purposes of this proof of evidence.

6. NETWORK RAIL'S RELEVANT LEVEL CROSSING STANDARDS AND RISK ASSESSMENTS

6.1 When carrying out a Level Crossing Risk Assessment, in line with Network Rail and ORR policies mentioned above, one must look to reduce hazard through the hierarchy of risk controls. Where practicable, this can be achieved through the elimination of level crossings in favour of bridges, under-passes or diversions.

6.2 There is a dedicated team of LCMs in the Anglia Route, each based locally around the route and with 45 – 71 crossings under their control. This has led to a considerable development of Network Rail's knowledge and understanding of level crossings using expert judgment.

6.3 Each LCM also undertakes all Asset Inspections – an appraisal of the level crossing asset's physical condition – which for level crossings takes place on average at three-monthly intervals (this interval may be decreased or increased to reflect local risks). The LCM can also act as a leader at local stakeholder liaison meetings, which helps to develop a sense of 'ownership' in the local community and encourages a more proactive approach to risk management.

6.4 Further information about Asset Management and Inspection of all types of level crossings, their frequencies (which in part are determined by the All Level Crossing Risk Model (**ALCRM**)) and how any faults or issues raised are prioritised and rectified, is contained in Network Rail Standards NR/L2/XNG/19608 **[JP6]** and NR/L2/XNG/202 **[JP7]**.

6.5 With the LCMs came the introduction of the full NRAs, which enable the LCM to take a holistic view of a level crossing, considering the qualitative and quantitative elements of the risk assessment to determine the foreseeable risk at that crossing and make a robust assessment of appropriate intervention using expert judgement through option selection.

6.6 NRA documents are also used to assist Network Rail in understanding the full risk associated with a level crossing, meeting the requirements of the Management of Health and Safety at Work Regulations 1999, and thus providing the necessary supporting safety information to a decision-making process for the level crossing. This will lead to recommendations as the most suitable option to reduce the risk to as low as reasonably practicable.

7. THE ASSESSMENT OF LEVEL CROSSING SAFETY RISK AND FATALITY WIEHTED INJURIES

7.1 The risk assessment of a given level crossing is provided in an NRA produced by an LCM. The Assessment is based on two elements: a quantitative one (calculated risk model) and qualitative one (structured expert judgement).

7.2 The NRA's main purpose is to support Network Rail's broader level crossing risk management process by providing a consistent methodology for assessing the safety risks to crossing users, train passengers and train staff at level crossings on Network Rail controlled infrastructure.

Qualitative Assessment of risk – LCMs and NRAs

7.3 The qualitative aspect of the assessment (LCMs Observations/Opinions) is derived from the LCM's expert structures opinions garnered from their local knowledge of that particular crossing.

7.4 The local knowledge will be gained from many sources such as for example, when the LCM is out on site doing their inspections – often several times a year, relationships cultivated with the authorised users (**AU**) who provide valuable information as to how and when they use the crossing, and interviewing local or regular users of the level crossing to identify particular day to day type issues that may not be immediately obvious etc.

7.5 All these sources of information are collated by the LCM and then used to understand and structure their qualitative opinions/views written into the NRA. Some examples of the information collated are – how many times over a given period the level crossing is being used (say over a year or less); whether the level crossing is being used correctly and therefore safety (that is a safe system of work is in place to use the crossing as part the signage instructions). There are other judgements or opinions that the LCM will use to put forward to the route optioneering panel, for safety elimination or mitigation improvements to the risks which they see as the key risk drivers from their assessment. These key risk drivers may well require the route to consider funding the LCM's proposed mitigations, either in the short term (which may involve changing existing planned priorities), or as a longer-term solution.

Quantitative Assessment of risk – ALCRM – the All Level Crossing Risk Model

7.6 The quantitative aspect of the risk assessment is carried out using the ALCRM Tool. ALCRM was first introduced in 2007 and has been developed with regard to extensive research and risk assessment approaches since the early 1990s. The original risk model was developed as the

result of a collaborative partnership between Rail Safety & Standards Board (**RSSB**), Network Rail and Arthur D. Little.

7.7 ALCRM assesses the risk profile of a level crossing based on the following metrics:

a. FWI (Fatality Weighted Injuries) – a numerical value measuring Safety Performance or Safety Risk as a crossing (e.g. a fatality is weighted numerically as 1, each major injury is weighted as 0.1 of a fatality and each minor injury is weighted as 0.005 of a fatality. It gives a numerical view of the level of risk associated with level crossings and the statistical likelihood of a person, vehicle etc being struck/killed or injured by a train at that particular crossing. ALCRM collates this information from the LCM's data collection and draws on this information entered to calculate the FWI.

b. Specific information about the Level Crossings – to calculate the level of risk for a particular level crossing, ALCRM requires specific information about the asset. Information is gathered from existing records held by Network Rail on that asset, using intelligence sources, stakeholder engagement and, not least, upon a full site visit being undertaken by the LCM, during which time the presence of a defined set of observable crossing features is recorded. The features recorded during the site visit are listed in site visit pro forma and include aspects such as crossing orientation, census and users, and the visibility of the crossing on approaches. This data is input into a Mobile App on the LCM's iPad and goes directly into the ALCRM system.

c. Pre-defined key risks – the calculated outputs of ALCRM enable Network Rail, in conjunction with the structured judgement of the LCM Assessors, to better identify the hazards and risks present at each of its level crossings. Known as key risk drivers, these include hazards such as sun glare, low sighting time or frequent trains. ALCRM also enables proposed risk control solutions to be modelled as scenarios. This option enables a comparison to be made with the current risk assessment and facilitates an understanding of how changes or improvements translate 'quantitatively' as a benefit or risk reduction. In this way, LCMs use ALCRM in order to support risk control selection and use identified key risk drivers to determine solutions which target risks and hazards.

7.8 The data for this assessment is derived from regular level crossing Asset Inspections conducted by LCMs, using standardised Asset Inspection questions on a mobile APP device which is used to populate asset condition information into ALCRM. Also, LCMs will conduct a specific Risk Assessment on site data collection form again recorded on a mobile app device which feeds directly into the ALCRM system. Any incidents in relation to the crossings outside of these inspections are uploaded to a Safety Management Information System and from the RSSB's Safety Risk model. The Safety management Information System is a repository database used by Railway Group members to record details of all safety related events which occur on infrastructure managed by Network Rail.

7.9 ALCRM assigns each level crossing two metrics:

a. Risk per Traverse (**RPT**) from A to M (with M being the least risky and A being the greater risk). This is based on the FWI measure, and the relationship between the two is explained below.

b. Collective Risk (from 1 to 13, with 1 being the most risk and 13 being the least risk). These metrics are explained below.

7.10 The RPT indicates how dangerous a crossing is to use regardless of usage level. RPT makes no assumptions about a 'typical user' and expresses risk in a numerical representation of

FWI/Traverse. It is basically the measure of the likelihood of being struck/killed or injured by a train every time the crossing is traversed.

7.11 RPT is, in effect, a fraction expressed as a decimal that expresses the chance of being struck or killed by a train each time the crossing is traversed. To give an example, if the RPT is 1/500,000 that means one can expect an injury/fatality in every 500,000 crossings – then the RPT will be 0.0000002.

7.12 There are different RPT assessments made for different kinds of users, e.g. heavy and non-heavy vehicles users, pedestrians, train staff and passengers. Each is allocated a decimal value in ALCRM once the overall calculation is completed, and together they all form the overall alphabetic letter value allocated by ALCRM as the RPT described below.

7.13 Given the difficulty of working with small decimal numbers, the RPT is mapped onto an alphabetic scale for usability. A weighted average is mapped to the existing individual risk scale - A to M, with 'A' representing the highest risk and 'M' representing nil risk.

7.14 Active crossings, such as MCB crossings, will be grouped around the lower end (towards L) as they are considered to be relatively safe. By contrast, the passive crossings are generally found around the higher end (towards A) as they are considered more risky.

7.15 Collective Risk is a measure of the total harm, or safety loss and is expressed in terms of FWI per year. For example, the value 1 represents: 1 fatality or 10 major injuries or 200 minor RIDDOR[1] injuries or 1000 minor non-RIDDOR injuries per year.

7.16 Collective Risk is reported by ALCRM in a simplified form referred to as a 'Collective Risk Number' ranked from 1 to 13 (1 representing the highest risk and 13 representing nil risk).

7.17 While both RPT and Collective Risk are measures of risks, they are different measures of risk. Collective Risk is an overall assessment of the actual injuries at a given level crossing in a given year. RPT, however, calculates risk 'per traverse'. Therefore, a dangerous level crossing will have a high risk 'per traverse', but may be used so infrequently that its Collective Risk will remain low.

7.18 ALCRM is therefore composed of two elements, a letter (representing RPT) and a number (representing collective risk).

Frequency of assessments

7.19 Since LCMs were introduced, the frequency of routine NRAs at each level crossing has been based upon the kind of level crossing and its current level of risk. In general, the risk level of an AHB level crossing requires it to be assessed between every 1.25 years for higher risk crossings and 3.25 years for the lower risk crossings.

[1] Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (2013). RIDDOR imposes duties on employers, the self-employed and people in control of work premises (the Responsible Person) to report certain serious workplace accidents such as fractured bones, accidental amputations, burns etc, occupational diseases (e.g. Carpal Tunnel Syndrome, HAVS – Hand, Arm, Vibration Syndrome etc) and specified dangerous occurrences (near misses - apply to all workplaces and include incidents involving, lifting equipment, pressure systems, overhead electric lines, electrical incidents causing explosion or fire).

7.20 MGH level crossings need to assessed between on average every 2.25 and 3.25 years, dependent on their ALCRM Risk Score. The higher the ALCRM score, the greater the risk and therefore the grater the frequency of the risk assessments.

7.21 Latest NRAs for the relevant crossings are appended as **[JP8]** .

8. DETAILED DESCRIPTION OF THE CROSSINGS

Milton Fen

8.1 Milton Fen level crossing is located at railway mileage 59m 10ch[2] on Anglia Route and has a line speed of 75mph. The crossing is situated on the outskirts of the village of Milton on Fed Road, which is a semi-rural location on a single-track road with passings places along the way. It is a public highway Automatic Half Barrier level crossing.

8.2 The crossing is used on daily basis by the few residents that live over the crossing in the lock keepers' cottage and is a regular route for both pedestrians and cyclists along the river Cam eastwards to Waterbeach or westwards to Cambridge.

8.3 The calculated safety risk for this crossing is D2 with the collective risk rating of 2 identifying it as a very high risk crossing.

8.4 Due to a number of deliberate act fatality incidents at this crossing in 2021 (as shown in the list of incidents appended at **[JP9]**), and a number of other near miss or pedestrian poor behaviours incidents, the British Transport Police have increased the frequency of their regular patrols at this crossing to deter such behaviours in the future. The crossing's main risk derives from the high number of all types of pedestrians (e.g. pushchair users, elderly pedestrian users, joggers, dog walkers etc) and cyclists that use this crossing, compared to its relatively low vehicle usage.

8.5 Since 2013 there have been – 2 barrier strikes, 4 near misses with vehicles and pedestrians and 1 deliberate act fatality

8.6 The crossing is deemed to have a high number of vulnerable users in the opinion of the LCM responsible for this crossing. The open nature of the AHB crossing on the non-barriered sides gives easy access to those wishing to deliberately ignore the train warnings when the crossing is activated or can lead to unintentional poor behaviour if a user is wearing headphones or is otherwise distracted.

8.7 This crossing is ranked 8th highest risk AHB level crossings in Anglia route and 19th nationally compared to all other AHBs.

8.8 I have considered the Proof of Evidence supplied by Nicholas Contentin of Modelling Group. Notwithstanding the impact of the proposed level crossing upgrade on the local highway network and waiting times for pedestrians and vehicles wishing to cross the railway at the crossing, raised by a number of objectors and discussed by Mr Contentin in his proof, I remain of the opinion that the overall safety benefits of upgrading this crossing significantly outweigh any impacts users of the highway including waiting times.

[2] This means 59 miles and 10 chains – it is the way the railway measures its asset locations on each individual line or engineer's line reference.

Dimmock's Cote

8.9 Dimmock's Cote level crossing is located at railway mileage 66m and 25ch on Anglia Route and has a line speed of 75mph. The crossing is situated on the A1123 between Ely and Waterbeach Railway Stations. It is a public highway Automatic Half Barrier Level Crossing.

8.10 This crossing sees a high number of vehicles on a daily basis, but the data shows very little pedestrian usage (due to the location of the crossing being in a very rural location with no public footpaths on either approach).

8.11 The calculated safety risk for this crossing is E2 with the collective risk rating of 2 identifying it as an extremely high-risk crossing.

8.12 This crossing has high vehicle usage on a national speed limit road where a frequent train service is able to pass over the crossing at 75mph. There have been several safety incidents recorded at this crossing in recent years, including a vehicle near miss, a significant barrier strike and other poor behaviours (as shown in the list of incidents appended to this Proof of Evidence).

8.13 Since 2013 there have been – 2 barrier strikes, 3 near misses involving vehicles and pedestrians and 1 deliberate act fatality at this crossing

8.14 The long straight roads on both approaches to the crossing enable drivers to easily see the approaching trains, which often encourages drivers to increase their speeds to avoid being delayed by the crossing activations.

8.15 The crossing is also on a potential diversionary route should the A10 be closed for any reason. Potential increased usage by all traffic when the primary route of travel is unavailable will further increase risk level at the level crossing.

8.16 I have considered the Proof of Evidence supplied by Nicolas Contentin of Modelling Group. Notwithstanding the impact of the proposed level crossing upgrade on the local highway network and waiting times for pedestrians and vehicles wishing to cross the railway at the crossing, raised by a number of objectors and discussed by Mr Contentin in his proof, I remain of the opinion that the overall safety benefits of upgrading this crossing significantly outweigh any impacts users of the highway including waiting times

Six Mile Bottom

8.17 Six Mile Bottom level crossing is located at railway milage 7m 65ch on Anglia Route and has a line speed of 60mph. The crossing is situated on A1304 London Road in the village of Six Mile Bottom and allows access to Newmarket and the villages of Six Mile Bottom and Brinkley from the A11. The crossing is in a rural village location, with residential properties and farmland nearby. It is a public highway Automatic Half Barrier Level Crossing.

8.18 ALCRM calculates the usage of the crossing to be mostly road vehicles with occasional use by pedestrians and cyclists.

8.19 The calculated safety risk for this crossing is H4 with the collective risk rating of 4 identifying it as a medium to high-risk crossing.

8.20 Six Mile Bottom is a highly used crossing with trains able to pass over it at 60mph on a 40mph road where drivers have been observed to go significantly faster. Several historic safety incidents have been recorded at this level crossing, including near misses and poor behaviours.

8.21 Since 2013 there have been – 2 barrier strikes and 5 near misses with vehicles at this crossing

8.22 The crossing has a slight sun glare risk that, on occasion, may mask the visibility of the road traffic lights on one of the approaches, although the current LED lights will partly mitigate this.

8.23 The crossing is also on a diversionary route should the A11 or A14 be closed off for any reason. Potential increased usage by all traffic when the primary route of travel is unavailable will further increase the risk level at the level crossing.

I have considered the Proof of Evidence supplied by Nicolas Contentin of Modelling Group. Notwithstanding the impact of the proposed level crossing upgrade on the local highway network and waiting times for pedestrians and vehicles wishing to cross the railway at the crossing, raised by a number of objectors and discussed by Mr Contentin in his proof, I remain of the opinion that the overall safety benefits of upgrading this crossing significantly outweigh any impacts users of the highway including waiting times Dullingham

8.24 Dullingham level crossing is located at railway mileage 10m 56ch on Anglia Route and has a line speed of 60mph. The crossing is situated near Dullingham village, on Station Road, next to Dullingham Station. The road is rural, giving access to the A1304 from Dullingham village as well as access to the station. It is a public highway manned gate barrier level crossing.

8.25 ALCRM calculates the usage of the crossing to be mostly road vehicles with some use by pedestrians and cyclists.

8.26 The calculated safety risk for this crossing is K7 with the collective risk rating of 7 identifying it as a moderate risk crossing. However, I note that this level crossing isa Manned Gate Crossing and the ALCRM score does not reflect the risk to staff controlling the gates, which is significant, but unquantifiable in the ALCRM terms.

8.27 Several historic safety incidents have been recorded at this level crossings, which include staff abuse, as well as near misses and poor behaviours.

8.28 Since 2013 there has been an incident where, as the gates were being closed, the signal person was driven at by a car and an incident where the crossing gates were struck by a vehicle. There have also been two near misses with pedestrian members of the public at this crossing

8.29 I have considered the Proof of Evidence supplied by Nicolas Contentin of Modelling Group. Notwithstanding the impact of the proposed level crossing upgrade on the local highway network and waiting times for pedestrians and vehicles wishing to cross the railway at the crossing, raised by a number of objectors and discussed by Mr Contentin in his proof, I remain of the opinion that the overall safety benefits of upgrading this crossing significantly outweigh any impacts users of the highway including waiting times

Croxton

8.30 Croxton level crossing is located at railway mileage 96m 45ch on Anglia Route and has a line speed of 40mph (temporary speed restrictions). The crossing is situated on the A1075 north-east of Thetford and provides access towards Watton and Dereham. It is a public highway Automatic Half Barrier Level Crossing.

8.31 ALCRM calculates the usage of the crossing to be mostly road vehicles with occasional use by cyclists.

8.32 The calculated safety risk for this crossing is G3 with the collective risk rating of 3 identifying it as a very high-risk crossing.

8.33 From the North-West direction (down side) the road approaching the crossing is straight until vehicles pass over the crossing. The road then bends towards the right and from this direction heavy sun glare can be an issue at certain times of year. Albeit, this is partially mitigated by LED lights.

8.34 From the South-West direction (up side) the road curves approximately 200m before the crossing. This means, given road speed and curvature, that vehicles approaching from this direction may have little time to react upon crossing activation.

8.35 Given high incident rates of barrier strikes, vehicles weaving through the barriers and running red lights, this level crossing is deemed to be high risk and a temporary speed restriction reducing line speed from 90mph to 40mph was enforced by the ORR I 2012 to reduce the risk of a catastrophic accident.

8.36 Since 2013 there have been 13 barrier strikes and 12 near misses with vehicles at this crossing.

8.37 The proposed upgrade will enable the ORR to sanction the removal of the temporary speed restriction and line speed can be restored safely, thus improving both safety and performance at this level crossing.

8.38 I have considered the Proof of Evidence supplied by Nicolas Contentin of Modelling Group. Notwithstanding the impact of the proposed level crossing upgrade on the local highway network and waiting times for pedestrians and vehicles wishing to cross the railway at the crossing, raised by a number of objectors and discussed by Mr Contentin in his proof, I remain of the opinion that the overall safety benefits of upgrading this crossing significantly outweigh any impacts users of the highway including waiting times.

Waterbeach

8.39 Waterbeach level crossing is located at railway mileage 61m 01ch on Anglia Route and has a line speed of 75mph. The crossing is situated by Waterbeach Station on Station Road/Clayhithe Road on the east side of the town of Waterbeach, in Cambridgeshire. The crossing allows access between Waterbeach and Clayhithe where there is a crossing over the River Cam; the road continues to join the A14 to the south, providing a convenient through route for many people as well as forming a diversionary route when there are problems on the A10. The crossing is between the platforms of Waterbeach Station, with the town to the west and the station car park to the east and is used by pedestrians to access the platforms.

8.40 The crossing is a public highway Automatic Half Barrier Level Crossing, which is a principal access route for users travelling to the nearby station and ticket machine.

8.41 The existing crossing has an ALCRM score of D2 with the collective risk rating of 2 identifying it as an extremely high-risk crossing.

8.42 Waterbeach level crossing is a highly-used level crossing, which is used by both members of the public in vehicles and on foot, given its location at a railway station. Location near to a station also means that the elderly, pushchair users, children, dog walkers and cyclists all use the

crossing to access the station. The LCM has, therefore, identified the crossing as having a high degree of vulnerable users.

8.43 The crossing can become even busier should the A10 road be closed as the road approaching the level crossing would be used as a diversion route (which has happened in the past). Should this happen again, a Network Rail Mobile Operations Manager would need to be deployed to watch over the crossing until the diversion has finished.

8.44 The crossing has an extensive, significant incident history (as is clear from the list of incidents appended to this Proof of Evidence) (including an attempted deliberate act fatality where a person parked on the crossing waiting for an approaching train) despite having various mitigations in place (e.g. flashing pedestrian signs, LED wigwags, yellow box on crossing, CCTV, audible alarms that stay on until barriers raise, spoken warning of another train coming and red-light safety enhancement cameras).

8.45 Since 2013 there have been 24 near misses involving vehicles and pedestrians and a train struck a vehicle on the crossing in a deliberate act suicide attempt

8.46 For Safety performance (FWI) this crossing is ranked 2nd highest risk AHB crossing in Anglia route and 2nd nationally compared to other AHB level crossings. The approach to the up side is long and straight, whereas the down side is not. There are junctions on both sides of the crossing and on the down side approach there is both left and right turns onto housing estates. On the up side approach there is a left-hand turn into the station car park and there are both left and right hand turns into depots very close to the crossing and there is field access. The number of these junctions potentially increases the blocking back risks at this crossing.

8.47 Sun glare could also be an issue at this crossing during the winter months when the low sun is rising, albeit this is partially mitigated by having all LED lights installed in the road traffic light boards on both sides of the crossing.

8.48 There is an extensive proposed development on the east side of Waterbeach village (this is on the old Waterbeach barracks area) approximately half a mile away from the crossing. This would increase the usage of the station and the crossing once houses became occupied but could be mitigated with the station being potentially moved to a different location.

8.49 I have considered the Proof of Evidence supplied by Nicolas Contentin of Modelling Group. Notwithstanding the impact of the proposed level crossing upgrade on the local highway network and waiting times for pedestrians and vehicles wishing to cross the railway at the crossing, raised by a number of objectors and discussed by Mr Contentin in his proof, I remain of the opinion that the overall safety benefits of upgrading this crossing significantly outweigh any impacts users of the highway including waiting times.

8.50 I have also considered the objection of the Fen Line Users Association to the Waterbeach Upgrade which appears to be made on the basis that a foot-bridge for pedestrians should be provided at the current crossing location. As part of the Level Crossing Manager's Narrative Risk process this option has been considered but when presented to the Anglia Route Optioneering Panel in 2022 (the panel that evaluates the suitability and safety benefit to cost proportionality) was discounted on the grounds of the cost being grossly disproportionate to the safety benefit gained. Network Rail would not consider this type of option in isolation and, if it were to be considered, it would need to involve other third parties such as local authorities and station owners. In order to facilitate a pedestrian foot bridge there would almost certainly be planning issues to be resolved, station modifications to be considered and all aspects would require a feasibility study. This, in my opinion, would be a project within itself and should therefore be considered outside of the scope of the current crossing upgrade project

Meldreth

8.51 Meldreth level crossing is located at railway mileage 49m 37ch on Anglia Route and has a line speed of 90mph. The crossing is located on Meldreth Road in the village of Shepreth, in Cambridgeshire and allows access between the villages of Shepreth and Meldreth. The crossing is in a rural village location, with residential properties to the east and mainly farmland to the west. It is a public highway Automatic Half Barrier Level Crossing.

8.52 ALCRM calculates the usage of the crossing to be mostly road vehicles with occasional use by pedestrians. There is also a significant use of the crossing by cyclists and motorcycles.

8.53 The existing crossing has an ALCRM score of D2 with the collective risk of 2 identifying it as a very high-risk crossing.

8.54 There are local residential homes and various gateways near the crossing on both sides of the crossing and no yellow lines near the level crossing. Therefore, cars could park on the road near the crossing, causing blocking back. There are also right turns into local residential homes near the crossing on both sides, which could also cause blocking back. This is a safety issue because, in its current AHB formation, once the treadle is activated the train will be going over the crossing irrespective of whether anything is on it. By contrast, an MCB type crossing is signal interlocked so if a vehicle were trapped on the crossing an approaching train would be held at an approaching signal and would not pass over the crossing.

8.55 Since 2013 there have been 4 near misses with vehicles and pedestrians at this crossing (as is clear from the List of incidents appended to this Proof of Evidence).

8.56 The skew of the crossing relative to the road increases the chance of vehicles weaving around the barriers. Whereas the long pedestrian walkways due to the skew of the crossing mean that pedestrian users may become trapped on the crossing.

8.57 This is combined with the fact that the crossing is busy for its location: over 1200 cars cross it per day and there is also a very high train count at 217 per day.

8.58 I have considered the Proof of Evidence supplied by Nicholas Contentin of Modelling Group. Notwithstanding the impact of the proposed level crossing upgrade on the local highway

network and waiting times for pedestrians and vehicles wishing to cross the railway at the crossing, raised by a number of objectors and discussed by Mr Contentin in his proof, I remain of the opinion that the overall safety benefits of upgrading this crossing significantly outweigh any impacts users of the highway including waiting times

9. OBJECTIONS AND REPRESENTATIONS

9.1 Thirty letters of objection and five representations were received by the Secretary of State, as summarised in the Statement of Case **[JP10]**.

MELDRETH

9.2 The vast majority of objections relate to the proposed upgrade of Meldreth Level Crossing from an Automatic Half Barrier Crossing to a Manually Controlled Barrier with Closed Circuit Television. They raise the following issues:

a. lack safety case for a double barrier;

b. flawed modelling of the proposed upgrade;

c. increased downtime resulting in air, light and noise pollution, traffic delays and inconvenience to residents, as well as speeding to get across the level crossing; and

d. lack of proper consultation in relation to the proposed changes.

9.3 The traffic modelling is dealt with in the Proof of Nicolas Contentin. The alleged environmental effects of increased downtime are dealt with in the Proof of Elliot Stamp.

9.4 On the safety case for upgrading the crossing, this has already been considered. In my view, there is a compelling safety case for upgrading the crossing from AHB to MCB-CCTV for the reasons set out above. In particular, it will help to seriously reduce all of the risks to crossing users.

9.5 In addition the Automatic Half Barrier Plus solution that has been raised previously has been discontinued as a viable alternative solution by Network Rail's Signalling Asset Technical Review Panel and the Central and Technical and Engineering Team. Following a process of hazard identification and assessment of acceptability, it was felt by the Panel that the residual risk of the system was not lower than the risks being addressed. The AHB+ system did not resolve all the necessary hazards that would have allowed this solution to be a viable alternative to AHB crossings already in existence. Network Rail are now investigating other alternatives available to reduce risk at AHB crossings

9.6 The risk to public safety at level crossings depends on their configuration, the volume of pedestrian and vehicle traffic traversing the crossing, and rail traffic and has been assessed through the Risk Assessment Method as noted above. The only way to eliminate this risk completely is to close each crossing.

9.7 However, in relation to Meldreth Level Crossing, Network Rail considers its closure impracticable given the impact on local road networks, the distance to nearby level crossings and the related costs with greater potential environmental social impacts.

9.8 Network Rail's proposals to upgrade this level crossing therefore involves striking a balance between the convenience to local communities in being able to cross a railway and maintaining public safety in line with Network Rail's legal requirements.

9.9 Consequently, on balance, notwithstanding the increase in the average barrier downtime and the increase in average and maximum queue lengths set out in the Proof of Nicolas Contentin, the fundamental safety risk posed by the current level crossing (ALCRM score D2) means that it must be upgraded to an MCB-CCTV level crossing.

9.10 The Statement of Case submitted on behalf of Shepreth Parish Council (which is addressed in detail in Mr Contentin's Proof of Evidence) also addresses the point of need for the proposed upgrades. In particular, the Parish Councils seeks reassurance that the incidents recorded at Meldreth level crossing in 10 years exclude equipment failures. This is a technical point, which I am not in a position to comment on. However, I do note that the List of Incidents appended to my Proof of Evidence clearly records cause of these incidents.

9.11 As to consultation undertaken by Network Rail in relation to the proposed changes – this is described in detail in the Consultation Report submitted with the Order application. However, by way of summary – prior to the Order application being submitted Network Rail sought to provide all interested parties with information in relation to the proposed upgrades through the public consultation exercise in March 2021 and through undertaking Traffic Modelling (which was made available via the Project website). Interested parties were also provided with further information through a Frequently Asked Questions document (also made available via the Project website). Network Rail also wrote to and spoke with the individual objectors.

WATERBEACH

9.12 One objection was also submitted by Fen Line Users Association (**OBJ14**) in relation to the proposed upgrade of Waterbeach Level Crossing. The objection raises the following points:

a. flawed modelling; and

b. increased downtime.

9.13 It is important, first, to emphasise the safety case for upgrading the crossing to MCB-CCTV. There are fundamental safety risks associated with the crossing for the reasons set out above. At Waterbeach, the significant number of safety incidents will be reduced dramatically by closing off all sides of the crossing to prevent deliberate barrier weaving and pedestrian incursions.

9.14 The Fen Line Users Association suggest that an AHB+ crossing should have been considered but, as I explain at paragraph 9.5.above, Network Rail considers that AHB+ crossings do not adequately address safety risks.

9.15 It is, of course, accepted that there will be increased downtime as a result of the installation of a new crossing. This, and the associated modelling, is considered in more detail in the Proof of Nicolas Contentin. Network Rail's proposals to upgrade this level crossing therefore involves striking a balance between the convenience to local communities in being able to cross a railway and maintaining public safety in line with Network Rail's legal requirements.

9.16 On balance, notwithstanding the increase in the average barrier downtime and the increase in average and maximum queue lengths, the fundamental safety risk posed by the current level crossing (ALCRM score D2) means that it must be upgraded to an MCB-CCTV level crossing.

10. CONCLUSION

10.1 Network Rail has a responsibility and legal duty under the Health and Safety at Work Act 1974 for the health, safety and welfare of its employees and for protecting others against risk. 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 their undertaking.

10.2 Network Rail is committed to reducing the risk on the railway and has identified that one of its greatest public risks is at level crossings. This is where the railway has a direct interface with other elements such as vehicles and/or pedestrians. Network Rail is working to reduce this risk to as low a level as is reasonably practicable.

10.3 Part of reducing the overall risk is to consider wherever possible closure (eliminating the risk entirely) or, if closure is not possible, then to consider other ways of reducing the level of risk at individual crossings. This will include enhancing the protection measures for all users, e.g. where a crossing is, for example, an automatic half barrier crossing (AHB), upgrading it to a full barriered type of crossing which is fully integrated into the signalling system and/or has some form of signaller controls.

10.4 The crossings proposed to be upgraded in the project are, with the exception of Dullingham, all automatic half barrier crossings (AHBs). They have, to a certain level, a number of common risk factors – high levels of vehicle and pedestrian usage, high train volumes passing over the crossing, high levels of accidents or incidents, or in most cases all three or at least two common risks. There is both a legal duty and a moral duty to reduce or eliminate this risk when a reasonable opportunity presents itself. The Project is that opportunity and, along with its other facets of work, the proposed crossing upgrades represent significant safety improvements for the general public as a whole and for persons travelling on trains. The AHB crossings are legacy crossings that have no signalling interfacing and, once a treadle is activated, the oncoming train will be passing over that level crossing come what may. With upgrades to MCB/OD or MCB/CCTV those crossings will be signalling or signaller protected and no train will pass over them unless it is absolutely safe to do so. What this means is that the risk of vehicle or pedestrian interface or collision with a train is virtually entirely removed, which represents a very significant safety improvement from the way the crossings currently operate.

10.5 Dullingham as it operates now carries a significant and very difficult to quantify risk (exposure to road traffic when opening or closing the gates every time a train is due at the station or passing through) to the staff members who operate the manned gates. The operational and safety benefits of enhancing this crossing are taken into account by the project proposing to automate the crossing. Again, this project represents a reasonable opportunity to improve safety and reduce risk at this crossing as Network Rail is legally and morally obligated to do.

10.6 I accept that upgrading the crossings will increase the downtime of the barriers and that, on average, crossing users will wait longer to cross. But the safety improvements far outweigh those downsides and there is, therefore, in my opinion a compelling case for them.

10.7 Again, considering the Proof of Evidence supplied by my colleague Nicholas Contentin at Modelling Group and notwithstanding the details contained in his proof, I am of the opinion that whatever the outcome of the traffic modelling undertaken, the overall safety benefit of upgrading all of the crossings within this project outweighs those issues or concerns

11. WITNESS DECLARATION

11.1 This proof of evidence includes all facts which I regard as being relevant to the opinion that I have expressed and that the Inquiry's attention has be drawn to any matter which would affect the validity of that opinion.

11.2 I believe the facts that I have stated in this proof of evidence are true and that the opinions expressed are correct.

11.3 I understand my duty to the Inquiry to help it with the matters withing my expertise and I have complied with that duty.

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JOHN PREST

Dated: 15 March 2023