The Planning Inspectorate

Report to the Secretary of State for Transport

by Malcolm Rivett BA (Hons) MSc MRTPI

an Inspector appointed by the Secretary of State for Transport

Date: 2nd October 2023

TRANSPORT AND WORKS ACT 1992

ACQUISITION OF LAND ACT 1981

THE NETWORK RAIL (CAMBRIDGE RE-SIGNALLING) ORDER 202[]

The Inquiry was held on 12, 13, 14 and 17 April 2023 and was closed in writing on 21 June 2023

File Ref: DPI/E0535/22/11

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List of Abbreviations used in this Report

AHB	Automatic Half Barrier
ALCRM	All Level Crossing Risk Model
AM	morning
BCR	Benefit Cost Ratio
CCTV	Closed Circuit Television
DfT	Department for Transport
DLUHC	Department of Levelling Up Housing and Communities
EIA	Environmental Impact Assessment
GDPO	General Permitted Development Order
ISRP	Infrastructure System Review Panel
M	million
m	metres
MCB-CCTV	Manually Controlled Barrier monitored by CCTV
MCB-OD	Manually Controlled Barrier monitored by Obstacle Detection
MGH	Manned Gate Hand-Operated
MHCLG	Ministry of Housing Communities and Local Government, now Department of Levelling Up Housing and Communities
ORR	Office of Rail and Road
PM	afternoon
s	seconds
SoM	Statement of Matters
TWA	Transport and Works Act, 1992
TWAO	Transport and Works Act Order

CASE DETAILS
THE NETWORK RAIL (CAMBRIDGE RE-SIGNALLING) ORDER 202[]

- The Order would be made under sections 1 and 5 of the Transport and Works Act 1992.
- The application for the Order was made on 5 August 2022 and the Order was subsequently amended as detailed later in this report.
- The application, supporting documents and Inquiry documents are available at the following website: Inquiry documents - Gateley (gateleyhamer-pi.com)
- The Order would authorise Network Rail to stop-up sections of certain streets and to (i) permanently acquire (ii) permanently acquire rights over (iii) temporarily acquire (iv) temporarily acquire rights over and (v) extinguish public and private rights of way over various parcels of land to enable the construction and operation of a scheme of re-signalling of the railway in the Cambridge area and to upgrade a number of level crossings.
- There were 28 objections to the Order outstanding at the close of the Inquiry.

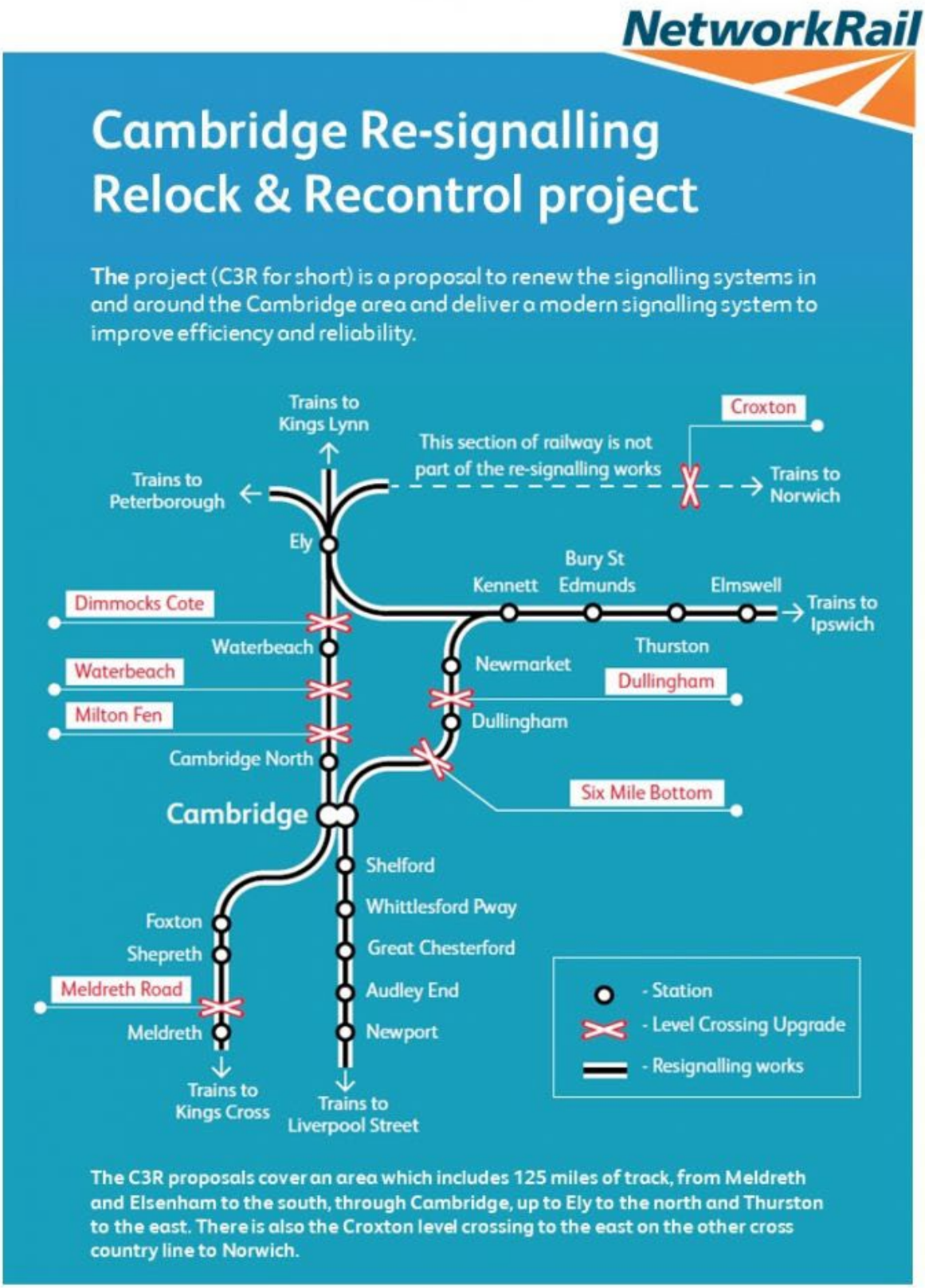
Summary of Recommendations:

That the Network Rail (Cambridge Re-Signalling) Order 202[] is modified and then made.

1 INTRODUCTION

1.1 The Order applicant is Network Rail Infrastructure Limited, a regulated statutory undertaker that owns and operates the national rail infrastructure network of Great Britain.

1.2 The Draft Order provides for Network Rail to stop-up sections of certain streets and to (i) permanently acquire (ii) permanently acquire rights over (iii) temporarily acquire (iv) temporarily acquire rights over and (v) extinguish public and private rights of way over various parcels of land. References to compulsory purchase and compulsory acquisition in this report refer to all elements of (i) to (v) as detailed above. The purpose of the Order is to enable the construction and operation of a scheme of re-signalling of the railway in the Cambridge area and to upgrade (with the aim of improving the safety of) seven level crossings at Meldreth Road, Six Mile Bottom, Dullingham, Milton Fen, Waterbeach, Dimmock's Cote and Croxton. The geographical extent of the re-signalling works, which covers around 125 miles of track, and the location of the level crossings to be upgraded are shown in the diagram below. The sections of street and parcels of land which are the subject of the Order are shown in the Deposited Land Plans (APP-53)


NetworkRail
Cambridge Re-signalling
Relock & Recontrol project
The project (C3R for short) is a proposal to renew the signalling systems in and around the Cambridge area and deliver a modern signalling system to improve efficiency and reliability.
Trains to Kings Lynn
Croxton
This section of railway is not part of the re-signalling works
Trains to Peterborough
Trains to Norwich
Ely
Bury St Edmunds
Kennett
Elmswell
Trains to Ipswich
Dimmocks Cote
Waterbeach
Thurston
Newmarket
Waterbeach
Dullingham
Milton Fen
Dullingham
Cambridge North
Six Mile Bottom
Cambridge
Shelford
Whittlesford Pway
Foxton
Great Chesterford
Shepreth
Meldreth Road
Audley End
Meldreth
Newport
Trains to Kings Cross
Trains to Liverpool Street
- Station
- Level Crossing Upgrade
- Resignalling works
The C3R proposals cover an area which includes 125 miles of track, from Meldreth and Elsenham to the south, through Cambridge, up to Ely to the north and Thurston to the east. There is also the Croxton level crossing to the east on the other cross country line to Norwich.

1.3 Acquisition of land/rights over land, and physical works are proposed at the seven, abovementioned, level crossings together with the provision of an equipment building and associated access at the Hauxton Road, Foxton level crossing where no change to the operation of the crossing itself is proposed. Additionally, the Order provides for the permanent acquisition of a small parcel of land at Long Road which forms part of an access to the railway and the ownership of which cannot be ascertained.

1.4 As submitted the draft Order included powers to stop-up sections of street to facilitate the scheme at Meldreth Road, Six Mile Bottom, Dullingham, Milton Fen, Waterbeach and Croxton level crossings. Network Rail has proposed a number of changes to the Order prior to the commencement of the Inquiry, in response to objections which have subsequently been withdrawn. These changes delete some, and alter the extent of other, sections of street to be stopped up. The changes also include the deletion of an incorrect reference to a planning permission in connection with works at Six Mile Bottom. The final versions of the submission documents are Draft Order (APP-50), Book of Reference (APP-52) and Deposited Land Plans (APP-53). Whilst consultation has not been carried out on these changes, they are of very limited scope and I am satisfied that no prejudice is likely to be caused by the Secretary of State reaching a decision on whether or not to make the Order on the basis of these changes.

The re-signalling and level crossings upgrade scheme

1.5 In essence the re-signalling work involves the replacement of the life-expired mechanical railway signalling system in the Cambridge area, dating from the 1980s, with a modern digital signalling system managed from the centralised Power Signal Box at Cambridge station. The purpose of this work is to prevent reduced capacity and poor reliability on the railway arising from signalling failures.

1.6 The level crossing upgrades involve the replacement of Automatic Half Barrier (AHB) crossings[1] with an MCB-CCTV (Manually Controlled Barrier monitored by CCTV) at Meldreth Road crossing and MCB-OD (Manually Controlled Barrier monitored by obstacle detection) at the other six level crossings.

1.7 The existing AHB crossings have barriers across half the width of the road (facing the oncoming vehicular traffic). The closure of the barriers is automatically triggered by an approaching train, but there is no means of detecting any vehicle, pedestrian or other obstacle on the railway line at the crossing, other than by the train driver's sight. The speed and proximity of the train is likely to mean that the driver is unlikely to be able to halt the train before confronting any obstruction on the line at the crossing.

1.8 The proposed MCB-OD/CCTV crossings would have barriers across the full width of the road, reducing the potential for vehicles, pedestrians and other obstacles to get on to the railway line once the barriers are closed. The closure of the barriers would be automatically triggered by an approaching train, but signalling would prevent the train from proceeding towards the level crossing

[1] Manned Gate Hand-Operated (MGH) is currently in place at the Dullingham crossing

until an obstacle detection system (in respect of the MCB-OD crossings) or CCTV monitored by signalling staff (in respect of the MCB-CCTV crossing) have shown there to be no obstacles on the line.

1.9 Collisions between trains and vehicles, pedestrians or other obstacles are therefore significantly less likely at the proposed MCB-OD/CCTV crossings than at the existing AHB crossings. However, the barrier "downtime" is generally significantly longer at the proposed MCB-OD/CCTV crossings than at the existing AHB ones. In essence this is because of the time required for obstacles to be detected and trains travelling at speed to be halted at a signal in advance of the level crossing if necessary.

Other Statutory Consents

1.10 The proposed Order would provide for Network Rail to acquire ownership of, or rights over, land and to stop-up sections of street to enable the installation, operation and maintenance of new equipment/structures essential to the re-signalling and level crossing upgrades scheme. In terms of Town and Country Planning Act consents, Network Rail contends that the equipment/structures at some of the locations are "Permitted Development", subject to Prior Notification, as defined by the General Permitted Development Order 2015 (as amended) (GDPO) and I have seen nothing to suggest that this is not correct. Under the GDPO some of the equipment/structures are permitted development subject to "Prior Approval" whilst others require express planning consent. The necessary prior approvals and consents have been secured as follows:

- Milton Fen – Permitted Development subject to Prior Notification made on 24 November 2022
- Six Mile Bottom – Permitted Development subject to Prior Notification made on 24 November 2022
- Waterbeach– Permitted Development subject to Prior Notification made on 24 November 2022
- Dullingham – Prior Approval (Ref 23/00048/P18) granted by East Cambridgeshire District Council on 29 March 2023
- Dimmock's Cote – Prior Approval (Ref 23/00043/P18) granted by East Cambridgeshire District Council on 28 March 2023
- Croxton – Planning Permission (Ref 3PL/2022/1442/F) granted by Breckland Council on 2 March 2023
- Meldreth – Planning Permission (Ref 22/05204/FUL) granted by South Cambridgeshire District Council on 25 May 2023
- Hauxton Road, Foxton – Planning Permission (Ref 22/05163/FUL) granted by South Cambridgeshire District Council on 13 April 2023

1.11 As stated above no physical works are proposed in connection with the proposed acquisition of land at Long Road and there is, thus, no requirement for any other statutory consents in respect of this location.

1.12 Screening Opinions Requests demonstrate that none of the work requires an Environmental Impact Assessment (EIA).

1.13 Level Crossing Orders, under the 1983 Level Crossings Act are likely to be required for each of the level crossing upgrades. Depending on the precise circumstances these Orders are made either by the Secretary of State himself or, under an agency agreement, on his behalf by the Office of Rail and Road, with the intention of providing for the protection of those using the level crossing. Section 2 of the Level Crossings Act states that the Order "may make such provision as the Secretary of State considers necessary or expedient for the safety or convenience of those using the crossing".

1.14 At the Inquiry Network Rail stated that it did not propose to formally apply for the necessary Level Crossing Orders unless and until this Order is made.

Statement of Matters

1.15 On 8 March 2023 the Department for Transport (DfT) issued a Statement of Matters pursuant to rule 7(6) of the Transport and Works (Inquiries Procedure) Rules 2004. The Statement sets out the matters about which the Secretary of State particularly wishes to be informed in respect of the application for the Order:

1) The aims and objectives of, and the need for, the proposed Cambridge Re-signalling (the scheme), including its effects on railway operations.

2) The main alternative options considered by Network Rail and the reasons for choosing the preferred option set out in the Order.

3) The likely impact of the exercise of the powers in the proposed Transport and Works Act Order (TWAO) scheme on local businesses, residents and crossing users. Consideration under this heading should include, on a crossing-by-crossing basis:

    i. The safety of crossing users.

    ii. The impacts of the changes on crossing users including motorised vehicles, pedestrians, cyclists and other non-motorised users. This should include the applicant's modelling on the scheme's effects on journey time, congestion, air pollution, accessibility for different groups, access arrangements (including the effect of changes to downtimes on access to stations) and the blue light routes for emergency traffic.

    iii. The impact on designated sites and species including sites of special scientific interest, scheduled ancient monuments, trees subject to tree preservation orders, and listed buildings.

    iv. The impact on the current owners and occupiers of the land to be acquired, including their amenity, access arrangements, and ability to carry out maintenance.

4) The impacts and interaction of the scheme with future planned developments including at Waterbeach New Town.

5) The effects of the scheme on statutory undertakers, statutory utilities and other utility providers and their ability to carry out their undertakings effectively, safely and in compliance with any statutory or contractual obligations and the protective provisions afforded to them.

6) Having regard to the criteria for justifying compulsory purchase powers in paragraphs 12-15 of the MHCLG Guidance on the "Compulsory purchase process and the Crichel Down Rules for the disposal of surplus land acquired by, or under the threat of, compulsion" published on 29 October 2015 (as amended on 28 February 2018)[2]:

    i. Whether there is a compelling case in the public interest to justify conferring on Network Rail powers to compulsorily acquire and use land for the purposes of the scheme.

    ii. Whether the purposes for which the compulsory purchase powers are sought are sufficient to justify interfering with the human rights of those with an interest in the land affected (having regard to the Human Rights Act).

    iii. Whether there are likely to be any impediments to Network Rail exercising the powers contained within the Order, including the availability of funding.

    iv. Whether all the land and rights over land which Network Rail has applied for is necessary to implement the scheme.

7) The outcome of the two planning applications currently being considered by the Local Planning Authority.

8) Whether all statutory procedural requirements have been complied with.

9) Any other matters which may be raised at the Inquiry which may be important and relevant to the Secretary of State's decision.

Note: due to repetition in the numbering of the Statement of Matters as originally published, the numbers set out above and referred to elsewhere in this report are different from those originally published.

Objections

1.16 31 objections and five representations to the Draft Order were received by DfT. Three objections (from Cambridgeshire County Council, Norfolk County Council and Kilverstone Estate LLP) were withdrawn prior to, or during the course of, the Inquiry.

1.17 Of the outstanding 28 objections one is from the owners/occupiers of land who would be directly affected by the Order's provisions for Network Rail to acquire

[2] Now Department of Levelling Up Housing and Communities' "Guidance on Compulsory purchase process and The Crichel Down Rules" of July 2019

land or rights over land at/close to the Six Mile Bottom level crossing. In brief this raises concerns about noise, disturbance, safety/security and access arrangements, privacy and residential parking space. In summary the remaining objections concern:

- The need for, and impact on the character and environment of the area of, the proposed service yard at the Meldreth Road level crossing.
- With particular respect to the Meldreth Road, Milton Fen and Waterbeach level crossings, the accuracy of the forecasts of barrier "downtimes" and consequent delays to vehicular and pedestrian traffic, and whether or not the delays would be outweighed by the likely safety benefits of the level crossing upgrades.

Compliance with Statutory Procedural Requirements

1.18 At the Inquiry, and with reference to its submitted Note of Compliance (APP-67), Network Rail confirmed that it had complied with all relevant statutory requirements in promoting the Order. Specifically, the Note details how Network Rail complied with its obligations under the Transport and Works (Applications and Objections Procedure) (England and Wales) Rules 2006 and the Transport and Works (Inquiries Procedure) Rules 2004 to:

- identify all those affected by the proposed Order;
- publicise and notify owners, occupiers and others about the application for the proposed Order;
- make information about the proposed Order available for inspection;
- serve a Statement of Case on the Secretary of State together with copies of documents to be referred to;
- serve a Statement of Case on each statutory objector and others together with a list of those documents to be referred to;
- give notice of where the Statement of Case and those documents referred to in it can be inspected;
- publicise details of the Inquiry; and
- serve proofs of evidence.

1.19 An affidavit prepared in compliance with rule 10(8) of the Application Rules which formally prove Network Rail's compliance with the Application Rules has been sworn by Emily Victoria Jane Williams of Addleshaw Goddard LLP. It was submitted to the Department for Transport and is appended to the Note of Compliance.

1.20 Whilst some objectors have argued that more extensive consultation on the proposed Order and the related scheme should have been undertaken, I have seen no evidence that the statutory requirements in this respect were not met. In the light of this, and the Note of Compliance, I am satisfied that

Network Rail has complied with all statutory procedural requirements in promoting the Order.

The Report

1.21 The remainder of this report sets out the gist of the objectors' and applicant's cases in respect of the proposed Order and my conclusions and recommendations to the Secretary of State. In reaching my conclusions I have had due regard to the aims expressed in S149(1) of the Equality Act 2010.

2 THE CASES FOR THE OBJECTORS TO THE ORDER

A Parmee – written objection (OBJ-13)

2.1 His property adjoins the railway at the Meldreth Road level crossing and part of his garden is to be acquired through the Order (land parcels 003 and 004). [Inspector Note: Network Rail contend that land parcels 003 and 004 are not owned by Mr Parmee as detailed in a letter to him (INQ-03). In the absence of any reply, or other evidence, to the contrary there is no reason to believe that these parcels of land are in Mr Parmee's ownership].

He objects to the Order for the following reasons:

- The scheme will include large lights which are likely to cause light pollution to his home when currently there is minimal lighting at the level crossing.
- The proposed service yard at the level crossing is likely to result in an increase in vehicle movements, including at night, which will cause disturbance. There is already a large Network Rail service yard at the other end of the village so there would not appear to be a need for another in this location.
- He is concerned at a loss of privacy in his property arising from the CCTV which would be installed at the upgraded crossing.
- The scheme will result in the loss of mature vegetation which provides screening between his property and the railway line.
- More widely, the level crossing currently operates efficiently and, as far as he is aware, there is almost no evidence of accidents or dangerous occurrences at it. Based on the experience of other similarly upgraded level crossings he strongly contests Network Rail's forecasts of barrier downtime for the Meldreth Road crossing. Longer barrier downtime will result in bigger queues of traffic making it more difficult for him to enter and exit from his property and cause pollution from vehicles with idling engines. He also fears that drivers will rush to get through the crossing, because of the longer barrier downtime, leading to more, not fewer, accidents.

P and S Woodley – written objection (OBJ-22)

2.2 On behalf of their family, which includes two children under five years of age, they object to the re-signalling project at Six Mile Bottom level crossing:

- Network Rail propose to acquire ownership of/rights over land which is currently used for the parking of their own and their neighbour's vehicles (land parcels 300, 305, 306 and 310). Under the adaptions proposed they will no longer be able to turn round in their parking area. Consequently, they will have to drive past their house and turn around in a busy shop car park to enable them to reverse park on their property. Being a busy 40mph road it is highly dangerous to reverse out on to the road.

- The new right of way over their property for their neighbour will bring them closer to their home giving them a clear view into it with an increased risk of it being hit by a vehicle, potentially putting their lives at risk.
- The scheme includes a new pedestrian access for maintenance of the Network Rail equipment across their property. They feel this will be very intrusive and gives them concerns for their safety and they will be unable to provide any security for their parking area.
- The crossing's signals currently disturb them throughout their property. They understand that as a result of the upgrade it will sound louder and for longer and the lights will be brighter.
- The level crossing upgrade will cause longer delays to traffic on an already very busy road. This will cause delays to them in general day to day life, is likely to increase their costs and outgoings and may necessitate a change to their childcare arrangements.
- They have significant concerns for the safety of their children during the construction work when they may be unable to park at their property and construction work will be ongoing very close to their home.
- As a result of these issues they also believe that the scheme will devalue their property.

J Grant for the Fen Line Users Association – written objection (OBJ-14) and spoke at the Inquiry

2.3 The Fen Line Users Association represents users of the railway between Cambridge and King's Lynn and they strongly support renewal and modernisation of the signalling system. However, they object to the conversion of the level crossing at Waterbeach station to full barriers without providing an alternative means for passengers to cross the line. This crossing is used by passengers arriving from the village to catch trains to Cambridge and London, and by those who have parked in the car park wishing to catch trains towards Ely and King's Lynn.

2.4 It will also be used by the shuttle bus, due to commence service in 2023, linking the station to the new town and the Research Park. The bus needs to cross the railway to reach a place where it can turn round. They note that Network Rail assumes the station will be closed to passengers by the time the crossing is converted. Closure was originally proposed more than 20 years ago, and the date has slipped repeatedly since then. At one time the replacement station was expected to open in time to support the 8-car service to King's Lynn which began in 2020, but when it was clear that date would not be met the platforms at the current station were lengthened. The most recent proposal is for December 2025, so the current station would be open for at least two and a half years from the planned date for conversion of the crossing, probably longer.

2.5 The effect on train passengers, which is not addressed in the modelling, therefore needs to be taken into account. With the current crossing, the barriers can go down for a train in one direction and then stay down for a train in the other direction. They always go up when the second train has passed through, because it is not possible for a third train to follow the first one closely enough to keep them down. This is because the maximum time the barriers can be down in this scenario is about two and a half minutes, whereas the minimum gap between two trains in the same direction is about four minutes. They expect that with the proposed full-barrier crossing the downtime would be enough that a third train could be approaching by the time the second has passed through, keeping the road closed and preventing passengers crossing. And the barriers could then stay down for a fourth train, and a fifth, or more, as has been seen at other full-barrier crossings.

2.6 Although the proposed crossing is described as "Manually Controlled Barriers" they understand that it would be operated automatically, in which case it must be possible to provide more accurate timings than the estimates in Network Rail's reports on its modelling. At other crossings at similar locations the barriers can be down for 15 minutes or more, and in the absence of better information they have to assume the same will be the case here. Currently, many passengers arrive from the village two or three minutes before the train is expected.

2.7 They request that Network Rail modify the project so that passengers have the same certainty that they will be able to cross the line to catch trains that they have at present, for instance by retaining the AHB or by providing a footbridge or underpass.

J Alderson – written objection (OBJ-31) and spoke at the Inquiry

2.8 He wishes to help Network Rail wherever possible by suggesting solutions. He is extremely supportive of the railway, and he trusts that Network Rail and its advocate recognises and appreciates that. However, that does not mean that he gives Network Rail carte blanche to do anything it likes without considering the impact to rail users, road users, the environment and society in general. Hence, his objection.

2.9 He wants to see the maximum number of trains on a route, which helps the finances of the railway and benefits society by modal shift from car to train. The only way you can maximise services on a route with level crossings is to minimise the barrier downtime, since rail and road traffic must co-exist. He does not want to appear unconcerned about safety on the railway. He has raised with the Train Operating Company management his concern about cars passing close to pedestrians at Waterbeach station, where the walking area is quite narrow. This has still not been addressed. The railway is not blamed for road accidents that occur close to the railway but when it involves a train they are. This surely affects the choice of which types of safety risks the railway chooses to act upon, and which it chooses to ignore.

2.10 A way of reducing the number of pedestrians using Waterbeach level crossing is to ensure that the ticket machines on both platforms are working all the time; Great Northern has failed to achieve this. This is not the responsibility of

Network Rail, although may be once subsumed into Great British Railways. He asks that the importance of working ticket machines is mentioned in my report as it is something the DfT can manage.

2.11 In terms of the modelling of the operation of the crossing, there is no model in the world that will tell you what he will do. If Waterbeach station level crossing is converted to full barrier then he will cease to use the station car park, which will mean a small loss of income to the railway. Instead, he will park either at the village green or outside people's homes, adding to the congestion, as he will have no practical alternative. He is not prepared to reach Waterbeach 20 minutes (rather than five or six minutes at present) before his train is due to be certain of being able to park in the station car park and walk over the crossing to the down platform in time (King's Lynn has only an hourly service so he cannot take a risk of missing it).

2.12 Much has been made of barrier downtime, but it is only part of the story. Delay time matters. An AHB results in a short queue of cars. Full barriers result in much longer queues. This has a non-linear effect. We must remember that when the barrier rises only the first car can move. There will be a compounding delay before the second and subsequent cars move. If there is, say, a five-second human delay before each movement, then in a queue of 20 cars the last car would start moving 95 seconds after the first. Therefore, it is likely that the twentieth stationary car in the queue would take two minutes before it reaches the level crossing. This optimistically assumes that there are no parked cars, which drivers must manoeuvre around. There are always obstructions in Station Road.

2.13 With an AHB there are usually a few oncoming cars, but with a full barrier it could be a continuous stream of oncoming cars. This delay is on top of the time spent waiting whilst the barriers are down. He is not going to challenge Network Rail's modelling, as this has been adequately covered by other objectors. But he is convinced that there will be occasions when the queue of cars will stretch back all the way along Car Dyke Road to the junction with the A10 road.

2.14 The mitigation he proposes is that Network Rail may not be permitted to convert the level crossing to full barrier until the new Waterbeach Town station has been opened (at which time the existing station will be closed). According to evidence today, the level crossing conversion is planned for 2025 and the new station will be open by December 2025. Delaying the conversion a few months hardly seems a problem. It is in Network Rail's hands to open the new station earlier.

2.15 As stated in his objection, he also regularly walks across the railway at Milton Fen for leisure purposes. He does so when the weather is good. Of course, the weather can change during his walk. If he gets wet then it is his fault, he has only himself to blame. However, if he finds himself being drenched for four minutes, whilst stuck behind a full-barrier crossing, he will be cursing Network Rail. He does not oppose a full barrier here, but he proposes a simple, cheap mitigation. A new equipment box will be installed on the village side and once commissioned the old AHB equipment box on the river side will be removed, leaving an unused concrete base. He asks that Network Rail should install a

bench seat with a basic shelter (either bus stop style or something more fitting the countryside) for people trapped behind the barrier. Walkers will still get wet in the rain, but hopefully not as much, especially not those who live close to the crossing. Network Rail will be seen to be a good neighbour to the community.

2.16 Finally, he asks me to offer Network Rail the following piece of advice in my report. He knows from talking to Network Rail people that its development teams tend to work in silos and often have little knowledge of other schemes in the area. Moreover, they often have no understanding of the deficiencies of the railway, and simply do the job they have been tasked without consulting their colleagues about what else could be done. In his objection, he suggested that some small enhancements could be done at the same time as the re-signalling work, particularly reinstating a short section of double track at Chippenham junction to enable a Cambridge-bound train to leave the mainline, enabling the train behind it (possibly a freight train) to continue without delay. Avoiding knock-on delays is important because of the long single-track section between Soham and Ely. This simple enhancement would also generate a time saving to passengers, as the stationary trains will then be closer to Newmarket station whilst waiting for the train from Cambridge to pass it. Doing work at the same time can change the economics of a previously unaffordable enhancement. [Inspector Note: as this is a matter not of direct relevance to the provisions of the Order, and may well require statutory powers of its own, I have not commented on it in my Conclusions or Recommendations.]

2.17 He will comment on my observations of Waterbeach level crossing yesterday, he was a daily commuter at Waterbeach from July 2008 to March 2011. He does not recount seeing a single so-called 'misuse' of the level crossing, although he accepts my entirely valid point that he may have been preoccupied on many occasions. He has seen so-called incidents only a handful of times as a leisure traveller since then. On one occasion he started to cross after the audible alarm had begun and he had not fully crossed when a southbound train appeared in the distance, although there was no risk to him whatsoever as the train took a further 30 seconds, or so, to reach the level crossing. Even so, the driver used their horn. The evidence refers to 'incidents', almost all of which are crossing 'misuse' without any consequences to anyone. What we really care about are four specific types of incidents: a) deaths, b) injuries, c) damage to a train that has hit an object and d) train driver distress. Those (and scary near misses) are the only incidents that have anything to do with safety.

Professor Roger James (OBJ-27) who spoke at the Inquiry for Meldreth Parish Council

2.18 He is the vice-chair of Meldreth Parish Council and a resident of Meldreth. His professional background and qualifications in the field of Operations Research include a background in the modelling of stochastic process – reflected here by estimated delays for traffic under the Do-Something Scenario. Meldreth is a village with a population of 2,000 from which the major exit route to the East, towards Cambridge (their nearest centre of population), is along Meldreth Road and makes use of the level crossing. As a village they have a greater

than the national average of car ownership and they surmise from the 2021 census data that it is a route for many villagers working in the Cambridge district.

2.19 In summary their objection is not on the principle or need for additional protection at the level crossing but on the detail of proposed changes. Specifically, it is a reaction to, and analysis of, the traffic modelling information provided in the Network Rail letter dated 23 November and titled ref: Cambridge Re-signalling, Relock and Recontrol (C3R) programme – Network Rail's response to objections against proposed upgrade of the Meldreth Road level crossing. (APP-W4-2, page 271). Their objection is that the data presented in this reply, in essence that the existing average barrier downtime at Meldreth Road of 62 seconds would increase to 169 seconds, is inappropriate and inaccurate. It fails to make the case for the technical solution or to reassure residents that the changes will have a 'minor' impact on local residents and the commercial life of the area.

2.20 Fundamentally substantive issues with the modelling work need to be addressed – the style and presentation of the modelling work is wrong. These are not just aspects of detail but are a fundamental challenge to the approach used by Network Rail. The scheme is presented as an upgrade but it represents a significant downgrade to the local residents and users of Meldreth Road.

2.21 Analysis of the Network Rail barrier downtime data suggests the period for which the barrier will be closed will rise from 10 minutes per hour to 33 minutes per hour. Whilst they can assume that vehicles arrive 'at random' during the hour they already know that the arrival of the trains is not random. If the traffic pattern of the trains is spread evenly through the hour this would produce a period of 2min 24 seconds down followed by 2 mins 25 seconds open. Instead, they know the trains do not arrive at equal periods through the hour, there is a clustering around two 30-minute periods. If this clustering is concentrated this would produce a pattern of 16 minutes closed followed by 13 minutes open. It is this 'synchronisation' of closures which leads directly to the problems reported at Shepreth station and there is no evidence that such realistic understanding of the train traffic patterns are incorporated in the modelling work.

2.22 The problem of traffic delays is not amenable to definitive conclusions such as those presented in the report; it is a stochastic process and categorical reassurances cannot be given nor should averages be used. The Network Rail letter presents the modelling 'evidence' with a confidence that is unwarranted. The situation being addressed is characterised by 'nearly' random events – the arrival of cars at the level crossing likely to be delayed and the arrival of the trains which necessitate closure. It is their common experience that traffic flows, such as gridlocks or rush hour, exhibit smooth predictable behaviour with increasing traffic loads up to a limit at which suddenly a catastrophic change is triggered and the system goes into gridlock.

2.23 In designing for the prediction of such failure from such 'random arrivals' we need to be aware of the science of stochastic processes: which are defined as "having a random probability distribution or pattern that may be analysed

statistically but may not be predicted precisely". We are all familiar with understanding the results of such investigations – typically it is to describe the event and then the frequency of the event. In situations such as this it would be something along the lines of "delays of over 15 minutes are to be expected once in 10 days". We are also familiar with the correct way to report estimates for a stochastic process, we do not use the mean ("average delays" are suggested in the Network Rail response) but the extremes (1 in 20 rush hour cars will be subject to a delay exceeding 10 minutes, 1 in 50 a delay exceeding 20 minutes). All of these estimates will be reliant on the quality of the data used in the study – the old adage is garbage in garbage out and this will be discussed next.

2.24 The 'real world data' on which the modelling was based is incomplete and unrepresentative. It is assumed that the timings and duration of closures is 'as per timetable' and does not consider the drift and clustering of train arrivals/closures which are observed in practice. The consequence of this, tipping the situation into gridlock, has been discussed earlier. The road traffic survey data is from July 2021 and April 2022; the first is markedly unrepresentative as a consequence of the pandemic. There is no data provided on the timing, duration and circumstances of the data used as representative of the situation. They know from their experience that it is the 'extreme ends' of the distribution which drives the extremes of waiting times. It is common practice in the science of modelling stochastic processes, and the observed failures, to evaluate and report on the 'worst-case scenario'. There is nothing in the report to provide such understanding or assurances on the validity and limitations of the modelling.

2.25 It is a matter of record for the Parish Council that when the nearby crossing adjacent to Shepreth station was similarly 'upgraded' (2018) the traffic delays and congestion to traffic between Shepreth and Barrington were significant with delays up to 20 minutes regularly reported. There was no impact assessment from Network Rail for this earlier change and no evidence that the observed phenomenon was predicted by the model used for Meldreth Road. The nature of the local road topology means there are greater traffic volumes from Meldreth to Shepreth than from Barrington to Shepreth which is likely to produce worse consequences. Under the current proposals local residents making the journey from Meldreth to Barrington will be subjected to the 'double whammy' of delays on Meldreth Road and then further delays at Shepreth station. There is an alternative route via Orwell but this is significantly longer.

2.26 There is no evidence provided that the 'improved system' (ie the upgraded crossing) actually requires a three times increase in the crossing closure times. Given that, to the layperson, the upgrade involves replacing the closing of a single barrier to the closing of a double barrier, there is no prima facie case to be made. If, however, the scheme represents a covert way of making life easier for the railway companies at the expense of the rights of way of the local population, this should be openly presented and open to inspection. After all, if the road were to be closed completely it would be much easier for the railway! If indeed this is a real reason for this significant increase, and the threat to the freedoms of the road users, then an impact assessment of why

this is required and the alternatives to mitigate the very real downsides should be part of the proposal. To say there is no 'appreciable' impact on the local population has already been proved to be wrong and the case for a threefold delay has not been made.

Hugh Wood on behalf of both himself and Shepreth Parish Council – written objections (OBJ-17 and OBJ-25) and spoke at the Inquiry

2.27 Hugh Wood and Shepreth Parish Council both object to the planned conversion of the half barriers at Meldreth Road level crossing to full barriers. The proposal will increase congestion in the village through substantially increased downtimes, increase the difficulty of traffic flow and the risk of speeding in one of the most densely populated parts of the village. There will also be a deterioration in air quality. In their opinion, the risks of such change outweigh the minimal safety benefits that will accrue.

2.28 Firstly, there has not been proper consultation; the large majority of the village were unaware of the original 2021 consultation. There was no poster visible to motorists at the barrier or within the village and no information meetings were held locally. Even people living immediately adjacent to the crossing were unaware with the only exception of the house affected by land purchase. They are unaware of anyone in Meldreth who received a leaflet. The proof of this lack of awareness is the fact that only 244 responses were made to the total scheme for all the crossings and only 31 of these related to the Meldreth Road level crossing, the majority of which it seems were negative.

2.29 Furthermore, they are of the opinion that the data underlying the conclusion that the effects on the village will be "minimal" is seriously flawed, being either contradictory, based on averages from other areas or inaccurate. As a minimum, they require consistent data, specific to the Meldreth Road and Shepreth crossings, be collected, analysed and presented in a transparent and accessible manner before any final decision is made.

2.30 A reading of "The Performance Report-Level Crossing Study" (APP-39) illustrates the data problem. On page 11, we read: "A set of absolute minimum barrier closure times for each crossing, with the exception of Meldreth Road where the times are proposed to be in line with the Shepreth crossing." Yet on page 12, in conflict with the statement on page 11, we are told: "For the Meldreth level crossing, as no other data is available, the barrier down time has been based on the average time from all of the other level crossings." [Inspector's Note: at the Inquiry Network Rail confirmed the page 12 statement to be an error. The minimum barrier time assumption for Meldreth Road is in line with the Shepreth crossing as stated on page 11.]

2.31 We are further told on page 44 of the APP-39 report "Network Rail undertook Traffic and Transport modelling for each of the seven no. level crossings". However "The Local Model Validation Report" (APP-58) contains a cursory one-day study of both the Meldreth Road and Shepreth level crossings. The data derived from this study appears to have been ignored. It is doubtless coincidental that this data points to longer downtimes than forecast and thus undermines the conclusion of a "minimal" impact on traffic.

2.32 The single point of clarity in this proposal is that its conclusions are based on confusing and conflicting information and there is no detailed, site-specific data on which to make a proper evidence-based evaluation. The current average downtime for Meldreth Road (based on those figures derived from other sites) quoted in Table 1.6 on page 12 of APP-39 is 169 seconds. The actual data in the Local Model Validation Report (APP-58) suggests an average downtime of 50 seconds. This difference means that the maximum incremental delay of 65 seconds as quoted in Table 9.1 on page 57 of the Performance Report is severely understated and should on this basis be 184 seconds.

2.33 This renders much of the modelling of traffic queues inaccurate, underlines the need for site-specific data and certainly undermines the conclusion that the impact of the proposal is "minimal". Data for Shepreth level crossing shown in the Local Model Validation Report (APP-58) suggests an average downtime of 208 seconds, with a maximum of 409 seconds. If the assumption on page 11 is to be used, the incremental downtime would likely be 158 seconds, with a maximum of 359 seconds, which is certainly not "minimal".

2.34 The above again reinforces the need for in-depth (ie more than a single day) accurate, site-specific information for both the Meldreth Road and Shepreth crossings. The failure to do so calls into question the integrity and validity of the proposal's conclusions.

2.35 There is further contradiction in Table 8.1 on Page 51 of the Performance Report (APP-39), where the data suggests that a 30 second delay in a train's arrival would trigger a downtime of 12 minutes, which again cannot be described as "minimal". This could pose a serious impediment for emergency services and the Parish Council requests an impact study on fire engine and ambulance routes before a decision is taken.

2.36 They further note on page 27 of the Consultation Report (APP-04) that: "In response to comments from the Highway Authorities (Cambridgeshire and Norfolk County Council) and Highways England[3], the Project has undertaken traffic surveys and modelling to assess the potential impacts of longer barrier downtimes at the upgraded level crossing works areas. Further engagement with these authorities has been undertaken to discuss the outcomes and findings of this modelling." This is curious as they are told above that data for Meldreth Road has not been collected. The data that has in fact been collected seems to have been discarded. They would like confirmation that the views of the various Transport Officers at District and County Council level have been sought as part of this consultation.

2.37 In terms of safety the Consultation Report (APP-04) states on page 7 that the outcomes of the All Level Crossing Risk Model (ALCRM) are shown in Appendix A. This is indeed true in that Meldreth Road level crossing is assigned a "D2" rating. There is, however, no explanation of how this evaluation is reached and no safety history of the crossing. Furthermore, we are told on Page 42 that: "Information based on the findings of the ALCRM for each of the seven no. level crossings was made available on request and could be viewed via

[3] Now National Highways

Network Rail's Level Crossing Safety page on their website". Other than the vague and unsupported rating described above, this is simply not the case and there is no source of, for example, historic incidents at Meldreth Road.

2.38 They are, however, grateful to a determined resident who has, under Freedom of Information legislation, winkled out some safety data on the Meldreth Road level crossing from Network Rail. Somewhat inevitably, this is poorly presented, poorly compiled and misleading. The spreadsheet provided suggests there have been 46 incidents on the level crossing since March 1997. A rather painstaking analysis gives a completely different picture, suggesting that of these 46: 19 were attributable to other crossings in the area; 17 involved equipment failure; and four were not relevant to the size of the barrier. On this basis, there have been six relevant incidents since 2002. Four involved individuals on the track (of which one was recorded as a near miss), though the narrative is inexact and it might be argued that at least three (including the near miss) may not have been prevented by a full barrier. The fifth was a marginal obstruction, and the sixth was an incident of a car zigzagging the crossing in 2018.

2.39 Thus there has, in the last 25 years, been only one incident that could definitively have been prevented by a full barrier and this was not classified as a near miss. They do not believe that this proposal can be justified on the grounds of a poor safety record at the Meldreth Road level crossing. It would be good to know whether or not the "D2" rating was derived from this inaccurate information.

2.40 The Meldreth Road level crossing is barely 200m from John Breay Close and the most densely populated area of Shepreth. They do not accept the downtime modelling of the Performance Report-Level Crossing Study (APP-39) for the reasons outlined above, believing these to be materially understated. They believe typical downtimes will be similar to Shepreth, where delays of up to 7 minutes are common, and a 10-minute wait is by no means unusual. This will lead to much longer queues than those forecast in the model and chaos as long lines of traffic try to negotiate a narrow residential street with many parked cars. Furthermore, they believe that it is inevitable, once drivers are aware of the new extended downtimes, that a minority will accelerate rapidly to try and beat the barrier descent and enter the residential area at high speeds. The proposal is thus designing-in a severe risk that does not currently exist.

2.41 The scheme will also lead to increased risk to the community in emergencies: Level Crossing Study – Modelling Methodology (APP-59) page 15, 2.8.3, states that "the level crossing… connects Meldreth to Shepreth. The only alternative route to these destinations would be along the A10 but this is a significant detour". In fact to reach the northern end of Meldreth via the other end of the village to avoid a long barrier downtime would involve circa 4 additional miles/6-7-minute drive for an ambulance or police car coming from Cambridge. In summary the proposed change would reduce a minimal risk on the rail but create much larger ones on the road and for the community in emergencies.

2.42 Furthermore, as a society we know we need to get out of our cars and into alternate transport. But a consequence of an increased downtime at Meldreth Road crossing, together with lengthy downtimes at Shepreth station crossing, and the lack of any bridge over the platform at Shepreth station will mean some journeys at least will divert to road. The real prospect of 5 min+ delays at one or both of the Meldreth Road crossing and Shepreth station will divert traffic from rail to road.

2.43 Overall they have no confidence in the traffic model and believe that the derived maximum queue length of 51m is woefully understated. Queues at Shepreth crossing have on occasion exceeded 300m. Yet again the absence of relevant data is potentially leading to a misinformed decision. The Parish Council further notes that the proposal is adjacent to a residential area on one side and a Site of Special Scientific Interest on the other. The reality of significantly longer queues than anticipated in the model means there will be increased pollution and deteriorating air quality. There does not appear to be an assessment of the impact of this on the surrounding environment. They would like to see the views of the relevant Environment Officers.

2.44 In conclusion they find that this proposal is under-researched and misleading and that a conclusion that will have a wide-ranging impact on the village is based on flawed data barely relevant to the Meldreth Road level crossing. They believe that the risks occasioned by the proposal, notably those involving road safety, emergency access and air quality, far outweigh any benefits that may accrue. They object in the strongest possible terms and call for a transparent and proper analysis of site-specific information for both Meldreth Road and Shepreth level crossings before any final decision is taken.

Roger Faires – written objection (OBJ-11) and spoke at the Inquiry

2.45 He is a Chartered Structural Engineer and a Fellow of the Institution of Structural Engineers; he is also an Affiliated Lecturer at Cambridge University, Department of Architecture. He lives south of the Meldreth Road level crossing in Meldreth and as such the Meldreth Road crossing is on one of his main routes north. His objections are solely in response to this level crossing.

2.46 The 2019 Risk Assessment for Meldreth Road AHB level crossing by, Sotera for Network Rail, (APP-14), page 39, states "Road closure time is an important parameter that impacts level crossing risk as well as utility. This is because a high road closure time can cause aggravation and frustration for users which can lead to increased misuse. Sotera has used a fairly simple model to estimate the potential impact of any upgrade to an MCB-type full barrier crossing (MCB-OD or MCB-CCTV). For Meldreth Road, this suggests that the busiest hour road closure time would increase from about 18% currently as an AHB level crossing to about 71% as shown in Figure 36.1."

2.47 The report goes on to state (Table 4, page 44) that an upgrade to an AHB+ type crossing would halve the current risk and (Table 11, page 57) that under an upgrade to the proposed MCB type crossing "Future busiest hour road closure time of Shepreth station and Meldreth Road may not be sustainable" .

2.48 One core reason he is objecting is that the Shepreth station crossing has already been "upgraded" and his personal experience with that change is that

it has caused disruption and changed his behaviour. Disruption from a level crossing is unpredictable, unlike traffic lights which are typically a known entity, the timings that a barrier is down is an unknown to the driver. This creates the frustration which the Risk Assessment (APP-14) speaks of.

2.49 Following a Freedom of Information request to Network Rail it has been confirmed that the upgraded Shepreth crossing has had three incidents from 2019-2021. He has witnessed cyclists weaving the barriers as the second set comes down and he can envisage this occurring on Meldreth Road with the large bike groups that use the road, with cyclists not wanting to be separated from the pack, as well as cars accelerating out of or into the village of Shepreth.

2.50 The issue with the traffic modelling carried out (APP-39) is not about the cars but about the train times. The barrier downtime is a function of three things – (i) the speed of the train; (ii) the distance from the signal that triggers the crossing to the level crossing; and (iii) any stoppages between the trigger and the level crossing. He does not believe the modelling takes this into account and the data used as a comparison is from a crossing at Hinxton which is further away from stations. He has not seen any data that compares the number of trains, distance to signals or line speeds from this Hinxton data to that of Meldreth Road.

2.51 Network Rail completed a risk assessment at Shepreth station prior to the upgrade. This calculated the barrier times using maths and included the longer time for the stopping trains with stopper trains creating a 240 second downtime. Looking at the output chart from the modelling (APP-39, page 52) at Meldreth Road the total blocks of downtime occupy almost 60% of the peak time, with a 6-minute block adjacent to a 5-minute block, separated by 30 seconds. What happens if the train proceeding the 30 second gap is a 240 second stopper and not the 169 second baseline? This would close that 30 second gap and give an 11 minute downtime.

2.52 11 minutes is excessive. It would frustrate him. It would frustrate most drivers. He therefore believes it would create at Meldreth Road the type of frustration and misuse we have experienced at Shepreth station level crossing and that Network Rail's own 2019 Risk Assessment warns against causing. There is no attempt to quantify this increased risk. Yet we know there are still incidents at Shepreth station level crossing. Where is this residual risk accounted for? As noted before, the signal positions that trigger the level crossing are key to the downtime. The issue at this level crossing is that the signals are the wrong side of the nearby stations.

2.53 The Meldreth Road Risk Assessment (APP-14) also reviews an AHB+ upgrade (Table 11, page 56), which is a similar cost but has much reduced downtime and halves current risk without increasing misuse from frustration.

2.54 Network Rail, in their response to his objections, suggest their modelling supersedes all previous modelling in risk assessments, including the Sotera modelling in APP-14. Whilst he understands the modelling has advanced for the modelling of vehicles, queues and traffic, the issue here is the modelling of the trains and the barrier times. The base data for that modelling is taken

from an unvalidated, unrelated station with the barrier downtimes modelled as an average time (169 seconds) for all trains regardless of where the signals are at Meldreth Road or if the train stops or not at Meldreth or Shepreth stations. This will not yield the worst-case scenario that then can be used to effectively critique the impact of the works and the residual risk of misuse.

2.55 In conclusion the alternative solutions of AHB+ or additional signals would be a better option to reduce residual risk from overly frustrated drivers. These options should be fully reviewed with respect to a complete data set of actual downtimes at the level crossing from the timetable rather than some abridged average-based chart.

Other written objections from those who did not appear at the Inquiry

2.56 In respect of the Meldreth Road crossing the following main issues are raised:

- There has been a lack of consultation with the local community. A public meeting requested by the Meldreth, Shepreth and Foxton Community Rail Partnership was scheduled for 14 September 2022 but cancelled by Network Rail due to the national period of mourning. There was no offer by Network Rail to rearrange it, and the consultation period was not extended to make up for lost time.
- There is no safety case for the barrier upgrade; the barrier currently operates efficiently; there is no evidence of any accidents at the crossing and the expenditure cannot be justified.
- The nearby level crossings at Shepreth and Foxton Stations were upgraded a few years ago and the delays to traffic are unacceptable. Pedestrians have been seen climbing over the barriers at Shepreth because of the length of the delays, worsening rather than improving safety.
- Long traffic tail backs will cause air pollution and inconvenience to drivers and local residents whose drives are blocked by queuing traffic.
- Emergency service vehicles will be delayed at the crossing.
- Drivers are likely to speed along Meldreth Road in order to "beat" the barriers coming down.

2.57 In respect of Milton Fen crossing concern is raised about delays due to increased barrier downtime by one objector who frequently walks across the crossing.

Other written representations

2.58 The Department for Transport categorised five other letters it received as representations. Four of these raise the following issues:

- Unacceptable delays to traffic likely to arise at the Meldreth Road level crossing which is unjustifiable when there have been no accidents. The delays at the recently upgraded crossing at Shepreth station are outrageous and have resulted in people missing trains.

- Querying the evidence supporting the level crossing upgrade at Six Mile Bottom.

2.59 The fifth letter (a joint representation on behalf of Cambridge City Council and South Cambridgeshire District Council) sets out a holding objection, pending further evidence from Network Rail to demonstrate that unacceptable impacts would not be caused, having particular regard to the following:

- Notwithstanding that the application for the proposed Order only confers powers to acquire land and does not consent the works to be carried out, the Councils consider it material to assess the impact of the intended works when commenting on this application. This is because the compulsory acquisition of land must be justified by the need for the works, and because the acquisition of land facilitates the use of permitted development rights and prior approval consents to carry out the works. Thus, the impact of intended works is intrinsic to the assessment of the acquisition of land which cannot be considered standalone.
- Whilst the principle of the scheme is supported the Councils consider that this should be balanced against the potential impacts of the scheme in terms of transport, access and safety, air quality and carbon emissions, and other environmental impacts.
- The Councils have not received confirmation that the applicant's modelling of barrier downtimes and impacts on traffic are supported by Cambridgeshire County Council as Highways Authority [Inspector's Note: email correspondence says they are satisfied with the modelling].
- The evidence on the current safety risk at the level crossings is unclear and it is not evident that safety risks arising from increased barrier downtimes have been taken into account.
- There is an absence of evidence in respect of the likely impact on air quality arising from increased numbers of queuing vehicles with idling engines, protected species, tree preservation orders, listed buildings and flooding.

3 THE CASE FOR NETWORK RAIL

Introduction

3.1 The purpose of the Order is to assist Network Rail deliver the Cambridge Re-signalling, Re-lock and Re-control project. This involves (a) renewing the life-expired signalling assets in the Cambridge "interlocking" area and the replacement of the 1980s mechanical signalling system with a modern digital system managed from the Power Signal Box at Cambridge station; and (b) providing for the upgrade of seven level crossings and ancillary works to deliver both safety and cost benefits when undertaken as part of the project. As updated in the oral evidence of Ms Heria, the project is not now planned to be commissioned until 2025.

3.2 The intended role of any Order granted as part of this application is relatively limited. The works themselves have been permitted under the planning process by either full planning permission or permitted development rights. In addition, the upgrades of the crossings themselves will be permitted through the Level Crossing Order process [Inspector Note: "will be permitted" is the phrase used by Network Rail and could be interpreted as implying that approval of the Level Crossing Order process is a foregone conclusion. Consequently, "would need to be permitted" would, in my view, be more accurate wording]. Rather, by this application Network Rail merely seeks powers to purchase rights in land compulsorily and to stop-up highways in order to enable the works referred to above and their subsequent operation.

Interaction of the Consenting Regimes

3.3 As set out in APP-07 the following consents, permissions or licences are required in order to commission the project:

- Planning permission for development associated with the upgrades to the level crossings, pursuant to the Town and Country Planning Act 1990 and the Town and Country Planning (General Permitted Development) (England) Order 2015.
- The Transport and Works Act Order which is the subject of this inquiry for the purpose of acquiring land rights and stopping-up highways.
- Level Crossing Orders, involving amendments to existing Level Crossing Orders, pursuant to s1 of the Level Crossings Act 1983.
- Potentially, further powers in relation to highways, involving Highways Orders, licences and permits.

3.4 Planning permission has now been obtained for all level crossings. [Inspector Note: as detailed in 1.10 above, whilst planning permission or prior approval has been secured for all aspects of the scheme (ie the level crossing upgrades and the re-signalling works) for which it is required, some of the level crossing upgrade works are permitted development and have, thus, not been the subject of a planning permission or prior approval.]

3.5 In relation to Level Crossing Orders (details of the statutory regime are set out in INQ-26), in essence the Secretary of State has the power to make an order providing for the protection of those using a level crossing, following either a request by the operator (ie Network Rail in this case) or of his own motion. Before an operator makes a request for an order, it must consult the Office of Rail and Road and the local traffic authority, any advice from whom the Secretary of State must take into account. Such an order may make provision as the Secretary of State considers necessary or expedient for the safety or convenience of those using the crossing. Once a Level Crossing Order has been made, the operator of the crossing is under a duty to ensure it is complied with. Subject to certain defences, it is a criminal offence for the operator to fail to comply.

3.6 Pursuant to an Agreement made between the Secretary of State, the Office of Rail and Road has agreed to perform the Order making function of the 1983 Act on behalf of the Secretary of State. [Inspector Note: the version of the Agreement which came into effect on 1 March 2023 indicates that in certain circumstances the Secretary of State will continue to exercise this function himself (Appendix C)].

3.7 Network Rail's position is that, as result of the planning regime and level crossings regime, there are some issues which ought not to be considered by the Inspector and Secretary of State for the purpose of the Transport and Works Act Order process. In particular, the highways impacts of the project are not a material consideration, or alternatively should be given minimal weight as part of the process, because the impact of development on the highways network is formally part of the separate planning regime.

3.8 When determining whether planning permission should be granted following a full planning application, Local Planning Authorities must consider a development's impact on the highway network. For example, the National Planning Policy Framework states that development can be refused on highways grounds "if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe". In respect of these highways impacts, the Local Planning Authority was obliged to take into consideration the views of the relevant expert, Cambridgeshire County Council as the Highways Authority.

3.9 In terms of those upgrades which Network Rail relies on permitted development rights, the Highways Authority has no formal involvement. But this is because Parliament has made the deliberate decision not to require highways impacts to be considered for development permitted by Parts 8 and 18 of Schedule 2 to the GPDO (on which Network Rail relies). In contrast, this is not the case for other parts of the GDPO which do not apply here. In circumstances where Parliament has made this deliberate decision in relation to Parts 8 and 18 of Schedule 2 to the GDPO, it would be inappropriate to carry out such highway assessment by the back-door as part of the TWAO process in the absence of an express requirement in the Transport and Works Act 1992.

3.10 In any event, in relation to those upgrades where full planning applications have been made (Croxton, Hauxton and Meldreth) and those in respect of

which Network Rail has relied on permitted development rights, the Highways Authority did consider the impacts of the upgrades and it made no objection – eg an email of 10 January 2023 from Cambridgeshire County Council to South Cambridgeshire District Council stated:

"From a transport strategy/planning point of view we don't have any further comments as the applications/notifications appear to do the same in traffic terms as the TWAO. There was no information attached to the applications/notifications in relation to traffic flows/transport modelling.

The modelling work was reviewed for the TWAO and we content with the methodology and content that the proposals would not have a significant impact."

3.11 In his Proof and expanded upon in his oral evidence, Mr Contentin referred to the fact that he had had several meetings with the Highways Authority discussing the methodology of his traffic modelling and results.

3.12 The impact of the upgrades on the highway network is also formally part of the separate Level Crossings Order regime. By s1(8)(a) of the 1983 Act, the Secretary of State must consult with the local traffic authority. As a matter of fact, Network Rail has been liaising with the local traffic authority at regular intervals.

3.13 As a result, Network Rail submits that the TWAO process is not the appropriate place to consider the highway impacts of the upgrades; by primary legislation, Parliament has designated two other consenting regimes to undertake that task. Alternatively minimal weight should be given to highways impacts that the Secretary of State considers will result from the upgrades.

The aims and objective of, and the need for, the proposed Cambridge Re-signalling, including its effect on railway operations

3.14 The need for the scheme is based on the following:

- The Cambridge interlocking is now life expired. It suffers from obsolete components, severe wire degradation and the Dullingham, Chippenham Junction and Bury St Edmunds signal boxes have reached the end of their useful lives. The effect of this is a decrease in asset reliability.
- Without the scheme there would be reduced capacity where increasing signalling failures would have the effect of putting certain routes or assets out of use.
- The seven level crossings proposed to be upgraded are considered to pose significant safety risks for users of the crossing and Network Rail staff.

3.15 The key objectives of the scheme are:

- To improve the performance, reliability and maintainability of the signalling infrastructure extending its life by 35 years and reducing equipment failures.

- To renew existing assets to enable safe operation of the railway. The proposed full renewal of existing interlocking and lineside equipment, including cabling, is by far the safest option. Moreover, the provision of axle counters, which count the trains coming in and out of a section of track, will provide a more reliable and robust system.
- To reduce the operational cost of the railway.
- To improve the safety of seven level crossings to a significant degree to enable compliance with the Office of Rail and Road's requirement to improve safety by moving away from automatic half-barrier crossings.
- To save costs and disruption to rail and road users by combining the re-signalling element of the scheme with the level crossing upgrades.
- For future-proofing, the scheme will enable the proposed Ely Area Capacity Enhancements and the Re-signalling of Peterborough – Ely – King's Lynn once funding them is received. It will also enable schemes for enhanced freight and cross-country passenger services and will make this area ready for "the digital railway" to be implemented in the future.
- To undertake all of the above as soon as possible. Funding has been agreed for the whole scheme to take place now and separating out the level crossing upgrades into a different project would lead to unknown delays. It is unclear when separate funding would be made available for the level crossing upgrades if they were taken out of the scope of the scheme.

The main alternative options considered and the reasons for choosing the preferred option set out in the Order

3.16 The scheme is fundamentally a renewal project and is seeking to bring up to modern standards assets that are several decades old. The only alternative would be not to undertake the renewal, which for the reasons set out above is no reasonable alternative at all.

3.17 In relation to the level crossings a menu of options was considered in the Narrative Risk Assessments for each crossing. Interventions such as footbridges were ruled out due to their cost. For example, the typical unit cost for footbridge installation is estimated at £6.9M. An underpass currently in development in Essex is estimated at £23M.

3.18 The level crossing upgrades are proposed to be undertaken as part of the wider re-signalling scheme, rather than individually and/or at a later date, in particular because:

- It will result in reduced impacts on train services and, therefore, the surrounding road network by avoiding the need to close lines or roads at a later date.
- It reduces the overall capital cost to do all the work at the same time. By way of example it would cost approximately £3.3M to undertake any of

the operations individually as opposed to around £2.4M if done as part of the overall scheme.

- It would delay to an unknown future time the upgrading of the level crossings and therefore the increased safety of crossing users, as a single source of funding has been agreed for the whole scheme. If the level crossing upgrades were removed from scope, it is unclear when alternative funding would be made available for them.

The likely impact of the exercise of the powers in the proposed Order on the safety of crossing users

3.19 Network Rail's position is that the safety of crossing users will be significantly improved by the upgrades to the level crossings. Currently, all the crossings have AHB, except for Dullingham which is Manned Gate Hand-Operated (MGH). Mr Prest (for Network Rail) describes AHB crossings as follows:

"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."

3.20 The main types of risk associated with these crossings are barrier weaving, blocking back over the crossing and poor behaviours from pedestrians. In addition, in respect of MGH crossings, there are additional risk of injury of, and abuse towards, staff members. The Narrative Risk Assessments set out in detail the risks posed by each of the crossings. In summary:

- Milton Fen – the All Level Crossing Risk Model (ALCRM) score is D2 making it a very high risk crossing and it is the eighth highest risk AHB crossing on the Anglia Route and 19th compared to all other AHBs in Great Britain. The crossing's main risk derives from the high number of pedestrians (eg pushchair users, the elderly, joggers, dog walkers etc) and cyclists who use the crossing, compared to its relatively low vehicle usage.

- Dimmock's Cote – the ALCRM score is E2 making it a very high risk crossing. 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.

- Six Mile Bottom – the ALCRM score is H4 making it a medium to high risk crossing.

- Dullingham – the ALCRM score is K7 making it a moderate risk crossing. This does not, however, reflect the risk to staff controlling the gates which is significant but unquantifiable in ALCRM terms. For example 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.

- Croxton – the ALCRM score is G3 making it a very high risk crossing. Given high incident rates of barrier strikes, vehicles weaving through the barriers and running red lights, this level crossing is deemed to be a high risk and a temporary speed restriction from 90mph to 40mph on the line was enforced by the Office of Rail and Road in 2012 to reduce the risk of a catastrophic accident. The crossing upgrade will enable the Office of Rail and Road to sanction removal of this temporary speed restriction improving performance at this level crossing.
- Waterbeach – the ALCRM score is D2 making it an extremely high risk crossing. This crossing is ranked as being the second highest risk AHB level crossing on the Anglia Route and is second nationally compared to other AHB crossings.
- Meldreth Road – the ALCRM score is D2 making it a very high risk crossing. The skew of the crossing increases the chance of vehicles weaving around the barriers and the long pedestrian walkways mean pedestrian users may become trapped on the crossing.

3.21 Such risks are not theoretical, as demonstrated by the long list of incidents referred to by Mr Prest. For example, at Waterbeach there have been 44 documented incidents in the last 18 years and this does not include the incident observed by the Inspector himself when viewing the level crossing for just 30 minutes. Mr Prest's evidence was that this was a "*typical day at Waterbeach*" and the sort of incident which he had seen on numerous occasions.

3.22 Similarly, in relation to Meldreth, there have been five documented incidents over the last 10 years, the most recent described in the Narrative Risk Assessment as follows:

"Nov 5, 2021….At 09:47 hours the driver of 2C21 09:27 Cambridge – London King's Cross, reported a near miss at Meldreth Road AHB level crossing between Meldreth and Shepreth with a member of the public. The person ran onto the crossing, the driver sounded the horn and the person stepped back clear. The driver did not apply the emergency brake stating that there was no time due to the proximity, the driver was fit to continue."

3.23 There are two main differences between the existing, legacy, crossings and those proposed in the upgrade – (1) the barriers extend across the width of the highway on both sides meaning there is full closure of the highway on all four sides; and (2) the barriers are interlocked with signal protection (MCB-OD) or signaller intervention (MCB-CCTV) to ensure that trains will only pass the final signal if the crossing is clear of vehicles and people.

3.24 At Waterbeach the upgrade will reduce the risk of fatality from an average of one every 23.75 years to one every 397.61 years. At Meldreth Road the risk of fatality will reduce from an average of 1 every 55.87 years to one every 921.66 years. It should be noted that these figures do not take into account deliberate acts or the crossing asset condition which <u>are</u> taken into account for the purposes of the Narrative Risk Assessments.

3.25 For each of the crossings Mr Prest is of the view that the overall safety benefits of upgrading the crossings significantly outweigh any impacts users of the highway will face, such as increased waiting times.

The impacts on crossing users - traffic modelling

3.26 The impact of the upgrades on highway users was considered extensively by the Modelling Group as set out in the Modelling Methodology Report (APP-59), the Local Model Validation Report (APP-58) and the Performance Report (APP-39). In his oral evidence Mr Contentin confirmed that the purpose of the documents was to agree a way forward with the Highways Authority and to demonstrate to them the highways impacts of the upgrades. In other words, they were prepared for a specialist audience, who can be taken to have understood its specialist content.

3.27 The Methodology Report was subsequently signed off by the Highways Authority. In his oral evidence Mr Contentin confirmed that he had had three meetings with the Highways Authority each lasting approximately two hours. Moreover, this was not a passive or rubber-stamping exercise. We know that the Highways Authority was fully engaged and demanded certain changes to the methodology (eg the 2018 traffic data sensitivity testing at Waterbeach). Contrary to the speculative claims of objectors, this does not paint the picture of a Highways Authority that was too busy or under-resourced to properly assess the potential impacts of the scheme. Furthermore, the Highways Authority would have been well aware of the highways issues that arose at Shepreth level crossing following its upgrade in 2018. As such it would have been particularly alive to the potential issues that could arise as a result of a similar upgrade at Meldreth Road.

3.28 The results are contained in the Performance Report:

- Waterbeach – the minimum and median barrier downtimes are forecast to be 125s and 180s respectively. Using the 2022 traffic data the average increased delay to all users of the highway within the Model Extent is forecast as being 7.2s in the morning peak. The average increase in journey time from the crossing to the A10 is forecast as being 53s eastbound in the morning peak. The maximum queue length increase is forecast as being 175m in the eastbound direction in the morning peak with an average increase in the morning peak of 37m.

- Meldreth Road – the minimum and median barrier downtimes are forecast to be 114s and 169s respectively. The average increased delay to all users of the highway within the Model Extent is forecast as being 27.9s in the morning peak. The average increase in journey time is forecast as being 65s eastbound in the morning peak. The maximum queue length increase at the crossing is forecast as being 52m in the eastbound direction in the morning peak with an average increase in the morning peak of 15m. The graphs show the queues clearing each time the barrier is raised.

- An important point to note is that Meldreth Road is a low-use level crossing with little traffic, certainly compared to most of the other crossings being upgraded.

3.29 The Performance Report was issued to the Highways Authority for a final update and no objections were raised. In an email to the Local Planning Authority (APP-61) the Highways Authority stated: "*The modelling work was reviewed for the TWAO and we [are] content with the methodology and content that the proposals would not have a significant impact….*". As detailed in paragraphs 9.22-9.25 of the Officer Report in connection with the determination of the Meldreth Road planning application (INQ-28) the author states that the Highways Authority had confirmed that concerns raised by the parish councils and other objectors about the inadequacy/unreliability of the modelling did not alter their advice and that there would be no reasonable transport grounds on which to refuse the planning application.

Air Quality

3.30 On the issue of air quality there will not be significant adverse effects. This was the conclusion of both Network Rail's original and updated EIA Screening Opinion Requests and no air quality issues have been raised by Environmental Health teams.

Accessibility and Access

3.31 Network Rail does not consider that the upgrades to the crossings would lead to adverse impacts in accessibility terms or on access arrangements. No objections on this basis have been made by objectors to the scheme.

Emergency Services

3.32 The emergency services are not a statutory consultee in respect of any of the relevant consenting regimes and, therefore, have no formal role. They have not been specifically consulted on the scheme but, once the upgrade has occurred, Network Rail will "take them through" changes in barrier downtimes and how these could affect journey times. Mr Prest's oral evidence was that there are up to five level crossing upgrades per year and, in ten years in his role, he had never known the emergency services to object to an upgrade; nor was he aware of an upgrade causing problems for them once it had been commissioned. As far as he knew the practice of discussing the upgrade with them only once the upgrade had taken place was standard.

3.33 Parliament has decided that for the purposes of the Planning, TWA and Level Crossings Order regimes, the emergency services are in the same position as other highway users. Their interests as users of the highway are to be taken into account and protected by the Highways Authority. Just as with any road closure, therefore, it is for the emergency services to be aware of any changes to the highway network and marshal their resources as they see fit.

Impact on designated sites and species, scheduled ancient monuments, listed buildings and trees subject to tree preservation orders

3.34 There will be no impact from the scheme on any scheduled ancient monuments or listed buildings. All other matters have been considered as part of the EIA Screening Opinion Request process. Each of the relevant local

authorities has confirmed that the order scheme is not EIA development and that no Environmental Statement is required.

Impact on current owners and occupiers of land to be acquired, including their amenity, access arrangements and ability to carry out maintenance

3.35 As set out in section 6 of the Proof of Simon Gilbey (APP-W3-1), Network Rail has sought to minimise the use of compulsory purchase of private land, so as to reduce the impact on the amenity and access arrangements of third parties. Further detail is set out below.

Impact and interaction of the scheme with future planned developments including Waterbeach New Town

3.36 The proposed works at Waterbeach will not conflict with or have any direct impact on the future developments at Waterbeach New Town or the relocation of Waterbeach station. As confirmed in the oral evidence of Ms Heria and Mr Stamp, Waterbeach New Town station (a relocation of the existing Waterbeach station) was granted planning permission in 2020. It is planned to be completed at the end of 2025. The effect is that, on the current timetable, the upgrade of Waterbeach level crossing will take place a matter of months before the station at Waterbeach is relocated.

Effects on statutory undertakers, statutory utilities and other utility providers

3.37 No objections to the Order have been received from any statutory undertakers. Moreover, their rights are protected by Articles 3(4), 13 and Schedule 6 of the Order. More generally, any impacts on utility providers will involve engagement with Network Rail to identify and protect utilities as standard practice.

The criteria for justifying compulsory purchase powers

3.38 Sections 4 and 5 of Mr Gilbey's Proof of Evidence (APP-W3-1) confirm that he is satisfied that:

- Network Rail has had due regard to paragraphs 12-15 of the DLUHC Guidance on the compulsory purchase process and the Crichel Down Rules.
- Network Rail has sought to revise and reduce the extent of land take and interference for which powers are sought following consultation with affected landowners and occupiers.
- The powers of compulsory purchase sought are necessary for Network Rail to deliver the scheme.
- All areas of land subject to powers in the Order are necessary for the Order scheme and no land will be acquired permanently or used temporarily unless essential to facilitate the scheme.

3.39 In any event the only outstanding objection to the Order by those whose land is required comes from the Woodleys (plots 300, 305, 306 and 310). Whilst

the objection technically remains outstanding, heads of terms have been agreed and completion of an agreement is awaited. Moreover, Network Rail has worked closely with the Woodleys to arrive at a position which is to the mutual satisfaction of all parties and reduces the land take and impact of the scheme on those owners to the greatest extent possible.

3.40 The Order also includes the power to stop-up those streets listed in Schedule 1 which are on land not owned by Network Rail and are within the adopted public highway. As set out in the Proof of Mr Deacon this is required in relation to the upgrade of the level crossings and is needed to allow the works and subsequent maintenance to take place safely, to increase public safety at the level crossings, to regularise the adopted highways boundary and to mitigate the impacts on neighbouring properties. Following revisions and re-designs the Order and Deposited Land Plans have been amended in respect of the stopping-up powers sought and Cambridgeshire County Council and Norfolk County Council have withdrawn their objections.

3.41 In all the circumstances, and given the compelling need for delivery of the scheme for reasons summarised above, Network Rail contends that there is a compelling case in the public interest for the conferral of powers to acquire compulsorily and/or temporarily possess the lands and rights included within the Order.

Impediments to Network Rail exercising the powers in the Order

3.42 There are no impediments to Network Rail exercising the powers contained within the Order. The scheme is fully funded by the UK Government to the total estimated cost of £193.449M.

3.43 There is also no planning impediment as Network Rail has planning permission to carry out the upgrades at all of the level crossings. The detail of the planning permissions and the permitted development rights for each crossing are set out in paragraphs 58 to 78 of INQ-31. This includes extracts from the three relevant planning application officer reports stating that the schemes would have acceptable impacts and accord with the development plan and National Planning Policy Framework (in respect of Meldreth Road and Hauxton) and would create a safer and more efficient railway operation, with wider community benefits (in respect of Croxton).

The outcome of the two planning applications

3.44 As set out above the two planning applications which were outstanding at the start of the Inquiry (Meldreth Road and Hauxton) have been approved.

Compliance with statutory procedural requirements

3.45 APP-67 includes the relevant material to demonstrate that all statutory procedural requirements have been complied with. APP-04 summarises the consultations undertaken.

Other Matters

3.46 It is considered that all relevant matters are dealt with above and below.

Response to Objections

3.47 Overall, in circumstances where planning permission has now been obtained for all upgrades and where the Highways Authority has raised no concerns, minimal weight ought to be given to these objections. Objections to Meldreth Road crossing have also now been overtaken by the grant of planning permission by South Cambridgeshire District Council and the comments in the Officer Report. In Network Rail's view these findings are effectively dispositive, but, in any event, the specific issues raised at the Inquiry are dealt with below for completeness, although the same points are not repeated where they were made by more than one person/organisation.

John Grant and Fen Line Users Association

3.48 The Association's concerns relate solely to the interests of rail passengers using the crossing to access Waterbeach station. The level crossing upgrade is due to take place in 2025 and the relocation of Waterbeach station (which includes a pedestrian footbridge at the new station) is due to take place in 2025. In cross-examination, Mr Grant accepted that his objections were, therefore, time limited and that the upgrade at Waterbeach level crossing will actually have little impact on rail passengers by the end of 2025. In those circumstances these objections are entirely academic and, in any event, lack merit.

3.49 The Association makes the assertion that at similar locations (Shepreth) barriers can be down for 15 minutes or more. But this is not borne out by the evidence (APP-W7-1, page 9) which demonstrates that the Shepreth barriers are down for longer than 15 minutes on only 0.04% of occasions. Approximately 75% of the time they are down for no more than 4 minutes and approximately 90% of the time they are down for no longer than 5 minutes.

3.50 In terms of the Association's criticisms of the use of data from the Hinxton crossing to calculate the median barrier downtime, the rationale for this is set out in Mr Contentin's Proof (APP-W7-1) and the additional sensitivity check demonstrates the robustness of the figure.

3.51 The Association argues that a 99th percentile is a more relevant figure than the modelled averages. However, that misunderstands the nature of the exercise being undertaken by the Modelling Group and being assessed by the Highways Authority. The purpose is to understand the impact on the highways at a network-wide level rather than at an individual level.

3.52 In criticising the "route" used in Fig 3.6 of the Performance Report (APP-39) the Association misunderstands the methodology. The average delays were calculated using all vehicle movement within the extent of the model shown in Fig 3.1 of the Validation Report (APP-58). Fig 3.6 of the Performance Report instead shows the average journey time from points A to B. Furthermore, whilst the Association refers to anecdotal evidence of traffic still increasing, especially mid-week, no evidence has been provided to support this and the Highways Authority is content with the approach taken by the Modelling Group.

3.53 In terms of the argument that the modelled existing queue lengths are not similar to those observed, Mr Contentin acknowledges in his Proof that, whilst modelled queue lengths do not always perfectly match the surveyed value at each crossing this does not affect the validity of the model.

3.54 In terms of the Association's suggested modifications to the scheme:

- Retaining the current AHB crossing: this is not a plausible option due to the safety risks and there is no evidence provided to support the view that the upgrade will lead to an increase in safety risks arising from speeding cars or pedestrians vaulting over the barriers. Mr Prest's evidence was that a full barrier crossing would make it less likely that pedestrians would misuse the crossing and that even if a pedestrian did jump over, the nature of the MCB crossing is that a train would be stopped at the previous signal until the crossing was clear of pedestrians [Inspector Note: the train would not be stopped by the signal if the pedestrian jumped over the barrier after the train had passed the signal]. Vehicle speeding is a matter for the Highways Authority and they had raised no concern. If it were to become a problem, measures such as traffic calming could be introduced. Mr Prest's clear view was that risk posed by the AHB crossing far outweighed the hypothetical risk of speeding cars following the upgrade. In terms of any other measures, Mr Prest's evidence was that Network Rail had now done everything it could at Waterbeach and, notwithstanding that, there continued to be serious incidents of misuse.

- AHB+: In his proof of evidence (paragraph 9.5 of APP-W2-1) Mr Prest explains that the AHB+ solution has been discontinued as a viable alternative solution by Network Rail. Further information on this is set out in Section 5 of INQ-27 which explains that (i) AHB+ has undergone a rigorous risk assessment process; (ii) a human behaviour study stated that AHB+ with the exit barrier up or partially up was perceived as the least safe crossing in comparison with MCB-OD and AHB; (iii) in November 2019 the Infrastructure System Review Panel decided that additional analysis of AHB+ was required; and (iv) an Interim Safety Report was prepared by Aegis Engineering Systems in January 2020 which concluded that the risks were too great; the residual risks were still not significantly lower than the risk being addressed by the application of AHB+.

- Pedestrian Gates: in his oral evidence, Mr Prest explained that there is no product of this sort currently available to Network Rail. In any event, he could not see the benefit of it; if added to an MCB barrier, it would still need to be locked when the barriers were down.

- Footbridge: Mr Prest (paragraph 8.50 of APP-W2-1) explains this would be grossly disproportionate to the safety benefit gained. A footbridge is estimated to cost £6.9M and would take a significant time to build. However a footbridge will be built as part of the relocation of Waterbeach station in 2025 making any footbridge at this level crossing virtually obsolete. Even Mr Grant agreed that this fact meant the cost-benefit for such a footbridge would be massively reduced.

- Underpass: the same argument applies to an underpass but with even greater force. The cost of an underpass project currently in development to close a level crossing in Essex is estimated at £23M.

Jerry Alderson

3.55 Whilst Mr Alderson challenges the safety case for upgrading the level crossing, he has no expertise on these issues and the relevant expert, Network Rail, disagrees with his assessment. More fundamentally Mr Alderson's approach to risk is misconceived. In his oral evidence his preferred approach was said to be:

"What we really care about are four specific types of incidents: a) deaths, b) injuries, c) damage to a train that has hit an object and d) train driver distress. Those (and scary near misses) are the only incidents that have anything to do with safety."

This analysis is flawed as it entirely ignores the reasonable foreseeability of such incidents occurring and the gravity of such a catastrophic event.

3.56 Mr Alderson also raises environmental issues but in his oral evidence he stated that this was "not my area". In any event the issues raised are dealt with above.

Hugh Wood and Shepreth Parish Council

3.57 Mr Wood's and the Parish Council's contention that the barrier downtime/highways impact modelling is flawed is rejected: in a large part they are based on a misunderstanding of the documents, as is understandable given the specialist audience they were intended for. The Parish Council is incorrect in thinking that the current average downtime at Meldreth Road is 169s; in fact it is the forecast median downtime following the upgrade. Moreover, the 65s referred to in the Performance Report is the average increase in journey time rather than the maximum increase as assumed by the Council. The Council's criticism of the traffic surveys are also based on a misunderstanding.

3.58 Whilst the Parish Council questions the safety case for the upgrade at Meldreth Road they are not an expert on these issues, unlike Mr Prest representing Network Rail. Furthermore, its assertions that drivers will accelerate to "beat" the barrier descent, or that only a small proportion of the reported incidents at Meldreth Road would have been definitely prevented by a full barrier, are unevidenced.

3.59 In terms of the proposed "depot" this would be, in fact, a building to house railway and level crossing equipment with vehicular parking, required in this location to avoid staff having to travel long distances on foot with maintenance equipment. Planning permission has been granted for this and the relevant Officer Report notes that the landscaping scheme proposed to screen the compound would not significantly affect the character or distinctiveness of the local landscape.

3.60 Mr Wood expressed his concern that the upgrade at Meldreth Road would cause the same delays to traffic he experienced at the nearby Shepreth crossing after its upgrade in 2018. Network Rail accepts that there were initial teething problems at Shepreth but it worked to resolve these. Ms Heria referred to a road safety audit undertaken with the Highways Authority in the light of the long delays which were occurring at the crossing and interventions such as road marking, no right turns and other highways improvements were instituted. These improved the situation and Ms Heria stated that Network Rail had understood the lessons from Shepreth and that the same issues would not be repeated at Meldreth Road. In any event there is significantly less car and road usage at Meldreth Road compared to Shepreth. This may well be why the Highways Authority has raised no concern.

3.61 Mr Prest's evidence was that there was also some potential for level crossing operators themselves to make changes to improve the situation if unforeseen delays were to result at Meldreth Road. If, for example, the barrier downtimes were having detrimental impacts on the highways, as discovered through public complaints, from inspecting data logs or from undertaking performance management of signallers, steps could be taken to attempt to reduce these delays. Moreover, an assessment has been undertaken and passed, to demonstrate that one signaller would be able to control and operate Meldreth, Shepreth and Foxton level crossings.

3.62 In terms of the statement in the Sotera Risk Assessment for Meldreth Road (APP-14) that barrier downtime would increase from 18% to 71% of the peak hour, the document itself makes clear that it had used a "fairly simple model". Now that detailed modelling has been carried out with a known methodology Sotera's figures are no longer relevant and ought to be ignored. Mr Contentin's evidence indicates that the barrier downtimes would actually increase from 21% to 54% in the AM peak and 17% to 44% in the PM peak. This can be compared with a traffic signal junction with four equal phases at which each phase would be red for 75% of the time.

Roger Faires

3.63 Mr Faires suggested use of an Automatic Number Plate Recognition camera instead of the proposed upgrade. However, that would not stop individuals or vehicles getting into the barrier or have any material impact on improving safety. The AHB+ alternative is not a viable option for the reasons set out above. He also refers to incidents occurring at the Shepreth crossing both before and after the crossing. However, putting aside the small sample size and the absence of details of those incidents, the safety risk is significantly reduced if there is an incident because trains will be held up at the previous signal on detection of anyone or anything on the tracks [Inspector Note: the train would not be held if it has already passed the previous signal when the person or object gets on to the track].

3.64 In terms of Meldreth Road's forecast barrier downtimes being based on those at Shepreth, this is appropriate because an MCB-CCTV barrier is proposed for the former as already exists at the latter. In terms of strike-in points, even if there was a difference between the two crossings of 30m, this would result in an extremely minimal difference in barrier downtime.

3.65 Late running of a train would be unlikely to result in an extended closure of the barrier to allow the following train also to pass, on the basis that the second train would also be likely to be delayed. In any case, a worst case scenario had been adopted in the modelling, assuming that all trains are slow trains, requiring a longer barrier downtime, when many trains are in fact fast trains. In terms of the use of the median, rather than mean, barrier downtime, Mr Contentin stated that modelling work using the mean produced barrier downtimes at Meldreth Road way in excess of what is actually experienced at Shepreth. Mr Contentin stated that he went back and forth with the team multiple times to ensure the most appropriate and robust values were being relied on.

Roger James

3.66 Mr James submitted an objection in his personal capacity on 22 September 2022. It does not appear that Meldreth Parish Council itself submitted any objection to the Order scheme. Mr James' Statement of Case also appears to have been written in his personal capacity. Therefore, although Mr James is vice-chair of the Parish Council and the Statement of Case is labelled "Meldreth Parish Council" on the Inquiry website, it appears that OBJ/27 strictly relates to the views of Mr James and not the Parish Council itself. [Inspector Note: Prior to the Inquiry Mr James advised me, via the Programme Officer, that he had been asked to speak at the Inquiry on behalf of Meldreth Parish Council and his Statement of Case, thus reflect this. Moreover, INQ-28 makes clear Meldreth Planning Committee, a committee of the Parish Council, objected to the planning application for the level crossing upgrade at Meldreth Road citing similar concerns to those set out in the Statement of Case. Parties who have not submitted a written objection to the Order can, at my discretion, be heard at the Inquiry.]

3.67 The criticisms of the modelling undertaken are, in large part, based on a misunderstanding of the relevant documents, as is understandable given the specialist audience they were intended for. Those criticisms not based on a misunderstanding have no foundation. Fundamentally, Mr James had no answer to the point that the experts, who spend their professional lives dealing with these issues (ie the Modelling Group and the Highways Authority), consider the methodology used and the results obtained to be robust.

3.68 The concerns raised about the use of averages in the modelling misunderstand the nature of the work, which is to understand the impact on the highways at a network level over a period of time, rather than at an individual level for a specific journey. As such it would not be appropriate to focus on a barrier downtime which would happen only very rarely. Moreover, the suggestion that delays could be reduced at Meldreth Road crossing by equally spacing trains throughout the peak hours, is not a realistic solution. As the Inspector noted during the Inquiry, any changes to suit one location would potentially cause worse problems at other level crossings. In any case, modelling based on the timetable at the date of commissioning, as has been undertaken, is the industry standard, such as Transport for London's Traffic Modelling Guidelines.

3.69 In terms of Table 8.4 of the Performance Report (APP-39) it does not show cars simply vanishing; instead it shows vehicles quickly leaving the queue as defined by them reaching a certain speed. In relation to the adjustment of traffic to reflect the COVID pandemic, the 6% figure used in the modelling is explained in the Performance Report and it was Mr Contentin's view that it is robust and that there is not robust evidence to use a higher figure such as 25% or 81%. In any event, even if the highest figure were to be used, in the vast majority of cases all queuing traffic would clear the level crossing on the opening of the barrier.

3.70 Remarkably, even though Mr James criticised the safety case for upgrading the level crossing, he appeared to admit during cross-examination that he had not read Mr Prest's Proof of Evidence. He stated that the key question was whether the improvement was "worth it". The safety experts on this issue, supported by the experts on highway modelling, have resoundingly said "yes".

Objectors not at the Inquiry

3.71 There are 22 outstanding objections from people/organisations who did not appear at the Inquiry. 20 objections relate exclusively to the impact of the proposed level crossing upgrade at Meldreth Road. These points have been addressed in (a) Network Rail's letter of 23 November 2022 (page 263 - 273 of APP-W4-2) which was sent to all the objectors; (b) in the Proofs of Mr Prest and Mr Contentin; (c) at the Inquiry; and (d) above.

3.72 In terms of Mr Parmee, who is not a statutory objector, whilst heads of terms have been agreed, his objection has not been formally withdrawn. The Officer Report supporting the decision to grant planning permission found the proposal compliant with local policy on residential amenity and Mr Prest confirmed at the Inquiry that CCTV and lighting (which will be protected because of the presence of bats) at the crossing would not be pointed at Mr Parmee's property which, in any case, is set-back and screened.

3.73 It is proposed to paint a yellow box on the highway to stop road users waiting over the access to Mr Parmee's property when queuing at the crossing. In terms of screening, Network Rail will minimise the removal of any mature trees and will install a concrete kick board fence and 1800mm close board fence, as has been agreed with Mr Parmee.

3.74 The final objection is from the Woodleys who are a statutory objector. Whilst heads of terms have been agreed, they have not formally withdrawn their objection. A full response to their objection was given orally at the Inquiry by Mr Gilbey as set out in Section 9 of INQ-27.

3.75 In addition to the objections, five representations were made, three of which concern the Meldreth Road level crossing upgrade and the concerns raised have already been addressed above. Cambridge County Council and South Cambridge District Council submitted a holding objection based on transport, air quality and other environmental impacts at the upgraded level crossings. These concerns are largely out of date; for example, the relevant officers at the local planning and highway authorities have confirmed that they have no objections to the proposed upgrade of Meldreth Road level crossing on transport, air quality or environmental grounds and planning permission has

now been granted. Importantly, that no Statement of Case or Proofs were provided by these authorities, suggests that the substance of these objections are no longer pursued. Certainly, there has been no reply to Network Rail's response to these concerns.

Conclusion

3.76 In conclusion, in light of the significant benefits to be brought about by the scheme, as well as the other reasons set out above, the Inspector is requested to recommend that the Order be made and the Secretary of State is requested to make the Order.

4 INSPECTOR'S CONCLUSIONS

4.1 My conclusions are set out below in the following sections:

- Consultation on the proposed Order and other statutory procedural requirements
- Interaction of the relevant consenting regimes
- Matters relevant to the scheme as a whole
- Matters specifically relevant to the re-signalling element of the scheme
- Matters specifically relevant to the level crossing upgrades element of the scheme
- Other matters
- Overall conclusion

In reaching my conclusions and recommendations I have had regard to my duties under the Public Sector Equality Duty.

4.2 References to earlier paragraphs in the report are shown thus: [1.19-1.21] and my conclusions on the numbered Statement of Matters (as listed in paragraph 1.15) are identified thus: **{SoM8}**. Appendix B of this report provides a list of the paragraphs in which there are main conclusions on each matter.

Consultation on the proposed Order and compliance with other statutory procedural requirements

4.3 The Transport and Works (Applications and Objections Procedure) (England and Wales) Rules 2006 set out the requirements for public consultation on a proposed Transport and Works Act Order and, as detailed above [1.18-1.20], I am satisfied that these have been complied with in this case. Indeed, the Consultation Report (APP-04) indicates that Network Rail went beyond the minimum requirements in seeking to publicise and explain the proposed scheme, including by setting up a dedicated website and providing face to face meetings, site meetings and digital presentations.

4.4 It is always the case that, as suggested by some people/organisations [2.28 and 2.56], more consultation could be undertaken to seek views on a scheme such as that proposed. However, given that Network Rail has exceeded the statutory requirements in terms of consultation, that there is evidence that this was successful in securing comments on the scheme as a whole, on various specific parcels of land to be acquired and on the principle of upgrading several level crossings, I conclude that the criticism of the consultation undertaken should not weigh against making the Order.

4.5 Furthermore, as detailed above, [1.18-1.20] I am satisfied that all other statutory procedural requirements have been complied with in promoting the Order **{SoM8}**.

Interaction of the relevant consenting regimes

4.6 On the grounds that the highway impacts of the proposed scheme are considered under the town and country planning and Level Crossings Act 1983 consenting regimes, Network Rail contends that such impacts, and the objections made in respect of them, should not be a material consideration, or should be one of minimal weight, in consideration of this Transport and Works Act Order [3.13 and 3.47]. This is fundamentally a matter of law on which the Secretary of State may wish to seek his own legal advice. However, I disagree with Network Rail's contention.

4.7 Whilst it is the case that the Transport and Works Act 1992 does not include an express requirement for highway impacts to be considered as part of a proposed Order [3.9], neither does it indicate that any issues considered in other consenting regimes should not also be considered as part of the TWAO process. Similarly, there is no indication in "Transport and Works Act orders: a brief guide" (Department for Transport, November 2013) of a limitation to the issues which will be appropriately considered by the Secretary of State in coming to an informed view on whether it is in the public interest to make a TWA order. Indeed, it states:

"All objections and other comments are carefully considered before a decision is taken on a TWA order, though clearly trivial or frivolous ones may be disregarded. The outcome is not a foregone conclusion. Orders may be rejected or amended as a result of objections…."

In terms of what the Secretary of State's decision on a TWA order is based on it goes on to state:

- "the Inspector's Report, if an inquiry or hearing took place
- local and national planning policy
- the need for the scheme
- any impacts upon the surrounding environment or communities and any proposed mitigations
- whether the scheme can reasonably be funded
- whether compulsory acquisition (if proposed) is justified"

In my judgement the highways impacts of the scheme are an impact upon communities.

4.8 Furthermore, as the proposed Order itself makes clear, Compulsory Purchase legislation is also key to the Order; section 5 of the Order advises that Part 1 of the Compulsory Purchase Order Act 1965 shall apply to the acquisition of land under the Order as if the Order was a compulsory purchase order under the Acquisition of Land Act 1981.

4.9 Guidance on Compulsory Purchase process and The Crichel Down Rules (DLUHC), which relates to the 1981 Act, states:

"A compulsory purchase order should only be made where there is a compelling case in the public interest" (section 12) and "The minister confirming the order has to be able to take a balanced view between the intentions of the acquiring authority and the concerns of those with an interest in the land that it is proposing to acquire compulsorily and the wider public interest." (Section 13).

This specific test is not one applied in relation to applications for planning permission. Furthermore, in my judgement the highway impacts of the proposed scheme are of fundamental relevance to the wider public interest.

4.10 As Network Rail points out [3.5], it is the case that the Level Crossings Act 1983 specifically provides for the Secretary of State to make as part of a Level Crossing Order such provision, as he considers necessary or expedient, for the safety or convenience of those using the crossing. The balance to be struck between safety and convenience of those using the level crossings which are the subject of this TWA Order is at the heart of the highway impact issues of this scheme and the majority of the objections to it. Consequently, whether or not highway impacts are considered as part of the TWA Order process, I agree that these impacts should be considered as part of the process of determining whether the necessary Level Crossing Orders should be made.

4.11 However, given that the necessary Level Crossing Orders for this scheme have not been made, nor has the relevant process been formally commenced yet [1.14], there remains a potential legal impediment to the scheme going ahead **{SoM6iii}**. Section 15 of the Guidance on Compulsory Purchase process and The Crichel Down Rules states *"The acquiring authority will also need to be able to show that the scheme is unlikely to be blocked by any physical or legal impediments to implementation".*

4.12 I appreciate that the statutory consultees in the Level Crossings Order process (the highway authorities and the Office of Rail and Road) have not objected to the level crossing upgrades through the Transport and Works Act Order process, but it cannot be automatically assumed that their positions will remain unchanged as part of the separate Level Crossings Order process. Moreover, in certain circumstances it would be for the Secretary of State himself, rather than the Office of Rail and Road on his behalf, to determine the necessary Level Crossings Orders. Whilst the Secretary of State would be required to take into account any advice from the Office of Rail and Road and the Highway Authorities, he would not be bound to accept it and could refuse to make the necessary orders, even if supported by the Office of Rail and Road and Highway Authorities.

4.13 In conclusion the interaction of the TWA Order, which is the subject of this report, with the planning and Level Crossings Order consenting regimes is primarily a matter of law, on which the Secretary of State may wish to seek his own legal advice. However, for the reasons set out above, it is my judgement that it is appropriate to consider the highways impacts of the scheme as part of the TWA Order process of determining whether or not there is a compelling case in the public interest to make the proposed Order which includes compulsory purchase powers.

4.14 Furthermore, the Secretary of State should not confirm this TWAO, insofar as it relates to each of the proposed level crossing upgrades, until he has satisfied himself that either (a) it is likely that he would also make the necessary Level Crossings Orders for each of those upgrades, or (b) it is likely that the Office of Rail and Road would make them on his behalf.

Matters relevant to the scheme as a whole

4.15 In terms of the planning applications waiting to be determined at the time the Statement of Matters was published **{SoM7}**, both have now been approved. Indeed, as set out above [1.10], consent has been secured for all elements of the scheme which require planning permission and prior approval has been secured and prior notification carried out for those elements which are permitted development subject to prior approval or prior notification.

4.16 It is potentially the case that a number of highways orders, licences and/or permits will be required during implementation of the scheme [3.3]. This is not unusual for a scheme of this scale and there is nothing to suggest that these are unlikely to be secured, or that delivery of the scheme would be fundamentally threatened if there were difficulties in securing one or more of these. The funding statement (APP-06) makes clear that the scheme is fully funded by the UK Government to the total estimated costs of £193.449M.

4.17 Consequently, the only potential impediment to the scheme going ahead is the need to secure Level Crossing Orders in connection with the level crossing upgrades element of the scheme as detailed above **{SoM6iii}**. I address the implications of this in my recommendations on the Order below.

4.18 No objections to the Order have been made by statutory undertakers, statutory utilities or any other utility providers and, in any case, the rights of statutory undertakers are protected by Articles 3(4) and 13 and Schedule 6 of the Order [3.37]. Consequently, I am satisfied that the scheme would not compromise the ability of statutory undertakers to carry out their functions and obligations **{SoM5}**.

4.19 For each parcel of land to be acquired by the Order an explanation is given as to why the acquisition is necessary to implement the scheme in sections 4 and 5 of doc APP-W3-1. In terms of the proposed compound at Meldreth Road (land parcel 002) there is no substantive evidence to support the suggestion that it is not required as part of the scheme because of the existence of other compounds in the area [2.1]. In the light of this I am satisfied that all the land and rights over land which are provided for in the Order are necessary to implement the scheme **{SoM6iv}**.

4.20 Other than indirectly in relation to a proposed shuttle bus (detailed below), there is no significant evidence to contradict Network Rail's assertion [3.36] that the scheme would have an adverse impact on new development proposed including at Waterbeach New Town **{SoM4}**. Furthermore, in the light of the details set out in the Environmental Impact Assessing Screening Opinion Request, the planning application officer reports and everything else I have read and heard, I concur with Network Rail's conclusion [3.34] that the scheme would not have a material impact on designated sites and species, including sites of special scientific interest (SSSI), scheduled ancient

monuments, trees subject to tree preservation orders and listed buildings **{SoM3iii}**. Whilst the Meldreth Road crossing is close to several SSSIs, the officer report for the planning application (INQ-28) concludes that subject to conditions requiring compliance with mitigation measures set out in an Ecological Impact Assessment, no harm in this respect would result.

Matters specifically relevant to the re-signalling element of the scheme

4.21 In terms of **{SoM1}**, the aim of the re-signalling element of the scheme is to renew the life-expired signalling assets in the Cambridge area, replacing the existing mechanical signalling system, dating from the 1980s, with a modern digital signalling system, managed from a centralised location. The re-signalling is needed because the existing system suffers from obsolete components, severe wire degradation and several signal boxes have reached the end of their useful lives, resulting in a reduction in signal reliability. Without the re-signalling project increasingly frequent signalling failures would be likely to reduce the capacity of the railway, causing delays to, and cancellations of, train services. The key objectives of the re-signalling scheme are [3.14 – 3.15]:

- To improve the performance, reliability and maintainability of the signalling infrastructure;
- To enable ongoing safe operation of the railway;
- To reduce the operational cost of the railway; and
- To future-proof in connection with future Ely area capacity enhancements, the re-signalling of Peterborough – Ely – King's Lynn and to enable enhanced freight and cross-country services.

4.22 There are no, in principle, objections to the re-signalling element of the scheme and, indeed, there is support for it from some of those who object to the level crossing upgrades [2.3]. In my view the identified benefits are substantial. Nor is there any evidence to indicate that the cited benefits of the re-signalling would not be achieved.

4.23 In terms of the alternatives considered **{SoM2}** Network Rail's statement that the only alternative to the renewal of the signalling would be to not undertake it [3.16], which would not be a reasonable alternative, is in my view credible, having regard to the lack of any substantial evidence to the contrary.

4.24 There are, however, objections to the acquisition of a number of parcels of land necessary to implement the re-signalling works. In terms of parcels 003 and 004 at Meldreth Road [2.1], I have no reason to dispute Network Rail's statement at the Inquiry that any additional lighting (which, in any case, will need to be restricted because of the presence of a bat corridor) will not be pointed at the objector's home. The loss of vegetation, whilst to a degree regrettable, would be replaced by a fence to maintain screening between the railway and his home. Moreover, given its distance from the objector's property and its likely level of use, the proposed compound would be unlikely to cause significant disturbance to the objector. On this basis I conclude that

any limited effect of the re-signalling works on this objector and their property would be clearly outweighed by the substantial benefits of the re-signalling element of the scheme **{SoM3iv}**.

4.25 In terms of parcels 300, 305, 306 and 310 at Six Mile Bottom, and to the extent that they are needed for the re-signalling element of the scheme [2.2], I understand that Network Rail has agreed heads of terms with the relevant objectors to acquire these parcels of land subject to various mitigation measures [3.39]. However, even if this agreement and the mitigation measures were not to materialise, I conclude that the likely harm caused to these objectors, in terms of access, delays, safety, convenience, the ability to carry out maintenance and disturbance, would be clearly outweighed by the benefits to the wider community of the re-signalling element of the scheme **{SoM3iv}**.

4.26 In the light of the above I conclude that there is a compelling case in the public interest to justify conferring on Network Rail powers to compulsorily acquire and use land for the purposes of the re-signalling element of the scheme **{SoM6i}**. Moreover, the purposes of this element of the scheme are sufficient to justify interfering with the human rights of those with an interest in the land affected by the compulsory purchase powers sought, having regard to the Human Rights Act **{SoM6ii}**.

4.27 There are no outstanding objections to the sections of street to be stopped-up by the draft Order, as amended prior to the Inquiry, (APP-50). In the light of this and the substantial benefits likely to arise from the re-signalling element of the scheme, I also conclude that there is nothing which would justify not stopping-up the affected sections of street to enable the re-signalling element of the scheme to be implemented.

Matters specifically relevant to the level crossing upgrades element of the scheme

Aim and Objectives

4.28 In terms of **{SoM1}**, Network Rail's aim and objective in respect of the level crossing upgrades element of the scheme is to improve the safety of the seven affected crossings to a significant degree and enable compliance with the Office of Rail and Road's requirement to improve safety by moving away from AHB crossings [3.14 and 3.15]. It is also stated that combining the re-signalling element of the scheme with the level crossing upgrades would, during construction works, save costs (around £0.9M per crossing on average) and disruption to rail and road users [3.18]. Moreover, Network Rail contend that if the level crossing upgrades were removed from the scope of the scheme it is unclear when alternative funding would be available for them [3.15].

Safety Impacts

4.29 With regards to the level crossing safety impacts of the scheme Network Rail point out [3.20] that currently Waterbeach is an "extremely high risk" crossing, Milton Fen, Dimmock's Cote, Croxton and Meldreth Road are "very high risk" crossings, Six Mile Bottom is a "medium to high risk" crossing and

Dullingham is a "moderate" risk crossing. It is also the case that Waterbeach crossing is ranked as the second highest risk half barrier crossing nationally. These assessments have been derived using the ALCRM tool, the use of which has not been challenged to any significant degree.

4.30 The safety impacts are most clearly and simply set out in section 4 of INQ-27 and are summarised in Table 1 below. The fatality rate seeks to represent all fatalities and injuries and is based on a Fatality and Weighted Injury Score, meaning, for example, that for each fatality there is the same likelihood of there being 10 serious injuries instead. The Network Rail calculation of the benefit cost ratio (BCR) is also shown, as indicated in the Narrative Risk Assessment for each crossing (JP8 of APP-W2-2). At the Inquiry Mr Prest confirmed that the ratio is essentially the forecast injury/fatality cost savings (based on standard assumed costs) against the construction and operation costs of the upgraded crossing.

Table 1

Crossing	**Current crossing average fatality rate (one every x years)**	**Upgraded crossing average fatality rate (one every x years)**	**Benefit Cost Ratio (BCR)[4]**
Milton Fen	76 years	1,272 years	0.13
Waterbeach	24 years	398 years	0.36
Dimmock's Cote	23 years	481 years	0.37
Croxton	145 years	2,704 years	0.08
Six Mile Bottom	82 years	3,080 years	0.14
Dullingham	15,536 years	8,919 years	0.03
Meldreth	56 years	922 years	0.425[5]

4.31 In proportional terms the forecast reductions in injuries/fatalities arising from the level crossing upgrades are very significant, although it is important to note that they do not include fatalities/injuries which result from deliberate

[4] Since the Inquiry I have noted that significantly higher BCRs are set out in the Sotera Risk Assessments (APP-11 to APP-17). However, these pre-date by several years the Narrative Risk Assessments (JP8 of APP-W2-2) which is the source of the BCRs listed in the table. Moreover, at the Inquiry I asked Mr Prest questions about the BCRs in the Narrative Risk Assessments and he did not suggest I should have regard to higher figures set out elsewhere. Albeit not in relation to BCRs, Network Rail has also argued [3.62] that aspects of the Sotera Risk Assessments should be ignored.

[5] Adjusted BCR. Unadjusted figure is 0.17.

acts or the asset condition of the crossing. Nor, in respect of Dullingham, do they include the risk to Network Rail staff who operate the existing MGH crossing at this location [3.20].

4.32 However, I consider that the reductions in forecast fatalities/injuries need to be considered in the context of the existing safety situation. Network Rail's document Enhancing Level Crossing Safety 2019-2029 (J3 of APP-W2-2) states (page 10): *"Great Britain can demonstrate a very good safety record at level crossings in comparison to any major rail network in the world"* with its Figure 1 showing Great Britain having the second lowest level crossing incident rate per thousand track kilometres amongst 22 European countries. Page 11 identifies that level crossings account for only 6% of the total railway system risk, as measured by the Rail Safety and Standards Board (2018).

4.33 Network Rail argues that the current risks at the level crossings are not merely theoretical [3.21] and JP9 of APP-W2-2 provides an extensive list of incidents which have happened at each of the seven crossings since 2005. However, it is important to distinguish between recorded incidents and actual fatalities and injuries which is what the ALCRM tool forecasts. Indeed, it is apparent that the vast majority of the recorded incidents did not result in an injury or fatality, although I recognise that a "near miss" can be very distressing for train drivers and may result in delays to the train service and road traffic.

4.34 Very sadly the list does include several suicides. However, whilst the full barriers and obstacle detection facility of the proposed level crossing upgrades would make suicides more difficult at the crossings themselves (although not impossible if someone were to climb over the barrier just as the train was approaching), it would, of course, not prevent people from instead jumping in front of a fast train from a nearby station platform.

4.35 It is clear that pedestrians skirting round the half barriers at Waterbeach is a relatively common incident. Whilst clearly a dangerous practice, it seems that in the last 18 years no deaths or injuries have resulted from this. I witnessed such an incident at this location the day before the Inquiry opened. Although I cannot be certain, this appeared to be caused by a problem with the ticket machine on the southbound platform leading the passenger to cross the line to use the machine on the northbound platform instead. Objectors have referred to issues with the reliability of the ticket machines at this station [2.10], albeit that this is the responsibility of the train operating company rather than Network Rail.

4.36 Network Rail argues that it has done everything it can to improve safety at Waterbeach [3.54]. However, whilst it may appear obvious to some, I noted that there are no obvious signs at this location to indicate that pedestrians should not cross when the half barrier is down, despite the white line marked footway not being blocked by a barrier on one side of the road when the crossing is closed. In contrast there are large signs on both sides of the crossing warning that passengers must buy a ticket before boarding a train.

4.37 An indication of the value of the reduction in injuries/fatalities likely to result from the level crossing upgrades is also given by the BCR. Whilst injuries and,

in particular, fatalities clearly have more than monetary costs, it is a common approach to assess the value for money of works to reduce such incidents by comparing standard assumptions about the monetary costs of the injuries/fatalities likely to be prevented against the construction/operational costs of the works, in this case the level crossing upgrades. Network Rail's calculations in this respect (listed in the table above and sourced from the Narrative Risk Assessments) indicate that the monetary costs of the upgrades would, in all cases, be more than double the monetary benefit of the forecast reduction in injuries and fatalities. At four of the crossings (Milton Fen, Croxton, Six Mile Bottom and Dullingham) the costs would be more than five times the benefits in terms of the forecast reduction in injuries and fatalities, although it must be recognised that fatalities resulting from deliberate acts are not included in the forecast reductions. Moreover, at the Inquiry Mr Prest confirmed that the Benefit Cost Ratio calculation does not include any allowance for the costs which would arise as a result of the level crossing upgrades in terms of increased delays to road users.

4.38 Consequently, whilst in proportional terms the forecast reductions in injuries/fatalities arising from the level crossing upgrades are very significant, having regard to the context of the current safety situation, I conclude that the proposed upgrades would have a moderate benefit in terms of safety **{SoM3i}**.

Impacts on road users

4.39 The main objections to the level crossing upgrades element of the scheme concern the accuracy of the modelling of barrier downtimes and consequent delays to pedestrians and road traffic which would arise from the crossing upgrades, with particular respect to the crossings at Meldreth Road and Waterbeach. I concur with the objectors who argue that the evidence submitted by Network Rail in respect of delays (most notably the Performance Report – Level Crossing Study (APP-39)) is confusing and in some places, I am sure accidentally, misleading [2.29]. This is particularly as a result of a number of important errors and a lack of explanation of some key figures in the documents which were only corrected and adequately explained at the Inquiry itself.

4.40 Indeed, it is clear that at least some of Network Rail's own staff did not properly understand the modelling work. This is evidenced by the statement in a Network Rail letter of 23 November 2022 (page 272 of APP-W4-2) to the local community in the Meldreth Road area:

"The proposed upgrade will have a minimal impact on eastbound journey times (2 seconds), with an approximate 65 second delay to westbound traffic, which is not considered significant".

At the Inquiry Mr Contentin, the author of the Performance Report, agreed that, although that report refers to the 2 seconds delay, it is not a realistic estimate of the impact of the proposed Meldreth Road level crossing upgrade on eastbound journey times because the modelling only took into account the eastbound journey beyond, not leading up to, the level crossing itself. He agreed that the delay to eastbound traffic heading towards the level crossing

would, in reality, be likely to be similar to the modelled approximate 65 second delay for westbound traffic.

4.41 To be clear, the 2 second figure is not an error as such when it is fully understood what it actually represents, but it does point to the extent to which the modelling work can, and has, resulted in misleading comments being made about the impacts of the level crossing upgrades on traffic. In addition to the Network Rail letter of November 2022, the Officer Report in connection with the approval of the planning application for the Meldreth Road Crossing Works (INQ-28, paragraph 9.21) also includes a similar, mistaken statement that "the report finds that the increased barrier downtime would have a minimal impact on eastbound journey times…."

4.42 Nonetheless, on gaining a full understanding of the modelling work at the Inquiry itself and in the light of all that I have read and heard both in support of and objection to it, I conclude, for the reasons set out below in relation to the main points of contention, that the modelling of delays advanced by Network Rail is essentially robust.

4.43 The modelling work is predicated on forecast minimum barrier downtimes for the upgraded level crossings, which were provided by Network Rail and are set out in the third column of Table 1.6 of the Performance Report (APP-39). One of the errors in the report (only corrected at the Inquiry) is a missing "114 seconds" in the third column for Meldreth Road crossing. The minimum downtimes are based on experience of the operation of similar crossings elsewhere combined with knowledge about the specifics of each crossing and its location. Whilst they can only be estimates (and are likely to vary marginally dependent on the precise location of new signals etc) there is no convincing evidence to indicate that they are fundamentally inaccurate.

4.44 Forecast "average" barrier downtimes are then set out in the fourth (in seconds) and fifth (in minutes and seconds) columns of Table 1.6. For six of the seven crossings, these were derived by adding 55 seconds to the minimum barrier downtime; 55 seconds being the difference between the minimum barrier downtime and the median barrier downtime at the Hinxton level crossing which is an MCB-OD crossing elsewhere in Cambridgeshire which has been in place for some time. Whilst no two level crossings are identical in their characteristics, I consider that this is essentially a reasonable approach to estimating the likely "average" barrier downtimes of the crossings proposed to be upgraded as part of this scheme. Moreover, there is no evidence to indicate that the "average" barrier downtime at the Six Mile Bottom crossing would not be the same as the identified minimum downtime for the reason stated in the ** footnote to Table 1.6. However, another error in the report (again corrected at the Inquiry) is the * footnote which completely incorrectly states that the "average" barrier downtime for the Meldreth Road crossing is based on the average of the other six crossings.

4.45 There has been considerable debate as to whether the "average" barrier downtimes should have been derived using the mean or median barrier downtime at the Hinxton level crossing. Use of the mean would add 81 seconds to the minimum barrier downtimes rather than the 55 seconds detailed above using the median. Further evidence (INQ-19) was submitted on

this particular point showing for the Meldreth Road and Waterbeach crossings the "average" barrier downtimes derived using both the mean and median. For the Meldreth Road crossing these downtimes are compared with observed downtimes at the nearby Shepreth level crossing which was recently upgraded to an MCB-CCTV barrier as is proposed for Meldreth Road. All trains which pass through the Meldreth Road crossing also pass through the Shepreth crossing.

4.46 The difference in forecast total barrier downtime across an hour, dependent upon use of the mean or median, is not enormous (in the order of 2-6 percentage points) in most cases. Whilst the difference is more significant (10 percentage points) at the Meldreth Road crossing in the PM peak, the lower median-derived figure (resulting in the barrier being down for 44% of that peak hour) is much closer to the observed 38% closure time at the Shepreth crossing than is the 54% barrier downtime at Meldreth Road derived using the mean.

4.47 Moreover, it is the nature of level crossings that the barriers will very occasionally be closed for a very long time, for example due to a fault or train failure. Whilst inevitably extremely frustrating to road users when this happens, it is not the experience of crossing users the vast majority of the time. The use of the median figure in deriving the "average" barrier downtime is much less distorted by such incidences than is use of the mean. Consequently, I consider use of the mean in deriving the average barrier downtimes set out in Table 1.6 of the Performance Report is appropriate.

4.48 There has also been debate as to whether or not barrier downtimes and the resulting delays to road users would be better expressed in ways other than the average [2.22]; for example the maximum delay experienced 99% of the time. However, whilst there are numerous different ways in which the effects of a level crossing on road users could be presented, I am satisfied that the "average" delay as set out in the Performance Report is suitable for indicating the overall likely impact of the proposed level crossing upgrades.

4.49 Having established "average" barrier downtimes at each of the level crossings the Performance Report goes on to model (using VISSIM) road traffic journey time increases and level crossing queue length increases which would be likely to be caused by the increased barrier downtimes at the upgraded crossings. There is some criticism of the road traffic survey data on which this modelling is based [2.24]. Whilst it is always the case that more traffic survey data could have been carried out or it could have taken place at different times, I consider that the surveys carried out (as detailed in paragraphs 16-20 of the Modelling Methodology Report (APP-59)) are fit for purpose. However, in respect of the Waterbeach crossing, traffic data captured in 2022 is significantly different from that surveyed in 2018. Paragraph 3.1.6 of the Performance Report (APP-39) notes the County Council's observation of "instability in the dataset post COVID-19". The report consequently models delays and queues at this crossing on the basis of both the 2022 ("DS1") and 2018 ("DS2") survey data. To my mind it would be foolhardy to assume that significantly reduced traffic flows observed in the immediate aftermath of the COVID-19 pandemic will continue into the future. I therefore favour the "DS2" results for delays and queue lengths at the Waterbeach crossing.

4.50 Overall, I conclude that, subject to the correction of errors at the Inquiry and when fully and properly understood, the modelling work advanced by Network Rail is essentially a robust assessment of the overall likely impact of the proposed level crossing upgrades on road users. Occasionally the "average" journey time increases and queues are likely to be considerably longer than the figures indicated (for example if the timetable is disrupted and trains are running in very close succession with no opportunity for the barriers to be raised between each train). Whilst on other, more frequent, occasions the delays are likely to be a little less than the average figures. But, essentially, in my view the modelling gives a good impression of the likely impact of the crossing upgrades on the majority of road users, the majority of the time.

4.51 Table 2 below sets out for each of the seven level crossings to be upgraded the average journey time increase, the maximum queue length increase and the average queue length increase. The increases are shown as both percentage and actual figures (seconds for delays and metres for queues) to make clear both the proportional and absolute increases. The AM and PM peak hour traffic flows are also shown to indicate the number of vehicles likely to be affected by the delays. The table is derived using the results of the modelling set out in the Performance Report (APP-39). The Performance Report sets out separate calculations for both directions on the road for both the AM and PM peak hours. For simplicity the average journey time increase, the maximum queue length increase and the average queue length increase shown in Table 2 is the highest of the AM and PM figures in each direction on the road for each crossing (either in absolute or proportional terms). It should be noted that the average journey time increases are based on "journey time routes" (shown in Fig 2.3, 3.6, 4.3, 5.3, 6.3, 7.3 and 8.3 of APP-39) which are example journeys in each area either to, or across, the level crossings. The journey times are not simply the time spent by a vehicle queuing at and then traversing the level crossing.

Table 2

Level Crossing	**Traffic flow (vehs)**	**Average journey time increase**	**Maximum queue length increase**	**Average queue length increase**
Milton Fen	16 (AM) 14 (PM)	**60%** (77s - 123s)	**600%** (1m - 7m)	**200%** (1m - 3m)
Waterbeach "DS2" Model	605 (AM) 480 (PM)	**44%** (132s - 190s)	**1,419%** (37m – 562m)	**1,845%** (11m- 214m)
Dimmock's Cote	403 (AM) 369 (PM)	**129%** (91s - 208s)	**1,435%** (17m – 261m)	**1,383%** (6m – 89m)
Croxton	522 (AM) 481 (PM)	**11%** (169s – 188s)	**84%** (73m – 134m)	**307%** (14m – 57m)

Six Mile Bottom	1,109 (AM) 1,060 (PM)	**9%** (129s -141s)	**199%** (162m – 485m)	**358%** (24m – 110m)
Dullingham	53 (AM) 40 (PM)	**-30%** (117s – 82s)	**-56%** (18m – 8m)	**-40%** (20m – 12m)
Meldreth Road	110 (AM) 114 (PM)	**138%** (47s - 112s)	**283%** (18m – 69m)	**375%** (4m – 19m)

4.52 The table shows that the impact of the proposed crossing upgrades on journey times and queues for vehicular traffic would vary considerably from location to location. Whilst there would be large proportional increases at Milton Fen this would affect only a small number of vehicles (around 15) in each peak hour. At Dullingham journey times and queue lengths would actually reduce (reflecting the specific current form of manually controlled barrier at this location) although again this would affect a modest number of vehicles (50 or so) in each peak hour.

4.53 Whilst average journey times would increase relatively little at Croxton and Six Mile Bottom, maximum queue lengths would increase significantly - to almost half a kilometre in the case of Six Mile Bottom, through which pass around 1,000 vehicles in each peak hour. At Dimmock's Cote (in the order of 350-400 vehicles in each peak hour) journey times would more than double and maximum queue lengths would increase from only 17m to more than a quarter of a kilometre.

4.54 At Waterbeach the average journey time would increase by more than 40% and the queues would increase very significantly to a maximum of over half a kilometre in length and to an average of nearly a quarter of a kilometre, where the peak hour traffic flow is in the order of 480 – 600 vehicles. At its maximum in the peak hour the queue would stretch back from the level crossing along Clayhithe Road, Station Road and Chapel Street to Waterbeach Green.

4.55 The increase in average journey time at Meldreth Road of 138% would also be significant, adding more than a minute to a journey currently taking 47 seconds. Meldreth Road has a moderate peak hour traffic flow of around 110 vehicles.

4.56 Overall, I conclude that, having regard to the traffic flow, the increased barrier downtime resulting from the proposed level crossing upgrades would give rise to significant adverse impacts on vehicular road users, in terms of either journey times or queuing or both, at Waterbeach, Dimmock's Cote, Six Mile Bottom and Meldreth Road crossings **{SoM3ii}**. I reach this conclusion notwithstanding the lack of an objection to the upgrades from Cambridgeshire County Council, as the local highways authority. Whilst the delays to road users have been quantified in terms of time, they have not been monetised, using standard values of time, which would enable them to be included in the Benefit Cost Ratio calculation and compared with the forecast monetised

savings in terms of fatalities and injuries. Whilst it appears to me that this would be a relatively straight forward task, at the Inquiry Network Rail declined my invitation for them to do/commission this work, stating that they considered this to be a matter for the local highway authorities.

4.57 Objectors have raised concern about the potential for the increased barrier downtimes encouraging drivers to speed on the approach to the barrier when open in order to get through the crossing before it closes [eg 2.40]. Network Rail derides this as unevidenced assertion [3.54 and 3.58]. However, I find Network Rail's position on this point contradictory, given that elsewhere [3.20] it itself argues that at Dimmock's Cote, where there are long straight approaches to the crossing, drivers are often encouraged to increase their speeds to avoid being delayed by the crossing activation. It appears to me that an increase in barrier downtime at Dimmock's Cote would only be likely to increase the likelihood of such speeding. Moreover, the eastbound approach to the Meldreth Road crossing also has a long straight approach and I share the concern of objectors that the increased barrier downtime would be an incentive for drivers to speed to "beat" the barrier here in the way Network Rail state currently often happens at Dimmock's Cote.

4.58 In the event that a speeding vehicle were to crash through the barriers and on to the railway line then the obstacle detection facility of the upgraded crossings would be likely to prevent a collision with the approaching train. However, I envisage such an event to be much less likely than the speeding vehicle passing through the crossing unhindered but presenting a safety risk to other road users on the approach to and immediately beyond the crossing.

4.59 In terms of pedestrians, Table 9.1 of APP-39 sets out the peak hour pedestrian flows at each of the crossings, which other than at Milton Fen and Waterbeach is less than four per hour and in some cases zero. A maximum of 21 pedestrians were counted at Milton Fen who, the nature of this location suggests, are most likely to be leisure/dog walkers. Whilst the extended barrier downtimes might cause these people some annoyance [2.15 and 2.57], it would be unlikely to result in any significant inconvenience. I consider the request for a shelter for walkers waiting at this crossing [2.15] to be a matter for Network Rail and not something on which the acceptability of the upgrade is dependent.

4.60 43 pedestrians were counted crossing the Waterbeach level crossing in the AM peak and 26 in the PM peak. It is most likely that these would be users of the adjoining Waterbeach station. The main settlement lies to the west of the railway line whilst the southbound platform and station car park are located, across the level crossing, on the east side. Consequently, most people using the station will need to cross the level crossing on foot on either their outward or return journey. Indeed, someone living in Waterbeach, who had parked at the station car park and were returning by train from Cambridge or London would need to cross the level crossing twice; once on foot from the northbound platform to the car park and then again, in their vehicle, back towards Waterbeach. The same would be true, in reverse, for someone heading northwards to, for example, Ely.

4.61 INQ-19 shows that, currently, the barrier is down at Waterbeach level crossing for 16% of the morning peak hour. This would increase to 49% of the same hour as a result of the proposed crossing upgrade. The chance of someone being delayed at the crossing on either one or both of their trips across it would increase more than threefold as a result of the upgrade. I share the concern of objectors [2.7 and 2.11] of the potential for passengers missing trains whilst waiting at the level crossing. Indeed, I can envisage the increased barrier downtime at Waterbeach resulting from the level crossing upgrade as being a real disincentive to residents of Waterbeach from using the train, particularly for the relatively short trip to Cambridge or Ely **{SoM3ii}**.

4.62 It is the case that planning permission has been granted for a replacement Waterbeach station, to be sited further north, away from the level crossing, at which point the existing station would be closed. At the Inquiry Network Rail argued that this significantly limits the inconvenience the upgrade will cause to rail passengers and substantially explains why a footbridge or pedestrian underpass (as suggested by some objectors) is not justified at Waterbeach. However, it could be equally argued that inconvenience which would be caused to station users justifies not implementing the level crossing upgrade at least until the replacement station is operational. Moreover, whilst the current forecast is that the relocated station will be operational by the end of 2025 [3.48], the same year in which the level crossing upgrades are proposed to be implemented, there is no guarantee of this. Network Rail has not disputed the objector's comment [2.4] that closure of the station was originally proposed more than twenty years ago, and the date has slipped repeatedly since then. Furthermore, in the absence of evidence to indicate the extent to which the existing vehicular traffic flow at the Waterbeach crossing will alter if and when the station is relocated, there remains the potential for significant journey time increases and queue lengths at this crossing even if the existing station is closed.

4.63 The Fen Line Users Association advise that the Waterbeach level crossing will be used by a shuttle bus, due to commence service in 2023, linking the station with the Cambridge Research Park and New Town [2.4]. The bus will need to cross the railway to reach a place where it can turn round. Consequently, unless and until Waterbeach station is relocated, it seems likely that the traffic queues likely to result from the level crossing upgrade would have the potential to adversely affect the reliability of this shuttle bus service and the ability for passengers to efficiently connect with railway services from the Research Park and New Town **{SoM4}**.

4.64 It is not a statutory requirement for the emergency services to be specifically consulted on a TWAO and Network Rail has not done so in this instance [3.32]. There is, therefore, no specific evidence on the effects of the crossing upgrades on blue light routes for emergency traffic **{SoM3ii}**. However, no objection to the order from any of the emergency services has been made in response to the widespread general consultation which was carried out.

Air Quality Impacts

4.65 Network Rail contends that there would be no significant air quality effects arising from the scheme, primarily on the basis of the conclusions of the

original and updated Environmental Impact Assessment Screening Opinion Requests (ES38 and ES39 of APP-W4-2) and that no air quality issues have been raised by Environmental Health teams [3.30]. However, that the Screening Opinion Requests rule out the need for a full Environmental Impact Assessment (EIA) on the basis of it being unlikely that the scheme would cause significant environmental effects in terms of air quality, this does not necessarily mean that it would not give rise to perceptible, adverse air quality effects, albeit of a level not warranting a full EIA.

4.66 Indeed, page 19 of the original Screening Opinion Request (ES38 of APP-W4-2) states:

"The most likely impacts would be on local air quality related to the nearby residential receptors from vehicle exhaust emissions related to traffic waiting at the level crossing due to increased barrier down times related to the upgrade of the existing level crossing barriers. These impacts would be localised and can be discounted beyond 200m from the emissions source (ie the traffic waiting at the level crossing) – although the impacts may be imperceptible at much closer distances. These impacts, albeit different, would not be considered to increase significantly and so the effects would be considered minor and so not significant".

4.67 At most of the crossings this conclusion appears to me to be broadly credible. Even at Meldreth, in relation to which objectors have raised concern about air quality [2.56], the maximum queue length would be likely to extend past a handful of residential properties, which are generally set well back from the road.

4.68 However, in terms of Waterbeach, the detail which supports the Screening Opinion Request conclusion (Table 2 of ES38 of APP-W4-2) identifies residential receptors "located to the west of the level crossing on Clayhithe Road approx. 25m away." The table goes on to conclude:

"During the operational stage it is considered that the single residential receptor noted may experience different/increased adverse air quality impacts due to traffic waiting at the level crossing related to the increased barrier down times. However, no increase in traffic numbers will result and so the impacts, albeit different would not to be considered to increase significantly and so the effects would be considered Minor in terms of magnitude."

4.69 Consideration of only the nearest residential property, on Clayhithe Road around 25m from the Waterbeach crossing, might be appropriate in relation to the current maximum queue length at this crossing of 37m. However, the conclusion of the Screening Opinion appears to ignore the forecast peak hour queue length of an average of 214m and a maximum of 562m extending from the crossing back along Clayhithe Road, Station Road and Chapel Street. These roads are closely bounded by numerous residential properties.

4.70 Network Rail refers to the potential for mitigation of adverse air quality impacts (paragraphs 6.12 – 6.14 of INQ-27): in essence signage and media campaigns to educate drivers to turn off their engines whilst in a queue at the level crossings. Stationary idling is an offence under the Road Traffic Act. Whilst this might be effective for the drivers of vehicles at the front of the

queue, further back in the queue (which at its maximum extent would extend more than half a kilometre) I envisage it likely that vehicles would not be at a complete standstill, rather edging very slowly towards the level crossing.

4.71 Consequently, on the evidence submitted and whilst noting that the relevant environmental health team has not submitted an objection, I am not persuaded that the air quality impacts of the Waterbeach level crossing upgrade would be only minor in terms of magnitude, as concluded by the EIA Screening Opinion Request. In the absence of further detailed evidence, it is difficult to reach a definitive conclusion, although there is nothing to indicate that the effect be such as to warrant a full EIA. However, given the increase in, and overall extent of, the queuing traffic at the crossing and the number and proximity of residential properties, I envisage that there would be an, at least, moderate localised adverse effect in terms of air quality **{SoM3ii}**.

Alternatives Considered

4.72 In developing the proposals to upgrade the level crossings to MCB-OD form (MCB-CCTV in the case of Meldreth) Network Rail considered a range of alternatives for each crossing. These are set out in Narrative Risk Assessments for each crossing (JP8 of APP-W2-2) and include options such as complete closure of the road, replacement of the crossing by a bridge, additional lights/alarms at the crossings and safety campaigns. In most cases, the reasons for rejecting the alternatives are credible and there are few, if any, objections arguing to the contrary.

4.73 Network Rail's "Enhancing Level Crossing Safety – 2019 – 2029" (J3 of APP-W2-2) sets out "the approach to managing level crossing safety" (page 6) and page 25 discusses automatic half barrier (AHB) crossings, the current form of the crossing relevant to this Order. As context it states:

"Whilst generating a proportionally high level of risk, automatic half barrier crossings do offer convenience through minimised barrier down times. This has the potential to reduce road delays and congestion. In contrast, however, the opportunity for user error or deliberate red light violations and barrier weaving is always present and offsets much of this benefit."

4.74 It then goes on to say:

"To improve the levels of protection, but maintain convenience levels, we will continue to develop a variant to half barriers by using obstacle detection technology to design an AHB+ crossing type. This solution will retain the convenience of limited road closure times, but users will be protected by full barriers. AHB+ technology, when available, will be deployed as part of risk-based improvements, upgrades and enhancements. Prioritised locations will be driven through risk assessment and will include those at stations, where there is high pedestrian use eg on the route to schools, stations or holiday parks and on high-speed lines. Specifically, AHB crossing types will not be renewed as equivalent like-for-like assets where they are adjacent to stations or regularly used by school children."

4.75 However, upgrading of the crossings to the AHB+ form is only considered in the Narrative Risk Assessments in respect of one of the crossings – Meldreth,

although I note that it had been considered in the earlier Sotera Risk Assessments (APP-11 to APP-17) in relation to some, or all, of the other crossings.

4.76 In response to my questions at the Inquiry on the consistency of the approach adopted in relation to these upgrades with Network Rail's published approach to level crossing safety, Network Rail submitted further written evidence (Section 5 of INQ-27) [3.54]. This explains that in the light of work undertaken by the Transport Research Laboratory and Aegis Engineering Systems in 2019/2020, Network Rail's Level Crossings Infrastructure System Review Panel (ISRP) has concluded that AHB+ should not be progressed on the basis that it would not present a sufficient improvement to the level of safety of AHB crossings.

4.77 However, the detail of this work has not been put before the Inquiry and it remains the case that some three years on from the ISRP's conclusions Network Rail's formally published approach to level crossing safety still references retaining the user convenience of limited road closure times through the use of AHB+ technology. I therefore conclude that, in terms of the consideration of alternatives to the proposed level crossing upgrades, there is a lack of clarity in respect of its accordance with the approach to level crossing safety set out in "Enhancing Level Crossing Safety – 2019 – 2029" **{SoM2}**.

Other matters

4.78 In terms of **{SoM9}** there are no other matters of relevance to the Order which are not already addressed in this report.

Overall conclusion

4.79 There is no, in principle, objection to the re-signalling element of the scheme and it is clear that it would give rise to substantial benefits to the wider community as a result of ensuring the ongoing reliability and efficiency of the railway network in the Cambridge area and beyond. These benefits would very clearly outweigh the limited harm likely to result to the small number of people who would be directly adversely affected by these works. Consequently, there is a compelling case in the public interest to justify conferring on Network Rail powers to compulsorily acquire and use land for the purposes of the re-signalling element of the scheme. **{SoM6i}**. Moreover, the purposes of this element of the scheme are sufficient to justify interfering with the human rights of those with an interest in the land affected by the compulsory purchase powers sought, having regard to the Human Rights Act **{SoM6ii}**. Furthermore, there is nothing which would justify not stopping-up the sections of street identified in the Order to enable this element of the scheme to be implemented.

4.80 In terms of the level crossing upgrades, other than at Dullingham, these would be likely to give rise to significant proportional reductions in fatalities/injuries. However, in all cases the cost of introducing and operating the upgraded

crossings would be more than double the monetised cost of the fatalities and injuries likely to be saved. In this context, and having regard to the number and nature of the fatalities/injuries which have happened at the level crossings over the past 18 years, I conclude that the safety benefits would be moderate.

4.81 The effects of the upgrades on delays to road users would vary from location to location but, overall, I conclude that, having regard to the traffic flow, the increased barrier downtime resulting from the proposed level crossing upgrades would give rise to significant adverse impacts on vehicular road users, in terms of either journey times or queuing or both, at Waterbeach, Dimmock's Cote, Six Mile Bottom and Meldreth Road crossings. There would also be significant adverse impacts on people using Waterbeach station, whether accessing it on foot, car or the proposed shuttle bus, to the extent that it would be likely to discourage them from using the train, particularly for journeys to Cambridge or Ely. This is unless and until the station is relocated about which there is no certainty.

4.82 Whilst the delays to road users have been quantified in terms of time, they have not been monetised which would enable them to be included in the Benefit Cost Ratio calculation and compared with the forecast monetised savings in terms of fatalities and injuries. Whilst it appears to me that this would be a relatively straight forward task, at the Inquiry Network Rail declined my invitation for them to do/commission this work, stating that they considered this to be a matter for the local highway authorities. Clearly, however, inclusion of the costs of delays to road users in the benefit cost ratio would only further reduce the existing ratios which in all cases show that the monetised value of fatality/injury savings would be substantially exceeded by the cost of constructing and operating the upgraded crossings.

4.83 Whilst in the absence of more detailed evidence, it is not possible to be definitive on the point, I consider it likely that a moderate, localised adverse effect on air quality for people living along Clayhithe Road, Station Road and Chapel Street in Waterbeach would be likely to result from the extensive queuing traffic (up to 562m in length) on these roads, arising from the increased barrier downtime at the upgraded crossing.

4.84 In terms of alternatives considered to the proposed level crossing upgrades there is a lack of clarity in respect of its accordance with the approach to level crossing safety set out in "Enhancing Level Crossing Safety – 2019 – 2029".

4.85 In essence conclusions on the level crossing upgrades turn on the weight to be given to the likely safety benefit in comparison with the delays and inconvenience likely to be caused to road users and people using Waterbeach station. I have also had regard to the level and nature of the objection to each of the upgrades. However, this is very much a matter of judgement and the Secretary of State could entirely justifiably reach different conclusions as to where the balance lies.

4.86 In respect of **Croxton** and **Dullingham**, in relation to which there are no outstanding objections, the impact on road traffic is likely to be limited and, at Croxton, the upgrade will enable the railway line speed to be increased from 40mph to 90mph [3.20]. Thus, I conclude there is a compelling case in the

public interest to justify conferring on Network Rail powers to compulsorily acquire and use land for the purposes of the level crossing upgrade elements of the scheme at these locations **{SoM6i}**. Moreover, the purposes of these elements of the scheme are sufficient to justify interfering with the human rights of those with an interest in the land affected by the compulsory purchase powers sought, having regard to the Human Rights Act **{SoM6ii}**. Furthermore, there is nothing which would justify not stopping-up the sections of street identified in the Order to enable this element of the scheme, at Croxton, to be implemented.

4.87 In respect of **Dimmock's Cote**, whilst there would be likely to be a significant adverse effect on road traffic, there are no objections to the proposals. In the light of this I conclude there is a compelling case in the public interest to justify conferring on Network Rail powers to compulsorily acquire and use land for the purposes of the level crossing upgrade elements of the scheme at this location **{SoM6i}**. Moreover, the purposes of this element of the scheme are sufficient to justify interfering with the human rights of those with an interest in the land affected by the compulsory purchase powers sought, having regard to the Human Rights Act **{SoM6ii}**.

4.88 In respect of **Milton Fen**, whilst there are a small number of objections in respect of pedestrians [2.15 and 2.57] I consider that the limited harm likely to be caused in terms of delay would be outweighed by the moderate safety benefits of the scheme, Consequently, I conclude there is a compelling case in the public interest to justify conferring on Network Rail powers to compulsorily acquire and use land for the purposes of the level crossing upgrade elements of the scheme at this location **{SoM6i}**. Moreover, the purposes of this element of the scheme are sufficient to justify interfering with the human rights of those with an interest in the land affected by the compulsory purchase powers sought, having regard to the Human Rights Act **{SoM6ii}**. Furthermore, there is nothing which would justify not stopping-up the sections of street identified in the Order to enable this element of the scheme, at this location, to be implemented.

4.89 In respect of **Six Mile Bottom**, there is one objection [2.2] from the residents of a property very close to the crossing in relation to the increased journey times likely to be caused for traffic by the crossing upgrade and the anticipated noisier and brighter crossing signals. However, the evidence (Table 2) shows that journey times are not likely to increase significantly. Whilst the length of traffic queues at the crossing would be likely to increase significantly, for these particular residents, I cannot envisage this would be likely to materially exacerbate any problems which already exist as a result of existing queuing at the crossing. And to my mind the disturbance likely to be caused by noisier and brighter crossing signals would be minimal.

4.90 Consequently, having regard to the moderate safety benefits of the scheme, I conclude there is a compelling case in the public interest to justify conferring on Network Rail powers to compulsorily acquire and use land for the purposes of the level crossing upgrade elements of the scheme at this location **{SoM6i}**. Moreover, the purposes of this element of the scheme are sufficient to justify interfering with the human rights of those with an interest in the land affected by the compulsory purchase powers sought, having regard to the

Human Rights Act **{SoM6ii}**. Furthermore, there is nothing which would justify not stopping-up the sections of street identified in the Order to enable this element of the scheme, at this location, to be implemented.

4.91 In respect of **Meldreth**, whilst there are no objections from anyone with a direct interest in the land to be acquired, there are a relatively large number of objections from individuals, two Parish Councils and the local Community Rail Partnership [2.1 and 2.18 – 2.56]. Amongst other things these argue that there is no safety case for the barrier upgrade: the barrier currently operates efficiently; there is no evidence of any accidents at the crossing and the expenditure cannot be justified. They also raise concern about the unacceptability of the delays which would be caused to drivers by the increased barrier downtime.

4.92 I appreciate that there is no objection to the crossing upgrade from either the District or County Councils and that the former has granted planning permission for the works at Meldreth Road. Nonetheless, in the light of the above, I conclude that the moderate safety benefits of the scheme would not outweigh the significant adverse impact likely to be caused to road users. Consequently, I conclude there is not a compelling case in the public interest to justify conferring on Network Rail powers to compulsorily acquire and use land for the purposes of the level crossing upgrade elements of the scheme at this location **{SoM6i}**. Moreover, the stopping-up of the sections of street identified in the Order to enable this element of the scheme, at this location, to be implemented is not justified.

4.93 In respect of **Waterbeach**, whilst there are no objections from anyone with a direct interest in the land to be acquired, there are objections from an individual and from an organisation representing rail users of the Cambridge – King's Lynn line [2.3 – 2.17]. These focus on the unacceptability of delays likely to be caused to people catching the train from Waterbeach station and of the increased likelihood of people missing trains and of them choosing to travel by car for their whole journey instead. I share these concerns and also conclude that significant delays are likely to be caused to traffic along Clayhithe Road, Station Road and Chapel Street as a result of the increased barrier downtime. Additionally, although it is not possible to be definitive about the impact, I consider that moderate, localised adverse air quality effects are likely to be caused to the residents of these roads as a result of queuing traffic. There is no guarantee that the relocation of the station will take place in the timescale indicated by Network Rail and, in any case, there is not the evidence to demonstrate that this would significantly reduce the forecast traffic queues likely to be caused by the crossing upgrade.

4.94 I appreciate that there is no objection to the crossing upgrade from either the District or County Councils. Nonetheless, in the light of the above, I conclude that the moderate safety benefits of the scheme would not outweigh the harm I have found the upgrade would be likely to cause. Consequently, I conclude there is not a compelling case in the public interest to justify conferring on Network Rail powers to compulsorily acquire and use land for the purposes of the level crossing upgrade elements of the scheme at this location **{SoM6i}**.

4.95 In reaching these conclusions I make no criticism of Network Rail for reaching different views on the balance between safety and road user convenience in respect of some of the crossings. They are, after all, charged with seeking to minimise the safety risk of level crossings. However, in reaching conclusions on the public interest test relevant to a Transport and Works Act Order, I consider that it is important that significant weight is also given to the adverse impact on road users likely to result from the minimisation of the safety risk.

4.96 That the upgrading of Meldreth Road and Waterbeach level crossings would be completed more cheaply and with less disruption if done as part of the overall re-signalling scheme, than if delayed until some future point, [3.18] is of little consequence given my conclusion that the Order provisions enabling them to proceed should not be approved at any time in the foreseeable future.

4.97 Anticipating the possibility that I might recommend that some but not all elements of the scheme provided for by the Order should proceed, I asked Network Rail to provide information on those provisions of the Order which relate to the re-signalling element of the scheme and those which relate solely to the level crossing upgrades element. The response is set out at Section 3 of INQ-27. Unfortunately, whilst this provides high-level information in respect of Meldreth Road and Waterbeach, Network Rail would need to carry out a more thorough review to provide definitive information for all the level crossings. Consequently, should the Secretary of State be minded to decide that some or all of the level crossing upgrades should not be included in the Order but that other parts of the overall scheme should, it will be necessary for Network Rail to be requested to provide a modified Order and revised Land Plans reflecting his decision.

4.98 Finally, as detailed above, the outstanding Level Crossing Orders which would be required to enable the level crossing upgrades to take place, are a potential legal impediment to this element of the scheme. Consequently, the Secretary of State should not make an Order including provisions only necessary to enable any of the proposed level crossing upgrades to take place unless he is satisfied that he, or the Office of Rail and Road on his behalf, would be likely to make the relevant Level Crossing Orders.

5 RECOMMENDATIONS

5.1 Insofar as it relates to the re-signalling element of the scheme, I recommend that the Network Rail (Cambridge Re-Signalling) Order 202[] is made;

5.2 Insofar as it relates to the level crossing upgrades at Croxton, Dullingham, Dimmock's Cote, Milton Fen and Six Mile Bottom I recommend that the Network Rail (Cambridge Re-Signalling) Order 202[] is made, if the Secretary of State is satisfied that it is likely that he, or the Office of Rail and Road on his behalf, is likely to make the necessary Level Crossing Orders for each of these upgrades; and

5.3 Insofar as it relates to the level crossing upgrades at Meldreth Road and Waterbeach I recommend that the Network Rail (Cambridge Re-Signalling) Order 202[] is not made.

5.4 In the event that the Secretary of State is minded to accept my recommendations, or otherwise decides that some or all of the level crossing upgrades should not be included in the Order but that other parts of the overall scheme should, it will be necessary to request Network Rail to provide a modified Order and revised Land Plans reflecting his decision.

Malcolm Rivett

INSPECTOR

APPENDIX A:

APPEARANCES AT THE INQUIRY

For Network Rail (the applicant):

Yaaser Vanderman

Who called:

Emily Heria Senior Sponsor, Network Rail Infrastructure Limited

Andrew Deacon Technical Director, Infrastructure Planning WSP

Elliot Stamp	Town Planning Manager, Network Rail Infrastructure Limited

Simon J Gilbey MRICS Partner, Brown and Co LLP

John Prest	Route Level Crossing Manager, Network Rail Infrastructure Limited

Nicolas Contentin Director, Modelling Group

Objectors

- Jerry Alderson
- Roger Faires
- John Grant on behalf of the Fen Line Users Association
- Prof. Roger James on behalf of Meldreth Parish Council
- Hugh Wood
- Hugh Wood on behalf of Shepreth Parish Council

APPENDIX B:

MAIN CONCLUSIONS ON EACH MATTER OF THE STATEMENT OF MATTERS

Matter (as listed in paragraph 1.16)	**Paragraphs of this Report**
SoM1	4.21, 4.28
SoM2	4.23, 4.77
SoM3i	4.38
SoM3ii	4.56, 4.61, 4.64, 4.71
SoM3iii	4.20
SoM3iv	4.24, 4.25
SoM4	4.20, 4.63
SoM5	4.18
SoM6i	4.26, 4.79, 4.86, 4.87, 4.88, 4.89, 4.91, 4.93
SoM6ii	4.26, 4.79, 4.86, 4.87, 4.88, 4.89
SoM6iii	4.11
SoM6iv	4.19
SoM7	4.15
SoM8	4.5
SoM9	4.78

APPENDIX C

AGENCY AGREEMENT BETWEEN THE SECRETARY OF STATE FOR TRANSPORT AND THE OFFICE OF RAIL AND ROAD

This AGREEMENT is made between the Secretary of State for Transport ("the Secretary of State") and the Office of Rail and Road ("ORR") under paragraph 7 of Schedule 3 to the Railways Act 2005. It relates to functions which ORR has agreed to perform on behalf of the Secretary of State, being functions which, in the opinion of the Secretary of State, can appropriately be performed by ORR in connection with its safety functions. The functions to be undertaken are those which are reserved matters. Where functions of the Secretary of State have been devolved, they are not covered by this agreement.

IT IS HEREBY AGREED that:

1. Subject to the provisions of this Agreement, the functions specified in the Schedule shall be performed on behalf of the Secretary of State by ORR.

2. ORR and the Secretary of State shall each provide the other with such information as they may at any time reasonably require in connection with the performance of the functions specified in the Schedule.

3. This Agreement shall come into effect on 1 March 2023 and shall terminate at a time agreed by both parties or on the expiry of 28 days following receipt of a written notice given by either party to this Agreement to the other.

4. Both parties will review the terms of the Agreement every 5 years after it comes into force. It may also be amended at any time outside of the 5 years, with the agreement of each party. Any such amendment must be in writing and signed by all the parties.

Signed by ..... Signed by .....

Jeremy Hotchkiss John Larkinson

Deputy Director, Rail Industry Standards

and Capability

Chief Executive

on behalf of the Secretary of State for

Transport

on behalf of the Office of Rail and Road

Date…… Date… ……..

8 February 2023

SCHEDULE

FUNCTIONS OF THE SECRETARY OF STATE TO BE PERFORMED BY THE OFFICE OF RAIL AND ROAD

1. The function under section 1 of the Level Crossings Act 1983 ("the 1983 Act") of

making any order in relation to a level crossing, except in cases where:

a) the crossing operator has not requested an order or has requested an order in compliance with a notice given to him by ORR under the powers in section 1(6A) of the 1983 Act; or

b) a draft order raises issues relating to:

(i) the designation or otherwise of rights of way; or

(ii) the safety or convenience of road users other than the users of the level crossing; or

c) ORR and the Secretary of State agree that the interests of those affected by an order would be best served by the Secretary of State making the order.

2. The function under section 42 of the Road and Rail Traffic Act 1933 of giving of

any direction in relation to a level crossing.

3. The function under section 64(2) of the Road Traffic Regulation Act 1984 of authorising the erection or retention of a traffic sign other than one specified in Regulations made under section 64(1) of that Act, (to the extent that such functions

have not been devolved) provided that:

a) the sign is at or near a level crossing;

b) the road in question is a road to which the public have access; and

c) the sign is one which is prescribed (albeit for another purpose) in Regulations made under section 52 of the Transport and Works Act 1992.

4. Functions in any private Act authorising the construction of a transport system

(where "transport system" is defined in accordance with regulation 2 of the Railways and Other Guided Transport Systems (Safety) Regulations 2006) with regard to the –

a) approval of plans, sections and other details of proposals with respect to any works, plant or equipment;

b) giving of permission for the use of any part of such a system and the prescribing of conditions for the safety of persons using such a system.

5. Functions under any order made under the Light Railways Act 1896 to approve,

consent to or allow any matter or thing or to prescribe or lay down any condition or

requirement (however expressed) in relation to the safety of a light railway.

6. Functions under any order made under the Transport and Works Act 1992 relating

to, or to matters ancillary to, the safe operation of a transport system of a kind specified in section 1 of that Act including –

a) approvals for the use of motive power on the railway or tramway; and

b) approvals in connection with barriers and protective equipment at or near level crossings.