Roger Faires Summary of evidence

Introduction

I am a Chartered Structural Engineer and a Fellow of the institution of Structural Engineers, I am also an Affiliated Lecturer at Cambridge University, Department of Architecture

I live south of the Meldreth Road level crossing, on North End in Meldreth and as such the Meldreth Road is one of the main routes North. My objections are solely in response to this level crossing.

As I have submitted a number of objections and a number of items have been responded to from network rail I write to summarize the key points of my objections below -

1. The 2019 risk assessment of the Meldreth Road level crossing by Soltera for Network Rail (core document APP-14) 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 fall 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. The report goes on to state (Table 4) that an upgrade to an AHB+ type crossing would halve the current risk.
2. The report goes on to state 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*" (table 11)
3. As a community I believe we have a different opinion on what is "significant disruption" to the road network to that of the specialists.
4. One core reason I am here and objecting is that the Shepreth station crossing was "upgraded" and my personal experience with that change is that it has cause disruption and changed my behaviour so I am objecting to this "upgrade" which covers the northern route from my part of Meldreth.
5. 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 2019 risk assessment speaks of.
6. Following an FOI request to NR it has been confirmed that the upgraded Shepreth crossing has had 3 incidents from 2019-2021. I have witnessed cyclists weaving the barriers as the second set comes down and I 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.
7. The issue with the modelling carried out (APP-39) isn't about the cars but about the train times.
8. In all my correspondence to the consultations I have wanted to understand the time the barriers will be down. This is a function of 3 things –
   i. The speed of the train
   ii. The distance from the level crossing to the signal that triggers the crossing
   iii. Any stoppages between the trigger and the level crossing

9. I do not believe the modelling takes this into account and the data used as a comparison is from a crossing at Hinxton that is further away from stations. I have 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.
10. Network rail completed a risk assessment at Shepreth station prior 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 down time.

A4.4 Calculations for Proposed Arrangements – Stopping Trains

Up EMU Passenger Train

Already calculated

Time from strike-in point to LX	176s
Station Dwell time	30s
Time for whole train to clear crossing 200m at 0>65mph	29s
Minus Amber / Red warning time	-8s
Add time for train detection to show clear	+3s
Add time for barriers to raise	+10s
	240 s

Barrier Down Time = 240 seconds

Figure 1 - Extract from Network rail risk assessment report at Shepreth station.

11. Looking at the output chart from the modelling (APP-39) at Meldreth Road the total blocks of down time occupy almost 60% of the peak time, with a 6 minute block adjacent to a 5 minute block by 30 seconds (circled blue). 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 down time.

AM Peak

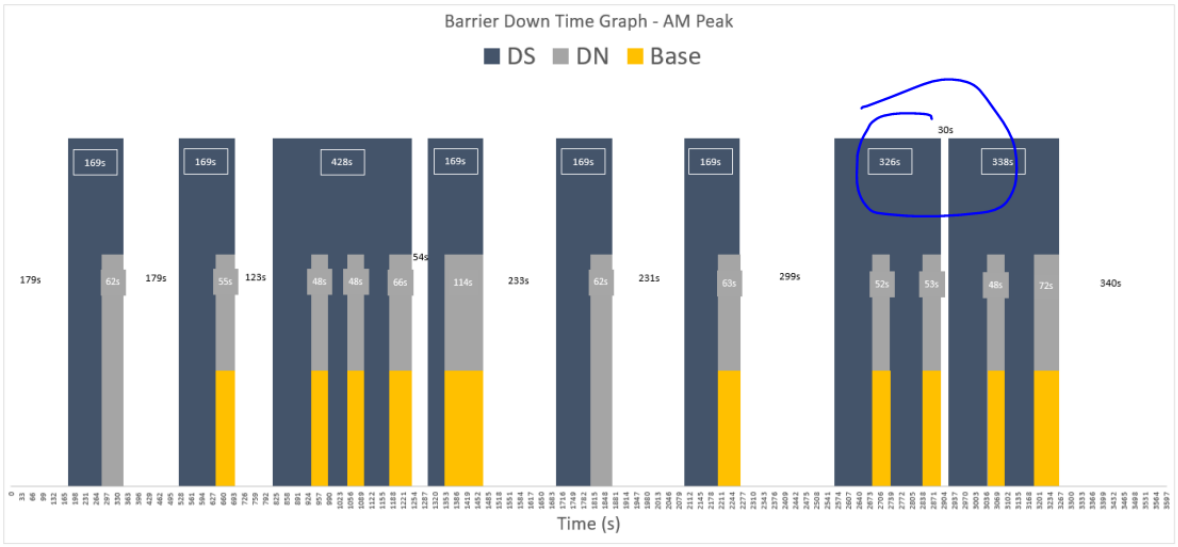

Figure 2 – extract from modelling, note the new blocks of down time are 169 seconds long when isolated, no attempt to differentiate trains that are stoppers.

12. 11 minutes is excessive. It would frustrate me. It would frustrate most drivers. I therefore believe it would create the type of frustration and misuse we have experienced at Shepreth station level crossing and that Network Rails own 2019 report warns against causing.
13. 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?
14. As noted before the signal positions that trigger the level crossing are key to the down time. The issue at this level crossing is that the signals are the wrong side of the nearby stations. There are a number of alternatives -
    i. As noted earlier the Meldreth Road risk assessment also reviews an AHB+ upgrade, which is a similar cost but much reduced down time and halves current risk without increasing misuse from frustration.
    ii. Or the Shepreth Station report highlighted the signals are not ideally located and discussed 4 aspect signalling to introduce an additional signal the correct side of the station.

<u>In conclusion:</u>

Network rail in their response to my objections suggest the applicants modelling supersedes all previous modelling in risk assessments, and whilst I understand the modelling is 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 the modelling is taken from an unvalidated, unrelated station with then barrier down times 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 worse case scenario that then can be used to effectively critique the impact of the works and the residual risk of misuse.

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

Cambridge Area Interlocking Renewals

GRIP Stage 4 – Barrier Down Time Study

Appendix A- Shepreth LX

Project Name: CAIR	Business Unit: IP
Project Manager: [redacted]	OP/PMCS number: 133838
Client: Anglia Route	

Signatures	
Prepared By: [redacted]	Name: [redacted]
	Job Title: [redacted]
	Date: 31/10/2016.
Reviewed By: [redacted]	Name [redacted]
	Job Title: [redacted]
	Date: 31/10/2016

Contents

A1 References

16-SO-43 Ver 0.8 – Cambridge Area Interlocking Renewals

Shepreth LX Renewal scheme sketch

A2 Version Number, Date and History

Version	Reason For Amendment / Re-issue	Prepared By	Reviewed By	Date Issued
0.1	Initial Draft for comment	[redacted]	[redacted]	04/08/16
0.2	Updated after initial check			06/09/16
0.3	Updated after Project Team comments			04/10/16
0.4	Updated after Project Team comment			27/10/16

For List of Abbreviations – see main document

A3 Introduction

A3.1 Purpose

This appendix shows:-

- Barrier down times for the current and proposed signalling arrangements
- Minutes per hour closed in worst case hour – both current and proposed (as shown on scheme plan reference A1)

A3.2 Level Crossing Background

Shepreth LX is currently an AHBC which is proposed to be renewed as an MCB-CCTV as a result of its Suitable and Sufficient Risk Assessment.

The current signal positions are appropriate for an MCB-CCTV crossing if mitigation for a SOYSPAD is provided in Shepreth Station.

There are station stops within the outermost strike-in in both directions – therefore both stopping and non-stopping crossing strike-ins shall be required.

A3.3 Assumptions

Assumptions covering all the level crossings are shown in the main document. Site specific assumptions are shown below:-

Shepreth LX is to be renewed as MCB-CCTV

A4 Barrier Down Time Calculations

A4.1 Calculations for Current Arrangements – Non - Stopping Trains

Up EMU Passenger Train

Already calculated

Time from strike-in point to LX	41s
200m beyond strike-out point at 65mph (29.06m/s)	7s
Minus 10s ATC delay	-10s
Minus Amber / Red warning time	-8s
Add time for train detection to show clear	+3s
Add time for barriers to raise	+10s
	43 s

Barrier Down Time = 43 seconds

Up DMU Passenger Train

Same speed profile for DMU trains as EMU trains

Barrier Down Time = 43 seconds

Up Class 4 Freight Train

Strike-in point is at	81,457m
500m (nominal train length) beyond strike-out point	79,655m
Distance travelled	1802m
65mph PSR at 80774m	
So 1119m at 65mph (29.06m/s)	39s
Decelerating from 75>65mph (75mph – 33.53m/s)	5s
159 m in 5 sec	
Remaining 524m at 75mph (33.53m/s)	16s
Total	60s
Minus 10s ATC delay	-10s
Minus Amber / Red warning time	-8s
Add time for train detection to show clear	+3s

Add time for barriers to raise	+10s
	55s

Barrier Down Time = 55 seconds

Down EMU Passenger Train

Already calculated

Time from strike-in point to LX	40s
200m beyond strike-out point at 65mph (29.06m/s)	7s
Minus 10s ATC delay	-10s
Minus Amber / Red warning time	-8s
Add time for train detection to show clear	+3s
Add time for barriers to raise	+10s
	42s

Barrier Down Time = 42 seconds

Down DMU Passenger Train

Same speed profile for DMU trains as EMU trains

Barrier Down Time = 42 seconds

Down Class 6 Freight Train

Travelling for 1702 m at 60mph (26.82m/s)	63s
(1202m + train length 500m)	
Minus 10s ATC delay	-10s
Minus Amber / Red warning time	-8s
Add time for train detection to show clear	+3s
Add time for barriers to raise	+10s
	58s

Barrier Down Time = 58 seconds

A4.2 Calculations for Current Arrangements – Stopping Trains

Up EMU Passenger Train

Strike-in point when train occupies Shepreth Station Track circuit

Station Dwell time	30s
Time to travel 200m starting from 0	29s
Time taken to arrive in Shepreth Station and pull away	59s
Minus 10s ATC delay	-10s
Minus Amber / Red warning time	-8s
Add time for train detection to show clear	+3s
Add time for barriers to raise	+10s
	54s

Barrier Down Time = 54 seconds

Up DMU Passenger Train

Same speed profile for DMU trains as EMU trains

Barrier Down Time = 54 seconds

Up Class 4 Freight Train

No Stopping Freight Trains

Down EMU Passenger Train

Same strike in as for the Non-stopping trains at 1202m but different speed profile,

And need to add on train length of 200m so 1402m

90>65/65/65>0

Using the figures calculated for the new Shepreth LX

Distance for 65>0 is 479m and	33s
Distance 90>65 is 438.76m and	13s

So remaining time at 65mph

(There is about 70m from the calculated start of deceleration from 90>65mph and the strike in point which has been include in the constant 65mph distance)

Remaining distance 484m,	17s
So total time for train to clear crossing and stop in station	**63s**
Minus 10s ATC delay	-10s
Minus Amber / Red warning time	-8s
Add time for train detection to show clear	+3s
Add time for barriers to raise	+10s
	58s

Barrier Down Time = 58 seconds

Down DMU Passenger Train

Same speed profile for DMU trains as EMU trains

Barrier Down Time = 58 seconds

Down Class 6 Freight Trains

No Stopping Freight Trains

A4.3 Calculations for Proposed Arrangements – Non-stopping Trains

Up EMU Passenger Train

Already calculated

Time from strike-in point to LX	112s
200m beyond strike-out point at 65mph (29.06m/s)	7s
Minus Amber / Red warning time	-8s
Add time for train detection to show clear	+3s
Add time for barriers to raise	+10s
	124s

Barrier Down Time = 124 seconds

Up DMU Passenger Train

Same speed profile for DMU trains as EMU trains

Barrier Down Time = 124 seconds

Up Class 4 Freight Train

Distance travelled 4669m

(4169m + train length 500m)

Strike out at 80155m

65mph PSR at 80774m

So 1119m at 65mph (29.06m/s)	39s
Decelerating from 75>65mph (75mph – 33.53m/s)	5s
159 m in 5 sec	
Remaining 3391m at 75mph (33.53m/s)	101s
Minus Amber / Red warning time	-8s
Add time for train detection to show clear	+3s
Add time for barriers to raise	+10s
	150s

Barrier Down Time = 150 seconds

Down EMU Passenger Train

Already calculated

Time from strike-in point to LX	136s
200m beyond strike-out point at 65mph (29.06m/s)	7s
Minus Amber / Red warning time	-8s
Add time for train detection to show clear	+3s
Add time for barriers to raise	+10s
	148s

Barrier Down Time = 148 seconds

Down DMU Passenger Train

Same speed profile for DMU trains as EMU trains

Barrier Down Time = 148 seconds

Down Class 6 Freight Train

Travelling for 5489 m at 60mph (26.82m/s)	205s
(4989m + train length 500m)	
Minus Amber / Red warning time	-8s
Add time for train detection to show clear	+3s
Add time for barriers to raise	+10s
	210s

Barrier Down Time = 210 seconds

A4.4 Calculations for Proposed Arrangements – Stopping Trains

Up EMU Passenger Train

Already calculated

Time from strike-in point to LX	176s
Station Dwell time	30s
Time for whole train to clear crossing 200m at 0>65mph	29s
Minus Amber / Red warning time	-8s
Add time for train detection to show clear	+3s
Add time for barriers to raise	+10s
	240 s

Barrier Down Time = 240 seconds

Up DMU Passenger Train

Same speed profile for DMU trains as EMU trains

Barrier Down Time = 240 seconds

Up Class 4 Freight Train

No Stopping Freight Trains

Down EMU Passenger Train

Already calculated

Time from strike-in point to LX	199s
Train is braking to halt, so using Appendix A of GKRT0075 Issue 4	
And train length of 200m , speed across LX will be 20mph(8.94m/s)	
Using t = (v-u)/a and a is 9%g 0.882m/s2	
Time for whole train to clear crossing, braking to halt	10s
Minus Amber / Red warning time	-8s
Add time for train detection to show clear	+3s
Add time for barriers to raise	+10s
	214s

Barrier Down Time = 214 seconds

Down DMU Passenger Train

Same speed profile for DMU trains as EMU trains

Barrier Down Time = 214 seconds

Down Class 6 Freight Train

No Stopping Freight Trains

A5 Worst Case Hour

A5.1 Timetabled Trains

The table below shows which trains pass Shepreth LX each hour from 0700 – 2000 in the May to December Working Timetable (WTT) LB02 Royston and Stansted Mountfitchet to Cambridge and Coldham Lane JN and LD01 Tottenham South JN to Ely.

Trains are only included in the data if they are timetables to run at least three days in the SX (Monday to Friday) timetable.

Time	0700 to 0800	0800 to 0900	0900 to 1000	1000 to 1100	1100 to 1200	1200 to 1300	1300 to 1400	1400 to 1500	1500 to 1600	1600 to 1700	1700 to 1800	1800 to 1900	1900 to 2000
Up Trains													
EMU	4	4	4	5	4	4	4	4	4	4	5	4	4
DMU	-	-	-	-	-	-	-	-	-	-	-	-	-
Class 4 Freight	-	-	-	1	-	-	-	-	-	-	-	-	-
Class 6 Freight	-	-	-	-	-	-	-	-	-	-	-	-	-
Down Trains													
EMU	4	4	4	4	4	4	4	4	4	4	4	4	4
DMU	-	-	-	-	-	-	-	-	-	-	-	-	-
Class 4 Freight	-	-	-	-	-	-	-	-	-	-	-	-	-
Class 6 Freight	-	-	-	-	-	-	1	-	-	-	-	-	-
Hourly Total	8	8	8	10	8	8	9	8	8	8	9	8	8

As can be seen from the table above, 1000 to 1100 is the busiest hour for trains passing Shepreth LX with 10 trains including one freight, which includes 4 Non–stopping/1 Stopping on the Up and 3 Non-stopping/1 Stopping on the Down.

A5.2 Calculations for Current Arrangements – 10 trains

Up EMU Non-Stop	43s	x	4	172s
Up EMU Stopping	54s	x	1	54s
Up Class 4 Freight	55s	x	1	55s
Down EMU Non-Stop	42s	x	3	126s
Down EMU Stopping	58s	x	1	58s
Total				465s

Rounding up to the nearest minute – Shepreth LX is currently closed for up to 8 minutes during the busiest hour of the day.

A5.3 Calculations for Proposed Arrangements – 10 trains

Up EMU Non-Stop	124s	x	4	496s
Up EMU Stopping	240s	x	1	240s
Up Class 4 Freight	150s	x	1	150s
Down EMU Non-Stop	148s	x	3	444s
Down EMU Stopping	214s	x	1	214s
Total				1,544s

Rounding up to the nearest minute – Shepreth LX will be closed for up to 26 minutes during the busiest hour of the day.

A6 Summary

The proposed changes at Shepreth LX will increase significantly the barrier down times encountered by road users as shown below.

Barrier Down Times for Single Trains

	Current Arrangements AHB	Proposed Arrangements MBC-CCTV
Up EMU	43 seconds *	124 seconds *
Up EMU - Stopping	54 seconds *	240 seconds *
Up Class 4 Freight	55 seconds *	150 seconds *
Down EMU	42 seconds *	148 seconds *
Down EMU - Stopping	58 seconds *	214 seconds *
Down Class 6 Freight	58 seconds *	210 seconds *

* Two trains passing the level crossing during the same road closure will incur a longer barrier down time.

Road Closure Minutes per Hour

	Current Arrangements AHB	Proposed Arrangements MBC-CCTV
Worst Case Hour	8 minutes per hour †	26 minutes per hour †

† The proportion of time that the crossing is closed to road traffic is likely to be less than these figures due to simultaneous trains passing the level crossing..