

**Report on Heavy Goods Vehicle Swept Path analysis
within Messing village**

Compiled and researched by the Messing and Inworth Action Group

July 2022

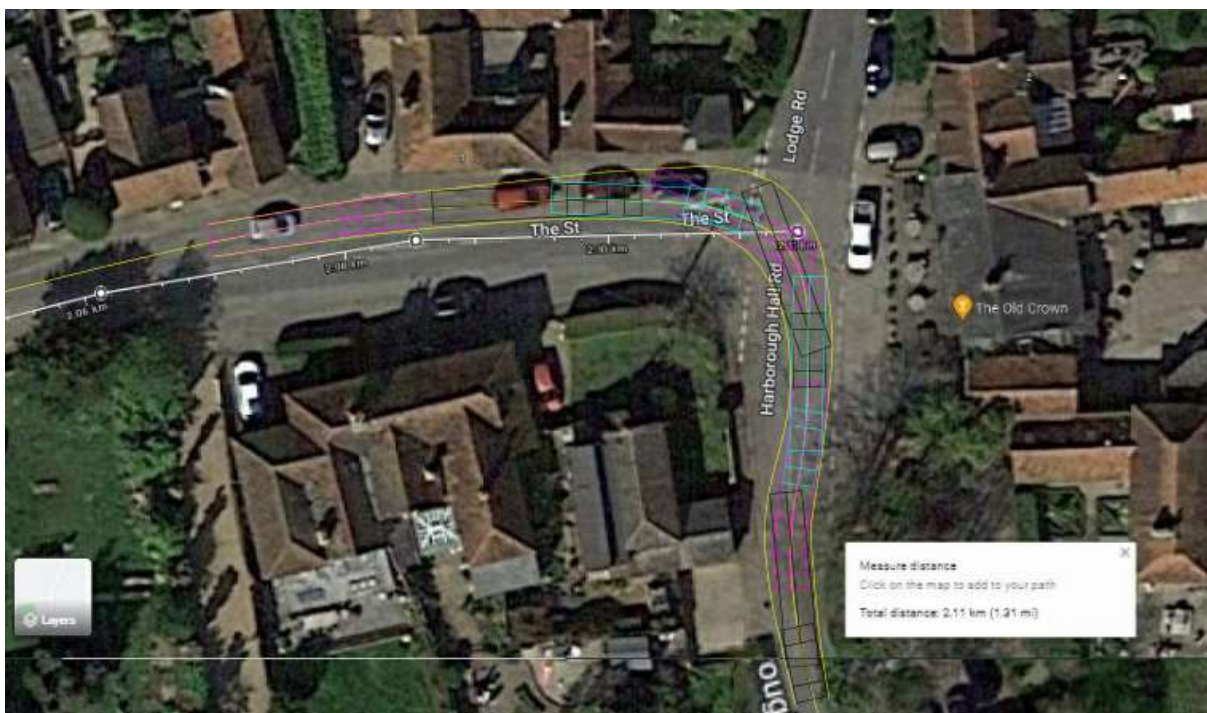
Messing village T junction – swept path analysis for 16.5m long articulated HGV

The 16.5 m long “Design Vehicle” has the worst case swept path for vehicles permitted to use UK highways.

Swept paths shown are theoretical and would vary slightly dependant on the driver of a particular vehicle.

1.0 From Kelvedon Road into Harborough Hall Road assuming no vehicles parked.

The design vehicle would be able to approach the T junction without impeding vehicles travelling in the opposite direction, on Kelvedon Road. After turning right into Harborough Hall Road, the design vehicle would occupy nearly the full width of the road and therefore require vehicles travelling in the opposite direction to give way. Harborough Hall Road is quite narrow making it difficult for vehicles travelling in the opposite direction to find somewhere to give way.



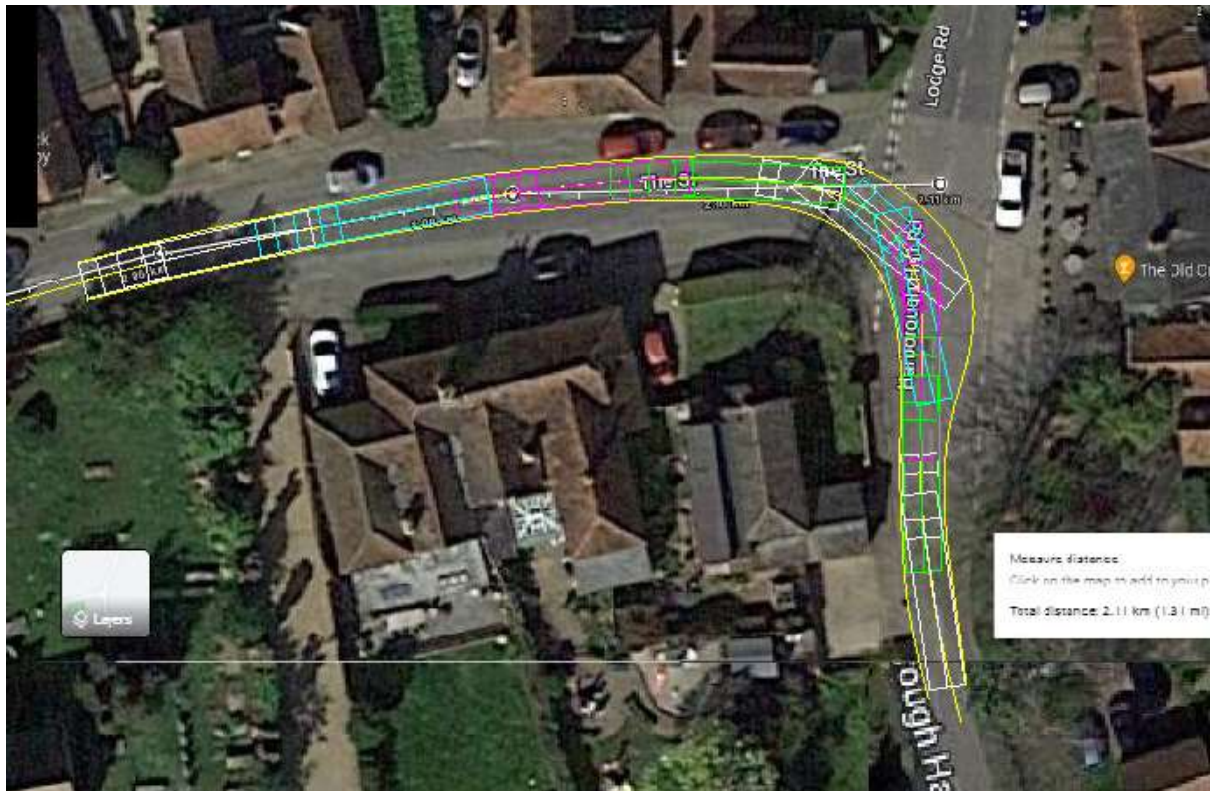
2.0 From Kelvedon Road into Harborough Hall Road assuming with vehicles parked.

On approach to the T junction the design vehicle would be forced into the opposing carriageway by parked vehicles thereby forcing vehicles travelling in the opposite direction on Kelvedon Road to give way. At the give way line of the T junction the design vehicle would need to occupy the opposing carriageway to avoid the trailer colliding with parked vehicles near to the junction. After turning right into Harborough Hall Road, the design vehicle would again occupy nearly the full width of the road and therefore require vehicles travelling in the opposite direction to give way, but as before this would be difficult due to the narrow width of Harborough Hall Road.



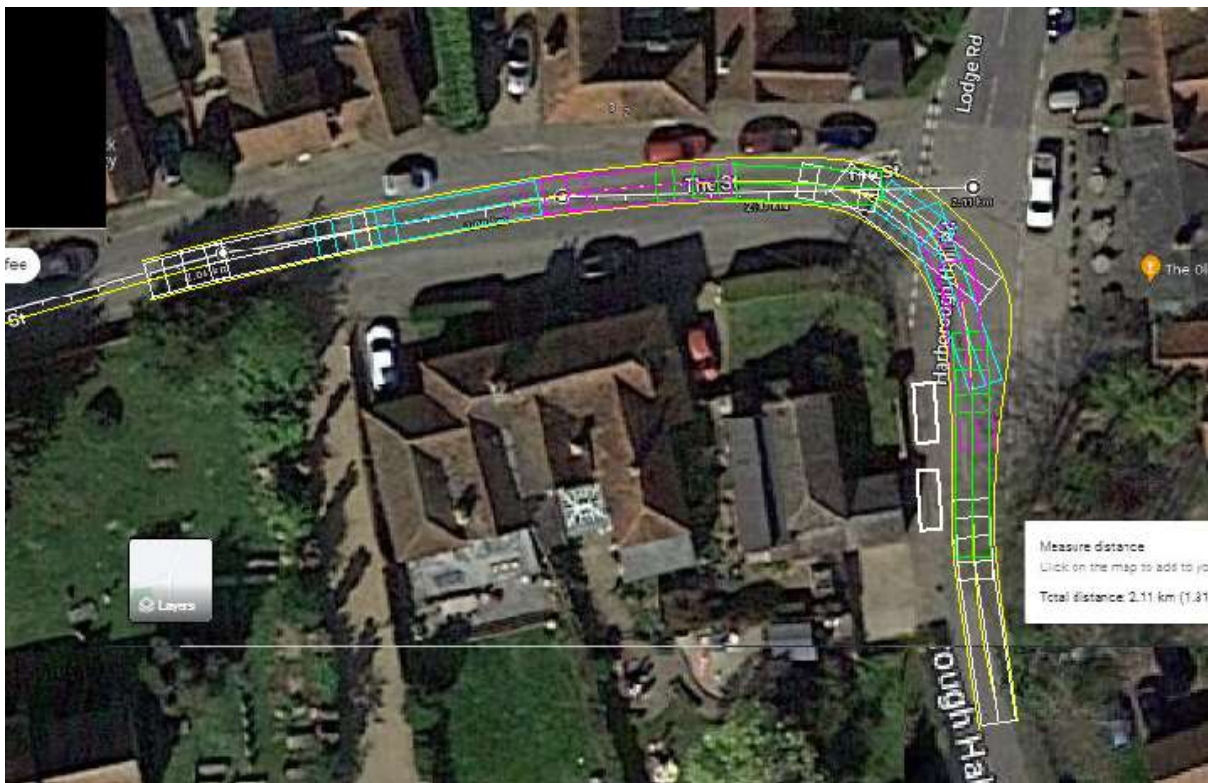
3.0 Harborough Hall Road to Kelvedon Road assuming no vehicles parked.

On approach to the T junction along Harborough Hall Road the design vehicle would occupy nearly the full width of that road. Where the road widens at the junction the design vehicle would need to occupy most of the opposing carriageway before turning left into Kelvedon Road, to allow for the swept path of the trailer. Vehicles travelling in the opposite direction would need to give way but with no parked vehicles there would be space to do this. On entering Kelvedon Road the design vehicle might need to cross into the opposite carriageway slightly. This would not leave much width for vehicles travelling in the opposite direction and most likely they would need to give way to the design vehicle.



4.0 Harbrough Hall Road to Kelvedon Road assuming with vehicles parked.

On approach to the T junction along Harbrough Hall Road the design vehicle would occupy nearly the full width of that road. Assuming there were vehicles parked on the west side of Harbrough Hall Road the design vehicle would need to move over to the opposing carriageway earlier than if no vehicles were parked. This would allow a better approach into Kelvedon Road by bringing the trailer further away from the nearside road edge before making the turn. Vehicles travelling in the opposite direction on Harbrough Hall Road would again need to give way while the design vehicle was completing its manoeuvre but there should be enough space available. The design vehicle would be able to avoid vehicles parked on the north side of Kelvedon Road. Vehicles travelling on Kelvedon Road towards the T junction would need to give way to the design vehicle.



Report on the Feasibility of Road Improvements to Kelvedon Road and Harborough Hall Lane in Messing

Compiled and researched by the Messing and Inworth Action Group

June 2022

Report on the Feasibility of Road Improvements to Kelvedon Road and Harborough Hall Lane in Messing to current DMRB standards.

Compiled and researched by the Messing and Inworth Action Group (MIAG)

1.0 Overview

The public consultation documents that National Highways published in 2021 proposed siting Inworth Road roundabout close to the existing junction of B1023 Inworth Road and Kelvedon Road.

With the roundabout in this position access from the proposed A12 Junction 24 to Kelvedon Road would be relatively easy. This would make it more attractive for traffic wishing to reach the B1022 to rat-run through Messing village than if the roundabout was sited further away from the Inworth Road/ Kelvedon Road junction. By taking this route traffic wishing to reach the B1022 Colchester Road would then be able to avoid passing through Tiptree.

Traffic predictions indicate traffic flows along Kelvedon Road, through Messing village and then along Harborough Hall Road to connect to B1022 Colchester Road could increase by as much as 3.5 times current volumes. Assuming Inworth roundabout would stay in the position proposed by National Highways this report will investigate the effect of improving both Kelvedon Road and Harborough Hall Road to cope with the predicted increases in traffic volumes.

Since Inworth roundabout as proposed at the time of the public consultation has many design faults and does not comply with National Highways design standards this investigation is purely a theoretical exercise. The design and positioning of Inworth roundabout is the subject of another report.

2.0 Conclusions

Providing a DMRB compliant highway design for the roads leading to Messing village would have a high construction cost and is unlikely to provide any substantial benefits. There would be a high environmental impact due to the land take required for the improved alignment from prime agricultural land and the loss of mature hedgerows and trees on existing property boundaries. The cost of diverting statutory undertaker's services would also be significant. By improving the road network leading to Messing village it would attract more traffic onto that network, particularly as a through route between the B1022 and B1023.

Since it would be very difficult to improve roads within Messing village from increased traffic volumes, gridlock will occur in the village centre. In addition, as road surfaces in the village centre are also substandard they will not be able to withstand the increase in traffic volume including higher truck usage. As a result, regular road closures for maintenance and repair can be expected along with a high risk of damage to properties / property boundaries, particularly those properties not benefitting from a footpath separating their property or boundary from the road.

3.0 Design Philosophy

To begin the design assessment for the improvements to the existing Kelvedon Road, through Messing village, continuing along Harborough Hall Road, the design speed for these roads was assessed. Once the existing design speed was determined an improvement of these roads to DMRB (Design Manual for Roads and Bridges) standards was investigated. Since the proposed design would be to a higher standard, the design speed would then need to be re-assessed. The design would be checked using the revised design speed to ensure it was still compliant.

The calculations in Appendix 1 below demonstrate this process. The design speed for the existing alignment was found to be 60kph, category A. To determine this value required some interpolation since values of its current average carriageway width and verge width were below those values given in CD 109 (Highway Link Design). Following the design of improvements to provide a 7.3m carriageway with 2.5m verges and improvements to horizontal curve radii, the design speed was re-calculated. Normally a rural 7.3m carriageway would have 1.0m hardstrips each side but this was thought to be an excessively high standard in this case. Kerb lines would need to be provided to protect the edge of carriageway and as part of a highway drainage system, using gulleys.

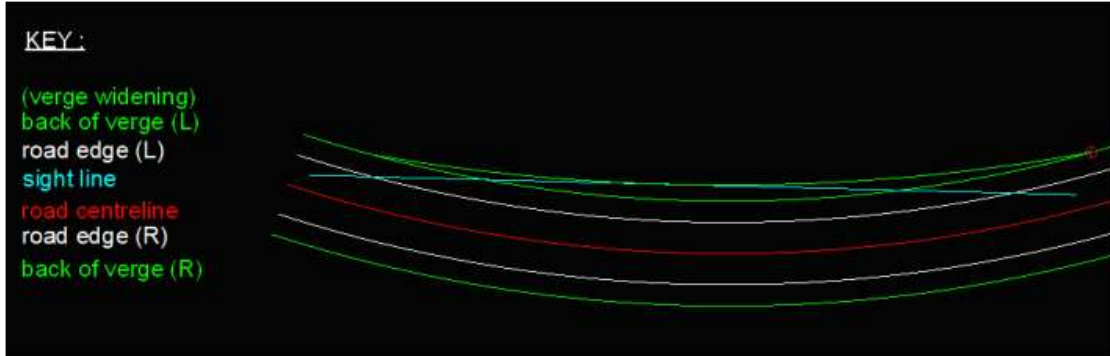
Improvements to the alignment gave a design speed on the border between 70kph category A and 85kph category B. 70kph category A was used to re-assess the design since this would have a shorter desirable minimum stopping sight distance than for 85kph and smaller horizontal radii could be used with shorter transition curves. Less verge widening for visibility would be necessary. In some areas it would not be possible to provide a compliant design to even 70kph and these areas would require some departures from standards and mitigation works, so 85kph was not considered appropriate as a design speed.

In designing these improvements an attempt was made to follow as closely as possible the existing alignment of Kelvedon Road and Harborough Hall Road. This proved to be quite difficult, with geometric requirements of CD 109 forcing the compliant design away from the existing alignment. Certain combinations of radius, transition length and angle turned through could not be accommodated. For example, a 90m radius (the lowest value permitted) would require a transition length of 272m either side of that radius. It is possible in some circumstances to use half-length transitions (ie. 136m long) but these too could not always be accommodated. Sometimes the transition length would be too long to allow the circular arc to be positioned as required. In some areas using a 90m radius would still be the preferred but to accommodate that radius would require departures from standard.

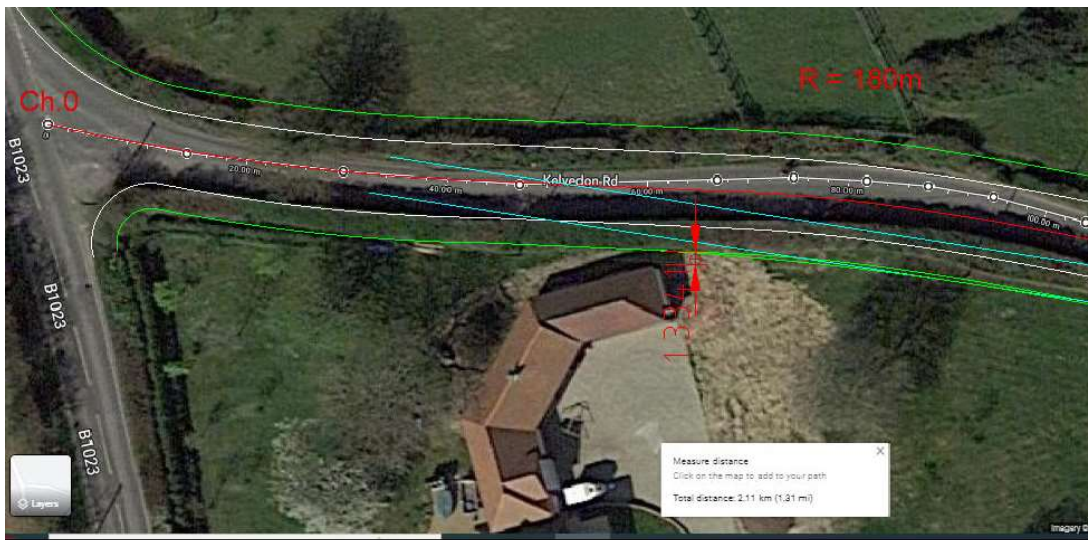
4.0 Assessment of Specific Locations

A reference point (“Chainage 0”) has been taken from the B1023 Inworth Road/ Kelvedon Road junction. Distances are in metres.

Key for screen shots :



4.01 Chainage 0 to Chainage 60



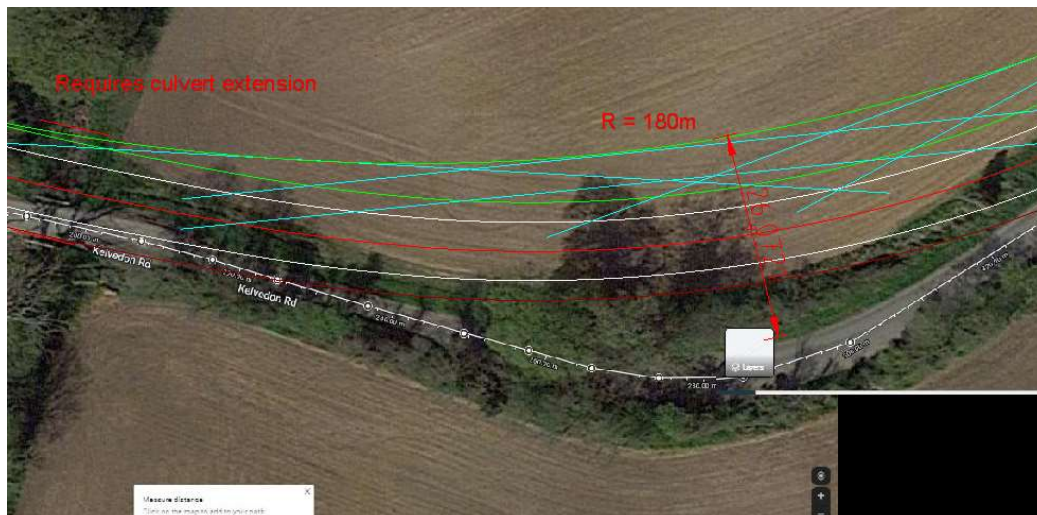
The improved alignment would follow the existing but an increase in road and verge widths would require removal of mature hedgerows on both sides of the road and some mature trees. At Chainage 60 the proposed verge would be only 1.33m from an existing building in the property on the south side. Overhead cables and poles are present on both sides of the road, these would need to be moved to the back of the proposed verge. It is not known what other services, if any, are present. There appears to be no drainage gulleys or inspection chambers present.

4.02 Chainage 60 to Chainage 150



Verge widening for visibility on the south side puts the back of verge approximately 5.0m into the property on the south side. Reducing the stopping sight distance would be a departure from standards since this would be within the immediate approach to the junction at Inworth Road. The verge widening above the normal 2.5m width would not be significant in any case. Due to an existing small radius curve at Ch.280 the alignment improvement starts to deviate from the existing alignment. The increase in road width would require removal of mature hedgerows on both sides of the road and some mature trees. Overhead cables and poles are present on both sides of the road and would need to be moved. No drainage gulleys or inspection chambers are visible.

4.03 Chainage 150 to Chainage 350



Requirements for a compliant alignment design result in the road improvement being pushed away from the existing alignment. The back of the proposed verge would be up to 26m offset from the original road edge into a field on the north side. Verge widening would be needed to provide the desirable minimum stopping sight distance on the immediate approach to property and field accesses. An existing culvert at Chainage 195 carries a ditch or water course under the existing road. This would need to be replaced by a longer culvert to allow for the increase in width of the proposed road improvement. Some mature hedgerow and trees would need to be removed.

Overhead cables and poles would need to be moved. Some of the cables cross the existing road before Chainage 170 then travel perpendicular to the road from that point.

4.04 Chainage 350 to Chainage 440



Following the small radius left hand curve (at Chainage 280), the alignment would return to its existing position for a short length. The increase in width would require some vegetation to be removed and existing ditches to be filled and replaced by new ditches at the back of verge. Overhead cables and poles would need to be moved.

4.05 Chainage 440 to Chainage 680



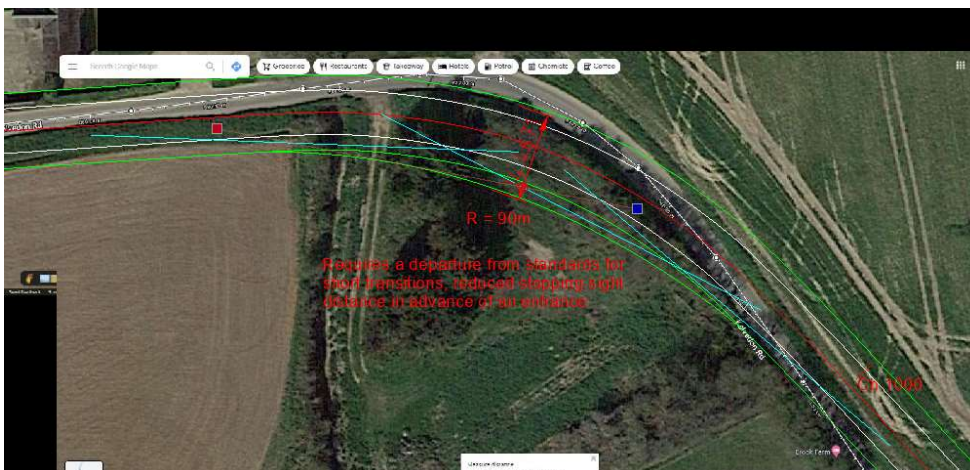
The use of a 180m radius left hand curve (at Chainage 280) followed by a 180m right hand curve (at Chainage 490) forces the improved alignment “offline” by up to about 16.5m from the existing road edge. Some mature hedgerow would need to be removed and overhead cables and poles moved.

4.06 Chainage 680 to Chainage 880



This section would be a straight alignment and would follow the line of the existing road for most of the length of the section. A proposed verge width of 2.5m would come close to one of the farm buildings but this should not cause any particular problem. Existing mature hedgerow would need to be removed from both sides of the road as well as a mature tree. Overhead cables and poles would need to be moved. The existing vertical alignment through this section appears to have a vertical crest curve with a low K value, which reduces forward visibility. This section of the road would need to have the vertical alignment improved to provide desirable minimum stopping sight distance since there are a number of accesses in the vicinity.

4.07 Chainage 880 to Chainage 1000

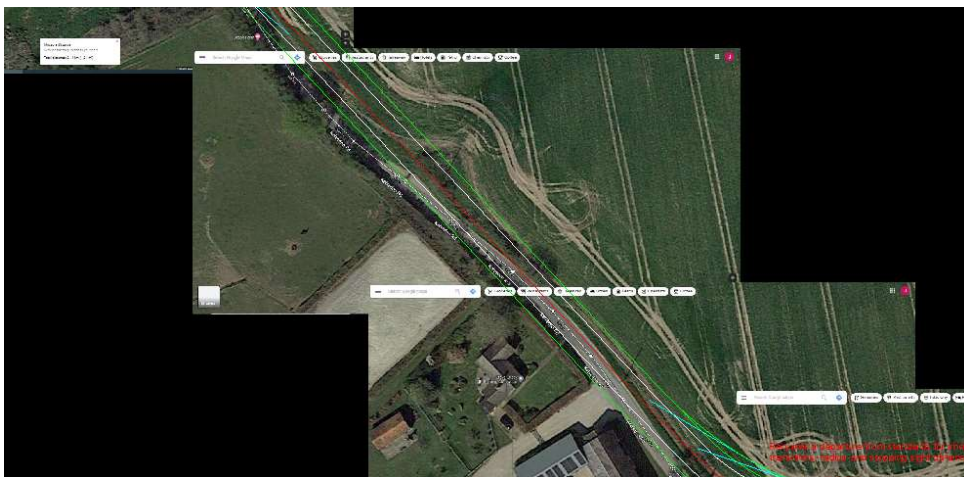


This section of the alignment presents a problem in that the existing radius here is only about 40m. The lowest value for a CD 109 compliant horizontal radius is 90m but as stated previously this radius would require very long transition lengths for a 70kph design speed. The design speed calculated for this road improvement (see Appendix 1) was 70kph, category A. For a category A design, a relaxation in horizontal radius of up to 3 steps is permitted. A 90m radius is a 4-step relaxation and is therefore a departure from standards. It would also require a considerable amount of verge widening to accommodate a stopping sight distance of 120m appropriate for a 70kph design speed. This would push the back of verge on the inside of the curve approximately 25m into the property on the south side, measured from the existing road edge. A reduction in stopping sight distance would also be a departure since there are accesses in this area.

A compromise in the design standards would therefore be necessary to provide a solution that would reduce the impact on properties but still provide a reasonable standard of design. Departures from standards would need to be applied for and could be mitigated by applying a lower speed limit over the length of alignment where the departures occur.

One possible solution would be to provide a 90m horizontal radius curve with transition curves of 49.6m length (ie. half-length) and a stopping sight distance of 70m. This would comply with a design speed of 50kph and with an advisory speed limit of 20mph applied would be a reasonable compromise. However, it would still encroach into the property on the south side by up to 14.5m from the existing road edge. There would still be a considerable impact on mature trees and hedgerows. Overhead cables and poles would also need to be moved.

4.08 Chainage 1000 to Chainage 1160



This section would be straight since CD 109 geometry requirements would not permit the existing reverse curve alignments to be replicated. The improved alignment would be pushed into the fields to the north east of the alignment. There should not need to be any intrusion into properties on the south west side. Some existing hedgerow would need to be removed and an existing ditch filled and relocated to the revised back of verge. Overhead cables and poles would also need to be moved.

4.09 Chainage 1160 to Chainage 1300

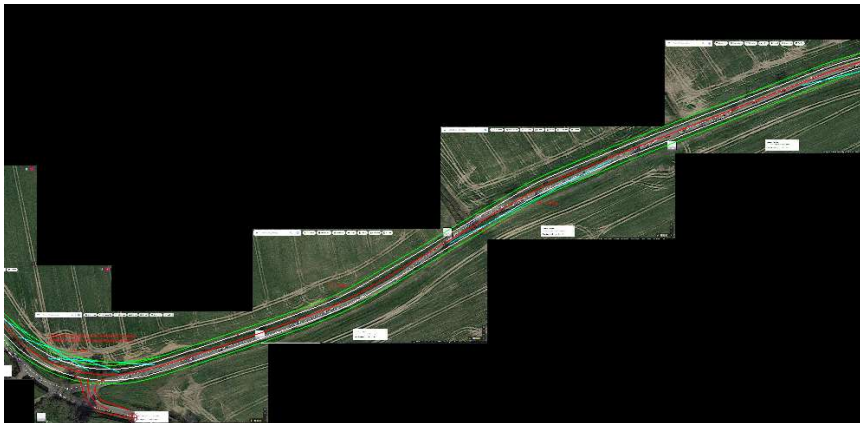


The existing horizontal radius of this section is as low as approximately 35m. To replace it with a 90m radius (the minimum permitted by CD 109) would push the alignment into fields to the north of the existing road. A 90m radius is a departure from standards for a 70kph category A design speed but to use a larger radius would intrude even further into the field. Transition curve lengths preceding and following the 90m radius would have to be quite short for this alignment to work, which could also be a further departure from standards. There is a junction with New Road on the outside of this curve.

As with the section of re-alignment between Chainage 880 and Chainage 1000 a compromise in design standards would be needed. A possible solution is to provide a 90m radius with transition lengths of approximately 50m (ie. half-length for 50kph). This would be to a compliant standard for a 50kph design speed but would require an advisory speed limit of 20mph to be applied. The desirable minimum stopping sight distance for 50kph is 70m and by designing verge widening to provide this the width of the verge could be reduced (when compared with a 70kph design). If a 20mph speed limit was applied, providing any longer stopping sight distance than 70m would encourage higher vehicle speeds, so 70m would be appropriate. As the junction with New Road is on the outside of the curve visibility for vehicles approaching the junction and exiting the junction would be good (ie. greater than 70m).

Road improvement works along section would require the removal of some trees and ditch reconstruction. Overhead cables and poles would need some changes where they cross over Kelvedon Road but they then continue along New Road away from the improved alignment.

4.10 Chainage 1300 to Chainage 1750



A relatively simple section following approximately the route of the existing Kelvedon Road but with a width increase. The increase in width would require the removal of several small trees. There are overhead cables crossing at approximately Chainage 1650 but it might be possible to leave these in their current position, with one of the poles in the proposed verge.

4.11 Chainage 1750 to Chainage 2110



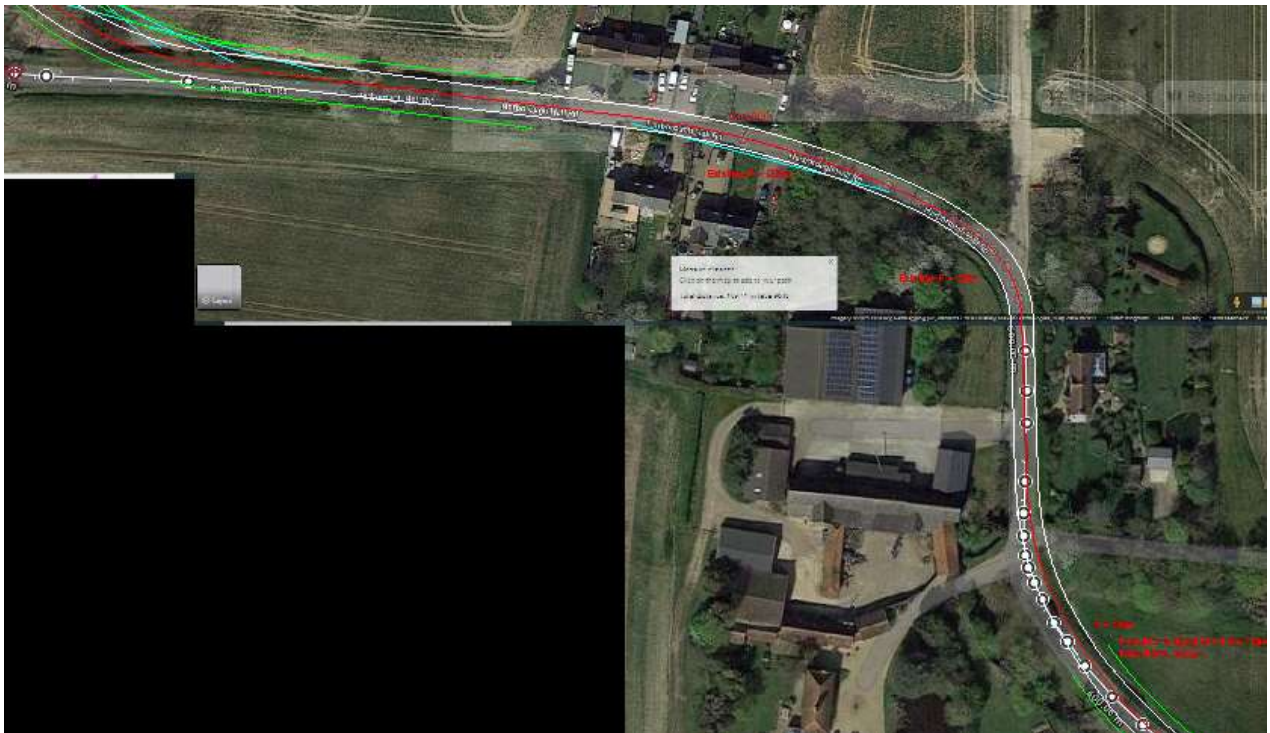
This section of Kelvedon Road and The Street pass through to the centre of Messing village. To provide an improved road alignment to DMRB standards would have a substantial impact on properties within Messing village. There would simply be insufficient space to allow for a compliant horizontal alignment, even to the lowest standards of CD 109. A carriageway width of 7.3m would also be impossible to accommodate without extensive intrusion into property boundaries. The proposal in this concept design would therefore be to leave the road alignment through Messing village untouched. From Chainage 1750 to Chainage 1820, on the approach to Messing, the proposed road width would be tapered from 7.3m to the existing width, which would then continue through the village. Currently there is a 30mph speed limit through the village but it might be appropriate to lower this to 20mph since the existing road geometry is of a quite low standard.

4.12 Chainage 2110 to Chainage 2400



This section of the alignment passes along Harborbrough Hall Road starting from the centre of Messing village. As with the section from Chainage 1750 to Chainage 2110, an increase in carriageway and verge widths would have a substantial impact on properties over the first 100 metres or so of this section. The proposal in this concept design would therefore be to leave this section of the road alignment untouched. After the first 100m (circa Chainage 2200) of Harborbrough Hall Road there are no properties on the north side of the road. There is an existing curve in the road with a radius of approximately 20m at Chainage 2300. From Chainage 2200 to Chainage 2400 it would be possible to widen from existing width to 7.3m and upgrade the horizontal alignment to replace the existing 20m radius curve with a 90m radius. The 90m radius would be required to have short transition lengths but if the 20mph advisory speed limit proposed through Messing village could be extended past this curve the alignment would comply with a 50kph design speed. With verge widening to allow a 70m stopping sight distance the alignment would be much improved over the existing alignment. It would intrude into fields on the north side but would move the road away from properties on the south side. Some trees and hedgerows would need to be removed. Overhead cables and poles would also need to be moved.

4.13 Chainage 2400 to Chainage 2650



As with the centre of Messing village this section of alignment would be difficult to improve because any realignment or widening would have a severe impact on adjacent properties. The current road widths are between 4.0m to 4.5m wide through this section. It might be possible to widen to 5.5m or 6.0m without too much impact on properties but there would be little space for verges. Up to Chainage 2500 visibility looks to be quite reasonable, providing at least 70m stopping sight distance. At approximately Chainage 2550 there is an existing curve with a radius of about 28m. To increase this radius by even a small amount would have a substantial impact on the property to the south. Visibility through the 28m radius is also quite limited, with a stopping sight distance of only about 18m. To provide even an urban standard of 33m stopping sight distance would require a verge width of about 3.5m on the inside of the curve. This would mean removing a considerable length of post and rail fencing from the property to the south.

If this section of road functions satisfactorily in its current state it might be prudent to leave it as it is. If there are currently any issues with accidents the hierarchy of improvements would be 1. Verge widening to increase stopping sight distance. 2. Increase the horizontal radius and verge width for even greater visibility. Both these measures would take a considerably amount of land from the property to the south. There is currently a 30mph speed limit applied but the advisory limit of 20mph suggested through Messing village could be applied beyond the 28m radius curve.

4.14 Chainage 2650 to Chainage 2750



This section would allow for a 90m radius with short transitions to be used. With a stopping sight distance of 70m this would still only be suitable for a 50kph design speed, so the 20mph advisory speed would need to be continued to this point. There is an existing ditch on the inside of this curve which would need to be replaced with a new ditch at the back of verge.

4.15 Chainage 2750 to Chainage 3340



The final section of the improved alignment would follow the existing Harborough Hall Road alignment as closely as possible but geometric constraints prevent the existing reverse curves being replicated. Some hedgerows and trees would need to be removed and moving some overhead cables and poles would be necessary. Some sections of existing ditch would need to be filled and replaced. Improvements to Harborough Hall Road would not need to intrude into properties to the east of the alignment on the approach to the B1022 in a final design.

5.0 Summary

Kelvedon Road and Harborough Hall Road are likely to have originally been farm tracks and probably do not have a construction depth or strength that would meet current standards. This would need to be determined by taking core samples and deflectograph readings. It might be that overlaying the original road pavement would give it an acceptable strength. However, due to the increased width of the improved alignment and those lengths of carriageway that are offline a considerable amount of new full depth construction would be needed.

Within Messing village no road improvements have been proposed since providing compliant geometry and widths would cause substantial impact on existing properties there.

Currently there appears to be no existing highway drainage system but some field ditches may also serve to drain surface water from the road. A highway drainage network would need to be added to an upgraded road since the impervious area of the widened carriageway would be increased over the existing and it follows that surface water run-off would also increase. Attenuation ponds would most likely be needed to prevent large amounts of surface water run-off directly entering existing water courses.

The only visible signs of existing statutory undertaker's services are overhead electricity and possibly telephone cables. These follow quite closely to the existing road edge for quite long lengths and would need to be moved in many areas.

There is a great deal of mature vegetation along the length of these roads. Widening and re-aligning the roads would require a substantial amount of this vegetation to be removed. Whilst it would be replaced it would be many years before it could provide the degree of screening that the current vegetation gives to properties along the route.

The Vertical alignment has not been considered in any detail since existing ground level information available is limited to 10metre contours. An accurate vertical alignment could not be designed but from the limited information available the ground looks to be mostly quite flat and should not present any problems in regards to gradients and vertical curve values.

6.0 Conclusions

Providing a DMRB compliant highway design for the roads leading to Messing village would have a high construction cost and possibly not provide any substantial benefits. There would be a high environmental impact due to land take required for the improved alignment from prime agricultural land and the loss of mature vegetation on existing property boundaries. The cost of diverting statutory undertaker's services would also be significant. By improving the road network leading to Messing village it would attract more traffic onto that network, particularly as a through route between the B1022 and B1023.

Since it would be very difficult to improve roads within Messing village from increased traffic volumes, gridlock will occur in the centre. In addition, as road surfaces in the village are also substandard they will not be able to withstand the increase in traffic volume including higher truck usage. As a result, regular road closures for maintenance and repair can be expected along with a high risk of damage to properties / property boundaries, particularly those properties not benefitting from a footpath separating their property or boundary from the road.

APPENDIX 1

Assessment of alignment geometry of existing Kelvedon Road and Harborough Hall Road

Kelvedon Road from junction with B1023 Inworth Road to Messing village.

To determine existing design speed:

From CD 109

2.8.2 The harmonic mean visibility for existing roads should be calculated using an empirical relationship given in Equation 2.8.2.

Equation 2.8.2 Empirical relationship

$$\text{Log}_{10} \text{VISI} = 2.46 + \frac{\text{VW}}{25} - \frac{B}{400}$$

where:

VW = Average verge width (averaged for both sides of the road)

B = Bendiness (degree per km - minimum length of 2 km)

NOTE 1 Equation 2.8.2 is applicable up to VISI = 720 metres.

Assume average verge width, VW = 0.5m

Bendiness, B (° per km):

B1023 Inworth Road through Messing village to B1022 Colchester Road (angles turned through)

10 (B1023)	4	59	8
20	4	14	40
8	62	(Messing village)	9 (B1022)
5	22	94	
33	5	31	
28	13	20	
20	50	79	
7	6	7	
3	25	29	
8	18	58	
9	5	49	
17	9	21	
4	46	25	

Bendiness, B = 984°/3.34km

Bendiness, B = 294.611°/ km

From equation CD 109 2.8.2:

$$\text{Log}_{10}\text{VISI} = 2.46 + \text{VW}/25 - \text{B}/400$$

$$\text{Log}_{10}\text{VISI} = 2.46 + 0.5/25 - 294.611/400$$

$$\text{Log}_{10}\text{VISI} = 1.871$$

$$\text{VISI} = 55.335$$

Alignment constraint, A_c :

From CD 109

Equation 2.2b Single carriageways

$$A_c = 12 - \frac{VISI}{60} + \frac{2B}{45}$$

where:

B = Bendiness degrees / km.

VISI = Harmonic mean visibility (metres)

$$A_c = 12 - VISI/60 + 2B/45$$

$$A_c = 12 - 55.335/60 + (2 \times 294.611)/45$$

$$A_c = 12 - 0.92225 + 13.0938$$

$$A_c = 24.17155$$

Layout Constraint, L_c :

From CD 109

Table 2.3 Layout constraint (L_c)

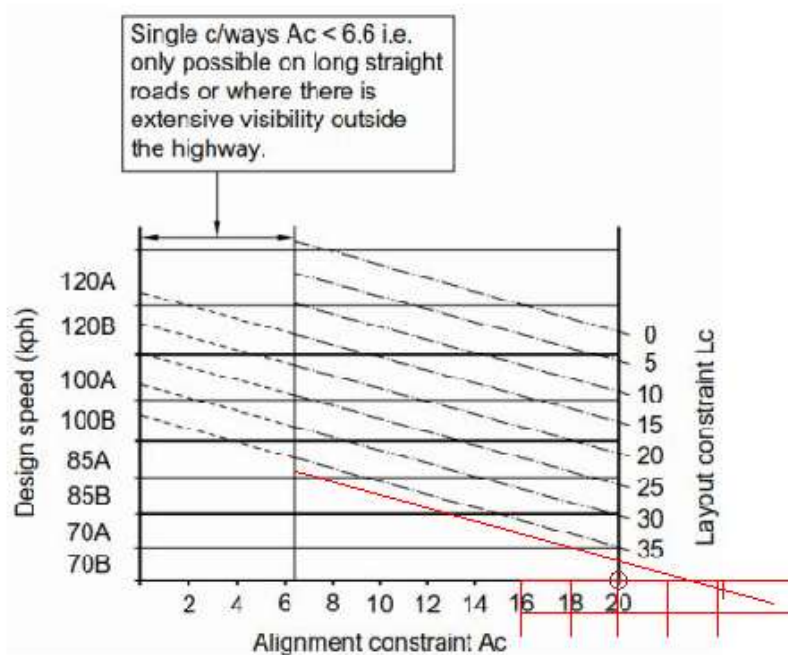
Road type	S2				WS2		WS2+1		D2AP		D3AP	D2M	D3M	D4M
	6 metres		7.3 metres		10 metres		11.5 metres		Dual 7.3 metres		Dual 11 metres	Dual 7.3 metres & hard shoulder	Dual 11 metres & hard shoulder	Dual 14.7 metres & hard shoulder
Frequency of commercial accesses, lay-bys and junctions	H	M	M	L	M	L	M	L	M	L	L	L	L	L
Standard verge width	29	26	23	21	19	17	19	17	10	9	6	4	0	0
1.5 metre verge	31	28	25	23	-	-	-	-	-	-	-	-	-	-
0.5 metre verge	33	30	-	-	-	-	-	-	-	-	-	-	-	-
L = Low number of commercial accesses, lay-bys and junctions, less than or equal to 5 per km														
M = Medium number of commercial accesses, lay-bys and junctions, between 6 to 8 per km														
H = High number of commercial accesses, lay-bys and junctions, greater than or equal to 9 per km														

Estimated L_c for average road width = 4.2m, average verge width = 0.5m, high number of accesses.

$$L_c = 37$$

Determine design speed:

Figure 2.1 Selection of design speed (rural roads)



NOTE 1 in Figure 2.1 the design speeds are arranged in bands (i.e. 120kph, 100kph, 85kph, etc). Suffixes A and B indicate the higher and lower categories of each band.

NOTE 2 As an example using Figure 2.1 to derive a design speed, an A_c value of 12 and an L_c value of 15 would give a design speed of 100A.

2.2 Alignment constraint (A_c) shall be calculated using Equation 2.2a and Equation 2.2b for dual carriageways and single carriageways respectively:

Existing design speed interpolated from Table 2.1 = 60A

Re-assess design speed for improved road alignments

Kelvedon Road from junction with B1023 Inworth Road to Messing village.

To determine design speed after improvements:

From CD 109

2.8.2 The harmonic mean visibility for existing roads should be calculated using an empirical relationship given in Equation 2.8.2.

Equation 2.8.2 Empirical relationship

$$\text{Log}_{10} VISI = 2.46 + \frac{VW}{25} - \frac{B}{400}$$

where:

VW = Average verge width (averaged for both sides of the road)

B = Bendiness (degree per km - minimum length of 2 km)

NOTE 1 Equation 2.8.2 is applicable up to $VISI = 720$ metres.

Average verge width, $VW = 2.5\text{m}$

Bendiness, B (° per km):

B1023 Inworth Road to Messing village to B1022 Colchester Road (angles turned through)

11 (B1023)	62
12	13
51	(Messing village)
18	94
13	31
52	54
65	74
12	41
10	11
13	38 (B1023)
9	
5	
54	

Bendiness, B = 743°/3.327km

Bendiness, B = 223.276°/ km

From equation 2.8.2:

$\text{Log}_{10}\text{VISI} = 2.46 + \text{VW}/25 - \text{B}/400$

$\text{Log}_{10}\text{VISI} = 2.46 + 2.5/25 - 223.276/400$

$\text{Log}_{10}\text{VISI} = 1.9218$

$\text{VISI} = 83.521$

Alignment constraint, A_c :

From CD 109

Equation 2.2b Single carriageways

$$A_c = 12 - \frac{\text{VISI}}{60} + \frac{2B}{45}$$

where:

B = Bendiness degrees / km.

VISI = Harmonic mean visibility (metres)

$$A_c = 12 - \text{VISI}/60 + 2B/45$$

$$A_c = 12 - 83.521/60 + (2 \times 223.276)/45$$

$$A_c = 12 - 1.392 + 9.923$$

$A_c = 20.531$

Layout Constraint, Lc:

From CD 109

Table 2.3 Layout constraint (Lc)

Road type	S2				WS2		WS2+1		D2AP		D3AP	D2M	D3M	D4M
Carriageway width (excluding hard strips and hard shoulder)	6 metres		7.3 metres		10 metres		11.5 metres		Dual 7.3 metres		Dual 11 metres	Dual 7.3 metres & hard shoulder	Dual 11 metres & hard shoulder	Dual 14.7 metres & hard shoulder
Frequency of commercial accesses, lay-bys and junctions	H	M	M	L	M	L	M	L	M	L	L	L	L	L
Standard verge width	29	26	23	21	19	17	19	17	10	9	6	4	0	0
1.5 metre verge	31	28	25	23	-	-	-	-	-	-	-	-	-	-
0.5 metre verge	33	30	-	-	-	-	-	-	-	-	-	-	-	-

L = Low number of commercial accesses, lay-bys and junctions, less than or equal to 5 per km
M = Medium number of commercial accesses, lay-bys and junctions, between 6 to 8 per km
H = High number of commercial accesses, lay-bys and junctions, greater than or equal to 9 per km

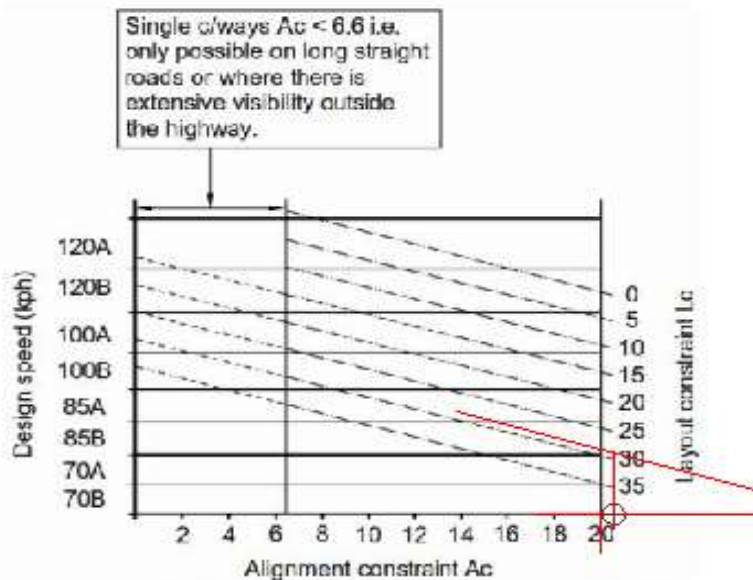
(Average road proposed width estimated at 7.0m taking into account some sections narrower than 7.3m).

Estimated Lc for average road width = 7.0m, average verge width = 2.5m, high number of accesses.

Lc = 28

Determine design speed:

Figure 2.1 Selection of design speed (rural roads)



NOTE 1: In Figure 2.1 the design speeds are arranged in bands (i.e. 120kph, 100kph, 85kph, etc.). Suffixes A and B indicate the higher and lower categories in each band.

NOTE 2: As an example using Figure 2.1 to derive a design speed, an AC value of 12 and Lc value of 28 would give a design speed of 100A.

2.2: Alignment constraint (Ac) shall be calculated using Equation 2.2a and Equation 2.2b for dual carriageways and single carriageways respectively:

Design speed interpolated from Table 2.1 = 70A/ 85B borderline

A12 Chelmsford to A120 widening scheme

Inworth Road Roundabout design checks:

Please Note:

Design checks have been based on the scheme as shown at Public Consultation November 2021, which may have been amended since then.

Design checks have been carried out on pdf files which are likely to have suffered some distortion from the original engineering drawings. However, the comments made below would not change if the original engineering design model was checked.

Google Maps screen shots have been used as a background. This is permitted by Google Maps terms.

Reference documents used:

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

1. Inworth Road Roundabout arm to B1023 in the direction of Feering and Kelvedon

Key:

120m long sight line approaching roundabout 

120m long sight line exiting roundabout 



Not to scale

Horizontal alignment

Design speed has been assumed to be 70 kph based on the vertical crest curve K value of 30 used. The B1023 Inworth Road in this area is currently subject to a 50 mph speed limit which equates to an 85 kph design speed. Does the designer intend to lower the speed limit to 40 mph to suit a 70 kph design speed?

Horizontal alignment consists of 3 elements:

Straight, Length = 3.922m

RH curve, Radius = 65.0 m, Length = 63.660m

Straight, Length = 28.972m

(No transition curves have been used between elements)

- The value of 65m for a horizontal radius does not comply with DMRB standard CD 109 Highway Link Design, para. 2.11 which states:

“Values for stopping sight distance, horizontal curvature and vertical curvature **shall** not be less than those given in Table 2.10 for 50kph design speed regardless of permitted relaxations.”

- No transition curves have been provided between horizontal elements. This does not comply with CD 109, para. 4.12 which states:

“Transition curves **shall** be provided on curves with radii less than shown in Table 2.10 (minimum R with adverse camber and without transitions).”

Visibility

For a design speed of 70 kph the desirable minimum stopping sight distance (SSD) is 120m as given by CD 109 Table 2.10 Design speed related parameters.

- Forward visibility on approach to the roundabout will not comply with CD 109 unless the sight line passes outside the Red Line boundary into the property “Park Farm” (or “Stonefield Farm”?). Visibility would be further impeded by proposed tree planting.

No relaxation in SSD is permitted on the immediate approach to a junction as defined by CD 109 para. 2.13 note 6): “for roundabouts, those lengths of carriageway on the approach to the junction between a point 1.5 times the desirable minimum stopping sight distance from the give way line and the give way line itself;”

- No verge widening has been provided in the design to allow for uninterrupted visibility for vehicles entering or leaving the roundabout.

CD 109 states that “The stopping sight distance **shall** be free of obstructions by fixed objects with the exception of:

- 1) A fixed object with a width / length less than or equal to 550mm;
- 2) A group of fixed objects with a combined width / length of 550mm or less
- 3) Those obstructions covered by the relaxations below.

Note 1 Isolated slim objects less than or equal to 550mm in width / length, such as lighting columns, sign supports, or slim footbridge support, only result in intermittent obstructions to sight lines.

Note 2 On horizontal curves where the road is in cutting, or at bridge crossings, verges and central reserves can be widened or bridge clearances increased to ensure the appropriate stopping sight distance is not obstructed.

Note 3 Verge and central reserve widening is sometimes required on horizontal curves to provide stopping sight distance in front of VRS.”

- As with the approach to the roundabout, forward visibility on exiting the roundabout would not comply with DMRB CD 116 Geometric Design of Roundabouts unless the sight line passes outside the Red Line boundary into the property “Park Farm”.

CD 116 para.3.50 states:

“On the circulatory carriageway, the exit visibility shall conform to Table 3.43.

NOTE Once a vehicle has crossed the inscribed circle at the exit from the roundabout, the SSD is to follow the requirements and advice provided in CD 109 “

Vertical Alignment

The alignment is not long enough to make a judgement about visibility in the vertical plane. It would need to be extended further along the B1023 in order to see what the existing carriageway geometry is. The use of a vertical crest curve with $K = 30$ would indicate a 70 kph design speed since no relaxations are permitted on the immediate approach to a junction (CD 109 table 2.10, CD 109, para. 2.11). The sight line would most likely be impeded by property boundaries where it passes outside the Red Line boundary.

The vertical alignment is made up of 4 elements:

Straight gradient at +4.140%, length = 10.329m

Crest curve with $K = 30$, length = 64.183m

Straight gradient at +2.001%, length = 1.374m

Straight gradient at -2.281%, length = 8.769m

(The last 2 elements show a roundabout crown line hence no vertical curve between two gradients)

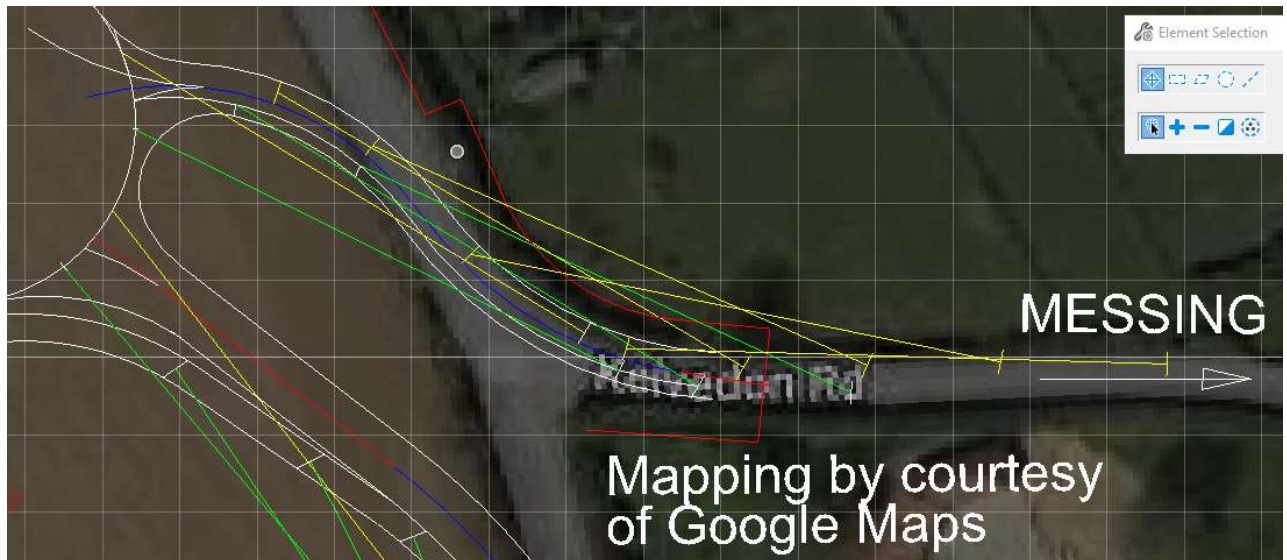
2. Inworth Road Roundabout arm to Kelvedon Rd. in the direction of Messing

Key:

70m long sight line approaching roundabout



70m long sight line exiting roundabout



Not to Scale

Horizontal alignment

Design speed has been assumed to be 50 kph based on the vertical crest curve K value of 10 used. Kelvedon Road is currently subject to a national speed limit, which varies from 40mph to 60mph dependant on vehicle type. It would be interesting to know why a 50kph design speed has been chosen.

Horizontal alignment consists of 3 elements:

Straight, Length = 11.809m

RH curve, Radius = 50.0 m, Length = 40.059m

LH curve, Radius = 40.0m, Length = 48.885m

(No transition curves have been used between elements)

- The value of 50m and 40m for horizontal radii do not comply with DMRB standard CD 109, para. 2.11 which states:

“Values for stopping sight distance, horizontal curvature and vertical curvature **shall** not be less than those given in Table 2.10 for 50kph design speed regardless of permitted relaxations.”

- Sharp curves are not good practice on the approach to a roundabout.

CD 116 para 3.6.9 NOTE 3 states that: “Reverse curves (to the right and then to the left on the approach) can be effective in providing additional deflection on poorly aligned existing roundabouts, **but sharp curves are not good practice and could induce HGV rollover or accidents involving powered two wheelers (PTW)**”

- No transition curves have been provided between horizontal elements. This does not comply with CD 109, para. 4.12 which states:

“Transition curves **shall** be provided on curves with radii less than shown in Table 2.10 (minimum R with adverse camber and without transitions).

- It appears that no curve widening has been allowed for on the horizontal radii of 50m and 40m

For horizontal curves with a low value of radius the carriageway should be widened to allow for the swept path of long vehicles. CD 109 gives values for radii as low as 90m, the minimum radius that should be used for a highway (CD 109 para. 2.11). For radii lower than 90m CD 123 Table 5.10 “Lane widening on curves of 90m radius or less” should be used. A swept path analysis for a 16.5m long articulated heavy goods vehicle (the design vehicle) should be made.

Visibility

For a design speed of 50 kph the desirable minimum stopping sight distance (SSD) is 70m as given by CD 109 Table 2.10 Design speed related parameters.

- Forward visibility on approach to the roundabout will not comply with CD 109 unless the sight line passes outside the Red Line boundary on the north side of Kelvedon Road. Visibility may be further impeded by proposed tree planting.

No relaxation in SSD is permitted on the immediate approach to a junction as defined by CD 109 para. 2.13 note 6) : “ for roundabouts, those lengths of carriageway on the approach to the junction between a point 1.5 times the desirable minimum stopping sight distance from the give way line and the give way line itself; ”

- No verge widening has been provided in the design to allow for uninterrupted visibility for vehicles entering or leaving the roundabout.

CD 109 states that “The stopping sight distance **shall** be free of obstructions by fixed objects with the exception of:

- 4) A fixed object with a width / length less than or equal to 550mm;
- 5) A group of fixed objects with a combined width / length of 550mm or less
- 6) Those obstructions covered by the relaxations below.

Note 1 Isolated slim objects less than or equal to 550mm in width / length, such as lighting columns, sign supports, or slim footbridge support, only result in intermittent obstructions to sight lines.

Note 2 On horizontal curves where the road is in cutting, or at bridge crossings, verges and central reserves can be widened or bridge clearances increased to ensure the appropriate stopping sight distance is not obstructed.

Note 3 Verge and central reserve widening is sometimes required on horizontal curves to provide stopping sight distance in front of VRS.”

- As with the approach, forward visibility on exiting the roundabout would not comply with DMRB CD 116 unless the sight line passes outside the Red Line boundary into the property “Park Farm”.

CD 116 para.3.50 states:

“On the circulatory carriageway, the exit visibility shall conform to Table 3.43.

NOTE Once a vehicle has crossed the inscribed circle at the exit from the roundabout, the SSD is to follow the requirements and advice provided in CD 109 “

Vertical Alignment

The alignment is not long enough to make a judgement about visibility in the vertical plane. It would need to be extended further along Kelvedon Road in order to see what the existing carriageway geometry is. The use of a vertical crest curve with $K = 10$ would indicate a 50 kph design speed. Since no relaxations in vertical curvature are permitted on the immediate approach to a junction 50kph would be the highest value of design speed for a crest K value of 10 (CD 109 table 2.10, CD 109, para. 2.11). The sight line would most likely be impeded by property boundaries where it passes outside the Red Line boundary.

The vertical alignment is made up of 3 elements:


Straight gradient at +2.028%, length = 19.382m

Crest curve with $K = 10$, length = 6.781m

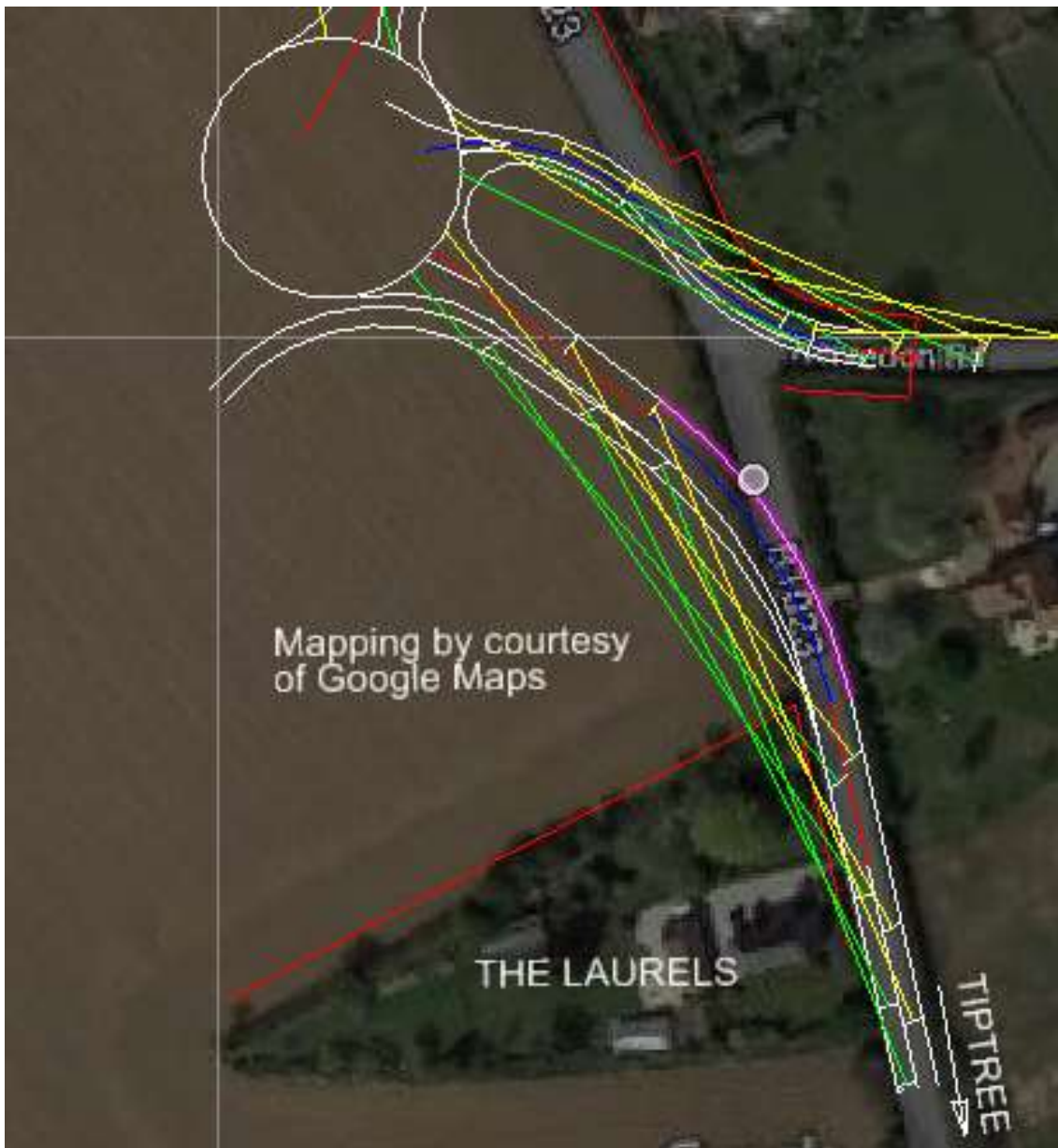
Straight gradient at +1.350%, length = 68.365m

3. Inworth Road Roundabout arm to B1023 in the direction of Tiptree

Key:

70m long sight line approaching roundabout 

70m long sight line exiting roundabout 



Not to Scale

Horizontal alignment

Design speed has been assumed to be 70 kph to be consistent with the design speeds of the arm connecting to the link road to A12 Junction 24 south roundabout and the arm to B1023 to Kelvedon. The B1023 Inworth Road in this area is currently subject to a 50 mph speed limit which equates to an 85 kph design speed. Does the designer intend to lower the speed limit to 40 mph to suit a 70 kph design speed?

Horizontal alignment consists of 3 elements:

Straight, Length = 30.212m

LH curve, Radius = 90 m, Length = 62.452m

Straight, Length = 49.241m

(No transition curves have been used between elements)

- No transition curves have been provided between horizontal elements. This does not comply with CD 109, para. 4.12 which states:

“Transition curves **shall** be provided on curves with radii less than shown in Table 2.10 (minimum R with adverse camber and without transitions).”

Visibility

For a design speed of 70 kph the desirable minimum stopping sight distance (SSD) is 120m as given by CD 109 Table 2.10 Design speed related parameters.

- Forward visibility on approach to the roundabout will not comply with CD 109 unless the sight line passes outside the Red Line boundary into the property “The Laurels”. Visibility may be further impeded by proposed tree planting.

No relaxation in SSD is permitted on the immediate approach to a junction as defined by CD 109 para. 2.13 note 6): “for roundabouts, those lengths of carriageway on the approach to the junction between a point 1.5 times the desirable minimum stopping sight distance from the give way line and the give way line itself;”

- No verge widening has been provided in the design to allow for uninterrupted visibility for vehicles entering or leaving the roundabout.

CD 109 states that “The stopping sight distance **shall** be free of obstructions by fixed objects with the exception of:

- 7) A fixed object with a width / length less than or equal to 550mm;
- 8) A group of fixed objects with a combined width / length of 550mm or less
- 9) Those obstructions covered by the relaxations below.

Note 1 Isolated slim objects less than or equal to 550mm in width / length, such as lighting columns, sign supports, or slim footbridge support, only result in intermittent obstructions to sight lines.

Note 2 On horizontal curves where the road is in cutting, or at bridge crossings, verges and central reserves can be widened or bridge clearances increased to ensure the appropriate stopping sight distance is not obstructed.

Note 3 Verges and central reserve widening is sometimes required on horizontal curves to provide stopping sight distance in front of VRS."

In addition to the roundabout entry the segregated left turn lane (SLTL) should provide for stopping sight distance of 120m. This would also cross the Red Line boundary into the property "The Laurels".

CD 116 para. 6.24 states that "The desirable minimum SSD for the SLTL **shall** be the lesser of:

- 1) The SSD obtained from CD 109 for the design speed of the approach; or
- 2) The SSD given in Table 6.27 of this document appropriate to the maximum nearside curve radius.

The maximum nearside radius of the SLTL in this design appears to be about 90m, which falls within the Table 6.27 range 80m-100m radius. This gives an SSD of 120m, which is the same SSD as for the approach alignment.

- As with the approach to the roundabout, forward visibility on exiting the roundabout would not comply with CD 116 unless the sight line passes outside the Red Line boundary into the property "The Laurels".

CD 116 para.3.50 states:

"On the circulatory carriageway, the exit visibility shall conform to Table 3.43.

NOTE Once a vehicle has crossed the inscribed circle at the exit from the roundabout, the SSD is to follow the requirements and advice provided in CD 109 "

Vertical Alignment

The alignment is not long enough to make an exact judgement about visibility in the vertical plane. It would need to be extended further along the B1023 in order to see what the existing carriageway geometry is. The sight line would most likely be impeded by property boundaries where it passes outside the Red Line boundary.

The vertical alignment is made up of 1 element:

Straight gradient at -0.281%, length = 138.393m

Report on the Design of the Main Alternative For Junction 24

Compiled and researched by the Messing and Inworth Action Group

May 2022

Report on the Design of the Main Alternative for Junction 24.

Compiled and researched by the Messing and Inworth Action Group (MIAG)

1.0 Overview

This report is to discuss the technical aspects of the Main Alternative for Junction 24 as proposed by Messing-cum-Inworth Parish Council. The Main Alternative has been produced to replace the National Highways (formerly Highways England) (NH) proposal for the construction of a new junction 24 connected to the B1023.

It is our belief that the original NH proposal will create increased and unsustainable traffic flows through the narrow lanes leading to Messing and through Inworth village itself. The Main Alternative Proposal seeks to reduce the impact of these changes by moving the connections to the B1023 to outside the limits of Inworth village. This report demonstrates that the provision of the alternative proposal is technically feasible and would achieve the required objectives.

This report is supplementary to the report produced by MAG on the impact of the Junction 24 proposals, and should be consulted for further information.

2.0 National Highways Proposal for Junction 24

The Proposal, from National Highways, (NH) was to 'Construct a New Junction 24 on the A12, south of Inworth Road. (To) Provide slip roads terminating where the Messing Road meets Inworth Road so that all traffic joining or leaving the A12 would use the Inworth Road'. Refer to the map in Appendix A. The technical design of this proposal is the subject of a separate report by MIAG.

3.0 The Main Alternative Proposal

Messing-Cum- Inworth Parish Council have put forward a proposal for an alternative to Junction 24 that joins the B1023 south of Inworth village, and also north of the A12. (Refer to the map in Appendix C). This proposal would divert all traffic away from Inworth and Messing villages, greatly reducing the problems of increased traffic through the villages and rural lanes. The route would for the most part follow the line of the former railway and pass to the west of Inworth village before re-joining the B1023 south of Inworth. This alternative route would have the effect of diverting traffic away from Inworth itself where road widening, surfacing and drainage works would be required under the NH proposal to bring the road up to standard. The roads through Inworth and Messing would therefore only serve local traffic and would be signposted as such.

The Main Alternative Proposal has been the subject of a detailed design review by the Messing and Inworth Action Group (MIAG), and this review is the subject of this report. The proposal is a concept design only to demonstrate that the route is a viable proposal and will need a full design if adopted by NH.

The Main Alternative has the backing of Priti Patel MP, Essex County Council, Colchester District Council and the local Parish Councils.

It is understood that NH have not considered this proposal in any detail at this point in time.

4.0 Assessment of Messing Action Group Alternative Proposal

4.1 Overview

The Main Alternative route would start to the south of Inworth and run west before following the route of the former Tiptree to Kelvedon railway line until it connected with the proposed south roundabout of A12 Junction 24. The route would continue across the proposed Junction 24 to the north roundabout. A further link road from A12 Junction 24 north roundabout connecting to the B1023 would then be necessary. This route could allow for a road alignment which would be compliant with National Highways design standards.

4.2 Detailed Assessment

From a new roundabout junction on the B1023 to the north of Perrywood Garden Centre car park a new link road alignment would run to the west before intersecting with Windmill Hill close to where the entrance to Bunting's Nest and Inworth Hall Farm is currently positioned. At the start of the new link, it would run through an area identified for flood plain compensation works, these works might need to be re-positioned. By using a design speed of 85kph for the whole alignment (since the existing B1023 is currently subject to a 50mph speed limit in this area) a design compliant with DMRB standards could be achieved. The horizontal alignment would be a simple straight of 200m length with a 1% gradient.

Where the proposed alignment would intersect with Windmill Hill, there is an access track which follows the route of a dismantled railway line and provides access to Bunting's Nest and Inworth Hall Farm. The Main Alternative link road could run alongside this track, the access track would need some realignment.

A roundabout at the intersection of the alternative link and Windmill Hill would be useful to change the direction of the alternative link alignment without using sharp horizontal curves. It could also provide for a revised entry to the access track off the roundabout. A short connection to Windmill Hill on the west side of the roundabout would also have to be provided. Windmill Hill to the east of the roundabout could be stopped up.

From the new Windmill Hill roundabout, the alternative link would follow approximately the route of the former railway line until crossing a private road from Inworth Hall. Another junction would be needed at the intersection of the private road from Inworth Hall and the alternative link. A roundabout would provide the best option here since the flows of vehicles along the private road would be considerably less than on the alternative link road. A roundabout would give the best opportunity for vehicles, which would include farm vehicles, from the private road to access gaps in traffic to cross the alternative link road.

The horizontal alignment of the alternative link between Windmill Hill roundabout and the roundabout at the intersection with the private road from Inworth Hall would be straight. The length of this section would be about 725m long and would allow sufficient length for an overtaking section. The existing ground profile is on the crest of a hill but is reasonably flat and

would allow for a Crest curve with K value of 285 or greater to be used which would allow full overtaking sight distance.

From the roundabout at the intersection with Inworth Hall private road the alternative link would follow approximately an existing field boundary and tree line before connecting to the south roundabout of A12 Junction 24. This section would be approximately 350m in length, which would not be long enough to provide an overtaking section. It would also go into cutting so that it could tie in vertically with the NH proposed A12 Junction 24 south roundabout. The alignment would need to use horizontal radii of less than 360m to make it clear it was not an overtaking section. It is usual to reduce the vertical alignment crest curve K values by 1 step for a non-overtaking section but in this case the vertical curve would fall within the “immediate approach” to the junction at either end of this section of the link. In that case the desirable minimum crest K would be needed in order to maintain forward visibility on approaching the junctions.

From the north roundabout of the proposed A12 Junction 24 a new link would be required to connect to the B1023 on the north side of the A12. This should be a relatively simple alignment across open fields. In order to discourage overtaking on this relatively short segment it is proposed to adjust the horizontal alignment by providing a straight, transition ($L = \sqrt{24R}$), circular curve $R = 360\text{m}$ (a 1 step relaxation), transition ($L = \sqrt{24R}$), straight. Because the $R = 360\text{m}$ curve with a 1 step relaxation would not be within the “immediate approach” to the junctions at either end of the alignment a reduction in stopping sight distance of 1 step would also be allowed. The link would have to cross Domsey Brook and therefore need a new structure to carry the link over the brook. A pre-cast box type structure would probably be sufficient for this purpose. To connect to the B1023 at the northern end of this link another roundabout would be required. As the B1023 has a longitudinal gradient of approximately 7% north of where the A12 crosses this would not be a good position for a roundabout. The gradient is flatter where there is an entrance into Threshelfords Rural Business Park. This would be a suitable place to site a new roundabout, which could include an arm providing access into the business park.

5.0 Conclusions

5.1 Design

The Main Alternative Proposal has been assessed and can provide a route that is fully compliant with the required design standards and achieves the objectives of removing through traffic from Inworth and Messing villages. The proposal avoids the problems of the pinch-points of Hinds Bridge and various locations within Inworth itself and avoids impacting local businesses.

5.2 Costs

The cost of the Main Alternative has not been fully evaluated at the time of this report.

This proposal would have a longer alignment than the NH proposed link from B1023 to A12 Junction 24 south roundabout. The NH proposed link would be about 500m long, but the alternative would be about 1435m on the south side of the A12 Junction 24 and a further 685m for the link on the north side. It would also require three more roundabout junctions than the NH proposal. That would increase the cost of a link from B1023 to Junction 24. Additional land would need to be purchased and there could be objections from any land owners affected.

The alternative proposal would remove the requirement for road widening works on the B1023 through Inworth. There is also a large area identified in Inworth village for an attenuation pond and flood plain compensation, which might have to remain in place in order for the proposed drainage design to work.

6.0 List of Appendices

- 6.1 Map of Area showing National Highways proposal for Junction 24
- 6.2 Map of Inworth showing National Highways for road improvements
- 6.3 Map of Area showing the alternative proposal

6.1 Appendix A

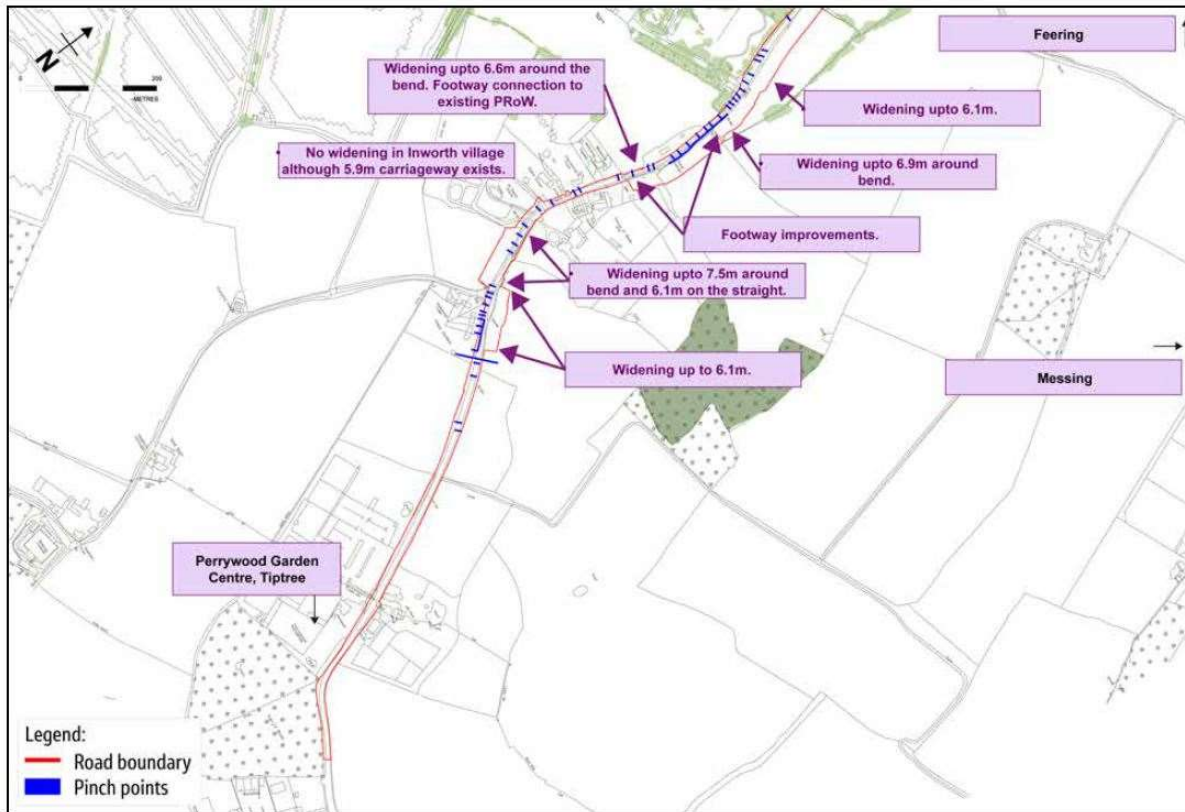
Map of Area showing National Highways Proposed Junction 24



6.2 Appendix B

Map of Inworth showing National Highways proposed road widening

Supplementary consultation November 2021



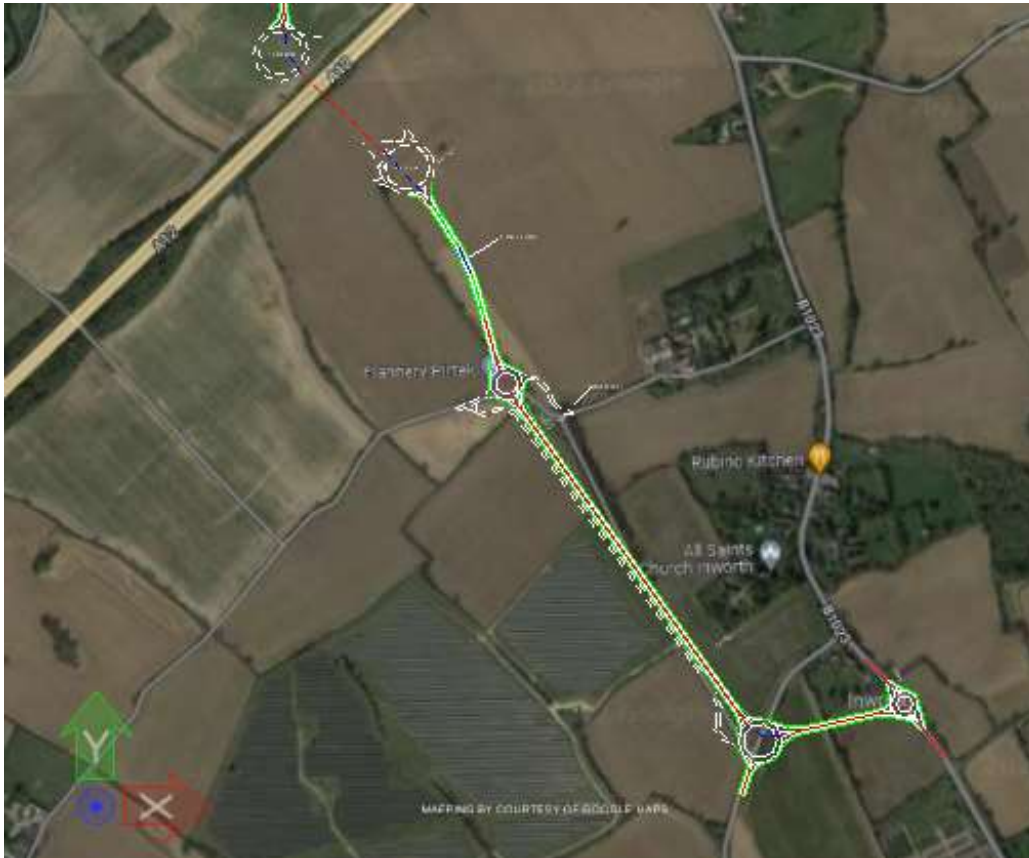
6.3 Appendix C

Map of area showing Main Alternative Proposal

1). Main Alternative north of A12



2). Main Alternative south of A12



**Report on the Technical Design
of the NH Proposal for Junction 24**

Compiled and researched by the Messing and Inworth Action Group

May 2022

Report on the Technical Design of the National Highways Proposal for Junction 24

Compiled and researched by the Messing and Inworth Action Group

1.0 Overview

This report is to discuss the technical design of the National Highways (NH) (formerly Highways England) proposal for the improvement of the A12 and the construction of a new junction 24 connected to the B1023. It is our belief that the original proposal does not comply with National Design Standards and does not address the problems of capacity of the surrounding roads.

This report is supplementary to the report produced in February by Messing Action Group on the impact of the Junction 24 proposals on Messing and Inworth, and should be consulted for further information.

2.0 National Highways Proposal for Junction 24

The Proposal, from National Highways, (NH) was to 'Construct a New Junction 24 on the A12, south of Inworth Road. (To) Provide slip roads terminating where the Messing Road meets Inworth Road so that all traffic joining or leaving the A12 would use the Inworth Road'. Refer to the map in Appendix A. The consultation documents make no referral to the effects of the proposed scheme on the lanes leading to Messing or any other surrounding lanes.

The proposal also allows for significant road improvements to the B1023 through Inworth village to bring it closer to the required standard to handle the increased volume of traffic. These works are highlighted in the NH document "A12 Chelmsford to A120 widening, Supplementary Consultation, November 2021" and shown on the plans Sheets 14 and 20 in Map Book 3: Updated General Arrangements (Set 3 of 3). The proposals are also shown in Appendix B of this report.

3.0 Comments on the Design

The design has been examined closely with respect to horizontal and vertical alignment, sightlines and stopping distances and found not to comply with National Design Standards. Specific issues are discussed in detail in the following paragraphs. It must be stressed that this is not an exhaustive list and there may well be other aspects that do not comply.

3.1 Kelvedon Road, Messing

The siting of the proposed Inworth Road Roundabout near to the existing junction of B1023 Inworth Road and Kelvedon Road gives a relatively easy path for vehicles leaving the A12 to access Kelvedon Road leading to Messing village. This may provide opportunity for drivers tempted to "rat run" through Messing village to connect with the B1022 at the south end of Harborough Hall Road. Siting the proposed roundabout at a location further away from Kelvedon Road would make this route less attractive. MIAG are rightly concerned regarding the suitability of roads in the vicinity of Messing village to cope with the significant increases in traffic volumes predicted. As demonstrated in the Messing Action Group Report these roads are sub-standard in respect of width, horizontal curvature, possibly vertical crest curvature, stopping sight distance, forward visibility to junctions and accesses and an absence of formal passing places. These roads are not

wide enough to cater for motor vehicles passing pedestrians, cyclists and equestrian users under recently revised Highway Code rules.

As stated in the report these roads fall short of the minimum road width of 5.5m that would be necessary to allow two vehicles to pass at low speed. Manual for Streets shows that 5.5m is sufficient for a heavy vehicle and a car to pass but this would be for a straight section of road alignment in an urban area. When horizontal curvature falls below a 90m radius, as it frequently does on these roads, there would be a requirement for widening above 5.5m width on curves to allow for the swept path of heavy vehicles.

3.2 Effect of NH Proposal on traffic through Inworth

Inworth is a small community of around 30 properties, including a number of listed buildings, with All Saints Church in the centre. The majority of the properties are directly fronting the B1023, with driveways onto the road. A few properties are set back from the road, with longer driveways from the road. The B1023 through Inworth is currently substandard with a number of pinch points and is poorly drained, with frequent instances of flooding following heavy rainfall. At certain points the carriageway is not wide enough to allow two HGV's to pass. There is a 30mph speed limit through the village, but there have been numerous reports of speeding.

NH propose to carry out certain road improvements through Inworth Village, including limited road widening. These improvements require land-take from a number of properties, but will not bring the road up to the required design standard.

3.3 Hinds Bridge

The NH proposal does not address the pinch point at Hinds Bridge on the B1023. NH traffic forecasts indicate that traffic flows over this bridge are expected to be around 900 vehicles in the peak hour. Hinds Bridge is narrow and only just wide enough for two cars to pass. A considerable number of HGV's use this road and hold-ups occur frequently. The road is also used by buses, both for the service that connects Tiptree to Kelvedon and Witham and also for school buses serving Thurstable School.



Congestion caused by HGV's 04 May 2022 at 10:20am

3.4 Inworth Road Roundabout

Referring to the consultation drawing HE551497-JAC-HSR-S3_J24-DR-C-0002 revision P02, the proposed Inworth Road Roundabout itself is badly designed in certain respects. It is questionable if it could be built to compliant standards in the location shown by the consultation drawings, even if the design was further developed.

The horizontal alignment of the arm from Kelvedon Road to the roundabout incorporates a short straight followed by a 50m right hand radius immediately followed by a 40m left hand radius, there are no transition curves provided between these elements. National Highways document CD 109 Highway Link Design para. 4.12 states that "Transition curves **shall** be provided on curves with radii less than shown in Table 2.10 (minimum R with adverse camber and without transitions)". There also appears to be no widening allowed for on these small radius curves for the swept path of heavy vehicles. No verge widening has been provided to allow for stopping sight distance on the approach to the roundabout from Kelvedon Road.

For vehicles leaving the roundabout stopping sight distance should follow the requirements of CD 109 once a vehicle has crossed the inscribed circle diameter of the roundabout, as stated in the note below para. 3.50 of Document CD 116 Geometric Design of Roundabouts. No relaxation in stopping sight distance would be permitted in combination with the relaxations in horizontal curvature (CD 109 para. 2.12). Proposed tree planting in the verges would further impede visibility.

CD 116 para. 3.6.9 Note 3 advises that right-left reverse curves on the approach to poorly aligned existing roundabouts can be effective in providing additional deflection but also notes that "sharp curves are not good practice and could induce HGV rollover or accidents involving powered two wheelers (PTW)". Although not an existing roundabout the reference to "sharp curves" is still relevant and the 40m and 50m curve radii used for this approach are "sharp curves". They do not conform to the requirement of CD 116 para. 3.36.1 Note 2 which states that "in advance of the entry flare, approach curvature follows CD 109 [Ref 3.N] requirements on horizontal radius". The vertical alignment of this roundabout arm uses a crest curve with a K value of 10, which is the desirable minimum for a 50kph design speed. Therefore, assuming this arm has been designed for a 50kph design speed the minimum value for horizontal radius given by CD 109 Table 2.10 is 90m, which is 2 steps below the desirable minimum radius of 180m. CD 109 para. 2.11 states that "values of stopping sight distance, horizontal curvature and vertical curvature **shall** not be less than those given in Table 2.10 for 50 kph design speed regardless of permitted relaxations."

As noted previously, no verge widening has been provided for visibility on the approach to or exit from this roundabout. Desirable minimum stopping sight distance of 70m should be provided for vehicles approaching the roundabout from 105m in advance of the give way line. Due to the small horizontal radii used, verge widening would be quite substantial to provide compliant stopping sight distance. Proposed tree planting would also need to be moved back behind sight lines. By providing an alignment with 90m radii in place of the 40m and 50m radii and with appropriate transition curves the alignment would be pushed into the property to the north east side of the existing B1023/ Kelvedon Road junction. The red-line boundary given on consultation drawing HE551497-JAC-HCN-SCHW-DR-C-0014 revision P05 would not allow for this.

The arm connecting the proposed roundabout to Inworth Road north of the roundabout (consultation drawing HE551497-JAC-HSR-S3_J24-DR-C-0003 revision P02) has similar issues to the Kelvedon Road arm. The vertical alignment has a vertical crest curve with a K value of 30, which would suggest a 70kph design speed (40mph) has been used. It is worth noting that this section of Inworth Road is currently subject to a 50mph speed limit, which is the equivalent of an 85 kph design speed. The radius of the horizontal alignment approaching the roundabout is only 65m (the desirable minimum radius for 70kph design speed is 360m) and again does not have any transition curves between alignment elements, nor does it show any verge widening for visibility. For vehicles approaching the roundabout this would be a right-hand curve. The line of forward visibility would therefore cross into the opposing lane and would be obscured by vehicles exiting the roundabout, this is poor design. For a 70kph design speed the stopping sight distance is 120m and this should be available from 180m in advance of the give way line. This is a mandatory requirement (CD 109 para. 2.13 Note 6) but the proposed alignment would not be able to accommodate the stopping sight distance without passing through the property boundary of Park Farm on the west side of the B1023. The red-line boundary given on consultation drawing HE551497-JAC-HCN-SCHW-DR-C-0014 revision P05 does not allow for this. If a CD 109 compliant horizontal radius was used for this alignment the intrusion into Park Farm would be even greater. The position of proposed tree planting should also be considered and placed behind sight lines to avoid impeding visibility.

The arm connecting the proposed roundabout to Inworth Road south of the roundabout (consultation drawing HE551497-JAC-HSR-S3_J24-DR-C-0002 revision P02) is assumed to have the same 70 kph design speed as the arm to the north. This section of Inworth Road is currently subject to a 50mph speed limit, the equivalent of an 85kph design speed. The vertical alignment has a longitudinal gradient of -0.281% which is insufficient to allow effective drainage of the carriageway. Care would need to be taken to ensure there were no flat-spots where changes in superelevation occur. The horizontal alignment approaching the roundabout consists of a straight element followed by a 90m radius left hand curve, then another straight element. No transition curves have been used between elements. As already noted for other arms of this roundabout CD 109 Highway Link Design para. 4.12 states that “Transition curves **shall** be provided on curves with radii less than shown in Table 2.10 (minimum R with adverse camber and without transitions)”. Proposed verge widening would be insufficient to allow compliant forward visibility on approach to the roundabout give way line. No relaxation in stopping sight distance is permitted on the immediate approach to a roundabout as defined by CD 109 para. 2.13 note 6. Widening the verge to allow compliant visibility would encroach into the property “The Laurels” and would be outside of the red-line boundary. Proposed tree planting would also impede visibility unless moved back behind sight lines.

In addition to the roundabout entry the proposed design shows a segregated left turn lane (SLTL) for Tiptree to A12 Junction 24 bound traffic. Stopping sight distance of 120m should be provided for the SLTL based on the maximum nearside radius, which appears to fall between 80m – 100m. For radii in this range CD 116 Table 6.27 requires a 120m stopping sight distance, the same as for the approach road. CD 116 para. 6.24 states that “The desirable minimum SSD for the SLTL **shall** be the lesser of:

- 1) The SSD obtained from CD 109 the design speed of the approach; or
- 2) The SSD given in Table 6.27 of this document appropriate to the maximum nearside curve radius.

Forward visibility for vehicles exiting the roundabout would also pass outside the red-line boundary into the property "The Laurels" in order to comply with CD 116 para. 3.50. No relaxation in stopping sight distance could be permitted due to relaxations in horizontal curvature (CD 109 para. 2.12).

The position of the link road between A12 Junction 24 south roundabout and Inworth Road Roundabout severs a large area of land between the link road and the A12 southbound exit slip road. This area has been identified as being permanently acquired by NH and as a possible location for a site compound, soil storage area and haul road during construction. There does not appear to be a use defined for this land after completion of the works.

3.5 Road Improvements through Inworth village

The alignment of the Inworth road through the village is considerably below current design standards in respect of horizontal radius, stopping sight distance and width. It also has numerous private properties with direct access onto Inworth Road. Stopping sight distance should not be relaxed where there are so many accesses. NH have proposed to widen Inworth Road through the village to bring the width to current standards (Appendix B). However, this would not address the geometry of the alignment, which currently has horizontal radii of about 75m in front of All Saints Church and 145m to the north of the village. To provide compliant stopping sight distance would require significant verge widening and intrusion into residential properties. For example, opposite All Saints Church verge widening of up to 6m would be required to provide compliant stopping sight distance. At the northern end of the village, where there is a 145m radius curve, there is no verge on the inside of that curve. A verge of up to 3.5m width would be required to provide for compliant stopping sight distance. Widening for sight lines would have a considerable impact on private properties.



B1023 approaching All Saints Church (looking south) – shows frequency of accesses, narrow verges, low radius (approximately 75m) curve and limited visibility



B1023 north of Inworth village (looking north) – Approximately 145m radius with no verge to allow compliant stopping sight distance

4.0 Conclusions

The National Highways proposed Inworth roundabout does not comply with National Highways design standards in its current form and position. It would require further land take from adjacent properties to allow for a compliant design, if the roundabout was to remain in this location. It is evident that a full redesign of this roundabout will be needed and unlikely that the proposal can be carried out within the NH red-line boundary.

The proposed road improvements in Inworth Village are insufficient to bring that section of road up to the required design standard. They do not deal fully with the pinch-points in this section of road and will not alleviate the problems of increased congestion.

The issue of the pinch point at Hinds Bridge has not been addressed in any of the documentation and remains a serious problem, even with the current traffic levels.

5.0 List of Appendices

- 5.1 Map of Area showing National Highways proposal for Junction 24
- 5.2 Map of Inworth showing National Highways for road improvements

5.1 Appendix A

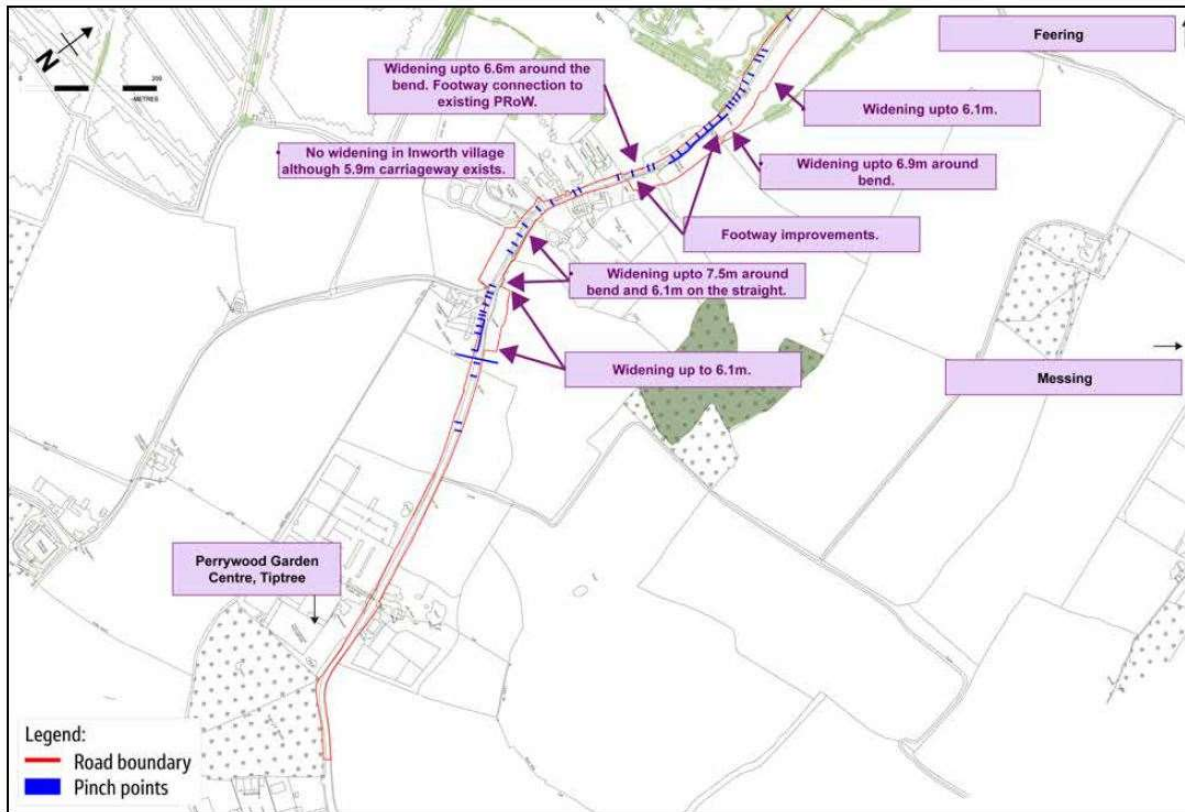
Map of Area showing Network Highways proposal for Junction 24



5.2 Appendix B

Map of Inworth showing Network Highways proposed road widening

Supplementary consultation November 2021



MIAG – Initial Report – Messing Roads, February 2022

Compiled and researched by the Messing and Inworth Action Group

February 2022

Revision 0	24/02/2022	Draft for Comments
Revision 1	28/02/2022	Issed for Circulation

MIAG – Initial Report – Messing Roads, February 2022.

Compiled and researched by the Messing and Inworth Action Group

Overview

This report is to review the effect of the National Highways (formerly Highways England) proposal for the improvement of the A12 and the construction of a new junction 24 connected to the B1023 (see the map in Appendix A). The report summarises the existing layout and condition of the lanes leading to and within Messing village. The area covered by this report is from the proposed feeder roundabout on the Inworth Road (near the short red arrow – see map in Appendix A), along the Kelvedon Road through the village at The Old Crown Public House and School Road, New Road, Lodge Road and Harborough Hall Lane.

It is our belief that this scheme, as proposed, will create increased and unsustainable traffic flows through our tiny ancient village. This report has identified dangerous road conditions, unsuitable road surfaces and hazards for all the roads surveyed and identifies substantial safety issues, as well as structural problems. We believe the proposal will endanger residents, local road users, (both motorised and non-motorised), to extreme hazard and life threatening risk and danger. Our report will show the impossibility of implementing the new Highway Code, which we believe will exponentially increase the danger to all road users.

National Highways Proposal for Junction 24

The Proposal, from National Highways, (NH), which this report extensively references, was to 'Construct a New Junction 24 on the A12, south of Inworth Road. (To) Provide slip roads terminating where the Messing Road meets Inworth Road so that all traffic joining or leaving the A12 would use the Inworth Road'. Refer to the map in Appendix A. The consultation documents make no referral to the effects of the proposed scheme on the lanes leading to Messing or any other surrounding lanes.

Effect of Proposals on traffic through Messing

Messing is a small village with a number of listed buildings, some of which date from the 16th and 17th centuries. The centre of the village is a Conservation Area, and many properties are directly on the street with narrow or no pavements. Many of the older buildings will have minimal foundations and can be more prone to damage from vibration caused by heavy traffic.

National Highways initially denied having any figures for traffic forecast through Messing, and asserted that the forecast traffic increase was 'slight'. Following multiple complaints both to them, and the Department for Transport, the following figures were provided

Kelvedon Road (between Messing & Inworth Road)		
	AM peak	PM peak
Without scheme	38	45
With scheme	133	109
Change	95	64

The roads through Messing are already struggling to cope with the significant increases in traffic seen in recent years arising from developments to the east of Messing, which use Messing as a cut through from the B1022 Maldon Road to Kelvedon station and the westbound A12. More developments, not all of which have been considered by National Highways (e.g. Middlewick Ranges), will further exacerbate the problem. It is inevitable that the increased traffic on the B1023 and congestion in Tiptree will force drivers to seek alternative routes and satnavs will direct traffic into the narrow lanes as a shortcut to the main Maldon-Colchester road.

NH have only recently admitted that they forecast that morning peak traffic (defined as vehicles, which means multi axle and HGV as well as cars and vans), on the Kelvedon Road out of Messing will increase by a factor of 3.5x, and evening peak traffic by a factor of 2.5x. It should be noted that the lanes do not meet the standards required for single track roads, have very few passing places and there are a number of blind bends and junctions.

Survey of Existing Roads

The report contains a breakdown, road by road, of all the matters of concern that we wish National Highways to consider. Refer to the street map in Appendix B for the locations of individual roads. The surveys can be found in the Appendices to this report and start from the T-junction at the centre of the village outside the Old Crown public house, unless noted otherwise. Pictures have been used to show examples of the extent that the dangers already exist and will be made far worse by this proposal.

The lanes around Messing are widely used by walkers, cyclists and horse-riders. The new Highway Code gives priority to horse-riders, cyclist and walkers over all other vehicles. Specifically, the new Code requires a minimum gap of 2m when vehicles are overtaking or passing pedestrians or horses and 1.5m when passing cyclists. This cannot be achieved for large lengths of the lanes other than in isolated passing places.

No roads have 'Passing Place' signage. No roads have signage which warns that the roadways are not suitable for multi-axle or HGV traffic. Lodge Road is prone to flooding and snow drifting. It is not gritted by Essex Highways during the winter months, and there are no warning signs. Kelvedon Road has a number of blind bends and hazardous conditions for non-vehicle road users, as well as motorised traffic, with widths as narrow as 2.8m for hundreds of metres. No road surveyed has 'safe haven' or 'refuge points'. There are no marked and safe crossing points.

The Alternative Proposal

Messing Cum Inworth have put forward a proposal for an alternative to Junction 24 that joins the B1023 south of Inworth village, and also north of the A12. (Refer to the map in Appendix B). This proposal would divert all traffic away from Inworth and Messing villages, greatly reducing the problems of increased traffic through the villages and rural lanes. The route would for the most part follow the line of the former railway and pass to the west of Inworth village before rejoining the B1023 south of Inworth. This alternative route would have the effect of diverting traffic away from Inworth itself where road widening and drainage works would be required under the NH proposal to bring the road up to standard. The roads through Inworth and Messing would therefore only serve local traffic and could be signposted as only such.

It is understood that NH have not considered this proposal in any detail at this point in time.

Actions Required by National Highways

1. Full review of the traffic impact of the current published proposal on all surrounding roads and the capacity of these roads.
2. Full consideration of the alternative route proposed by Messing Cum Inworth Parish Council including traffic predictions and costings
3. In the event that the National Highways proposal is adopted and construction begins, how will National Highways and Essex Highways address the following:
 - a. Pedestrian and non-vehicle safety as there are no pavements, no safe havens and the road speed is derestricted, i.e. 60mph
 - b. Blind bends and unsighted oncoming traffic on a single lane road
 - c. Concealed entrances and accident blind spots
 - d. Width of roads at 2.4m to 4.5m with no passing places and no signage
 - e. Absence of legally required passing places in sight of each other
 - f. The possibility of face to face HGV or multi-axle traffic with no possibility of reversing and unable to pass due to inadequate road width bordered by deep ditches and gullies
 - g. Verge erosion, trespass and damage as traffic 'forces' passing places
 - h. Weight limits on narrow bridges to be assessed. There are currently no warning signs after vehicles are on these roads, with no turning points, and no alternative to avoid these bridges
 - i. The centre of Messing is a conservation area – how will the structural safety of buildings and walls be maintained ?
 - j. Buildings, houses and telegraph poles are within 25cm of road edge. How will their safety and integrity be guaranteed ?
 - k. How will the safety of children be ensured where there are no pavements in most of the roads, no crossings, and the road is blind to on-coming traffic ?
 - l. How will pollution and air contamination especially at the school and village playing area, be controlled and kept at low levels ?

Conclusions

As the attached surveys clearly demonstrate, all the roads leading to Messing village are for the most part well below the 5.5 metre width recommended as the absolute minimum for two cars to pass in safety at low speed. There are many pinch points where the roads are well below the recommended width of 3.5 metres for a single-track road. From a safety perspective, the roads are in many places between 3.5 and 5.5 metres, giving rise to the increased risk of uncertainty about whether two vehicles can pass each other over a length without passing places, and leading to the extensive damage to roadside verges and significant encroachment on private land that we have seen and illustrate. Messing residents report numerous instances of lost wing mirrors and more serious collisions along these narrow roads, not to mention near misses. Major problems already arise whenever a car meets a bus, HGV or tractor coming in the opposite direction.

The research also revealed how close the road edge is to old and historic properties. There are concerns about vibration damage and associated problems to these buildings.

Air pollution is of special concern from the roads in close proximity of the village primary school and of the children's playground outside the village hall.

The subsequent increase in danger to all road users is a direct consequence of this proposal. It is evident that the proposed increases in traffic and vehicle flow will additionally further deteriorate the condition of the roads. The safety of the roadway is already compromised and the proposal will cause further extensive erosion of land and inevitable trespass onto private property.

List of Appendices

- A) Map of Area showing main traffic routes and new proposals
- B) Map of Area showing the alternative proposal
- C) Map of Messing showing road names
- D) Survey of Kelvedon Road from the junction with the B1023 to the junction with New Road
- E) Survey of Harborough Hall Road
- F) Survey of Kelvedon Road from the junction with School Road to the junction with New Road
Survey of The Street
- G) Survey of Lodge Road
- H) Survey of New Road from the junction with Kelvedon Road to the junction with School Road
- I) Survey of New Road from the junction with School Road to the junction with the B1022
- J) Survey of The Street to Kelvedon Lane (Burial Ground)
- K) Survey of School Road

Appendix A

Map of Area showing main traffic routes and new proposals



Appendix B

Map of Area showing alternative proposal



Appendix C

Map of Messing showing road names



Appendix D

Survey notes for Kelvedon Road from Junction of B1023 to New Road Triangle.

Research conducted on Monday 14th February 2022

The mouth of the entrance to Kelvedon Road from the B1023 is obscured by dense hedges to each side. It is 9.20m wide.

By 8m there is a broken illegible street sign, hidden in hedges.

By 25m the road has narrowed to 4.15m, there are no signs or passing places.

By 86m the road is 4.5m with high dense hedges and embankments obscuring all sight of on - coming traffic.

By 134m there is extensive damage and trespass to private land as vehicles are forced to drive up banks and destroy verges.

By 174m the road is 4.15m wide with no road markings on either side as the road approaches the bridge.

By 181m there is a private drive that is used as a passing place.

By 194m the narrow bridge, unsigned for weight or width restriction is 5.7m wide. It is bordered by concrete and metal posts with telegraph poles at 60cm and 30cm of the edge of the road. There is a telegraph pole within 25cm of that road edge.

By 242m the road is bordered by high hedges and steep verges.

By 277m the blind 'S' bend starts and the road is 4.4m wide. There are no road markings nor warning signs of danger.

By 410m the 'S' bend has 1.2m deep ditches to either side. There are no passing places for over 400m.

By 535m there is access to private land that has been extensively eroded and damaged by vehicles forcing a passing place.

By 535m there is an entrance for East Anglian Farm Ride. This is extensively used by horse riders crossing the road.

By 579m the road has been forced wider to allow passing and has extensively and substantially damaged land.

There are no pavements and no safe havens for horse riders or pedestrians.

By 630m the road is 4m wide and bordered by high banks and blind to all on-coming traffic.

By 672m the road is 3.25m and drops down to a blind bend. This is already an accident black spot.

By 712m the road is 4m wide with a telegraph pole set in land that has been eroded and damaged and is now 50cm from road edge.

By 733m the road rises to an unsighted blind and brow.

By 790m the road is 2.9m wide and blind to all on-coming traffic.

By 808m there is a destroyed illegible road sign.

By 820m Yew Tree Farm entrance is used as a passing place. This is private property and at severe risk of damage and trespass.

By 844m the road is 3.4m wide and is bordered by high hedges and banks.

By 870m the road is 3m wide.

By 881m there is a concealed farm entrance with extensive damage caused by vehicles trying to pass.

By 908m the road is blind to on-coming traffic with an unfenced pond 3.5m from road edge. There is a deep drainage culvert under the road with no weight or width warning signage.

By 930m the farm entrance has extensive traffic damage.

By 930m there is an East Anglian Horse Ride trail. This is accessed on the blind bend.

By 942m the road is eroded on the bank of the bend, and is blind to oncoming traffic. This is already an accident black spot.

For the distance from 242m to 998m the road is prone to deep snow drifts and can be impassable.

By 998m the road is 3.8m wide and is bordered by high banks and hedges. The road is blind to oncoming traffic.

By 1105m the road is 3.8m wide. There are no passing places and a sign facing 'west bound' traffic indicates a sharp bend. It is overgrown and obscured.

By 1135m there are a series of concealed entrances with obscured vision and access.

By 1222m there is a concealed access to Parsonage Farm House which is on the triangle junction.



1. This is the approach to B1023 from Messing Village. High hedges and no passing places



2. This is facing towards Messing, and illustrates blind narrow bend



3. Damage to verges and unsighted road



4. Illustrating extensive damage and destruction to verges and edges



5. Further evidence of the already massive damage to road edge and verges



6. Extensive damage and destruction to road edge



7. East Anglian Farm Ride access



8. Extensive damage to private access as traffic uses this as a passing place



9. Blind rise to brow of hill. High verges and hedges, no passing places



10. To show narrow road and difficulty of passing. Road verges damaged and unsafe for all road users



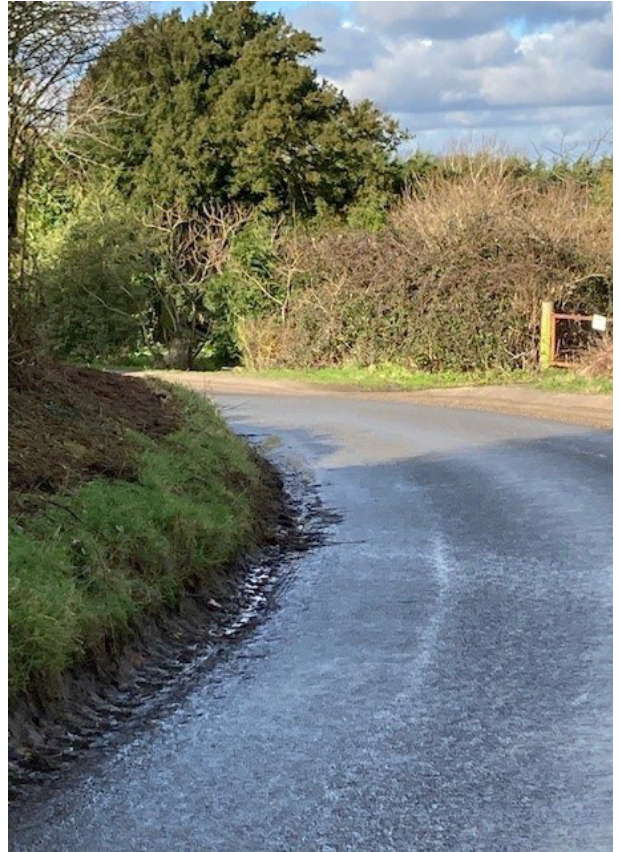
11. Blind bend and obscured vision



12. Road damage to high verges and blind bend



13. Further extensive damage caused by existing traffic



14. Blind bend, deep pond, concealed farm access



15. In only one direction, acknowledgement of dangerous bend



16. High sides of banks and verges showing extensive damage to land



17. This is facing back down Kelvedon Road near the junction with New Road and shows the narrow blind bend.



18. Blind junction existing Kelvedon Road with entrances opposite



19. Photo of junction showing entrance opposite

Appendix E

Survey Notes for Harborough Hall Lane.

Research conducted on Friday 10th February 2022

Width of road at T junction -7.30ms.

By 25m road narrows to 4.65ms and is edged to roadway by historic solid brick wall. Hedges to the other side.

For a further 112ms road is narrow and bordered by walls and concealed driveway access. There are no passing places and the road bends to obscure all view.

By 137m road has subsided and deep troughs have been forced into traffic making a passing place on private land.

By 180m, road curves to a blind bend and is 4.15ms wide. There are no passing places.

By 224m deep ditches on left side prevent passing. Road surface is breaking up and potholes are severe.

By 258m there are still no road markings and the road is bordered by ditches.

By 295m telegraph pole abuts roadway which is 4.05m wide.

By 320m a raised manhole is 25cm from road way with a deep ditch on the other side. There are no passing palaces, and the road is obscured.

By 343m there speed restriction signs, and the road narrows to 4.3m.
There are no passing palaces at any point from T junction.

By 350m a raised manhole cover has already been damaged. It has a concrete surround which is a substantial tyre damage risk.

By 372m there is a hidden gully opposite another raised manhole.

By 392m the road is 4.45m wide and the gully protector has collapsed into the roadway, narrowing it to 4.2m.

The road is bordered and crossed by low hanging wires.

By 416m blind bend starts, deep pond to one side, no passing places.

By 474m there are 3 farm entrance gateways, all with obscured access and site lines. They are all damaged from existing traffic using this private land as the only viable passing place.

By 500m from T junction there are still no passing places. Such places as have been created by existing traffic have broken down side margins, and created damage and erosion to private land.

By 565m the road is 5.4m wide and has a concealed water hydrant that abuts the road way.

By 584m the road is bordered by a metal fence which protects an unmarked blind bend from traffic falling 2.2m into a deep pond.

By 616m the road has a steep drop directly on road edge and a deep ditch facing it. This runs for 71m, and is unmarked.

There are no passing official or adopted places.

By 641m the road changes at traffic speed signs and narrows to 4.2m and single track. There are no road markings.

By 648m the road is bordered by deep surface cut trenches to handle water run off to ditches each side.

By 681m the road is 3.85m wide.

By 750m the road crosses a culvert. There are no weight limit or warning signs.

By 771m private land is being eroded and destroyed by traffic attempting to pass.

By 828m there is a passing place. This is the first since the T junction at the centre of the village. This is 70m from a narrow bridge and is unsighted to the other side.

By 868m the road is edged by 2m trenches, less than 0.40m from the road edge.

By 899m the road is 3.65m wide. The narrow bridge is badly damaged, has no weight or warning signage, and has 2m drops each side.

By 973m the road is 3.35m wide, unsighted from either passing place and unsigned.

By 1020m the passing place is badly damaged and full of holes. The positioning means that neither place is in sight of the other.

By 1069m the road crosses the major gas pipe. There are no weight or warning signs.

By 1153m there are a series of concealed entrance and exits from private homes. These driveways are already badly damaged as traffic destroys verges and private land.

By 1240m the request bus stop obscures the view of traffic in both directions.



20. Looking up Harborough Hall Lane showing the brick wall outside the Bell House



21. Looking back towards The Street



22. Looking back towards The Street



23. Extensive edge of road deterioration and damage



24. Blind bend



25. Looking back at Blind bend



26. Drainage ditch



27. Low hanging wires, blind bend, no signage



28. Blind bend near Harborough Hall Farm



29. Hidden warning sign



30/31. Deep pond on bend



32. Extensive damage already caused by traffic forcing passing places



33. Damage already existing to narrow bridge



34. To show extensive verge and road edge damage

Appendix F

Survey Notes for Kelvedon Road from Junction with School Road to Junction with New Road outside Parsonage Farm.

Research on conducted on Friday 10th February 2022

This survey and research is from the turn of School Road at 256m, where Kelvedon Road continues straight ahead.

By 277m there is a direct access to a cemetery. This is 2m from the road edge. There are no road markings or signage. Funeral corteges block the roads in both directions:

By 296m the road is 4.70m wide with a manhole in the verge to the edge of the road.

By 298m the road widens for farm access and a Public Footpath. Both are directly onto the road with no signage or warning signs.

By 363m the road is badly damaged and eroded as traffic has forced back the verges and destroyed the embankments.

By 397m the road narrows to 3.00m with no passing places and high embankments on each side.

By 459m there is an adopted passing place. This is the first since the T junction at The Crown.

By 464m the road is bordered by 2.5m deep ditches and high verges.

By 610m the road is 3.35m wide with substantial damage to farm land and destruction to verges.

By 822m the road is 3.5m wide and for this whole length of road there is extensive damage to verges and edges, with ground broken down to enable passing.

By 822m the culvert is unsigned with no weight or warning signage. Less than 0.40cm from road edge is ditching which is 2m deep.

By 879m the road narrows to 3m as it approaches the blind triangle junction with New Road and Kelvedon Road.



35. To show deep hidden ditches within 50cm of road edge



36. To show extensive damage to land as traffic forces a passing place



37. Blind bend, no safe haven or refuge. To show danger to all non-vehicle road users – especially horse riders and pedestrians



38. Obscured view of junction



39. Junction of Kelvedon Road and New Road. No signs in New Road. Road is bordered by deep ditches



40. Additional photo of junction

Appendix G

Survey Notes for Lodge Road.

Research conducted on Tuesday, 1st February 2022

Width of road at T junction – 7m.

Distance to White House is 4.3m, where there is a telegraph pole 25cm from edge of road way.

The road is 43cms from houses.

By 53m there is a hidden Public Footpath with access directly onto road:

For 112m the road is 3.3m wide and is bordered by houses, gardens and driveways. There are no passing places.

Distance from T junction now total 128m and the road width has been no more than 3.3m.

By 175m there is extensive land destruction and forced 'widening' by traffic.

By 196m there is a blind bend. The road 3.6m wide and unsighted in both directions.

From 196m to 250m the road is 3.3m wide, bordered by hedges and walls, no passing places

By 300m the road narrows to 3.1m wide. There are no passing places and the roadway is bordered by deep ditches within 25cm.

There are several concealed entrances and dangerous blind spots.

By 300m in total from T junction, the road is now 3.2m wide.

By 322m the road is 3.5m wide, no passing places and no signage.

By 357m there is a concealed entrance/exit for the village pumping station, which requires 24 hour access and is used by traffic as the only possible passing place.

By 379m, there are 2m deep ditches within 25cm on either side of the road edge.

For this whole stretch the damage, land erosion and destruction are already severe.

By 400m from T junction, the road is without any passing places, there is no signage and no danger or warning information.

By 541m, there is a narrow bridge over a culvert, which has no weight or danger signage and is already showing signs of severe damage.

By 654m there is a blind bend, with no visibility and no sight lines for traffic in either direction or there are deep 1.5m ditches on either side.

By 700m the road passes 'Messing Lodge' and narrows to 2.8m wide. The road crosses farm land for 800m at this width and with high hedges and walls on the road edge for this entire distance. This road leads to East Thorpe. There are no passing places.

792m at Footpath sign, road narrows to 2.8m wide.

Total fully surveyed road 800m, with a further 800m visually surveyed.

There is only one unmarked 'passing' place, on the entire distance surveyed.



43. Looking back towards the “white house”



44. Looking back – showing properties directly on the road



45. Showing the road width from 120m onwards



46. To show hidden deep drainage ditch, and road edge erosion



47. To show deep ditches within 20cm of road edge. No signs, no warning



48. To show extensive damage to verges and edges caused as traffic forces a passing place



49. To show massive damage caused by existing traffic. No safe havens no pavement and no refuge

Appendix H

Survey Notes for New Road from Junction with Kelvedon Road outside Parsonage Farm to junction with School Road outside Messing Primary School.

Research conducted on Friday, 10th February 2022

By 10m towards the village School Road is 4.10m wide.

By 55m the road is now 3.5m wide, with no signage for narrow roads, or signage that would indicate not suitable for multi axle or HGV vehicles:

By 68m the road bends and narrows to 3.00m with high trees and hedges on each side completely obscuring road.

By 124m the bend ends and the road is 3.4m wide. There is extensive destruction and damage to the verges on either side, with no passing places.

By 188m the road is 2.90m wide, the degradation to verges and edges is extreme, and the road has subsided into the potholes.

At 280m from the 'triangle' junction the road is 3.65m wide. There are no passing places, no signage and several house access drives that are broken and eroded by traffic.

At 287m the bend ends with the road 3.80m wide. This road is now approaching the village school, which is partially unsighted.

By 375m the road warns of a school, there are no speed restrictions and no signage.

By 479m the road speed indicator advises reduction to 30mph. This is within 74m of actual school entrance, which is directly from this road, with no protection between the road and children.

By 520m the road markings indicate two way traffic, and is 3.85m wide, there are no passing places.

By 550m the school entrance opens directly onto the road, there are no safety barriers or protections.

By 560m there are zig zag yellow lines – these are after the school entrance.

By 583m the road arrives at the triangle junction signposted for the village and Tiptree.

For the entire stretch surveyed, the road has no passing places, no signage and no warnings of safety issues for the school and children.



50. To show extensive damage to land and road edge. No safe haven, no passing places and no refuge point for non-vehicle road users



51. Showing extensive road deterioration and damage, no signage warning of school and no safe haven for pedestrians and children



52. Showing erosion and damage to road as traffic forces a passing place



53. Vision obscured approach road to school. No signage and no haven or refuge for children or other non-vehicle road users

Appendix I

Survey Notes for School Triangle to 'Maypole' Junction with B1022.

Observations on 14th February 2022

There is extensive tree root damage to large sections of the road making the surface unsafe and unstable in the approaches to the school.

The road has multiple access points for horse riders and walkers, and has no warning signage.

The road is subject to constant and severe flooding, forcing traffic into the middle of the road, and into on-coming traffic.

The junction from New Road onto B1022 is blind and obscured. Within 10m of junction the road is less than 3.5m wide.

Traffic turning onto B1022 is unsighted to left. This is already an accident black spot.



54. To illustrate extensive damage already made as traffic is forced to make passing places



55. Blind junction from B1022 with narrow unsighted lane



56. Extensive damage already done to low hanging trees – no warning signage



57. Towards B1023 junction showing narrow 2.8m width



58. Accident black spot for obscured right turn



59. Blind bend, no signage, no passing places except by destroying private land

Appendix J

Survey Notes for The Street to Kelvedon Lane (Burial Ground)

Research conducted on Friday, 10th February 2022:

At the white line on the T junction, the road is 16m wide. The view to both sides, Lodge Road and Harborough Hall Lane is obscured. The road width reduces to 11m immediately.

By 58m the ancient wall retaining the church burial ground starts and the road reduces in width to 5.6m. There is a narrow pavement here for pedestrians for part of the length, but does not continue around the corner. The wall curves to the church gates and is a blind 'S' bend, passing the village hall and children's playground. This is unsighted in both directions.

By 125m the village war memorial abuts the road which is 5.25m wide and in the middle of the 'S' bend, unsighted in both directions.

By 238m a raised and obscured Fire Hydrant has no warning signage.

By 250m there is the junction with School Road. This is a blind T junction for any traffic emerging to turn left to continue on Kelvedon Road, or right into the village.



60. To show angles and difficulty of T junction for all traffic



61. To show difficulty of unsighted T junction and rapidly narrowing road bordered by houses



62. To show proximity of ancient wall, blind bend and over-hanging tree. This is corner for War memorial, children's playground and village hall



63. Blind corner outside the Village Hall



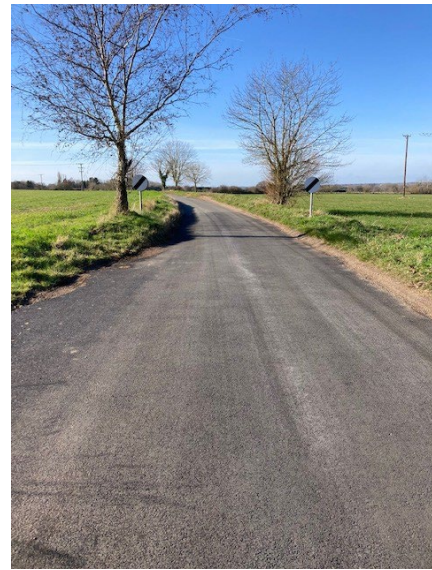
64 Looking back at the blind corner outside the Village Hall



65. To show proximity of war memorial and village hall entrance and entrance for children's playground



66. Raised manhole, within 25cm of road edge, already substantially damaged by existing traffic



67. Road narrows as it leaves village, no signage, no markings then single track road. No passing places, no safe haven for non-vehicle road users



68. Traffic congestion caused in The Street by a single lorry and tractor.

Appendix K

Observations on the current state of School Road

School Road is for the most part of sufficient width to cope with local traffic. The road has residential properties on both sides for the majority of its length. The only section with a footpath is on the bend by Messing Green where the road turns sharply right and the remainder of the road has no footpaths. This road is used by children attending Messing School. The majority of the road is of adequate width for two vehicles to pass. A detailed survey was not considered necessary for this road.

The junction with Kelvedon Road is blind and extreme care is needed at this point.



69. Blind Junction with Kelvedon Road



70. Blind Junction with Kelvedon Road



71. View from Kelvedon Road showing blind junction



72. School Road showing the short section of footpath around the bend in the road.