Essex Highways

Inworth, Messing & Tiptree Mitigation Options Technical Note

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Essex County Council

Document Control Sheet

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1 Introduction

As part of National Highways' A12 Chelmsford to A120 widening scheme, a new junction 24 is proposed for Kelvedon which would provide access to both the northbound and southbound A12. The location of the junction would be on the current A12 Kelvedon bypass, as opposed to the existing junctions to the north and south of Kelvedon, and access to the junction would be via Inworth Road.

National Highways modelling has indicated that the scheme would result in increased traffic on Inworth Road south of the new junction 24, as well as increased traffic in Messing village with the layout presented in the Preferred Route Announcement. This has raised concerns from local residents and, in response, National Highways has produced a Technical Note to assess a number of Inworth Road bypass options to consider their ability to mitigate the impact of the increased traffic (Junction 24, Inworth Road and Community Bypass Technical Report, 25/05/22).

Essex County Council (ECC) has commissioned Essex Highways to:

a) Review the multi-criteria assessment that National Highways has used to compare the Inworth Road bypass options.
b) Look into potential measures that might help to reduce the impact of traffic flow changes in the vicinity of Messing, Inworth and Tiptree

This Technical Note provides a summary of the above work:

- Section 2 provides an overview of the two main bypass options assessed by National Highways
- Section 3 summarises our review of National Highways' multi-criteria bypass assessment
- Section 4 sets out the characteristics of the three alternative highway routes that traffic might take from the B1022 (east) to the proposed new Junction 24 – summarising their physical characteristics, traffic collision data and journey times
- Section 5 discusses potential mitigation measures for Messing, Oak Road and Inworth Road
- Section 6 provides a recommendation on the way forward.

2 Overview of Main Bypass Options

The original layout for Junction 24 for the proposed A12 widening project, as presented in the Preferred Route Announcement, is shown in Figure 1, below. This is referred to in the Technical Note as DS2.

Figure 1 Original Junction layout for Junction 24 (DS2)

With this layout, the access road to and from Junction 24 meets Inworth Road with a new roundabout junction proposed with Kelvedon Road.

National Highways modelling has shown that this option would lead to an increase in traffic on Kelvedon Road between Inworth Road and Messing village. Table 1, below, shows the two-way flows for both AM and PM peak periods on Kelvedon Road.

Table 1 2042 Traffic Flows on Kelvedon Road with and without preferred A12 Junction 24 Scheme

Kelvedon Road	DM – no A12 scheme	DS2 – with A12 scheme
AM	44	147
PM	47	134

In light of strong feedback at consultation and representations from ECC, National Highways has assessed two key Inworth Road bypass options in further detail. They have summarised their assessment of the options in a Technical Note (Junction 24, Inworth Road and Community Bypass Technical Report, 25/05/22). The two Bypass options (referred to as DS3 and DS4) are set out in Figures 2 and 3, below.

Figure 2 Bypass Option DS3

Bypass option DS3 connects Junction 24 to Inworth Road north and south of Kelvedon Road, thereby bypassing a section of Inworth and making the approach to the junction from Kelvedon Road slightly more indirect than DS2.

Figure 3 Bypass Option DS4

Bypass option DS4 connects Junction 24 to Inworth Road north and south of the A12, thereby bypassing Inworth and Kelvedon Road. Of the options tested by National Highways this was the option that reduced A12 related traffic in Messing the most. As shown in Table 2.

Table 2 Forecast Traffic Flows on Kelvedon Road (Vehs/hr)

Kelvedon Road	DM – no A12 scheme	DS2 – with A12 scheme	DS3 Bypass Option	DS4 Bypass Option
AM	44	147	116	58
PM	47	134	113	74

The report contains a multi-criteria assessment of two bypass options, following which it concludes that:

'Although the scoring was close, on balance of all considerations the mitigation measures on Inworth road (Option DS2) were found to be the preferred option when scored against either a DS3 or DS4 community bypass.'

3 Review of National Highways' Bypass Option Assessment

National Highways states that the Road Investment Strategy (RIS) objectives were used as the scoring criteria in their multi-criteria assessment of bypass option. It is not clear where these objectives have been obtained from. The categories ('Supporting Economic Growth, 'A Safe and Serviceable Network' etc.) appear to share similarities with some of National Highways RIS2 Vision and Performance Specification headings, but there is no direct correlation to these.

The overall scores from the National Highways Assessment are as follows:

- Option DS2: +2
- Option DS3: -1
- Option DS4: -2

It can be seen that the scores are actually very close and there is, therefore, a risk that the choice of criteria in this assessment, and number of items within each category, could have a material impact on the ranking of the options.

In order to provide an independent check of the scoring system used in the technical report, Essex Highways has carried out an alternative scoring assessment using the DfT's Early Assessment Sifting Tool (EAST). This was done by matching the objectives that National Highways scored against equivalent EAST tool objectives, and averaging the score where there were more than one National Highways objectives related to one EAST objective. Details on which National Highways objectives were matched to EAST objectives can be found in Appendix A.

A significant proportion of the criteria required by EAST have not been covered by the 'RIS Objectives' based scoring system used by National Highways. When only putting data that National Highways used in its assessment into EAST, the relative score for each option broadly reflects National Highways' results (albeit, all the scores are more negative). This assessment can be seen in the first table in Appendix B:

- Option DS2: -2
- Option DS3: -4
- Option DS4: -5

However, if additional EAST criteria that can be scored are added in, the overall scores could be quite different. By adding in strategic objectives, for example, and other criteria that can reasonably be scored at a high level, the overall results could be similar to the second table in Appendix B:

- Option DS1: -6
- Option DS2: -4
- Option DS3: -4
- Option DS4: -6

Option DS1 (A12 scheme without any additional improvements on Inworth Road) has been added into the second table to provide a full comparison of all the options. It is noticeable that the DS3 bypass option has

the same overall score as National Highways' proposed option (DS2). Thus, although DS2 scores better than the baseline option (DS1), the assessment doesn't indicate that DS2 is a better option than DS3.

It is also noticeable that, using the EAST-based assessment, none of the options have resulted in an overall positive score – indicating that the neither the proposed or alternative measures go far enough in mitigating the impact of the additional traffic attracted to the area by the A12 Scheme. This emphasises the need to investigate further mitigation, over and above the measures proposed in DS2 – as explored further in this Technical Note.

4 Characteristics of Alternative Routes to Inworth Road

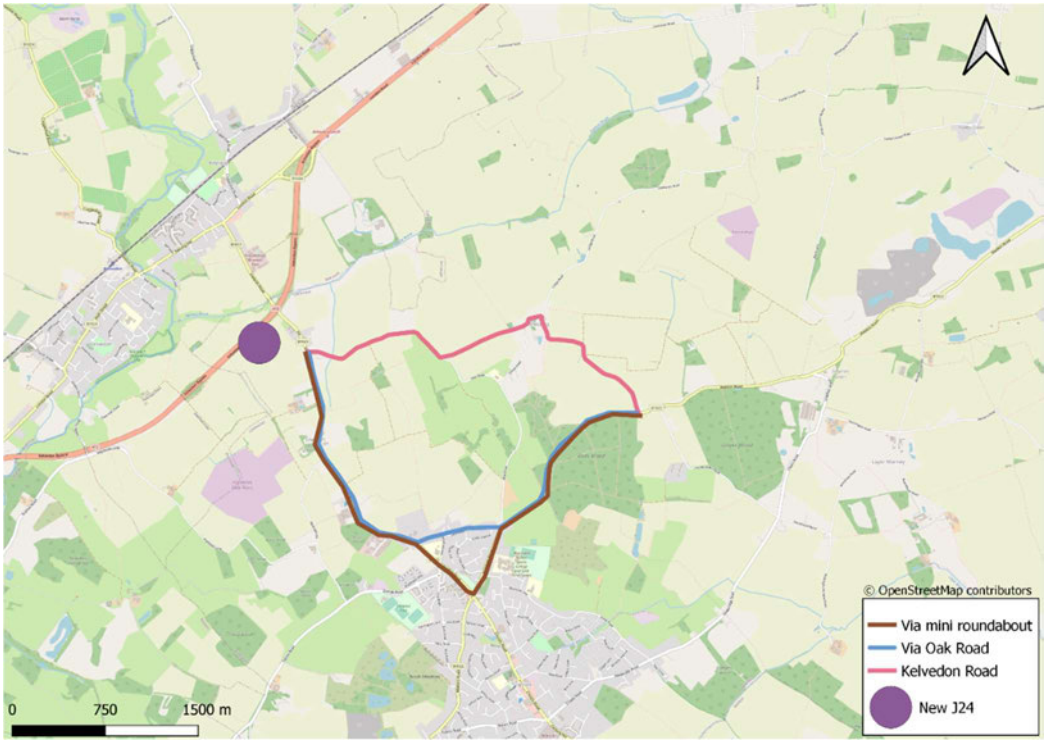
This section will look at three different routes that vehicles are likely to take from east of Messing/Tiptree to the new Junction 24. Due to the predicted increase of vehicles through Messing, it is appropriate to assess the alternative routes that might be used by traffic should the flows through Messing be reduced. The three routes are:

- Kelvedon Road/The Street/ Harborough Hall Road (via Messing)
- B1022/Oak Road/B1023 (Via Oak Road)
- B1022/B1023 (via double mini roundabout)

The first section will outline the characteristics of the routes by using Google Street view, following by collision analysis and journey time analysis.

Figure 4, below, shows the location the three routes in relation to the new junction.

Figure 4 Possible routes to Junction 24



4.1 Route Characteristics

This section will present the conditions along each of the routes, using Google Streetview.

4.1.1 Kelvedon Road / The Street / Harborough Hall Road (via Messing)

Figure 5 Harborough Hall Road through Messing (Source: Google Streetview)

Figure 5, above, shows the route through the village of Messing. In this section of the route there is enough room for two way traffic, but if a larger vehicle like a HGV met a car or van there is restricted width to move past. Additionally, the close proximity of the wall to the road restricts the width further and is at risk of being damaged.

Figure 6 Kelvedon Road (Source: Google Streetview)

Figure 6, above, shows Kelvedon Road between Messing and Inworth Road. This figure represents a large proportion of the route where there is insufficient width for two way traffic, with intermittent passing places. Vehicles will need to reverse back to a passing place, especially when meeting larger vehicles such as HGVs or Farm traffic. Additionally, these roads will not be treated with grit during the winter months.

Figure 7 Kelvedon Road (Source: Google Streetview)

Figure 7 above and Figure 8 below, show that there are sharp bends along the route which could cause safety issues if vehicles are travelling at speed towards each other, as there is limited space to pass. Figure 14 also shows low foliage and the potential for limited visibility from overgrown verges.

Figure 8 Kelvedon Road (Source: Google Streetview)

Figure 9 Kelvedon Road (Source: Google Streetview)

Figure 9 above again shows how narrow the road can be in places along the route. It additionally shows the potential for farm traffic which could not only cause passing issues along the road, but can cause dirt and debris which may have an adverse impact on vehicle safety.

4.1.2 B1022/ Oak Road/ B1023 (via Oak Road)

Figure 10 B1022 (source: Google Streetview)

Figure 10, above, shows the B1022. As expected from a 'B' road it is of sufficient width to accommodate larger vehicles in each direction.

Figure 11 Oak Road (Source: Google Streetview)

Figure 11, above, shows Oak Road. There is a considerable amount of on street parking on the road and many direct accesses to houses.

Figure 12 Oak Road (Source: Google Streetview)

Figure 12, above shows that in places Oak Road narrows to one lane only, emphasising the local nature of the road.

4.1.3 B1022/B1023 (via double mini roundabout)

Figure 10 in section 4.1.2 above indicates the nature of the B1022 east of Tiptree, which is also applicable for this route. Figure 13, below, shows the B1022 within Tiptree after the junction with Oak Road but before the double mini roundabout. The road has sufficient width to accommodate two-way flow comfortably and is suitable for HGVs.

Figure 13 B1022 (Source: Google Streetview)

Figure 14, below, shows the B1022/B1023 double mini roundabout which is suitable for all traffic.

Figure 14 B1022/B1023 double mini roundabout

Figure 15, below shows the B1023 in between the double mini roundabout and Oak Road. It shows that it is narrow in some places but should still accommodate HGVs. There may be an opportunity to improve the road to improve safety along the route.

Figure 15 B1023 (Source: Google Streetview)

4.2 Collision Data

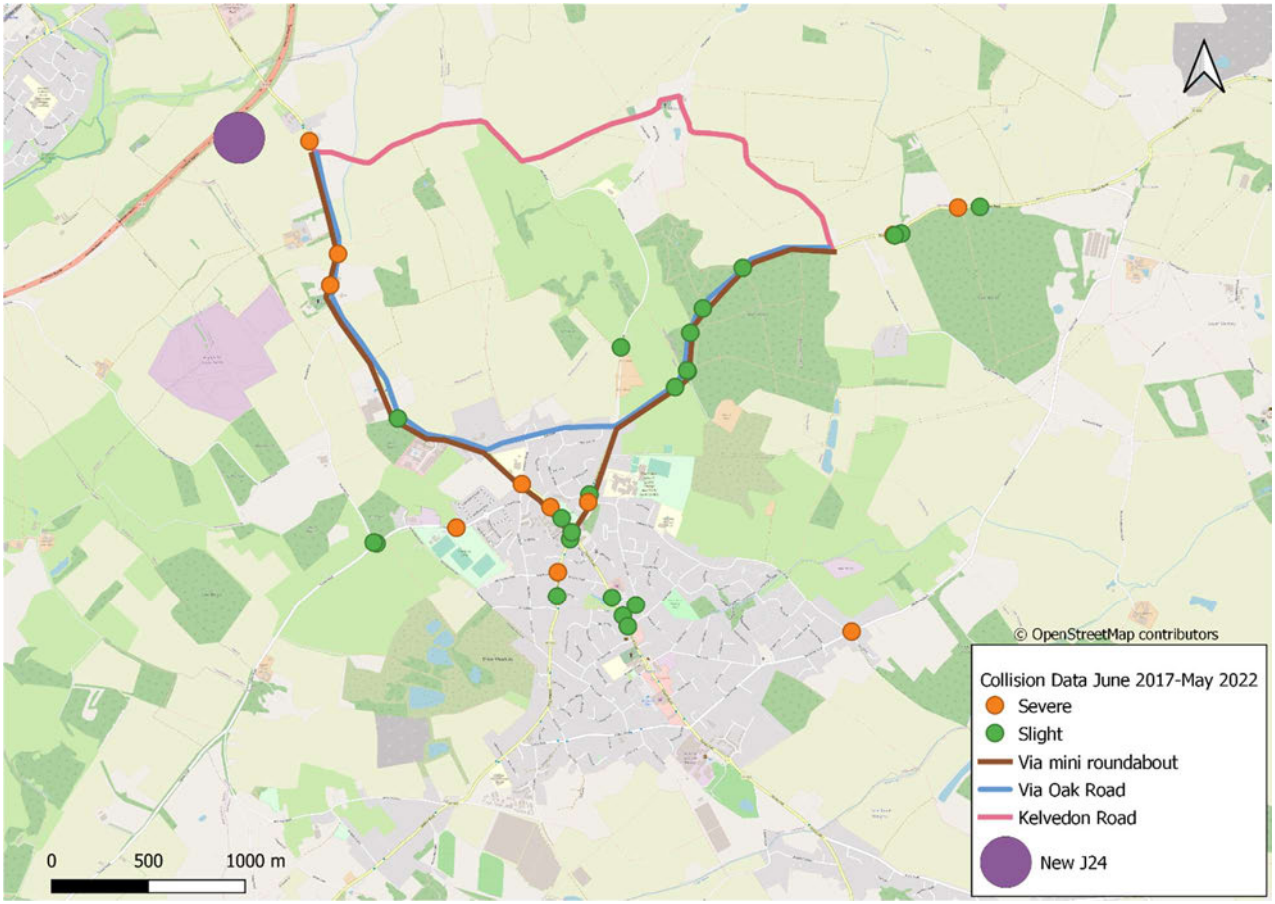
Collision Data was obtained from Essex Highways Accident Data team for Messing, Tiptree and the surrounding area. It was recorded by Essex Police over the past five years for the time period 1st June 2017 to 31st May 2022 and is shown in Table 4. The data shows that there were 11 severe collisions and 23 slight collisions, with no fatal collisions recorded in the time period.

Table 3 Collisions in the Area between June 2017 - June 2022

Severity of Collisions	Number of Collisions
Fatal	0
Severe	11
Slight	23

Figure 16, below shows the locations of the collisions for the past five years in relation to Kelvedon Road, the B1022, B1023 and the proposed Junction 24. There were no collisions on Kelvedon Road within this time period, however the existing traffic flow was low. The number of vehicles predicted to travel along the road would increase with the new junction 24 in place, therefore there is a risk that collisions could increase.

Figure 16 Collisions in the area around Messing



There were six severe collisions on B1023 Inworth Road, three of the collisions involved vehicles turning right into or out of a side road or property and not seeing a vehicle travelling towards them, indicating that visibility could be improved along the route.

4.3 Journey Time Data

Journey Time data for both AM and PM peak in both directions have been obtained from Google Maps, with the start/end points of the junction of Harborough Hall Road / B1022 and the junction of Kelvedon Road/ B1023 Inworth Road. The following days and times have been used for analysis.

- AM – Depart at 08:00 on a typical Thursday
- PM – Depart at 17:00 on a typical Thursday

Figures 17-20, below present the Google Maps journey time results.

Figure 17 AM Peak Eastbound

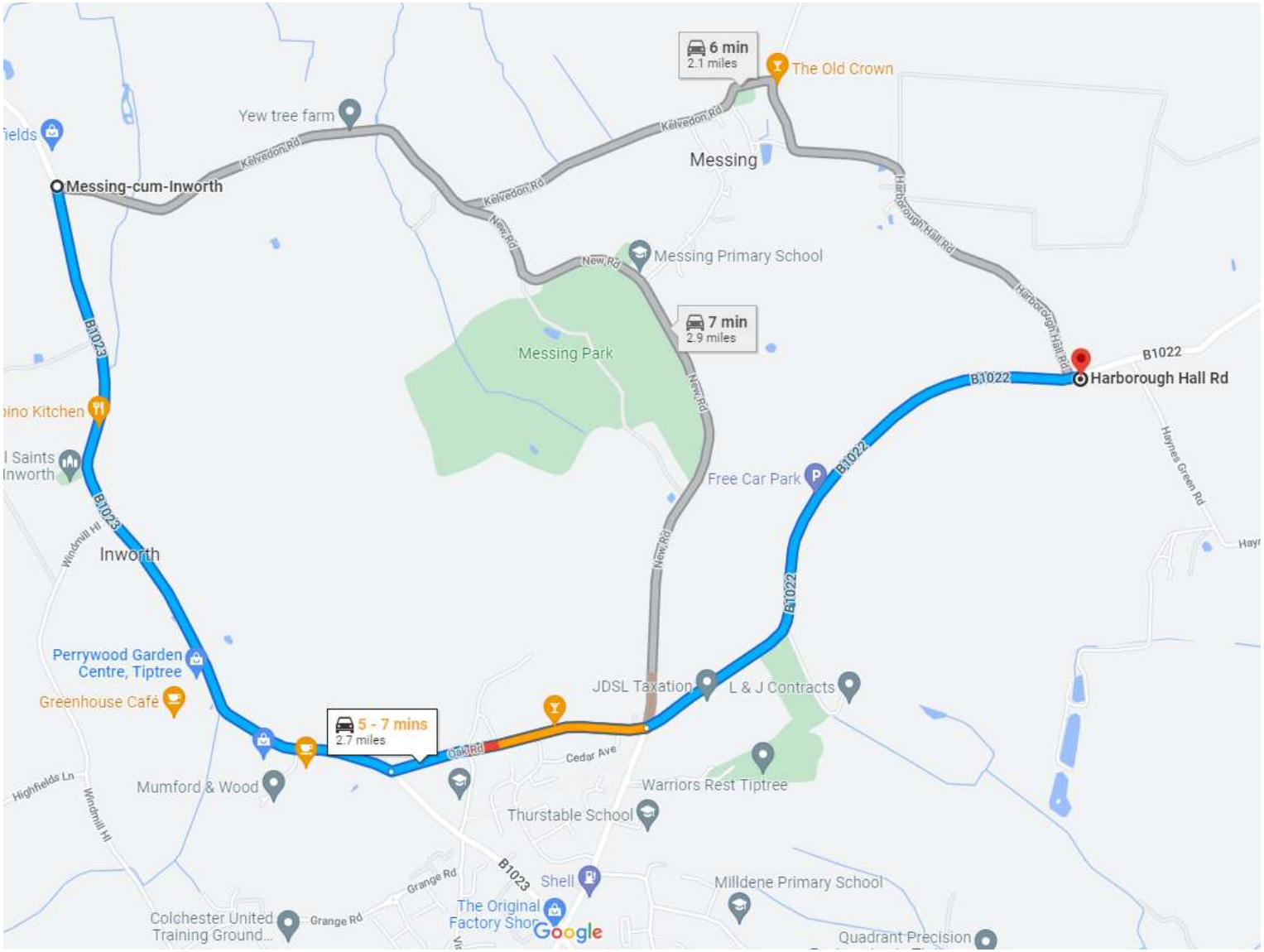


Figure 18 AM Peak Westbound

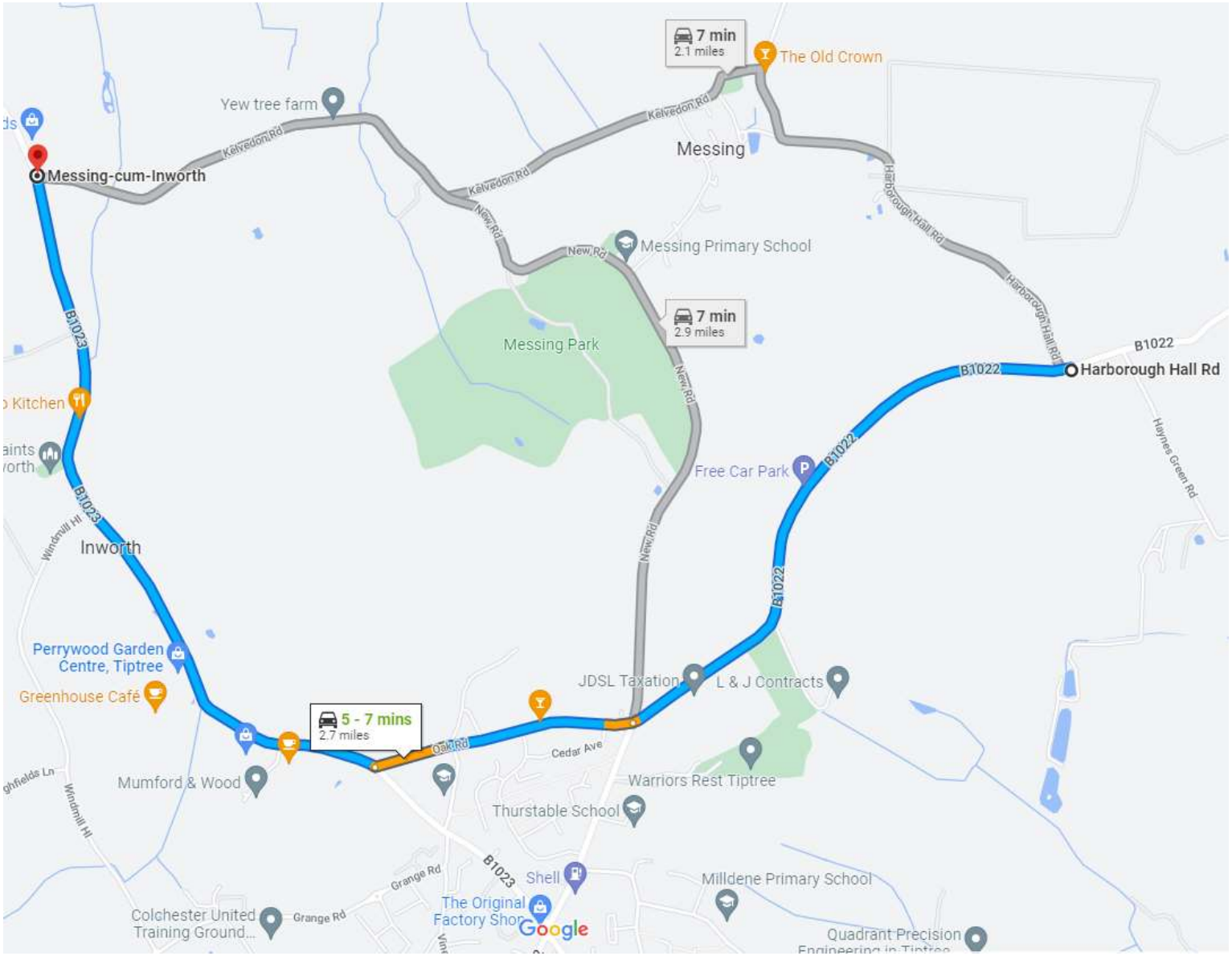


Figure 19 PM Peak Eastbound

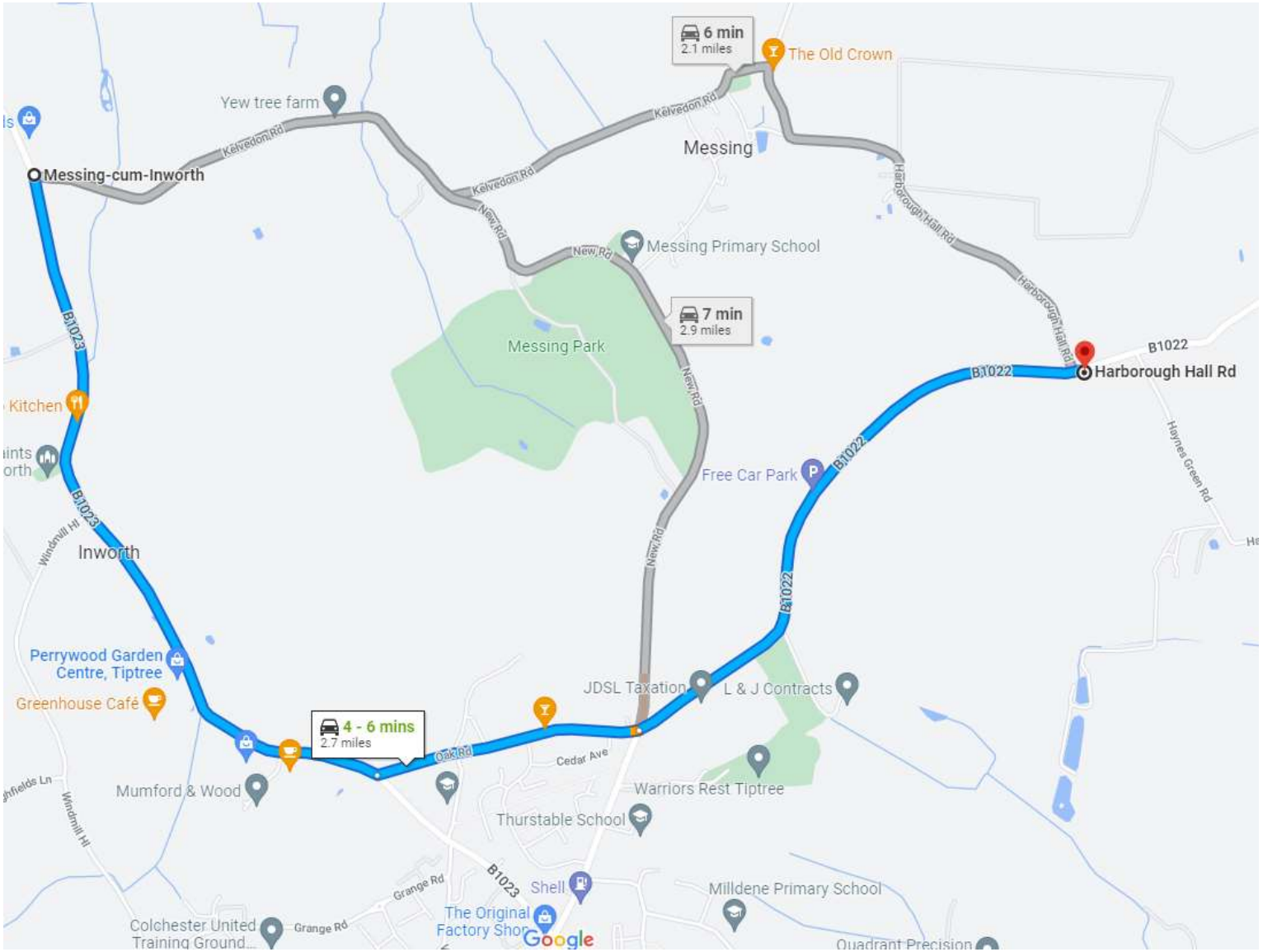
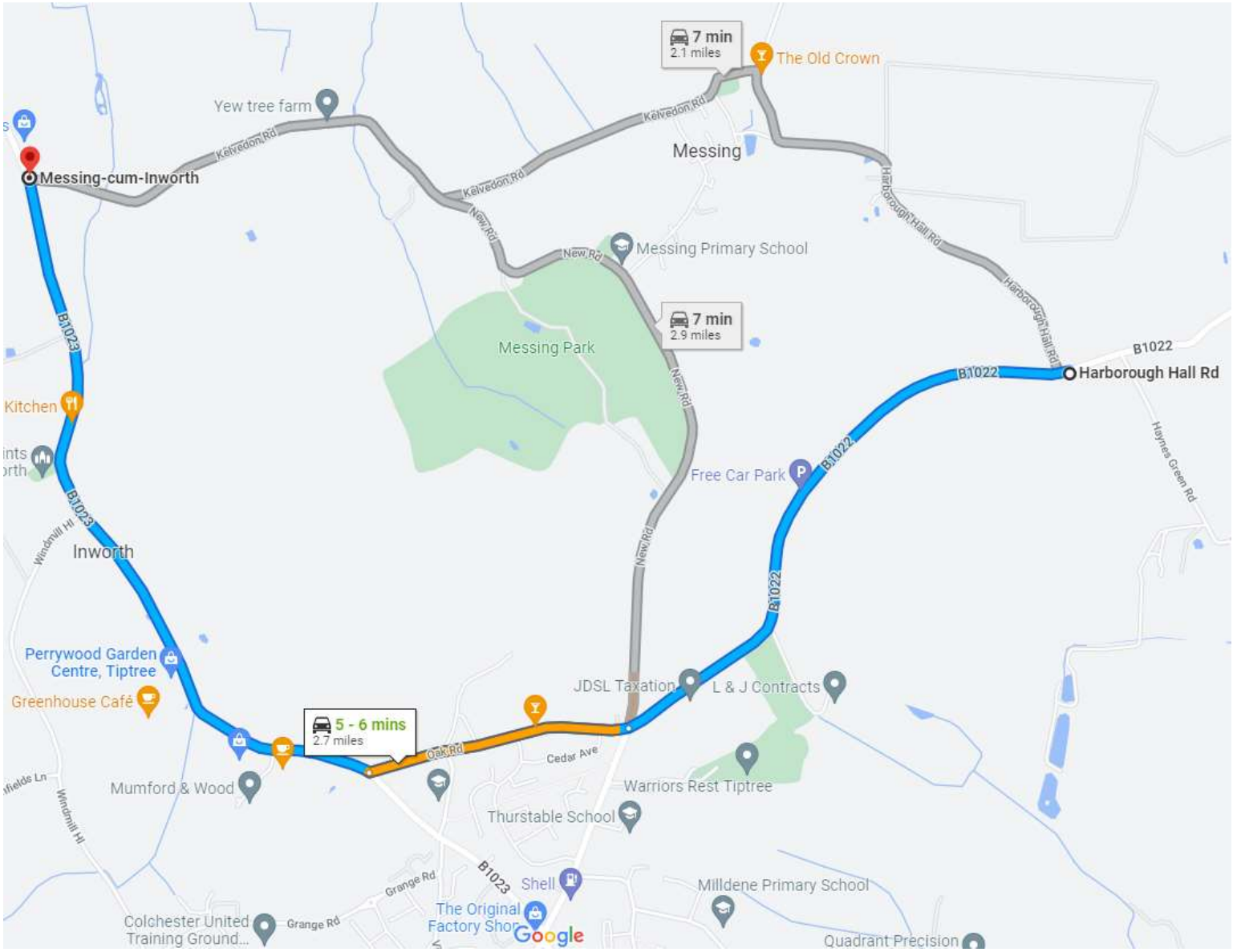


Figure 20 PM Peak Westbound



As Figures 17-20 show, in each direction for both peak periods Google Maps recommends travelling through Tiptree via Oak Road rather than through Messing via Kelvedon Road, despite some delay on Oak Road. This suggests that traffic is more likely to use Oak Road to access Junction 24 than Kelvedon Road, via Messing.

However, in the AM peak for both directions and PM peak eastbound the maximum journey time given for the via Tiptree route is the same as the Messing route on average.

Figures 21-24 show the journey time for vehicles travelling through Tiptree via the double mini roundabout on B1022.

Figure 21 AM peak Eastbound via double mini roundabout

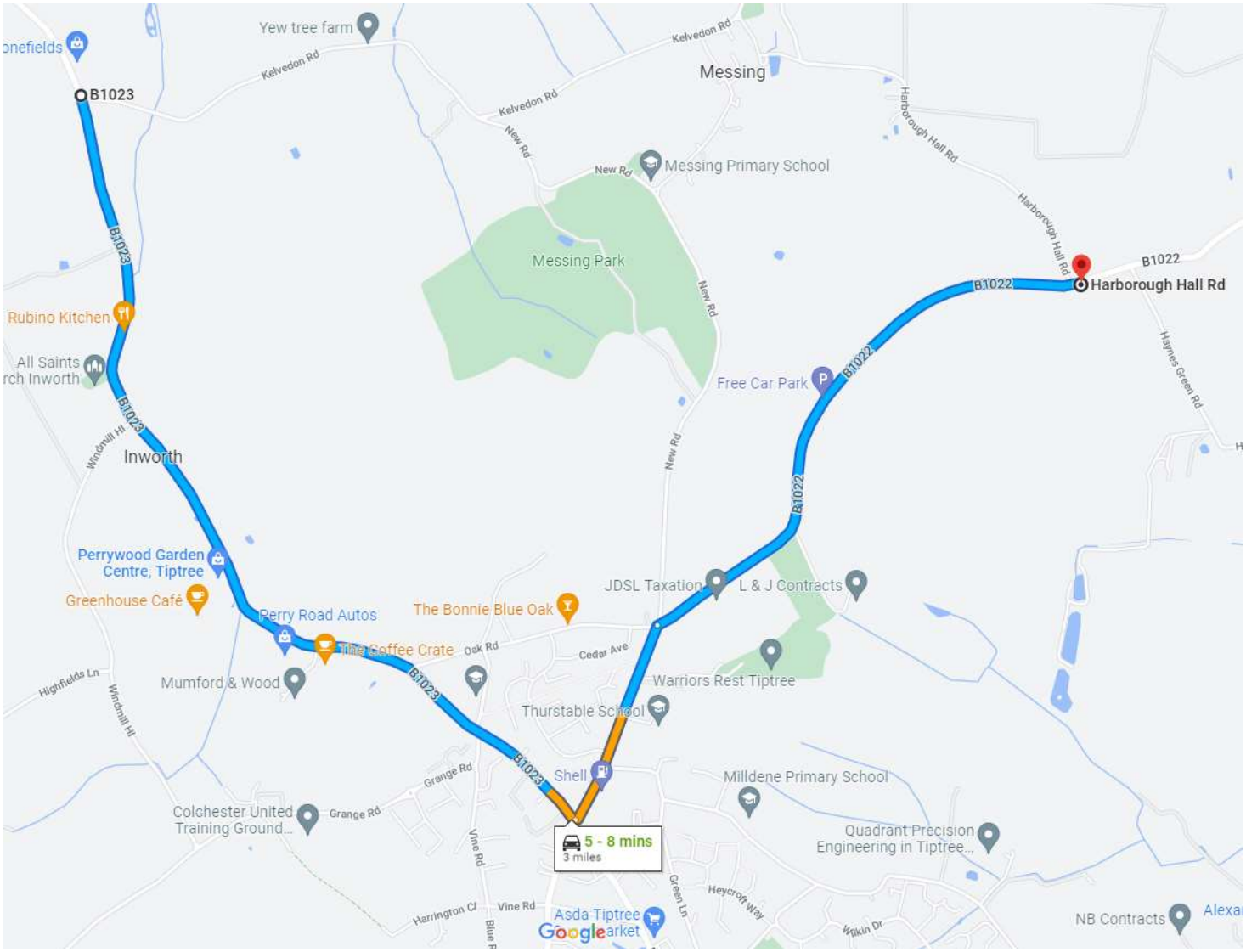


Figure 22 AM peak Westbound via double mini roundabout

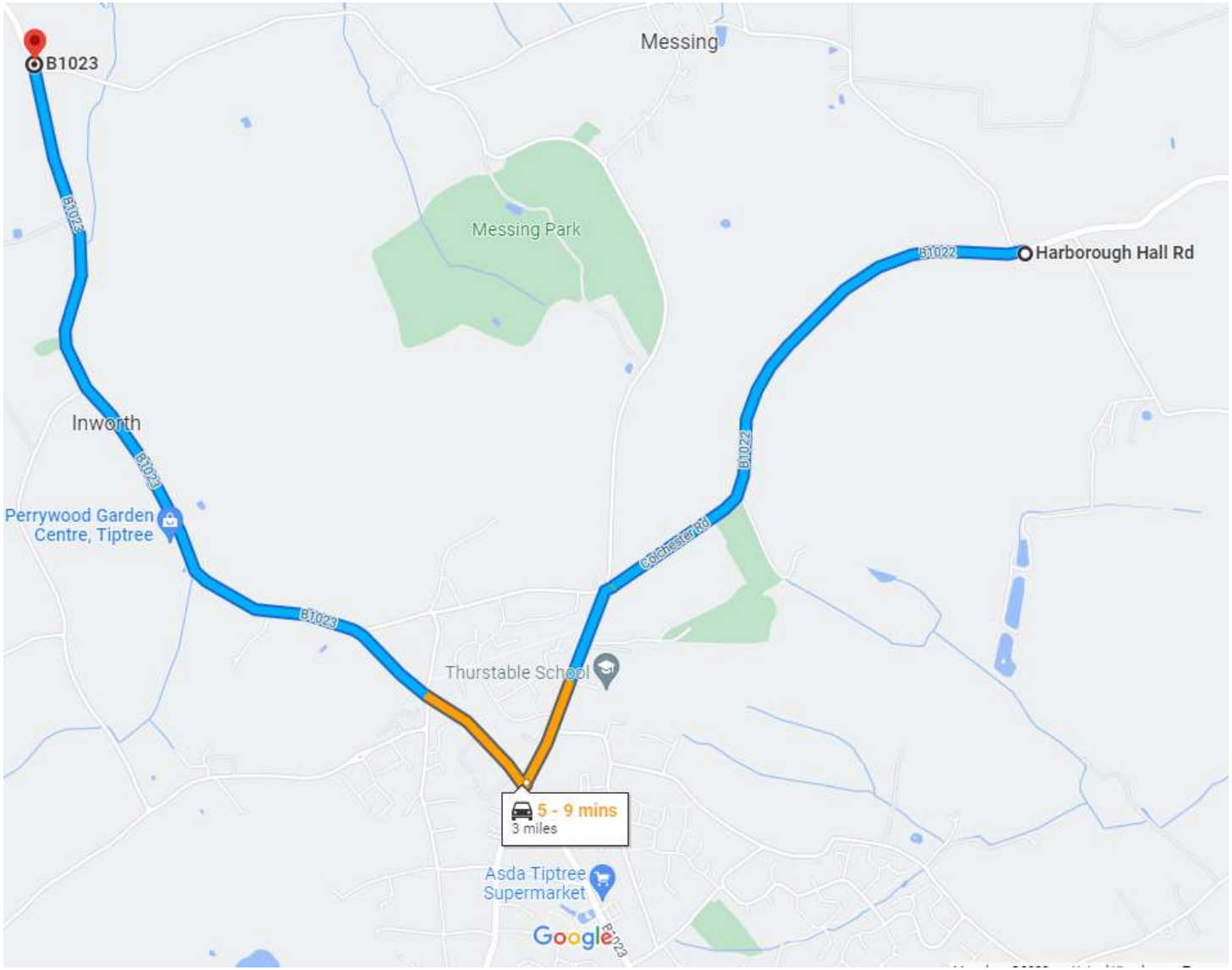


Figure 23 PM peak Eastbound via double mini roundabout

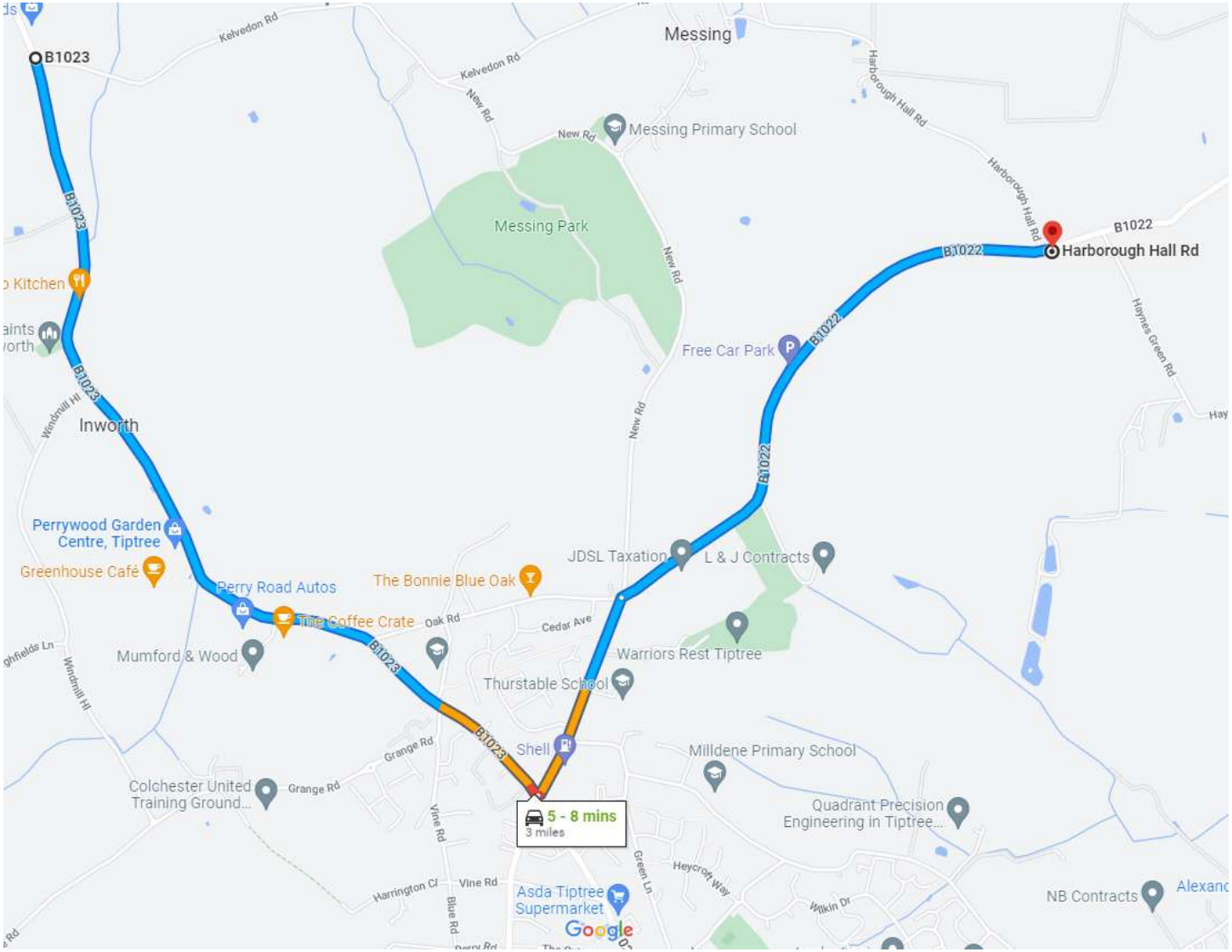
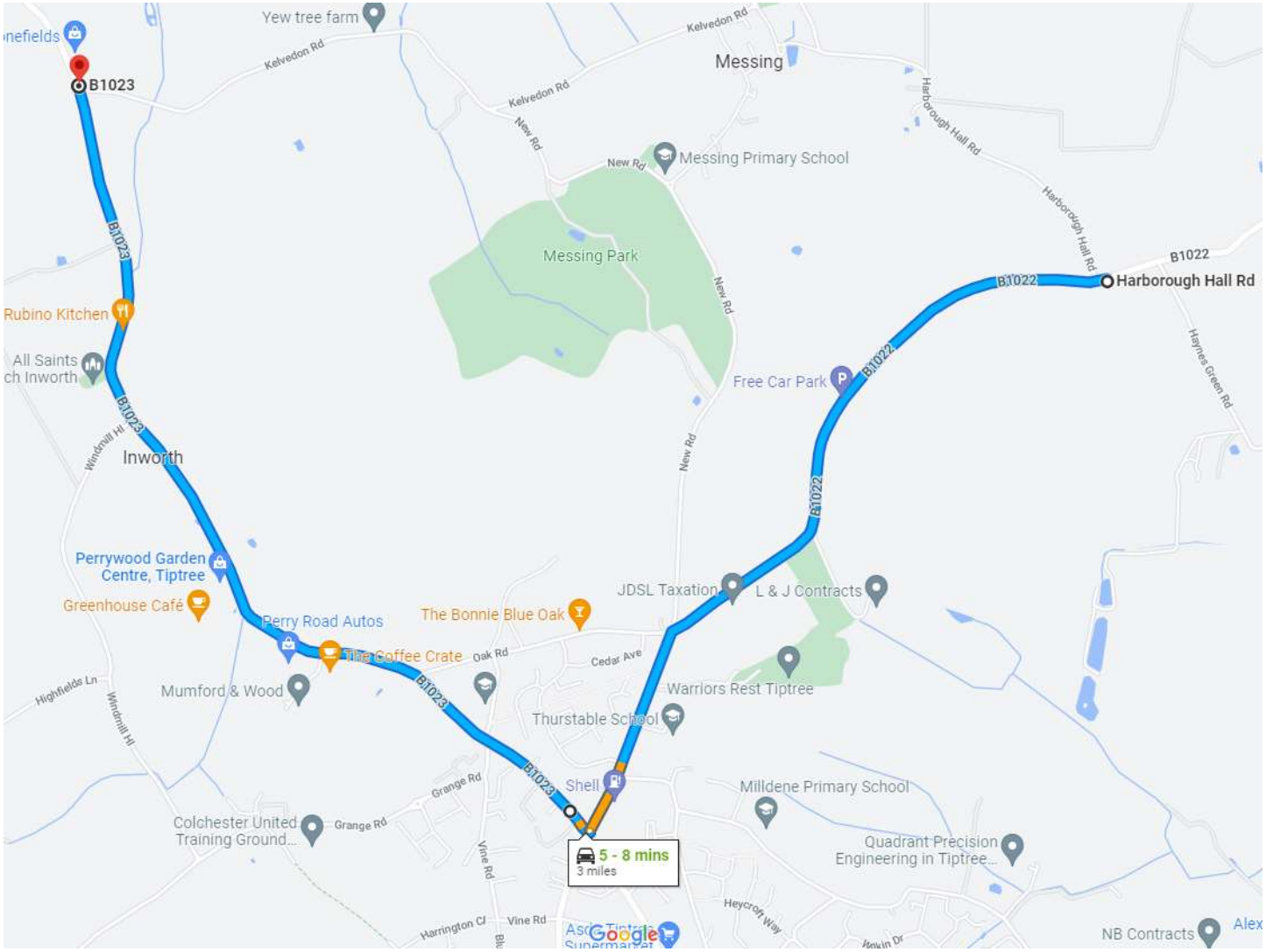


Figure 24 PM peak Westbound via double mini roundabout



The journey time via the double mini roundabout in Tiptree takes on average 5-9 minutes for both peak periods in both directions, with some delay experienced at the double mini roundabouts.

Table 5, below, summarises the journey times along for each route examined. On average, journey times are shorter via Oak Road, but the higher figure is the same as through Messing. Additionally, while the lower figure for travelling via the double mini roundabout is quicker than via Messing, the higher figure is slower. Therefore, on some days it may be quicker to travel via Messing and it would, therefore, be appropriate to investigate measures to reduce the potential for rat-running

Table 5 Journey times for different route options

	Via Messing	Via Oak Road Tiptree	Via double Mini Roundabout Tiptree
AM Peak Eastbound	6 minutes	5-7 minutes	5-8 minutes
AM Peak Westbound	7 minutes	5-7 minutes	5-9 minutes
PM Peak Eastbound	6 minutes	4-6 minutes	5-8 minutes
PM Peak Westbound	7 minutes	5-6 minutes	5-8 minutes

4.4 Summary

In summary, the route via Messing offers challenges for vehicles to travel through to access the new A12 Junction 24. While Google Maps does suggest another route, the average times mean that in some instances the route via Messing may be suggested, should there be congestion on the alternative route. Furthermore, the alternative route that Google Maps suggests via Oak Road in Tiptree is primarily residential with on street parking.

Therefore measures could be introduced to discourage vehicles from these routes and travel via the B1023 and B1022 via the double mini roundabout. However, improvements to the B1023 need to be considered from the double mini roundabout to the A12 junction, especially as there have been previous collisions along the road most likely due to visibility issues.

5 Potential Mitigation Options

This section will discuss potential measures to deter through traffic on Kelvedon Road and Oak Road and help to mitigate the impact of increased traffic on Inworth Road (from the B1022/1023 double mini roundabout to the new A12 Junction). The measures discussed are conceptual, at present, and require more detailed study before finalisation.

5.1 Kelvedon Road / Messing Village

5.1.1 Road Closure

In their Junction 24, Inworth Road and Community Bypass Technical Report, National Highways have provided the results of a traffic modelling exercise that assessed the likely impact of closing Kelvedon Road to traffic between Messing and Inworth Road. The modelling showed that traffic heading from the B1022

(east) to the new Junction 24 would reassign through Tiptree, and that there would be a significant increase in traffic on Oak Road, in particular.

National Highways found that, in terms of noise, the closure of Kelvedon Road would remove the predicted significant adverse effects on properties within Messing, but that there would be there would be significant adverse effects at a number of dwellings along Oak Road and along the B1023 (Kelvedon Road) in Tiptree, with no other measures in place.

In terms of traffic, the reassignment of traffic from Messing to Oak Road would merely change the location of the impact from one sensitive location to another, due to the residential nature of Oak Road. In addition, the closure of Kelvedon Road would be very inconvenient for residents of Messing wishing to gain access to the A12, and could have an adverse impact on access to farming land. As such, a full closure of Kelvedon Road (Messing) would not appear to be an appropriate mitigation measure.

5.1.2 Shuttle working signals

An option of placing shuttle working signals along Kelvedon Road near Messing has been considered. This would create a delay for vehicles travelling on the road and encourage them to use an alternative route. After discussions with Essex Highways ITS Design Services this option has been discounted on the following grounds:

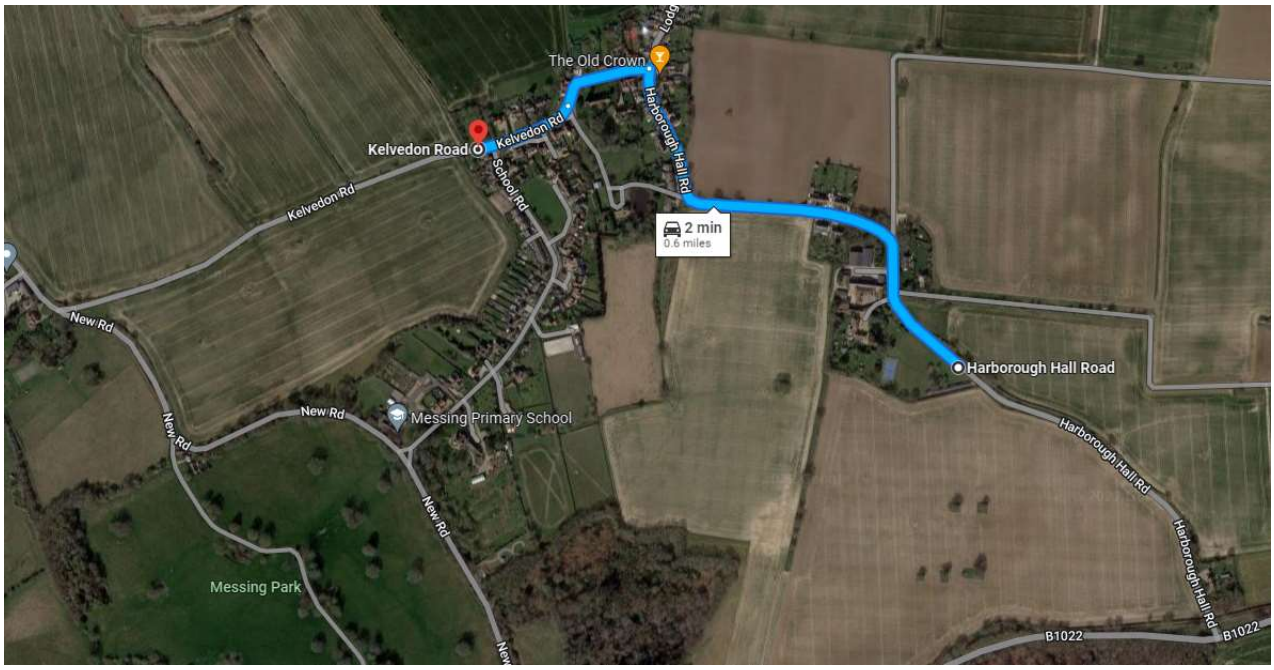
- There is no current congestion or safety concern on the route therefore it is difficult to justify the cost.
- The signals would need a power source and street lighting, the rural nature of the route means this would likely need installing and would incur significant costs from UK Power Networks.
- Maintenance costs will be around £2,000 a year and it is in a location where it could be subject to vandalism due to a lack of natural surveillance form passers-by, resulting in high repair costs.
- Moreover, driver compliance may be an issue if the road has typically low flows. There is a risk that drivers may take a chance that there will be no oncoming traffic.

5.1.3 Speed Restrictions

Speed restrictions could potentially be put in place within Messing village to discourage through traffic by increasing the journey time. The speed limit could potentially be reduced to 20mph.

The potential impact of speed restrictions on journey times has been investigated on the route via Messing. Currently, the speed limit is 30mph on the route highlighted in Figure 25 below. Either side of this marked route is the national speed limit. Google Maps shows that travelling between the two ends of the 30mph zone takes on average 2 minutes over 0.6 miles. This would indicate that the average vehicle is travelling at 18 miles an hour. Therefore, putting a posted speed limit of 20mph would mean drivers could assume it is safe to travel at the posted speed, but this may not be the case. Therefore this has been discounted.

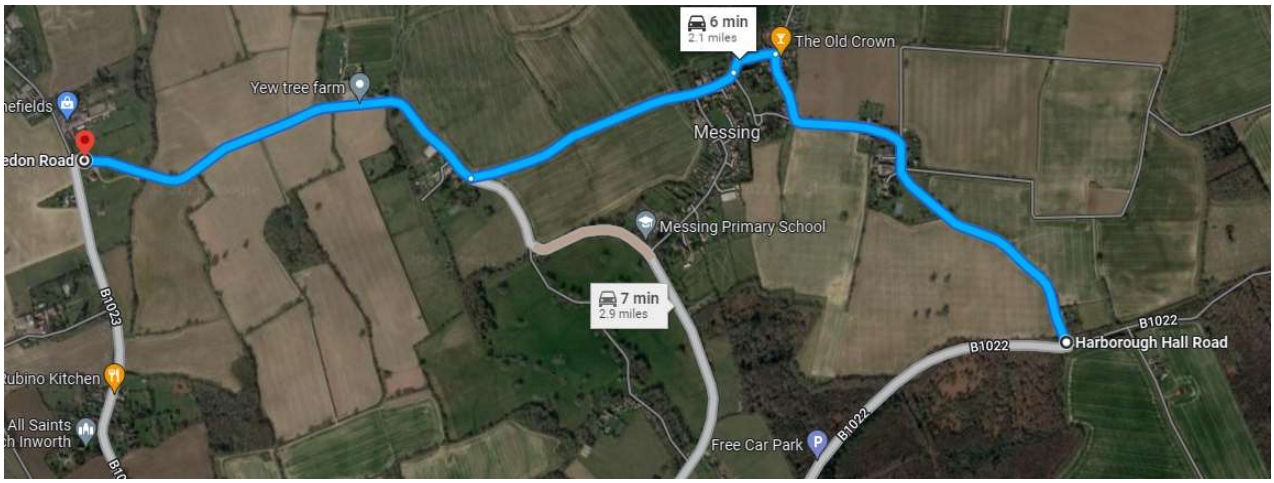
Figure 25 Journey time for 30mph zone in Messing



Furthermore, when the route is taken as a whole (see Figure 26, below), Google Maps indicate that the average speed is around 21mph, despite a large section of the route having the national speed limit. This is likely to be due to the route's physical characteristics.

Due to the nature of the road, the extension of the 30mph speed limit to sections outside the village is unlikely to make a significant difference to average speeds, and therefore has been discounted.

Figure 26 Journey time for Kelvedon Road/the Street/ Harborough Hall Rd



5.1.4 Weight Restrictions

Weight restriction orders make it an offence to drive a vehicle through the restricted area where the vehicle exceeds the weight limit imposed unless they are delivering or collecting within the weight restriction. The

police and the Trading Standards Service can enforce weight restriction orders under the Road Traffic Regulation Act 1984.

A weight restriction could potentially be put in place on both Kelvedon Road, but still allow access for farm traffic, deliveries, and essential HGV vehicles. However, this would not restrict cars and LGVs and experience from elsewhere indicates that it would be difficult to enforce, and therefore has been discounted.

5.1.5 Physical speed restriction measures

In order to discourage traffic through Messing village, prominent village entry gateways could be considered, to reinforce the fact that drivers are entering a small village, rather than a through route. Additional vegetation could be used to emphasise the gateway function of the sign. It would probably not be appropriate to include speed bumps and build outs as part of this due, to the requirement for farm traffic to use the road and the already narrow nature of the roads.

5.1.6 Signage

Although a weight restriction has been discounted for Kelvedon Road, “Not Suitable for HGVs” signage could be placed at the entries to both Kelvedon Road and Harborough Hall Road to reiterate that these roads are not suitable for large vehicles and to encourage HGVs to use the B1022 and B1023. This could help to reduce the number of inappropriate HGV through trips in Messing.

5.2 Oak Road

5.2.1 Road Closure

As outlined above. National Highways have carried out a traffic modelling exercise to see what impact the closure of both Kelvedon Road (Messing) and Oak Road would have on the local highway network. Clearly, a full closure of both roads to through traffic would result in all traffic travelling between the new A12 Jn 24 and the B1022 (east) using the B1022/B1023 double mini roundabout, which would increase pressure on an already congested junction.

ECC is not advocating the closure of either Kelvedon Road (Messing) or Oak Road (Tiptree) to through traffic. However, it is important to provide other measures that would help to minimise the impact of A12 related traffic on these roads.

5.2.2 Speed Restrictions

A 20mph could potentially be introduced along Oak Road in Tiptree, particularly as it is mainly residential in nature. The reduced speed limit may help to discourage traffic using it as a shortcut instead of routing via the double mini roundabout on the B1023/B1022 which is the most appropriate route.

Oak road is 0.4 miles in length. It would take 48 seconds for vehicles to traverse this section, travelling at 30mph. If the speed limit was reduced to 20mph and vehicles travelled at 20mph then it would take 1 minute 12 seconds, an increase of 24 seconds.

Although an increase in journey time of 24 seconds would not necessarily put traffic off using Oak Road, formalising the 20mph zone with signage at the beginning of Oak Road to indicate a 20mph zone or ‘Home

Zone' ahead may discourage further traffic along this route. Additional considerations to limit speed could be considered such as speed bumps, as there are no public transport services along Oak Road.

5.2.3 Weight Restrictions

As with Kelvedon Road, a weight restriction could potentially be put in place on Oak Road but still allow access for deliveries, and essential HGV vehicles. However, this would not restrict cars and LGVs and experience from elsewhere indicates that it would be difficult to enforce. It has, therefore, has been discounted for Oak Road.

5.2.4 Physical speed restriction measures

In order to discourage through traffic on Oak Road, priority narrowing could be considered. Priority narrowing involves introducing road narrowing which creates a one-way priority system at that point. The speed reducing effect relies upon the regular presence of oncoming vehicles in order to ensure that traffic without priority has to periodically give way and consequently reduces its speed.

Appropriate locations for priority narrowing measures would appear to be just west of Bishops Lane (giving priority to westbound traffic) and just east of the eastern end of Cedars Avenue (giving priority to eastbound traffic). It should be noted that any impact on on-street parking would have to be considered carefully, in discussion with local residents.

Presently, the junctions either end of Oak Road are large junctions which encourage higher speeds and give the indication of a strategic through route. Potential entry treatments could be investigated to adjust the junctions to be smaller and tighter by building out the kerbs to give the impression of a more residential street. Physical measures like building out the kerb could be designed in a way which gives the impression of entering a "home zone", this could be coupled with a 20mph zone, as suggested above, which would lengthen journey times along the route.

5.2.5 Signage

In association with the entry treatments to Oak Road, signage could be included to guide vehicles towards the B1023/B1022 junction either end of Oak Road. On the western side of Oak Road signage to Colchester should direct vehicles straight ahead continuing south on B1023. On the eastern side of Oak Road signage directing vehicles to the A12 could sit on the junction pointing left to continue south on the B1022.

"Not Suitable for HGVs" signage could be placed at the entries to Oak Road to reiterate that these roads are not suitable for large vehicles and to encourage HGVs to use the B1022 and B1023.

5.3 B1023 Kelvedon Road / Inworth Road

5.3.1 Carriageway Widening

The increase in traffic predicted on the B1023 Inworth Road, with the A12 scheme in place, will exacerbate existing problems on both Inworth Road and Kelvedon Road, Tiptree (the southern section of the B1023).

SYSTRA provided comments on National Highways' 'Junction 24 Inworth Road and Community Bypass Technical Report' in a separate Technical Note for ECC dated July 2022. The focus of SYSTRA's Technical

Note was on the proposals put forward by National Highways in the DCO scheme. However, they suggested that further attention should be paid to Inworth Road, north and south of the section where National Highways are currently proposing mitigation measures. They commented that:

- The proposed A12 widening scheme would result in an increase in traffic on the northern section of Inworth Road (north of the new Junction 24) in comparison to the scenario without the A12 scheme. The increase in traffic in the PM peak is considered to be particularly significant.
- Considering the increased in traffic on the northern section of Inworth Road following the introduction of the NH proposed scheme, and the presence of the acknowledged pinch point at Hinds Bridge, SYSTRA suggest that the basis for discounting any road improvements along this section is flawed and that further examination should be carried out by National Highways in this regard.
- From discussions with ECC, there are additional pinch points on the B1023 between Perrywood Garden Centre and the junction with the B1022 Maldon Road (in particular At Oak Road junction & between Vine Road & Windmill Green Place). National Highways technical report does not explain at present why this stretch of the B1023 has been excluded from consideration.

With measures in place to reduce the amount of through traffic on Kelvedon Road, Messing and Oak Road, Tiptree, there would be an even greater traffic impact on the southern section of the B1023 than currently predicted for the DCO scheme. As such the measures suggested by SYSTRA are particularly relevant.

5.3.2 Hinds Bridge

The DCO traffic modelling indicates that there will be a 2% increase in AM and 9% increase in PM peak traffic in 2042 at Hinds Bridge. As the busier peak hours are the times when incidents are most likely to occur, the increase in peak hour flows, in combination with the expected profile of traffic (including HGVs), means that delays associated with the constraints of the current structure are likely to increase and this could potentially have a significant impact upon journey times and traffic routing. In line with the localised widening proposed elsewhere on Inworth Road, it would be logical for this structure to be widened so that it can accommodate two large vehicles passing in opposite direction.

5.3.3 Average Speed Cameras

Though important to mitigate the impact of increased traffic on Inworth Road, localised widening would not be a traffic calming measure. As a result, there is a risk that the A12 DCO could lead to an increase in traffic speeds on Inworth Road. To ensure that the widening has a positive impact without an increased likelihood of collisions, average speed cameras could be considered on Inworth Road. Essex Police has expressed support for the installation of average speed cameras on the B1023, in order to help ensure that drivers comply with the speed limits with the A12 DCO scheme in place.

5.3.4 Other Measures

In addition to increased traffic on the southern section of the B1023, measures to reduce the amount of through traffic on Kelvedon Road, Messing and Oak Road are likely to result in an increase in traffic at the B1022/B1023 mini roundabout. The impact of this increase in traffic is currently uncertain and it is therefore recommended that National Highways be asked to provide more detailed traffic modelling information for this junction.

There are no improvements proposed for cyclists on Inworth Road and, with the expected increase in traffic, the likelihood of collisions will increase. More should be done to mitigate the impact of increased traffic on the B1023 on pedestrians, cyclists and horse riders.

6 Summary and Conclusion

This Technical Note has:

a) Reviewed the multi-criteria assessment that National Highways has used to compare the Inworth Road bypass options.
b) Looked into potential measures that might help to reduce the impact of traffic flow changes in the vicinity of Messing, Inworth and Tiptree

The review of the National Highways multi-criteria assessment suggests that using a more standard EAST-based assessment could potentially result in a different option being identified as the best performing option. The exercise carried out in this note resulted in National Highways' proposed option (DS2) having the same score as the DS3 Inworth Road bypass option. This would need to be investigated in more detail, but it does call into question the robustness of National Highways methodology.

It was also noticeable that, using the EAST-based assessment, none of the assessed options resulted in an overall positive score. This emphasises the need to investigate further mitigation, over and above the measures proposed by National Highways.

Having reviewed potential measures that might help to reduce the impact of traffic flow changes in the vicinity of Messing, Inworth and Tiptree, it is recommended that the following measures should be investigated in more detail:

- Village entry gateways for Messing village
- "Unsuitable for HGVs" signage on Kelvedon Road and Harborough Hall Road
- Narrowing of the entries to Oak Road (both the eastern and western ends), through tightening of entry radii and appropriate landscaping.
- 20mph zone / speed limit along the length of Oak Road and side roads, with traffic calming measures, as appropriate
- Priority narrowing measures on Oak Road just west of Bishops Lane and just east of the eastern end of Cedars Avenue
- Improved signage at either end of Oak Road to guide through-traffic to the B1022/B1023 junction.
- Widening of Hinds Bridge, to support the forecast increase in traffic flow and reduce the likelihood of vehicle strikes
- Further improvements on the B1023 for walking, cycle and horse riding users, to help off-set the impacts of increased traffic on this route
- Widening of pinch points between Perrywood Garden Centre and the B1022 to a minimum carriageway width of 6.1m in line with approach to other pinch point widening proposals
- Average speed cameras on the B1023

Appendix A – Bypass Assessment Criteria Mapping

The table below shows the criteria that National Highways has used in their multi-criteria assessment of Inworth Road bypass option mapped against corresponding EAST tool criteria.

National Highways Assessment Criteria	EAST Criteria
1a supporting economic growth Proposed scheme supports the growth identified in Local Plans by reducing congestion related delay, improve journey time reliability and increase the overall transport capacity of the A12	Economic Growth
1b supporting economic growth Proposed scheme promotes specific traffic flow across the highway network	Economic Growth
2a A safe and serviceable network Proposed scheme improves user safety	Wellbeing
2b A safe and serviceable network Proposed scheme improves road worker safety	Wellbeing
3a a more free flowing network Proposed scheme increases the resilience of the transport network to cope with incidents including collisions, breakdowns, maintenance and extreme weather	Economic Growth
3b a more free flowing network Proposed scheme fully understands the impacts of the other schemes and recognises other RIS schemes	Economic Growth
4a an improved environment Improve the environmental impact of transport on communities along the existing A12	Wellbeing
4b an improved environment Reduce the impact of new infrastructure on the natural and built environment by design	Local Environment
5a a more accessible and integrated network Proposed scheme provides a safe WCH route between communities and seeks to address severance	Wellbeing
5b a more accessible and integrated network Improve safety and effective access for public transport users	Wellbeing

6a customer satisfaction Improve customer satisfaction	Public acceptability
6a customer satisfaction Improve scheme profile	Public acceptability
7a traffic and economic value of money Economic benefits	Economic growth
7b traffic and economic value of money Cost	Capital Cost
8a deliverability/construction carbon	Carbon Emissions
8b deliverability/construction Highway geometry	Practical feasibility
8c deliverability/construction Construction challenge	Practical feasibility
8d deliverability/construction Drainage challenge and flood risk	Practical feasibility
8e deliverability/construction Structures challenge	Practical feasibility
8f deliverability/construction Planning and land challenge	Practical feasibility

Appendix B – Alternative Multi-Criteria Assessment using the EAST tool

Overall			Strategic					Economic						Managerial				Financial						Commercial				
Name/No.	Date	Description	Identified problems and objectives of the option	Scale of impact	Fit with wider transport and government objectives	Fit with other objectives	Degree of consensus over outcomes?	Economic Growth	Carbon emissions	Socio-distributional impacts and the regions	Local environment	Well being	Expected VfM Category	Implementation timetable	Public acceptability	Practical feasibility	What is the quality of the supporting evidence?	Affordability	Capital Cost (£m)?	Revenue Costs (£m)?	Cost Profile	Overall cost risk	Other costs	Flexibility of option	Where is funding coming from?	Any income generated? (Y/N)	If yes, how much income generated (£m)?	
National Highways Scoring within EAST Tool Categories																												
DS2	18/07/202	B1023 Inworth Road in 2042, with the A12 scheme in place and the Widening Option 2 mitigation measures in place						0.00	-1.00		-1.00	0.00			1.00	0.00			-1.00										-2
DS3	18/07/202	Inworth Road in 2042, with the A12 scheme in place and the second community bypass concept with southern J24 link road in place. No mitigation measures on Inworth Road.						1.00	-2.00		-2.00	0.00			2.00	0.00			-3.00										-4
DS4	18/07/202	Inworth Road in 2042, with the A12 scheme in place and the latest community bypass concept with northern J24 link road in place. No mitigation measures on Inworth Road. (north bypass north of A12)						1.00	-2.00		-3.00	1.00			2.00	-1.00			-3.00										-5
National Highways Scoring with added criteria																												
DS1	18/07/202	The existing B1023 Inworth Road, as it would be in 2042 with the A12 scheme in place, and no mitigation measures. Set as the baseline	Mitigate impact of increased traffic on local roads	-2.00	-2.00			0.00	-1.00		0.00	-1.00		0.00	-1.00	1.00	0.00		0.00			0.00				0.00		-6
DS2	18/07/202	B1023 Inworth Road in 2042, with the A12 scheme in place and the Widening Option 2 mitigation measures in place	Mitigate impact of increased traffic on local roads	0.00	-1.00			0.00	-1.00		-1.00	0.00		0.00	1.00	0.00	0.00		-1.00			-1.00				0.00		-4
DS3	18/07/202	Inworth Road in 2042, with the A12 scheme in place and the second community bypass concept with southern J24 link road in place. No mitigation measures on Inworth Road.	Mitigate impact of increased traffic on local roads	1.00	1.00			1.00	-2.00		-2.00	0.00		0.00	2.00	0.00	0.00		-3.00			-2.00				0.00		-4
DS4	18/07/202	Inworth Road in 2042, with the A12 scheme in place and the latest community bypass concept with northern J24 link road in place. No mitigation measures on Inworth Road. (north bypass north of A12)	Mitigate impact of increased traffic on local roads	1.00	1.00			1.00	-2.00		-3.00	1.00		0.00	2.00	-1.00	0.00		-3.00			-3.00				0.00		-6