

Safety Review

A38 Markeaton Roundabout Improvements and Road Safety Audit

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A38 Markeaton Roundabout Improvements and Road Safety Audit

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SCP

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Reference; -

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Safety Review A38 Markeaton Roundabout Improvements and Road Safety Audit.

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1 Introduction

1.1 Commission and Terms of Reference

1.1.1 This report has been prepared in response to a request to undertake an independent Safety Review of the A38 Markeaton Roundabout improvements and specifically the proposed access arrangements to the existing Esso/McDonalds site by Bill Booker Consultant on behalf of SCP.

1.1.2 Bill Booker has approved Meraki Alliance Ltd as suitable to carry out this review. Jonathan Birkett IEng MICE FIHE MSoRSA Cert Comp and has over 30 years' experience in road safety engineering as well as 13 years' experience as a Road Safety Auditor both on local authority and trunk roads.

1.1.3 **Google Image 1** below shows the location of the site.



Google Image 1: Site Location in Relation to London Road and A421

1.1.4 **Image 2** below shows a rough sketch of the proposed works to the roundabout taken from Road Safety Audit.

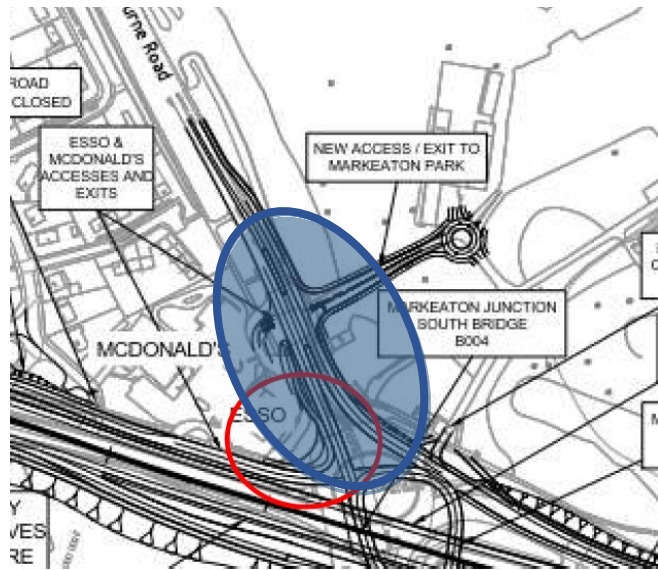


Image 2: Area of Safety Review Shown in Blue

1.1.5 Discussions with SCP has been used to inform this Safety Review and includes.

- Review of the extract of the RSA provided,
- Visibility,
- Slip/Trips and Falls,
- Level differences/gradients,
- Pedestrian vehicle conflict,
- NMU movements,
- Junction layouts,
- Junction operation,

1.1.6 The review as instructed comprised a desk top study of the drawings provided no site visits have been undertaken as part of the review.

1.1.7 Collision data was not available. However, as part of the Safety Review “CrashMap” was examined for the most recent five years of data. From the data forty-five Personal Injury Collisions (PICs) have been identified resulting in four serious and forty-one slight collisions.

- 1.1.8 There has been a total of four slight collisions associated with the existing access/egress junction onto the A52 Ashbourne Road. One of the collisions involved a cyclist.
- 1.1.9 Details provided by McDonalds and Esso indicate that the restaurant attracts 3000 two way trips a day and the petrol filling station 1350 two way trips a day. The total two way daily trips associated with the existing site is 4350.

2 Safety Review Road Safety Audit

2.0 Road Safety Audit

- 2.0.1 Only an extract of the Road Safety Audit has been provided by Highways England, this makes it difficult to undertake an accurate assessment of the full improvements of the Markeaton Roundabout and specifically the Esso/McDonalds site and proposed junction arrangements.
- 2.0.2 Details of the Audit Team and respective organisation is not provided and from the information provided impartiality and compliance with GG119 cannot be determined
- 2.0.2 There also appears to be a number of safety related problems that have not been considered as part of the Road Safety Audit process and will be considered as part of this review.
- Full and detailed consideration of the proposed left turn into the site from the A52,
 - Access to McDonalds from the A52,
 - Capacity of the A52 north westbound,
 - NMU movements,
 - Possible mitigation measures.

2.1 Safety Observations

Observation 1

- 2.1.1 Significant changes are proposed at the Markeaton roundabout to improve safety and congestion. The existing entry into the site from the A38 north eastbound direction will be closed. Access to the site will only be available from the A52 Ashbourne Road located to the north of the site.
- 2.1.2 To facilitate these increased turning movements a new signalised junction will be constructed close to the existing Esso/McDonalds access onto the A52 Ashbourne Road. As part of these works the access into Markeaton Park will be incorporated into this junction. Examination of the preliminary layout indicates that the left turn into the site is a radius of 3.5m.
- 2.1.3 The issue of the left turn has been considered within the RSA problem 4.3.5. However, it has not considered the full implications of this extremely tight radii and its effect on the access arrangements for Heavy Commercial Vehicle (HCV) entering the site from A52 Ashbourne Road.
- 2.1.4 An articulated HCV will have considerable difficulty in turning left from the A52 into the site. Details of tracking have been considered but the reality may not be quite so easy to achieve.

2.1.5 Consideration of layout has a number of safety related issues that have not been fully considered as part of the Road Safety Audit.

- Any driver error will result in over running of the footway increasing the risk of NMU/vehicle collisions.
- Vehicles over running the footway will both damage the footway and may strike traffic signal equipment or other street furniture located close to the entrance.
- It is likely that HCVs will use the offside A52 northbound lane to turn left into the site, drivers travelling northbound would not expect this manoeuvre and as such could increase the risk of side swipe type collisions.
- HCVs making very tight turns will scrub away the surface course causing increased damage to the surface material reducing the polished stone value and increasing the risk of loss of control type collisions.
- The radius of the turn is much sharper than drivers would expect and could enter the left turn into the site carrying too much speed resulting in an increased risk of heavy braking resulting in skidding and loss of control type collisions.
- The use of thin surface courses in these situations is not suitable as they are easily damaged in high wear areas and the dragging of the rear axles/wheels can cause the surface to be seriously damaged.
- The location of the right turn into McDonalds is very close to the traffic signal junction and could lead to vehicles queuing out onto the A52 resulting in shunt type collisions.
- There is very little distance and therefore time for drivers to understand and react to the new road layout and as discussed above the very close proximity of the right turn into the McDonalds car park could be a serious safety risk. The A38 is a popular route and as such the A38 carries a significant number of drivers who do not know the area well and as such confusing road layouts can increase the risk of collisions. A lack of clear road markings and signing could result in both shunt and failure to give way type collisions.
- The right turn does not meet the current standards set out in CD123.

2.1.6 The details above have not been fully considered in the RSA and within the designer's response.

Recommendation

2.1.7 Undertake detailed traffic modelling of the junction and ensure that realistic tracking of left turn HCV's into the site are undertaken. Implement additional signing works for the right turn into the McDonalds.

Observation 2

- 2.1.8 Details of the traffic modelling of the new A52 Ashbourne Road/McDonalds/Esso traffic signalised junction is unavailable and as such there is no understanding of how the improvements will impact on the Markeaton junction. There is concern that the Esso/McDonalds arm will only run for a limited green time every cycle. The McDonalds site is one of the busiest in the country with up to 3000 unique visits a day and the Esso garage 1350 a total of 4350 two-way trips. It is expected that upwards of 2800 vehicles will use the A52 junction to exit the site (allowing 33% to use the A38 exit). These can be particularly high in the morning and more specifically the evening peak period where the peak trips to the restaurant will coincide with the peak period on the A52.
- 2.1.9 It is unclear how the signals will be configured should only a minimum green of seven seconds be allocated to the exit from the site twice a cycle then there is an increased risk of long queues into the site. This will affect the ability of vehicles to both enter and exit the site, especially the right turn into McDonalds car park which could easily become blocked.
- 2.1.10 If queues become excessively long from the site vehicles may be tempted to use the exit lanes inappropriately resulting in an increased risk of side swipe/head on type collisions.
- 2.1.11 There is concern that there will be an uncontrolled crossing of the site access details of the layout of this crossing are not provided. The layout of this could affect the position of the stop lines resulting in an increased risk that the junction could become congested.

Recommendation

- 2.1.12 Undertake detailed traffic modelling of the junction and if queues block the entrance into McDonalds consider the use of "Keep Clear" markings and perhaps ensure that detection used on the exit from the site is positioned appropriately ensuring that queues are kept to a minimum.

Observation 3

- 2.1.13 Details of the proposed pedestrian facilities at the junction have been only partly considered as part of the RSA Problem 4.3.7. It does not consider NMU movements across the A52 to and from Markeaton Park. The park is well used with established trips between the park and the Esso/McDonalds site. No details have been provided on how pedestrian movements will be accommodated across the A52. A lack of suitable NMU facilities can increase the risk of NMU/vehicle collisions.

Recommendation

- 2.1.14 Undertake detailed observations including NMU counts (Saturdays and Sundays) to determine the NMU demand at the proposed junction and if necessary, consider including signalised/un-signalised facilities at the junction (covering the A52 and site access). If traffic signal control of the NMUs is required, then detailed modelling of the changes will be required. This could have a material impact on the capacity of the junction.

2.2 Conclusion

- 2.2.1 There are a number of elements of the proposed access arrangements to the Esso/McDonalds site that need further consideration. It is not clear if the new arrangement will cater safely for the types and frequency of vehicles proposed at the junction.
- 2.2.2 Also, it is unclear if the new traffic signals and proposed layout will work well with the access to McDonalds which is located only a few metres into the site. Some thought has gone into the need for some form of pedestrian crossing facilities running across the site access but trips across the A52 to and from Markeaton Park have not been considered and before any further work is undertaken the feasibility of introducing staggered signalised pedestrian facilities both across the A52 and site access should be investigated further.

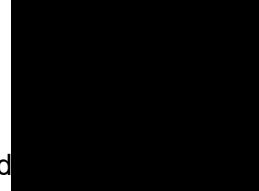
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Approval

JONATHAN BIRKETT

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CERTIFICATE OF COMPETENCY



Signed

Dated 03.03.2020...

Appendix A

The following Drawings and Documents were made available by SCP.

Documents

Extract of Road Safety Audit Highways England

Vehicle tracking

Appendix B

Observations and Recommendation Plan

