



# M65 TERMINUS – DESIGN REVIEW TECHNICAL NOTE

<b>DATE:</b>	05 July 2023	<b>CONFIDENTIALITY:</b>	Confidential
<b>SUBJECT:</b>	M65 Terminus - Highways Design Check Technical Note		
<b>PROJECT:</b>	M65 Terminus	<b>AUTHOR:</b>	Jacob Butterworth
<b>CHECKED:</b>	James Outterside	<b>APPROVED:</b>	Richard Verity

## HORIZONTAL ALIGNMENT

The design speed for this highway is 50mph/85kph.

The entry path radii specified in CD116, note 3.26.1 is considered achievable with some minor horizontal realignment of the Eastern arm, southern carriageway to achieve the maximum 100m radii without compromising the forward visibility/traffic signal design parameters. This would not affect the northern carriageway and its entry path radii, however the stop line for the southern carriageway may need adjusting to facilitate this.

Visibility within the roundabout is achieved in line with Table 3.49 in CD116, however due to vegetation growth a maintenance schedule may be required to maintain visibility within the roundabout.

## SPEED REDUCTION MEASURES

Traffic Signs Manual Chapter 5 paragraph 6.10.1 specifies transverse yellow bar markings are not appropriate at roundabouts controlled by traffic signals.

Based on Traffic Signs Manual Chapter 6 paragraph 5.4.4. as the design speed is in excess of 50mph the use of Advanced Traffic Signal Warning signs should be considered to notify drivers approaching the roundabout of the upcoming signals. Due to the design speed for the approach the signs should be located circa 250m from the signal stop line to give drivers enough warning on their approach.

The use of high friction surfacing should be integrated in excess of the stopping distance of vehicles (53m), it is anticipated this would be installed up to circa 75m from the signal stop line. This could be coloured buff to provide an added visual reference for the upcoming junction.

## LANE ALLOCATION SIGNAGE

Referring to CD 116 paragraph 2.1.4. Note 2, additional map type direction signs should be implemented ½ a mile from the junction and circa 115m for the M65 approach and 100m for the M6 approach. This aligns with the road markings for each approach.

Lane boards should be incorporated in advance of the lane flare for each approach, this would locate them circa 250m on the M65 approach and 200m on the M6 approach.



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## TRAFFIC SIGNALS

The feasibility general arrangement has been reviewed for compliance against applicable guidance and standards, namely the DfT's Traffic Signs Manual, DMRB CD 116 Geometric Design of Roundabouts and CD 123 Geometric Design of At-Grade Priority and Signal-Controlled Junctions.

The proposed layout has been modelled in LinSig and is forecast to operate within operational capacity with no exceptional queuing or delay.

Generally, the arrangement is such that a compliant detailed design can be achieved, with the following considerations:

- Review all potential requirements for a proposed splitter island as shown between lanes 2 and 3 of the north (A6) arm. As the movements from this stop line are all within the same phase, suitable signal head positioning could be arranged without this in place. It is recognised the island could be necessary for other purposes e.g., deflection.
- Notwithstanding the above, there is a potential departure from standards associated with the visibility to the signal heads on the north (A6) arm (near side). This is to be reviewed at detailed design with measures explored to address, potentially including vegetation clearance, embankment reprofiling and/or a reduction in speed limit. Additional signal heads could be provided on the off-side (high level or close-associated), as well as a 'Traffic Signals Ahead' sign to Diagram 543. Visibility on all internal approach (circulatory) signals should also be reviewed and associated measures considered.
- Visibility on the east arms (M6 and M65) approaches is considered to be achievable, with a signal head arrangement to be developed in consideration of the speed and alignment. The use of louvres and secondary hoods should be considered on the signal heads to mitigate against the risk of any confusion between the different approaches. The use of physical screening could also be considered. The proximity of the M6 and M65 stop lines is similar to other arrangements and even separately controlled movements on the same arm.
- All markings including arrows (lane and bifurcation), destination, hatching, yellow boxes, give ways and circulatory channelising is to be reviewed at detailed design. For example, it is suggested that the ahead/left arrows on the east arms (M6 and M65), and the arrow on the conflicting circulator lane be ahead only. The exit point to the Business Park may benefit from a left arrow (instead of ahead). Yellow boxes should only be used when blocking is expected to be a problem. The give way markings could be removed, and lane markings added to channelise traffic and indicate which lane to use at and through the roundabout.
- 'Traffic Signals Ahead' signs to Diagram 453 are to be considered on all approaches at detailed design noting the speed limits on the approaches.