

# TECHNICAL NOTE: STATION ROAD/DOVER ROAD & GRAM'S RD DOVER RD TRAFFIC SIGNAL CONTROLLED JUNCTION FEASIBILITY ASSESSMENT

<b>DATE:</b>	24 March 2023	<b>CONFIDENTIALITY:</b>	Public
<b>SUBJECT:</b>	Station Road/Dover Road & Gram's Road/Dover Road Feasibility Assessment		
<b>PROJECT:</b>	Dover Local Plan Mitigation	<b>AUTHOR:</b>	Mohsin Khan
<b>CHECKED:</b>	Juan Balboa	<b>APPROVED:</b>	Tony Adebajo

## INTRODUCTION

WSP have been commissioned by Dover District Council (DDC) to undertake a high-level assessment of the feasibility of introducing a traffic signal controlled junction at the intersection of Station Road/Dover Road and Gram's Road/Dover Road.

WSP has completed a geometric design review against Design Manual Roads and Bridges (DMRB) standard CD 123 Version 2.1.0 Geometric design of at-grade signal-controlled junction.

*Table 1- Station Road/Gram's Road Dover Road Location plan*





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## STATION ROAD/DOVER ROAD & GRAM'S RD/DOVER RD -SIGNAL- CONTROLLED JUNCTION JUSTIFICATION CRITERIA

The primary objective in providing traffic signal control at a junction is to reduce the conflict between opposing traffic streams, as these conflicts can result in traffic delay and accidents. Traffic signal installations are designed to minimise the occurrence of both of these.

There are four main factors to take into account when assessing the need for the justification of traffic signal control :-

- Traffic Delays: In absence of traffic data it is assumed that delays and queues occur at these junctions in the busiest hour
- Accident Records: the average accident rate for the junction is unavailable. The provision of traffic signals is typically considered if the site has an accident rate equal to or greater than the average signal junction on the roads in the borough area and it achieves a positive outcome within a defined timescale.
- Traffic Management: In absence of traffic data WSP assumes that the signalisation of both Station Road/Dover Road and Gram's Road/Dover Road will help provide better traffic management control in the area..
- Providing a Pedestrian and/or cycling facility: There is an existing signalised pedestrian crossing 50m south of the junction of Station Road and Dover Road. In absence of pedestrian movement data the signalisation of the junction facilitate the introduction of controlled pedestrian crossing points which could improve pedestrian movements along the junction.



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## STATION ROAD/DOVER ROAD & GRAM'S RD DOVER RD - COMPLIANCE WITH GEOMETRIC DESIGN REQUIREMENTS FOR A SIGNAL -CONTROLLED JUNCTION

Table 1 below summarises the outcome of the assessment of compliance of the junction geometry with the requirements set out in DMRB CD123 Version 2.1.0

The horizontal layout of the existing layout of Station Road/Dover Road and Gram's Road/Dover Road junctions has been taken from aerial photography which has been exported to ATOCAD, please note it is approximate only. The vertical geometry is not available.

Table 1 is informed by the proposed layout sketches that can be found on Appendix A .

It is important to note that as part of the signalisation some driveways will be within the proposed signalised area. We have checked CD123 V2.1.0 . Geometric design of at-grade priority and signal-controlled junctions and the only reference to "driveways" direct access is that it should be avoided where possible . Unfortunately, in urban environments this is not always possible, you can see examples everywhere in London where driveways are within the signalisation area. Mitigation measures can be investigated during initial and detailed design, although in a way drivers accessing their property in some instances can benefit from the gaps created by the signals to egress their properties.

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Table 2-Geometric Design Review

	CD123 V 2.1.0 Requirement		Measured Value				Mitigation/Comments
			Arm 1	Arm 2	Arm 3	Arm 4	
Junction intersection angle	>70 degrees		97 degrees ✓		94 degrees ✓		
Visibility of signals	70m		✓	✓	✓	✓	
Junction intervisibility zone					✓		
Lane widths	>3m		✓	✓	✗	✓	The width of Dover Road north of Gram's Rd is approximately 5.7m
Exit lane continuity			N/A	N/A	N/A	N/A	Not applicable since the layout will comprise single lane approaches
Swept path and corner radii			✗	✗	✗	✗	WSP have assessed refuge vehicle and single decker buse since it appears a number of bus routes operate across the junction. <b>Major changes the kerb lines would be required resulting in loss of footway space and parking .</b>
Staggered Junction	stagger length > (75 to 250m)				✗		Stagger length less than 75m and reservoir distance less that 15m so considered as a single signal controlled crossroad with special account being taken of longer clearance distances. Note that Staggered signal-controlled junctions with short stagger distances could suffer from junction blocking due to a limited reservoir length between the two staggered arms



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## CONCLUSION

WSP have assessed the swept path analysis of a refuse vehicle and a single decker bus (it appears a number of bus routes operate across the junction). This assumption needs to be reviewed and confirmed by DCC since some of the turning movements may not need to be completed by these vehicles on a regular basis. Most of the movements can be accommodated however major changes to the kerb lines would be required resulting in loss of footway space and parking. WSP has been made aware of some potential changes to the kerb line across the junction to accommodate the Millers Retreat Development proposals

Dover Road carriageway appears to reduce north of Gram's Road rendering this arm not compliant in terms of lane widths. The existing carriageway width at this location could result in conflict between large vehicles cross each other. Due to proximity of the adjacent buildings widening the carriageway is not a feasible option

In absence of traffic data this assessment assumes that traffic signals are installed at both Station Road/Dover Road and Gram's Road/Dover Road. In this case the two junctions would need to be treated as a traffic signal controlled crossroad since the staggered distance is less than 75m and the reservoir for right turning movements is less than 15m. Staggered signal-controlled junctions with short stagger distances could suffer from junction blocking due to a limited reservoir length between the two staggered arms. A traffic modelling assessment would be required to confirm if it is feasible to provide a signal staggering/timings able to mitigate the potential blockages.



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## APPENDIX A - DRAWINGS

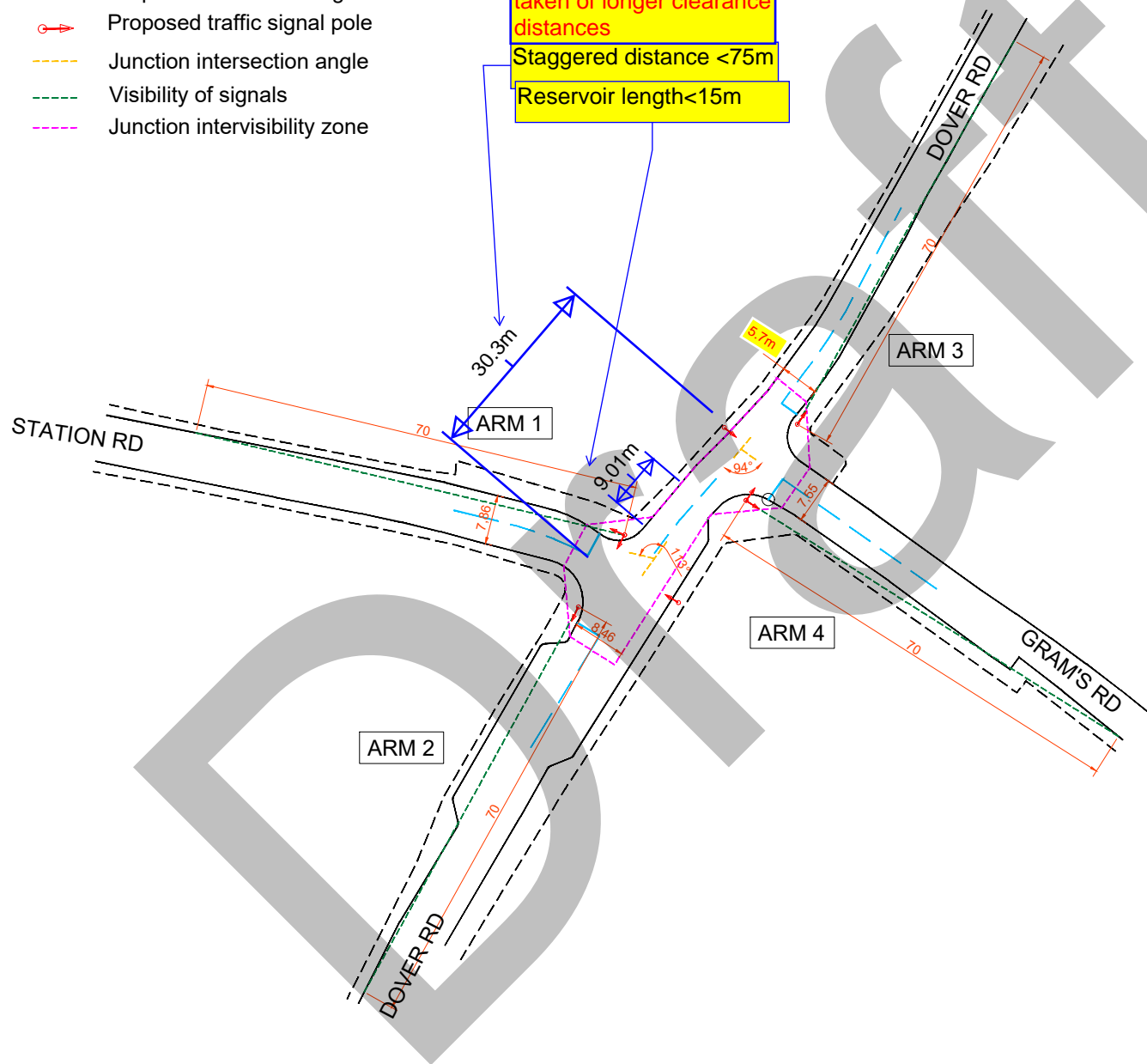


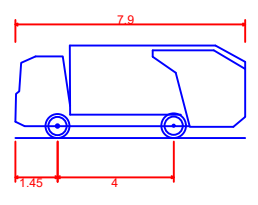
- Existing Kerb line
- - - Existing back of footway
- Proposed Road Markings
- 🚦 Proposed traffic signal pole
- Junction intersection angle
- - - Visibility of signals
- - - Junction intervisibility zone

The junction is normally treated as a signal controlled crossroad with special account being taken of longer clearance distances

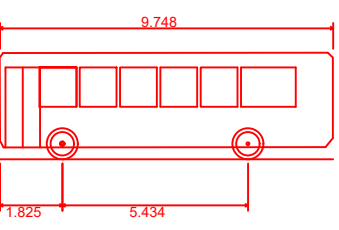
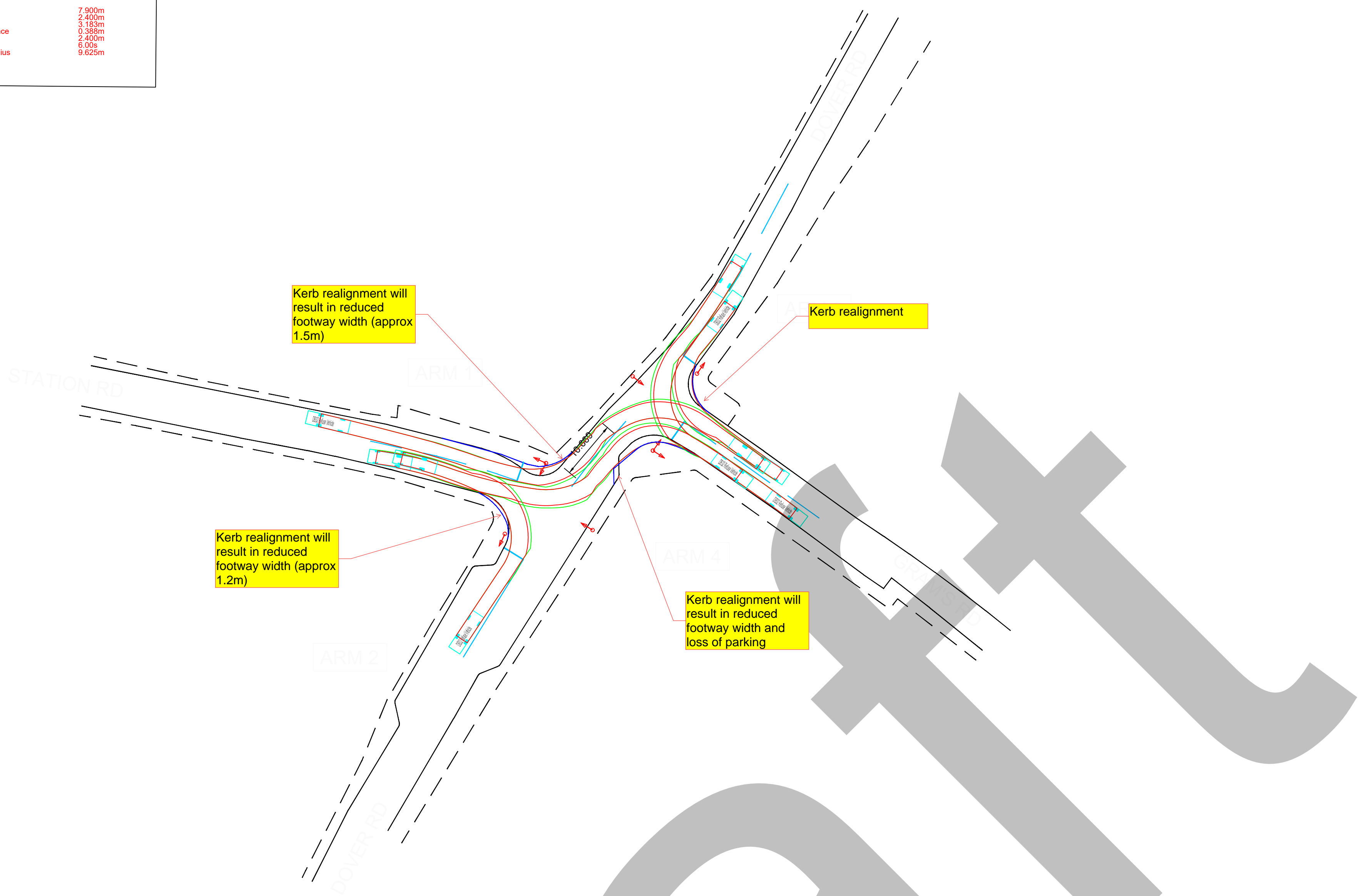
Staggered distance <75m

Reservoir length <15m





DB32 Refuse Vehicle  
Overall Length 7.90m  
Overall Width 2.40m  
Overall Body Height 3.183m  
Min Spoly Ground Clearance 0.356m  
Max Track Width 2.400m  
Lock-to-lock time 5.03s  
Curb to Curb Turning Radius 9.625m



Single Deck Bus  
Overall Length 9.749m  
Overall Width 2.557m  
Overall Body Height 3.114m  
Min Body Ground Clearance 0.349m  
Track Width 2.300m  
Lock-to-lock time 6.00s  
Max Wheel Angle 40.00°

