

APPENDIX P
ITS TECHNOLOGY REPORT

A46 Coventry Junctions Upgrade (Walsgrave Junction)

Technical Note – Technology Requirements

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Glossary of Terms and Abbreviations

Abbreviation	Definition
APTR	All-Purpose Trunk Road
CCTV	Closed Circuit Tele-Vision
DMRB	Design Manual for Roads and Bridges
DNO	Distribution Network Operator
EMS	Electronic Message Sign
ERT	Emergency Roadside Telephone
GA	General Arrangement
HE	Highways England
ITS	Intelligent Transport Systems
LD	Loop Detector
MP	Marker Post
MS3	Message Sign (Mk.3)
NRTS	National Roads Telecommunications Service
PCF	Project Control Framework
SDP	Service Delivery Point
SSD	Stopping Sight Distance
SVD	Stopped Vehicle Detection
TN	Technical Note
VMS	Variable Message Sign

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1 Introduction

- 1.1.1 AECOM Intelligent Transport Systems (ITS) have been commissioned by Highways England (HE) to undertake a review of technology equipment, systems and infrastructure, that may already exist in order to be retained, or may be required to be provided as dictated by current standards for the A46 Coventry Junctions Upgrade (Walsgrave Junction).
- 1.1.2 The project proposes the upgrade of the existing at-grade Walsgrave junction and is being recommended to reduce congestion, improve safety and support development in the region. The A46 dual carriageway and the B4082 single carriageway are both affected by the proposed works.
- 1.1.3 It is noted that at this time the project is within HE Project Control Framework (PCF) Stage 2, and there are four options of road layouts being assessed in this Technical Note. The four options are:
- **Option 6 - Full Grade Separated Junction.** Option 6 is a grade separated junction approximately 1km to the north of the existing roundabout location. The geometry of this option allows a 70mph speed limit on the mainline dual carriageway.
 - **Option 7 – Left-In, Left-Out Junction.** Option 7 is a left-in / left-out arrangement, allowing merging or diverging from the proposed A46 northbound carriageway. Access / egress to the local road network from the southbound carriageway is removed. The speed limit on the mainline through the junction will be 50mph.
 - **Option 8 – Left-in, Left-out Junction.** Option 8 is also a left-in / left-out arrangement, allowing merging or diverging from the proposed A46 northbound carriageway. Access / egress to the local road network from the southbound carriageway is removed. The mainline in this option has a larger radius to allow for a 70mph speed limit on the proposed A46 through the junction.
 - **Option 11 – Grade Separated Junction.** Option 11 is a grade separated junction approximately 1km to the north of the existing roundabout location. The geometry of this option allows a 50mph speed limit on the mainline dual carriageway.
- 1.1.4 The investigation and conclusions of ITS requirements are detailed within this Technical Note (TN).

2 Process

- 2.1.1 The task required that an initial desk top analysis be undertaken to fully understand and identify the existing deployment of technology equipment, systems and infrastructure within the project extents, and in the vicinity of the Walsgrave Junction roundabout.
- 2.1.2 The current applicable HE standards and guidance documents from the Design Manual for Roads and Bridges (DMRB) were assessed to determine suitability when applied to the four road layout options previously detailed. The DMRB documents used within this assessment are noted to include, but not be limited to:
 - TD131 Roadside technology and communications
- 2.1.3 Presented within this TN are the conclusions, highlighting the assessment, recommendations, and any issues or pertinent points for further and additional consideration by relevant stakeholders and the existing or new asset owners, where applicable.

3 Existing Technology Deployments

- 3.1.1 Google earth/maps analysis indicated that there is currently no existing deployed technology equipment, systems and infrastructure at, or in the immediate vicinity of the A46 Coventry Eastern Bypass approaches to the A46/B4082 Junction (Walsgrave Roundabout). It shall be noted however, that the presence of functioning street lighting columns indicates the presence of Distribution Network Operator (DNO) power supply exit points and hence likely ducted network infrastructure.
- 3.1.2 A review of the link-road from the B4082 Clifford Bridge Road to the A46/B4082 Junction (Walsgrave Roundabout) has also not highlighted the presence of existing technology equipment, systems or infrastructure during the desktop study. It is observed that there is existing third-party communications equipment and infrastructure equipment at the furthest end of the link-road where it intersects with Clifford Bridge Road. This equipment and infrastructure can be found on the C2 Statutory Undertakers responses collated during PCF Stage 2.
- 3.1.3 The section of the A46 Coventry Eastern Bypass between the A46/A428 Junction (Binley Roundabout) and the A46/B4082 Junction (Walsgrave Roundabout) does not contain any existing technology equipment, systems or infrastructure. Although the presence of traffic signals, control cabinets and induction loops on the A46 approach to the Binley Roundabout are observed. There is also evidence of BT network infrastructure and DNO power supply exit points at this location. As mentioned, equipment and infrastructure can be found on the C2 Statutory Undertakers responses collated during PCF Stage 2.
- 3.1.4 Technology equipment, systems and infrastructure is observed upon the northern section of the A46 Coventry Western Bypass between the A46/B4082 Junction (Walsgrave Roundabout) and the M69/A46/B4065 Junction and is noted below:

No.	Equipment Type	MP	Quantity
1	ERT	98/0A	1
2	ERT	97/8B	1
3	MS3	97/9A	1
4	600EMS cabinet	97/9A	1
5	609P cabinet	97/9A	1
6	MS3	98/5A	1
7	600VMS cabinet	98/5A	1
8	609P cabinet	98/5A	1
9	Signal Portal Gantry	98/9A	1
10	600LD cabinet	98/9A	1
11	609P cabinet	98/9A	2
12	600R cabinet	98/9A	1
13	609M-S-TR-C cabinet	98/8A	1
14	Signal/VMS Portal Gantry	99/6A	1
15	609P cabinet	99/6A	1
16	600EMS cabinet	99/7J	1

Table 1 - Existing Technology equipment, systems and infrastructure

4 Application of DMRB Technology Standards

- 4.1.1 As an instruction to upgrade the A46 Coventry Western Bypass to Expressways standard has not been given by Highways England, the DMRB standard, GD300 - Requirements for New and Upgraded All-purpose Trunk Roads (expressways) will not be applied.
- 4.1.2 With due consideration to the application of TD 131 - Roadside Technology and Communications the following was identified:
- CCTV - CCTV shall be provided on motorways and All-purpose Trunk Roads (APTR) to meet the operational requirements of the Overseeing Organisation.
 - ERT - The provision of Emergency Roadside Telephones (ERT) on APTRs shall be identified by the Overseeing Organisation on a scheme-by-scheme basis.
 - Detectors - Detector locations shall meet the needs of the system functions they are supporting (*Note, Walsgrave Junction area is absent of deployed technology equipment and systems that are required to be supported by detectors).
 - Traffic Counting - The Overseeing Organisation should be consulted to confirm the need for counting sites.
 - Stopped vehicle detection (SVD), not currently prescribed for APTRs.
- 4.1.3 New provision of the above identified Roadside Technology and Communications equipment shall only be provided if Highways England issue specific instructions to do so.

5 Review of Options

Option 6 - Full Grade Separated Junction (70mph)

- 5.1.1 Unless specifically instructed by the Overseeing Organisation, no new technology equipment, systems, or infrastructure are prescribed by the DMRB technology standards, whereby specific criteria are not met or specifically required to be included. However, it shall be highlighted that within this option the project extents extend to a greater area than those of the other options, and as such consideration shall need to be given to elements of the aforementioned existing A46 Coventry Eastern Bypass technology equipment, systems and infrastructure and included for retention throughout during future PCF stages. These assets are listed in **Table 1**.

Option 6: General Arrangement Drawings
HE604820-ACM-HGN-WAL_SW_OP6_Z-DR-CH-0001 (Opt. 6 GA Drawing)
HE604820-ACM-HGN-WAL_SW_OP6_Z-DR-CH-0002 (Opt. 6 GA Drawing)
HE604820-ACM-HGN-WAL_SW_OP6_Z-DR-CH-0003 (Opt. 6 GA Drawing)
HE604820-ACM-HGN-WAL_SW_OP6_Z-DR-CH-0004 (Opt. 6 GA Drawing)

Table 2: A46 Option 6 Drawings

Option 7 – Left-In, Left-Out Junction (50mph) and Option 8 – Left-in, Left-out Junction (70 mph)

- 5.1.2 Unless specifically instructed by the Overseeing Organisation, no new technology equipment, systems, and infrastructure is prescribed by the DMRB technology standards, whereby requirement criteria are not met or specifically detailed to be included. It shall be noted that the existing technology equipment, systems and infrastructure, although outside of the project extents of these options, are in proximity (approximately 200m). **Table 1** illustrates that ITS roadside assets 1 through to 8 are the nearest and as such due consideration shall be given to their retention for operation and functionality, and for suitability during any construction works.

Option 7 & 8: General Arrangement Drawings
HE604820-ACM-HGN-WAL_SW_OP7_Z-DR-CH-0001 (Opt. 7 GA Drawing)
HE604820-ACM-HGN-WAL_SW_OP7_Z-DR-CH-0002 (Opt. 7 GA Drawing)
HE604820-ACM-HGN-WAL_SW_OP8_Z-DR-CH-0001 (Opt. 8 GA Drawing)
HE604820-ACM-HGN-WAL_SW_OP8_Z-DR-CH-0002 (Opt. 8 GA Drawing)
HE604820-ACM-HGN-WAL_SW_OP8_Z-DR-CH-0003 (Opt. 8 GA Drawing)

Table 3: A46 Option 7 & 8 Drawings

Option 11 - Full Grade Separated Junction (50mph)

- 5.1.3 Unless specifically instructed by the Overseeing Organisation, no new technology equipment, systems, or infrastructure are prescribed by the DMRB technology standards, whereby specific criteria are not met or specifically required to be included. However, and as stated with Option 6, it shall again be highlighted that within this option the project extents extend to a greater area than those of the other options, and as such additional consideration shall need to be given to elements of the aforementioned existing A46 Coventry Eastern Bypass technology equipment, systems and infrastructure and included for retention throughout during future PCF stages. These assets are listed in **Table 1**.

Option 6: General Arrangement Drawings
HE604820-ACM-HGN-WAL_SW_OP11-Z-DR-CH-0001 (Opt.11 GA Drawing)
HE604820-ACM-HGN-WAL_SW_OP11-Z-DR-CH-0002 (Opt.11 GA Drawing)
HE604820-ACM-HGN-WAL_SW_OP11-Z-DR-CH-0003 (Opt.11 GA Drawing)
HE604820-ACM-HGN-WAL_SW_OP11-Z-DR-CH-0004 (Opt.11 GA Drawing)

Table 4: A46 Option 11 Drawings

6 Conclusions

- 6.1.1 The deployment of new technology equipment, systems and infrastructure when applied to the aforementioned options, is not required by the DMRB standards, whereas the scheme options do not meet the defined criteria within the DMRB. However, it should be noted that the inclusion of new technology equipment, systems and infrastructure can be undertaken by specific instruction of the Overseeing Organisation.
- 6.1.2 It is well documented that forethought and due consideration toward the inclusion of new technology equipment, systems and infrastructure is supportive of the HE aims, namely, to ensure that major roads are more dependable, durable and most importantly – safe.
- 6.1.3 To contribute towards the primary HE aims and wider future vision, the deployment of Technology Equipment by specific Overseeing Organisation instruction should be considered, incorporating technology infrastructure (i.e. Ducts and Chambers) whilst undertaking the junction works, as this may be beneficial for any future upgrades and may present future financial savings. This is to be attributed to reduced construction costs (incorporating any future technology infrastructure construction into the current junction works) and reduced road-space restrictions (combining current and future construction works activities). There may also be a desire to include this section of the A46 into future planned Expressway upgrades. This should be reviewed at PCF Stage 3.
- 6.1.4 Whilst we are aware of a possible desire to include this section of the A46 into future planned Expressway upgrades, elements of technology equipment and systems should be considered for inclusion now. This may be limited to a single CCTV surveillance camera located within, or at the Walsgrave Junction for network surveillance, incident management and response and as an extension of the nearby M69 Motorway CCTV surveillance system. This should be reviewed at PCF Stage 3.
- 6.1.5 Whilst the existing technology equipment and systems on the A46 Coventry Eastern Bypass between the A46/B4082 Junction (Walsgrave Roundabout) and the M69/A46/B4065 Junction are noted to be served by the existing National Roads Telecommunications Services (NRTS) network and Service Delivery Points (SDPs), this network does not extend south to the Walsgrave Junction. As an alternative to extending the NRTS physical wired network, alternative wireless communication solutions shall be sought from NRTS utilising third party suppliers (i.e. BT, mobile network operators) if a limited deployment of technology equipment and systems is directed to be included. Those deployments are additionally supported by the noted presence of existing DNO power supply exit points to facilitate the availability of required electrical power.