A428 Black Cat to Caxton Gibbet improvements

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Volume 7

7.4 Outline Construction Traffic Management Plan

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7.4 Outline Construction Traffic Management Plan (clean)

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1 Introduction

1.1 Purpose and objectives

1.1.1 The purpose of this Outline Construction Traffic Management Plan (OCTMP) is to describe the temporary traffic management processes that will be followed for the safe and efficient construction phases of the A428 Black Cat to Caxton Gibbet improvements (the Scheme). It is necessary to minimise the impact on customers and stakeholders while ensuring work is carried out efficiently and completed as quickly as possible. It is of the upmost importance that no one should be harmed when travelling or working on the strategic road network (SRN).

1.1.2 This version of the OCTMP has been prepared during the preliminary design stage and has been developed with the input and support of National Highways' construction advisors that were appointed to provide construction advice to the Scheme.

1.1.3 This OCTMP outlines how traffic management will be implemented and actively monitored on the existing strategic and local road network. It does not provide anticipated construction traffic flows on the existing strategic and local road network, with one exception for a discreet element of work relating to the Cadent gas main diversion and construction of the east abutment of the bridge over the East Coast mainline railway. These are dealt with in the Transport Assessment **[APP-241, APP-242]**, the Transport Assessment Annex **[APP-243]** and the Combined Modelling and Appraisal (CoMMA) Report **[APP-250]**.

1.1.4 At this stage the content is preliminary. Further refinement of the traffic management plan and provision is required at each subsequent stage of the Scheme's development. The next major revisions will be during the detailed design stage, at which time the Scheme's construction methods and programmes will be developed in more detail following consultation with the key stakeholders. This will be undertaken by the Principal Contractor. Further reviews and revisions will also be made during the construction stage. The traffic management plan will build on and comply with the commitments made in this OCTMP.

1.1.5 The land required for the Scheme has included allowance for space needed to implement sufficient capacity at the temporary junctions and to phase the traffic management layouts to accommodate the works.

1.1.6 The development of the OCTMP, including proposed diversion routes during construction of the Scheme and other key features, has been informed by discussions with the Strategic Road Users Technical Working Group which includes representatives from relevant local authorities.

1.1.7 Key stakeholders, including the Principal Contractor, National Highways' East Regional Operations Centre (EROC), affected Local Highway Authorities and the emergency services who will be consulted as the traffic management plans and provisions are developed in subsequent design stages.

1.1.8 The main traffic management objectives during the construction period are as follows:

a. To provide adequate protection for the workforce against the risks to health and safety associated with working on or adjacent to live carriageways.

b. To ensure the safety of road users (including walkers, cyclist and horse riders) as they approach, and travel through, sections of the existing A428 and other routes affected by roadworks required as a result of the Scheme.

c. To minimise the health and safety risks to the local community resulting from construction operations, including the impacts of (intended and unintended) traffic diversion onto the adjacent side road network.

d. Minimise disruption to road users, local businesses and communities.

e. Use best practice to set the traffic management standard through a holistic and collaborative approach.

1.2 Scheme description

1.2.1 The purpose of the Scheme is to address the problems of congestion, poor journey time reliability and poor resilience against incidents between the Black Cat and Caxton Gibbet roundabouts. The Scheme seeks to address these problems through construction of a new 10 mile (16km) dual 2-lane carriageway from the Black Cat roundabout to Caxton Gibbet roundabout, to be known as the A421 (hereafter referred to as the 'new dual carriageway') and in addition approximately 1.8 miles (3km) of tie-in works shown in schematic form in **Figure 1-1** below.

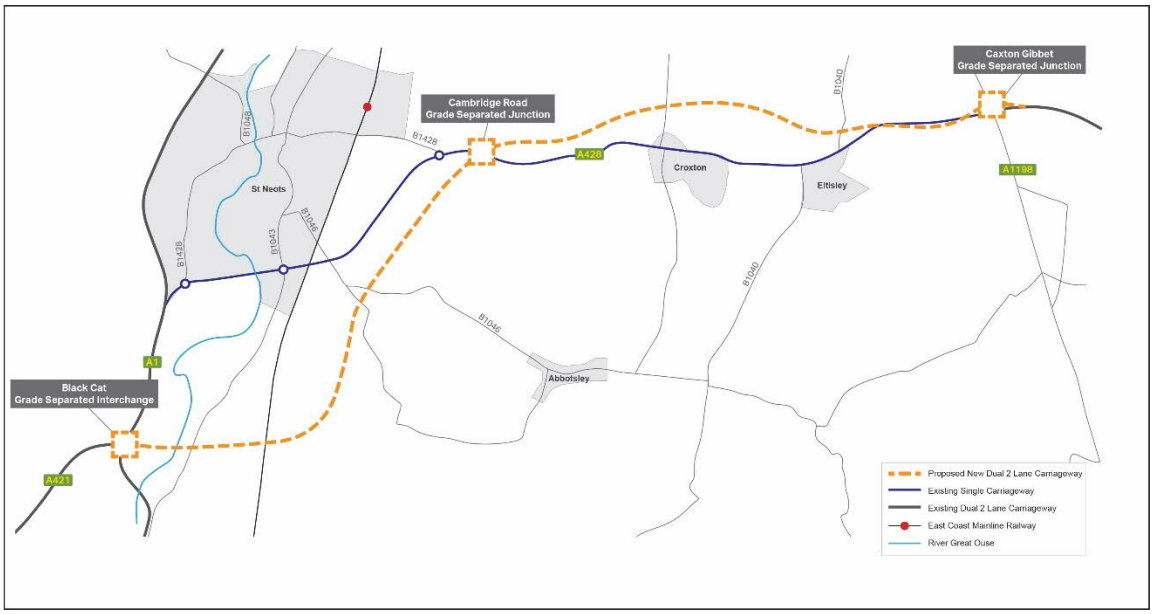


Figure 1-1 The Scheme

1.2.2 The Scheme includes the following components:

a. A new three-level grade separated junction at Black Cat roundabout, with the A1 at the lower level, the new dual carriageway on the upper level and a roundabout between the two at approximately existing ground level. In addition to slip roads, a new free flowing link between the A421 eastbound carriageway and the A1 northbound carriageway will also be provided.

b. A new grade separated all movements junction will be constructed to the east of the existing Cambridge Road roundabout to provide access to the new dual carriageway and maintain access to the existing A428.

c. At the Caxton Gibbet roundabout, a new grade separated all movements junction will be constructed, incorporating the existing roundabout on the south side of the new dual carriageway and a new roundabout on the north side. The new dual carriageway will then tie-in to the existing A428 dual carriageway to the east of the new Caxton Gibbet junction.

d. In the vicinity of the new Black Cat junction, direct access onto the A1 from some local side roads and private premises will be closed for safety reasons. A new local road will provide an alternative route. The existing Roxton Road bridge will be demolished and replaced with a new structure to the west to accommodate the realigned A421.

e. New crossings will be constructed to enable the new dual carriageway to cross the River Great Ouse, East Coast Main Line railway, Barford Road, the B1046/Potton Road, Toseland Road and the existing A428 at Eltisley.

f. The existing A428 between St Neots and Caxton Gibbet will be de-trunked and retained for local traffic and public transport with maintenance responsibility transferred to the local highway authorities.

g. An alternative access will be provided to side roads at Chawston, Wyboston and Eltisley.

h. There will be safer routes for walkers, cyclists, and horse riders.

1.2.3 A detailed description of the Scheme is set out in Chapter 2, The Scheme of the Environmental Statement **[APP-071].**

1.2.4 The Scheme is identified within the Roads Investment Strategy 2 (RIS2) for the 2020 - 2025 Road Period. RIS2 sets out that the existing Black Cat roundabout at the western end of the Scheme, shall be a grade separated junction that will provide free-flowing movements for traffic on the A1 and the A421.

1.3 Challenges and considerations

1.3.1 The size and complexity of the Scheme means that there will be multiple construction locations, many of which will overlap or where construction works will be undertaken simultaneously with other construction works elsewhere along the route of the Scheme. It is for this reason the project has been broken down into sections. These sections are described in Chapter 2, The Scheme of the Environmental Statement **[APP-071]**.

1.3.2 Complex areas include, but are not limited to:

a. Three tier junction construction (Black Cat junction) involving interaction with the A1, A421 and Bedford Road. This will involve construction of a temporary gyratory system and traffic signals to isolate the work area whilst keeping the A1 and A421 open and maintaining capacity.

b. Closure of side road access to the A1.

c. River Great Ouse Viaduct.

d. Bridge over the East Coast Main Line railway.

e. Cambridge Road junction involving interaction with the existing A428. This will involve construction of temporary roads.

f. Construction of a new bridge and junction between the existing A428 and B1040, involving interaction with the existing A428 at Eltisley.

g. Caxton Gibbet junction involving interaction with the existing A428 and A1198. This will involve construction of temporary roads and roundabouts.

h. Earthworks operations, including borrow pits (further details on the borrow pits can be found in the Borrow Pits Optioneering Report **[APP-246]**).

i. Public Rights of Way, footways and cycleways that are affected by the Scheme.

1.3.3 In order to construct the complex junctions, multiple phases of traffic management (TM) will be required. This is in order to keep the junctions in use and running at a suitable capacity whilst also carrying out the works.

1.3.4 The TM phasing will be based on the construction phasing at Black Cat junction, Cambridge Road junction, Eltisley and Caxton Gibbet junction. The phasing is discussed and shown in Chapter 2, The Scheme of the Environmental Statement **[APP-071]**.

1.3.5 There will be significant earthworks operations required to cut, move and place fill material to construct the new road. Borrow pits are located close to four of the major embankments. Haul routes will be established between the borrow pits and adjacent fill areas with further haul routes used along the new alignment to facilitate the movement of material between cut and fill zones. The aim of the haul routes is to minimise transportation of material on the surrounding highway network.

2 Customer requirements and customer requirements log

2.1 Customer requirements and customer requirements log

2.1.1 This provides a profile of the customers affected by the Scheme. Customer Groups are defined in full in “National Highways Customer Group Definitions” and shown in the Customer Impact Assessment Tool in **Appendix A**.

2.1.2 The Customer Impact Assessment Tool in **Appendix A** will be completed to provide an indicator of the level of impact anticipated by the project on each customer group as the detailed plans for the Traffic Management (TM) are updated, reviewed and completed during the detailed design and construction stages.

2.1.3 The programme of works will be co-ordinated to allow optimum use of full road closures, which will minimise the overall number of full closures required and help maintain operational efficiency on the road network. Full closures will be co-ordinated with Local Highway Authorities, National Highways and emergency services and communicated via stakeholder and community engagement methods. Due to the nature of construction, full closures will be required in order to facilitate specific activities such as carriageway tie-in works and road marking installation.

2.1.4 It is essential that road markings and road signs, both temporary and existing are clear and in good condition. Poor road markings and lane delineation cause customer frustration and impact the customer experience through the works. Consideration of requirements for the above elements, based upon driver behaviour and prioritising customer and workforce safety will be given.

2.1.5 In addition to Local Highway Authority engagement, the appointed TM contractor will integrate within the National Highways project delivery community, attending workshops and advising on programme and works including roadspace allocation, stakeholders, risk, opportunity and buildability. A 90% accuracy over a seven day period in regard to roadspace booking and allocation will be targeted in order to maintain customer confidence, for instance when closures are advertised.

3 Nature of the works

3.1.1 The project covers a large geographical area between the Black Cat roundabout and Caxton Gibbet roundabout (see **Figure 1-1**). There will be multiple construction locations operating simultaneously. It is for this reason the project has been broken down into sections.

3.1.2 The Scheme involves many construction/engineering elements. These include, but are not limited to:

a. Numerous structures including a river crossing, a rail bridge, a three-tier junction at Black Cat Roundabout and two further main junctions at Caxton Gibbet and Cambridge Road.

b. Side roads.

c. Permanent walkers, cyclist and horse rider diversions.

d. Cut and fill earthworks incorporating borrow pits.

e. Temporary works including roads, roundabouts and junctions.

f. Utility diversions.

3.1.3 In order to complete the construction of the junctions, multiple phases of TM and construction will be required. These are necessary to keep the junctions open and maintain suitable capacity, whilst also being able to carry out the works.

3.2 Proposed traffic management measures

3.2.1 Traffic management will be implemented in a manner that minimises the need for traffic to divert on to alternative routes, minimises the impact on the local community and minimises delays and disruptions to existing traffic, walkers, cyclists and horse riders.

3.2.2 There are multiple TM measures that will be used throughout the Scheme duration and these are documented in items 3.2 to 3.24. In addition, plant crossing systems will be used during construction where site haul routes cross side roads, a typical example of which is shown in

3.2.3 **Figure 3-1**. These will be installed in accordance with Traffic Signs Manual: Chapter 8 (TSM:CH8) and the indicative locations are shown on the plans in **Appendix B**. These plans also show temporary speed limits. The temporary speed limits are discussed in Section 3.8.

3.2.4 No haul road crossings are proposed on the existing A428. Signalised haul route crossings for construction traffic will be provided at the side road locations listed below. The signals will be controlled manually by a trained traffic marshal to maintain traffic flows on the side roads.

a. Roxton Road, north of the Bedford Road junction.

b. Barford Road.

c. B1046, near the B1046/Potton Road junction.

d. Toseland Road, north of the A428.

e. B1040, north of the A428.

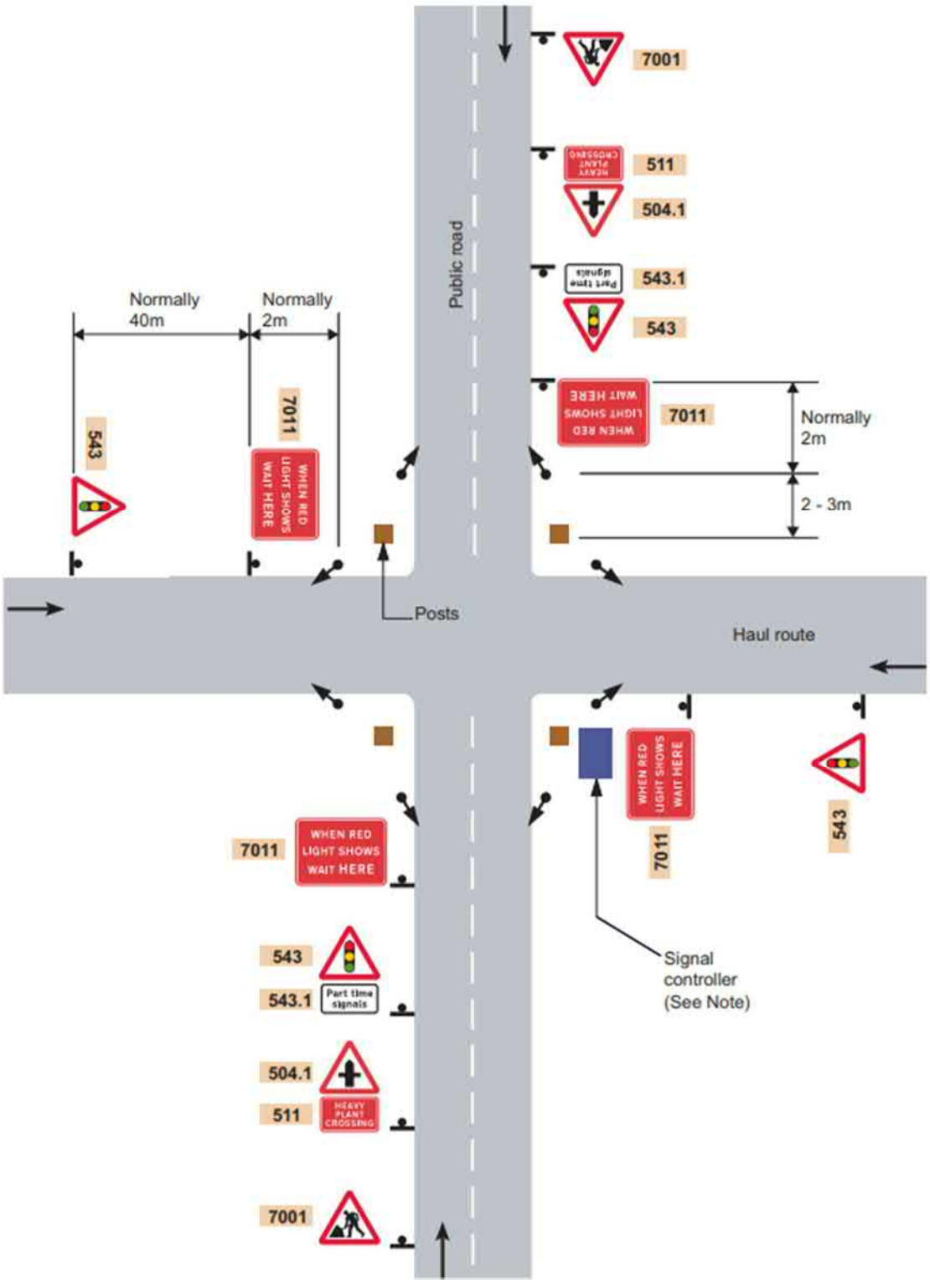


Figure 3-1 Extract from Chapter 8 Traffic Signs Manual (Part 1) haul route crossing

3.2.5 These locations will be used for the movement of earthworks plant including large dumpers. Temporary works will be installed at the access and crossing points to ensure they are suitable for the construction traffic. A detailed highway condition survey will be undertaken over the section of road that is anticipated to be used prior to the works commencing. Where deterioration of the existing road surface or verges occurs, this will be repaired in consultation with the local Highway Authority.

3.3 Restricted routes for construction vehicles

3.3.1 Construction traffic will not be permitted to use a number of specifically identified side roads for the duration of the Scheme. These restricted routes are shown in **Appendix C** and have been identified to mitigate the impact of the construction works on communities adjacent to the Scheme. The red 'No Construction Traffic' routes that have been shown on the plans are intended to apply to all construction traffic. The green routes and amber dashed routes that are shown on the plans will be used in developing logistics and construction plans. Typically, the amber dashed routes will be used by construction traffic for early access at specific locations or when working on specific aspects of the Scheme e.g. Roxton Road at Wyboston for construction of the Roxton Road Link and will become restricted routes once those works are complete.

3.3.2 The strategy for the restricted routes shown on the plans in **Appendix C** is to prevent construction vehicles from using through routes on the local road network as a convenient alternative to using routes within the site or the existing A428, A1 and A421. Access to and from some villages and towns is still allowed for light vehicles only so that facilities and businesses (e.g. suppliers, catering and hospitality) within those villages can still benefit from construction worker trade.

3.3.3 It is important that the restricted routes are complied with by all construction vehicles. Road traffic signs will be erected at every restricted route. Suppliers for all plant and materials will be instructed on the permitted delivery routes and site access points. All staff and operatives working on the project will attend a site induction before they are able to start works on the site. This induction will include the site rules including details of the prohibited and restricted routes. These routes will be further communicated to the workforce through regular inclusion in the daily works and staff briefings. Workforce briefings will detail the access routes that are to be used for particular works activities. Reports of infringements will be investigated and appropriate action taken such as informal warnings and/or disciplinary action, - or for a supplier a contractual penalty may be applied.

3.3.4 One of the amber dashed routes uses part of Barford Road and Cromwell Road between the A428 (near the Tesco store) and the B1046 Potton Road. The Barford Road section of this route passes Ernulf Academy. Use of this section of the route by any construction vehicles will be time restricted and it will not be used between 07:30 to 09:00 and 15:00 to 16:30. Further, it will only be used by light construction vehicles less than 3.5t outside those restricted hours.

3.3.5 A prohibited route has also been included through the village of Hilton, to the north east of the Scheme. Although somewhat remote from the Scheme, this was introduced to discourage use of the village as a route to the site if aggregates are brought to site from the quarries near St Ives.

3.3.6 There is also an amber dashed route on Station Road, through Tempsford, which is to allow access for works to construct the Cadent Gas Main diversion and the East Abutment of the bridge over the East Coast Mainline railway. For information, usage of this is expected to be an average of 30 heavy goods vehicles (HGV) per week when these works are in progress.

3.3.7 As the Scheme is still at a preliminary design stage, procurement and detailed logistics planning to determine which suppliers will be used to provide specific resource has not yet been determined. This will not be established until the detailed design and the detailed construction planning is in place. It is anticipated though that this construction traffic will, in the main, be deliveries of plant, machinery and materials to site. It is not expected that this traffic will cause serious damage to the existing road surface. Nevertheless, the condition of the road surface will be recorded for the permitted and restricted construction traffic routes that use specific sections of the local highway network for access from the SRN. These will be surveyed and monitored and if there is extraordinary damage this will be repaired in consultation with the local Highway Authority.

3.4 Carriageway restrictions and closures

3.4.1 Carriageway and lane restrictions will be used to create safe working space. Full closures will be required on various occasions for specific operations such as carriageway tie-in works for example. Further examples are listed in paragraph 3.10.3. Indicative closure times are currently envisaged to be as shown in **Table 3.1**. The closures and restrictions will be developed further and dealt with by temporary traffic regulation orders and will be applied for via National Highways or the Local Highway Authority (LHA), as appropriate to the road in question, post-DCO consent when specific details are known. Full closures will only be used for planned works at night or at weekends – weekday, daytime closures will not be implemented unless otherwise agreed with the relevant Local Highway Authority'.

Table 3.1. Restrictions

Restriction to be Implemented	Time of Day (indicative) (Start to End)	Day/s in Week
Full closure	21:00 – 06:00	Any
Weekend full closure	21:00 – 06:00	Friday pm to Monday am
Lane closure	20:00 – 06:00	Any
Mobile lane closure	20:00 – 06:00	Any
Width restriction	24 hours (static)	TBC

3.4.2 TM will consist of off-peak lane closures, controlled where appropriate by traffic signals, temporary single lane restrictions, overnight full carriageway closures, full weekend closures (when necessary) and the use of mobile lane closures. The closures will continue up to and including the completion stage of the Scheme. The times in **Table 3.1** are indicative and will be subject to roadspace booking/LHA agreement. Full closures during the evening will only be implemented when traffic flows have fallen below a threshold level that will have been developed in consultation with National Highways Operations Directorate (National Highways OD) or the LHA as appropriate for the road in question. Closures of this nature have been successfully used on this scheme during ground investigation works, utilities surveys and archaeological trial trenching works.

3.4.3 The Transport Assessment **[APP-241 and APP-242]** anticipates that there will be some delays caused by the works. These are relatively modest and less than 5 minutes for through journeys on the A421/A428 and A1 corridors. Nevertheless, it is important to acknowledge that a perception of delay may cause traffic to reroute onto less suitable routes. National Highways cannot prohibit this. But by use of strategic real time messaging on routes such as the A14, A1(M), M25 and M1 long distance traffic can be encouraged to use alternative strategic routes rather than the A1 or A421/A428 corridor. This may have the effect of reducing traffic flows through the works, reducing delays and increasing journey time reliability during the works.

3.5 Strategic diversion routes

3.5.1 The strategic diversion routes for the Scheme in **Appendix D** will be used when there are closures on sections of the A428, A421 and A1 affected by the works. These have been derived from the National Highways approved routes planner and **Table 3.2** will be updated during the detailed design and construction stages.

Table 3.2. Diversion routes

Diversion Route Description	Location *(Start to End with respect to nearest junction or Marker Posts, if known)*	Signs to be implemented	Length of Diversion	Duration of the Diversion	Additional Journey Time for the Customer due to Diversion Route	No. of Closures required
	See **Appendix D** for diversion route drawings					

3.5.2 All routes will be discussed with the local National Highways OD team, the EROC and with the LHAs who will be affected.

3.5.3 Diversion routes will be signed using Scheme specific signing, and will include liaison with satellite navigation system providers, to allow plotting of the routes on Waze for example. This will ensure that satellite navigation systems also recognise the approved routes. The closures and strategic diversions must be signed well in advance of the works, using for example the variable messaging sign systems on the A14, A1(M), M25 and M1 to allow road users to make early decisions on route choices.

3.5.4 The project team will monitor the strategic diversion routes when they are in operation to ensure incident management/response measures mitigate congestion and delays to road users. Traffic monitoring sensors may be used to recognise hot spots on key routes that can automatically notify National Highways control rooms and the travelling public.

3.5.5 Journey time recognition will be used on the routes to determine the overall delay and travel time for users and this will be displayed on variable message boards both in advance and within the routes. If strategic network monitoring indicates that journey times are increasing on the SRN, the project team can alter the variable message boards to warn drivers of the delays and to direct them to use alternative routes at an appropriate point on the strategic network, and this is done in real time.

3.5.6 Signing close to the Scheme extents will be designed carefully to allow early route decisions to be made and to make diversions simple to follow. This, in combination with liaison with satellite navigation system providers, will aim to minimise the use of inappropriate local routes. This will not necessarily prevent those with local knowledge from using such routes.

3.5.7 All routes will be surveyed by the TM team i.e. Traffic Safety and Control Officer (TSCO) and designers to ensure suitability of the routes closer to the time of implementation.

3.5.8 There will also be condition surveys of any planned diversion routes prior to and after use. Any requests for remedial action would be discussed at the traffic management forum meetings.

3.5.9 The project team will communicate and engage with communities along the planned diversion routes, where possible act on feedback in advance, and gain feedback from communities to establish community access requirements (residents, businesses, local clubs, events, etc).

3.5.10 Where the LHA advises of a significant increase in self-diverting traffic on the local network, the project team will review this information against performance on the SRN. Should a relationship between network performance and self-diverting traffic be established the project team will work with the LHA to determine suitable temporary traffic management measures, which may include temporary chicanes with priority arrows or additional closures on local roads, weight restrictions or other measures on the local roads or strategic road network to act as a deterrent to self-diverting traffic. National Highways will work with the local highway authority and police to determine suitable measures and means of enforcement.

3.6 Traffic monitoring

3.6.1 Some pre construction traffic counts will be carried out at specific locations as shown on the location plan in Appendix E. Traffic volumes without the Scheme (the Do Minimum scenario (DM)) and for Construction Phase 3 (the most notable phase of the construction programme for self-diverting traffic) have been used to inform these locations.

3.6.2 The pre construction traffic count locations are based on a criterion of either a greater than 30% increase in HGV traffic (subject to a minimum 12 vehicle increase), or 1,000 vehicles in total per day (which is an average of 1.4 vehicles per minute over a 12 hour weekday, daytime period). This has resulted in the identification of seven pre-construction traffic count locations:

a. Barford Road, Little Barford
b. High Street, Abbotsley
c. School Lane, Cambourne
d. Caxton Road, Great Gransden
e. High Street, Toseland
f. High Street, Yelling
g. Toft Road, Bourn (B1046)

3.6.3 In addition to these traffic count locations, where potential perceptible differences in traffic flows have been identified by the traffic modelling, the data from these locations will also allow conclusions to be drawn to identify impacts at points in between these traffic count locations.

3.6.4 Baseline data will be collected in the Autumn prior to construction starting and outputs will distinguish between HGV and lighter vehicles. The results of the baseline counts will be shared with LHAs for the purposes of comparison with construction phase monitoring which National Highways proposes is undertaken by the LHAs in the usual course of their traffic monitoring operations on the local road network. The results will be discussed during Traffic Management Forums and, if necessary, appropriate temporary traffic management measures agreed, as noted in paragraph 3.5.10.

3.7 Operating lanes

Black Cat junction

3.7.1 The number of operating lanes approaching the Black Cat junction on the A1 and A421 will only be reduced (from the existing two lanes in each direction) during off peak hours. Full carriageway closures will only be implemented at night or at weekends, with narrow lane working during daytime.

Cambridge Road junction

3.7.2 Temporary traffic signals will be used during off peak hours on the approaches to Cambridge Road junction when necessary. During peak hours Cambridge Road junction will use all available lanes i.e. two lanes, one in each direction, with the use of temporary road narrowing. Full carriageway closures will only be implemented at night or at weekends.

Caxton Gibbet junction

3.7.3 The number of operating lanes approaching Caxton Gibbet junction will also be reduced when necessary, during off peak hours with the use of temporary signals. During peak hours Caxton Gibbet junction will use all available lanes i.e. A428 west of Caxton Gibbet roundabout, two lanes with one in each direction, A428 east of Caxton Gibbet roundabout, two lanes in both directions, A1198 northbound and southbound, two lanes, one in each direction. Temporary road narrowing will be used. Full carriageway closures will only be implemented at night or at weekends.

3.8 Speed limits

3.8.1 Please refer to **Table 3.3** and **Appendix B** for proposed speed restrictions and locations of temporary speed limits. The speed restrictions will be dealt with by temporary traffic regulation orders and will be applied for via National Highways or the LHA, as appropriate to the road in question, post-DCO consent when specific details are known.

Black Cat junction

3.8.2 A speed limit of 40mph is envisaged to ensure maximum working room can be achieved during peak hour working. The End of Works signs on the A1 northbound and southbound will be located to match the existing de-restriction signs, whose location will be checked at detailed design in the event that they are moved in the meantime.

3.8.3 Consideration will be given to a variable speed limit using electronic signs. This could be used during off peak hours when no work is taking place. During weekends and bank holidays an increase to 60mph may be possible to improve the customer experience. This may be possible during Phase 1 of the works (see Chapter 2, The Scheme of the Environmental Statement **[APP-071])** at Black Cat junction, whilst traffic remains on the existing alignment of the A1 and A421. The viability of temporarily raising the speed limit during Phase 1 will be developed in more detail during the detailed design and construction stages, when there will be a greater understanding of the interface arrangements between construction activities and the existing or future live carriageways.

3.8.4 It is unlikely to be possible to temporarily increase speed limits during the remaining phases. The link road between the A421 eastbound and the A1 northbound will be open to traffic at the start of the second phase, it will however form part of the 'large temporary gyratory' and will initially be accessed via a temporary tie in east of the existing Roxton Road bridge and will have a 40mph temporary speed limit. From an operational and safety perspective it will not be possible to change the speed limit during this phase.

3.8.5 In the third phase for the Black Cat junction works the new permanent gyratory will be open to traffic. The temporary 40mph speed limit on the new road alignment may have to remain in place as it will not be possible for live traffic to use the new alignment at the design speed until it has been commissioned and handed over, following a road safety audit. Handover in small sections such as the link road is not normally possible, so at this early stage it is expected this link road arrangement will stay at 40mph until the whole or large sections of the junction are complete.

Cambridge Road junction

3.8.6 A temporary speed limit of 40mph is envisaged to ensure workforce and public safety whilst travelling through roadworks. Another factor influencing this is the available working room behind a Temporary Vehicle Restraint System (TVRS). Increasing the limit to more than 40mph adversely affects available working room.

Caxton Gibbet junction

3.8.7 A temporary speed limit of 40mph is envisaged to allow for running on temporary carriageways and to allow barriers to be installed that will cater for maximum working width.

Table 3.3. Speed restrictions

Temporary Speed Limit (mph)	Location *(Start to End with respect to nearest junction or Marker Posts, if known)*	Justification for Speed Limit
40	A421 approach to Black Cat roundabout. A421 eastbound from MP25/7 (approx.) 2.6km from Black Cat roundabout)	Safety of road workers and road users
40	A1 northbound approach to Black Cat roundabout From MP81/8 (approx. 2.5km from Black Cat roundabout)	Safety of road workers and road users

Temporary Speed Limit (mph)	Location *(Start to End with respect to nearest junction or Marker Posts, if known)*	Justification for Speed Limit
40	A1 southbound approach to Black Cat roundabout From MP88/6 (approx. 2.7km from Black Cat roundabout)	Safety of road workers and road users
40	Black Cat roundabout.	Safety of road workers and road users
40	Cambridge Road junction (A428)	Safety of road workers and road users
40	A428 east of the B1046 Potton Road bridge (for construction of the Wintringham site compound access)	Safety of road workers and road users
40	Caxton Gibbet junction (A428)	Safety of road workers and road users
50 to 40	A421/A1 approaches to Black Cat roundabout A421 eastbound from MP25/2 (approx. 3.3km from Black Cat roundabout) A1 northbound from Tempsford overbridge, MP81/3 (approx. 3km from Black Cat roundabout) A1 southbound from MP89/1 (approx. 4.4km from Black Cat roundabout and north of the Wyboston A1 southbound on-slip)	Safety of road workers and road users
40	Roxton Road	Safety of road workers and road users
40	Bedford Road	Safety of road workers and road users
40	Barford Road	Safety of road workers and road users
40	Potton Road	Safety of road workers and road users
40	B1046	Safety of road workers and road users
40	Toseland Road	Safety of road workers and road users
40	B1040 Eltisley	Safety of road workers and road users
40	A1198	Safety of road workers and road users

3.8.8 The locations in the table above are preliminary and may change following updates during the detailed design and construction stages.

3.8.9 The temporary speed limits will be in place to enable safe operation of the temporary VRS and narrow lane systems and are necessary to protect the workforce and public during the works and to ensure sufficient working room for the temporary and permanent works to be installed. The work area and minimum deflection zone can be achieved by enforcing 40mph speed limits where necessary. Variable speed limits are to be considered once final construction phasing and alignment design has been confirmed. Further details will be provided in the update to this document during the detailed design and the construction stages.

3.8.10 Speed limit enforcement measures and methods will be reviewed and considered during TM design process and TM design risk assessment.

3.9 Length of the traffic management

Black Cat junction

3.9.1 TM static works will consist of an estimated two kilometres on the A1 and A421 approaches to the roundabout. The Scheme will require a temporary speed limit of 40mph and temporary barriers to allow for the TM to be in place 24 hours a day, seven days a week. These are likely to be in place for the duration of the works. The narrow lanes and reduced speed limits will also allow traffic to be diverted safely onto temporary alignments.

Cambridge Road junction

3.9.2 Most of the works around the Cambridge Road junction will be completed using off peak lane closures, with the addition of traffic signals, these closures will be implemented during agreed hours (expected to be 09:30 and 15:30). As the Scheme progresses the use of narrow lanes will be implemented. A 40mph temporary speed limit will be in place during the works.

Caxton Gibbet junction

3.9.3 During the initial phase of the Scheme much of the construction will be offline that will not require static narrow lanes. Narrow lanes and speed limits will be implemented to allow traffic to be diverted safely onto temporary alignments. A 40mph temporary speed limit will be in place during the works.

3.10 Carriageway and slip road closures

3.10.1 Full carriageway closures will be used from time to time for planned overnight or at weekend closures during the Scheme from early works right up to completion, detailed below are some of the routes that may be closed. The closures will be dealt with by temporary traffic regulation orders and will be applied for via National Highways or the LHA, as appropriate to the road in question, post-DCO consent when specific details are known.

Table 3.4 Carriageway and slip road closures

Type of Closure (Slip road / Full carriageway)	Location (indicative) (Start to End with respect to nearest junction or Marker Posts, if known)	Overnight closure Time of day (start to end) (indicative)	Weekend closure Time of day (start to end) indicative
Full carriageway	A1 northbound carriageway from Sandy to Black Cat roundabout.	21:00 to 06:00	21:00 Fri to 06:00 Mon
Full carriageway	A1 northbound carriageway from Black Cat roundabout to Wyboston.	21:00 to 06:00	21:00 Fri to 06:00 Mon
Full carriageway	A1 southbound carriageway from Wyboston to Black Cat roundabout.	21:00 to 06:00	21:00 Fri to 06:00 Mon
Full carriageway	A421 eastbound carriageway from Renhold to Black Cat roundabout.	21:00 to 06:00	21:00 Fri to 06:00 Mon
Full carriageway	A421 westbound carriageway from Black Cat roundabout to Renhold.	21:00 to 06:00	21:00 Fri to 06:00 Mon
Full carriageway	A428 eastbound carriageway from Caxton Gibbet roundabout to Cambourne.	21:00 to 06:00	21:00 Fri to 06:00 Mon
Full carriageway	A428 westbound carriageway from Cambourne to Caxton Gibbet roundabout.	21:00 to 06:00	21:00 Fri to 06:00 Mon
Full carriageway	A428 eastbound and westbound on the single carriageway section between Caxton Gibbet roundabout and B1046 Potton Road bridge.	21:00 to 06:00	21:00 Fri to 06:00 Mon
Full carriageway	Roxton Road	21:00 to 06:00	21:00 Fri to 06:00 Mon
Full carriageway	Bedford Road	21:00 to 06:00	21:00 Fri to 06:00 Mon**
Full carriageway	Barford Road	21:00 to 06:00	21:00 Fri to 06:00 Mon
Full carriageway	Potton Road	21:00 to 06:00	21:00 Fri to 06:00 Mon

Type of Closure (Slip road / Full carriageway)	Location (indicative) (Start to End with respect to nearest junction or Marker Posts, if known)	Overnight closure Time of day (start to end) (indicative)	Weekend closure Time of day (start to end) indicative
Full carriageway	B1046	21:00 to 06:00	21:00 Fri to 06:00 Mon
Full carriageway	Toseland Road	21:00 to 06:00	21:00 Fri to 06:00 Mon
Full carriageway	B1040 Eltisley	21:00 to 06:00	21:00 Fri to 06:00 Mon
Full carriageway	A1198	21:00 to 06:00	21:00 Fri to 06:00 Mon

**A weekend closure on Bedford Road will be for tie-in works at Black Cat junction itself. Full weekend closures further west on Bedford Road, adjacent to the garden centre for example, are not expected to be needed.

3.10.2 In addition to the above, temporary TM will be used at all locations where the works interface with existing road networks.

3.10.3 Full closures will be required for multiple activities, which may include, but are not limited to:

a. Carriageway tie-in works.
b. Construction of bridge deck e.g. beam lifting operations.
c. Demolition of existing Roxton Road bridge.
d. Resurfacing works.
e. TM phase changes.
f. Road marking installation.
g. Bridge deck waterproofing.
h. Construction of temporary widening.
i. Construction of abutments.
j. Earthworks operations.
k. Installation of large roadside signs.

3.10.4 Where possible full carriageway closures will be avoided and the use of single lane running will be implemented. There may be potential to use some of the newly constructed road during later phases of the project.

3.10.5 The early construction and use of the slip road and link roads to create a temporary ‘large gyratory’ while the new A1 underpass is constructed forms a key part of the strategy to maintain traffic flow on the A1 and A421 routes and will help reduce the number of full closures.

3.10.6 It is however anticipated that A1 closures will be required to allow the safe construction of the tie-ins, central reserve and verge works on the new junction approaches and that these may require a combination of full weekend closures, weekday night closures and weekend night closures. Given that the A1 is only a dual 2-lane carriageway, combined with the restraints on minimum lane width, safety zones etc it is likely that closures will be required to facilitate a significant number of construction activities.

3.10.7 There are a number of properties to the north of Black Cat junction and others to the south (Greenacres and the Anchor Hotel (also known as the Vanilla Alternative)) that will need access to be maintained at all times. Communication with the residents and businesses will be essential. Further information regarding the Scheme communications plan is given in paragraph 3.16. Depending on the final phasing of its construction, many of the properties to the north of Black Cat junction and west of the A1 will be able to use the new Roxton Road Link. The remaining properties that can only use the A1 may at times have to be escorted through the works, but as the full closures will be at night or at the weekend the numbers requiring such access are anticipated to be low.

3.10.8 Development of the detailed TM layouts during the detailed design and the construction stages will enable a better understanding of the site constraints and determination of works that can be completed using lane closures rather than full closures.

3.11 Walkers, cyclists and horse riders

3.11.1 There are Public Rights of Way (footpaths and bridleways), footways and cycleways that will be permanently diverted or closed as part of the Scheme.

3.11.2 The sections of Public Rights of Way, footways and cycleways that are not permanently closed will be maintained where possible, using permanent diversion routes or temporary diversion routes where necessary.

3.11.3 Temporary diversions will be provided to ensure that they are accessible and safe. The temporary diversion routes will be developed during the detailed design and the construction stages in consultation with the relevant LHA. This will be undertaken as early as possible in order to enable the implementation of appropriate, timely measures and avoid unnecessary inconvenience to non-motorised users (NMUs). Survey counts have been completed to identify which routes are used regularly and will be taken into consideration when deciding whether a diversion is required. Permanent diversions and closures are secured within the DCO along with the power to temporarily close or divert Public Rights of Way. Some temporary closures may be required for safety reasons.

3.11.4 NMUs will not be inconvenienced any longer than reasonably practicable by road construction. Routes temporarily closed or diverted will be actively reviewed in consultation with the LHA and reopened as soon as it is reasonably practicable and safe to do so, in order to support existing NMU needs and ongoing modal shift policy requirements.

3.11.5 Works crossings will be required, but will be minimised as far as possible by combining routes in close proximity via diversions.

3.11.6 Where works crossings are required then these will be designed to ensure that the crossing locations are safe and clearly visible to users and to construction vehicles moving within the site through the use of manned crossings, signs, fencing and barriers for example. The details and operation of such crossings will be developed during the detailed design stage in consultation with the relevant LHA.

3.12 Site compound access

3.12.1 Site compound locations are described in Chapter 2, The Scheme of the Environmental Statement **[APP-071]**. The entrances to the three main compounds will be designed to allow staff, visitors and deliveries to enter efficiently to minimise the risk of site traffic backing up onto the highway. A typical configuration for a main compound is shown in **Figure 3-2**. Other compounds may be similar, but commensurate with the scale/size and purpose of those compounds.

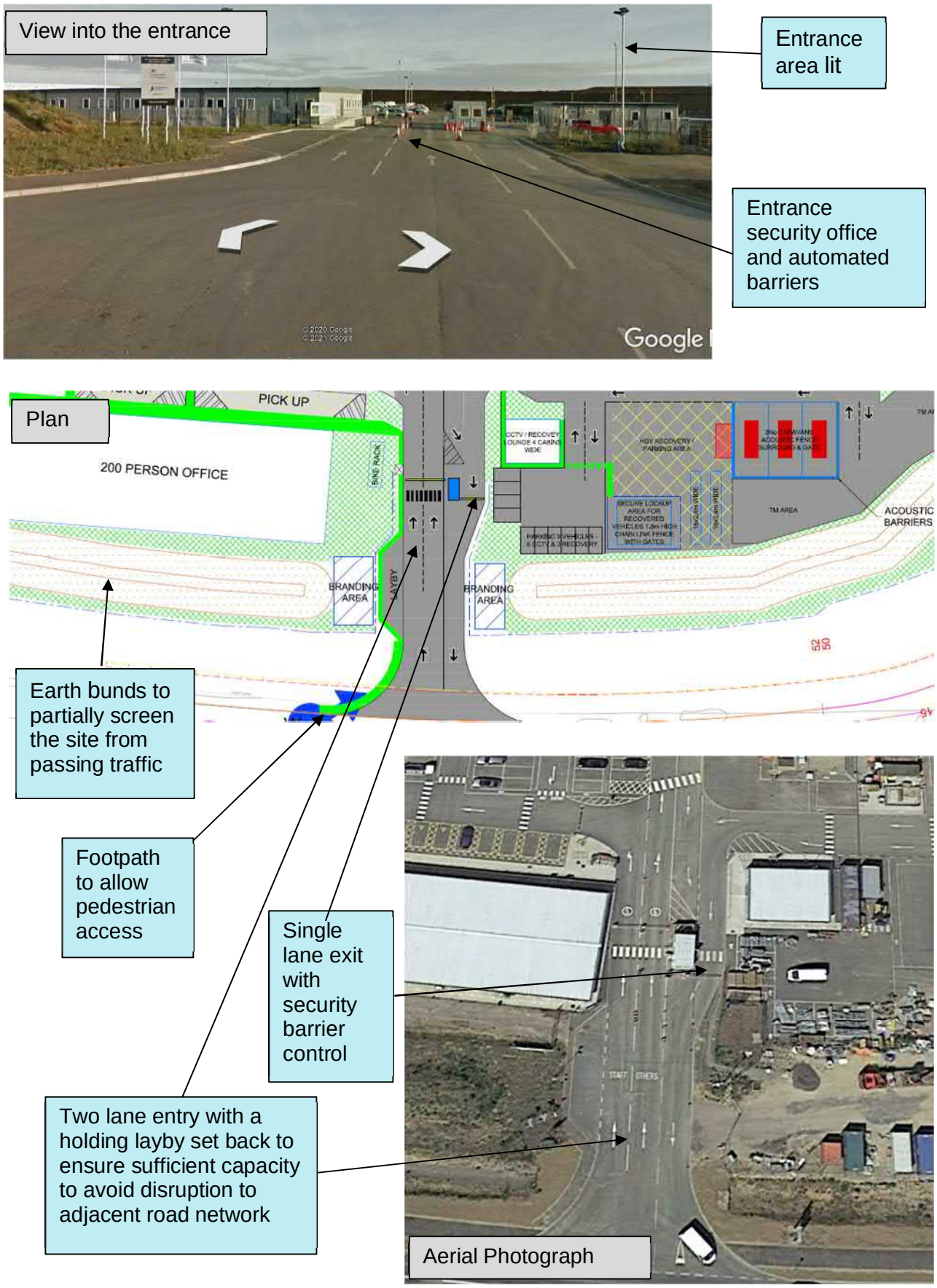


Figure 3-2 Typical compound entrance details

3.13 Incident management

3.13.1 Vehicle recovery services will be provided for works around the Black Cat junction and the Caxton Gibbet junction areas.

3.13.2 Four recovery vehicle areas, which will accommodate breakdown recovery vehicles and crew, will be formed as part of the Scheme, and will be used during the construction phase for the recovery of broken-down vehicles:

a. The first area will be located off the B645 Kimbolton Road at Crosshall, close to the A1 at St Neots.

b. The second area will be located off the A421 lay-by north of Great Barford, adjacent to Footpath No. 3.

c. The third area will be located off Tempsford Road, adjacent to the A1 east of Blunham.

d. The fourth area will be located within the Caxton Gibbet junction site compound.

3.13.3 The location and size of the vehicle recovery areas is illustrated on **Figure 2.2** of the Environmental Statement **[APP-089]**.

3.13.4 The following points will be discussed with the LHAs and emergency services and developed into an Incident Management plan:

a. Rapid deployment of recovery vehicle to each section including associated link roads.

b. Locations of proposed CCTV monitoring stations.

3.13.5 CCTV control rooms will be established at either the Wintringham compound or the Black Cat junction compound to cover the whole Scheme, or one at each. These will monitor the traffic on the roads and mobilise vehicle recovery units when needed.

3.13.6 Recovered vehicles and occupants will be taken to customer care centres, which will be safe and secure areas within the compounds at either Black Cat junction or Wintringham, where they will wait to be collected.

3.13.7 The occupants of recovered vehicles will have access to facilities such as those listed below. These facilities will be accessible to all, in accordance with the Equality Act 2010:

a. Phone service.

b. Toilet facilities.

c. Drinking water, tea & coffee.

d. Shelter with light and heat.

e. Baby changing facilities.

f. TV.

g. WiFi.

h. Children's Games.

3.14 Adjacent roadworks and other traffic management

3.14.1 The A428 Project Team will engage with National Highways Operations Directorate (National Highways OD) and LHAs once programme dates are confirmed and complete **Table 3.5** as necessary.

3.14.2 All three LHAs and National Highways OD operate roadspace booking systems and the A428 Project Team will liaise with all, as appropriate, to book roadspace and to inform of roadspace bookings so that the Scheme works and work by others in the area can be managed holistically.

Table 3.5. Adjacent roadworks and other traffic management

Nearby Traffic Management Location	Distance from Project	Interaction with Diversion Route(s)	Duration	Contact Details	Road Spacing Compliant?
	Table to be updated during detailed design stage				

3.14.3 The A428 Project Team will engage with National Highways Network Occupancy team to confirm future predicted embargo dates and complete **Table 3.6** as necessary.

Table 3.6. Bank Holidays and embargos affecting the road network

Holiday	*Year*	*Year*	*Year*	*Year*
New Year's Day	2022	2023	2024	2025
Good Friday				
Easter Monday				
Early May Holiday	Table to be updated during detailed design stage			
Spring Bank Holiday				
Summer Bank Holiday				
Black Friday & Cyber Monday weekend				
Christmas Day				

Holiday	*Year*	*Year*	*Year*	*Year*
Boxing Day				
Any additional Bank Holidays or Embargos to be added, as appropriate				

3.15 Significant events and seasonal traffic

3.15.1 The A428 Project Team will engage with National Highways OD and local authorities once programme dates are confirmed and complete/update **Table 3.7** as necessary. It should be noted that the below events table is not a definitive list and will be updated as planning progresses.

Table 3.7. Significant events and seasonal traffic

Event	Implications with TM	Proposed Mitigation Measures
Bedford River Festival**	JTR impact	Review TM/construction phasing programme in line with the river festival dates.
Harvest season	JTR impact	Liaison with local farmers and the National Farmers Union.
Little Gransden Airshow	JTR impact	Review TM/construction phasing programme in line with the event dates.
Cambridge Folk Festival	JTR impact	Review TM/construction phasing programme in line with the event dates.

**Bedford River Festival is a bi-annual event attracting approx. 300,000 visitors over the weekend that it is held, generating additional traffic on the road network. It should have been held in July 2020, but at the time of writing is postponed until July 2022 due to Covid-19 restrictions. The River Great Ouse will be open to navigation during the festival period.

3.16 Communications plan

3.16.1 Communications between National Highways, its maintenance contractors, LHA, emergency services, road users and local communities will form an integral part of the approach to TM on the Scheme. Communications in advance and during any works will involve use of a wide range of channels to maximise coverage and impact, all will be channelled through the dedicated Scheme communications team. These will include for example:

a. Roadside signage during planned works.

b. Roadside signage that provides advance notice.

c. Meetings with the local community and businesses.

d. Publicity campaigns surrounding key events within the construction programme.

e. Social media routes.

f. Local authority meetings.

g. Use of existing National Highways variable message signs.

h. Use of strategically placed portable message signs.

i. Use of journey time recognition system.

j. Waze Navigation and Live Traffic App updates.

k. Local letter drops for the community.

l. Stakeholder email lists.

m. Community based updates.

n. Information available in areas where there is a heavy footfall in the local areas e.g. fuel filling stations/service areas, libraries, local Council offices where relevant.

o. News releases to local press and radio travel bulletins.

p. Sharing of TM bulletins with neighbouring schemes to create a wider journey picture for those customers who travel further afield.

q. Utilising councils/businesses webpages and request them to display project/TM updates.

r. Having a presence in the neighbouring communities.

s. Tactile signage and engagement with local, regional groups/centres in order to help to keep vulnerable users safe during construction.

3.16.2 Of particular note are sensitive locations such as the Eltisley Manor care home, located on the existing A428 between St Neots and Croxton. The care home has residents with special care needs and clear lines of communication with the care home will be established at an early stage. This will allow the care home to be adequately informed of any operations or TM measures that may affect the routes they use for transporting residents or that staff use, and alternative plans made as necessary. Further consideration to the care home is given in the Equality Impact Assessment **[APP-245]**.

3.16.3 Typically, the project team will notify all affected stakeholders of temporary traffic management changes at least ten working days in advance. Depending on the circumstances, advance notification of traffic management arrangements and/or changes may be more than ten working days when possible. Emergency events will be notified as widely as possible through local contact points and via the Scheme's social media channels.

3.16.4 LHAs and parish councils will be invited to the regular traffic management forum meetings where plans are discussed between a number of parties including the emergency services. These meetings often start by being weekly, moving to fortnightly or monthly as the project progresses and the work and routines become better understood. The Applicant would establish the relevant point of contact to establish the forums and would work with all parties and the appointed contractor to minimise impacts and support local connectivity and ease of movement

3.16.5 Those people affected by more localised limitations to vehicle movements will be engaged directly to minimise disruption to them. An example might be making arrangements with a works team to enable farm vehicles to safely cross a haul route or working space during planting or harvest periods, or rescheduling a work package to enable farm work to take place unhindered during certain periods.

3.16.6 The stakeholder and community engagement team will work with all parties to find reasonable resolutions wherever possible and minimise disruption to the public as a whole.

3.17 Safety measures and efficiency through design

3.17.1 As one of National Highways' Key Imperatives, safety is extremely important. During TM planning and design, the assessment of the following factors will be carried out:

a. Safe taper locations.
b. Road marking condition.
c. Existing and proposed carriageway alignments.
d. Stopping sight distances.
e. Road user fatigue.
f. Customer experience (aligned to "Roadworks a Customer View (RACV)").
g. Walkers, cyclists and horse rider (WCH) interfaces.
h. Clear and concise signage.
i. Clear and safe access and egress detail and locations.
j. Assessment of existing flows and impact of works on said flows.
k. Minimal maintenance and risk mitigation of operational procedures.
l. Assessment of speed (85th percentile speed recognition).
m. Working space for road workers and machinery.

3.17.2 As a minimum the following measures in **Table 3.8** will be in place to ensure the safety of all customer groups, including road users and the workforce.

3.17.3 An example of a Safe System of Work is shown in **Appendix F** together with an example Vehicle Incursion Reporting Template and an example gating vehicle record.

Table 3.8. Safety measures

Customer Group	Safety Measure
Workforce	Reduced speed limits, TVRS system, safe works access/egress points, incursion risk management, eliminate the need for reversing operations as far as it is reasonably practicable to do so.
Road User	Clear TM (RACV considerations), clear road marking system, clear signage, advanced signage of restrictions, strategic and advanced warning of full closure. Adequate lane widths for HGVs. Safety audits will be undertaken of the TM layouts once these have been developed in more detail. Any recommendations should be implemented.
WCH	WCH routes to be segregated from works and be kept clear and well signed. Diversion routes will be developed in consultation with LHAs and routes kept open as far as it is reasonably practicable to do so.
Local Stakeholders	Communication of phasing, maintain clear access and egress to businesses and residences.

3.17.4 The TM design risk assessment will consider key risks and mitigations within the TM strategy and designs. For instance, undertaking an incursions mapping exercise to identify the likelihood of unauthorised incursions and implement appropriate mitigations such as early stakeholder engagement, strict adherence to National Highways Safety Hub initiative, “Raising the Bar 27 Managing temporary traffic management incursions” [redacted] and use of incursion cameras and other innovations such as Intellicone. Extracts from a TM design risk assessment is shown in **Figure 3-3** and an incursion mapping example in the local vicinity is shown in **Figure 3-4**.

3.17.5 Collision risks on the network have been identified, which will feed into the TM design and planning, ensuring that layouts integrate risk areas and mitigate them appropriately.

3.17.6 **Figure 3-5** and **Figure 3-6** illustrate the road risk rating in the surrounding area and historic collision data. It is important that the SRN is considered when planning works. For example, when diverting traffic and using diversion routes, consideration should be given to the routes used and the impact on those routes when diverted traffic is added to the existing traffic flows.

1. General Items of Consideration				
Ref No.	**General Activity**	**Risk**	**Potential Consequence**	**Mitigations**
1.1	Incorrect TTRO Applications	TTRO Extents do not cover the required time length, physical length or temporary restrictions required to carry out works	Delay to programme, re-structuring of programme. Denial of roadspace occupancy.	Review of ttro/s and supporting documents by all parties
1.2	TVRS Pinning	Cable/stats strike, penetration of waterproofing membrane	Cable or services strike with potential to lead to fatal injury and interruption of services	Full cat-scan by GT and permit to penetrate issued to HWM prior to installation.
1.3	Alteration of existing road markings	Damage to existing carriageway surface	Scarring of surface, break up of running surface which could lead to dangerous Trafficked conditions	Survey of carriageway condition where road markings are to be removed and agree suitable method to cause least impact i.e. do not hydroblast fragile surface
1.4	Overhead Power lines	Cable strike during installation of TVRS	Injury or fatality to workers and power outages to local stakeholders. Delay in carriageway re-opening	Carriageway to be surveyed prior to TVRS install. Side shifter to be utilised where OHC are in close proximity. OHC to clearly marked out within full closure as a no access area.
1.5	Access to Farmland and adjacent properties	Slow moving and large agricultural vehicles causing journey time delays and physical obstruction	JTR becomes erratic. Change in driver behaviour i.e. overtaking with less care	Communication with local farmers and residents. Use of 'green lanes' and alternative access points. Follow procedure outlined in DCO
1.6	Sudden rise in farm and agricultural traffic	Slow moving and large agricultural vehicles causing journey time delays and physical obstruction	JTR becomes erratic. Change in driver behaviour i.e. overtaking with less care	Communication with local farmers and residents in order to forecast rises in traffic. Use of 'green lanes' and alternative access points. Follow procedure outlined in DCO.
1.7	Access to broken down vehicles through works	If vehicle breaks down in difficult to access location traffic flow will be drastically affected.	JTR scorecard heavily affected. Frustration of road users. Traffic flow reduced to stand still having impact on whole of network and also surrounding networks	Multiple recovery locations with multi-purpose recovery capabilities. 'Minute man' motorcycle recovery to be utilised allowing recovery vehicle to gain access to breakdown.

Figure 3-3 Design risk assessment example

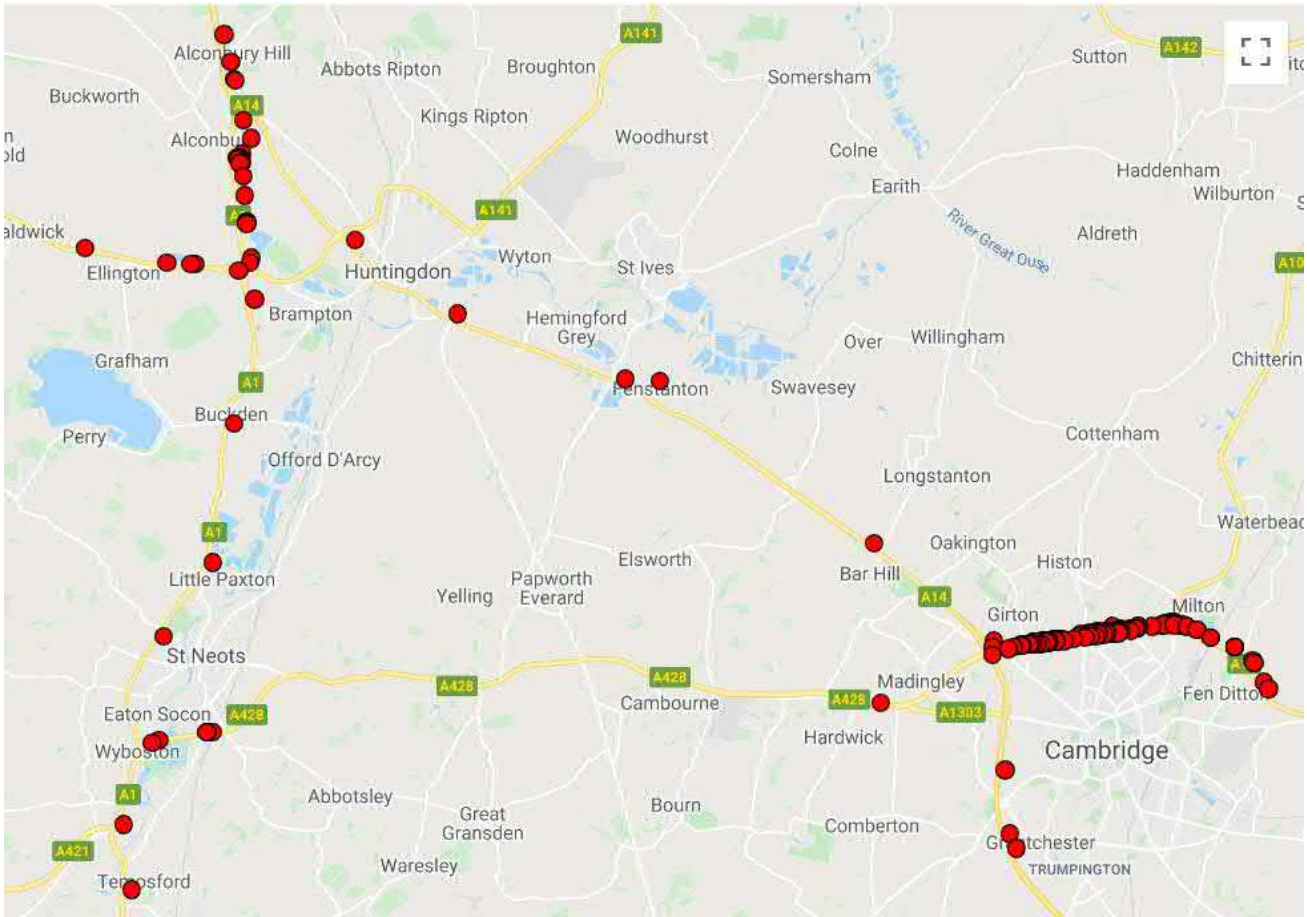


Figure 3-4 Roadworks incursion mapping example

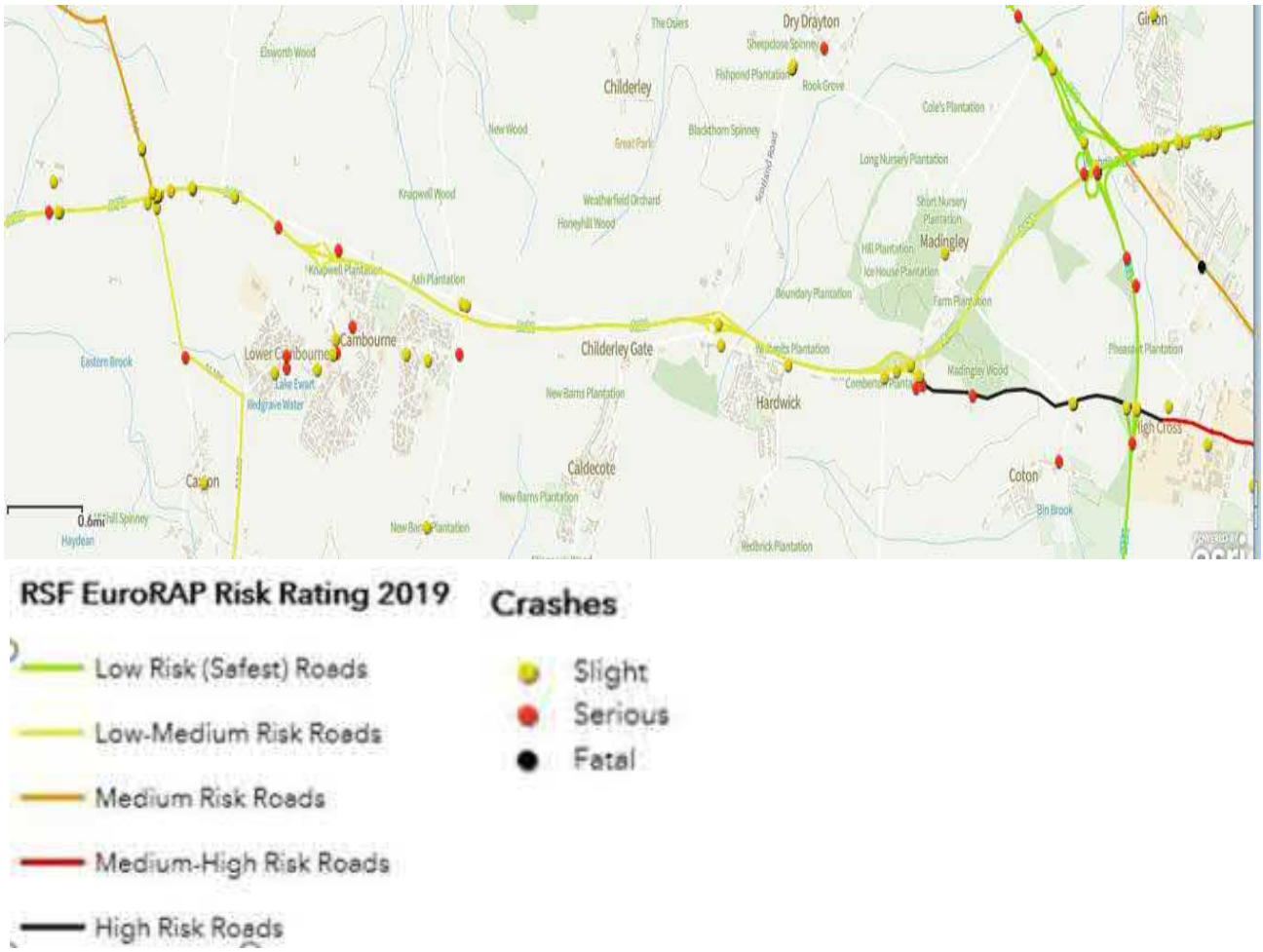


Figure 3-5 Example EuroRAP risk rating and crash data

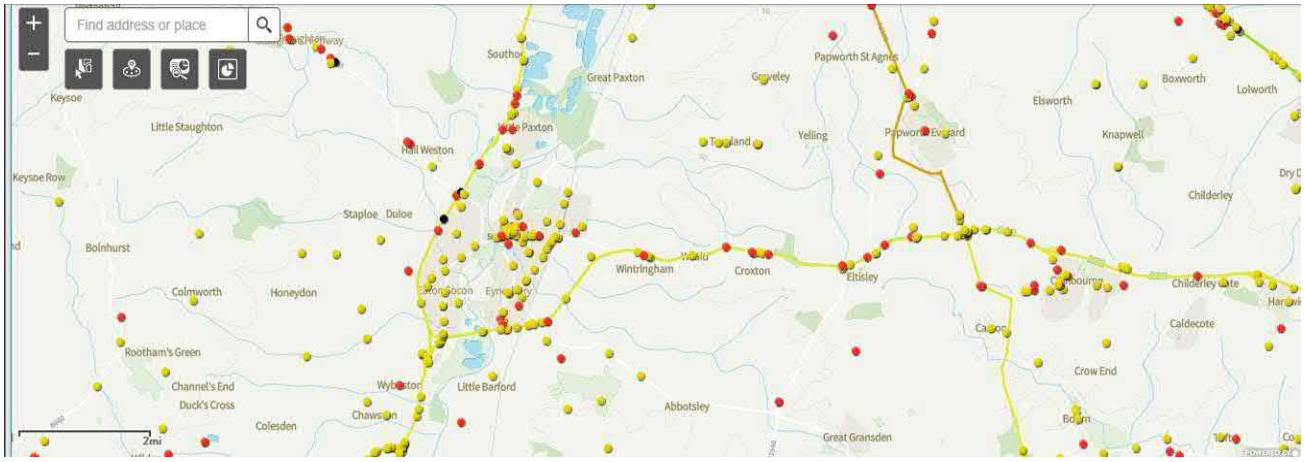


Figure 3-6 Summary collision analysis (01/01/2015 – 19/04/2019)

3.17.7 Through engagement with specialist sub-contractors, the requirement for Closed Circuit Television (CCTV), Temporary Automatic Speed Camera at Road works (TASCAR) and temporary markings will be assessed. Road markings and road signs, both temporary and existing will be kept clear and in good condition. Poor road markings and lane delineation cause customer frustration and impact the customer experience through the works. Consideration of requirements for the above elements, based upon driver behaviour and prioritising customer and workforce safety will be given.

3.17.8 The appointed TM contractor will work with the Principal Contractor to ensure programme requirements can be achieved within TM phases and will contribute to the overall construction phasing strategy.

3.18 Incursion risk management

3.18.1 Incursion risk management will commence from the very first stages of design. The TM will be designed not only in accordance with the relevant legislation i.e. Traffic Signs Manual (TSM), Construction Design and Management Regulations (CDM) and Design Manual for Roads and Bridges (DMRB) but also to consider driver behaviour, fatigue, carriageway alignment, works access and egress locations, and clarity through road works as per the RACV document.

3.18.2 Where full closures are used, a safe system of work will be adopted to ensure workforce safety and to prevent errant vehicles from entering the works. This will be achieved at gate-points via an airlock system. Airlock systems will be installed in accordance with ‘Raising the Bar 27’.

3.18.3 Extracts of safe systems of works and incursion management for a typical scheme are shown in **Appendix G.**

3.19 Driver compliance

3.19.1 Compliance will be discussed with the Police to agree procedures for enforcement where necessary. Further details will be provided by the Contactor in updates to the OCTMP.

3.19.2 Operationally, the project team will monitor compliance and review layouts, lane widths signage and speed limits as necessary to improve driver compliance.

3.20 Human factors

3.20.1 A customer is defined as anyone National Highways interact with throughout the life cycle of the project and is any person or organisation that uses or is affected by the SRN. According to National Highways Customer Group Definitions, this could include (but is not limited to) the following customer groups:

a. Road users.

b. Communities and community groups.

c. Network reliant businesses.

d. Emergency services.

e. Communities and pressure groups.

f. Tenants and persons and organisations that lease from the Client.

g. The public who use the SRN.

3.20.2 In the preparation of the traffic management plan during detailed design, prior to implementation, a Human Centred Design approach will be used to review proposals to ensure that the needs of all customer groups are identified and addressed in the traffic management plan where practicable. This behavioural-led approach is also aligned to HSE best practice guidance [redacted] and therefore also considers the needs of the workforce in terms of safety and wellbeing from a human factors perspective.

3.20.3 By understanding the behavioural drivers for customer satisfaction and aligning Traffic Management proposals to the 20 principles of Roadworks: A Customer View, the Human Centred Design approach includes the following aspects:

a. Comprehensive identification of customer and stakeholder groups and their respective needs, as well as the safety and wellbeing of the workforce.

b. Analysis to understand external influences such as political, social and economic factors, on travel demand, road user and stakeholder behaviour.

c. Review and audit of OCTMP to ensure adequate consideration of Customer needs.

d. Review and input to communication interventions planning to support TM using behavioural change techniques – e.g. emotive rather than directive messaging to positively impact driver behaviour.

3.21 Proposals for management of network occupancy

3.21.1 The traffic management plans and provision will be updated (during the detailed design and construction stages) and will provide detail on all actions undertaken or proposed to assist National Highways OD and its suppliers in being compliant with the network management obligations specified in the:

a. Network Management Manual (NMM).

b. Asset Maintenance and Operational Requirements (AMOR).

c. National Highways Managing Network Occupancy Requirements.

d. Accurately updating NOMS (Network Occupancy Management System) and our Digital Channels guidance.

3.21.2 This will include, but not be exclusive to:

a. Occupancy planning and consultation with the area maintenance provider.

b. Management of Network Occupancy Planning within the Major Projects Contractor organisation.

c. Management and contact protocol with the area maintenance provider during times of occupancy.

d. Communication of high impacting works as defined in the operational requirements. For high impacting works, bookings are to be confirmed and not amended after:

   i. 13:00 hrs on the day of the closure for closures between 19:00hrs and 24:00hrs.

   ii. 13:00 hrs on the day preceding the closure for closures between 00:01hrs and 19:00hrs.

It should be noted however that later changes can be made in exceptional circumstances where the amendment is due to safety or as a consequence of an incident or weather conditions which could not have been reasonably foreseen. This requirement applies to start times, changes to traffic management layout and end/stop times except for early finishes to end/stop times.

3.22 Implications of traffic management measures

3.22.1 Proposed traffic management measures can have implications on the operation of the network for traffic monitoring, data collation and driver information services e.g. variable message signs.

3.22.2 At this stage, the Scheme will not directly affect any Intelligent Transport Services. This will be reviewed and **Table 3.9** updated during the detailed design and construction stage as necessary.

Table 3.9. Intelligent Transport Service infrastructure impacts

Infrastructure	Impact on Infrastructure	Duration

Table to be updated detailed design stage

3.23 Operations

3.23.1 The updated traffic management plan will describe how the project has or will engage with services provided by the EROC/Traffic Officer Service (TOS) to help manage disruption.

3.23.2 As a minimum, this section will include:

a. A strategy to mitigate any risks on operations – consideration will be given to the implications on day-to-day operations (such as incident management). It will provide a reference for and link to the Incident Management Plan.

b. Any roadside infrastructure that impacts the operation of TOS/EROC(s) (e.g. VMS, Automatic Number Plate Recognition (ANPR) cameras, traffic loops) that will be removed during construction will be detailed. This will be cross referred to the Intelligent Transport Service in paragraph 3.22.1 as necessary.

c. Suitable measures/strategies that are being proposed/have been agreed with the TOS/EROC(s) to mitigate the disruption and impact.

3.24 Maintenance activities

3.24.1 This section will be updated to describe how the project will engage with National Highways and local highway authority maintenance providers in order to understand and capture details of any disruption to and impact on services they provide.

3.24.2 As a minimum, this section will include:

a. Impact on the maintenance service provider, including those responsible for maintenance of technology (in liaison with National Traffic Operations Centre (NTOC) for ANPR and inductive loops equipment).

b. Suitable measures/strategies that are being proposed or have been developed in consultation with the maintenance service provider (following liaison with NTOC for ANPR and inductive loops equipment) to mitigate the disruption and impact.

c. Status of any local operating agreements for equipment and include reference and link to relevant documents.

d. Winter maintenance operations including gritting.

3.25 Other service providers

3.25.1 Updates to the traffic management plan will provide details of impacts on services provided by ‘others’ such as Driver and Vehicle Standards Agency (DVSA), Department for Transport (DfT) Statistics, National Roads Telecommunications Service (NRTS) contractor, etc. and how this will be managed.

3.25.2 As a minimum, this section will include:

a. Impacts on these other service providers.

b. Suitable measures/strategies which are being proposed/have been developed in consultation with these other service providers to mitigate the impacts on their services.

3.26 Traffic Management Plan review and management

3.26.1 The traffic management plans and provision will be updated regularly and reviewed in line with changes in the works on site.

3.26.2 Gathering data will be an important part of managing the traffic management plan. The data will be used to understand and monitor how the TM is impacting on the road performance and help to identify opportunities to mitigate any issues.

3.26.3 Updates to the traffic management plans and provision will provide detail on the measures that may be put in place for reactively and proactively managing the traffic management throughout the project, including:

a. Who will be responsible for managing the final traffic management plan on site.

b. What data will be collected as part of the TM activities.

c. The criteria for updating the traffic management plan (e.g. in relation to traffic accident rates).

Appendix A Customer Impact Assessment Tool

The Customer Impact Assessment Tool tables below are taken from the RACV Implementation Toolkit. This will be completed to provide an indicator of the level of impact anticipated by the project on each customer group during the detailed design and construction stages.

Customer group	Who is affected by this project?	What are their requirements and how are they impacted?	How has the traffic management plan taken these requirements into account and proposed mitigations using the customer principles?
Customer	*HGV drivers/operators.* *Car drivers.* *Motorcyclists.* *Royal Mail.* *Emergency services.* *Local traffic.* *Long distance drivers/tourists.* *Public transport providers e.g. school buses, Stagecoach 905 service (previously called the X5).* *Delivery carriers/couriers.*	*Journey time reliability (JTR).* *Advance warning of closures and/or diversions.* *Appropriate diversion routes.* *Maximised lane widths where possible.* *Clear easily navigable TM.* *Review use of speed control.* *Co-ordination with existing schemes.* *Emergency services require access or alternative measures to reach destination.* *Couriers under pressure to deliver – diversion routes, full closures and general works have potential to affect delivery JTR.*	*Sufficient notification of closures.* *Diversion routes avoid narrow roads and low bridges.* *Those affected to be notified via communication team.* *Notification and liaison with individuals and / or local group representatives.* *Ensure HGV operators/drivers are given sufficient notification of closures.* *Ensure local residents have advance warning of closures and / or diversions.* *Advance warnings and notification via mobile variable message signs and existing technology on the network.* *Advanced warnings via nationwide network technology and comms to allow long distance drivers and tourists to plan appropriately.* *Give clear and accurate information of*

Customer group	Who is affected by this project?	What are their requirements and how are they impacted?	How has the traffic management plan taken these requirements into account and proposed mitigations using the customer principles?
			delays displayed at remote locations so traffic can decide on alternative route. *Give clear and accurate information on the works*. *Consideration given to Roadworks: A Customers View.* *Efficient locating of lead in zones/zone of influence to minimise traffic flow impact.* *TM to be designed, installed and maintained in accordance with TSM.* *Ensure closure clashes do not occur i.e. no closures on alternative routes that also have diversions.* *Ensure emergency services have access through works during emergencies, have suitable diversion routes and have advance warning of closures and / or diversions.* *TM needs to have sensitivity to local requirements for example market days, events.* *Ensure minimal disruption due to works, including environmental factors (for example, noise,*

Customer group	Who is affected by this project?	What are their requirements and how are they impacted?	How has the traffic management plan taken these requirements into account and proposed mitigations using the customer principles?
			dust, lighting and diversion routes. *Activity curfews.* *Diversion route signs and information to meet driver requirements and optimise usability to reduce opportunities for error and therefore reduce congestion.*
	Disabled car driver.	*Method of recovery that is suitable for physically disabled vehicle occupants and their vehicles.* *Suitable roadside facilities for disables users i.e. toilets.*	*Wheelchair accessible recovery vehicles where recovery is applicable.* *Welfare facilities take account of disabilities.*
	Walkers, Cyclists and Horse riders (WCH).	*WCH routes i.e. footpaths and bridleways within Order Limits.* *Shared cycle route.* *Existing crossing points (signal controlled).*	*Sufficient width of guarded temporary WCH route provision.* *Shared WCH temporary routes with compliant signage and disabled access. Route to be lit, guarded and step free.* *Crossing point to be assessed with provision of tactile paving or alternative suitable measures e.g. audible warnings.*
Stakeholder	*Bedford Borough Council, Central Bedfordshire Council and Cambridgeshire County Council.*	*Communicate and seek approval of LHA network use for full closures/ diversions.*	*Advance warning of proposed full closures with approval from LHA roadspace team(s).* *Liaise with LHA's to agree*

Customer group	Who is affected by this project?	What are their requirements and how are they impacted?	How has the traffic management plan taken these requirements into account and proposed mitigations using the customer principles?
		Sufficient notification of above closures. *Co-ordinated and appropriate diversion routes.* *Minimise impact to JTR's.*	*proposed/approved diversion routes.* *TM design to consider minimum impact to surrounding road networks.* *Works planning to consider events and embargos.*
	Adjacent Local Businesses and landowners including Eltisley Care Home. *Adjacent communities.*	*Advance warning of closures or diversion requirements.* *Business access is maintained throughout the works.* *Use local media for project updates.* *Account for seasonal peaks e.g. Black Friday, Christmas.* *Use Variable Message Signage to better inform users of incidents.*	*Advance warning and sensitivity around peak times* *Project comms team to liaise with local businesses*
	Area 8: Asset Support Contractor.	*Journey time reliability.* *Advance warning of closures and/or diversions.* *Appropriate diversion routes.* *Maximised lane widths where possible.* *Access for routine maintenance.*	*Sufficient notification of closures.* *Closure clash avoidance – not having closures on alternative routes that are not subject to diversions.* *Anticipated that the Principal Contractor will undertake the majority of maintenance activities.* *Liaison with roadspace team to ensure*

Customer group	Who is affected by this project?	What are their requirements and how are they impacted?	How has the traffic management plan taken these requirements into account and proposed mitigations using the customer principles?
			appropriate/approved diversion routes are utilised. *Liaison with roadspace team to avoid event clashing i.e. wide load movements.*

Following completion of the Customer Impact Assessment table, populate the Customer requirements and customer requirements logsection, focusing on how the traffic management plan takes account of the requirements of the customer groups rated as red and amber within this appendix, high and medium impact respectively.

Impact of roadworks and associated construction traffic on different types of road users and level of impact

	Road user type (e.g. commuters, leisure drivers, freight, etc.)	Level of impact		
		High	Medium	Low
1.	Local residents to project		✓	
2.	HGV drivers, car drivers, motorcyclists		✓	
3.	Cyclists/Pedestrians/WCHs		✓	
4.	Emergency services			✓
5.				
6.				
7.				

Impact of roadworks and associated construction traffic on communities and level of impact

	Community (e.g. commuters, leisure drivers, freight, non-motorised user, etc.)	Level of impact		
		High	Medium	Low
1.	Commuters		✓	
2.	Leisure Drivers			✓
3.	Cyclists/Pedestrians/WCHs			✓
4.	Freight		✓	
5.				
6.				
7.				

Impact of diversion routes on road users and communities and level of impact

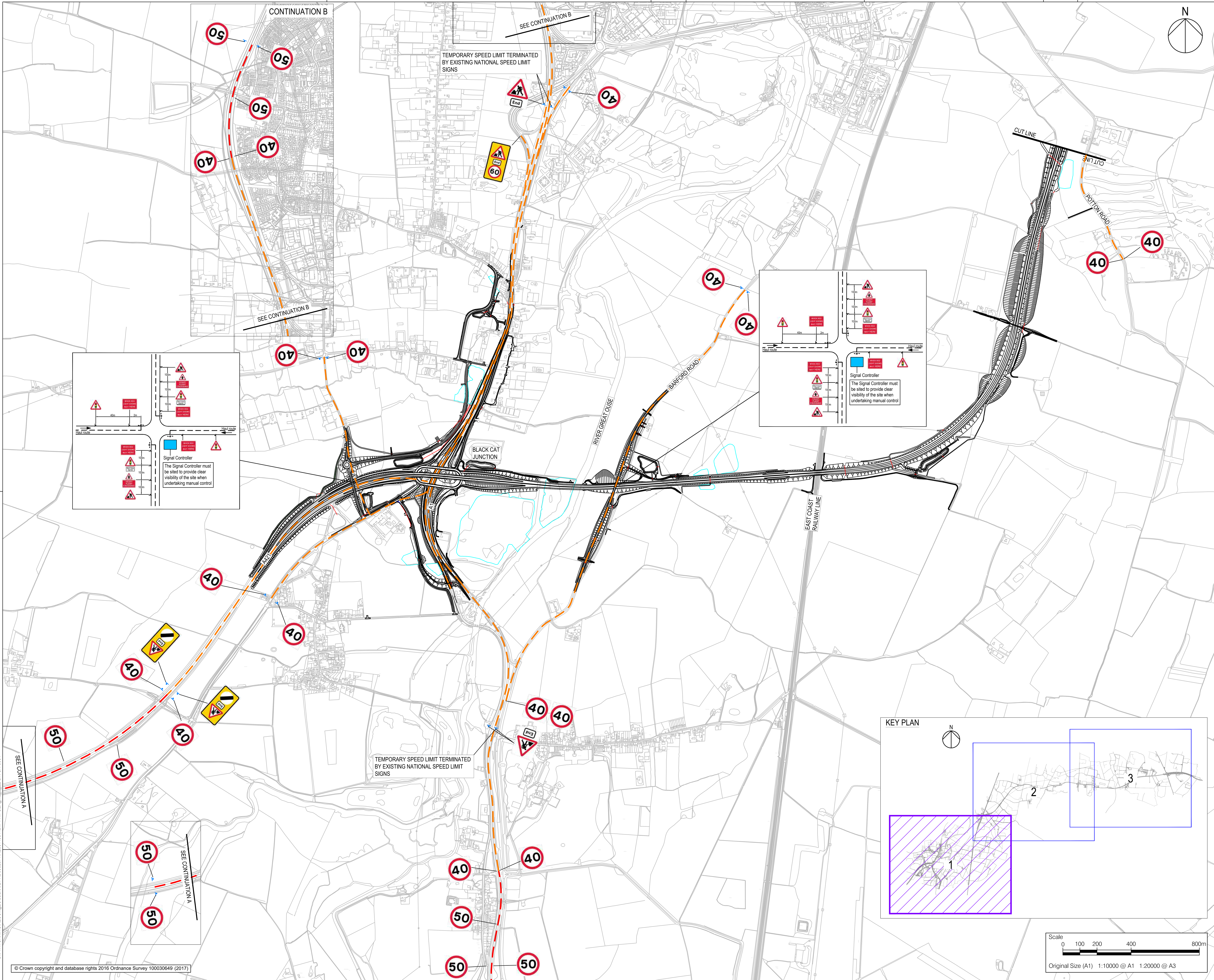
	Customer types (e.g. commuters, leisure drivers, freight, industrial estates, residents, local authorities, retail parks, schools, stadiums, local events, land owners, etc.)	Level of impact		
		High	Medium	Low
1.	Adjacent Local Businesses		✓	
2.	Local communities/villages i.e. Wyboston, Little Barford		✓	
3.	St Neots, Cambourne, Croxton		✓	
4.				
5.				
6.				
7.				

Appendix B TTRO Speed Limit Overview

TTRO Speed Limit Restriction Overview Sheet 1 of 3

TTRO Speed Limit Restriction Overview Sheet 2 of 3

TTRO Speed Limit Restriction Overview Sheet 3 of 3



Plot Date : 18 February 2021 13:50:17

N

NOTES

1. ALL TRAFFIC MANAGEMENT TO BE DESIGNED AND INSTALLED IN ACCORDANCE WITH CHAPTER 8 OF THE TRAFFIC SIGNS MANUAL.

2. WORKS END SIGNS ARE SHOWN FOR THE TRUNK ROADS, BUT FOR DRAWING CLARITY ARE NOT NECESSARILY SHOWN FOR THE SIDE ROADS.

3. THE ORIENTATION OF THE SIGNS ON THE DRAWING IS INTENDED TO INDICATE THE DIRECTION IN WHICH THEY WILL FACE.

KEY

50mph TEMPORARY SPEED LIMIT

40mph TEMPORARY SPEED LIMIT

Revision Details	By / Check	Date	Suffix
First Issue	JB / TD	18/02/21	P02

Purpose of issue

DCO APPLICATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number

TR010044

Project Title

A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title

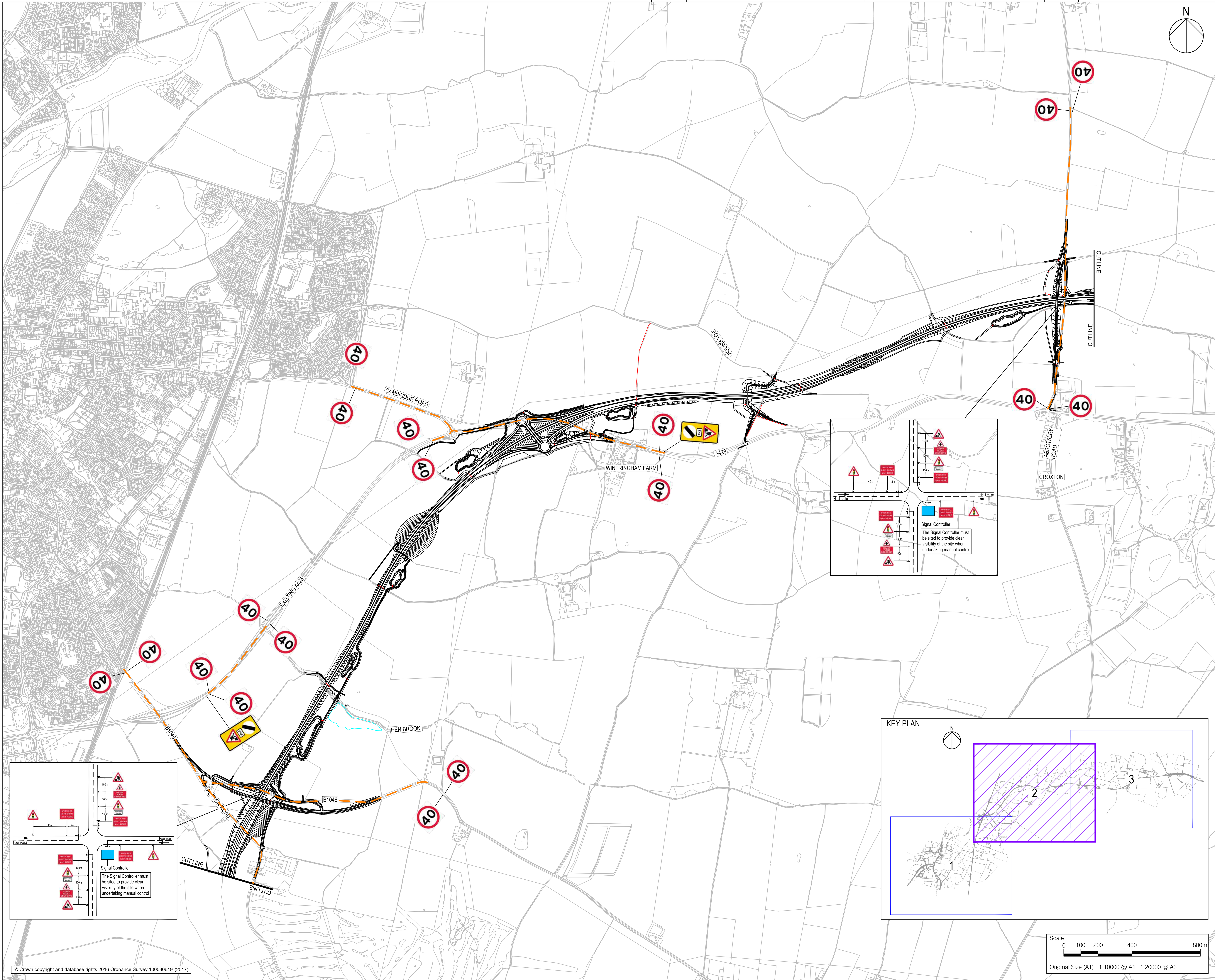
TTRO SPEED LIMIT RESTRICTIONS OVERVIEW SHEET 1 OF 3

Designed	Drawn	Checked	Approved	Date
	JB	PS	TD	18/02/21

Internal Project No.	Suitability
60541541	D7
Scale @ A1	**Zone**
1:10000	General

Drawing Number
Highways England PIN | Originator | Volume
HE551495 -ACM -TTM -
GEN_ML_Z_ZZ -DR -CH -0001
Location | Type | Role | Number

Rev
P02



NOTES

1. ALL TRAFFIC MANAGEMENT TO BE DESIGNED AND INSTALLED IN ACCORDANCE WITH CHAPTER 8 OF THE TRAFFIC SIGNS MANUAL.
2. WORKS END SIGNS ARE SHOWN FOR THE TRUNK ROADS, BUT FOR DRAWING CLARITY ARE NOT NECESSARILY SHOWN FOR THE SIDE ROADS.
3. THE ORIENTATION OF THE SIGNS ON THE DRAWING IS INTENDED TO INDICATE THE DIRECTION IN WHICH THEY WILL FACE.

KEY

- 50mph TEMPORARY SPEED LIMIT
- 40mph TEMPORARY SPEED LIMIT

Revision Details	By / Check	Date	Suffix
First Issue	JB / TD	18/02/21	P02

Purpose of issue

DCO APPLICATION

Client

Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number

TR010044

Project Title

A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title

TTRO SPEED LIMIT RESTRICTIONS OVERVIEW SHEET 2 OF 3

Designed	Drawn	Checked	Approved	Date
	JB	PS	TD	18/02/21

Internal Project No.	Suitability
60541541	D7
Scale @ A1	**Zone**
1:10000	General

Drawing Number: HE551495 -ACM -TTM -GEN_ML_Z_ZZ -DR -CH-0002 (Highways England PIN | Originator | Volume | Location | Type | Role | Number)

Rev: P02

Plot Date : 18 February 2021 14:04:35
File Name C:\PWWORKING\AECOM_EU\BLISSETTT\D0352071\HE551495-ACM-TTM-GEN_ML_Z_ZZ-DR-CH-0002

N

SEE CONTINUATION A

CONTINUATION A

Haul route

Signal Controller

The Signal Controller must be sited to provide clear visibility of the site when undertaking manual control

CUT LINE

CUT LINE

GALLOW BROOK

B1040

A428

A1198

CAXTON GIBBET JUNCTION

ELTISLEY

SEE CONTINUATION A

NOTES

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2. WORKS END SIGNS ARE SHOWN FOR THE TRUNK ROADS, BUT FOR DRAWING CLARITY ARE NOT NECESSARILY SHOWN FOR THE SIDE ROADS.
3. THE ORIENTATION OF THE SIGNS ON THE DRAWING IS INTENDED TO INDICATE THE DIRECTION IN WHICH THEY WILL FACE.

KEY

50mph TEMPORARY SPEED LIMIT

40mph TEMPORARY SPEED LIMIT

KEY PLAN

Scale 0 100 200 400 800m

Original Size (A1) 1:10000 @ A1 1:20000 @ A3

First Issue	JB / TD	18/02/21	P02
Revision Details	By / Check	Date	Suffix

Purpose of issue

DCO APPLICATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number

TR010044

Project Title

A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title

TTRO SPEED LIMIT RESTRICTIONS OVERVIEW SHEET 3 OF 3

Designed	Drawn	Checked	Approved	Date
	JB	PS	TD	18/02/21

Internal Project No. 60541541	Suitability D7
Scale @ A1 1:10000	Zone General

Drawing Number

Highways England PIN	Originator	Volume	Type	Role	Number	Rev
HE551495	-ACM	-TTM	-			P02
GEN_ML_Z_ZZ	-DR	-CH	-0003			

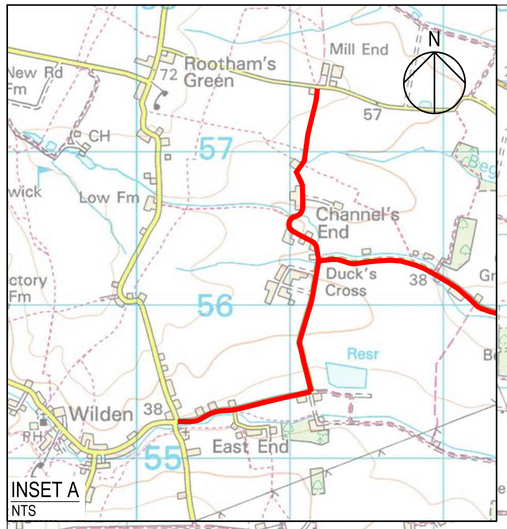
Location

Plot Date: 18 February 2021 14:16:02
File Name: C:\PWORKING\AECOM_EU\BLISSETT\60535071\HE551495-ACM-TTM-GEN_ML_Z_ZZ-DR-CH-0003

Appendix C Construction Traffic Restrictions

Construction Traffic Restrictions Sheet 1 of 2

Construction Traffic Restrictions Sheet 2 of 2



INSET A
NTS

THIS ROUTE PROVIDES RESTRICTED ACCESS TO POTTON ROAD FOR CONSTRUCTION VEHICLES.
ONLY TO BE USED BY CONSTRUCTION VEHICLES UP TO 3.5 TONNES.
USE OF THIS ROUTE IS PROHIBITED BETWEEN 7.30AM & 9.30AM AND BETWEEN 3PM AND 4.30PM.

PERMITTED FOR THE CONSTRUCTION OF ROXTON ROAD LINK ROAD AND ASSOCIATED WORKS ON THE LANE, NAGS HEAD LANE AND CHAWSTON LANE. WHEN THESE WORKS ARE COMPLETE THIS WILL BECOME A PROHIBITED ROUTE.

SEE INSET A

PERMITTED FOR THE CONSTRUCTION OF BARFORD ROAD REALIGNMENT, BARFORD ROAD BRIDGE AND TOP FARM BRIDGE. WHEN THESE WORKS ARE COMPLETE THIS WILL BECOME A PROHIBITED ROUTE. CONSTRUCTION TRAFFIC TO OBEY WEIGHT LIMIT ON BARFORD ROAD

PERMITTED FOR THE CONSTRUCTION OF TURNING HEADS ON SCHOOL LANE AND CONVERSION TO BRIDLEWAY. WHEN THESE WORKS ARE COMPLETE THIS WILL BECOME A PROHIBITED ROUTE.

PERMITTED FOR THE CONSTRUCTION OF POTTON ROAD WORKS AND TOP FARM BRIDGE. WHEN THESE WORKS ARE COMPLETE THIS WILL BECOME A PROHIBITED ROUTE.

PERMITTED FOR THE UTILITIES DIVERSION AND CONSTRUCTION OF THE EAST ABUTMENT OF THE EAST COAST MAINLINE BRIDGE. WHEN THESE WORKS ARE COMPLETE THIS WILL BECOME A PROHIBITED ROUTE.

LITTLE PAXTON

ST NEOTS

CAMBRIDGE ROAD JUNCTION

CROXTON

ABBOTSLEY

BLACK CAT JUNCTION

INDICATIVE NEW DUAL CARRIAGEWAY

CUT LINE

CUT LINE

A1

A428

A421

B 1041

B 645

B 1048

B 1428

B 1046

NOTES

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE OUTLINE CONSTRUCTION TRAFFIC MANAGEMENT PLAN.
2. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.

KEY

- PERMITTED CONSTRUCTION TRAFFIC
- NO CONSTRUCTION TRAFFIC
- PERMITTED CONSTRUCTION TRAFFIC ASSOCIATED WITH WORKS LOCAL TO THAT AREA. WHEN WORKS ARE COMPLETE THE ROUTE WILL BECOME A PROHIBITED ROUTE FOR CONSTRUCTION TRAFFIC

Permitted routes and annotations amended.	JB / TD		29/10/21	P03
Revision Details	By / Check		Date	Suffix

Purpose of issue

DCO APPLICATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number

TR010044

Project Title

A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title

CONSTRUCTION TRAFFIC RESTRICTED ROUTES SHEET 1 OF 2

Designed	Drawn	Checked	Approved	Date
	JB	PS	TD	29/10/21

Internal Project No.	Suitability
60541541	D7
Scale @ A1	Zone
NTS	General

Drawing Number

Highways England PIN	Originator	Volume	Location	Type	Role	Number	Rev
HE551495	-ACM	-TTM -	GEN_Z_Z_ZZ	-DR	-CH	-0006	P03

Plot Date: 01 November 2021 13:38:16
File Name: C:\Work\Projects\HE551495-ACM-TTM-GEN_Z_Z_ZZ-DR-CH-0006

SEE INSET A

INSET A
NTS

INDICATIVE NEW DUAL CARRIAGEWAY

CUT LINE

CUT LINE

PERMITTED FOR THE CONSTRUCTION OF THE NEW ROAD ALIGNMENT / FOOTWAY / CYCLEWAY ON CAMBRIDGE ROAD. WHEN THESE WORKS ARE COMPLETE THIS WILL BECOME A PROHIBITED ROUTE.

PAPWORTH EVERARD

CAXTON GIBBET JUNCTION

ELTISLEY

CROXTON

CAMBOURNE

GREAT GRANSDEN

HARDWICK

A1198

A1307

A14

A428

B1040

B 1046

NOTES

1. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH THE OUTLINE CONSTRUCTION TRAFFIC MANAGEMENT PLAN.
2. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.

KEY

- PERMITTED CONSTRUCTION TRAFFIC
- NO CONSTRUCTION TRAFFIC
- PERMITTED CONSTRUCTION TRAFFIC ASSOCIATED WITH WORKS LOCAL TO THAT AREA. WHEN WORKS ARE COMPLETE THE ROUTE WILL BECOME A PROHIBITED ROUTE FOR CONSTRUCTION TRAFFIC

Prohibited route for construction traffic added at Hilton.	JB / PW	08/12/21	P04
Revision Details	By / Check	Date	Suffix

Purpose of issue

DCO EXAMINATION

Client
National Highways
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of
national highways

Development Consent Order Number
TR010044

Project Title
A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title
CONSTRUCTION TRAFFIC RESTRICTED ROUTES SHEET 2 OF 2

Designed	Drawn	Checked	Approved	Date
	JB	PS	PW	08/12/21

Internal Project No. 60541541	Suitability D9
Scale @ A1 NTS	Zone General

Drawing Number
Highways England PIN | Originator | Volume | Location | Type | Role | Number
HE551495 -ACM -TTM - GEN_Z_Z_ZZ -DR -CH-0007

Rev P04

Plot Date: 08 December 2021 15:54:31
File Name: C:\Projects\60541541\A428_EU\03\207\HE551495-ACM-TTM-GEN_Z_Z_ZZ-DR-CH-0007

Appendix D Diversion Routes

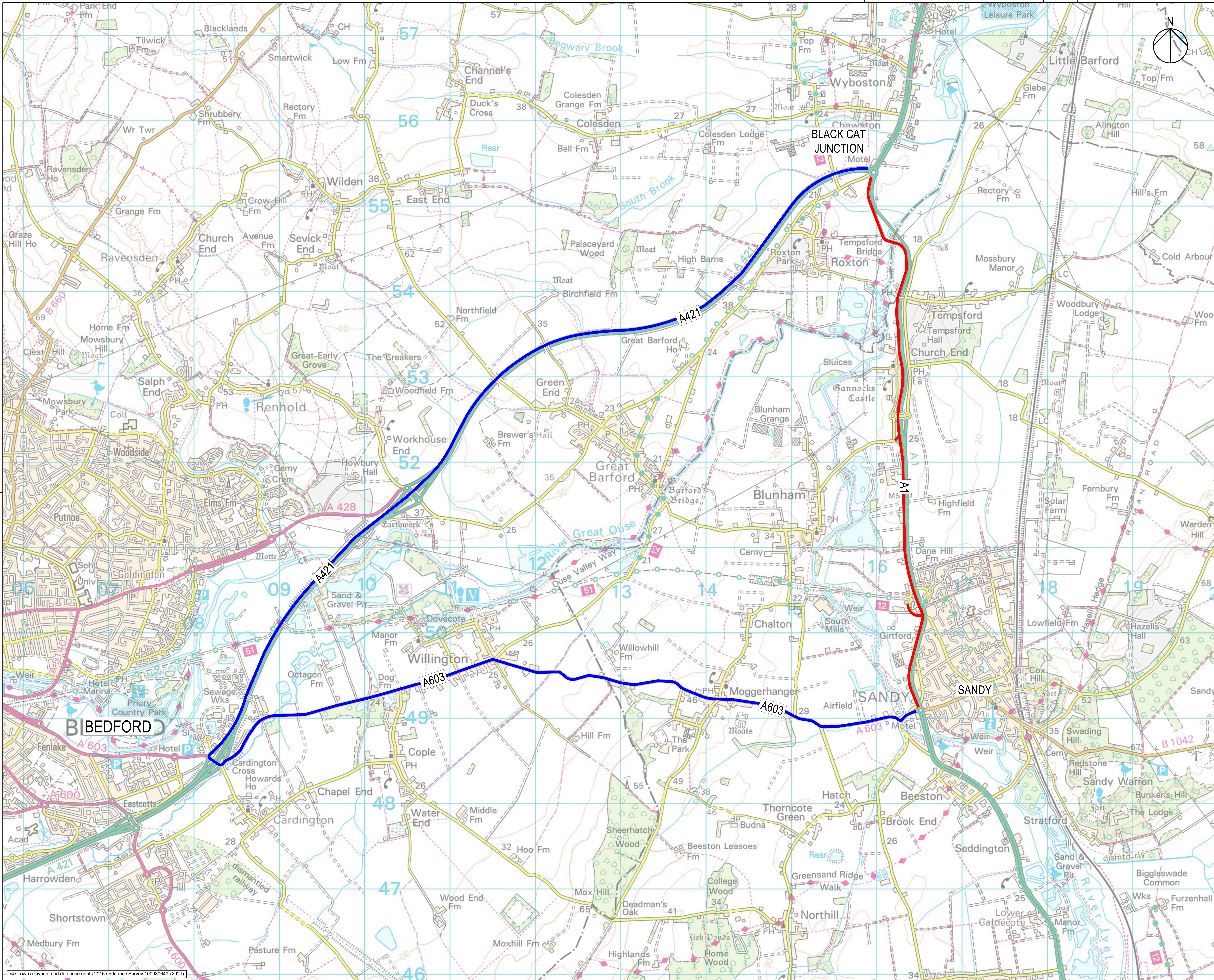
Diversion route A1 Sandy to Black Cat

Diversion route A1 Wyboston to Black Cat

Diversion route A421 Black Cat to Renhold

Diversion route A428 Caxton Gibbet to St Neots

D5 Diversion route A428 Girton to Caxton Gibbet



NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.
2. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.
3. ADDITIONAL WORKS ACCESS AND EGRESS TO BE CONFIRMED ON SITE.
4. APPROACH SIGNAGE TO BE OMITTED IN ACCORDANCE WITH IAN 150/14 REV1.
5. ENTRY TAPERS WILL BE 'ALTERNATIVE' AS PER IAN 163/12.
6. WORKFORCE IN ROAD SLOW TO BE PLACED PRIOR TO THE FIRST CROSSING POINT IN A SAFE LOCATION DURING INSTALLATION & REMOVAL OF TRAFFIC MANAGEMENT.
7. STAGGERED/GHOST WALLS TO BE INSTALLED PRIOR TO WORKS AREA AGREED ON A NIGHTLY BASIS PRIOR TO THE START OF SHIFT.

KEY

- DIVERSION ROUTE
- ROAD CLOSURE

Revision Details	By / Check	Date	Suffix
First Issue	JB / TD	18/02/21	P02

Purpose of issue
DCO APPLICATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number
TR010044

Project Title
A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title
DIVERSION ROUTE FOR A1 CLOSURE BETWEEN SANDY AND BLACK CAT ROUNDABOUT

Designed	Drawn	Checked	Approved	Date
	JB	PS	TD	18/02/21

Internal Project No. 60541541	Suitability D7
Scale @ A1 NTS	Zone General

Drawing Number
Highways England PIN | Originator | Volume
HE551495 -ACM -TTM -
GEN_Z_Z_ZZ -DR -CH-0001
Location | Type | Role | Number

Rev P02

Plot Date : 18 February 2021 13:49:27
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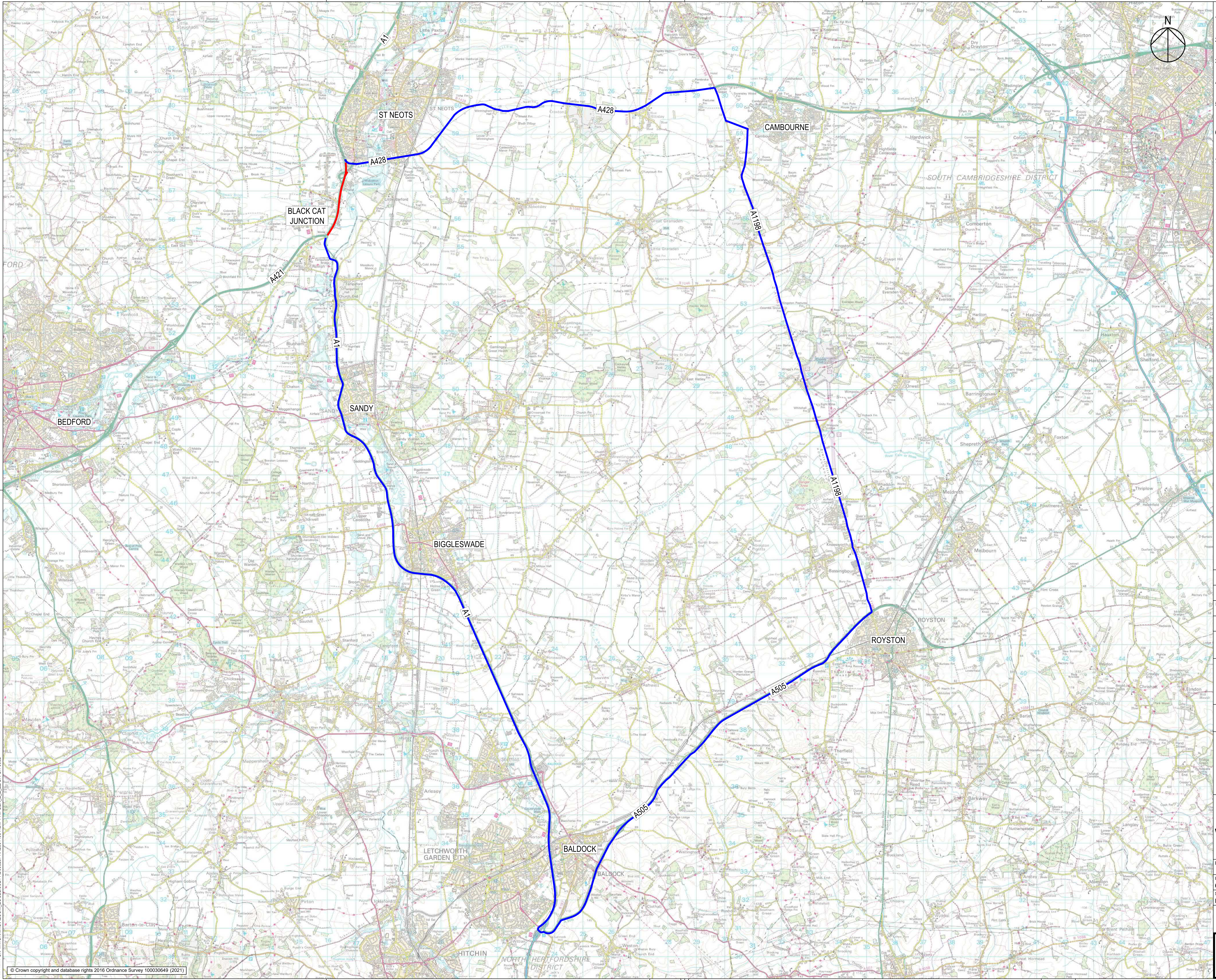

Plot Date: 18 February 2021 13:51:05
File Name: C:\PWWORKING\AECOM_EU\BLISSETT\D0032077\HE551495-ACM-TTM-GEN_Z_Z_ZZ-DR-CH-0002

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.
2. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.
3. ADDITIONAL WORKS ACCESS AND EGRESS TO BE CONFIRMED ON SITE.
4. APPROACH SIGNAGE TO BE OMITTED IN ACCORDANCE WITH IAN 150/14 REV1.
5. ENTRY TAPERS WILL BE 'ALTERNATIVE' AS PER IAN 163/12.
6. WORKFORCE IN ROAD SLOW TO BE PLACED PRIOR TO THE FIRST CROSSING POINT IN A SAFE LOCATION DURING INSTALLATION & REMOVAL OF TRAFFIC MANAGEMENT.
7. STAGGERED/GHOST WALLS TO BE INSTALLED PRIOR TO WORKS AREA AGREED ON A NIGHTLY BASIS PRIOR TO THE START OF SHIFT.

KEY

DIVERSION ROUTE
ROAD CLOSURE

First Issue	JB	TD	18/02/21	P02
Revision Details	By	Check	Date	Suffix

Purpose of issue

DCO APPLICATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of
highways england

Development Consent Order Number

TR010044

Project Title

A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title

DIVERSION ROUTE FOR A1 CLOSURE BETWEEN WYBOSTON AND BLACK CAT ROUNDABOUT

Designed	Drawn	Checked	Approved	Date
	JB	PS	TD	18/02/21

Internal Project No. 60541541	Suitability D7
Scale @ A1 NTS	Zone General

Drawing Number
Highways England PIN | Originator | Volume
HE551495 -ACM -TTM -GEN_Z_Z_ZZ -DR -CH -0002
Location | Type | Role | Number

Rev
P02

BLACK CAT JUNCTION

BEDFORD

SANDY

A421

A603

A428

A1

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.
2. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.
3. ADDITIONAL WORKS ACCESS AND EGRESS TO BE CONFIRMED ON SITE.
4. APPROACH SIGNAGE TO BE OMITTED IN ACCORDANCE WITH IAN 150/14 REV1.
5. ENTRY TAPERS WILL BE 'ALTERNATIVE' AS PER IAN 163/12.
6. WORKFORCE IN ROAD SLOW TO BE PLACED PRIOR TO THE FIRST CROSSING POINT IN A SAFE LOCATION DURING INSTALLATION & REMOVAL OF TRAFFIC MANAGEMENT.
7. STAGGERED/GHOST WALLS TO BE INSTALLED PRIOR TO WORKS AREA AGREED ON A NIGHTLY BASIS PRIOR TO THE START OF SHIFT.

KEY

DIVERSION ROUTE

ROAD CLOSURE

First Issue	JB	TD	18/02/21	P02
Revision Details	By	Check	Date	Suffix

Purpose of issue

DCO APPLICATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number

TR010044

Project Title

A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title

DIVERSION ROUTE FOR A421 CLOSURE BETWEEN RENHOLD AND BLACK CAT ROUNDABOUT

Designed	Drawn	Checked	Approved	Date
	JB	PS	TD	18/02/21

Internal Project No.	Suitability
60541541	D7
Scale @ A1	Zone
NTS	General

Drawing Number					Rev
Highways England PIN	Originator		Volume		
HE551495	-ACM		-TTM	-	P02
GEN_Z_Z_ZZ		-DR	-CH	-0003	
Location		Type	Role	Number	

Plot Date: 18 February 2021 13:52:31
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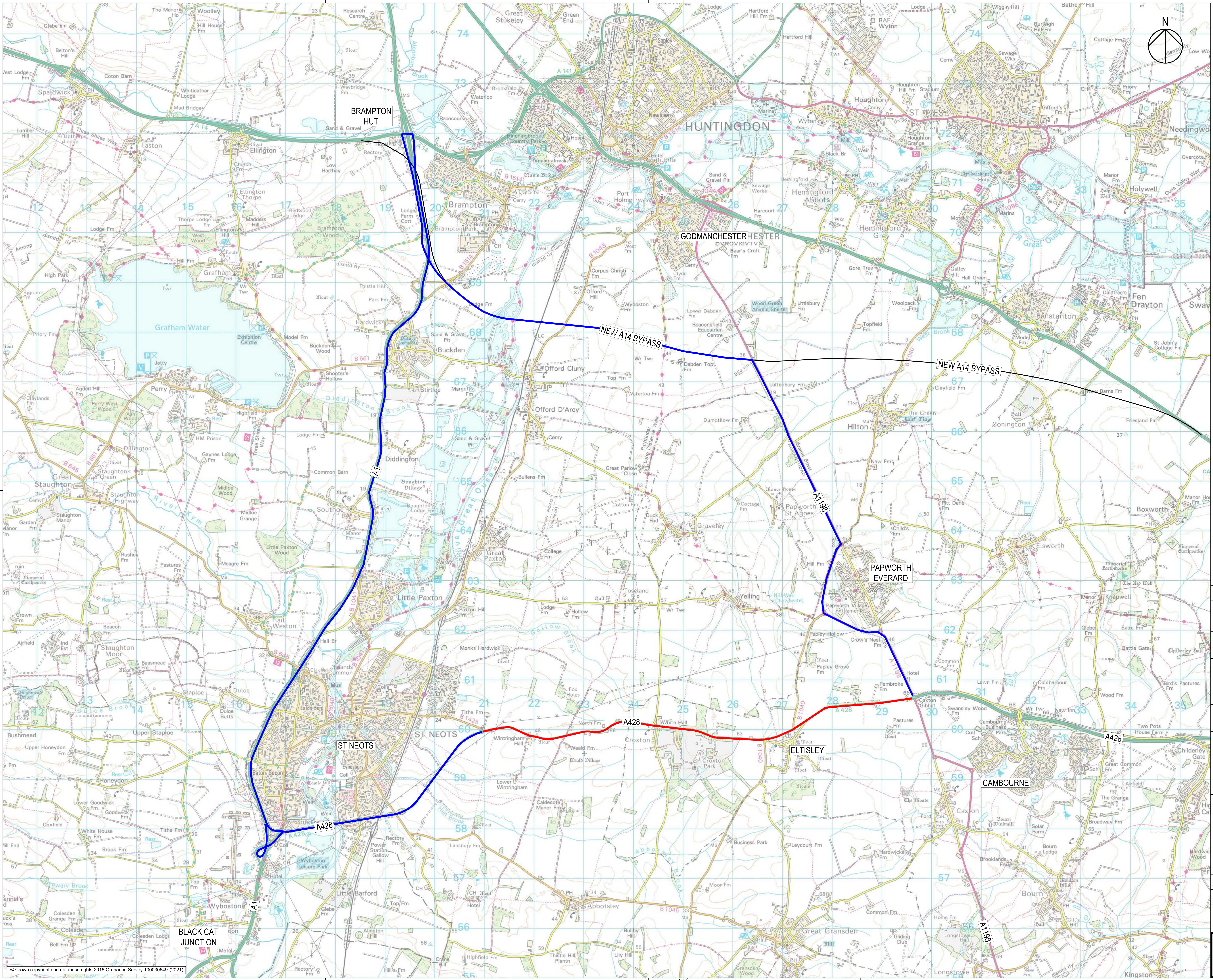

Plot Date : 18 February 2021 13:54:43
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NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.
2. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.
3. ADDITIONAL WORKS ACCESS AND EGRESS TO BE CONFIRMED ON SITE.
4. APPROACH SIGNAGE TO BE OMITTED IN ACCORDANCE WITH IAN 150/14 REV1.
5. ENTRY TAPERS WILL BE 'ALTERNATIVE' AS PER IAN 163/12.
6. WORKFORCE IN ROAD SLOW TO BE PLACED PRIOR TO THE FIRST CROSSING POINT IN A SAFE LOCATION DURING INSTALLATION & REMOVAL OF TRAFFIC MANAGEMENT.
7. STAGGERED/GHOST WALLS TO BE INSTALLED PRIOR TO WORKS AREA AGREED ON A NIGHTLY BASIS PRIOR TO THE START OF SHIFT.

KEY

- DIVERSION ROUTE
- ROAD CLOSURE

Revision Details	By	Check	Date	Suffix
First Issue	JB	TD	18/02/21	P03

Purpose of issue

DCO APPLICATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number

TR010044

Project Title

A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title

DIVERSION ROUTE FOR A428 CLOSURE BETWEEN CAXTON GIBBET RBT AND ST NEOTS

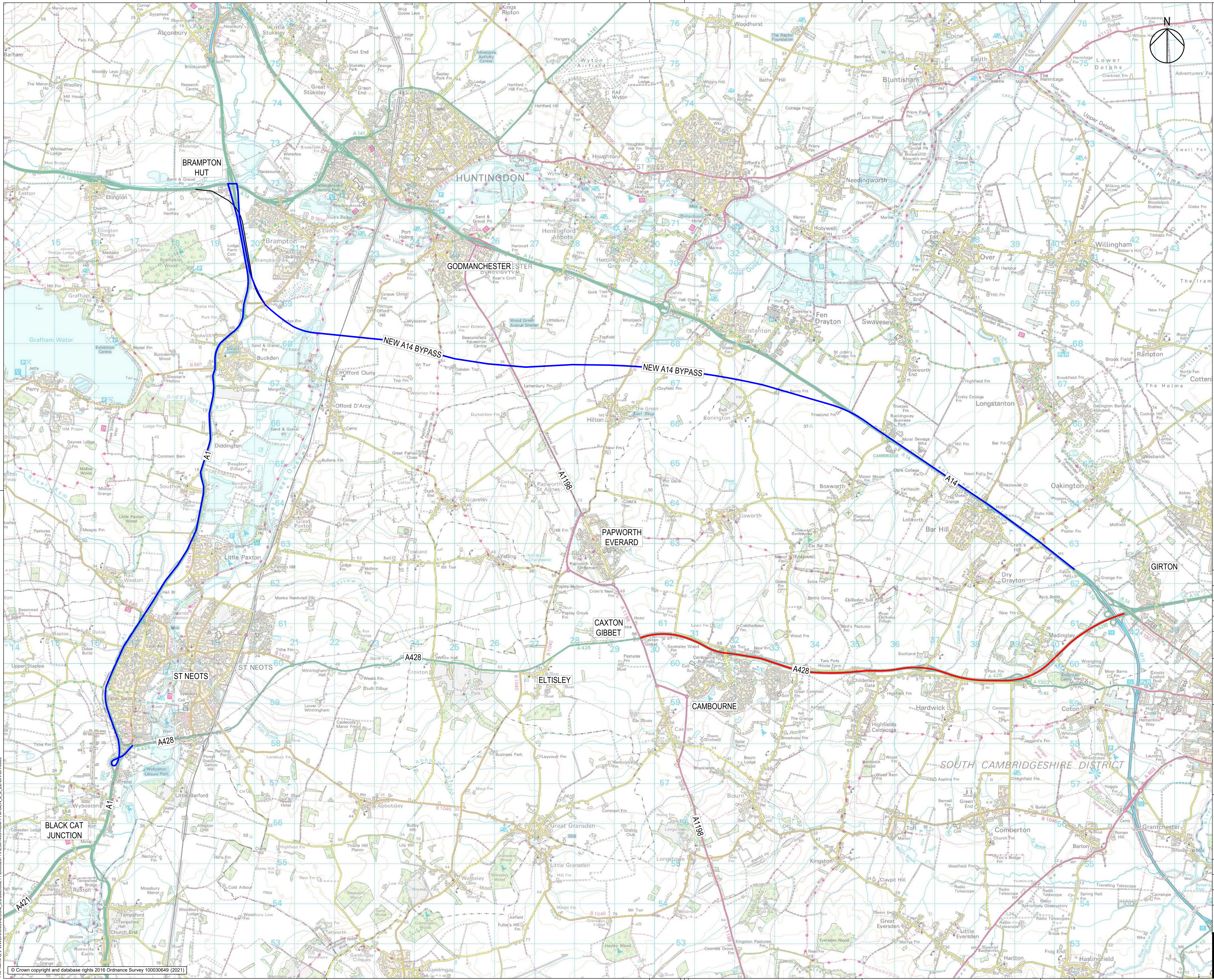
Designed	Drawn	Checked	Approved	Date
	JB	PS	TD	18/02/21

Internal Project No.	Suitability
60541541	D7
Scale @ A1	**Zone**
NTS	General

Drawing Number
Highways England PIN | Originator | Volume | Location | Type | Role | Number

HE551495-ACM-TTM-GEN_Z_Z_ZZ-DR-CH-0004

Rev: P03



N

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DOCUMENTATION.
2. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.
3. ADDITIONAL WORKS ACCESS AND EGRESS TO BE CONFIRMED ON SITE.
4. APPROACH SIGNAGE TO BE OMITTED IN ACCORDANCE WITH IAN 150/14 REV1.
5. ENTRY TAPERS WILL BE 'ALTERNATIVE' AS PER IAN 163/12.
6. WORKFORCE IN ROAD SLOW TO BE PLACED PRIOR TO THE FIRST CROSSING POINT IN A SAFE LOCATION DURING INSTALLATION & REMOVAL OF TRAFFIC MANAGEMENT.
7. STAGGERED/GHOST WALLS TO BE INSTALLED PRIOR TO WORKS AREA AGREED ON A NIGHTLY BASIS PRIOR TO THE START OF SHIFT.

KEY

DIVERSION ROUTE

ROAD CLOSURE

Revision Details	By	Check	Date	Suffix
First Issue	JB	TD	18/02/21	P02

Purpose of issue

DCO APPLICATION

Client
Highways England
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of highways england

Development Consent Order Number

TR010044

Project Title

A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title

DIVERSION ROUTE FOR A428 CLOSURE BETWEEN CAXTON GIBBET RBT AND GIRTON

Designed	Drawn	Checked	Approved	Date
	JB	PS	TD	18/02/21

Internal Project No. 60541541	Suitability D7
Scale @ A1 NTS	Zone General

Drawing Number
Highways England PIN | Originator | Volume
HE551495 -ACM -TTM -
GEN_Z_Z_ZZ -DR -CH -0005
Location | Type | Role | Number

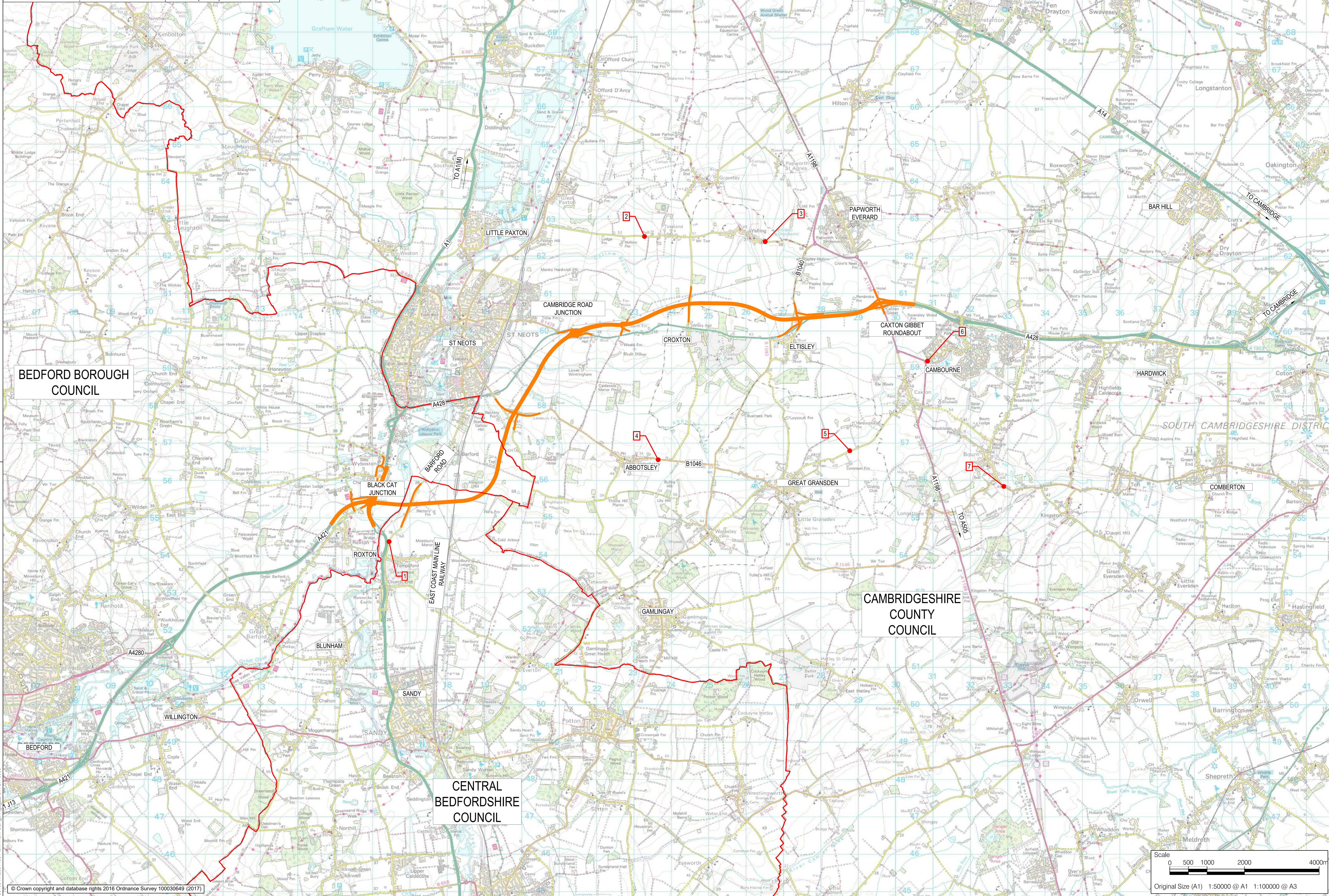
Rev
P02

Plot Date : 18 February 2021 13:57:38
File Name: C:\PWWORKING\AECOM_EU\JBUSEYT\D0352071\HE551495-ACM-TTM-GEN_Z_Z_ZZ-DR-CH-0005

Appendix E Construction phase traffic monitoring locations

Construction phase traffic monitoring locations

Location Nmuber	Village	Road
1	Little Barford	Barford Road
2	Toseland	High Street
3	Yelling	High Street
4	Abbotsley	High Street
5	Great Gransden	Caxton Road
6	Cambourne	School Lane
7	Bourn	Toft Road (B1046)



NOTES

1. DO NOT SCALE FROM THIS DRAWING, USE ONLY PRINTED DIMENSIONS.
2. ALL DIMENSIONS, CHAINAGES, LEVELS, AND COORDINATES ARE IN METRES UNLESS DEFINED OTHERWISE

KEY

- TRAFFIC MONITORING LOCATION
- COUNTY BOUNDARY
- PROPOSED DEVELOPMENT

Purpose of issue

DCO EXAMINATION

Client
National highways
Woodlands
Manton Lane
Manton Industrial Estate
Bedford
MK41 7LW

Working on behalf of national highways

Development Consent Order Number

TR010044

Project Title

A428 BLACK CAT TO CAXTON GIBBET IMPROVEMENTS

Drawing Title

CONSTRUCTION PHASE TRAFFIC MONITORING LOCATIONS

Designed	Drawn	Checked	Approved	Date
KBP	KBP	JW	PS	24/01/22

Internal Project No. 60541541 — Suitability D9

Scale @ A1 --- — Zone General

Drawing Number: National Highways PIN HE551495 - Originator ACM - Volume HGN - Location GEN_SW_Z_ZZ - Type DR - Role CH - Number 0003 — Rev P01

Final for DCO Deadline 9	KBP	PS	24/01/22	P01
Revision Details	By	Check	Date	Suffix

Plot Date : 25 January 2022 09:53:33
File Name C:\PWWORKING\PWAECOM_EU\D0501\0HE551495-ACM-HGN-GEN_SW_Z_ZZ-DR-CH-0003

Appendix F TM Options selection example

TM Options Selection

TM Option	*Details of TM Option*	*Advantages (including time, cost, customer impact, safety implications, operational impact)*	*Disadvantages (including time, cost, customer impact, safety implications, operational impact)*	*Are there further implications or additional TM requirements if this option is selected?*	*Option Selected or Rejected? (if selected, colour cell green and if rejected, colour cell red)*
1	*Full Closure of impacted junctions*	• Significant reduction in programme time	• *Unacceptable closure of SRN carriageway and junctions* • *Diversion route saturation* • *Increased zone of influence* • *Wide load restrictions* • *Unacceptable customer impact*	• *Re-alignment of junction markings* • *Destination signage alteration* • *JTR adversely affected* • *SRN capacity reduction*	
2	*Phased construction of scheme around existing junctions and impacted carriageway*	• *Potential for 24 hr working leading to reduction in programme time* • *Works carried out within VRS separated work zone* • *Minimise temporary TM installations and removal scenarios*	• *Increased cost due to sub con elements* • *Full closures required for installation of narrowed lanes (temporary lining, VRS, central signage)* • *Speed limit reductions* • *Potential JTR impact*	• *Additional full closures will be required for mainline narrow lanes installation and removal* • *Temporary mainline speed restriction maintenance*	

TM Option	*Details of TM Option*	*Advantages (including time, cost, customer impact, safety implications, operational impact)*	*Disadvantages (including time, cost, customer impact, safety implications, operational impact)*	*Are there further implications or additional TM requirements if this option is selected?*	*Option Selected or Rejected? (if selected, colour cell green and if rejected, colour cell red)*
		• *Minimal changes to TTM alignment and scenarios in regard to customer impact*	• *Increased zone of influence* • *Wide load restrictions*		
		•	•		
		•	•		
		•	•		
		•	•		

Temporary Traffic Management Design Process Decision Tool					
Document Reference No:		Drawing No:		Design Verification By:	
Project Title:		Designer & Qualification		Design Validation By:	
Project Location:		Date Created:	/	Required Review Date:	
Client/Employer:		Revision No:		Status:	*Preliminary/Comment/Approval/Final*

Against all relevant sections, add notes to describe your design process. Not all sections will be relevant to your design; any that aren't shall be marked with 'N/A'
Prior to design, Check HWM database for relevant data/historical or current schemes and existing design

Design Process Decision Tool

Use Of this Document:

It is important that thorough records of the design process are recorded and all relevant factors that may influence the design of the TM, the customer and the general project works are documented. This document works as not only a decision tool, but as an aid during the initial ECI/buildability, early -PCF stages of a project to ensure data required for accurate TTM design is gathered and utilized.

TM Design Brief:

Following the preliminary client design stage, traffic management plans will be developed with all relevant parties in order to be usable, working designs. This document is in place to allow the designer to record all actions and give 'reasons why'. The stage TM design process shall focus on detailed analysis and development of each traffic management scheme; due diligence must be applied to each design. The document is broken down into categories and aims to cover all aspects of traffic management however its purpose is not to record items in every section, only those that are specific to the design being created.

The designs should be compliant with redacted *standards and include (but are not limited to)*

1. *Clear explanation of the traffic management proposed whether illustrated, annotated or both*
2. *Safe areas of work*
3. *Acknowledgement of public interface*
4. *Safe systems of access and egress*
5. *Dimensions of all temporary arrangements, including, taper lengths, guide islands, Chicanes/kickovers/crossovers and longitudinal and lateral safety zones*

1: Scope

Appendix G Incursion risk managements, safe system of work examples

Incursion Risk Management Table

Incursion Risk	Proposed Control/Mitigation Measures
Driver following works vehicles into works access.	Close access immediately after works vehicles have entered site.
Driver entering works access of own accord (including drivers following a Sat Nav).	Ensure works access location is in suitable place i.e. consider alignment of both existing carriageway and traffic management.
Breakdown – Driver entering closure due to vehicle breaking down and becoming stationary.	Close monitoring of site surveillance. Regular maintenance checks/Traffic Safety and Control Officer (TSCO) checks.
Driver coming into contact with gate point	Full gate point Safe System of Work (SSOW).
Driver entering works at night due to confusion/sign blindness	Ensure TM design caters for associated human factors and site is easily navigable.

What are the main hazards associated with these works?	What is the method for carrying out the works safely?
Main Hazards are: • Errant vehicles • Lone Working • Subjected to abusive or violent behaviour • People and Plant interface • Reputational damage • Inclement Weather • Failure to understand the brief • Failure to brief / induct the team **What PPE should I be wearing?** 	**The Operative will:** • Receive and understand the pre-works briefing from the management team. • Will take instruction from TSCO Foreman/Supervisor during the shift. Ensure that you have received the site and area inductions. • Fully understand the escalation procedure. • Facilitate access by approved persons. • Expeditiously inform personnel at the work area if the closure is breached by the travelling public. • The traffic management vehicle should be located within the closed carriageway to further highlight the road or slip road closure, but without obstructing any approved access route. • Sidelights should be displayed during the hours of darkness but roof-mounted amber warning beacons should be switched off when stationary. • A gatemen is not expected to physically stop any persons or vehicles attempting to unlawfully enter the closed carriageway. • When dealing with members of the public, gatemen should always be polite, courteous and helpful answering any questions if they are able so to do. • Avoid at all times rude, abusive or sarcastic behaviour from gatemen towards members of the public is not acceptable no matter what provocation. • Personnel will operate with Body Worn CCTV will need the CCTV in Operation body sign. This is placed in the specific place on your hi-viz vest and must remain visible at all times

Example Safe System of Work

- Collect the body worn camera from your depots appointed person and re-familiarise yourself with its workings using the redacted user guide. Ensure the camera is fully charged and the date and time is set correctly (the date and time are essential in the event of an incident.)

- Along with the camera you will need the CCTV in Operation body sign. This is placed in the specific place on your hi-viz vest and must remain visible at all times.

- If a member of the public approaches the gate the body worn camera should be turned on before you exit the vehicle to record the event, ensure that your CCTV badge is in view at all times

- On completion of the works the CCTV camera will need to be handed back in to the appointed person so it can be recharged. Any incidents will need to be highlighted to this person so that the cameras footage can be downloaded and then stored in a secure folder on their computer so It can be used as evidence if needed to be.

The Management Team will ensure that:

- Information sheet should be provided to all gatemen detailing the escalation procedure, including all the necessary contact names and telephone numbers in the event of an incident.
- Drawings of closure points and access points is provided
- Brief operatives with *'Dealing With The Public Presentation'*
- Body worn CCTV is provided to all SAMs
- CCTV instruction sheet / operating procedure
- Ensure all personnel are briefed and inducted
- Ensure relevant Tool Box Talks are delivered – EG *'Dealing With The Public'*
- Enough vehicles are provided.
- A TSCO is allocated if required.
- Enough resource is required for Comfort breaks
- Regular communication is stipulated between teams.
- Incursions / breaches are logged on AIRSweb
- Record specific details any incidents on Near Miss or IORR system at the earliest opportunity.

- CCTV footage is retrieved and downloaded and stored in an approved place

Example Safe System of Work

What qualification / training should I have?	Sources of Health & Safety Information
• TMF NHSS 12A/B Foreman accredited. • Access point SAMs NHSS 12A/B Operative • Soft Closure point SAMs 12A/B Operative Training Course • CSCS – All SAMs • Area 4 induction all SAMs • Use Of Body Worn CCTV Briefing & TBT – All SAMs	• redacted Golden Rules • redacted Risk Assessment 017 & 030 • Chapter 8 2009 • TSRGD • Safety at Street Works and Road Works *A Code Of Practice* • HSG136 *'A Guide To Workplace Transport Safety'*
What should I do in an emergency on site?	**Occupational Health Considerations**
• Contact the TSCO or the site foreman / supervisor, the escalation procedure will be provided at the start of shift briefing. • Details for nearest A&E / Hospital will be given at the site briefing. • Record all incidents / occurrences • All incursions must be escalated to senior management who should send the details to the 'Traffic Management Incursions Working Group' • A Specific 'Road Closure Breach' pro – forma should be provided.	• All gate points will have a vehicle to provide personnel shelter from the elements and provide maximum conspicuity. • Where practical ensure adequate resources are provided to enable breaks from duties can regularly occur (4 hourly intervals is ideal)
How do I protect the environment?	**Important things to remember**
• Take all litter home • Switch off engine on vehicles at gate points • Remove all Traffic management equipment from the site.	Stop if something changes Always receive a briefing Always be fit for work CCTV instruction sheet Always turn the CCTV on when dealing with any third party or contractor Escalation procedure and remember SCAR Be polite and courteous. Always return the equipment to your Manager Ensure your Manager is aware of any data that needs downloading – this maybe needed as evidence at a later date. If members of the public become abusive, gatemen should not enter into a dispute with them, but should walk away and inform their designated supervisor.
General Information	
This safe system of work is intended to outline the system of work to be adopted for manning gate points at full road closures. It is not a method statement for deploying Traffic Management for closing the road, a site specific method statement will have been produced for that activity. A system of work is designed to outline how to undertake specific high risk activities that form the sequence of events outlined within a method statement. It is essential all / any concerns relating to Systems Of Work are escalated to ensure high risk activities are undertaken in the safest possible manner with risks totally eliminated where possible.	

Example Safe System of Work

Annex A – Vehicle Incursion Reporting Template

This form should be completed each time a vehicle incursion is witnessed. The information gained from this form will be used by Highways England to identify ways to eliminate vehicle incursions into your workplace. Please complete this form as fully as possible and hand it to your supervisor.

Name of road or contract	
Your name (This information will not be kept or used by Highways England)	
Date of incursion	
Time of incursion	
Exact location of incursion	
Weather Conditions	

Type of Incursion

- ☐ Intentional to seek benefit
- ☐ Intentional because of breakdown
- ☐ Intentional to seek information
- ☐ Unintentional – Driver confused
- ☐ Unintentional – Follow in
- ☐ Unintentional – Result of an accident

Please give any further details, including type of vehicle (use reverse of this form if required)	
Registration of vehicle (if known)	
Were the Police notified?	☐ Yes ☐ No
If yes, please give incident number	
Did the driver give any verbal abuse or threaten? physical abuse	☐ Yes ☐ No

Thank you for completing this form, the information you have provided will help us stop vehicle incursions in the future and improve your workplace safety

Example vehicle Incursion Reporting template

Gating vehicle record/log sheet			
Job title		Site name/Location	

If a vehicle stops at your gate point please record all the details listed below before you communicate with them.

IMPORTANT – BEFORE YOU SPEAK TO MEMBERS OF THE PUBLIC TURN YOUR CAMERA ON.

Date	Time	Registration number	Vehicle make/colour	COMMENTS	Abuse or Altercation YES/NO	Operatives name

Example gating vehicle record

Appendix H Roadworks Principles

NOTE: The text and tables below are from a National Highways template and will be used during the detailed design and the construction stages when developing the traffic management plan.

The table details the proposed project approach to addressing the Principles identified within Roadworks a Customer View (RACV) and the Roadworks a Customer View Implementation Toolkit. Within the table, the 'proposed approach' is the preferred option which has been selected and the project team is required to communicate the status of the project and activities completed at the current stage. The colour-coded text in the table is an indicator of the level of activities anticipated to have been completed during PCF Stage 3 and PCF Stage 5 and should be used as guidance for completing this table. This text is based on best practice within the RACV Implementation Toolkit but should not be considered exhaustive. Within 'Other options considered', project teams should record any discounted options. The RACV Implementation Toolkit should be utilised to provide further guidance regarding best practice for achieving success with regards to each Customer Principle.

Colour Coding Key

Green activities – Activities for planning, identifying and set up within PCF Stage 3 in anticipation of further detailed works to be undertaken within PCF Stage 5. These activities should also be refined within PCF Stage 5.

Blue activities – Activities to be completed during PCF Stage 5.

		Key Principles	Proposed Approach	Other options considered (rejected/discounted options)
Planning and Design of Traffic Management	1	Other roadworks and improvements	• *TM planned in co-ordination with other projects and areas across the region (National Highways and non-National Highways)* • *Consideration of diversion routes in co-ordination with other projects and areas across the region (National Highways and non-National Highways)* • *Identify local regular forums prepared to review plans for TM* • *Liaison with NOMS representative for works within the area.* • *Co-ordination of diversion routes at key decision points and publication once approved.* • *Identify and mitigate the impact of major events* • *Produce schedule for local regular forums prepared to review plans for TM* • *Signing on local roads to inform of incidents or roadworks on the SRN*	
	2	Speed of delivery	• *Review proposed key design decisions to ensure these can be constructed without significant impact on customers* • *Increasing workforce/shift patterns/productivity to maximise utilisation of the restricted road space* • *Use available technology to minimise impact and maximise productivity* • *Manufacturing components off-site*	
	3	Length of roadworks	• *Phasing of road works delivery* • *Length of road works in accordance with Traffic Signs Manual, Chapter 8, Part 3* • *Suitable traffic modelling of the TM proposals to understand the impact on the customer* • *Formal agreements for road works not in accordance with Traffic Signs Manual, Chapter 8, Part 3 requirements*	

		Key Principles	Proposed Approach	Other options considered (rejected/discounted options)
	4	Lane width	• *Consider alternative layout options, including widening non-standard/temporary 'narrow' lanes within roadworks, in design and communication of reasoning to customers* • *Consider contraflow* • *Alternate widths to facilitate traffic flows* • *Smooth road surfaces and clear demarcation during works and after TM has been removed, and ensure sufficient budget is available to maintain this*	
	5	Speed Limit	• *Options considered to maintain the permanent speed limit and why a lower speed limit is required, where applicable* • *Suitable traffic modelling of the TM proposals to understand the impact on the customer* • *Road works designed to be safe for permanent speed limit in accordance with Traffic Signs Manual, Chapter 8, Part 3*	
	6	Line demarcation	• *Removal of white line set within contracts as a standard requirement* • *Use of permanent standard white lines* • *Demarcation for night time/rain/bright sunlight conditions* • *Night time lighting requirements* • *Regular checking and maintenance*	
	7	Visibility of temporary barrier	• *Good visibility of temporary vehicle barrier* • *Visibility in narrow lanes* • *Improving visibility of temporary vehicle barrier* • *Maintenance of vehicle barrier reflectors*	
	8	Night time visibility	• *Risks and requirements of temporary lighting* • *Improving night time visibility of lanes/temporary vehicle barrier in road*	

		Key Principles	Proposed Approach	Other options considered (rejected/discounted options)
			works using temporary lighting or through the retention of existing lighting • *Alternative solutions to using temporary lighting*	
Information Provision	9	Advance notice of works	• *Providing advanced notice, i.e. a minimum of 4 weeks prior to project commencing* • *Use of billboards and VMS at roadside prior to start of roadworks* • *Information communicated through various networks/media* • *Planning for advanced notice of changes to TM provided throughout delivery*	
	10	Scheme information at the roadside	• *Dependent upon the scale of the project use of either billboards or temporary signage to display reasons and timescales for the work, including signage along diversion routes, in accordance with MPI 48-042016* • *Number and locations of billboards or temporary signage within main works and along diversion routes in respect to TM* • *Size and appearance of temporary signage/billboards across the Scheme* • *Planning for updates to billboards or temporary signage*	
	11	Electronic signage	• *Use of standard approach in accordance with the Variable Signs and Signals Policy for flexible project specific messaging and in accordance with MPI 54-062016 (reissued 15/08/2018)* • *Use and location of portable VMS for travel time and project specific messaging* • *Consideration of signing strategy with respect to information overload* • *Consistency in language across projects for VMS messages*	

		Key Principles	Proposed Approach	Other options considered (rejected/discounted options)
	12	Travel Time VMS (TTVMS)	• *Use and location of TTVMS through project TM for main works and diversion routes in accordance with MPI 54-062016 (reissued 15/08/2018)* • *Accuracy of travel time including travel time for alternative routes (diversion routes)*	
	13	Visible progress	• *Providing updates to customers about overall progress via signage within roadworks* • *Use of alternative media to provider customer updates* • *Accuracy of information in line with key milestones and completed works*	
Engaging and Communicating with Customers	14	Local communications and outreach	• *Approach/strategy for delivering good communications at the right time* • *Stakeholder mapping for project/area* • *Use of public exhibitions* • *Use of various media for communications, e.g. newsletters, radio, etc.* • *Understanding of public requirements and key events for TM* • *Diversion route engagement (pre- and post-works) to understand access requirements* • *Progress updates* • *Communications plan*	
	15	Use multiple media channels, regularly	• *Identify provision/frequency of information and media methods to be used (make proportional to project)* • *Use of NOMS to ensure accuracy of traffic data* • *Engagement with appropriate organisations to raise awareness/advertise through their sites*	

		Key Principles	Proposed Approach	Other options considered (rejected/discounted options)
	16	Impactful messages	• *Information to be communicated – programme/community/customer benefit messages* • *Identify media to be used*	
	17	Explain no activity	• *Strategy to provide explanation of no activity and manage customer perception of project* • *On-road/off-road communications approaches*	
	18	Seek customer feedback on new Traffic Management	• *Planning for early customer drive through of new traffic management to spot issues, improvements, etc.* • *Agree standard approach to seek feedback from traffic officers, customers and/or customer managers*	
	19	Understand customer experience	• *Agree approach to collecting customer feedback* • *Agree mechanisms to engage with various customers* • *Identify process for analysis of correspondence and feedback* • *Planning for use of analysis outcomes to influence future communications*	
	20	Complete the feedback loop	• *Identify strategy to communicate how customer input has influenced delivery and project management* • *Agree approach for communicating customer benefits when realised* • *Plan customer specific POPE type assessments – during and after project to share learning* • *Agree consultation strategy to collate customer views/feedback, e.g. pre-project, during construction, during operations, post-project* • *Agree use of social media to share good news stories*	

		Key Principles	Proposed Approach	Other options considered (rejected/discounted options)
			• *Identify strategy for sharing best practice, both internally and externally with customers*	