Norwich Western Link

Environmental Statement Chapter 18: Major Accidents and Disasters (MAD)

Appendix 18.1: Long List

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Contents

Tables

1 Introduction

1.1.1 The table below contains a long list of Major Accidents and Disasters Risk Events and presents whether they are to be scoped in / out of the assessment within **Chapter 18: Major Accidents and Disasters** (Document Reference 3.18.00).

Table 1 Major Accidents and Disasters Long List

MA&D Event Group	MA&D Event Category	MA&D Event Type	Technical Chapter(s) with Relevant Information	Relevant to Scheme Area	Phases which Exacerbate Vulnerability	Potential Receptors	Basis of Decision to Scope In / Out	Scope In?
Natural Hazards	Geophysical	Earthquakes	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	No	Not applicable	No	Do not occur in Britain of a sufficient intensity owing to the motion of the Earth's tectonic plates causing regional compression. In addition, uplift from the melting of the ice sheets that covered many parts of Britain thousands of years ago can also cause movement. The British Geological Survey acknowledges that on average, a magnitude 4 earthquake happens in Britain roughly every two years and a magnitude 5 earthquake occurs around every 10 to 20 years. As such the Cabinet Office National Risk Register of Civil Emergencies states that "Earthquakes in the United Kingdom are moderately frequent but rarely result in large amounts of damage. An earthquake of sufficient intensity (determined on the basis of the earthquake's local effect on people and the environment) to inflict severe damage is unlikely". The Proposed Scheme is not in or close to an active area. According to the British Geological Survey the nearest recorded earthquakes to the Proposed Scheme occurred (1) in Wymondham in 2007 approximately 14 kilometres south of the scheme which measured 1.5 on the Richter scale and occurred at a depth of 8.4 kilometres, and (2) in South Walsham in 2016 measuring 1.3 on the Richter scale and occurring at a depth of 10.8 kilometres - this was located 19 kilometres to the east of the Proposed Scheme. The largest earthquake to have been recorded near the Proposed Scheme occurred 25 kilometres south-west of the Proposed Scheme near Watton in 1994, measuring 4 on the Richter scale. As earthquakes have not caused any deaths in the UK since 1950, and buildings are damaged (not devastated) this MA&D Event type is scoped out.	No
Natural Hazards	Geophysical	Volcanic Activity	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	No	Not applicable	Not applicable	The Proposed Scheme is not in an active area and it is highly unlikely that an ash cloud could significantly impact on any aspect of the Proposed Scheme.	No
Natural Hazards	Geophysical	Landslides	Chapter 13: Geology and Soils (Document Reference 3.13.00)	Not applicable	Not applicable	Not applicable	Local landscape is reasonably flat / undulating in nature. No historical landslides have been recorded within the Red Line Boundary. There are several marl and clay pits within close proximity to the Proposed Scheme; however, these were infilled in the 1970s. Landslide Risk is assessed in the "Geology and Soils" chapter of the Environmental Statement and is recorded as "Low / Very Low" and as such has been scoped out.	No

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Natural Hazards	Geophysical	Sinkholes	Chapter 13: Geology and Soils (Document Reference 3.13.00)	Yes	Construction, Operation	Workers Road users Public and local community	Although this is likely to be covered in the geotechnical design, there are sufficient examples of roads that have been affected by sinkholes in England to warrant taking this event forward, particularly given the nature of the underlying local geology (Chalk Group) as there is a potential for natural cavities, such as sinkholes and solution pipes. The nearest sinkholes which have occurred to the Proposed Scheme occurred in Norwich city on Earlham Road, which is approximately 10 kilometres southeast of the Proposed Scheme, and on Merton Road approximately 11 kilometres away from the Proposed Scheme to the south-east. Chalk mining, sinkholes and dissolution features present a general Risk for the Proposed Scheme. The design shall take into consideration the associated Risks and include any required mitigation measures.	Yes
Natural Hazards	Geophysical	Tsunamis	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	No	Not applicable	Not applicable	The Proposed Scheme is located inland, outside a tsunami Risk zone. There have been no previously recorded tsunamis which have impacted the Study Area.	No
Natural Hazards	Hydrology	Coastal Flooding	Chapter 3: Description of the Scheme Flood Risk Assessment (Document Reference 3.12.02)	No	Not applicable	Not applicable	The Proposed Scheme is located inland, approximately 40 kilometres from the Norfolk Coast. There have been no recorded incidents of coastal flooding impacting the Study Area.	No

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Natural Hazards	Hydrology	Fluvial Flooding	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 12: Road Drainage and the Water Environment (Document Reference 3.12.00) Flood Risk Assessment (Document Reference 3.12.02)	Yes	Construction, Operation	Aquatic environment and ecological receptors Properties Road users Public and local community Workers	The Environment Agency Flood Map for Planning (Rivers and Sea) indicates that the majority of the Proposed Scheme lies within Flood Risk Zone 1 (low Risk), however parts of the Proposed Scheme are located in Flood Risk Zones 2 and 3. Flood Zone 3 is classed as having a High Probability of flooding and is assessed as land having a 1 in 100 or greater annual probability of river flooding. Flood Zone 2 is classed as having a Medium Probability of flooding and is assessed as land having between a 1 in 100 and 1 in 1,000 annual probability of river flooding. The viaduct element of the Proposed Scheme, to the northerly end, crosses a flood plain. The high flood Risk stems from the presence of the River Wensum which runs across the northern end of the Proposed Scheme and has a large catchment area. Therefore, at this site, fluvial flooding can directly cause damage to transport infrastructure, hastening the deterioration of materials. High levels of precipitation (i.e. in winter) may also damage bridge infrastructure (through increased scour and erosion of embankments) so the viaduct over the River Wensum could be affected by this. A routine monitoring programme would be implemented for the piers to identify any damage to bridge infrastructure as a result of scour / erosion. In addition, a preventative maintenance programme would be implemented to ensure that any damage to infrastructure is repaired within appropriate timescales. Existing floodplains have the potential to be impacted by any crossings and earthworks through them or by changes to nearby existing roads. However, flooding from the River Wensum in the vicinity of the Proposed Scheme is largely confined to the surrounding rural floodplain and open green space. A review of the Chronology of British Hydrological Events (2020) indicates that the largest flood on the Wensum occurred in 1912. More recently, a flood investigation report by Norfolk County Council from 2014 indicates that two rainfall events occurred on the 27th of May and the 20th of July 2014, resulting in the flooding of 80 properties within the Norwich urban area. Along the reach of interest, no flooding incidents have been reported. The latest flood event where Norfolk was listed as an affected area recorded on the NatCatSERVICE database was in December 1993 - January 1994, however the surrounding Norfolk area has been susceptible to localised flooding more recently (during summer / autumn 2019 due to heavy rainfall). A detailed assessment of flood Risk has been undertaken which concludes that there is not a significant change in the baseline conditions as a result of the Proposed Scheme. Therefore, it is not considered that a separate Major Accidents and Disasters assessment is required and as such this MA&D Event type has been scoped out.	No

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Natural Hazards	Hydrology	Pluvial Flooding	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 12: Road Drainage and the Water Environment (Document Reference 3.12.00) Flood Risk Assessment (Document Reference 3.12.02)	Yes	Construction, Operation	Aquatic environment and ecological receptors Road users Workers	The Norfolk Local Flood Risk Management Strategy highlights that there have been a number of significant historic floods in Norwich, with an event in 1912 being the greatest. 15 flooding events were reported between 2001-2009. A review of the Chronology of British Hydrological Events (2020) indicates that the largest flood on the Wensum occurred in 1912. More recently, a flood investigation report by Norfolk County Council from 2014 indicates that two rainfall events occurred on the 27th of May and the 20th of July 2014, resulting in the flooding of 80 properties within the Norwich urban area. Along the reach of interest, no flooding incidents have been reported. Review of the Environment Agency Flood Risk from Surface Water map indicates that sections of the Proposed Scheme are at high, medium and low Risk of flooding from surface water sources. Surface water flooding is also predicted to increase up to 40% over the next 100 years due to climate change in line with Environment Agency Guidance. Due to the nature of the Proposed Scheme being a highway, the introduction of impermeable surface area may increase flood Risk. Isolated sections of the Study Area are identified to be at Risk of surface water flooding due to natural depressions in topography and overland flow paths, typically associated with the watercourses that are crossed by the Proposed Scheme. The Flood Risk Assessment concludes that whilst there is a change compared to the baseline in flood frequency linked to the increases in flood depths and duration, this change compared to the baseline is negligible. The assessment also shows that increases in flood depths are constrained to those areas that are already impacted by flooding and so there would be no change to potential damage, danger or disruption resulting from a flood. The Risk of a Major Accident and Disaster associated with the operation of the Proposed Scheme during surface water flood conditions is no different to the Risk on other roads in the United Kingdom. Therefore, this Hazard can be scoped out as the Proposed Scheme would not increase Risk relative to the baseline.	No

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Natural Hazards	Hydrology	Groundwater Flooding	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 12: Road Drainage and the Water Environment (Document Reference 3.12.00) Flood Risk Assessment (Document Reference 3.12.02)	Yes	Construction, Operation	Construction workers Road users Aquatic environment	The Environment Agency's Areas Susceptible to Groundwater Flooding dataset indicates that the vast majority of the Proposed Scheme is located within an area considered to be at very low Risk of groundwater flooding. Only those areas of lower topography in close proximity to the River Wensum and the junction with the A47 (due to its proximity to the River Tud) are considered to have a higher Risk of groundwater flooding. Foundations would be required to install the proposed viaduct and bridge. Where rest groundwater levels are near the surface, groundwater back-up and emergence / flooding could pose an issue during the construction and operation of the Proposed Scheme. The Flood Risk Assessment concludes that the proposed River Wensum bridge foundations are not likely to significantly alter the groundwater / surface water hydraulic link and consequently do not represent an additional flood Risk.	No
Natural Hazards	Hydrology	Avalanches	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	No	Not applicable	Not applicable	Not considered relevant given the geographical location of the Proposed Scheme.	No

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Natural Hazards	Climatological and Meteorological	Cyclones, hurricanes, typhoons, storms and gales	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 16: Climate Resilience (Document Reference 3.16.00)	Yes	Construction, Operation	Property Workers Road users	Cyclones, hurricanes and typhoons do not occur in the United Kingdom. Storms and gales could result in damage to highway infrastructure and could affect journeys made by road users; the Proposed Scheme crosses a main river and the floodplain. Even though extreme rainfall events are experienced, the East of England has minimal rainfall in comparison to the rest of the United Kingdom. One extreme event occurred in August 2020 in Eastern England when approximately 239.9 millimetres fell in one day; however, the long-term average of total number of days where rainfall exceeded 10 millimetres between 1981 and 2010 is 1.2 annually. Eastern England is one of the more sheltered parts of the United Kingdom since the windiest areas are to the north and west. During March 2019 “Storm Gareth” hit the United Kingdom. The East of England experienced maximum gusts of 40 to 50 Knots (46 to 58 miles per hour). In October 2013, the East of England experienced maximum gusts around 70 to 80 Knots (80 to 92 miles per hour) during another storm. In February 2022, three storms hit the United Kingdom (Storm Dudley, Storm Eunice and Storm Franklin) which resulted in the issuing of a rare Met Office red warning for wind covering the East of England. Gusts of approximately 39 to 56 Knots (45 to 64 miles per hour) were recorded. The Risk of a Major Accident and Disaster associated with the operation of the Proposed Scheme during storm conditions is no different to the Risk on other elevated roads in the United Kingdom. During construction, it is only likely to be construction workers (excluded from this assessment) who are affected by construction related incidents during storm conditions, due to the location of the Proposed Scheme. Therefore, this Hazard can be scoped out as the Proposed Scheme would not increase Risk relative to the baseline.	No
Natural Hazards	Climatological and Meteorological	Thunderstorms	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 16: Climate Resilience (Document Reference 3.16.00)	Yes	Construction	Workers	During the construction phase, this type of event could result in lightning strikes to temporary elevated structures during construction (for example tower cranes) and new elevated structures (such the viaduct at the northern end of the Proposed Scheme). Required control measures would be addressed in the construction Health and Safety Plan prepared by the Principal Designer and Contractor as part of legal Construction Design Management requirements. During operation, the Risk is anticipated as being not significantly different to similar roads or road users in the locality.	No
Natural Hazards	Climatological and Meteorological	Wave surges	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	No	Not applicable	Not applicable	The Proposed Scheme is located sufficiently inland (40 kilometres from the coast), and therefore is not subject to wave surges.	No

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Natural Hazards	Climatological and Meteorological	Extreme temperatures: Heatwaves Low (sub-zero) temperatures and heavy snow	Chapter 16: Climate Resilience (Document Reference 3.16.00) Chapter 17: Population and Human Health (Document Reference 3.17.00)	Yes	Construction, Operation	Road users	This type of event could give rise to changes in climatic conditions, with road infrastructure exposed to greater heat intensity and exposure to sunlight. The Risk of a Major Accident and Disaster associated with extreme temperatures impacting road infrastructure is no different to other existing roads operating in the vicinity of the Proposed Scheme. Heavy snow could cause workers and road users to be trapped on the highway. In February to March 2018 the region experienced the most significant spell of snow and low temperatures for the United Kingdom overall since December 2010. Another snow event occurred in March 2013 - winds from the east or north, drawing bitterly cold air from northern Europe and Siberia. The hottest day in the United Kingdom on record was experienced during heatwave conditions in July 2022 with temperatures widely exceeding 35 degrees Celsius and reaching a record 40.3 degrees Celsius in Coningsby, Lincolnshire (approximately 129 kilometres north of the Proposed Scheme). This led to national disruption to transport infrastructure with temperatures causing disruption to rail and road transport, due to equipment failure and melting tarmac. Between 1981 and 2010 the summer mean temperature is 20 degrees Celsius and there have been 18 occurrences where the summer mean temperature has exceeded 25 degrees Celsius on five or more consecutive days. Mean frequency of 0.6. Between 1981 and 2010 the temperature was below zero for 1,421 days. Mean frequency of 47.3. Between 1981 and 2010 there were 3,032 days with ground frost, giving a mean frequency of 101. Between 1981 and 2010 snow fell for 497.3 days (mean of 16.6) and there was snow cover for 281.9 days (mean 9.4). The Population and human health assessment found that there is a potential increase in heat Risk for vulnerable members of the population, such as older people and children, due to potential loss of trees within the Proposed Scheme. This may consequently decrease shade provision and cooling effects from the existing trees for vulnerable walkers, cyclists and horse-riders. However, with the establishment of new roadside verge planting, it is not likely that there would be a significant effect on vulnerable walkers, cyclists and horse-riders. Specific measures are therefore not considered to be required as part of the Proposed Scheme.	No

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Natural Hazards	Climatological and Meteorological	Droughts	Chapter 13: Geology and Soils (Document Reference 3.13.00) Chapter 12: Road Drainage and the Water Environment (Document Reference 3.12.00) Chapter 16: Climate Resilience (Document Reference 3.16.00)	Yes	Construction, Operation	Aquatic environment and ecological receptors People Properties Workers Road users	Over the past 40 years or so England has experienced six long-duration droughts and two shorter periods of drought. During the 2010-12 drought, parts of eastern England recorded their lowest 18-month rainfall total in over 100 years. The East of England, where the Proposed Scheme is located, is the driest region in the United Kingdom. In 2010 to March 2012, much of central, eastern and southern England and Wales experienced a prolonged period of below average rainfall due to a sequence of dry months from winter 2009/10 to March 2012, particularly in the spring, autumn and winter seasons. For England and Wales, this was one of the ten most significant droughts of one to two years duration in the last 100 years. In August 2022, drought was declared in many parts of the United Kingdom due to a dry winter and spring, the hottest July since 1935, record-breaking temperatures and very low levels of rainfall. The Proposed Scheme should not be vulnerable to drought as water is not an essential service during the construction and operation and maintenance phases. The design of the sub-structure and bridges would be resilient to ground shrinkage and should remain in the design Risk register until designed out.	No
Natural Hazards	Climatological and Meteorological	Severe Space Weather: Solar Flares	Not applicable	No	Not applicable	Not applicable	Solar flare events are known to interrupt radio and other electronic communications. Records from solar storms in 1921 and 1960 describe widespread radio disruption and impacts on railway signalling and switching systems. There is no increased reliance on roadside technology therefore the Proposed Scheme is no more vulnerable than other routes.	No
Natural Hazards	Climatological and Meteorological	Severe Space Weather: Solar Energetic Particles	Not applicable	No	Not applicable	Not applicable	Solar energetic particles which cause solar radiation storms, but only in outer space, so this MA&D Event type can be scoped out.	No
Natural Hazards	Climatological and Meteorological	Severe Space Weather: Coronal Mass Ejections	Not applicable	No	Not applicable	Not applicable	Coronal mass ejections cause geomagnetic storms. The geomagnetic storm in 2003 caused the UK aviation sector to lose some global positioning system functions for a day, however no known significant impact on road users or infrastructure occurred.	No

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Natural Hazards	Climatological and Meteorological	Fog	Chapter 16: Climate Resilience (Document Reference 3.16.00) Norwich Western Link Annex 19: Stage 1 Safety Audit (NCCT41793, June 2020) Norwich Western Link - North Section Stage 1 Safety Audit (GEN/271, August 2022) Norwich Western Link - Central Section Stage 1 Safety Audit (GEN/271, September 2022)	Yes	Not applicable	Not applicable	Fog is one of the most common weather conditions in the United Kingdom, particularly throughout autumn and winter. Severe disruption to transport occurs when the visibility falls below 50 metres over a wide area. However, the Risk from fog for the Proposed Scheme should be no higher than the nearest existing route (reported in the Stage 1 Safety Audit report GEN/271 as the A1067, A1270 and A47). According to the June 2020 Stage 1 Road Safety Audit, as the Proposed Scheme is off-line there are no previous records of collisions except at the northern tie-in. On the A1067 and A1270 within 1 kilometre of the proposed tie-in, there have been no recorded accidents during the five-year period (2014 - 2018). The updated Stage 1 Safety Audit for the North Section (dated August 2022) states that there have been no personal injury collisions recorded over the three-year period ending June 2022 according to the collision record at the existing A1270 / A1067 roundabout. The updated Stage 1 Safety Audit for the Central Section (dated September 2022) states that no accidents have been recorded over the three-year period ending June 2022, according to the collision record for Ringland Lane in the vicinity of the overbridge. An updated Stage 1 Safety Audit has not been prepared for the Southern Section as recent route alignment changes were only to the Central and Northern Sections.	No
Natural Hazards	Climatological and Meteorological	Wildfires: Forest fire, Bush / brush, pasture	Chapter 16: Climate Resilience (Document Reference 3.16.00)	Yes	Construction, Operation	Aquatic environment and ecological receptors Properties Workers Road users	Between February and May 2019, a series of wildfires broke out across the United Kingdom. The cause of most of the fires was attributed to much higher than average temperatures and drought conditions which had prevailed since the spring of 2018. Parts of the Proposed Scheme would be located in, and be surrounded by, areas of woodland that could be at Risk of wildfire events during hot, dry periods and / or fires initiated by construction related activities. During construction, standard control measures would be implemented by the appointed contractor to manage the Risk of fire. During operation however, the Risk is no different to similar roads or road users in the locality. Specific measures are therefore not considered to be required as part of the Proposed Scheme.	No

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Natural Hazards	Climatological and Meteorological	Poor Air Quality	Chapter 6: Air Quality (Document Reference 3.06.00) Chapter 10: Biodiversity (Document Reference 3.10.00) Chapter 17: Population and Human Health (Document Reference 3.17.00)	Yes	Construction	Ecological receptors People Workers Road users	In 2006 the United Kingdom experienced two periods of extended hot weather with associated elevated ozone and harmful airborne particles. In the spring of 2015, two particle pollution episodes caused widespread poor air quality throughout the United Kingdom, with multiple areas measuring “High” on the Daily Air Quality Index and resulted in around 1,100 deaths due to exacerbation of pre-existing ill-health conditions. Summer 2015 also contained two elevated ozone episodes. **Construction:** Construction effects would be temporary for the duration of the construction phase. Increased dust emissions from construction activities and traffic could lead to potential loss of amenity at sensitive receptors. Traffic management measures may result in both positive and adverse changes to emissions from vehicle exhausts and roadside pollution concentrations. Emissions from construction plant and machinery are unlikely to give rise to significant effects. Plant and machinery would be moved around the site. Emissions would be transitory in nature and are unlikely to have a significant impact. A neutral impact on human receptors is confirmed in the Population and Human Health chapter. **Operation:** The Air Quality assessment in Chapter 6 of the Environmental Statement concludes, from a human health perspective, that the change in pollutant concentrations attributable to traffic emissions associated with the operational phase of the Proposed Scheme are negligible. Therefore, no additional mitigation is required for the operational phase of the Proposed Scheme. Emissions from the operation of the Proposed Scheme are unlikely to result in a MA&D Event. A population and human health assessment carried out as part of the Environmental Impact Assessment has found a neutral impact on human receptors as a result of the Proposed Scheme during operation. The Arboriculture chapter found a negligible impact of air quality changes on trees. Although some significant ecological impacts resulting from air quality deterioration were identified in the biodiversity chapters (for example reduced suitability of nesting sites for breeding birds), it is considered unlikely that these would lead to a MA&D Event.	No

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Natural Hazards	Biological	Disease epidemics: - Viral - Bacterial - Parasitic - Fungal - Prion	Chapter 10: Biodiversity (Document Reference 3.10.00) Chapter 13: Geology and Soils (Document Reference 3.13.00)	Yes	Construction	Aquatic and ecological receptors People Workers Road users	The Proposed Scheme is located in a developed country where the population is in general good health. Disease epidemics in England are currently limited to COVID-19, the first cases of which were identified in February 2020. COVID-19 is currently a global pandemic and the Vulnerability of the Proposed Scheme to a MA&D Event caused by this pandemic during construction and operation should be mitigated by the occupational health and safety processes that are implemented by both the contractor and Government rules and guidelines on the control of spread of COVID-19. Furthermore, the likelihood of the use of the Proposed Scheme as a highway giving rise to any disease epidemics is not considered to be any greater than that associated with other highways schemes. The United Kingdom Health Security Agency is the executive agency of the Department of Health responsible for protecting the nation from public health Hazards, and preparing for and responding to public health emergencies. One of the United Kingdom Health Security Agency's functions is to protect the public from infectious disease outbreaks and the Agency has produced a document providing operational guidance for the management of outbreaks of communicable disease, "Communicable Disease Outbreak management: Operational Guidance". Risks from Weils Disease (or leptospirosis) due to working near water were considered to be of low likelihood, but not of high consequence as a low number of people contract this disease in the United Kingdom each year. It would be unlikely for any workers to contract Weil's as appropriate personal protective equipment would be worn and any Risks managed in the construction environmental management plan.	No
Natural Hazards	Biological	Animal Diseases: - zoonotic: • avian influenza • West Nile virus • Rabies - non-zoonotic: • foot and mouth • swine fever	Chapter 10: Biodiversity (Document Reference 3.10.00) Chapter 13: Geology and Soils (Document Reference 3.13.00)	Yes	Construction	Aquatic and ecological receptors People Workers Road users	Low and highly pathogenic avian influenza has been recorded in poultry in the UK several times in the last 10 years, most recently in the winter of 2021/22 and 2022/23, although with no human cases reported. There was a devastating foot and mouth outbreak in 2001. However, there are no recorded foot and mouth burial pits in the Norwich area. This MA&D Event type has been scoped out as it is not likely that the use of the Proposed Scheme (highway) is going to be the source of any disease epidemics and greater than that associated with other highway schemes, and spread would be controlled through containment of infected animals including prohibition of transportation.	No
Natural Hazards	Biological	Plants	Chapter 10: Biodiversity (Document Reference 3.10.00)	No	Construction	Aquatic and ecological receptors People Workers	The Biodiversity chapter of the Environmental Statement does not consider Invasive Non-Native Species to be Important Ecological Features but management of them to stop their spread has been considered in developing the mitigation measures for the Proposed Scheme. If identified during construction, standard control measures would be implemented by the appointed contractor to handle and dispose of any diseased plants and / or injurious weeds, and prevent their spread.	No

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Technological or Manmade Hazards	Societal	Extensive public demonstrations which could lead to violence and loss of life.	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 17: Population and Human Health (Document Reference 3.17.00)	Yes	Construction	Road users Public and local communities	The Proposed Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts. Although the Proposed Scheme has been subject to some local controversy (relating to access issues with landowners, some camera footage of surveyors, and a coordinated campaign focusing on environmental issues and local amenity), the Proposed Scheme is not considered sufficiently controversial to result in large demonstrations or unrest that may lead to violence.	No
Technological or Manmade Hazards	Societal	Widespread damage to societies and economies.	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 17: Population and Human Health (Document Reference 3.17.00)	No	Not applicable	Not applicable	The Proposed Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	No
Technological or Manmade Hazards	Societal	The need for large-scale multi-faceted humanitarian assistance.	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 17: Population and Human Health (Document Reference 3.17.00)	No	Not applicable	Not applicable	The Proposed Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	No
Technological or Manmade Hazards	Societal	The hindrance or prevention of humanitarian assistance by political and military constraints.	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 17: Population and Human Health (Document Reference 3.17.00)	No	Not applicable	Not applicable	The Proposed Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	No
Technological or Manmade Hazards	Societal	Significant security Risks for humanitarian relief workers in some areas.	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 17: Population and Human Health (Document Reference 3.17.00)	No	Not applicable	Not applicable	The Proposed Scheme is located in a developed country that has steady, yet small population growth. England is politically stable with no direct border with countries experiencing conflicts.	No

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Technological or Manmade Hazards	Societal	Famine	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 17: Population and Human Health (Document Reference 3.17.00)	No	Not applicable	Not applicable	The Proposed Scheme is located in a developed country that produces its own crops and imports food. It is politically stable and not subject to hyperinflation and therefore food is available, whether produced within the United Kingdom or imported. Famine is also not relevant to the use of the Proposed Scheme (highway).	No
Technological or Manmade Hazards	Societal	Displaced population	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 17: Population and Human Health (Document Reference 3.17.00)	No	Not applicable	Not applicable	There would be no significant displacement of populations as part of the Proposed Scheme. There is potential for permanent significant adverse effects on private farm properties, where potential land take and demolition are required. However, given that there are no secured housing allocations located within or adjacent to the Red Line Boundary, it is anticipated that there would be no impact on housing land.	No
Technological or Manmade Hazards	Industrial and Urban Accidents	Major Accident Hazard Chemical sites	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	No	Not applicable	Not applicable	There are no Control of Major Accident Hazard sites within a 2.5 kilometre linear buffer along the Proposed Scheme (buffer zone is 2.5 kilometres on each side of the proposed route). The nearest Control of Major Accident Hazard site is approximately 4.3 kilometres to the north / north-east of the Proposed Scheme. This constitutes Felthorpe (operated by Hook 2 Sisters Limited) and is a lower tier agricultural establishment. Flammable liquids and gases, in the form of liquefied petroleum gas storage, are stored on site at the Control of Major Accident Hazard site but these are too far away to result in a MA&D Event for the Proposed Scheme.	No

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Technological or Manmade Hazards	Industrial and Urban Accidents	Major Accident Hazard Pipelines	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	Yes	Construction, Operation, Maintenance	Workers Road users Public and local communities	A National Grid high pressure natural gas pipeline, parts of whose inner and outer zones overlap with several areas within the Red Line Boundary of the Proposed Scheme, is present. This is classified as a Major Accident Hazard Pipeline. **Construction and Maintenance:** The Proposed Scheme involves construction works in close proximity to the existing pipeline. There would be an increased Risk of a MA&D Event during the construction and maintenance phases due to the nature of the work required. However, any work within the Major Accident Hazard Consultation Zone of the pipeline must be undertaken with the agreement of the pipeline operator, which would include providing Risk assessment and method statements covering the works before they can commence, under existing legal requirements of the Pipelines Safety Regulations 1996. The construction phase and maintenance of the road would be considered further as part of the assessment. **Operation:** Compared to the baseline there would be an increase in the societal Risk due to the presence of road users which did not previously exist within the Major Accident Hazard Consultation Zone. However, this would be a transient population with only a small period of time exposed to Risk. There would also be periods of time with no population present. Therefore, it is considered unlikely that the presence of the pipeline would lead to a MA&D Event during the operational phase.	Yes
Technological or Manmade Hazards	Industrial and Urban Accidents	Nuclear	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	No	Not applicable	Not applicable	Nuclear sites are designed, built and operated so that the chance of accidental releases of radiological material in the United Kingdom is extremely low. The last historical Major Accident in the United Kingdom was Windscale in 1957. There are no nuclear sites within a 5 kilometre corridor along the Proposed Scheme. The nearest nuclear site is Sizewell B Power Station which is located approximately 60 kilometres to the south of the Proposed Scheme on the Norfolk coast.	No
Technological or Manmade Hazards	Industrial and Urban Accidents	Fuel storage	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	No	Not applicable	Not applicable	In December 2005 Europe's largest peacetime fire occurred at the Buncefield Oil Storage Terminal in Hemel Hempstead, England. The surrounding area was temporarily evacuated and some local businesses experienced long-term disruption to operations. There are no bulk fuel storage sites identified within the Study Area. Baseline data indicates potential for hydrocarbons / petroleum in certain areas of the site (north) where made ground is present – this, however, is associated with existing tracks and roads (access points). This is not anticipated to change as a result of the Proposed Scheme.	No

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Technological or Manmade Hazards	Industrial and Urban Accidents	Dam breaches	Chapter 12: Road Drainage and the Water Environment (Document Reference 3.12.00) Flood Risk Assessment (Document Reference 3.12.02)	No	Not applicable	Not applicable	Dam breaches in the United Kingdom are rare; the last major breach was at the Cwm Eigiau dam in 1925, which caused 17 fatalities and widespread flooding. However, there was the potential for the dam in Whaley Bridge at Toddbrook Reservoir to give way in August 2019 after prolonged heavy rainfall which has heightened concerns. The Environment Agency's Flood Risk from Reservoirs mapping shows that parts of the study area typically at fluvial flood Risk (Flood Zone 2 and Flood Zone 3) are also at Risk of flooding from reservoir failure. This is the floodplain of the River Wensum. The single reservoir upstream in the catchment which poses a Risk to the Proposed Scheme in the event of structure failure is Haveringland Lake on the Trout Steam tributary of the River Wensum upstream of Attlebridge. Risk of flooding from reservoirs has a very low likelihood of occurring in any given year. Reservoirs are inspected regularly by a suitably qualified reservoir inspecting engineer to ensure that Risk of failure is minimised. The Proposed Scheme is therefore considered to be at low Risk of flooding from artificial sources.	No
Technological or Manmade Hazards	Industrial and Urban Accidents	Mines and storage caverns	Chapter 13: Geology and Soils (Document Reference 3.13.00)	No	Not applicable	Not applicable	Coal Authority records state that there are no areas of coal workings. There are several marl and clay pits within close proximity to the Proposed Scheme that appear to have been infilled in the 1970s. These were quarry pits which have been potentially infilled; these are not mines. The Study Area has remained relatively unchanged throughout the 20th Century until the present. Proposed bridge structures would be treated as areas where possible unrecorded workings would pose an unacceptable Risk. **Section 13.5.20** of **Chapter 13: Geology and Soils** (Document Reference 3.13) identifies the presence of a historical opencast chalk pit to the north-west of the Site Boundary. This Risk should remain in the Proposed Scheme design Risk register (as required by the Construction Design Management Regulations 2015) to avoid / minimise the likelihood of a MA&D Event and ensure that appropriate mitigation is in place.	No
Technological or Manmade Hazards	Industrial and Urban Accidents	Fires	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 8: Cultural Heritage (Document Reference 3.08.00) Chapter 17: Population and Human Health (Document Reference 3.17.00)	Yes	Construction	Cultural heritage sites People Road users	**Urban fires:** There are no significant urban developments in close proximity of the Proposed Scheme. **Industrial fires:** There is a scrap yard (Anglian Metals) located within the Study Area on The Broadway 100-300 metres from the nearest point of the Proposed Scheme. The nearest petrol station is at Taverham 2.4 kilometres away. **Construction phase:** Fires could be initiated by construction-related activities which impact areas adjacent to the construction activities. During construction, standard control measures would be implemented by the appointed contractor to manage the Risk of fire to as low as reasonably practicable under existing fire and health and safety related legislation. Therefore, further consideration is not required with regard to Major Accidents and Disasters.	No

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Technological or Manmade Hazards	Transport Accidents	Road	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 13: Geology and Soils (Document Reference 3.13.00) Chapter 12: Road Drainage and the Water Environment (Document Reference 3.12.00) Chapter 17: Population and Human Health (Document Reference 3.17.00) Norwich Western Link Annex 19: Stage 1 Safety Audit (NCCT41793, June 2020) Norwich Western Link - North Section Stage 1 Safety Audit (GEN/271, August 2022) Norwich Western Link - Central Section Stage 1 Safety Audit (GEN/271, September 2022)	Yes	Construction, Operation	Aquatic environment and ecological receptors Properties Workers Road users	Significant transport accidents occur across the United Kingdom on a daily basis, mainly on roads, and involving private and / or commercial vehicles. During construction there would be an increase in heavy construction plant and equipment on the local road network which may increase the Risk of accidents or create access issues. There are no existing accident rates as the Proposed Scheme is off-line (no road currently exists). The June 2020 Stage 1 Road Safety Audit states that accident records for the location indicate that there have been no reported accidents in the five-year period of 2014-2018. The updated Stage 1 Road Safety Audits (GEN/271) indicate that there have been no recorded accidents in the three-year period ending June 2022 on existing nearby tie-in roads. The Stage 1 Road Safety Audit (GEN/271) identifies potential issues which could lead to road traffic accidents. However, it is clear from the narrative of the report that the designer has considered these issues and where necessary amended the design. The Risks have therefore been reduced to as low as reasonably practicable. The Population and Human Health chapter found a slight increase in road safety for pedestrians due to a diversion of a footpath to a safer route, as an embedded mitigation measure. A traffic assessment for the Proposed Scheme found no impact on existing accident clusters during construction and improved road safety during operation. As such road traffic accidents resulting in a Major Accident and / or Disaster have been scoped out from further assessment in this chapter.	No
Technological or Manmade Hazards	Transport Accidents	Rail	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 13: Geology and Soils (Document Reference 3.13.00) Chapter 12: Road Drainage and the Water Environment (Document Reference 3.12.00)	No	Not applicable	Not applicable	There are no railways within the Study Area.	No

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Technological or Manmade Hazards	Transport Accidents	Waterways	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 12: Road Drainage and the Water Environment (Document Reference 3.12.00)	No	Not applicable	Not applicable	There are none located in the Study Area used for significant transport by water. No historical evidence of waterway accidents impacting the road network.	No
Technological or Manmade Hazards	Transport Accidents	Aviation	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Wildlife Hazard Management Design Risk Assessment and Suitability Statement	Yes	Construction	Workers Road users Public and local communities	There have been no major air accidents in the UK since the Kegworth incident in 1989. Norwich International Airport lies approximately 6 kilometres east of the Proposed Scheme. The Proposed Scheme does fall into the 13 kilometre safeguarding zone around the airport. At this distance, it is considered that the height of any construction equipment (e.g. cranes) or formation of drainage ponds would significantly increase the Risk to aircraft operating into / out of the airport. The Risk of an aircraft accident impacting the Proposed Scheme is considered no greater than existing roads in the immediate area. A Wildlife Hazard Design Risk Assessment has been undertaken to identify the potential features and activities that could lead to increased wildlife Hazard Risks for aircraft using both Norwich Airport and Norwich Hospital Helicopter Landing Site and their surrounding critical airspace. The Risk assessment identifies required management actions which would be implemented through a Wildlife Hazard Management Plan for the Proposed Scheme.	Yes
Technological or Manmade Hazards	Pollution Accidents	Air	Chapter 6: Air Quality (Document Reference 3.06.00) Chapter 10: Biodiversity (Document Reference 3.10.00)	Yes	Construction	People Road users Ecological receptors	Use of fossil fuelled mobile plant and equipment during the construction phase; however, emissions from mobile plant and equipment covered under health, safety and environmental legislation. Diverted traffic during construction phase may lead increase of traffic along the diversion route and this has a potential to increase pollutant concentrations in the vicinity of the diversion route on a temporary basis. The Proposed Scheme is an open, rural location. This has been considered further in Chapter 6: Air Quality of the Environmental Statement but it is not anticipated to result in a MA&D Event. Impacts on ecological receptors are considered in the biodiversity chapter.	No

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Technological or Manmade Hazards	Pollution Accidents	Land	Chapter 13: Geology and Soils (Document Reference 3.13.00) Chapter 12: Road Drainage and the Water Environment (Document Reference 3.12.00)	Yes	Construction, Operation	Ecological receptors Local heritage Public and local community	During construction there may be an increase in the Risk of leaks and spillages of hazardous materials associated with the construction activities. Use of fossil fuels and storage of lubricants and oils for mobile plant and equipment during the construction phase are a potential source of spillage which could impact the Site of Special Scientific Interest and Special Area of Conservation and other sensitive receptors. Means of prevention would be addressed in the Construction Design Management Risk register and Construction Environmental Management Plan. Consultation was undertaken with the Environment Agency in November 2019. The proposed route does not cross current landfills. Attlebridge Landfill, a safeguarded waste management facility and former landfill site, intersects a small part of the northern Site Boundary of the Proposed Scheme. Norfolk County Council noted that construction works in this area may indirectly impact the aftercare of the former waste facility. The Environment Agency stated that they did not envisage issues resulting from this site. No hazardous landfill sites are present within the region. During the operational phase there is a Risk of contaminated highway runoff and accidental spillages from the Proposed Scheme, infiltrating into the aquifer. The Risk comes from surface contamination sources, such as accidental vehicle spillages or fluid leakages, or routine highway runoff which may be mildly contaminated. The Road Drainage and Water Environment Chapter concluded that the proposed drainage design should be sufficient to mitigate these Risks and the less permeable layers within the superficial deposits may offer some protection to the underlying principal aquifer. On this basis, it is not considered necessary to further assess this Risk for Major Accidents and Disasters.	No

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Technological or Manmade Hazards	Pollution Accidents	Water	Chapter 13: Geology and Soils (Document Reference 3.13.00) Chapter 12: Road Drainage and the Water Environment (Document Reference 3.12.00)	Yes	Construction, Operation	Public and local community Water environment	The Proposed Scheme lies above a Principal Aquifer (bedrock), Secondary A aquifers, and Secondary B aquifers. The Proposed Scheme is also located within a Groundwater Source Protection Zone 3 Total Catchment and is approximately 2.1 kilometres northwest of an Inner Source Protection Zone (SPZ 1). The Proposed Scheme is located in a surface water and groundwater Nitrate Vulnerable Zone. The nearest licensed groundwater abstraction is within the Site Boundary, where water is abstracted from the chalk aquifer for general farming and domestic use. The closest surface water abstraction is from the River Wensum at Ringland within the north-western Site Boundary, for general agriculture for direct use and storage for spray irrigation. Some abstraction wells are deregulated or abstract groundwater quantities too small to be recognised as a licensable abstraction point. The minimum and maximum registered daily abstraction limits are 2 metres cubed per day and 3,273 metres cubed per day. It is possible that such unregistered abstraction points are present within the Site Boundary. During construction there may be an increase in the Risk of leaks and spillages of hazardous materials associated with the construction activities. During construction, standard control measures would be implemented by the appointed contractor to manage the Risk of spillages and leaks. It is anticipated that any contaminants encountered during construction would be remediated. During operation, any spills or leaks would be directed to the drainage system which forms part of the road design. The Risks associated with accidental spillage of pollutants has been considered and assessed within the Road Drainage and Water Environment Chapter. This Chapter states that: “the proposed drainage design should be sufficient to mitigate these Risks and the less permeable layers within the superficial deposits may offer some protection to the underlying principal aquifer.” It identifies that additional mitigation may be required in the form of closing manual penstocks and implementing a clean-up operation, before the drainage system can be reinstated. The Chapter concludes that the residual effect on principal aquifer is not significant following the implementation of mitigation measures. The mitigation measures identified in the Road Drainage and Water Environment Chapter are considered sufficient to ensure that a MA&D Event would not occur. On this basis, the Risk of pollution accidents to water has been scoped out from further assessment.	No

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Technological or Manmade Hazards	Utilities Failure	Electricity	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	Yes	Construction	Public and local community Workers	Instances of electricity failure (also referred to as power loss or blackout) can be caused by a number of things, such as severe weather (e.g. very strong winds, lightning and flooding) which damage the distribution network. These tend to be mainly specific places, local (e.g. in the metropolitan area) and less frequently regional as a result of severe winter storms and consequent damage to the distribution overhead line network. Underground and above-ground electrical transmission lines are present across the Proposed Scheme, the responsibilities of which lie with the relevant local operator or company should this infrastructure fail. However, the Proposed Scheme includes the diversion and burial of 11 kilovolt-amps overhead transmission lines along Ringland Road. No pylons are being removed. The overhead transmission lines would be removed and replaced in an underground trench as per United Kingdom Power Networks (public utility owner) letter to WSP dated 27/12/2019. United Kingdom Power Networks would be responsible for undertaking the works. Information regarding these diversion works has been considered in the Environmental Statement. In addition, the 132-kilovolt line crossing the Proposed Scheme is likely to require diversion either above or below ground. Any works associated with this diversion would be undertaken by the asset owner. The potential Risk of construction-related incidents when undertaking these diversion works as part of the Proposed Scheme would be covered by existing legislation in addition to remaining in the design Risk register.	No
Technological or Manmade Hazards	Utilities Failure	Gas	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	Yes	Construction	Workers Road users Public and local communities	Underground and above-ground gas transmission pipelines are present across part of the Red Line Boundary, the responsibilities of which lie with the relevant local operator or company should this infrastructure fail. A high-pressure natural gas pipeline is within the study area and is considered separately above under the Major Accident Pipelines MA&D Event category. Information regarding diversion works of the natural gas pipeline has been considered in this chapter of the Environmental Statement. The potential Risk of construction-related incidents when undertaking diversion works as part of the Proposed Scheme would be covered by existing legislation in addition to remaining in the design Risk register. No ongoing gas use is associated with the Proposed Scheme.	No

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Technological or Manmade Hazards	Utilities Failure	Water supply	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	No	Not applicable	Not applicable	The Norwich and the Broads and / or the Norfolk Rural North Water Resource Zone serves the area of the Proposed Scheme. Neither of these Water Resource Zones are classified as “vulnerable to severe drought” in Anglian Water's latest Water Resource Management Plan (2019). The Proposed Scheme is located within a Source Protection Zone III for total catchment. There is one licensed groundwater abstraction point within the Site Boundary. No water use is associated with the Proposed Scheme during its operation and relatively low use during construction which could be addressed by bringing supplies in by tanker, if required.	No
Technological or Manmade Hazards	Utilities Failure	Sewage system	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	No	Not applicable	Not applicable	No use of the sewage system is associated with the Proposed Scheme. During the construction phase, temporary portable systems will be in place covered by health and safety welfare requirements.	No
Technological or Manmade Hazards	Malicious Attacks	Unexploded ordnance	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 13: Geology and Soils (Document Reference 3.13.00)	Yes	Construction	Property Public and local community Workers	The potential exists for encountering unexploded ordnance (UXO) during construction of the Proposed Scheme due to the proximity of the former RAF Attlebridge airfield. This airfield, which is located approximately 500 metres to the west of the Proposed Scheme, was operational during World War 2 and for a short period after its conclusion (1941-1950). . As outlined in **Section 13.5** of **Chapter 13: Geology and Soils** (Document Reference 3.13.00), a detailed UXO Risk assessment identified numerous historic bombing incidents within proximity of the Site Boundary although none within the Site Boundary. The reports also highlight the Risks associated with historic World War 2 military training activities at Morton Hall Estate as well as RAF Attlebridge. The Risk associated with German air dropped weapons and British anti-aircraft munitions was assessed as low, however the Risk from other munitions within zoned areas of the Proposed Scheme was assessed as medium where there is an elevated risk. Within areas determined to be at medium Risk, the CEMP would include the requirement for a UXO Engineer to be retained on-site in order to detect for excavations and earthworks and safely manage UXO items, prior to and during construction. Measures would be undertaken during construction to brief operatives to raise awareness of this issue, and to define appropriate response strategies should UXO be discovered during the works. There would be a limited Risk of UXO affecting the Proposed Scheme, once operational but no greater than similar schemes in the area. On this basis, the Risk of UXO has been scoped out from further assessment.	No

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Technological or Manmade Hazards	Malicious Attacks	Attacks Chemical Biological Radiological Nuclear	Not applicable	No	Not applicable	Not applicable	Extremists remain interested in Chemical, Biological, Radiological and Nuclear materials, however alternative methods of attack such as employing firearms or conventional explosive devices remain far more likely. Historical use has been in closed densely occupied structures (underground, buildings) or targeted at specific individuals. The Proposed Scheme is unlikely to be a target for this type of event due to the low number of exposed targets vulnerable to malicious attacks.	No
Technological or Manmade Hazards	Malicious Attacks	Transport systems	Not applicable	No	Not applicable	Not applicable	Potential systems would include (but are not limited to) railways, buses, passenger ferries, cargo vessels and aircraft. The Proposed Scheme is unlikely to be a target for this type of event due to the low number of exposed targets vulnerable to malicious attacks.	No
Technological or Manmade Hazards	Malicious Attacks	Crowded places	Not applicable	No	Not applicable	Not applicable	The Proposed Scheme does not fall within the definition of a crowded place, i.e. pedestrian routes and other thoroughfares as well as sports arenas, retail outlets and entertainment spaces. The Proposed Scheme is unlikely to be a target for this type of event due to the low number of exposed targets.	No
Technological or Manmade Hazards	Malicious Attacks	Cyber	Not applicable	No	Not applicable	Not applicable	Cyber-attacks occur almost constantly on key national and commercial electronic information, control systems and digital industries. There is no increased reliance on roadside technology which could render the Proposed Scheme vulnerable to a cyber-attack.	No
Technological or Manmade Hazards	Malicious Attacks	Infrastructure	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	No	Not applicable	Not applicable	Terrorists in the UK have previously attacked, or planned to attack, national infrastructure. The Proposed Scheme would have minimal impact on local infrastructure and is not considered as a high-profile attack target.	No
Technological or Manmade Hazards	Engineering accidents and failures	Bridge failure	Chapter 3: Description of the Scheme (Document Reference 3.03.00) Chapter 16: Climate Resilience (Document Reference 3.16.00)	Yes	Construction, Operation	Aquatic environment and ecological receptors People Road users Workers	Bridge works are proposed as part of the Proposed Scheme. A viaduct is being constructed at the northerly end of the Proposed Scheme to adjoin the new road to the existing A1067 and cross the River Wensum and there are several smaller bridge features along the proposed route where existing roads are being crossed. These structures have been designed to meet modern safety standards, which reduces their likelihood of future failure and should be addressed as part of the Construction Design Management Risk register. Routine inspections and preventative maintenance would be carried out throughout the lifetime of the Proposed Scheme. The Risk associated with the Proposed Scheme of this MA&D Event is considered no greater than other similar roads that include new structures designed to comparable standards.	No
Technological or Manmade Hazards	Engineering accidents and failures	Flood defence failure	Chapter 12: Road Drainage and the Water Environment (Document Reference 3.12.00)	No	Not applicable	Not applicable	The Study Area associated with the Proposed Scheme does not benefit from flood defences or flood storage areas. The design of the Proposed Scheme has been developed to include allowances for future climate change predictions that could result in flooding.	No

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Technological or Manmade Hazards	Engineering accidents and failures	Mast and tower collapse	Not applicable	Yes	Not applicable	Not applicable	The only towers and masts in close proximity to the Proposed Scheme are telegraph poles and electricity poles / pylons. However, no pylons are being removed, only the 11 kilovolt-amps lines along Ringland Lane are being diverted and buried. In addition, the 132-kilovolt line crossing the Proposed Scheme is likely to require diversion either above or below ground. Any works associated with this diversion will be undertaken by the asset owner.	No
Technological or Manmade Hazards	Engineering accidents and failures	Property or bridge demolition accidents	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	Yes	Construction	People Road users Workers	The Proposed Scheme involves removal of a small number of existing trees and vegetation and fences and gate structures. Where the Norwich Western Link ties-in, and in a section of the A1067 dualling, existing pavement and roadside furniture would be removed if these cannot be retained. The Risks of accidents occurring during these works would be taken into account by the appointed Principal Contractor, and considered as part of their detailed methodology and Risk assessments in advance of these works as required under the Construction Design Management Regulations 2015.	No
Technological or Manmade Hazards	Engineering accidents and failures	Tunnel failure/fire	Chapter 3: Description of the Scheme (Document Reference 3.03.00)	No	Not applicable	Not applicable	There are no tunnel structures proposed as part of the Proposed Scheme or within the Study Area.	No