

A417 Missing Link  
TR010056

6.4 Environmental Statement  
Appendix 4.4 Major Accidents and  
Disasters Long List and Short List

Planning Act 2008

APFP Regulation 5(2)(a)  
Infrastructure Planning (Applications: Prescribed Forms and  
Procedure) Regulations 2009

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**A417 Missing Link**

Development Consent Order 202[x]

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<b>Regulation Number:</b>	5(2)(a)
<b>Planning Inspectorate Scheme Reference</b>	TR010056
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C01	May 2021	Application Submission

Major event		Relevance to Scheme	Potential receptors	Include on short list?
<b>Natural disasters</b>				
<b>1 Geological disasters</b>				
1.1	Slope instability, including landslides and rockfall	There is a history of landslides in the study area, and the existing slopes have been reported to be marginally stable. The cutting slopes could generate global instability during construction due to unforeseen ground conditions (e.g. presence of gulls) or reactivation of relic landslides. Severe weather can trigger slope instability, for example through increased pore water pressure. This could be exacerbated by a projected 47% increase in pore water pressures in the winter months due to climate change.	Road users Infrastructure Construction workers Maintenance workers Environment & Landscape	Yes
1.2	Earthquakes	The site is not in a seismically active area and as such earthquakes are not considered to be a risk to, or can occur as a result of, the scheme.	N/A	No
1.3	Sinkholes	Construction over previously mined areas may accelerate natural rates of subsidence or collapse of shallow underground mine workings. Construction over unforeseen ground conditions (e.g. presence of gulls, natural cavities or dissolution features) and consolidation and differential settlement of compressible soils due to applied load embankment materials could generate sinkholes.	Road users Infrastructure Construction workers Environment & Landscape	Yes
1.4	Volcanic eruptions	The site is not in a volcanic area. Although volcanic eruptions can impact on air travel, it is considered highly unlikely that an ash cloud could significantly impact on any aspect of the scheme.	N/A	No
<b>2 Hydrogeological disasters</b>				
2.1	Floods	There's a history of flooding on the A417, and the project has the potential to exacerbate this flooding by altering flow paths (e.g. the diversion of Norman's Brook culvert) and increasing peak run-off - this should be considered in terms of the risk to the scheme and the increased risk to receptors due to the scheme.	Waterways Infrastructure Road users Downstream water environment and communities	Yes
2.2	Tsunami/storm surge	Not applicable as the site is not in a coastal location.	N/A	No
<b>3 Meteorological disasters</b>				
3.1	Blizzards, storms and gales	Blizzards could cause adverse conditions on the scheme, causing accidents, traffic delays or trapping road users. A wind tunnelling effect could also be produced by the proposed cuttings at Crickley Hill.	N/A	Yes
3.2	Fog, mist and reduced visibility	Severe weather could cause decreased visibility on the approach up or down Crickley Hill. This could worsen with a projected 47% increase (2070-2099) in precipitation in the winter months due to climate change.	Road users	Yes
3.3	Cyclonic storms	Not applicable to the UK climate.	N/A	No
3.4	Droughts	Droughts are considered a disaster when a sustained lack of rainfall causes a water shortage. This can cause fatalities amongst vulnerable groups, disruption to essential services, environmental damage and additional pressure on healthcare. The scheme is not considered to be vulnerable or a potential contributor to drought.	N/A	No
3.5	Lightning strikes	There are several new bridge structures being constructed. However, the risk is not considered to be any greater than any other road bridge.	N/A	No
3.6	Hail storms	Hail storms could cause adverse conditions on the scheme, causing accidents, slow moving traffic or traffic delays. However, the risk to the scheme is considered no greater than the current A417. Consideration should be given to changing conditions due to climate change, and the scheme will be designed to account for this.	N/A	No
3.7	Heatwaves	Heatwaves are considered a disaster when high temperatures last several weeks, harming people's health. This can cause fatalities amongst vulnerable groups, environmental damage and additional pressure on healthcare. The scheme is not considered to be vulnerable or a potential contributor to heatwaves.	N/A	No
3.8	Low (sub-zero) temperatures	Winter temperatures are projected to increase by between 1.1 and 5 degrees (2070-2099) from current levels due to climate change. This can cause fatalities amongst vulnerable groups, environmental damage and additional pressure on healthcare. The scheme is not considered to be vulnerable or a potential contributor to low temperatures.	N/A	No
3.9	Tornadoes	Although tornadoes have been known to occur in the UK, their destructive force is less than that in other parts of the world. The scheme is not considered more vulnerable to tornadoes than the existing A417 or any other development, nor will the scheme contribute to the hazard of tornadoes.	N/A	No

Major event		Relevance to Scheme	Potential receptors	Include on short list?
3.10	Wildfires	There is potential for scrub, grassland or heathland fires, especially given the expected increase in temperatures and heatwaves associated with climate change. Although the scheme is considered no more vulnerable than the existing A417, and is expected to reduce the accident rate due to improved traffic flow limiting potential wildfire sources, wildfires still require some consideration.	Road users Infrastructure Ecology Environment & landscape Residents	Yes
3.11	Air quality events	Vehicle emissions can contribute to poor air quality, and smog can be induced by weather events - temperature inversions - 'trapping' pollution. These events are more likely in dense urban areas with multiple sources of pollution, although events have been known to occur in the Welsh valleys near industrial sites.	Road users Residents Ecology Environment & landscape	Yes
<b>4 Space disasters</b>				
4.1	Impact events and airburst	The scheme is considered no more vulnerable than the existing A417 or any other development.	N/A	No
4.2	Solar flare	Solar flares can interrupt radio and other electric communications. The increased reliance on roadside technology could mean the scheme is more vulnerable than the existing A417.	Motor vehicles Electrical infrastructure	Yes
<b>5 Transport</b>				
5.1	Road accidents	A driving factor for the scheme is to increase safety on a road that has an above-average accident rate. Although the aim of the scheme is to increase traffic flow and hence reduce accidents, there is still the potential for fatal accidents. There is also a risk posed by spillage from hazardous loads as a result of a road traffic accident. This risk is unlikely to increase due to the scheme.	Road users Infrastructure	Yes
5.2	Rail accidents	No railways are located within the study area.	N/A	No
5.3	Aircraft disasters	The scheme is considered no more vulnerable than the existing A417 or any other development.	N/A	No
5.4	Maritime disasters	Not applicable as the site is not in a coastal location.	N/A	No
<b>6 Engineering accidents/failures</b>				
6.1	Bridge collapse or failure	There are structures in the scheme that could be at risk of collapse, including the overbridge and underbridge crossings and retaining walls.	Construction workers Infrastructure Road users	Yes
6.2	Tunnel collapse or failure	There are no tunnels designed into the scheme.	N/A	No
6.3	Dam failure	There are no dams in the study area.	N/A	No
6.4	Flood defence failure	There are no formal flood defences in the scheme area.	N/A	No
6.5	Mast and tower collapse	There are radio communication and telecommunication masts in the study area servicing EE, O2 and Vodafone. The emergency services use the EE tower on the escarpment for their communications.	Infrastructure Businesses Emergency services Residents	Yes
6.6	Building failure or fire	There is the potential for building collapse during the demolition phase.	Construction workers Property and infrastructure	Yes
6.7	Temporary structure failure	There is the potential for temporary structure failure during the construction of elements of the scheme. This could be due to inclement weather, an infrastructure strike by road traffic or a lack of maintenance of temporary structures during construction.	Construction workers Infrastructure Road users	Yes
6.8	Utilities failure (gas, electricity, water, sewage, oil communications)	There are electricity and water utility pipes beneath the scheme. A cable strike or damage to one of the utilities could cause electrical failure, cut off radio communication, flooding, or a fire or explosion. The emergency services use the EE tower on the escarpment for their communications.	Electrical infrastructure Emergency services Residents Businesses	Yes
6.9	Pollution of watercourses	Construction activities close to an existing watercourse or earthworks drainage causing fouling due to carbonate deposits can lead to pollution of watercourses.	Environment Waterways - water environment and ecological habitats	Yes

Major event		Relevance to Scheme	Potential receptors	Include on short list?
6.10	Demolition contamination	Tar is potentially present in existing pavement layers. Tar is a carcinogenic hazardous waste which was used to bound pavements and carriageways before the 1980s. There are therefore restrictions on how the waste is handled and disposed of. Data provided by HE indicates that a section of the Missing Link from the start of the single carriageway, through the Air Balloon roundabout and down to Birdlip Junction was constructed in 1972. The construction of the scheme will involve breaking out some of this existing pavement. Disturbance of the pavement can release fumes and the material itself is carcinogenic. If this waste is not handled correctly, it may be improperly disposed of, leading to contamination events through leaching.	Environment Waterways Construction workers	Yes
<b>7 Industrial accidents (historical and existing risks)</b>				
7.1	Defence industry/military accidents	The scheme is considered no more vulnerable than the existing A417 or any other development.	N/A	No
7.2	Energy industry (fossil fuel)	The scheme is considered no more vulnerable than the existing A417 or any other development.	N/A	No
7.3	Nuclear power	The Oldbury Nuclear Power Station lies within a 50 miles radius of the scheme, which is a potential source for radiation	N/A	No
7.4	Oil and gas refinery/storage	The scheme is considered no more vulnerable than the existing A417 or any other development.	N/A	No
7.5	Food industry	The scheme is considered no more vulnerable than the existing A417 or any other development.	N/A	No
7.6	Chemical industry	The scheme is considered no more vulnerable than the existing A417 or any other development.	N/A	No
7.7	Manufacturing industry	The scheme is considered no more vulnerable than the existing A417 or any other development.	N/A	No
7.8	Mining industry	There is a history of mining and quarrying within the study area, which could cause hazards such as ground instability.	Infrastructure Construction workers	Yes
<b>8 Terrorism/Crime/Civil unrest</b>				
8.1	Bomb/vehicle attack on people	Possible that the structures could be a target for a terrorist attack.	Road users Infrastructure	Yes
8.2	Bomb/vehicle attack on infrastructure	Possible that the structures could be a target for a terrorist attack.	Road users Infrastructure	Yes
8.3	Mass shooting	Unlikely to be a target for this type of incident due to the low number of exposed targets.	N/A	No
8.4	Chemical/gas attack	Unlikely to be a target for this type of incident due to the low number of exposed targets.	N/A	No
8.5	Rioting	Unlikely to occur in a rural location. The scheme is not considered more vulnerable than the existing A417.	N/A	No
8.6	Cyber attacks	Increasing reliance on roadside technology could render the scheme more vulnerable to a cyber attack.	Road users Electrical infrastructure	Yes
<b>9 War</b>				
9.1	Conventional	The scheme is considered no more vulnerable than the existing A417 or any other development.	N/A	No
9.2	Chemical	The scheme is considered no more vulnerable than the existing A417 or any other development.	N/A	No
9.3	Nuclear	The scheme is considered no more vulnerable than the existing A417 or any other development.	N/A	No
<b>10 Disease</b>				
10.1	Human	The scheme is considered no more vulnerable than the existing A417 or any other development.	N/A	No
10.2	Animal	The scheme is considered no more vulnerable than the existing A417 or any other development.	N/A	No
10.3	Plant	The scheme is considered no more vulnerable than the existing A417 or any other development.	N/A	No

Major event	Does the major event need to be considered further?		Where considered
<b>Natural disasters</b>			
1	Geological disasters		
1.1	Slope instability, including landslides and rockfall	Yes - slope instability that may impact the scheme could have health and safety consequences for road users, maintenance workers and potentially damage existing infrastructure. Design of slopes and rockfall protection measures will be developed in accordance with the Design Manual for Roads and Bridges (DMRB) Geotechnics Design document CD 622 Managing Geotechnical Risk with the aim of mitigating the occurrence and severity of slope instability. This will manage the risk both in terms of the vulnerability of the scheme to these types of event, and in terms of the potential for the scheme to increase the risk of such an event happening. Ensure structures are designed in consideration of environmental conditions including climate change.	Design, mitigation and monitoring to be detailed in the Geotechnical reporting in accordance with the Design Manual for Roads (DMRB) and Bridges CD 622 Managing Geotechnical Risk
1.3	Sinkholes	Yes - the risk will be managed in accordance with CD 622 Managing Geotechnical Risk and will be assessed based on the ground investigation and considered during design development where appropriate.	Design and mitigation to be detailed in the Geotechnical reporting in accordance with DMRB CD 622 Managing Geotechnical Risk
<b>2 Hydrogeological disasters</b>			
2.1	Flooding	Yes - A Flood Risk Assessment (FRA) of the scheme has been undertaken, and an Environmental Management Plan (EMP) has been prepared for the scheme (Appendix 2.1). The scheme will be designed to cope with new ranges of precipitation and temperature.	ES Appendix 13.3 Flood Risk Assessment (Document Reference 6.4) and ES Chapter 13 Road Drainage and the Water Environment (Document Reference 6.2)
<b>3 Meteorological disasters</b>			
3.1	Blizzards, storms and gales	Yes - using a design of shallower cuttings and slopes will mitigate the wind tunnel effect and limit the carbon use of the retaining walls. Consideration should be given to changing conditions due to climate change, and the scheme will be designed to account for this.	Severe weather considered as part of scheme design
3.2	Fog, mist and reduced visibility	No - although the presence of the scheme will not increase the risk above baseline conditions, variable speed limits could be used to increase reaction times when visibility is low, and the scheme will be designed to cope with new ranges of precipitation and temperature.	N/A
3.10	Wildfires	No - the reduced accident rate achieved by the scheme will limit the potential fires caused by road traffic collisions compared to baseline conditions,	N/A

Major event		Does the major event need to be considered further?	Where considered
3.11	Air quality events	Yes - an Air Quality Assessment has been undertaken (reported in Chapter 5 Air Quality) and any necessary design action has been incorporated. The road will be moved away from sensitive receptor locations at the Air Balloon roundabout. The scheme is designed to increase the capacity of the current road, which will improve flow and reduce emissions associated with slow-moving traffic. Acute air quality phenomena, such as smog are highly unlikely to be an issue given the rural location of the scheme. There is no real risk or serious possibility of acute air quality effects as a result of, or likely to affect the scheme. The scheme is considered no more vulnerable than the current road and so will not be considered further.	ES Chapter 5 Air Quality (Document Reference 6.2)
4	Space disasters		
4.2	Solar flares	No - the scheme is considered no more vulnerable than any other new development and so will not be considered further. There are back up generators at the Birdlip radio tower in case of widespread electricity failure.	N/A
5	Transport		
5.1	Road accidents	No - the reduced accident rate achieved by the new road will limit the potential fatal road accidents.	N/A
6	Engineering accidents/failures		
6.1	Structural failure (i.e. bridge collapse)	Yes - ensure structures are designed and maintained in accordance with standards and with consideration of environmental conditions including climate change. Maintenance activities would be undertaken for the lifetime of the structure.	Considered as part of Construction (Design and Management) (CDM) and as part of design
6.5	Mast and tower collapse	No - not considered to be a risk as these can be designed out of the scheme.	N/A
6.6	Building failure or fire	No - will be appropriately managed and mitigated by competent contractors adhering to The Construction (Design and Management) Regulations 2015 (CDM Regulations) and construction planning.	N/A
6.7	Temporary structure failure	No - will be appropriately managed and mitigated by competent contractors adhering to the CDM Regulations and construction planning. Structures are designed in accordance with design codes and with consideration of environmental conditions including climate change.	N/A
6.8	Utilities failures	No - there are back up generators at Birdlip telecommunications tower, and the risk will be appropriately	N/A
6.9	Pollution of	Yes - appropriate mitigation measures are included in the Environmental Management Plan (EMP).	ES Appendix 2.1 Environmental
6.10	Demolition contamination	Yes - encountering tar in pavements is common for all roads constructed before the 1980s and as such there are codes and best practice to minimise the risk. A pavement core testing based on the available information, followed by lab testing to identify the appropriate acceptable thresholds is required. This requires a pavement investigation spec. It is necessary to inform contractors where tar is identified, so they can apply their hazardous waste procedures and workers can protect themselves with the appropriate Personal Protective Equipment (PPE). Designing out the risk is not an option due to the significant level changes between the existing road and the scheme.	ES Appendix 2.1 Environmental Management Plan (Document Reference 6.4)



Major event		Does the major event need to be considered further?	Where considered
<b>7</b>	<b>Industrial accidents (historical and existing risks)</b>		
7.8	Mining industry	No - the design avoids any areas of historic mining e.g. north of Birdlip	N/A
<b>8</b>	<b>Terrorism/Crime/Civil unrest</b>		
8.1	Bomb/vehicle attack on people	There is considered to be no greater risk of a bomb/vehicle attack as a result of the scheme compared to any other road/tunnel within the highways network, therefore this does not need to be considered further. Infrastructure are designed in accordance with design codes and in consultation with authorities. The UK Government's counter-terrorism strategy (CONTEST, 2011), has provided clear objectives to reduce the terrorism risk to the UK.	N/A
8.2	Bomb/vehicle attack on infrastructure	There is considered to be no greater risk of a bomb/vehicle attack as a result of the scheme compared to any other road/tunnel within the highways network, therefore this does not need to be considered further. Infrastructure are designed in accordance with design codes and in consultation with authorities. The UK Government's counter-terrorism strategy (CONTEST, 2011), has provided clear objectives to reduce the terrorism risk to the UK.	N/A
8.6	Cyber attacks	There is considered to be no greater risk of a cyber-attack as a result of the scheme compared to any other road/tunnel within the highways network, therefore this does not need to be considered further. Infrastructure are designed in accordance with design codes and in consultation with authorities.	N/A