# FLOOD RISK IMPACT

# FTC TOPIC PAPER NO.1

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## Introduction

1. The UK Climate Change Committee warned in 2019 that the most recent climate change risk assessment revealed 1.4 million people in England currently face a risk of 1:75 or greater of flooding of any kind, including coastal. This means there is a 1.33% chance of flooding in any given year and the current associated damages to homes cost £270 million annually. The number at this level of risk could increase to 1.7 million if global warming reaches 2˚C above the pre-industrial temperature. Recent Global Warming statistics show that we are fast approaching this threshold. The Climate Change Committee and other experts consider that progress in increasing resilience to flooding in the UK is not keeping pace with the rising risk.

2. Even in February 2018, the Environment Agency warned that intense bouts of flooding are set to become more frequent. The warning followed a pattern of severe flooding over the previous 10 years, linked to an increase in extreme weather events as the country's climate changes. Met Office records showed then that since 1910 there had been 17 record-breaking rainfall months or seasons – with 9 of them since 2000. More recently, the UK has seen even more records broken. As intense storms become more frequent, sea levels are rising because of climate change.

3. The winter of 2013 to 2014 started with a coastal surge and record sea levels on the north and east coasts. This was followed by 12 storms in succession and became the wettest winter for 250 years – 11,000 homes were flooded in the UK.

4. The threat of flooding is real and increasing, as is also demonstrated by its listing as one of the nation's major threats in the National Risk Register 2020: "The UK's Climate Change Risk Assessment, last published in 2017,

highlighted that more intense rainfall, more extreme weather and wetter winters are projected to increase the threat of damage and disruption as a result of all types of flooding."

5. In July 2020, the Environment Agency published its National Flood and Coastal Erosion Risk Management Strategy for England, with a vision for "a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100". It states: "In the face of a changing climate, we need to also make our places more resilient to flooding and coastal change, so that when it does happen it causes much less harm to people, does much less damage, and ensures life can get back to normal much quicker."

**Why Assessments of Flooding Are Important and Should Have Been Carried Out Before a Preferred Route Was Identified**

6. In the present case, there has been no proper strategic environmental assessment of the impact of flooding on the currently proposed route for the Eastern Bypass (now referred to in the Draft Local Plan as an "Eastern Movement Corridor"). This paper should not be regarded as a substitute for the work that should but was not carried out by CCC. However, it evidences the prejudice caused by the failure and flaw in the decision-making process and contributes to the overall evidence base that the currently proposed route is the most damaging and least optimal of the three Stantec routes. Flooding poses an important threat to roads and can lead to massive obstruction of traffic and damage to road structures, with possible long-term effects (Buren and Buma 2012). Flooding leads to significant repair costs for road control authorities, access difficulties for emergency services (Versini, Gaume, and Andrieu 2010a), and disruption for road users and the community at large.

7. The consequences for businesses and the economy, in general, can be very significant (Brabhaharan, Wiles, and Frietag 2006). Because of the time and costs required for rebuilding, sustainable and long-term planning is crucial

(Michael, Høegh, and Søren 2010); therefore, the consideration of flood risk constitutes an important input for decision-making in planning this type of infrastructure. Flood risk analysis for road networks should be carried out as part of any plans (Balijepalli and Oppong 2014; Jenelius and Mattsson 2014).

8. Roads can be damaged by floods and can exacerbate hazardous flood conditions. The flooding of a road induces two levels of consequences: on the one hand, people may be injured, and vehicles may be destroyed; on the other hand, the disruption of traffic may have severe indirect consequences. Road closures can have economic, social, and security consequences (Tacnet and Mermet 2012). At the same time, roads and road development can considerably affect natural flood patterns. Roads fragment habitats and interrupt the flow of water, sediments, nutrients, and aquatic life, thereby impacting the beneficial effects of the natural flood cycle (Douven, Goichot, and Verheij 2009).

**Fig 1.** The above photograph shows a car on a road during the 2014 flooding by the Great Stour River as reported in "*Canterbury flood fears as Great Stour littered with debris*" Gerry Warren, Kent Online.

9. "A susceptibility to incidents that can result in considerable reduction in road network serviceability" (Berdica 2002). The link, route, or road serviceability describes the possibility of using that link, route, or road during a given period. Furthermore, since accessibility depends on the quality of the functioning of the transportation system, this concept has to do with different levels of vulnerability in reducing accessibility for various reasons.

10. Taylor, Sekhar, and D'Este (2006) define vulnerability as follows: 1. A network node is vulnerable if loss (or substantial degradation) of a few links significantly diminishes the accessibility of the node, as measured by a standard index of accessibility.

    1. For transport networks, levels of impact are defined as open with minimum loss of road capacity, partially closed, and fully closed.

    2. A network link is critical if loss (or substantial degradation) of the link significantly diminishes the accessibility of the network or particular nodes, as measured by a standard index of accessibility.

11. In the present case, the current route of the Eastern Bypass is highly susceptible to flooding (see further below). As the Eastern Bypass is proposed to be an important element in the so-called "ring road", the vulnerability of this key section will risk making the whole ring road system vulnerable.

12. Added to this there has been no assessment of the future impacts of climate change on the adverse impact of the current route of the Eastern Bypass.

**<u>The Fordwich Situation</u>**

13. The town centre sits on lowland at just 2.8 metres above sea level, and there are nearby marshes east of the town in Westbere. The land around the river in the

north of the parish is at the lowest levels and rises towards the south of the parish to about 22 metres above sea level. As a result, there is a high flood risk across the parish and a Zone 3 flood risk covers the north of the parish, which includes parts of the town centre. Most postcodes in the town fall under high flood risks.

14. The river level monitor at Fordwich Bridge has designated (by the Environment Agency) the upper level of its 'normal range' as 2.75 metres above the local datum. At Fordwich, there is also a tidal variation as the river is still affected tidally. At a river level of 2.8 metres, flooding on at least part of the water meadows West of the bridge is usual. These are natural flood plains, supported by a network of drainage ditches, and flood frequently: at least once over the Autumn, Winter, and Spring periods in each of the past 10 years, for example. At 2.9 metres the river over-tops its bank in many places. It was recorded at 3.14 metres on 3rd January 2003, and, as in the aerial photograph of Fordwich in 2014 below at Fig 2 in this Topic Paper, many of the properties on the western side of Fordwich Road (which, north of 'Tancrey', the first house on the west side of Fordwich Bridge, are in Sturry parish) suffered at least garden flooding. In the floods of 2000, most of the houses on that side of the road suffered some degree of flooding.

15. The water meadows offer only limited protection to the centre of Fordwich, but even in the past two years river levels have risen to the point of concern that historic buildings, such as the ancient Town Hall, would suffer flood damage.

**Fig. 2**

The above picture shows Fordwich in early 2014. The town was similarly affected in October/November 2000, and flooding, to a lesser extent, of the fields and gardens north of the river and of the George and Dragon Car Park has, between times and since, been a regular occurrence.

## Likely and Potential Adverse Effects of the Eastern Bypass

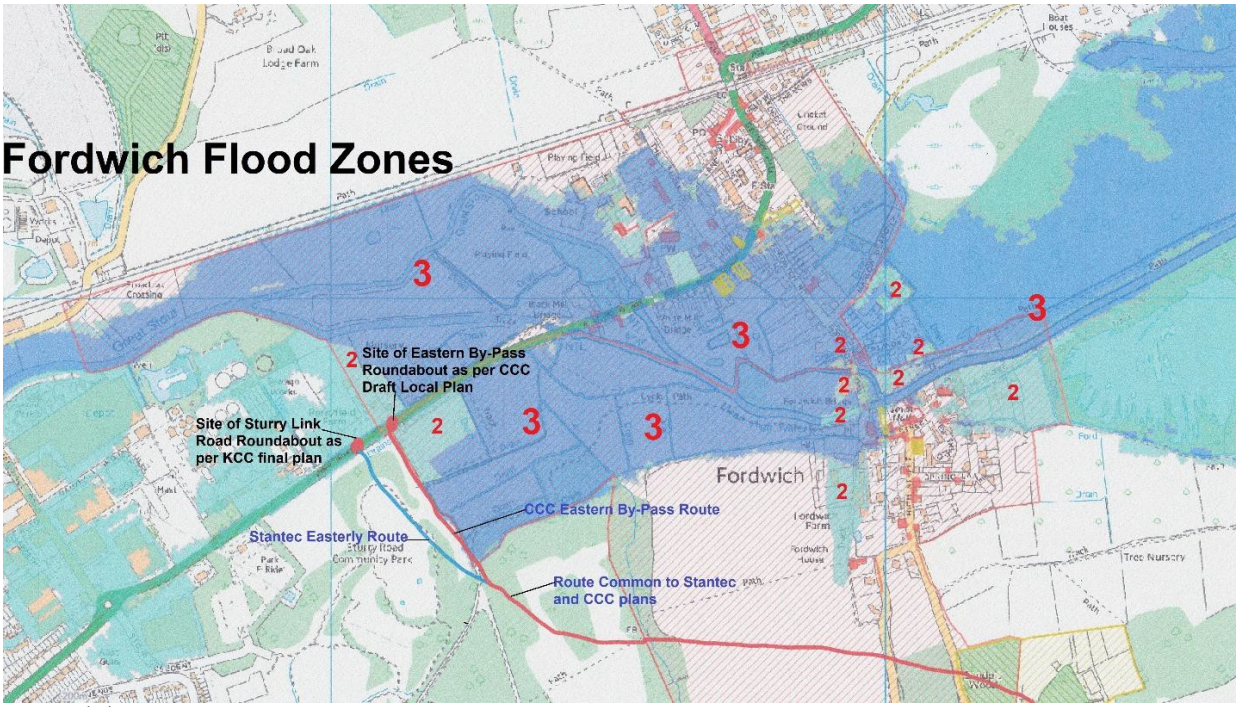
16. Fordwich is in a Flood Warning Area. The proposed Eastern Bypass route foresees the construction of a paved road of 7.3 metres in width, but at least an equal width on either side of this will be ancillary to and supporting this structure. The road will form a barrier to sub-surface water movement and exacerbate run-off problems as it slopes down towards its junction on the Sturry Road.

17. There is a discrepancy between the Eastern Bypass route referenced in the Stantec report (the Stantec Route) and the CCC indicative route from the Draft Local Plan (the CCC Route). The latter joins the Sturry Road approximately 120 metres east

along Sturry Road from the roundabout shown on the KCC Drawing of the Sturry Link Road, with which the new Eastern Bypass route should connect.

18. The Stantec Route just avoids the Flood Zones shown on the Fordwich Flood Zones chart (shown below) but the CCC Route is contiguous to both the Western edges of a Flood Zone 3, and Flood Zone 2 where it approaches the Sturry Road.

19. The Eastern Bypass poses an unquantifiable and unassessed, but almost certainly detrimental, effect to the flood mitigation of the water meadows and supporting drainage. It will disrupt the present natural flows of water as the new road sweeps down towards the flood zones from the higher ground to the South. The flood zones themselves must be expected to expand, in view of the climate change considerations already discussed, and thus these factors increase the risk of flooding in Fordwich and Sturry.




**The National Planning Policy Framework 2021 (NPPF)**

20. Paragraph 152 of the NPPF states that the planning system should support the transition to a low-carbon future in a changing climate, considering flood risk fully. Paragraph 153 states that plans should take a proactive approach to mitigating and

adapting to climate change, considering the long-term implications of flood risk. Paragraph 161 NPPF provides as follows:

> "All plans should apply a sequential, risk-based approach to the location of development- taking into account all sources of flood risk and the current and future impacts of climate change- so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by-
>
> (a) applying the sequential test and then, if necessary, the exception test as set out below.' [emphasis added]

21. The PPG Technical Guidance to the National Planning Policy Framework:

> "1. As set out in the National Planning Policy Framework, inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere. For these purposes: • "areas at risk of flooding" means land within Flood Zones 2 and 3; or land within Flood Zone 1 which has critical drainage problems and which has been notified to the local planning authority by the Environment Agency; "flood risk" means risk from all sources of flooding - including from rivers and the sea, directly from rainfall on the ground surface and rising groundwater, overwhelmed sewers and drainage systems, and from reservoirs, canals and lakes and other artificial sources.
>
> 2. The sequential test aims to steer new development to areas with the lowest risk of flooding by stipulating that development should not be permitted if there are reasonably available alternative sites. If the sequential test is passed then it is necessary to pass the exception test, which requires that the wider sustainability benefits would outweigh the risk of flood harm and that the development will be safe for its lifetime."

22. The Feasibility Study notes that the Eastern Bypass route is in close proximity to Flood Zone 3 (the highest flood zone). In particular, the Eastern Bypass route passes through Flood Zone 3 as it approaches the Sturry Road northwards. It is obvious that the extensive construction works necessary for a 7.3m wide bypass will exacerbate flood risk in the area.

23. Despite this, there is no evidence that the Council has considered this factor or sought to avoid the flood risk by considering reasonable alternatives.

24. Paragraph 6.48 of the Draft Local Plan states that 'Many parts of the district are at risk of flooding, and the impacts of climate change are expected to increase this risk over the period of the Local Plan. New development should be appropriately located to avoid increasing the risk of flooding, and where proposals come forward in areas of existing risk, specific assessments will be required'. No such specific assessment has been undertaken.

25. Further, neither the sequential nor the exception test provided for in the NPPF has been applied. The Council has also failed to consider reasonable alternatives. The current proposals for the Eastern Bypass are not sound because they are not based on evidence and are inconsistent with national policy, which places a strong emphasis on decreasing flood risk.

26. The very real and increasing risk of flooding also increases the need for the strategic gap policy advocated by FTC, which would also serve to preserve the flood plain protecting Fordwich from flooding.