



## **A5 Western Transport Corridor (A5 WTC)**

### **Appendix TNI – Theme Report: Flood Risk Assessment**

**16 July 2016**

## Appendix TNI – Theme Report: Flood Risk Assessment

1. The Proposed A5WTC Scheme is subject to a Flood Risk Assessment (FRA) in accordance with guidelines contained within the Design Manual for Roads and Bridges (DMRB), Volume 11 (Environmental Assessment), Section 3 (Environmental Assessment Techniques), Part 10 HD 45/09 (this supersedes HA 216/06 from November 2009) (Road Drainage and the Water Environment); and, Department of Environment (DoE) Planning Service, Planning Policy Statement 15 (PPS 15) – Planning and Flood Risk: Annex D: Assessing Flood Risk and Drainage Impact. Construction Industry Research and Information Association (CIRIA) C624 – Development and Flood Risk – Guidance for the Construction Industry and Rivers Agency Guidelines have also been referred to in developing the flood risk assessment.
2. The purpose of the flood risk assessment is to identify areas of existing flood risk, and where development within floodplains is essential; to ensure that the Proposed Scheme is not at risk from flooding nor does it materially increase flood risk elsewhere.
3. Preliminary flood risk assessments identified specific areas along the proposed A5 WTC route where detailed consideration using hydraulic models was required, the process of which included liaison with Rivers Agency. Consequently, detailed hydraulic models were developed for the locations identified to facilitate detailed and site specific appraisals of flood risk. As part of this exercise extensive survey activities have been undertaken to identify existing watercourses, floodplains, drainage ditches and culverts along the length of the Proposed Scheme.
4. Hydraulic models were used to determine the peak water levels and associated extent of flood events of a range of return periods (including the 'design' event of 100 year return period) on specific watercourses. Modelling also allowed an assessment of the likely effects resulting from the crossing of the watercourses and floodplains with the proposed road. This information was then used for developing possible flood mitigation measures, and ensuring the design complies with the recommendations set out in the DMRB.
5. Generally, potential flood impacts are mitigated in the Proposed Scheme by:
  - Avoidance of floodplains as far as practically possible;
  - Minimisation of road footprint as far as practically possible;
  - Culverts sized appropriately to maintain existing upstream and downstream water levels;
  - Provision of floodplain connectivity structures and large span structures to maintain floodplain conveyance where floodplains are bisected by the road alignment;
  - Provision of compensatory storage where volumetric floodplain encroachment remains.

6. Upon receipt of the original draft FRA submission, the statutory body Rivers Agency expressed their approval for both the findings of the report and the methodology used to determine flood risk. In December 2011, Rivers Agency stated they were satisfied the evidence provided demonstrated that:

- The development will not be at risk of flooding in events of less than 1 in 100 year return period;
- There will be no increase in flood risk elsewhere as a consequence of this development proceeding.

The report demonstrated that assessment against DMRB parameters deemed the overall impact of the proposed scheme to be slight, 15 modelled areas have been identified as risk neutral, and 9 as slight adverse (7 of which contain no properties). Rivers Agency accepted both the conclusions and logic supporting the draft FRA submission.

7. The FRA and associated models were updated to support the phased development of the scheme in 2012, including updated alignments, adding additional tributaries and extending the models. Again, Rivers Agency were satisfied that the Flood Risk Assessment was appropriate to the scale and nature of the development, and the evidence provided demonstrated that:

- The development will not be at risk of flooding in events of less than 1 in 100 year fluvial return period and in events of less than a 1 in 200 year coastal return period where appropriate;
- There will be no increase in flood risk elsewhere as a consequence of this development proceeding.

In reference to the DMRB methodology, the overall impact of the proposed scheme on flood plains and flood risk (scheme wide) is Slight Adverse. 6 areas are predicted to be risk neutral, while of the 5 areas predicted to have a slight adverse flood risk, 3 have no properties within the modelled floodplain extents. Again, Rivers Agency, confirmed they had no reason to disagree with the conclusions of the report.

8. A draft FRA for 2016 has also been developed, using the latest accepted methodology to update the hydrology input for the hydraulic models. The subsequent results have been assessed against the previous FRA results, and water levels remain largely unchanged and have reduced at specific locations. The impact of the scheme has been assessed against the DMRB, and as a conservative measure a more stringent interpretation has been applied to the parameters. The overall impact of the scheme remains Slight Adverse. This FRA is yet to be submitted to Rivers Agency, the content being subject to review upon the conclusion of the Public Inquiry in 2016. Pending the outcome of the PI, any minor amendments will be progressed and a final submission will be delivered to Rivers Agency for consideration.