The effects of Climate Change on the UK Road Transport System

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HIGHWAYS AGENCY

England's Strategic Road network

Adaptation to climate change

Flooding on M25

We base our work on the historical evidence of the weather

Past is no longer the key to the future

Future predictions needed to set parameters for design, maintenance & management

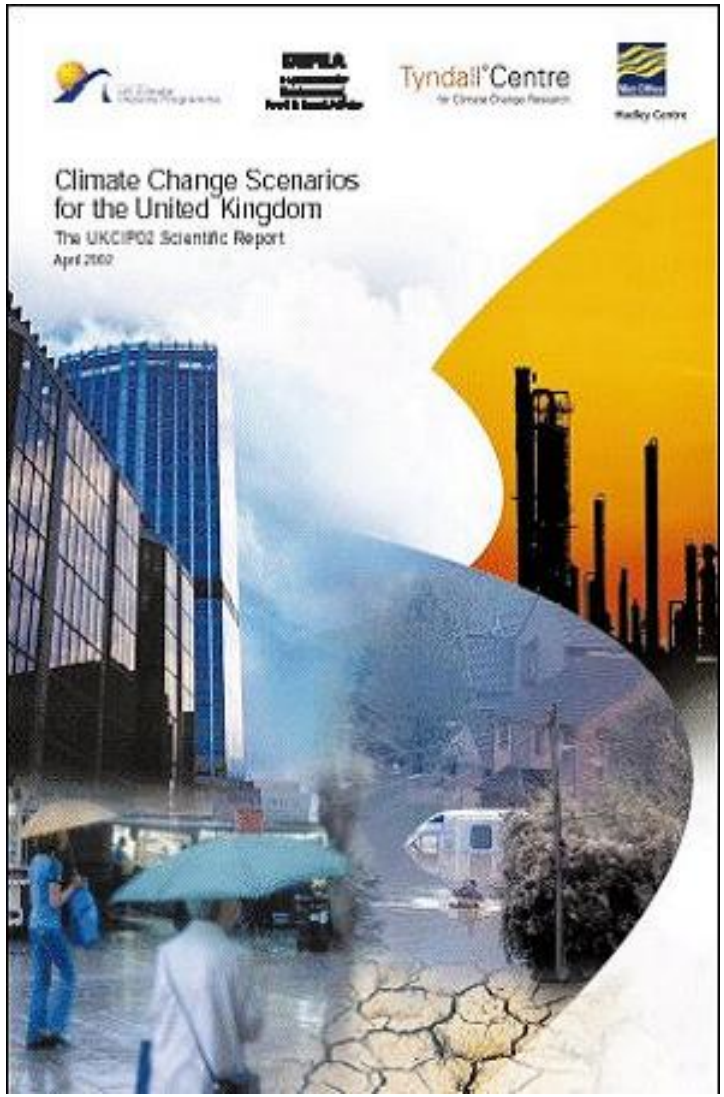
Foundations in UK Climate Impacts Programme

4 Scenarios

- Low
- Medium-Low
- Medium-High
- High

- **Changing Temperatures**

- **Changing Rainfall**



HA / Met Office research

Examined HA standards + specifications against future UK Climate

Impact of changes in extremes

- Temperature
- Precipitation

Temperature

Small increasing trend in extreme daily maximum temperature

50 year return maximum temperature + 10deg C by 2100

BS EN 1991-1-5 typical effective bridge temperature	Steel Bridges	Steel/ concrete composite	Concrete Bridges
Maximum Effective Temperature	51.5 ^{o}	39 ^{o}	36 ^{o}

BS EN 1991-1-5 typical effective bridge temperature + 10degC	Steel Bridges	Steel/ concrete composite	Concrete Bridges
Maximum Effective Temperature	60 ^{o}	48 ^{o}	46 ^{o}

Precipitation

2080': return period of one year

➔increase in precipitation up to 10%

2080': return periods of 5 and 30 years

➔**increase in daily precipitation by upto 40%**

Risk Management

- Review monitoring and maintenance regimes
- Review of design standards, specifications
- Improve infrastructure resilience
- Consider need for major upgrades or re-routing
- Avoid new development in at risk locations

Is this the Future?

1 Barricades that should have been used to defend Upton-on-Severn were stored in Bristol. The material wa loaded on to a lorry and dispatched but got caught in a 40-mile gridlock on the M5.

2 More than 750 people stranded in cars, caravans, houses and boats were rescued ir Worcestershire.

3 In Pershore 86.8mm of rain fell in 8 hours according to the Met Office.

4 Tewkesbury's Mythe Water Pumping station became inoperable after being deluged by flood waters on Sunday, leaving 150,000 homes without water.

5 The Castlemeads power station in Gloucester was repaired by emergency services on Tuesday, restoring power to more than 48,000 homes. Walham power station was protected, with water reaching within 25mm of flooding the station forcing the power to be cut off from 250,000 people.

6 Thousands of motorists on the M5 were stranded for up to 10 hours in a 40-mile jam on Friday night and Saturday morning.

7 In Brize Norton 101mm of rain fell in 7 hours, a 1:600 year event.

8 The roads out to Chipping Norton and Whitney were impassable, and in Charlbury flood waters badly damaged the bridge into town.

9 In Oxfordshire river levels appeared to have stabilise after 3,000 homes were flooded. Three flood warnings are still in place for stretches of the Thames and the River Ock.

10 Residents in Buckingham were warned to avoid water contaminated with chemicals and sewage after th River Great Ouse burst its banks on Saturday.

or this?

"Water airlifted to parched M25 drivers" Daily Telegraph June 2006

Current HA research

Development of a climate change adaptation strategy

- ➔Provision of guidance on future UK climate parameters
- ➔Develop a risk assessment methodology that can be applied across the HA business

Research part 2

Climate Change adaptation and mitigation are part of the wider Sustainable Development agenda

We contribute to causes of climate change

➔ Developing carbon accounting framework

The End