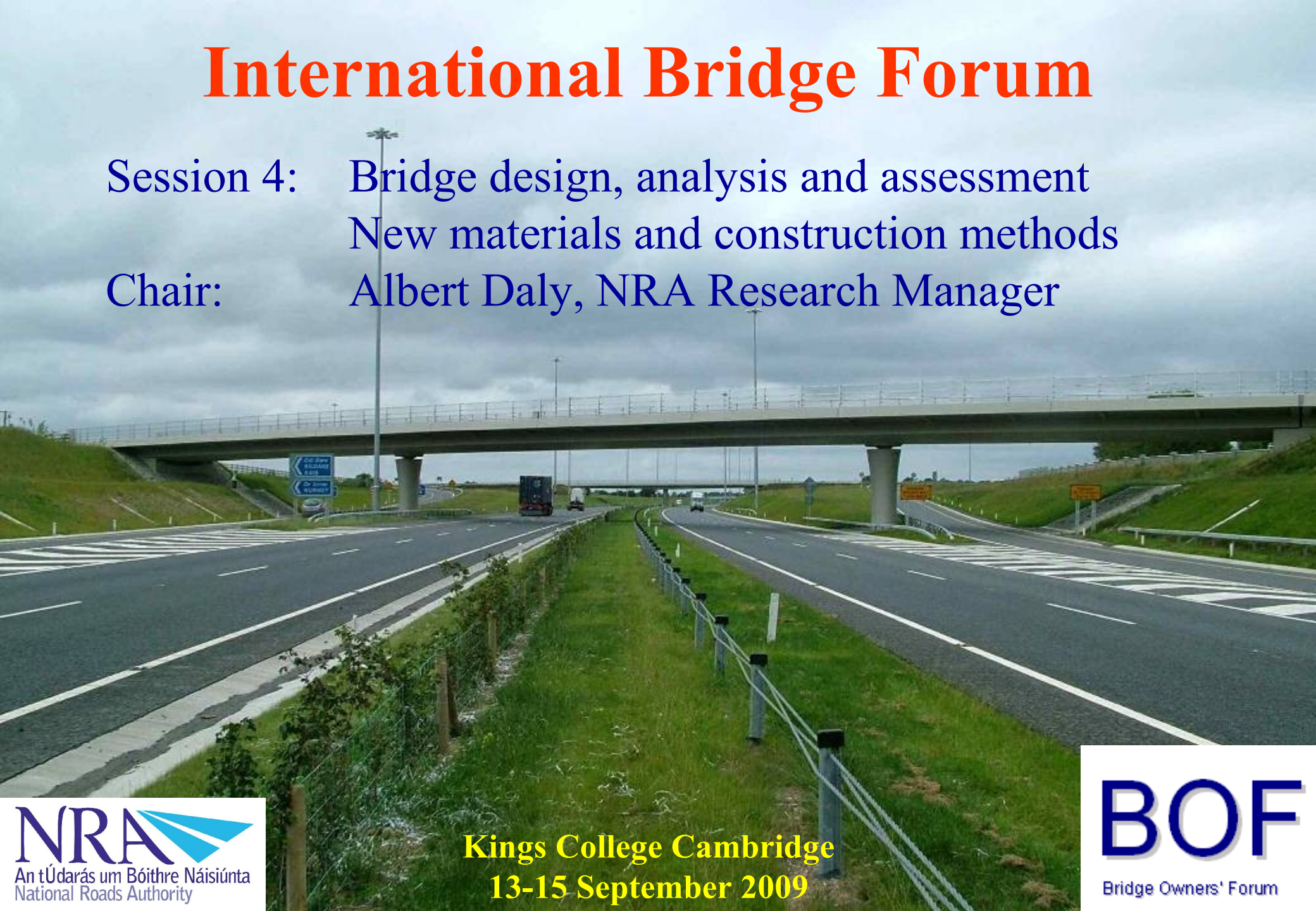
International Bridge Forum

Session 4: Bridge design, analysis and assessment
New materials and construction methods

Chair: Albert Daly, NRA Research Manager



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Kings College Cambridge
13-15 September 2009

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SESSION TOPICS

Bridge design

- New codes, eg, Eurocodes
- New materials
  - Fibre Reinforced Polymers
  - "Green" concrete
  - Recycled materials
- How do we build for
  - Durability
  - Inspectability
  - Replaceability
  - Maintenance

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SESSION TOPICS

Bridge analysis

- Loading
- New analysis methods
- Computer-aided design
- Greater efficiency

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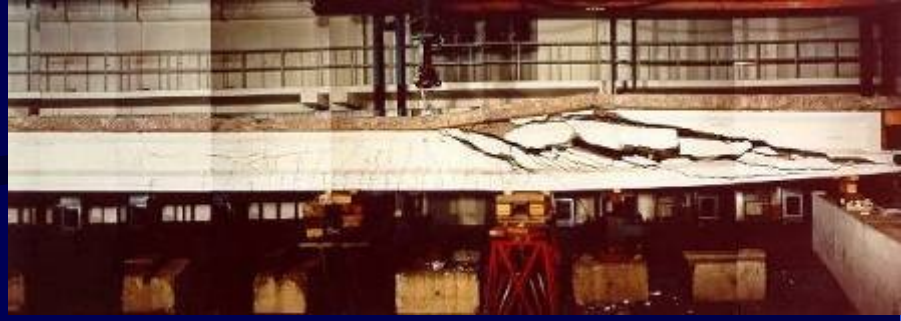
SESSION TOPICS



Bridge assessment

- Safety, reliability
- Serviceability
- Methods of determining capacity
  - Assessment codes
  - Load testing
- Bridge condition
  - Structural implications of defects
  - Rate of deterioration
  - Asset value

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Schedule

Presentations

- Structural safety evaluation of bridges on the Swiss highways:
  Stefan Kun, Swiss Federal Road Office
- The use of FRP on bridges: Network Rail's experience:
  Brian Bell, Network Rail, UK

Contributions

- Design, analysis and load rating:
  Rudolf Kotse, Transit New Zealand
- Design for increased traffic loading:
  Geoff Boully, AustRoads, Australia
- Multi-design design and analysis:
  Ian Frieland, FWHA, US
- Thin surfacing on bridge decks:
  Graham Muir, Transport Scotland

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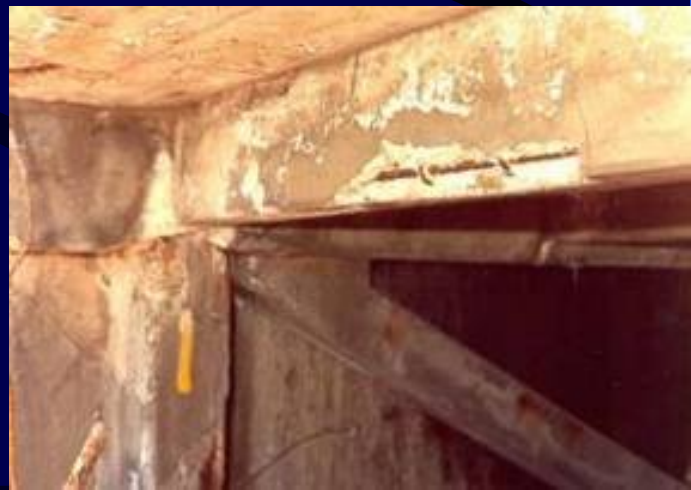
Bridge assessment

Code-type calculations to determine load carrying capacity

- Remove unnecessary conservatism
- Remove code limitations
- Takes account of structure "as-is"
- Different levels of assessment

Deterioration

- Importance of inspection regime
- Diagnosis of deterioration mechanisms
- Maintenance/rehabilitation strategies
- Implication for assessment
- Deterioration rate



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Bridge loading

- New/Existing bridges
- Weigh-in-motion
- Future trends

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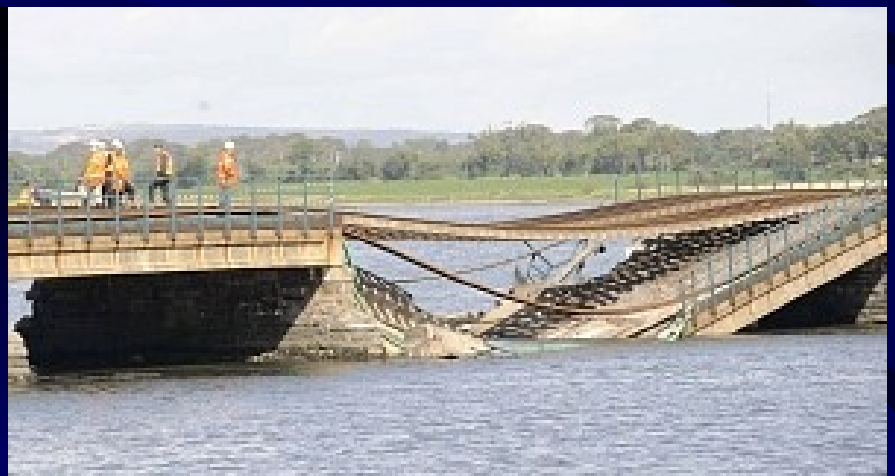
Climate change

- Bridge loading
  (wind, temperature, water)
- Drainage
- Mitigation measures



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What works and what does not

- Experiences
  - Successes
  - Failures
- Research

Key issues

- Assessment: need for specialist codes
- New materials: UHPC Concrete, FRP
- FRP - problems with application (codes, connections
- Analysis methods
- Loading: Bigger and heavier vehicles
- Vehicle regulation
- Rapid construction