International Bridge Forum

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

Chair: Albert Daly, NRA Research Manager
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
SESSION TOPICS

Bridge analysis

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

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

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