Austroads Bridges Task Force – 16 July 2020

UK Bridge Owners Forum

Introduction

Bridge Management in the UK

Bridge Owners Forum

UK Best Practice

International Comparisons

Grand Challenges

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Introduction

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Technical Secretary: Bridge Owners Forum

Independent Consultant – Bridge Asset Management

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Bridge Management in the UK

4 Countries

4 Devolved Governments

>200 Highway Authorities

Another 10 -15 Significant Bridge Owners

UK Roads Liaison Group

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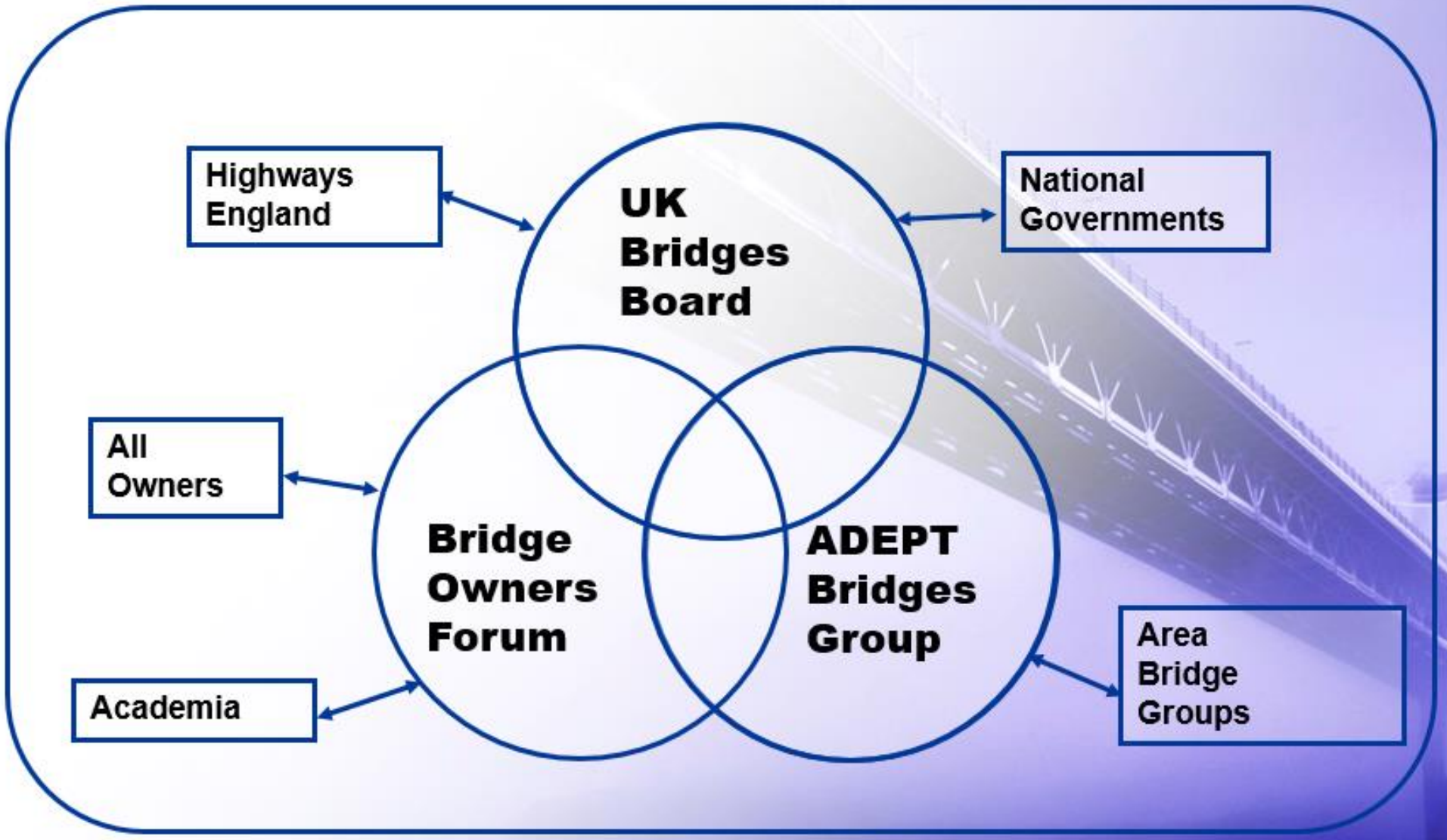

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Bridge Owners Forum

Established in 2000

Membership – 21 Bridge Owners in UK & Ireland

Key roles:

- Sharing and dissemination of information
- Collaboration
- Promoting and facilitating Research

Sub-group of UK Bridges Board

The UK & Ireland Bridges “Think Tank”

Horizon scanning – national and international.

www.bridgeforum.com

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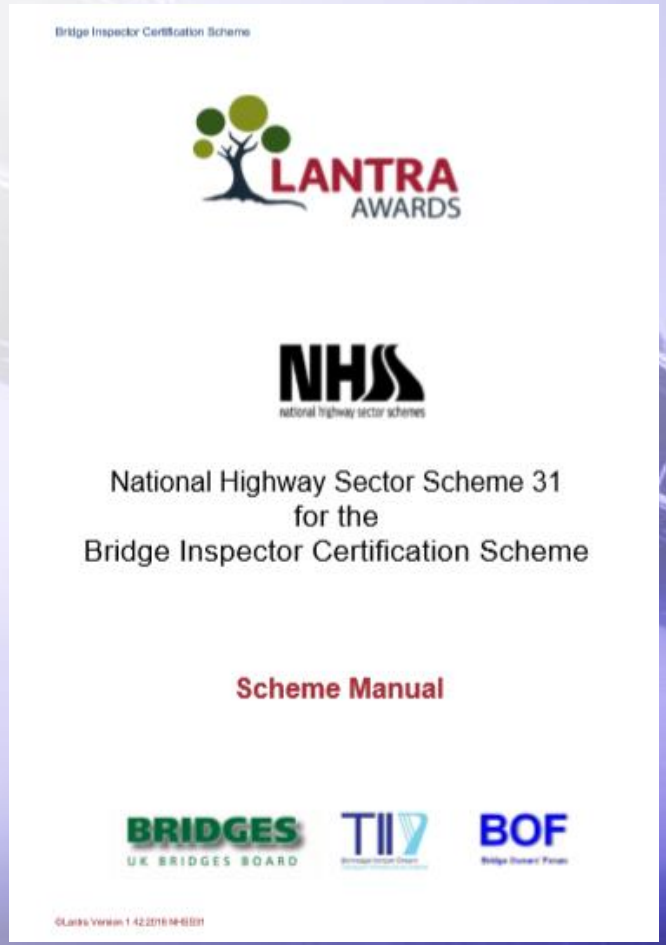
UK Best Practice



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International Comparisons

USA – National Bridge Database (FHWA)

2013

Total 607,380

Average age 42 years

65,605 Structurally Deficient (1 in 9)

20,808 Fracture Critical

7,795 Both

2017 (Washington Post)

130,000 Bridges Structurally Deficient or Functionally Obsolete

NB Only 43% of annual capital budget goes on maintenance

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Grand Challenges

What…

- Preventing Bridge Failures
- Extending Life of Existing Structures
- Building Bridges that will perform better.

How…

- Embrace innovation and embed technology
- Securing a competent and diverse workforce

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Grand Challenge 3

BRIDGE OWNERS FORUM GRAND CHALLENGES

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3 BUILDING BRIDGES THAT WILL PERFORM BETTER

Bridge infrastructure in the UK has been developed over centuries. Performance has varied – canal structures built 300 years ago for horse and cart perform well under modern loading, whereas concrete structures built in the 1960s have been closed due to safety concerns stemming from degradation of materials.

In the great road building age of the 1960's and 70's designs were pushed to the limits of engineering without sufficient understanding of the processes of deterioration that could affect the service life. 21st century innovations in materials and technology must address this legacy as bridge managers deal with increasing risk with limited budgets.

The world is changing, and structures must be designed to perform under increasing demand. Climate change brings flood and scour risk. The digital age brings autonomous vehicles and the Internet of Things. Consumer demand increases freight and vehicle loading.

Landmark new bridges are celebrated as connections open up and journeys are made easier. Bridges of the future will need to be efficient structures, adaptable to change of use and resilient to environmental factors.

PRIORITY AREAS FOR DEVELOPMENT

- Climate change research and impact analysis
- Understanding bridge behaviour and deterioration through data analytics and sensor technology
- Improved standards for design and assessment
- Off-site manufacture
- New materials – self-healing, high strength, low maintenance
- Adaptable bridges that facilitate change of use
- Cradle to grave bridge management
- Guidance on new techniques and technologies
- Use of BIM in management of structures

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Emerging Initiatives

BIM

Digital Twins

Embedded Sensors

Real time SHM/SPM

SAVI

Risk Based Inspections

UAV Inspections

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Blockers

Lack of awareness/reluctance to engage from politicians

Over reliance on technology

Professional capacity and capability in Bridge Managers

Unwillingness to share information

Procurement – lowest first capital cost

Risk Management and Ownership

Lack of supervision on site.

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Discussion