



**BM**  
**5**

INTERNATIONAL CONFERENCE  
ON  
BRIDGE MANAGEMENT

*11<sup>th</sup> - 13<sup>th</sup> April 2005*

***Conference Programme***



[www.surrey.ac.uk/eng/BM5](http://www.surrey.ac.uk/eng/BM5)

Uni**S**

**University of Surrey**

## Conference Background and Objectives

The importance of sound Bridge Management strategies is now accepted by the bridge engineering fraternity throughout the world. Because of the huge amount of effort that has been expended in finding solutions for saving ageing and deteriorating bridge stocks, a paradigm shift seems to have taken place so that bridge engineers now consider every aspect of design, construction and commission with management in mind. This has resulted in a change from a curative to a preventative mentality with regards to bridge management, and hopefully means that not only will the next generation of bridges last longer and outperform previous ones, but that the whole life costs will be reduced resulting in a lesser amount of money having to be set aside for maintenance.

The aim of the Fifth International Conference on Bridge Management is to bring together the results of research projects ongoing since the last conference, to highlight notable successes and to discover how the results can be utilised in a practical manner.

It is now widely recognised that successful bridge management must encompass traditional techniques such as assessment and NDT, wider issues such as sustainability, asset valuation and knowledge management, as well as the ever increasing impact of IT on society at large.

The Conference has been designed to be as wide ranging as possible and it is hoped that both delegates and bridge engineers at large will be able to use the Proceedings to find answers to their questions and solve some of their dilemmas. In this respect it is hoped that a great number of Case Studies will be presented to illustrate the success of good bridge management. The three day Conference will include four Plenary Sessions, sixteen Technical Sessions, and a Conference Dinner.

## General Conference Topics

Papers to be presented cover a wide range of topics related to road and railway bridges.

They include the following:

Whole life costing

Bridge management systems

Strengthening using advanced composites

Reliability and risk management

Non-destructive testing

In-situ stress measurement

Design for durability

Service life prediction

Inspection

Maintenance strategies

Assessment and evaluation

Repair techniques

Rehabilitation and replacement

Bridge widening

Monitoring techniques

Historic bridges

An exhibition of items related to the Conference theme from specialist contractors, consultants and manufacturers will run during the event. A list of exhibitors and a brief description of their products or area of expertise will be given to all delegates.

## Conference Organisers

Prof. Gerry Parke (Chairman)

Dr Janina Disney (Secretary)

Prof. Marios Chryssanthopoulos

Dr Peter Disney

Dr Toula Onoufriou

Mr Harry Wickens (Exhibition)

Prof. Gerry Parke

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## Further Information

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**Further Information and electronic booking form [www.surrey.ac.uk/eng/BM5](http://www.surrey.ac.uk/eng/BM5)**

## Overview of Sessions 3

### Introduction to the Session format

#### Sunday

4.00pm - 7.00pm	Early Registration
7.00pm - 9.00pm	Cocktail Reception in Roots Restaurant

#### Monday

8.10 - 9.15	Registration
9.15 - 10.30	Session 1 (Plenary Session)
11.00 - 13.00	Session 2a & 2
14.00 - 16.00	Session 3a & 3b
16.15 - 18.15	Session 4a & 4b
18.30	Thomas Telford reception
19.30	Dinner for delegates staying on Campus

#### Tuesday

9.00 - 10.15	Session 5 (Keynote Session)
10.45 - 12.45	Session 6a & 6b
14.00 - 16.00	Session 7a & 7b
16.30 - 18.15	Session 8a & 8b
18.30	Coaches to take delegates to the Conference Dinner
19.30 - 11.00	Conference Dinner at the Great Fosters Hotel, Egham

#### Wednesday

9.00 - 10.15	Session 9 (Keynote Session)
10.45 - 12.45	Session 10a & 10b
14.00 - 16.00	Session 11a & 11b
16.30 - 18.15	Session 12 (Plenary Session)

#### Plenary, Keynote and Technical Sessions Locations

Session 1	AP Lecture Theatre 3/4
Sessions 2-4	AP Lecture Theatre 3 & 4
Session 5	AP Lecture Theatre 3/4
Sessions 6-8	AP Lecture Theatre 3 & 4
Session 9	AP Lecture Theatre 3/4
Sessions 10-11	AP Lecture Theatre 3 & 4
Session 12	AP Lecture Theatre 3/4

## Conference Programme 4

Monday, 11 April 2005      Lecture Theatre  
Registration & Session 1      AP3/4

- 9.15      *D M Frangopol, M Liu*  
Bridge management based on multiple-objective optimization
- 9.45      *L Pardi*  
New developments of the Italian bridge management system
- 10.15      Discussion
- 10.30      Coffee

Monday, 11 April 2005      Lecture Theatre  
11.00am Session 2a      AP 3

- 11.00 *S Mehrkar-ASL, C L Brookes, W G Duckett*  
Saving half through girder bridges using non-linear finite element analysis
- 11.20 *E J O'brien, Y Y Li, A Gonzalez, S P Brady*  
The influence of speed on the dynamic amplification of two loads crossing a simply supported bridge
- 11.40 *J D Shave, T J Ibell, S R Denton*  
A new assessment model for shear in reinforced concrete bridges with short anchorage lengths
- 12.00 *H Stempfle, T Vogel*  
Robustness of standard Swiss overpasses with V-columns
- 12.20 *S E Taylor, G I B Rankin, D J Cleland*  
Arching action in concrete bridge deck slabs for increased durability and sustainability
- 12.40 Discussion
- 13.00 Lunch

11.00am Session 2b      Lecture Theatre  
AP 4

- 11.00 *M Kaszynska, A S Nowak*  
Target reliability for design and evaluation of bridges
- 11.20 *N H Jin, M K Chryssanthopoulos, G A R Parke*  
Bridge management using principles of whole life costing and life cycle assessment subject to uncertainty
- 11.40 *A S Nowak, A A Czarnecki*  
System reliability for bridge evaluation
- 12.00 *E Tantele, T Onoufriou, M Mulheron*  
Effectiveness of preventative maintenance for reinforced concrete bridges - a stochastic approach
- 12.20 *A Strauss, K Bergmeister*  
Monitoring and identification of time dependent random variables
- 12.40 Discussion
- 13.00 Lunch

## Conference Programme 5

Monday, 11 April 2005	Lecture Theatre		Lecture Theatre		
14.00	Session 3a	AP 3	14.00      Session 3b      AP 4		
14.00	<i>P Jackson, R Ko</i> BD91/04 a new departmental standard for new unreinforced masonry arch bridges		14.00	<i>D A Ives, A S Jandu</i> Maintenance prioritisation of highway structures	
14.20	<i>C Melbourne, H Tao</i> The behaviour of open spandrel brickwork masonry arch bridges		14.20	<i>B M Kamyra</i> Industrial rope access approach in the inspection and maintenance management of bridges	
14.40	<i>C Melbourne, J Wang</i> The 3-dimensional behaviour of masonry arches		14.40	<i>H Inagaki, Y Fujino, K Kitagawa, K Kawamura</i> Maintenance and management strategy of bridges for local governments in Japan	
15.00	<i>C Melbourne, A K Tomor</i> Effect of FRP and radial-pin reinforcement on the modes of failure and fatigue performance of multi-ring masonry arches		15.00	<i>P Pulkkinen, R Kiviluoma</i> Maintenance issues in the design of long cable-stayed bridges	
15.20	<i>C Melbourne, A K Tomor, J Wang</i> Modes of failure of multi-ring masonry arches under fatigue loading		15.20	<i>A Katsanos, M Mulheron, S O Nwaubani</i> Prolonging bridge life through innovative approach to de-icing operations	
15.40	<i>M Miri</i> The effect of spandrel wall strengthening on load capacity of arch bridges		15.40	Discussion	
16.00	Discussion		16.00	Tea	
16.10	Tea				
Monday, 11 April 2005	Lecture Theatre		Lecture Theatre		
16.30	Session 4a	AP 3	1630      Session 4b      AP 4		
16.30	<i>G Kim, I Kim, J Lee</i> A case study on the evaluation of the hanger rope for the Namhae Suspension Bridge		16.30	<i>F Hille, R Rohrmann, W Rücker</i> Guideline for the assessment of existing structures	
16.50	<i>J Redpath</i> The replacement of worn pendel bearings for the A9 Kessock Bridge, Inverness		16.50	<i>J D Shave, S R Denton, A Jandu</i> A review of bridge assessment on the UK motorway and trunk road network	
17.10	<i>J H Shin, Y H Lee, W T Kwon, Y J Kim</i> A large scale demolition in a densely populated urban area - a case study		17.10	<i>R J Walker, S R Denton, A V Hill, J D Shave, A Jandu</i> A technical review of BA79 'The management of sub-standard structures'	
17.30	<i>D T Slater</i> Tay Road Bridge improvements		17.30	<i>G Sterritt, N Shetty, A Jandu, M Young</i> Performance measures for highway structures	
17.50	<i>R Welsford, J St Leger, D Alefs</i> A14 Huntingdon Railway Viaduct - half-joint strengthening works		17.50	<i>K S Chauhan, F Najafi</i> Current bridge management practices in United States of America	
18.10	Discussion		18.10	Discussion	

## Conference Programme 6

Tuesday, 12 April 2005      Lecture Theatre  
8.45                      Session 5                      AP 3/4

9.00                      *S Nakamura, K Suzumura*  
Corrosion assessment of bridge cables

9.30                      *B Mahut, R J Woodward*  
Comparison of bridge management practice in England and France

10.00                      Discussion

10.15                      Coffee

Tuesday, 12 April 2005      Lecture Theatre  
10.45                      Session 6a                      AP 3

11.00 *J Liu, Y Wang, D Hu, Y Zheng, M Zhou, Y Dai, Y Liu, H Xie*  
Case studies on the impact of overloading bridges in China

11.20 *D A Smith*  
Refurbishment of the old Medway bridge

11.40 *A Cooke, R Peers, S Sunderland*  
Paddington bridge project - risk management

12.00 *J St Leger, R Welsford, D Alefs*  
A14 Huntingdon Railway Viaduct - re-grouting of post-tensioning tendon ducts

12.20 *F Klaptocz, A Robson, R Wheatley*  
Threading the needle - holistic solutions in an urban junction improvement, East London

12.40 *C Taweep, P Nanakorn*  
Assessment of superstructures of Bangkok expressways under the 10-wheel truck with increased legal weight

13.00 Discussion

13.10 Lunch

10.45                      Session 6b                      Lecture Theatre  
AP4

11.00 *K N P Steele, G Cole*  
Environmental sustainability for bridge management

11.20 *E J Kruger, R Ronny*  
The successful implementation of a defects-based bridge management system and adoption of bridge performance indicators for national roads in South Africa

11.40 *S Kim, S Lee, H Mha, Y Kim, S Jo*  
Application of an energy-dissipating sacrificial device (EDSD) for seismic performance improvement of girder bridges

12.00 *S Collard-Jenkins, J L Ford, D Pearson-Kirk*  
Sulphate induced deterioration of above ground components of highway structures

12.20 *M I Rafiq, M Chryssanthopoulos, T Onofriou*  
Comparison of bridge management strategies using life-cycle cost analysis

12.40 *D Gration, W H Algaard*  
Assessment of multispan masonry arch road bridge using explicit nonlinear finite element techniques

13.00 Discussion

13.10 Lunch

## Conference Programme 7

Tuesday, 12 April 2005      Lecture Theatre  
14.00      Session 7a      AP 3

- 14.00 *C Cremona, M Elachachi, D Breysse, S Yotte*  
Probabilistic assessment of cable residual strength
- 14.20 *A Getachew, E J O'Brien*  
Sensitivity of predicted bridge traffic load effects to the tails of truck weight distributions
- 14.40 *S I Jo, T Onoufriou, A D Crocombe*  
System reliability - based bridge assessment using the response surface method
- 15.00 *L Pardi, T Onoufriou, N Shetty, C G Soares*  
Application of risk and reliability to the management of bridges
- 15.20 *D Imhof, C Middleton*  
A multi-criterion approach for the risk assessment of existing bridges
- 15.40 Discussion
- 16.00 Tea

14.00      Session 7b      Lecture Theatre  
AP 4

- 14.00 *G Cole*  
An asset management plan for a local authority bridge stock
- 14.20 *B Godart, B Mahut, P Fasseu, M Michel*  
The new French technical guide for aiding to the management of structures damaged by concrete expansion
- 14.40 *G Sterritt, J Jarritt, R McFarlane, A Hilmy*  
From the condition indicator to asset management
- 15.00 *B H Allison*  
The structures management system (SMIS) database
- 15.20 *D Pearson-Kirk*  
The performance of post-tensioned bridges - a global review
- 15.40 Discussion
- 16.00 Tea

Tuesday, 12 April 2005      Lecture Theatre  
16.30      Session 8a      AP 3

- 16.30 *C A Bamgbade, S A Coxon, G Cole*  
Old Wey Bridge refurbishment
- 16.50 *D Collings*  
The Bhairab Bridge Bangladesh - A case study of the planning, design and construction of a second crossing of the Meghna river
- 17.10 *W B Conway*  
Widening the Huey P. Long Bridge
- 17.30 *I S Hofmann*  
Replacement of the Keppelerbrücke in Rottenburg / Neckar, Germany
- 17.50 *W Hoorpah*  
Rehabilitation and replacement bridge widening case studies in France
- 18.10 Discussion

16.30      Session 8b      Lecture Theatre  
AP 4

- 16.30 *C Birnstiel*  
The Nienburg cable-stayed bridge collapse: an analysis eighteen decades later
- 16.50 *C Cremona, R de Cassia Silva*  
Some considerations on the performance analysis of concrete girders in France
- 17.10 *B Imam, T D Righiniotis, M K Chryssanthopoulos*  
Remaining fatigue life estimates for riveted railway bridges
- 17.30 *R Kotze*  
Life extension of a 100-year old timber truss rail bridge
- 17.50 *G Rus, S-Y Lee, S-C Wooh, R-C Lee, R Gallego*  
Plate impact testing NDE based on the specimen response transfer function and the FEM
- 18.10 Discussion

18.30 Coaches leave the University to take delegates to the Conference Dinner held at The Great Fosters Elizabethan Hotel, Egham, Surrey.

## Conference Programme 8

Wednesday, 13 April 2005 Lecture Theatre

8.45 Session 9 AP 3/4

9.00 *J M Kulicki, W N Marianos, T B McMeans*

Designed-in maintenance features of the  
I-70 Mississippi river bridge

9.30 *T Kitada, M Matsumura, M Arino, M Kijitani*

Strengthening the strength and ductility of existing box  
columns built up with insufficient corner welding

10.00 Discussion

10.15 Coffee

Wednesday, 13 April 2005 Lecture Theatre

10.45 Session 10a AP 3

11.00 *A Calderon*

Strain measurement of a space structure bridge

11.20 *A O Dean*

Recent developments in the inspection of railway  
bridges

11.40 *F Matta, M Vath, N Galati, A Nanni*

Modular frame concept cart for inspection of slab-  
on-girder bridge superstructure

12.00 *M McKenzie*

The use of embedded probes for monitoring  
reinforcement corrosion rates

12.20 *S Lee, S Lee, R Lee*

Damage identification of truss bridges from  
dynamic response measurements

12.40 *S C Lee*

Analysis and strengthening method for damage of  
edge cross beam in tied girder arch bridge

13.00 Discussion

13.10 Lunch

Lecture Theatre

10.45 Session 10b AP 4

11.00 *K Ahmadi-Kashani*

Strengthening box-girder bridges using external  
post-tensioning

11.20 *S Z Khan*

Proposed remedial scheme for restoring load  
distribution action to a complex bridge deck

11.40 *T Yamaguchi, T Kitada*

A fundamental study on the improvement and  
refreshment of existing bridges

12.00 *S Luke, L Canning*

Strengthening and repair of railway bridges using  
FRP composites

12.20 *P Brown, B Martin*

Living with CFRP - a local authority view on using  
CFRP in new works and repairs

12.40 *J Park, Y Park, K Lee, H Shin*

Bonding properties of concrete-epoxy interface  
in RC beams strengthened by externally bonded  
steel plates

13.00 Discussion

13.10 Lunch

## Conference Programme 9

Wednesday, 13 April 2005 Lecture Theatre

14.00 Session 11a AP 3

- 14.00 *S Perno, Z Rinaldi, C Valente, L Pardi*  
Experimental evaluation of the load bearing capacity of corroded beams
- 14.20 *A C Shroff*  
Remote sensing techniques for bridge deck evaluation
- 14.40 *I Koljushev, P Toivola, A Vesterinen*  
Combining the construction period and service life structural monitoring requirements, resulting in a single, cost effective solution
- 15.00 *J Watson, S Yuyama, R Pullin, M Ing*  
Acoustic emission monitoring applications for Civil structures
- 15.20 *E Yamaguchi, S Kawamura, K Matsuo*  
A real - time bridge weigh - in - motion system
- 15.40 Discussion
- 16.00 Tea

Lecture Theatre

14.00 Session 11b AP 4

- 14.00 *B Bakht, H Mutsuyoshi*  
Development of bridge management system (BMS) in Japan and USA
- 14.20 *R J M Cairns, D Pearson-Kirk*  
The management of post-tensioned bridges - the client's perspective
- 14.40 *P A Nordengen, A J Nell*  
The development and implementation of a bridge management system for the provincial government of the Western Cape, South Africa
- 15.00 *S Omer*  
Potentials of a knowledge-based system for bridge management optimisation
- 15.20 *M J Garvin, H C Wu, R B Testa*  
Multi-objective optimization in a circumscribed bridge system
- 15.40 Discussion
- 16.00 Tea

Wednesday, 13 April 2005 Lecture Theatre

16.30 Session 12 AP 3/4

- 16.30 *N Shetty, G Sterritt, J Menzies, R Cole, E Bunting, D Yeoell, S Pearson, G Cole*  
Code of practice for the management of highway structures
- 16.50 *D Abruzzese, S Camo*  
Management of suspension bridge cables - the US experience
- 17.10 *M C Forde, B Hill, I Kennedy-Reid, R J Woodward*  
The UK Highways Agency's advice notes on the non-destructive testing of highway structures
- 17.30 *B Allison, R J Woodward*  
Inspection, testing and monitoring of trunk road bridges in England
- 17.50 Discussion and Conference close

# General Arrangements 10

## Delegates

The Conference should be of interest to Engineers, Architects and Researchers working for Consultants, Contractors, and in research and teaching establishments.

Anyone interested in attending should return a completed registration form as early as possible to guarantee their place.

## Publication

A high quality volume produced by Thomas Telford containing the papers to be presented at the Conference will be given to all delegates. The cost is included in the Conference fee.

## Conference Fee

The fee for the Conference which includes the volume of Conference papers, entrance to technical sessions, reception, lunches, morning coffee and afternoon tea and the Conference dinner will be as follows:

Delegates fee	£545
Delegates fee (early registration *)	£495
Authors fee (early registration*)	£465

\* Registration forms must be received before 1st March 2005.

## Conference Location

The Conference will be held in the Austin Pearce building of the University of Surrey.

The University is set in attractive countryside near to the colourful historic town of Guildford. London is only a 35 minute rail journey away, and both Heathrow and Gatwick airports are within easy access.



## Accommodation

Residential accommodation is available in University Halls for a limited number of delegates. The majority of the rooms are single. There are a few twin rooms available. All rooms have an en-suite shower and W.C. The cost of this accommodation (per person) is:

April 10th (Bed and breakfast)	£ 56.40
April 11th (Dinner, bed and breakfast)	£ 66.40
April 12th * (Bed and breakfast)	£ 56.40
April 13th (Dinner, bed and breakfast)	£ 66.40

\* The Conference dinner is on April 12th.

Hotels are available in the Guildford area and a list of selected hotels will be sent to delegates on request. Delegates wishing to stay in a hotel are asked to make their own arrangements. Apart from April 12th, no dinners will be provided for delegates staying in hotels.

## Social Programme

Reception: A drinks reception will be held on the evening of April 10th (Sunday) in the University. Delegates and accompanying persons are welcome.

Conference Dinner: This will be held at the Great Fosters Hotel in Egham on the 12th April (Tuesday). Coach transport will be provided from the University.

## Partners

Partners are welcome to take part in the drinks reception and Conference dinner. There is a charge of £50 for the latter.

## Payment

All payments should accompany the registration form or be sent as quickly as possible after registration. The organisers reserve the right not to admit delegates who have not paid. No refunds can be given for cancellations received after March 15th. Cancellations received before this date will be subject to a £50 cancellation fee.

### Further Information

Further information may be obtained from the organisers:  
Dr Janina Disney (Tel + 44 (0) 1483 689251)  
Dr Peter Disney (Tel + 44 (0) 1483 689251),  
Professor Gerry Parke (Tel + 44 (0) 1483 689544),  
Harry Wickens (Exhibition + 44 (0) 1483 686654)  
Fax + 44 (0) 1483 450984

# Registration Form 11

A separate form should be used for each delegate

Please complete in block capitals or type

Surname.....  
 First Names.....  
 Title (Prof/Dr/Mr/Mrs/Miss).....  
 Job title.....  
 Company/Institute/Organisation.....  
 .....  
 Address.....  
 .....  
 .....  
 City/Town.....  
 Post/Zip code.....  
 Country.....  
 Telephone.....  
 Mobile.....  
 Fax.....  
 E-mail.....

Please email to

J.Disney@surrey.ac.uk

or send the completed form to:

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FAX + 44 (0) 1483 450984

**Fifth International Conference on Bridge Management**

Delegates	@ £545	£.....
Delegates (Early Registration)	@ £495	£.....
Authors (Early Registration)	@ £465	£.....

**University Accommodation (Single Rooms)**

(Please indicate the number of rooms required in the boxes)

Sunday April 10th	<input type="checkbox"/>	En-suite (£56.40)	£.....
Monday April 11th*	<input type="checkbox"/>	En-suite (£66.40)	£.....
Tuesday April 12th	<input type="checkbox"/>	En-suite (£56.40)	£.....
Wednesday April 13th*	<input type="checkbox"/>	En-suite (£66.40)	£.....

\*Dinner is included on the evenings of 11th and 13th April for participants staying in University accommodation. The Conference dinner on the 12th April is included in the registration fee, for all participants.

Accompanying persons wishing to attend the Conference dinner on 12th April (£50 per person)  
 (please indicate number in box)  £.....

**TOTAL** £.....

Direct payment into the University of Surrey bank account NatWest Bank,  
 Sort code 60-09-50 Account No. 58080716  
 Please quote University reference No. MA1501 with payment.

Please indicate  
method of payment

If you wish to pay by Credit Card please include the following information (by FAX or letter)

CARD NUMBER .....   
 NAME OF CARD HOLDER .....  
 EXPIRY DATE eg ( 11/02) .....  
 THREE DIGIT CODE ON THE BACK OF THE CARD.....  
 TYPE OF CARD: (Visa, Mastercard, Solo, JCB, Switch).....

If paying by Cheque, please make it payable to the UNIVERSITY OF SURREY



# **FIFTH INTERNATIONAL CONFERENCE ON BRIDGE MANAGEMENT**

**University of Surrey**

Programme and other details subject to change