



# Newsletter

**br / tpave**

The British In-situ Concrete Paving Association

Winter 2002 | 3

## APPROACHING Gridlock...

The result of two generations of neglect of transport in this country is clearly shown by the first comprehensive comparison of investment in the UK and in Europe, which was recently reported by the Commission for Integrated Transport.

Chair of the Commission, Professor David Begg, said the survey showed "a transport network starved of investment for half a century" - forcing people into their cars whether they wanted or not.

This resulted in more congestion in the UK than elsewhere in Europe, Prof Begg maintained, and despite the relative compactness of the UK, "we spend more time commuting than any other European nation".

The new report was first requested by the Deputy Prime Minister who said that if we were to rival the best in Europe in transport we first needed to establish benchmarks.

"The report shows historical levels of under-investment. The Government's Integrated Transport White paper and last year's 10-Year Transport Plan mark a welcome and long awaited focus on integrated policies and a step change in levels of investment", added Prof Begg.

• **As Nick Hawkins, key speaker at the 2000 Britpave conference, urged, members should all contact their local MP to lobby for greater spend on the transport infrastructure.**

## ...but innovation has kept the traffic moving on the **M25**



*The working space needed is reduced by tipping the concrete onto a transverse conveyor that places it across the slab. On emptying a lorry, the conveyor lifts to allow passage of the next truck.*

The section of the M25 from Junction 5 to Clackets Lane Services is one of the busiest parts, with 120,00 vehicles using it daily. After more than 20 years' pounding from 38-tonne lorries and countless waves of commuter traffic, this important stretch of road was seriously suffering, as described in *Britpave News No. 2*.

The £11.7m remedial contract, covering more than 6 km of the east- and west-bound carriageways, was one of the largest lane rental jobs let as one project by the Highways Agency.

Awarded to Fitzpatrick Contractors Ltd in late February 2001 for a mid-March start, the project transformed a concrete carriageway at the end of its working life into a new road - without the need for complete full-depth reconstruction.

This was achieved by slipforming a continuously reinforced concrete pavement (CRCP) onto the top of the existing road surface, to cover lanes one and two, with an overlap onto the hard shoulder and lane three.

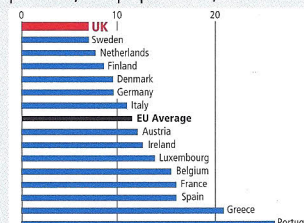
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### The following European-wide comparisons make the point

**DAILY COMMUTING TIMES**  
minutes per day



**ROAD DEATHS**  
per 100,000 population, 1988



**INFRASTRUCTURE INVESTMENT**  
per head, 1995







## Innovation... *Continued*

The existing carriageway exhibited steps of up to 50 mm across longitudinal joints and provided an uncomfortable ride. Planing and a thin bituminous regulating layer addressed this problem and provided a uniform base for the CRCP.

Reinforcement in the CRCP is provided by 16 mm diameter longitudinal bars spaced at 150 mm, and 12 mm diameter transverse bars spaced at 575 mm. The steel fixing was kept one day ahead of the paver, considerably reducing site congestion.

CRCP anchorage construction incorporated steel beams, but no expansion slabs were required on the flexible side. One pair of intermediate anchorages was required at Croydon Road under-bridge, as the structure would not carry the CRCP loading.

It was vital that the concrete placement method was:

- quick
- within the hard shoulder width
- movable to allow free passage of trucks

Having considered the options, Fitzpatrick opted to make a further investment in its specialist concreting plant with the purchase of a Gomaco 2600 Placer/Spreader. This unit, the only one in the UK, was shipped in from the USA especially for this project.

All concrete for the pavement was produced using Fitzpatrick's own batching plants, located at the Highways Agency's Hooley compound on the M23. To ensure that the critical paving programme was met, two Elba batching plants, with a combined output of 150 m<sup>3</sup> per hour, were erected.

Typically, 12 eight-wheeled tippers were used to haul loads of 8 m<sup>3</sup> on the 25 km round trip. Access through the site was restricted to the hard shoulder only. This was reduced to less than 2.5 m wide at the paver, requiring its temporary widening.

The two-track machine, equipped with a 1.5 m wide transverse conveyor, is designed to handle end-tipped loads of concrete. The conveyor places the concrete across the slab and, after receiving a lorry load, lifts to allow passage of the next truck.

## Tim Gibb's presentation at the recent Britpave Seminar



*Tim Gibb describing the M25 contract at Britpave's annual seminar.*

With the conveyor lifted, the placer/spreader travels forwards, distributing concrete across the slab by means of high-capacity transverse augers. The material is spread to a uniform, full-width surcharge ready for final shaping and compaction by the slipform paver following a few metres behind.

The surface of the finished slab was given a light brush texture before being sprayed with bituminous emulsion as a curing membrane. Once the concrete had been placed, the operation became a routine slipform paving exercise, albeit one carried out in a severely confined area: there was only one metre between the paver track and the coned safety zone.

On completion of concrete paving, the hard shoulder and lane three were surfaced with roadbase and the whole carriageway was covered with a 30 mm high-performance thin asphalt wearing course. This is expected to reduce traffic noise by up to 6 dB (equivalent to a 50% reduction in traffic flow).

Britpave is pressing for further similar contracts now that the effectiveness of this form of construction has been demonstrated.

For more information on this project contact Tim Gibb, Fitzpatrick Paving Manager on 01707 644466, or e-mail [gibbst@Fitzpatrick.co.uk](mailto:gibbst@Fitzpatrick.co.uk)

## MINIMUM DISRUPTION

A major problem that had to be overcome was to minimize disruption to traffic at such a busy section of the M25.

The paving window in the original project programme was based around a traffic management scheme of a 2+1 contraflow, which gave an average of eight hours' access per night to the closed lane. Taking account of set up and clearance times, however, this was reduced to about six hours. The net result was a programme estimated at 119 days.

Fitzpatrick's proposals reduced this programme significantly. The company's alternative solution was to harden the central reserve and thus create sufficient space for a full 3x3 contraflow. This removed the restraint on paving operations and created a 12-hour paving window every night.

This approach was successfully used throughout the project, apart from one short length of 2+1 contra-flow running, necessitated by the two separate decks of the Croydon Road under-bridge.

The project was completed in just 75 days, on time and to budget, and returned the road to full use before the busy Spring Bank Holiday.





# Wire-free guidance for slabtrack in Europe

Following successful trials with wire-free guidance of the slipform paver, a contract section of almost 10 km in each direction has been paved in this way on the new high-speed link between Cologne and Frankfurt. With train speeds of up to 300 km/hr, a rigid trackbed was required for the whole length of the link in order to provide high levels of load-bearing capacity, coupled with lower maintenance and repair requirements.

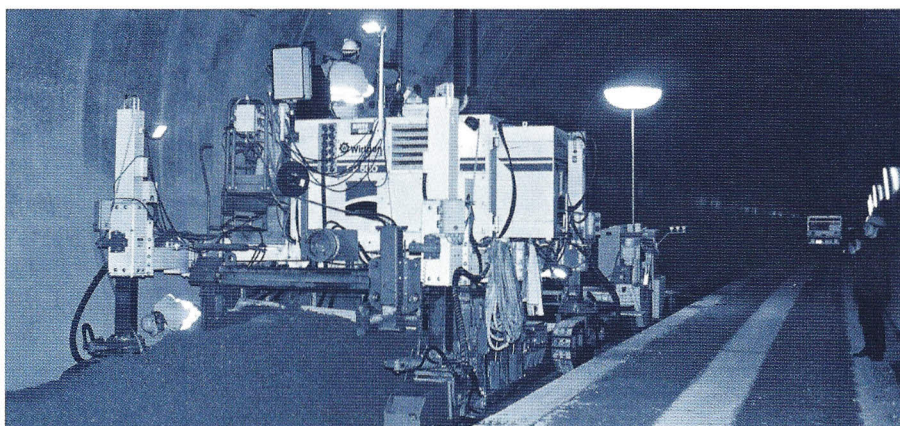
The trial placing of 1.3 km of concrete trough was carried out with a Wirtgen SP 500 slipform paver using computer-controlled wire-free guidance. Measurements from the equipment were fed back to the computer on board the paver by radio, and this controlled the track levels precisely.

In Switzerland, the track in the new two-laned Murgenthal tunnel, part of the update link between Zurich and Bern, has also been laid by a Wirtgen slipform paver using wire-free guidance. The work demonstrated that material supply is on the critical path in slipforming. A theoretical performance of 400 m per day could be achieved, but it was not possible to increase the concrete supply to this site.

For more information, contact [sales@wirtgen.co.uk](mailto:sales@wirtgen.co.uk)



*The Wirtgen paver at work on the Cologne-Frankfurt line, showing the 12% camber and side delivery of concrete supplies.*



*Wire-free guidance was used in the Murgenthal Tunnel in Switzerland. The completed track running in the opposite direction can be seen on the right.*

## Aviation White Paper

Later this year the government will publish an Aviation White Paper, the first in more than a decade, which will tackle the crucial question of siting a new runway in the Southeast. Evidence given at the Terminal Five inquiry indicated that the demand for flights will outstrip runway capacity in the Southeast within 20 years. Boeing estimate that even the gloomiest prognosis of long-term effects of 11 September will mean the global aviation industry being set back by just one year's growth in the next two decades. So where will the Southeast's new runway be built? The least contentious choice of Heathrow, Gatwick and Stansted would probably be the latter. Britpave members await the White paper with interest.

## Britpave's visit to RAF Fairford

In November, 30 Britpave members visited RAF Fairford. Numbers were restricted, and those who had put their names forward in September were invited to re-apply.

This contract is the first in the UK where a wireless guidance system has been used for the paver, leaving the machine operator to concentrate on construction site procedures. Productivity has been greatly increased by the elimination of guide wires and a reduction in surveying time. Movement of the paver around the site has also been greatly speeded on the £55m project, which is due to be completed early in 2002. See *Britpave Newsletter 2* for more details of the contract.

## NEW MEMBERS

We are delighted to welcome the following new members:

- Ballast Phoenix Ltd
- Lilley Construction Services Ltd
- Weeks Consultants Ltd
- Kerb West (Perth, Australia)

We are actively encouraging new membership, and referral by existing members is an effective way of generating interest. Let the office know if you want copies of the current prospectus, or have any leads that we should follow up.





# Britpave's 10th confe

The 10th Anniversary Dinner was particularly well attended by members and guests who were entertained by guest speaker Garry Richardson, the broadcaster. Tim Matthews, Chief Executive HA, gave an upbeat presentation on the Transport 2010 programme. There was a strong programme of road-related topics as well as coverage of the Heathrow Terminal 5 project, feedback of Technical Committee work and an insight into the activities of similar organisations to Britpave in Canada and Belgium. The now regular rail slot before dinner was well supported with presentations by Pandrol and Alstom, illustrating how slabtrack systems are progressing in Europe and the rest of the world.

- **Two papers of general interest are summarized below.**

## Sustainability definitions

**Sustainable development** is development which meets the needs of the present without compromising the ability of future generations to meet their own needs.

This means:

- Social progress which recognises the needs of everyone
- Effective protection of the environment
- Prudent use of natural resources
- Maintenance of high and stable levels of economic growth and employment.

**Sustainable construction** is construction that supports sustainable development by:

- Enhancing the quality of life, offering customer satisfaction
- Offering flexibility, the potential to cater for future user changes
- Providing and supporting desirable natural and social environments
- Maximising the efficient use of resources



*Jonathan Green (Chairman) on the left with Tim Matthews (Chief Executive, Highways Agency) at the Britpave seminar.*

## Sustainability - the government is serious

Speaking for the Highways Agency, Gary Thomas explained how it was using its procurement policy to achieve better sustainability in the nation's road network.

The HA aims to deliver the 2010 transport plan in a sustainable way, and will implement the Government Construction Client Panel's sustainable construction action plan by 2003. Creating a construction clients' charter should lead to improved performance on site and he reminded the audience that greater sustainability is good business.

The Agency has to understand the application of sustainability to highway work, establish just how sustainable it is and review standards and specification in this light.

He maintained that the HA operated in a more sustainable way than many organisations, but there was still room for improvement. There was, however a lack of data, indicators were needed, and R&D should be more focused on the issue.

The GCCP sustainable construction action plan was established in June 2000, containing nine key themes concerning sustainability that would be addressed by March 2003 and delivered through the procurement process. These themes are:

- Consider re-use as an alternative to new build and permit the use of recycled material in pavements

- Design for minimum waste - increasing use of performance-based specifications
- Aim for lean construction - by changing procurement to promote greater integration in the supply chain
- Minimise energy use in construction and use, by developing performance indicators to benchmark energy consumption
- Avoid pollution by inducing all suppliers to operate an environmental management system by 2004
- Preserve and enhance biodiversity by continuing to manage the trunk road network for biodiversity
- Conserve water resources by producing minimal impact on them
- Respect people by introducing the Considerate Contractors Scheme
- Set targets by introducing performance indicators into all contracts. They are already in the latest PPPs and MACs.

The speaker made the point that, while there was no single item labelled 'sustainability', the Agency was procuring it by addressing the issue when assessing tenders and setting performance indicators during a contract's operation.





# rence and annual dinner

## Planning for Heathrow's fifth terminal

David Harwood of BAA gave some insight into the thinking behind Heathrow's new Terminal 5, which was announced by the government about a month after the seminar.

He said that the facilities at Heathrow were becoming uncomfortable, and T5 was required to provide extra capacity. Heathrow would then be one of the first airports designed to handle the new Airbus 380. There was now an immediate need for additional aircraft standing capacity.

Under the banner 'Achieving success together', the project organisation uses philosophies similar to the current BAA Frameworks. This involves multidisciplinary teams, with all key suppliers located in the project office. The supply chain is involved as early as possible in the design and construction process. All risks are owned and managed by BAA.

A total of 675,000 m<sup>2</sup> of aprons and taxiways will be constructed, using some 350,000 m<sup>3</sup> of pavement quality concrete and 100,000 m<sup>3</sup> of wet lean concrete. Forty five aircraft stands will be constructed in phase 1.

These pavements will be among the most heavily loaded in the world, and will rest on London clay fill which provides extremely poor subgrade strength. They expect to use 2% CBR to improve this.

The construction will be phased to cater for the predicted rises in aircraft traffic, with the earliest stands being built in the southeast corner of the site and completed in 2008.

In order to achieve best value, the speaker said that some existing design and construction requirements are being challenged. These include:

- The use of air entrainment
- Minimum cement content
- Frictions requirements
- Joint sealing
- Increased pfa content
- Operational flexibility
- In-situ stabilised base layers

The pavement design is based on the BAA Design Guide for heavy aircraft loadings, and the integrated design and construction model allows best value solutions to be achieved. The design and cost models are linked directly to the planning drawing, which defines up to 25 different construction types and 37 phases of construction. The cost model uses real time information provided by the pavement team.

The speaker explained that initial pavement design calculations indicated pavement depths of over 650 mm, based on the current F6 PQC mix that provided a flexural strength of 6 N/mm<sup>2</sup>. There is clearly a need for a higher strength mix, and an F7 mix was developed in 1999/2000, and successfully laid in trials in summer 2000. An even stronger F8 mix has been achieved in recent laboratory trials.

Further work is being carried out on workability and construction issues, and mixes with the pfa content increased from the current 30% to a proposed 40% are being investigated.

In conclusion, Mr Harwood said that the design and construction for

## KEY DATES

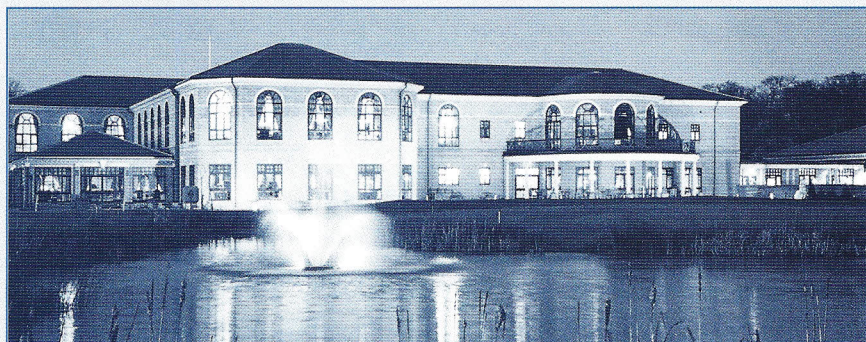
- Scheme first discussed in 1988
- Planning Application submitted in 1993
- Planning inquiry started in 1995
- PI completed 1999
- Government decision announced November 2001
- Work to start on site April 2002

T5 has demanded a different approach, and the integrated project team has been the key to the success of the project so far. The next phase will be the development of an F8 mix, aiming to reduce cement content while increasing the percentage of pfa. Increased concrete strengths should lead to reduced pavement thickness.

Site trials are taking place to ensure that F7 concrete can be paced using a slipformer. Other trials include stabilisation of in-situ gravels and planing these gravels after stabilisation

For more information on this project, contact David Harwood, e-mail [davidharwood@t5.co.uk](mailto:davidharwood@t5.co.uk)

## 2002 Dinner and Seminar



This is being held on 23 and 24 September at Belton Woods Hotel. Set in 475 acres of countryside, this hotel has excellent dining and conference facilities. For the golfer there are two championship courses and a 9 hole course. Leisure facilities are first class, with swimming pool, spa, gym, sun beds and snooker

room. Belton Woods is 5 minutes drive from the A1 near Grantham. East Midlands Airport is 45 minutes away, Birmingham 90 minutes, Leeds 1 hour and Kings Cross is only 60 minutes by rail. Building on the success of recent years, Britpave is delighted to be holding its 2002 event at this prestigious location.





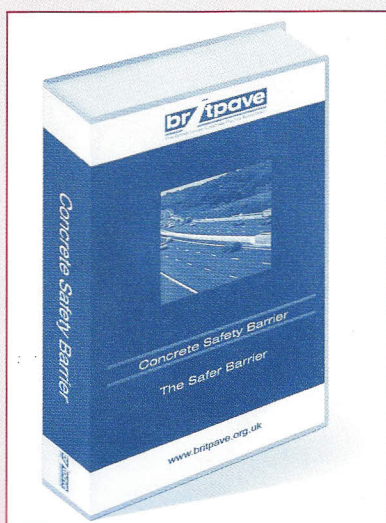
# Keeping up-to-date with **Britpave...**

## Concrete barrier promotional video

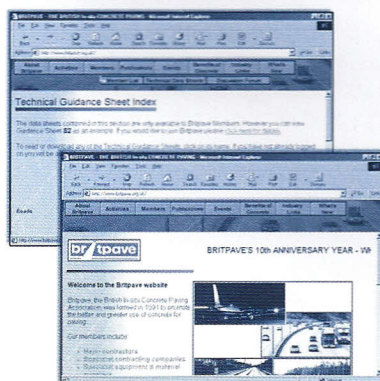
All members will receive in January a copy of the new promotional video on concrete safety barriers. Aimed at the informed, but not technical expert, this video underlines the effectiveness of concrete safety barriers in preventing crossover accidents, and demonstrates graphically the often-fatal results of such incidents. The benefits of concrete barriers in enabling carriageway widening to take place without the need for further land take are also highlighted, together with the immense savings in maintenance when concrete is used instead of steel.

The safety message in this video is extremely powerful. Members are asked to consider using their own contacts in local authorities, the police, Rotary and other professional clubs and organisations to promote the message.

This video was produced with financial support from the Ready-mixed Concrete Bureau, and Britpave looks forward to further co-operation with the RCB in technical and promotional projects. Further copies of the video are available to members on request from Jan Stamp on 01344 725731.



## WEBSITE - members-only area



The Britpave website ([www.britpave.org.uk](http://www.britpave.org.uk)) is being enhanced by the inclusion of a password-protected area. A password enabling you to enter this area has already been e-mailed to you. The new series of Technical Guidance Sheets are available to view and download from this area, enabling a much wider distribution of information among member company staff. Make sure the office has your up-to-date e-mail address so you can access this part of our site.

# NEW Technical Guidance Sheets

The series of Guidance Sheets has been prepared by qualified staff within Britpave member organisations. The advice given takes into account the majority views of Britpave members, and so may not align exactly with those of all members. For further advice on their use, please contact the office, who will provide the contact details for appropriate members to discuss a particular topic.

Each member organisation has been sent three copies of the complete folder, which should be kept up to date as additional sheets or amendments are issued from time to time. To check availability, or to download further copies, visit the website and look at [www.britpave.org.uk/tds/index.asp](http://www.britpave.org.uk/tds/index.asp)

### Roads

- R1** Empirical highway pavement design
- R2** Examples of empirical designs
- R3** Flexural strength - design implications
- R4** Cement bound materials

### Airfields

- A1** Slip-forming deep airfield pavements

### Rail

- RL1** Slip-formed track bed

### Specialist applications

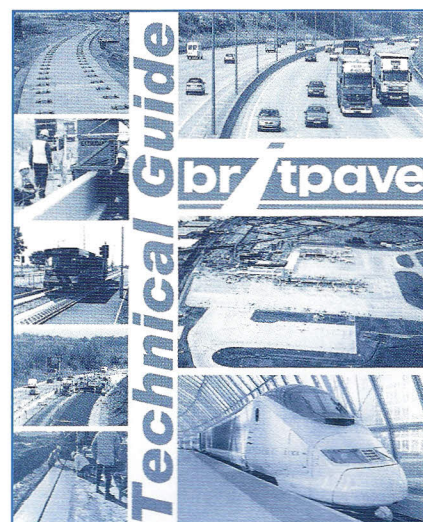
- S1** Vertical concrete barriers
- S2** Special vertical concrete barriers
- S3** Slip-formed slot drain

### Environment

- E1** Re-cycling concrete pavements
- E2** Quieter road surfaces
- E3** Fuel saving on concrete pavements
- E4** Secondary materials in CBM

### General

- G1** Slip membranes







# News from the industry - at home and abroad

## The Concrete Show at SED2002

The organisers of SED (Site Equipment Demonstration) have joined forces with the Concrete Show to mount a combined event on 14 to 16 May. To be held at SED's site at Fen Farm, Milton Keynes, the Concrete Show will be held within a newly created pavilion, with outdoor demonstrations nearby. The event will now take place annually.

The Concrete Show enjoys Britpave sponsorship along with that of BCA, the Ready-mixed Concrete Bureau, the Association of Industrial Flooring Contractors and The Concrete Society. Last year SED attracted over 17,000 visitors. Many of them will also visit the Concrete Show within the exhibition area.

For more information about booking space, contact Daniel West of the Westrade Group on 01923 778311, or visit [www.sed.co.uk](http://www.sed.co.uk)

## Leeds 'supertram' scheme sparks interest

Major contractors from the UK have lined up to register interest in bidding for the Public Private Partnership deal worth £500m for the 'supertram' project in Leeds. They include Mowlem, Balfour Beatty, Sir Robert McAlpine and Amec. It is also reported that firms from mainland Europe, the US and Canada could also express an interest.

The 'supertram' network includes 28 km of track and 50 stations, as well as four park-and-ride sites with space for 4,500 vehicles.

All this follows the success of the Leeds guided busway. Following its introduction, bus use increased by 70%. Leeds is one of only five cities in the world to have a guided busway.

- Another city with transport plans is Liverpool, with massive construction plans worth £500m. This includes £210m on upgrading 25 mainline stations and four underground stations, as well as constructing 90 km of bus lanes

## Roads, concrete and climate change



*Will we be seeing more of this in the future?*

Debate still rages over the types of climate change we can expect over the coming decades, and the extent to which the changes are man-made. However, there is now a strong consensus that the trends we have seen over the last years are now established and that the British Isles is entering a period of milder, wetter winters, hotter summers and increased storminess. The return periods for extreme weather will become shorter and we can expect to see more episodes of both heavy rainfall and drought, and wider extremes of temperature.

What will the impact be on transport infrastructure? How will this change the market for cement and concrete paving? It's not too soon to ask.

Perhaps the most important and wide-ranging impact will be on drainage systems. Without good drainage, road surfaces, rail tracks and tramways will flood and become impassable or unsafe. Sub-surface water could destabilise foundations and compromise the structures they support. Drainage designs will need to be reviewed. The performance of existing systems will need to be assessed and improved. What products will be used for this and do they exist or do they need to be developed?

If foundations will be at greater risk of compromise, we could see an upturn in the market for stabilisation. But where is the clear evidence for improved performance from stabilised materials? Now would be a good time to present it.

Changes in the climate may influence the performance of concrete in pavements and runways, through higher temperatures and degrees of thermal expansion, along with greater rates of carbonation. The properties of concrete can be carefully specified for individual applications and now may be the time to account for climate change in the design of materials.

We may not have much faith in weather forecasts for tomorrow, let alone for 10 or 20 years hence. However, most meteorologists believe that change is a reality and that the infrastructure we build today will end its life in a different climate. Shouldn't what we use today be designed for tomorrow's conditions?

If you have answers to any of these questions or would like to discuss them with other members, or if you have an opinion on the points raised in this article, then contact Dr Tony Parry ([aparry@trl.co.uk](mailto:aparry@trl.co.uk))





## New boss at Strategic Rail Authority

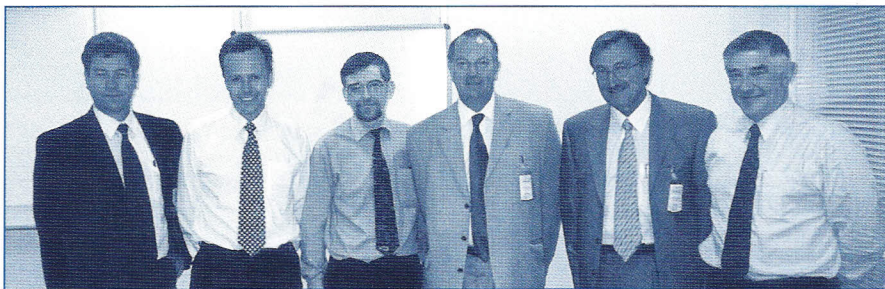
Richard Bowker, 35, has been appointed to head up a new, powerful Strategic Rail Authority.

Bowker moves from Virgin Rail, where he was co-chairman, and replaces Sir Alastair Morton. From Blackburn, Bowker is grammar school educated and has a degree in economics from Leicester University. He is very much in the Branson mould of carefully studied

casualness, rarely wearing a suit and never a tie. He is widely credited with Virgin's bid for the East Coast Main Line franchise, which included proposals to build a new high-speed line parallel to the old one. Slabtrack may have a supporter at last at the top of the railway industry!

If you are interested in joining Britpave's Rail Task Group contact Rory Keogh ([rory@easynet.co.uk](mailto:rory@easynet.co.uk)).

## Britpave's Rail Task Group meets SRA in July



Members of the Rail task Group had a very encouraging meeting with the SRA last summer. Pictured left to right are: Rory Keogh (Chairman

Rail TG), Peter Richards (SRA), Maxwell Henn (SRA), David Jones (Rail TG), Chris Howe (Rail TG) and John Bygate (SRA).

## DON'T FORGET

This year's **Dinner and Seminar** will be earlier than usual.

Make a note of the **23rd and 24th September** in your diary today.

## New Chairman for Britpave's Marketing Committee

John McCabe of Blue Circle Cement has taken over as Chairman of your marketing committee. A professional marketer, John will be steering the Committee as Britpave enters an exciting stage its development, and you can expect to see a greatly increased flow of deliverables during 2002 and beyond.

## International conference focuses on new technology

The 7th International Conference on Concrete pavements held in Orlando, USA, in September carried on the tradition of the first six international conferences previously held at Purdue University, Indiana. The focus was on presenting information on new technologies related to design, construction and rehabilitation of various types of concrete pavements. Some 470 delegates were in attendance including 150 from outside the USA. David Jones was the only UK attendee.

Britpave plans to make the more relevant papers available to its members.

## In and out in 72 hours in USA

Three intersections in Kennewick, Washington State, were completely reconstructed last year in under 72 hours. The State Department of Transportation took the unusual step of completely closing each intersection for one weekend to perform the repairs with a full-depth concrete reconstruction. The contractor used high early strength Portland cement concrete that allowed the road to be opened to traffic within 12 hours. Closed at 7.00 pm on a Thursday, the roads were re-opened after an asphalt running surface had been added by the Sunday evening.

- **What has happened to fast-track in the UK?**



*Britpave Newsletter* is published regularly by Britpave with the aim of keeping members up to date on Association matters, industry developments and member company news and views. Please help keep us in the picture on all of this by sending us any relevant information that you feel may be of interest to the membership.

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