

**CHAPTER MEETINGS** – To kick-start the New Year, we have two meetings in February ... ..

### Thursday 5 February 2009 – The Big Bang?

Join PWI members for a day trip to **Southern Quarries**, Sellicks Hill.

The tour will comprise bus travel to and from Sellicks Hill, for a guided tour of the quarry and its operations, followed by a BBQ lunch. With a quarry blast if possible.

Meet at the TransAdelaide car park, Richmond Road, Mile End South, ready for a 10:00 am departure. Wear enclosed footwear (preferably safety type), and bring a hard hat if possible (limited numbers of hats will be available at the quarry). The tour will arrive back at Richmond Road around 3:00 pm.

### Thursday 19 February 2009 – Trams, Trains, and Tramtrains

A presentation on developments in German transport infrastructure, by Chapter member **Daniel Martucci**.



**Venue: Engineering House, 11 Bagot Street, North Adelaide**

**Light refreshments from 5:30 pm, meeting commences 6:10 pm**

Daniel will highlight inspirational German transport infrastructure, including the Kassel and Karlsruhe tramtrain systems, the Hanover tram vehicles, and a railcar plant in Salzgitter. Aspects of the impressive Deutsche Bahn network will also be showcased, together with illustrated commentary about European styles of urban development, attitudes to risk, and consequent implications for the provision of transport infrastructure.

With tramtrains proposed for Adelaide, this will be a topical and timely presentation, and one not to be missed.

## Contents

Chapter Meetings.....	2
Coming Events.....	3
News .....	3
Chairman's Chatter .....	4
Rail Revitalisation .....	5

### Publisher

This newsletter is a publication of the South Australian Chapter of the Railway Technical Society of Australasia, Engineering House, 11 Bagot Street, North Adelaide SA 5006.

Opinions expressed within are not necessarily those of the Chapter, Society or Editor.

### Contributions

Contributions, including news, opinions, or letters to the editor, are always welcome. Send to [sa@rtsa.com.au](mailto:sa@rtsa.com.au).

### Continuing Professional Development

Engineers Australia members are reminded that attendance at RTSA technical meetings contributes towards CPD requirements. Each RTSA technical meeting generally has a value of 1 CPD point.

### RTSA Website

The RTSA website [www.rtsa.com.au](http://www.rtsa.com.au) has details of RTSA activities, including future meetings and reports from past meetings, for all Chapters.

### Membership

Information for potential new members and an application form may be found at [www.rtsa.com.au](http://www.rtsa.com.au).

### Chapter Contacts

Chairman	Duncan McLeod	8338 7919
Deputy Chairman	Daniel Martucci	8204 8213
Secretary	Tom Hampton	8291 5383
Treasurer	Michael Forbes	8217 4127
Newsletter Despatch	Steve Torok	8264 2552
Editor	tba	

### Newsletter Despatch

Despatch of the newsletter is undertaken by Steve Torok. Contact Steve on [storok@tge.com.au](mailto:storok@tge.com.au) if you have any problems receiving newsletter electronically or in hard copy, or change your e-mail address.

## Chapter Meetings

### Thursday 5 February 2009

Chapter meeting, day trip to Southern Quarries, hosted by PWI – see page 1.

### Thursday 19 February 2009

Chapter meeting, 11 Bagot St North Adelaide – Trams, Trains and Tramtrains by Daniel Martucci, – see page 1.

### Thursday 5 March 2009

Chapter meeting, 11 Bagot St North Adelaide – non-destructive measurement of neutral temperature in rails, by Max Shuard and Duncan McLeod.

### Thursday 2 April 2009

Chapter meeting hosted by PWI, venue to be advised – ultrasonic rail flaw detection.

### Thursday 7 May 2009

Chapter meeting, 11 Bagot St North Adelaide – standards for track materials.

### Thursday 4 June 2009

Chapter meeting, 11 Bagot St North Adelaide – Rail maintenance developments in the Pilbara.

### Thursday 2 July 2009

Chapter meeting, 11 Bagot St North Adelaide – Belair line upgrade.

### Thursday 6 August 2009

Chapter meeting, 11 Bagot St North Adelaide, with joint mechanical groups.

### Thursday 3 September 2009

Chapter meeting, hosted by IRSE.

### Thursday 1 October 2009

Chapter meeting, 11 Bagot St North Adelaide – ARTC network enhancement investment update.

### Thursday 5 November 2009

Chapter meeting, 11 Bagot St North Adelaide.

### Tuesday 24 November 2009

Annual dinner meeting + AGM.

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## Coming Events

### IRSE Convention

The Institution of Railway Signal Engineers is holding a technical meeting "Controlling Railways – Australia's Next Generation Systems" in Adelaide on 3 – 5 April 2009.

Full details can be obtained from Malcolm Menadue: mmenadue@internode.on.net.

### Study Tour on Railway Engineering

The NSW Chapter is planning a Study Tour on Railway Engineering (STORE) to Asia, tentatively in September/October 2009.

Details will be advised in the newsletter as they become available.

### CORE 2010

RTSA's biennial Conference on Railway Engineering, CORE 2010, will be held in Wellington, NZ on 12 – 15 September 2010.

Conference theme is "Rail – Rejuvenation & Renaissance". Details are becoming available on [www.core2010.org.nz](http://www.core2010.org.nz).

## News

### Chapter Committee for 2009

At the Annual General Meeting on 25 November 2008, the following committee was elected for 2009:

Chairman	Duncan McLeod
Deputy Chairman	Daniel Martucci
Secretary	Tom Hampton
Treasurer	Michael Forbes
Committee	Tim Calver
	John Dring
	Bill Edmonds (programme)
	George Erdos
	Robert Schweiger
	Steve Torok (catering)
	Roger Wyatt

### New Members

The Chapter welcomes recent new members **Paul Burns, Phillip Campbell, Angelo Lanzilli, Ian Fox, and Alice Weatherford.**

In addition, NSW Chapter member **Lucie Mitchell** is transferring to South Australia.

### John Adams Receives Award

RTSA life member and founding Chapter member **John Adams OAM** recently received his Medal of the Order of Australia from the Governor of South Australia, His Excellency Rear Admiral Kevin Scarce AC CSC RANR.



## Chairman's Chatter

ARTC Chief Executive David Marchant's address to the Chapter's annual dinner meeting last November gave an interesting perspective on challenges facing the rail industry over the next few years.

David identified the main features of the external environment impacting on rail as being:

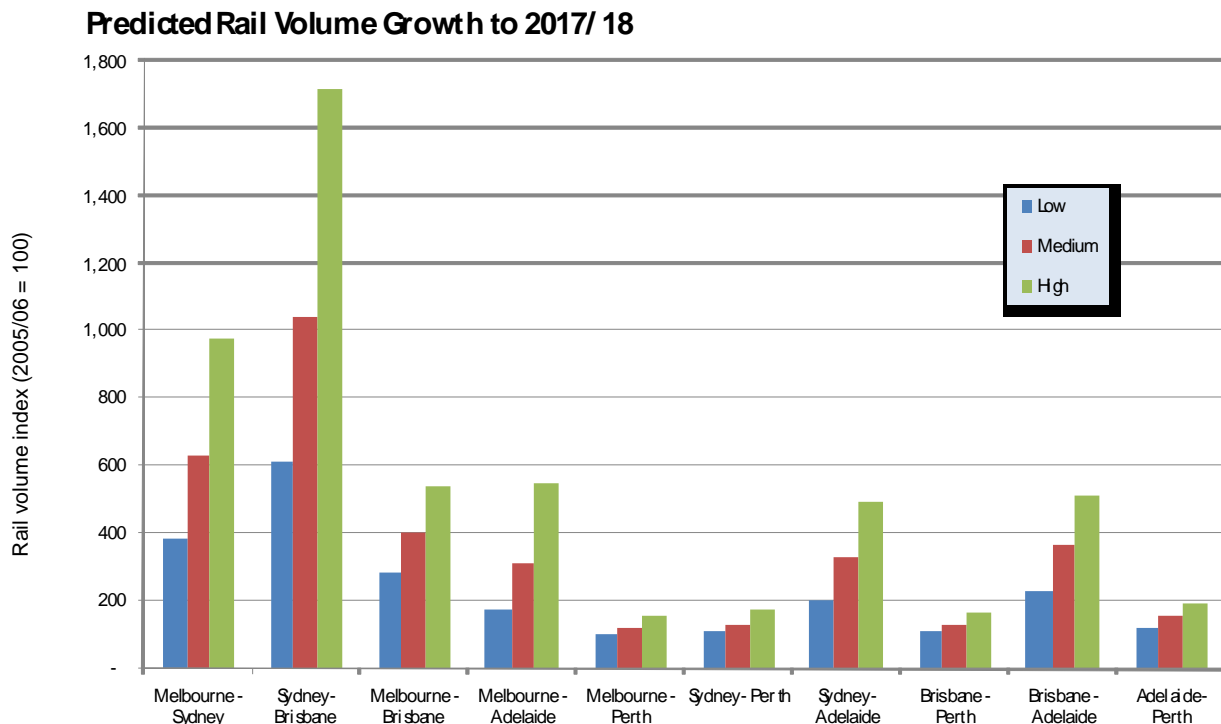
- Fuel prices;
- Carbon tax;
- Road user charges;
- Labour costs;
- Urban congestion; and
- Surging demand for commodities,

combining to bring a high level of uncertainty to the industry. Indeed, only two months later, the

likelihood of a surging demand for commodities seems to be diminishing.

One's immediate reaction might be that most of these influences present a negative outlook for rail. On the contrary however, David Marchant's expectations were of significant growth in the rail transport task. Economic modelling shows significant growth of traffic on most corridors, particularly on the relatively short sectors between Melbourne, Sydney and Brisbane. Here there is forecast to be a considerable modal shift from road to rail, lifting rail's share to around 80%. Growth on the east – west corridor is forecast to be less, as rail already holds a high share of the available market.

Details are shown in the following chart:



With regard to climate change and the proposed Carbon Pollution Reduction Scheme, transport accounts for about 14% of Australia's overall greenhouse gas emissions. Rail's share of this is very low, at around 2% of all transport emissions.

In other words, rail's contribution to greenhouse gas emissions in Australia is effectively negligible.

New carbon taxes, as with most of the other externalities identified above, present a positive perspective for the growth of rail. The big unknown is, how accurate are the forecasts?

As has been said so often recently, we live in interesting times.

**Duncan McLeod**

# Rail Revitalisation

by **Tim Warren, Project Director Rail Revitalisation, Department for Transport, Energy & Infrastructure**

*Summary of a presentation to the November 2008 Chapter meeting.*

## What is Rail Revitalisation?

In June 2007 the South Australian Government announced initial rail revitalisation projects:

- 1 An upgrade of the Belair (hills section only) and Noarlunga lines at a budgeted cost of \$121 million. This work included:
  - Installation of gauge convertible concrete sleepers;
  - Formation upgrading
  - Drainage upgrading;
  - Turnout refurbishment; and
  - New or refurbished continuously welded rail.
- 2 Rail Car Depot Relocation (\$157 million).
- 3 Railcar Refurbishment Programme.



**Upgraded Track on the Belair Line**

A year later, in June 2008, the South Australian Government announced that the rail revitalisation scope would be expanded to a total estimated cost of \$2 billion. The expanded scope included:

- 1 Track upgrading of the entire network;
- 2 Gauge standardisation of the entire network;
- 3 Electrification of all lines except the Belair line from Goodwood to Belair;
- 4 A tramline extension to the Adelaide Entertainment Centre (AEC);
- 5 A tram-train network to Port Adelaide, Semaphore and West Lakes;
- 6 Purchase of trams, tram-trains and electric railcars;
- 7 Conversion of 58 diesel railcars to electric traction;
- 8 Station upgrades including TOD's (Transit Oriented Developments); and
- 9 A new ticketing system.

## Timeframes – Key Milestones

When the expanded rail revitalisation scope was announced, the timeframe over which the project would be delivered was also announced. This timeframe is:

- 2009 Upgrade the Belair line and start the upgrade of the Noarlunga line
- 2010 Tramline extension Stage 1 to the AEC complete, start Outer Harbor electrification and complete the Dry Creek Depot.
- 2012 First new trains commissioned and upgrade of the Gawler line started.
- 2013 Electrification of the Outer Harbor line completed and West Lakes tramline started.

2014 First tram-train commissioned and the upgrade of the Noarlunga line completed

2016 Gawler line completed

2017 Station upgrades completed

2018 Port Adelaide to Semaphore tramline completed



Adelaide's Passenger Transport Network



Artist's Impression of Tram Extension to Adelaide Entertainment Centre



Artist's Impression of Train and Tram-Train Operation on Outer Harbor Line



Artist's Impression of New Electric Trains and Upgraded Stations



Artist's Impression of Tram at Semaphore

## What Has Been Done Since June 2007

### Project Establishment

A large project such as the rail revitalisation requires substantial preparatory work before actual upgrade work can commence. The main preparatory work carried out since June 2007 includes:

- Establishing a project team;
- Establishing new construction code of practice;

- Establish design management framework;
- Accreditation for rail construction work;
- Industry briefings;
- Submissions to Cabinet and the Public Works Committee; and
- Development of a procurement strategy.



**Geotechnical Investigation on the Belair Line**

### **Belair and Noarlunga Line Upgrade Work**

Preliminary project work has been carried out, including:

- Corridor survey;
- Environmental investigations;
- Location of utility services;
- Geotechnical investigations; and
- Establishment of a contract for the supply of gauge convertible sleepers at a cost of \$20m.

### **Project Work Since June 2008**

Since June 2008, work in the following areas has been carried out:

#### **Belair Line**

- Extensive data has been collected;
- A procurement strategy for the Belair line upgrade has been developed;
- A reference design has been prepared;
- Submissions to the Cabinet and Public Works Committee have been made;

- A shortlist of contractors has been determined for an Expressions of Interest process;
- A rail condition assessment has been carried out;
- Replacement service planning has commenced; and
- A call for tenders has been issued.



**Track Upgrading on the Belair Line**

#### **General Work**

- A review of the various Staging/Program of the various aspects of the project to Tier 2 is ongoing;
- Service Planning to determine the effects on train operations and resources;
- Modelling of future services;
- Master Planning looking at the intermediate and distance future requirements;
- Station planning to develop the appropriate levels of upgrade;
- Signalling and Communications – Effects of changes track layouts and of electrification;
- Procurement review to ensure that materials and resources are available when required;
- An Electrification reference design; and
- The initiation of discussions with electricity providers to ensure supply of electrical power.



**Belair Line Train at Blackwood**

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## Key Challenges

For a project of the magnitude of the rail revitalisation project there are many key challenges that must be addressed including:

1 Provision of Resources – to ensure that suitable resources are available within the following organisations:

- Within the project delivery team;
- Within TransAdelaide – infrastructure and operations;
- Other e.g. ARTC (Australian Rail Track Corporation); and
- Contractors.



**Provision of Train Drivers and Driver Training**

2 Communication – to ensure appropriate communication channels are established between the following areas:

- Within the project team;
- Across project teams;
- With TransAdelaide;
- With Government, to manage expectations;
- With the rail industry;
- With the public, and local interest groups;
- With other key affected parties;
- Government departments;
- Local Government;
- ARTC;
- The Rail Regulator; and
- DTEI Traffic Control.

3 Procurement – the procurement procedure is required to deliver:

- Value for money;
- Flexibility as many changes will occur during the project;

- Interface management between the various teams;
- Risk profiles, to ensure risks are managed; and
- Quality outcomes



**Sleeper Laying**

4 Staging – must be planned and managed in order to:

- Ensure efficient use of funds;
- Minimise the impact on the community;
- Determine the number and duration of closures;
- Determine the level of service reliability; and
- Limit the number of timetable changes.

5 Operating the Rail Network – except for those closures of individual lines for upgrade works, the rail network must continue to operate. This leads to a number of challenges, including:

- Identification of risk profiles;
- Ensuring the ability to deal with problems as they arise;
- Maintaining a clarity of purpose for staff; and
- Establishing a system for managing railcar fuelling, maintenance, etc.

6 Rolling Stock Management – the project introduces a number of challenges including:

- The conversion from broad to standard gauge;
- The conversion from diesel to electric motive power; and
- Management of 2000 class / 3000 class railcars, including where conversions are to be done, and access paths for standard gauge vehicles between various depots and lines.

7 Fuelling / Maintenance / Stabling Facilities – the challenges facing the fuelling, maintenance and stabling facilities include:

- Conversion from broad to standard gauge;
  - Conversion from diesel to electric power;
  - Access paths into the facilities for broad and standard gauge vehicles; and
  - The requirement for temporary facilities.
- 8 Testing and Commissioning of infrastructure and rolling stock.
  - 9 People – Availability and training.
  - 10 Time of Year Factors including weather, and special events.
  - 11 Replacement services, with special emphasis on the availability of buses.
  - 12 Roadworks – identifying and minimising interface with roadworks.
  - 13 Lead times, including design, design review, approval for construction, and contract award.
  - 14 Plant and personnel availability.
  - 15 Materials availability and procurement.
  - 16 Technical – “devil in the detail”. While the general requirements of the rail revitalisation project appear straight forward, when one looks at the detail, quite a deal of complexity and interaction come into play which makes the project demanding to complete. The factors that interact to cause the complexity include:
    - Tram-Trains – determining the affect on both the tram and train system from both an engineering and operational perspective;
    - Signalling and communications – changes necessary for new operational requirements as well as for electrification;
    - Electrification – engineering, construction and staging implications;
    - The new railcar depot –to accommodate operational requirements, as well as the broad gauge / standard gauge transition;
    - Allow for the future – master planning for future requirements and deciding what allowance should be made for the future requirements in the current developments.



**Artist’s Impression of New Railcar Depot at Dry Creek**

- 17 Scope – the project scope of work must have sufficient breadth and flexibility to both accommodate changes as they are identified, and to manage expectations.
- 18 Safety – must be managed not only to deliver the project safely, but also to meet requirements associated with:
  - Rail Accreditation; and
  - Pedestrian / traffic management.
- 19 Environmental – the project must meet environmental legislative and public expectation requirements including:
  - Waste materials;
  - Noise;
  - Vibration;
  - Dust;
  - Water Quality;
  - Vegetation; and
  - Heritage.



**Track Upgrade including Embankment Stabilisation and Drainage**

- 20 Handover – having constructed the new and upgraded rail system, it must be handed over to the operator in such a manner that it can be operated to achieve the new service requirements

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efficiently and safely. Some of the factors to be addressed include:

- Resources – must be identified and put in place;
- Operational clarity – responsibilities must be clearly identified (who does what);
- Contractual arrangements – related to operational, maintenance and warranty requirements;
- Technical capability – ensuring that resources are trained and capable of operating and maintaining the system; and
- Industrial – ensuring that appropriate industrial relations agreements are in place for harmonious operation of the system