

# RTSA NSW CHAPTER NEWSLETTER

OCTOBER 2011 EDITION

NEXT MEETING – Wed 2<sup>nd</sup> November 2011



## WARATAH TRAIN SIGNAL COMPATIBILITY

Dave Nolan – RailCorp



Modern electric trains with three-phase inverter drives have the potential to adversely affect track circuits and other signalling equipment. One of the reasons for the increased time now required to approve a modern train for service operation is the need to perform extensive testing of the train under all circumstances to prove that there are no such adverse or unpredictable effects.

Dave Nolan has been involved in testing trains such as the Millennium, Oscar and Waratah on the CityRail network for a number of years and he will outline the process developed to fast track successfully the signal testing of the Waratah train and to approve its use on the CityRail network.

## RTSA TECHNICAL PRESENTATION

VENUE:

477 Pitt St – ground  
floor South Tower  
(opposite the tram  
ramp from Central  
main concourse)

DATE:

Wed 2<sup>nd</sup> November 2011

TIME:

11.30 for 12.00

*LIGHT REFRESHMENTS  
WILL BE PROVIDED*

MEMBERS, GUESTS AND  
INTERESTED FRIENDS  
ARE MOST WELCOME TO  
ATTEND.

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## THE ROOM

Apart from the coming December meeting we now have some clarity as to the meeting venue well into the future.

For the coming November meeting (see cover page) we will be at the same place at 477 Pitt St that has been our temporary venue for a few months.

Location of the December meeting has yet to be confirmed – we will advise in the next Newsletter.

Starting with the February 7<sup>th</sup> 2012 meeting (the first for the year) we will meet on the **first TUESDAY of each month**, February through to December, at our old meeting place in the Bradfield Room on the main concourse at Central Station.

At the same time we will be dating each Newsletter for the month of the meeting that it advertises – so the first edition in 2012 will be the February issue, which will be distributed in late January. Hopefully this will avoid confusion between the Newsletter and meeting dates and should also simplify the archiving of Newsletters.

## ADDITIONAL MEETING

The EA Sydney Chapter, Transport Panel, and RTSA will have a joint meeting on Monday 14<sup>th</sup> November to hear **Don Yuratovac**, Senior Transit Project Planner, URS, talk on the subject of **Introducing Bus Rapid Transit or Light Rail into Existing Road Infrastructure**. The meeting will be in the Bradfield Room at Central Station (our usual room until earlier this year, and from next February) and will be at 11.30 for 12.00.

Donald Yuratovac is based in Houston, USA, and is a public transport professional with over 40 years experience in public transport operations, management, marketing, planning, product development, financing and major project development. He has led special projects with emphasis in research, analysis, diagnosis, and implementation of new procedures to improve the

efficiency and performance of various transit organizational and operational functions.

Don currently works on URS public transport projects around America, including planning for BRT on 34th Street, which crosses Manhattan and is the address for Macy's, the Empire State Building and Madison Square Gardens.

Don's presentation on the 34th Street Bus Rapid Transit (BRT) case study focuses on the challenges of introducing dedicated public transport infrastructure (BRT or light rail) into existing roads infrastructure.

A separate reminder flyer will be sent to members closer to the date.

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## WORDS FROM THE CHAIR – BILL LAIDLAW

John Watsford and I have been busy in the final stages of preparation for the forthcoming AusRail Plus 2011 conference to be held in Brisbane from 22<sup>nd</sup> November to 24<sup>th</sup> November. [John and Bill are the RTSA coordinators for all AusRail conferences]. We had a record of sixty plus papers to choose from which had to be culled to four sessions of three papers each. Indeed a difficult set of decisions. Many thanks to all the contributors. Perhaps some of those who missed out on the opportunity to present at this conference will make themselves available to present their papers to either CORE 2012, again in Brisbane, or to one or more of the Chapter meetings over the next year.

The four sessions at AusRail Plus 2011 are themed: Rollingstock, CBD Underground, High Speed Rail with the final stream on Management & Operations. John and I will be chairing a session each with Alex Howie and Mark Wishart from the Queensland Chapter assisting.

Meanwhile back in NSW we have been privileged to team up with the Transport Panel of the Sydney Chapter of Engineers Australia to hold an additional meeting on the 14<sup>th</sup> of November with Don Yuratovac from URS based in Houston, USA who will be visiting Sydney and is available on that day.

This joint meeting will be in the Bradfield Room at Central Station on the main concourse with the usual 11:30 for 12:00 noon start, the usual refreshments will be provided beforehand. See the separate flyer for additional information, please make a point of showing your support and bring a colleague.

Members are encouraged to print out additional copies of the forthcoming meeting flyers [front cover of each Newsletter, or periodically by a separate flyer sent to members] to place on your workplace notice board and /or otherwise to advise potentially interested people of our meetings.



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LETTERS TO THE EDITOR



*No words this month but we have a picture to the Editor (actually there were over twenty!!):*



*For the story attached to this 1/8<sup>th</sup> scale operating Big Boy see later in this Newsletter*

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## POINT OF VIEW – MAX MICHELL

Vigilant readers will no doubt recall the number of times i have railed on about the parlous state of the north-south general rail freight on the nominally main Brisbane – Sydney – Melbourne line. This line connects the three largest cities in Australia with a combined population approaching 12 million – more than half of this country's population - yet it barely manages to carry more than 10% of the contestable freight on that corridor.

On the east-west corridor to Perth rail manages to consistently capture 80% of the land transported general freight, while on the Adelaide – Darwin line the market share is even higher. On both those corridors rail is able to match road freight times and to do so at considerable low cost. The pick up and delivery (PUD) activity that is an inevitable consequence of putting all our eggs in the inter-modal basket is a considerably less onerous impost on the long haul routes than it is for the shorter inter-capital legs of the north- south corridor. This however cannot explain the relative disparity. Chronic unreliability (anecdotal data indicates north south inter-capital freight trains average 80 minutes loss on already slow transit times) and the almost complete abandonment of siding to siding traffic are contributors, along with infrequent services and non competitive pricing. But is there more?

I would contend that there is much more. In an ideal and just world rail would be a bulk general freight hauler between warehouses or other *direct contact* nodes, which would be the focus points for retail distribution, predominantly a road task. As such rail would have a defined part in the supply chain, albeit one that has limited control over its position in that chain. Some of you, no doubt, are already muttering that that is what we have – rail

between inter-modal terminals, but i would contend that you would be wrong, very wrong. The freight forwarders have usurped rail's role and basically left rail as a mendicant provider of transport services to such organisations. The whole freight forwarder thing is now very entrenched such that any attempt to change the system would almost certainly be met with some fairly aggressive counter punches. But somewhere along the line something has to change.

The supply chain is the series of linked actions required between the point of origin (e.g. mine, manufacturer, grower) and the end user for any transportable freight. Some of the supply chain components will be inside the process of the producer or consumer – for instance the grower will harvest, grade and 'pack' his produce to suit his market(s) before it ever leaves his control. Transport and storage will provide the main components of the task to deliver the freight to the consumer, although in many cases that is in fact only an intermediate stage. For instance the growers produce might well be destined for the distribution warehouse of a major retailer, from where it will make a further journey in smaller lots to the various retail outlets on demand.

The freight forwarders have largely taken over management of the activity between producer and consumer, leaving rail (and the owner operator truckers) as simple providers of transport to suit the needs and objectives of the forwarder.

One of the things rail needs to do, particularly in the shorter haul markets, is to look to providing a 'value added' approach to the business. It can be done – look at SCT and how it works, and also CRT before it was sold to QR. Provision of the

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PUD aspect, along with warehousing / storage facilities combined with a rail capability has allowed these companies to carve a significant niche in the freight market. Not all customers or potential customers are alike, but the basic principles of supply chain collaboration remain constant. What rail needs to aim for is to be the enabler of the supply chain – the central player in a collaborative process that allows a win – win for all participants in the chain.

At present north-south rail is slower than road, has an as yet unresolved reliability problem, and is beholden to excessively high PUD costs. Road carries all the freight that is not on rail – something near 90% - often under the Just in Time (JIT) principle. There is no doubt time is money, but when you look closely at the supply chain you will notice that the demand for JIT is in part illusory – freight wheeled between capitals with great urgency then sits in warehouses or on shelves for extended periods giving the lie to this claim. In my view the JIT thing is in part a mechanism used by the forwarders to first gain control of traffic from producers and secondly to screw the most vulnerable players in the supply chain – the owner-driver truckers. It is far easier to ‘sell’ a job to an anxious trucker than it is to do some deep and meaningful work with the producers and consumers to come up with an efficient and effective supply chain.

Some years ago it was reported that one of the ‘Big Four’ railroads in USA bought into a joint venture to detail new cars (automobiles to them). Quite apart from a valuable use of railroad land the finished cars (under joint control of a railroad!!) were sent

by rail to their ultimate destination. A smart way to provide the value added aspect of transportation while gaining a few dollars on the side from land rental and joint venture income. A semi processed car was the input to the process and delivery to the end consumer outlet was the output, all largely under control of the railroad. In another relatively simple situation just think about the vast array of plastic goods that are now available. The raw material for these is largely a product of the chemical industry so there needs to be suitable transport to get this material to the producers of plastic goods – a semi bulk haul that can be suited to rail. But what then? Traditionally the output from the plastic (or any other) manufacturer was treated as if it was on another planet. What would happen if the transporter actually recognised the linkages either side of the intermediate processing and collaborated on a package that managed all input and output from the plant?

Canadian National is reported to be driving to become a ‘true supply chain enabler’. They describe it as taking their Precision Railroad model to a new level – delivering on an agenda of operational and service excellence anchored on supply chain collaboration to improve end-to-end service for their customers. There in a nutshell is a fairly clear definition of what might be required (inter alia) to improve rails lot on the north-south corridor. The key ingredients are innovation, productivity and supply chain collaboration to create value to customers and the railway company. Although the word “National” is common to the Canadian and both major Australian railways, the similarity, at present, ends right there.

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## COMING EVENTS OF INTEREST

### RTAA / RAILCORP ANNUAL FIELD DAY

RTAA, in conjunction with RailCorp, will again be holding their Field Day at Clyde Yard on Wed 26<sup>th</sup> and Thur 27<sup>th</sup> of October – this week. This event is the only one of its kind in Australasia and is expected to again have over 50 exhibitors.

The displays are primarily to do with track and track maintenance (which includes working displays of some quite impressive machinery) so will be of considerable interest to people who are involved in

the rail industry at any level, people who are interested in rail, people who are studying engineering and anyone who is considering a career in rail.

Entry is free and includes morning tea, lunch and a 'show bag' of goodies from the exhibitors. Further information is available on the RTAA web site – [www.rtaa.org.au](http://www.rtaa.org.au)

**AusRAILPLUS2011**  
CONFERENCE & EXHIBITION

2011 Theme:  
**Innovation and Customer Relations**

**22nd – 24th November 2011**  
Brisbane Convention & Exhibition Centre

AUSTRALASIAN RAILWAY ASSOCIATION INC. NSW TECHNICAL SOCIETY ARIC IRSE ENGINEERS AUSTRALIA RTSA

### HUNTER VALLEY STUDY TOUR

This event will now be a joint two day event with PWI up in Newcastle and intended to run over three days from Fri 23<sup>rd</sup> March to Sun 25<sup>th</sup> March next year. The plan is:

#### Friday 23 March 2012

Following arrival of the morning train from Sydney  
Short bus tour in Newcastle area

Lunch at Monte Pio at Telarah

3 - 4 Papers on topics concerning coal and train operations in the Valley  
Evening dinner at Monte Pio  
Overnight at Monte Pio or other accommodation

#### Saturday 24 March

All day bus tour to a number of new, exciting and interesting facilities relating to the coal operations  
Lunch included

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For those wishing to return to Sydney by train, the bus will return to Broadmeadow

Overnight at Monte Pio or other accommodation

## Sunday 25 March

**Optional** Rail Motor tour to Gulgong via Muswellbrook and Ulan giving an opportunity to see the numerous rail and mining activities underway in the Valley.

Lunch will be served at Gulgong

Return to Broadmeadow in time for a train to Sydney

As a number of attendees will be locals, the various activities will be optional and able to be booked separately.

An attractive all-up price will be available for those who have the time to enjoy the full weekend. Partners will be most welcome.

It is anticipated that booking will be open late this year.

## OCTOBER MEMBERS MEETING – REPORTER: MALCOLM CLUETT

### THE ALTERNATIVE RAILWAY – WHAT HAPPENS WHEN THERE ARE POSSESSIONS AND SHUTDOWNS

**Nigel Parker - Manager Alternative Transport, RailCorp**

Back in 1988, there was concern at the poor levels of productivity during relatively short between peak track possessions, ie;

- Travel time for track equipment to the work site
- Set up time
- Productive Work time
- Time to break down work site
- Travel time for machinery to be in the clear again.

In some areas, an eight-hour shutdown might lead to a two-hour productive work window. Increasing safety regulations have made it more difficult to mix train operations and work crews.

In 1989 – Night Rider Buses were introduced, which allowed some degree of access to the rail tracks, but not sufficient to eliminate possessions.

1990s – start of major close-downs. A RailCorp staff member came up with the concept of putting resources into a smaller number of larger projects. An early example was the Illawarra Line rebuilding between Mortdale and Sutherland, and then between Sydenham and Hurstville. Both of these were for a few weeks duration.

Large Projects reduce the average frequency of travellers encountering bus substitution in a typical year.

Occasional closedowns can also lead to avoidance of the bus substitution, for discretionary travel. (ie, people can decide not to travel on that particular weekend, or to use a private car).

Nigel produced figures to demonstrate the increase in productivity, in terms of track work spending

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versus associated bus travel expenditure, from 02/03 to 08/09. There was a significant increase in track work expenditure but bus travel costs were almost static.

The large closedown concept was further developed into **Configurations** – a number of standard closedown patterns that are worked out in advance. There are approximately fifteen different configurations across the network, and the planning and time-tabling for each of these can build on past experience.

The Airport Line may not be needed for future Configuration 2 closedowns. The extra cost of having buses service the airport line stations is \$130K per weekend. Airport trains may terminate at Turella and not interfere with the planned trackwork in Configuration 2 (which covers the East Hills Line).

**STOPPING PATTERNS** – buses cannot mimic trains exactly. On some early bus substitution exercises, a string of buses travelled on an all stations path, but it was realised that this was not efficient. The only good thing about this arrangement is that only one bus driver needed to know the route – and the others followed the leader. Typically there is now provision of all-stations, semi fast and express buses. Signage and marshals direct travellers to the best bus service for them.

At Wondabyne – a Water Taxi operates during train closedowns (because there is no road access at all). The nearest railway station is Hawkesbury River.

Como is another example of a station which is difficult to service by bus. There is poor road access to the North (due to the natural barrier of the Georges River, and the lack of a nearby road

bridge). The journey to Oatley takes 5 min by train & 25 min by road.

Waverton and Wollstonecraft – also have poor road access to the neighbouring stations of North Sydney and St Leonards, via narrow winding roads.

On the route Waterfall – City, trains are faster than buses. So buses from the Wollongong area normally transfer passengers to trains here for the remainder of their journey to Sydney.

At Sutherland – there was insufficient infrastructure for the recent major Cronulla Line closedown on weekdays. (ie, lack of Road Space and bus stand space). So the innovation was made to have direct bus services Miranda – Gymea – City, and also Cronulla – Caringbah – City. Some customers liked the bus service better than the rail service!

Standeers – can be a problem on long bus trips. The Illawarra line in particular has heavy passenger loadings.

There are certain days when it is customary not to have closedowns – Christmas, Easter & Anzac days. This is the community expectation, and the trackwork and possession programme is planned around it.

When the Main Lines or the Suburban lines in the inner west are worked on, it is the local line all-stations services that are replaced with buses. Express services are then diverted onto the local lines. This minimises the inconvenience for the greatest number of passengers, while still allowing the necessary track work. Intercity commuters from the Blue Mountains and Newcastle, and also CountryLink services, can still get through without needing to transfer to bus.

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Freight rail companies – have the expectation that each line will be closed for only four weekends per annum. The alternative for these companies (delaying their shipments, or alternative road haulage) can be expensive.

Configuration 13 – involves heavy use of buses at Strathfield. Unfortunately the road layout and bus stand space here is inadequate.

Hornsby is another key station during bus substitution, with heavy use of the existing bus interchange. Wynyard is another location with insufficient infrastructure for handling additional bus traffic.

## PLANNING

The Customer is the centre of all decision making, in the planning of bus substitution. There are a few criteria involved:

- Provision of a bus service equivalent for every train.
- Travel time criterion.
- Minimising multiple Bus Boardings for each journey (85% of people don't want to change buses more than once.)
- Some bus services must unavoidably depart earlier than the train (to make connections)
- Need to accommodate Walk-ups (ie, travellers who turn up at random times expecting the usual train service, and not knowing about the bus substitution).
- Stations – stopping patterns – driver training, traffic congestion, are all considered.
- Need to accommodate the disabled

- Need to accommodate those with poor English.
- Frequency
- Cost

Planners endeavour to use coaches rather than buses for trips over one hour duration. Coaches with toilets are procured for the longest services.

**DISABLED ACCESS** – is not always possible as there are few accessible coaches available. Standby buses with lifts, or low floors, are kept on standby in the event of disabled people requiring transport, and despatched as required.

## POOR BUS INFRASTRUCTURE

On occasions RailCorp pays to obtain additional bus space at interchanges, for train replacement buses. This can slightly inconvenience the incumbent bus company, and its regular travellers, but is better for the general good of the travelling public. Otherwise temporary bus stops in inconvenient locations would be required, which would increase traffic congestion and walking distances.

## OPERATION FROM AS CLOSE TO STATION AS POSSIBLE

Train replacement buses need to pick up and set down from the actual station, rather than from a nearby street. Stations provide the ticketing (as normal) while anyone not aware of the shutdown would naturally head for the station.

For example, at Wahroonga buses leave from the station itself, and not from the Pacific Highway (which would speed bus traffic as they would not need to negotiate traffic lights to enter and leave the highway).

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## LANGUAGE

Attempts are made to publicise the changed arrangement on foreign-language press and radio.

For the Bankstown line closedown, there was a bussing arrangement in which buses connected directly with the roughly-parallel East Hills Railway. This provided a faster and more direct trip than attempting to duplicate the Bankstown line route with buses, with interchange at Sydenham only. However it was a bit more confusing for the travelling public, who might never have travelled on a train route other than the Bankstown line.

## EMERGENCY TRAVEL DUE TO UNSCHEDULED TRAIN DISRUPTION

This is not handled by Nigel Parker. A different division of RailCorp procures buses when there is an unscheduled outage of the train service. However it is difficult to obtain buses and drivers when required, particularly in peak hours. Emergency bus provision is a thankless task, which often makes the news media. (Floods, Power outages, Derailments, Police Operations, etc).

## QUESTIONS & ANSWERS

Q Personal experience – bus with wrong destination displayed in Destination Box.

A Sometimes things will not run smoothly. Often drivers are unfamiliar with the area. Might have just a case of someone keying in the wrong destination code number.

Q Replacement of footpath paving coinciding with bus substitution caused problems in a recent event. How are such problems sorted out ?

A There is planning to go into bussing events to reduce problems such as this. Obviously attempts are made to avoid poor pavement conditions during bus substitution.

Marshalls are kitted out with communications equipment. They can order more resources and shorten meal breaks for drivers, if required. They can send out empty buses from the origin in anticipation of filling up down the route, to reduce overcrowding.

Q Road traffic congestion.

A Saturday is now just as bad as a weekday, in terms of road traffic. Discussion about parking restrictions and clearways. Train replacement bus services do add to existing traffic congestion.

Additional 24/7 clearways in Sydney would aid bus transport on weekends.

NB Clearways allow infringing cars to be towed away, while No Standing zones just results in a parking ticket being issued.

Special Event Clearways are declared for some Configurations – especially in Chalmers St, Surry Hills and the Homebush area. These greatly improve bus operations.

This problem demonstrates that rail travel has a big advantage over road transport, ie, it is not affected by road congestion.

The speaker was thanked for an interesting presentation, with an insight into a part of the railway operation that has affected us all at some point.

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## THE BIG BOY STORY

Back around 1941 Union Pacific Railroad had a series of simple articulated steam engines built that were the biggest steam locomotives (dimensionally) ever made. Although very successful at moving tonnage across the mid west of USA, these giant locomotives only survived around 15 years before being retired in the face of considerably more efficient diesels. Several survive in museums but none are operational.

Fairly predictably smaller scale versions of the Big Boy were constructed for 'garden' railways – lines that were usually 1/8<sup>th</sup> scale or smaller but large enough to carry people around a garden or adventure park. One such railway was the Dobwall Forest Railway near Liskeard in Cornwall. This railway had two 'main' lines with fairly heavy grades, so the then owner built powerful American based locomotives to haul his people carrying trains. A fleet of four steam locomotives and four diesels were constructed over time; all based on Union Pacific, Denver and Rio Grande or Santa Fe prototypes.

As happens the site of the railway was eventually up for re-development, forcing the railway to close. Subsequently the owner decided to sell the locomotives as a collection, rather than see it broken up and lost. At the time the auction was described as unique in that

there never had been anything like quality and quantity of 7 ¼ inch gauge motive power on offer as a group in any previous sales.

Which is how the collection came to be in Australia. Col Rees has bought the whole fleet of eight locomotives and at present periodically gives his new acquisitions a run on the Diamond Valley Railway at Eltham (north eastern suburb of Melbourne). This parkland railway is described as heavy duty, having 6kg/m rail, which allows operation of heavyweights such as Big Boy and its brethren. The DVR is quite notable in its own right – it is described among being in the top five Railways in Miniature in the world. So now we have a top miniature railway with guest operation with the only 7 ¼ gauge Big Boy in existence.

As for the locomotive itself despite the 'little' gauge it weighs in at 2 tonnes, runs on a boiler pressure of 125 lb/sq in (it is an American design so it still speaks in Imperial!!!) and has a tractive effort of 1,560 lb.

The picture below shows Big Boy on its first run on the DVR, rather incongruously hauling a train made up from scaled down Victorian Railways W type cars



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## RAIL ENGINEERING STUDENT THESIS AWARDS

The following 2012 Railway Technical Society of Australasia (RTSA) student thesis awards are **NOW OPEN** for nominations!!!

### THE RAILWAY ENGINEERING STUDENT THESIS AWARD

Presented by the Railway Technical Society of Australasia (RTSA), and in celebration of the outstanding achievements of undergraduate engineering students, the Railway Engineering Student Thesis Award is presented to the author of an exceptional final year project on a topic of Railway Engineering.

The 2012 winner will receive a **\$4000 CASH PRIZE** and a FREE year long membership to the RTSA!!!

To learn more about the award, or to nominate online TODAY

go to [www.rtsa.com.au/awards/student-thesis-award/](http://www.rtsa.com.au/awards/student-thesis-award/)

### THE WHEEL-RAIL INTERFACE AWARD

The Wheel-Rail Interface Award is presented to the author of an outstanding final year project on a topic related to the contact conditions between wheel and rail and the consequences of these conditions in terms of material behaviour and damage modes.

The winner of the Wheel-Rail Interface Award will also receive a **\$4000 CASH PRIZE** and FREE year long membership to the RTSA!!

To learn more about the award, or to nominate online TODAY go to [www.rtsa.com.au/awards/contact-mechanics-award/](http://www.rtsa.com.au/awards/contact-mechanics-award/)

*Please note that nominations for both the above awards close on the **Friday 24th November 2011.***

## WHERE AND/OR WHAT IS IT?

This month we have reverted to a relatively simple "Where is it" – or is it? This now rather dated picture comes from the collection of Tony

Woodland and shows a location that was, and may again be, rather unique on the railways of NSW. Where is it?

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The answer to the “where is it” in the last newsletter is Barnes – the junction of the Deniliquin and Moulamein (at one time Balranald) lines north of Echuca. The signals are an immediate give away that this is a Victorian Railways line, but despite that the location is very much in NSW. As one of the successful respondents noted “A lovely pair of dolls”. Three readers responded and they were all right – Steve Malpass, Weston Langford and Stephen Townsend. From this I guess we can conclude that inter-state members know more about the far reaches of NSW than do NSWmen.

No one at all responded to the second question which was the distance between the rear end of two coal trains passing at Maitland. In theory the

distance would be 3080 metres – each train is nominally 1540 metres (based on the wagon type visible in the picture that length would be right). That might have been OK some time ago but large numbers of new wagons recently supplied to all operators are shorter than the earlier type so the distance might be a little less than the quoted.

Recently the maximum load for 3/90 class, or 4/3000hp locos was raised from 91 to 92 wagons (11040 tonnes loaded) in deference to the shorter wagons now being drafted into the coal fleet. The maximum length however is still 1540 metres, largely dictated by loop lengths on the Ulan line and some elements of the double track between Muswellbrook and the ports.



# RTSA NSW CHAPTER NEWSLETTER

OCTOBER 2011 EDITION



## FUTURE MEETINGS AND EVENTS FOR 2011

Date and time	Activity	Location
Wednesday 2 November 2011 11.30 for 12.00	Waratah Train Signal Compatibility Dave Nolan - RailCorp	477 Pitt St – ground floor South Tower
Monday 14 <sup>th</sup> November 11.30 for 12.00	Introducing BRT or Light Rail into Existing Road Infrastructure Don Yuratovac, URS	Bradfield Room Main Concourse, Central Station
Wednesday 7 December 2011 11.30 for 12.00	Heritage Topic Speaker from TrainWorks Thirlmere	To Be Advised

**Note: From February 2012 regular members meetings will be on the first TUESDAY of each month.**

## CONTACT AND SOCIETY DETAILS

Bill Laidlaw

[vacant]

Malcolm Cluett

Max Michell

Andrew Mackay

**Committee:**

Katharina Gerstmann

Candice Ng

**Chair**

**Deputy Chair**

**Secretary**

**Newsletter Editor**

**Treasurer**

Coen Stoltz

Silvia Fedakova

02 4975 4310

Andrew Honan

Pascal Sueess

[nsw-chair@rtsa.com.au](mailto:nsw-chair@rtsa.com.au)

[nsw@rtsa.com.au](mailto:nsw@rtsa.com.au)

[max412@gmail.com](mailto:max412@gmail.com)

John Watsford

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The best way to submit contributions is by e-mail to the Editor at [max412@gmail.com](mailto:max412@gmail.com) or alternatively to the address shown in the footer.

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

The Railway Technical Society of Australasia (RTSA) - NSW Chapter

PO Box 6038, Kingston ACT 2604

Tel: 02 6270 6530 Fax: 02 6273 2358

Email: [nsw-chair@rtsa.com.au](mailto:nsw-chair@rtsa.com.au)

[www.rtsa.com.au](http://www.rtsa.com.au)



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