

RTSA NSW CHAPTER NEWSLETTER

MARCH 2011 EDITION



NEXT MEETING

ADELAIDE RAIL REVITALISATION

Stephen Townsend



The South Australian Government has embarked upon a \$2.5B upgrade of the **Adelaide Public Transport System**. A major component is the revitalisation of the Adelaide Rail Network including **upgrade of both the train and tram systems**. Work on the **train** system includes track reconstruction and selected infrastructure upgrade, electrification, new and refurbished rail cars, new railcar depot, station upgrading and track extension. The **tram** system has also had track upgrades and extensions, new trams, renewal of the overhead and the tram depot upgrade.

Stephen will discuss the background leading to the revitalisation of the Adelaide Rail Network, provide details of the many projects that have been and are being carried out and provide some detail of the possible future direction of the Adelaide Rail System.

TECHNICAL PRESENTATION

VENUE:

TEMPORARY VENUE

Pymble Room,
477 Pitt St – South Tower

- between Eddy Avenue and Hay St opposite the ramp up to the Central Station concourse level

DATE:
Wednesday 6th APRIL
2011

TIME: 11.30 for 12.00

*LIGHT REFRESHMENTS
WILL BE PROVIDED*

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WORDS FROM THE CHAIR – KATHARINA GERSTMANN

The London Crossrail presentation in March attracted a sold-out audience in Brisbane, Sydney and Melbourne. Over 90 people were in attendance in Sydney and our monthly meetings provide a great opportunity for us to gather and exchange ideas or touch base with other RTSA members.

For all those who have missed this presentation or who want to watch it again, it is now, along with other past technical presentations, available online as a webcast. Visit <http://rtsa.com.au/events/webcasts> for a complete list.

High Speed Study Tour

The study tour is almost fully subscribed with 17 delegates leaving in May this year. We have again wonderful support from organisations in all the countries we are visiting. Many thanks go to Andrew Honan and the STORE sub-committee for their hard work and their commitment to making this tour happen.

With the devastating events in Japan, however, we will have to reassess the Sendai part of the tour, with our colleagues in the Japanese Overseas Rolling Stock Association. The events surrounding Sendai and subsequent earthquakes as well as the travel advisories issued by DFAT will be monitored over the next few weeks. Clearly, the first priority is to deal with the emergency situation in Japan and the RTSA do not wish to impose any additional burden on rail agencies dealing with the aftermath of the earthquake and the tsunami.

Our thoughts are with the people in Japan, Christchurch and Queensland affected by floods, earthquakes and the tsunami.

Katharina Gerstmann
Chair – NSW Chapter

2011 year
of
humanitarian
engineering

NOT QUITE BACK TO OUR NORMAL MEETING PLACE

For the March meeting and at short notice we were returned to our normal meeting place (now known as the Bradfield Room), which was just as well given the large number of attendees.

We had hoped to remain there but as a result of further internal work on the room we will have to once again go to our temporary venue – at 477

Pitt St (see front cover for details). We will have a larger room than last time we were there.

We are hopeful that we will be able to return to our regular venue at Central Station from next month – we will advise in the April Newsletter how things stand.

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POINT OF VIEW – MAX MICHELL

A week or two ago I had to go to Brisbane for a day meeting. As some will have realized I now live between Newcastle and the Central Coast, so the choice of an airport is either 140 km south or 60 km north. The former has more flights (and impositions) than can be imagined while the latter is actually RAAF Williamtown, which has a modest commercial set up on its southern perimeter. Only a decade or so ago the only commercial flights of any significance from Williamtown were half a dozen commuter flights a day in aircraft that would have had a capacity of 20 - 30 passengers at best. Most of these were to Sydney although there was at one stage a 'milk run' to Coffs Harbor and Brisbane in the mix. So it was with some interest that I scanned the current timetables of the 'big' airlines for suitable flights to Brisbane – a route that essentially didn't exist until recently.

Much to my surprise I found Jetstar has 4 flights each way daily (720 seats), Virgin Blue has 2 flights (360 seats) while Qantas actually run three prop-jet Dash 8-400 flights a day (220 seats) which appear to be direct. So from virtually nothing maybe 10 years ago we now have an established market that provides around 1300 passenger seats per day in each direction, a very good example of the aggressive expansionist marketing that the airlines tend to do as a matter of course. In the same period the sole train between Newcastle and Brisbane has remained fixed on around 300 seats per day, the majority of which are used for intermediate regional rather than inter-capital travel.

It is unclear where this new air business comes from on the Newcastle – Brisbane corridor.

Undoubtedly some comes from the Sydney – Brisbane route (including a small amount of former Newcastle – Sydney – Brisbane travel) while some would have come from road – encouraged to change mode by high fuel prices and the take-over of the Pacific Highway by intimidating trucks. A few may have come from rail, but the numbers in that category are probably small in any case (grey hairs dominate the rail market). Low air fares (return to Brisbane for \$140 is less than the petrol cost to drive a small car) is undoubtedly a factor, but all indications are that the airlines have largely created a new market altogether.

What a contrast with rail. Existing train services remain immobilized in the past, with little encouragement on either the passenger or freight front to grow the market. In fact, as has recently been the subject of comment, the east coast inter-capital freight business has been obstinately stuck on a downward slide despite substantial infrastructure investment in capacity and reliability.

There is a rough rule of thumb that each person will generate one tonne of retail freight each year – food, durables and discretionary purchases. So a city the size of Sydney would generate around 4 million tonnes of 'retail' freight a year just to serve its own population. Taking a couple of classic regional cases, just have a look at Newcastle and Canberra. The former has a population of around 250,000 in the immediate area with another 50,000 to 100,000 in surrounding areas, while the latter has more than 300,000 population with more in the surrounding parts of NSW. Each of these locations should generate a requirement for around 300,000 tonnes of 'retail' freight a year but none of

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that is on rail at all. A daily task of something around 1000 tonnes per day and rail is completely out of it – that has to be a statement in itself

The North Coast between Newcastle and Queensland has maybe 200,000 residents, mainly in a number of major regional centres, which might be expected to generate around 200,000 tonnes of retail freight p.a., but once again none of this traffic is on rail. The North Coast is also a significant 'exporter' of freight – dairy, timber and other rural produce yet even this bulked up freight escapes rail. In fact almost all regional and inter-capital 'retail' freight has been allowed to drop off the railway map as a deliberate (and it should be said lazy) policy on the part of past rail business strategists, and recovery has been of no interest to the current ones.

Passenger business is harder to deal with in such simplistic terms, but it has been notable that Sydney (CityRail) passenger numbers have grown only marginally in recent times compared to astronomical growth in Brisbane, Melbourne and Perth. There are many reasons, ranging from inflexible and unfriendly fare systems to an obsession with peak travel at the expense of the far more growable off peak and out of hours (discretionary) travel. Sydney has had limited capacity for additional peak hour travelers for years, so the railway obsession with peak hour is to some degree counterproductive – it is simply a 'stand still' policy as long as the network is not expanding and train capacity through the central part of the network is (and has been for years) fully utilized. It is understood that around 90,000 passengers enter the CBD per hour in the peak (more go through) on the existing system. Based on a conservative capacity of 20,000 per hour per track, an additional track pair through the city would open up capacity for something like 25 % more peak passengers than is presently achievable.

This is obviously on someone's radar in CityRail but seems to be way beyond the understanding of anyone in Macquarie St (either last week or next I would suggest).

It is notable that in Victoria the redevelopment of regional travel, with improved tracks and track speeds, some realignments, new high speed DMU trains and high frequencies have had the effect of growing the business almost faster than the expansion of resources can handle – a relatively lonely rail example of a highly successful market growth strategy at work

The opening part of this editorial was about aggressive and constructive marketing – the uncovering and stimulation of new and growing opportunities as contributor to the corporate goals. Airlines are good at it, trucking in a different way is good at it, but rail is generally very bad at it. There are exceptions – such as in Perth suburban rail and Victorian regional rail – but in general these only highlight how stodgy and poorly focused much of the railway business is and has been for a long time.

Looking at this state in particular, the suburban and inter-urban rail system is torpid at best, having failed to spend where the best bang is and failed to support consistent and progressive policy development for continuous improvement. Regional rail passenger is at best a token gesture using now aging equipment for limited and relatively slow services to key towns. Regional freight is dying for lack of any, let alone good, policy and disinterest in the broader issues of regional support and development. The regional rail issue is a case study (thus far) in the victory of torpid bureaucracy over any objective policy. Longer distance inter-state freight is locked in a time warp with ever diminishing market share. Only in the bulk heavy haul (predominantly coal) is

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there any light on the horizon, and that is entirely driven by the customers and not by the rail operators who simply bask in the glory of growing business that is profitable without having to put in

much more than a token effort at business development. In other words, in a business sense, there is little to be optimistic about as things currently stand. I wish it were otherwise.

LETTERS TO THE EDITOR

See later in this Newsletter and see if you can be provoked into writing!!

COMING EVENTS

HIGH SPEED STUDY TOUR – TAIWAN, KOREA AND JAPAN.

Following the recent earthquake and tsunami centred in northern Japan, I wrote to our Japanese associates, the Japanese Overseas Rolling Stock Association (JORSA) who are coordinating our tour in Japan expressing, on behalf of the study tour delegation, our sympathies and to convey that our thoughts are with the many people affected by the recent disaster, particularly the rail people and the rail systems that support the Japanese society.

I indicated that at this time, the RTSA study tour did not wish to impose any burden on JORSA or JR and we sought advice as to whether the tour should be truncated or deferred.

The overwhelming message received from JORSA was that they very much wanted us to come, and that the tour would not be a burden. JORSA (comprising of the major rolling stock suppliers) as well as JR West, JR East and JR Central have huge membership and they claim that at this level the tour would not impose a burden.

For those unfamiliar with JORSA, they comprise of the following major companies:

- [Fuji Electric Systems Co.,Ltd.](#)
- [Hitachi, Ltd.](#)
- [Kawasaki Heavy Industries, Ltd.](#)
- [The Kinki Sharyo Co.,Ltd.](#)
- [Mitsubishi Electric Corporation](#)
- [Mitsubishi Heavy Industries, Ltd](#)
- [Nippon Sharyo, Ltd.](#)
- [The Nippon Signal Co., Ltd.](#)
- [Toshiba Corporation](#)
- [Tokyu Car Corporation](#)
- [Itochu Corporation](#)
- [Marubeni Corporation](#)
- [Mitsui & Co.,Ltd.](#)
- [Sumitomo Corporation](#)
- Taiwan Shinkansen Corporation
- [Yashima & Co., Ltd.](#)

Obviously, there will be changes to the itinerary. Initially we were planned to go to Sendai, to see the latest generation Shinkansen trains. Clearly this is no longer possible. Also some rolling stock

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plants have curtailed production lines due to raw material shortages, and so other sites are being proposed for visitation.

Our initial plans for the tour, coming up from the south island of Kyushu up to Kobe, Osaka, Nagoya and Kyoto are unaffected. Also the tour to Taiwan and South Korea is also unaffected.

JORSA has indicated that the rail infrastructure and systems have largely returned to normal. The RTSA STORE committee is working through options for Tokyo and monitoring the situation closely there. JORSA believe there is no problem with Tokyo and want us to continue on with our itinerary there. We had planned 2 rest days in Tokyo, and as a suggestion we are looking at spending the rest days outside of Tokyo (to the south) and compressing the time in Tokyo. We are also looking at different options for Tokyo altogether.

It has to be stressed that no decision has been made, and we will obviously consult with the delegates and RTSA National Executive before any decision is made on Tokyo. At time of writing this article we have over 7 weeks before our planned arrival in Tokyo so there is quite some time to monitor developments and change plans if needed.

We will have a revised itinerary out next week and will consult with all our delegates at this time.

I would particularly like to thank Pascal Sueess from the RTSA and also Nick Brown from Marubeni

(here in Sydney representing JORSA) for all their efforts in planning the tour. I also thank the tour delegates themselves, for their patience and understanding and Bill Laidlaw for assisting on Taiwan and also helping out in Japan.

Lastly, if you could please remember in your thoughts the many people who have perished in northern Japan, in particular those associated with the rail industry. I have seen many photographs of local rail infrastructure in the north of Japan, that reflect the general devastation that you would have witnessed on your television screens. These pictures seem surreal, but if you reflect upon them, each one in itself is a tragedy. We should remember however that Japan is a strong and resilient society and it will rebuild from this disaster.

Andrew Honan

HUNTER VALLEY STUDY TOUR

This long awaited event has been advanced a month or so to a date (TBA) in August or September. The plan is for a tour and seminar on the Friday, a bus inspection of facilities in the near Newcastle area on the Saturday and a rail inspection to Muswellbrook, Ulan and Gulgong on the Sunday. Given the intensity of traffic on the core Hunter Valley network, primarily to do with coal, there is a lot to see and a lot more to try and comprehend to get an understanding of this network.

Stay tuned for more details as the year progresses.

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AusRAILPLUS2011
CONFERENCE & EXHIBITION

2011 Theme:
Innovation and Customer Relations

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

Australian Railway Association Inc. IRSE RTSA

MARCH MEETING – REPORTER: MALCOLM CLUETT

LONDON CROSSRAIL: Dr Mark Raiss, FICE, FI Structural Engineers, Programme Director for Crossrail Central Section, URS Scott Wilson

Summary of Crossrail project;

- 118km route length (21km of which is in new tunnel) east west across London
- 28 existing surface stations upgraded (11 of which are major reconstructions)
- 8 new underground stations and one new surface station
- 24 trains per hour in each direction

The two outer termini of the main East West corridor are Maidenhead and Shenfield. There is a short branch to Heathrow, and another branch to Abbey Wood in North Kent, passing under the Thames.

In the Australian context – similar to new rail projects being considered for Brisbane, Sydney (North West Sector line) and Melbourne.

Like Crossrail, the Sydney NW line will also be partially overground and partially underground. The speaker showed a slide demonstrating the similarities between CrossRail and Brisbane's Cross River line, Sydney's NW line and

Melbourne's proposed Footscray – City – Domain Metro.

There are five airports in London, and Crossrail connects directly to two of them. There are indirect connections (one change of train) to the other three.

The Crossrail stations have multiple connections to London Underground and Network Rail (especially in the central tunnelled area). A slide was shown demonstrating the number of possible changing points on the new CrossRail stations. There will also be interchange with Eurostar and the Docklands Light Rail.

Victorian Legacy – long-distance trains were not allowed to enter Central London (though Thameslink is now an exception). There are numerous termini outside the City of London, which has inconvenienced travellers since the dawn of railway transport.

One third of London's employment is in just 2% of the area of Greater London, viz.

- West End
- City
- Canary Wharf

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CrossRail will allow an additional 1.5 million people to be within 45 minutes commuting distance of central London. It will provide direct employment for 14,000 during the construction phase.

The Business Case shows a benefit of £42b in the UK's GDP in the first 60 years after Crossrail's opening, resulting in £16b of taxation income.

The London Underground's existing *Central Line* is roughly parallel to CrossRail, but is slow and hugely overcrowded. This is one of LUL's deep lines with the restricted loading gauge. Speeds can not be increased on this line.

A precursor to Crossrail was first proposed by the Great Western Railway in 1904. Since then, there have been numerous proposals, but none have got beyond the planning stage. In the meantime, tunnelling and construction technologies have advanced, allowing possibilities of light airy stations that are much more attractive than (for example) the century-old stations on the LUL network. A private Bill for design was submitted to Parliament in 1991. The current Crossrail scheme dates from the year 2001. The Bill for construction went before Parliament in 2005 and construction (at Canary Wharf station) commenced in 2009. Importantly, the scheme survived a *Comprehensive Spending Review* in 2010. Construction contracts were let in December 2010. The first four major tunnelling contracts have been let.

Costs have been shaved by extending the construction programme, allowing better utilisation of construction plant. (Normally, an extension of the contract duration is associated with an increase in costs.)

Funding for the project is quite complex, as might be expected.

There are two main sources of funding, viz TfL (Transport for London) & DfT (Department for Transport). Network Rail, Canary Wharf and the City of London also contribute to the CrossRail project. The speaker presented some slides which went into this topic in some depth. The funding envelope for the entire project is £15.9b.

A number of slides relating to the cost of Design Packages and Consultancies were also presented.

The speaker then moved on to the specifics of two stations, Paddington (which will be built next to the heritage former GWR terminus) and also Farringdon. The former will be built by cut and cover techniques in the current Taxi Rank area, and will feature an extensive skylight and uninterrupted sight-lines within. Farringdon, on the other hand, will be constructed deep underground near Smithfield Market, in a site with numerous constraints in three dimensions. It will, however, be more spacious than the existing LUL stations in the vicinity. There are pedestrian connections to other underground ThamesLink and LUL stations. Paddington is in Westminster City Council's area and there was much negotiation regarding road closures. WCC lost its planning powers in order to expedite the process. There was extensive modelling of surface traffic, and also of pedestrian flow. There were also extensive meetings with community groups. Farringdon station will have an inclined lift (a first for the UK) which hints at the congested site.

Both Paddington and Farringdon stations are surrounded by Heritage buildings. The speaker displayed a number of three-dimensional diagrams of the proposed stations superimposed on the existing facilities, and also artist's impressions of the finished product.

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Two tunnelling machines will approach each other at Farringdon.

Spoil from tunnel construction will be handled by rail freight, which will be a relief to London residents. The bored tunnel will be constructed first, then the station box construction, facilitating rail haulage of spoil. After unloading, spoil will be barged down the Thames to create a new island and nature refuge.

Every one of the new underground stations will have platform screen doors. (over 400 sets).

A diagram of the various tunnelling drives and shafts was presented, as well as a summary of the current state of works at various key sites.

A short section of the Docklands Light Railway had to be relocated laterally to allow room for a tunnel ramp at East London.

The Crossrail line will also utilise the disused Connaught Road tunnel, and some trackbed in East London, which was formerly utilised by the North London railway until recent years.

In the 1980s a South East – North West *CrossRail* 2 line was contemplated, connecting Wimbledon with Hackney via Chelsea. This scheme is dormant at present.

Questions and Answers

Q Why is the total construction duration so long (8 years) ?

This is due to the size of the project, and the sequencing (ie, the need to finish tunnels before station box excavation can commence). The complexities at Farringdon have already been

outlined, for example. Farringdon also has poor-quality ground for large-scale excavation.

Q Will there be a different loading gauge for the rolling stock ?

It will be different to the LUL lines, but the same at British Mainlines. Crossrail will be managed by Network Rail.

All stations will be designed for 12-car trains, but services will commence with 10-car trains. Tunnels will be 6.1m diameter. Signalling will be compatibility with the latest European standards.

Q What will the passenger volumes be at the stations ?

There will be 24 trains per hour in the central section, with 1500 passengers per train.

Farringdon will be the busiest station on the network. Incidentally, there will be 4 trains per hour to Heathrow.

Q Comparison with RER in Paris ?

Similar concept, and much overdue in London.

Q Will the Loading gauge be compatible with European standards ?

Yes. Electrification will be 25kV with an overhead solid-rail conductor.

Q Tottenham Court Road and Bond St station re-design ?

These two sites are being upgraded earlier. LUL are involved in the design. Unfortunately the Astoria Theatre had to be demolished.

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Q Why Platform Screen Doors ?

To prevent people falling (or being pushed) onto the tracks from the platform. A secondary reason is for ventilation control. (Stations will be air conditioned).

Incidentally the LUL Jubilee Line has partial-height screen doors. (Full height doors complicate design considerations for smoke and fire safety).

Q How is progress going so far ?

It is going as expected, including profitability, from the speaker's company's perspective. There are some current design issues at Bond St station site. The organisation has just gone through *Project Assure*, which is a Value Engineering exercise. Example Tottenham Court Road – and Crossrail's links to the Central Line. (An escalator was deleted and the location of a vertical-transport shaft was changed.)

The programme director wants Crossrail to be the *World's Best five-year old railway*. (ie, he does not want any nasty surprises from new and untried hardware).

The Jubilee Line Extension did not go as planned. (There are signalling problems. Works to rectify this has resulted in ongoing closures on weekends.)

This is an example of adopting untested new technology.

Q Why not re-route the CrossRail line over Holborn Viaduct ?

The selected solution will relieve severe local congestion, and will take people between where they want to live and work.

Q Geology and method of construction, design life, etc ?

Tunnel lining uses traditional precast segments. Design life is 120 years.

Western area of Crossrail tunnels are bored in London clay. The Eastern area is constructed in the Woolwich beds of clay, which are more complex.

Earth Pressure Balance TBM machines are used to bore under the Thames River.

(Writer's note – there is a Crossrail website, and related information, on the internet. There is also information on the Thameslink project, which is of a similar magnitude. There is certainly a lot more railway-building activity in London than in Sydney at present.)

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WHERE IS IT?



The editor was out and about recently and came across this rather interesting signal with three vertically aligned red lights. Not your ordinary garden type signal by any means.

The focus of the upper and lower lights may help identify the location, as may the background (the little bit the editor has left visible!!). There are a couple of other clues in there but I will leave that to you to identify. The question for readers is where is it and why the three lights (Noel Read should probably be disqualified due to insider knowledge ☺)

Frequent travellers may have passed this signal (but hopefully not at 'stop') many times without actually realising it is configured this way.

Railways are created to a normally quite precise and formalised set of rules, but inevitably circumstances out in the field will occasionally require unique variations to the norm. Half the fun of travelling by rail is observing the quirks that grow up in the network and trying to understand why they came about.

Readers might like to write to the editor with their comments on this particular oddity or with others that they may be aware of that could intrigue readers

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FUTURE MEETINGS AND EVENTS (6 MONTH HORIZON)

Date and time	Activity	Location
Wednesday 6 April 2011 11.30 for 12.00	Adelaide Rail Revitalisation Stephen Townsend, DTEI (SA)	477 Pitt St – South Tower. Pymble Room Sydney
Wednesday 4 May 2011 11.30 for 12.00	Making Rail the Preferred Option for Travel Nick Shorter, Human Factors Specialist, Interfleet	Meeting Room Central Station Concourse Sydney
Sun 8 May to Sun 22 May 2011	High Speed Rail Study Tour	Taiwan, Korea and Japan
Wednesday 1 June 2011 11.30 for 12.00	Digital Train Radio - TBC	Meeting Room Central Station Concourse Sydney
Wednesday 6 July 2011 11.30 for 12.00	TBA	Meeting Room Central Station Concourse Sydney
Wednesday 3 August 2011 11.30 for 12.00	AGM plus Port Botany and Freight Line Resignalling - TBC	Meeting Room Central Station Concourse Sydney
11 th or 18 th August 2011	RTSA NSW Dinner with Guest Speaker	TBA
Wednesday 7 Sept 2011 11.30 for 12.00	TBA	Meeting Room Central Station Concourse Sydney

Members with ideas for meeting topics should contact the Secretary, John Watsford, in the first instance – contact details on the back page of this Newsletter

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.

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