

RTSA NSW CHAPTER NEWSLETTER

SEPTEMBER 2010 EDITION



NEXT MEETING

BUSWAYS AND BRT – A THREAT TO RAILWAYS?

Basil Hancock



Although the Adelaide O-Bahn may be familiar to many Australians, it is but one example of the many types of Busway and Bus Rapid Transit (BRT) systems already in use throughout the world. Operations can range from simple bus lanes, through kerb-guided systems and high capacity reserved track routes to proprietary installations using electrically powered vehicles, with guidance by rail, wire or optical means.

Capacities, facilities, complexity and costs can vary enormously, and systems can be built incrementally, often starting with only a few hundred metres.

Basil will take us through the many types of systems in use today and highlight the advantages and disadvantages compared with rail. He will also suggest why such systems may be attractive to politicians and planners and why they may form a threat to more conventional rail systems.

TECHNICAL PRESENTATION

VENUE:

Central Station
Meeting Room
(Opposite Platform 2,
Beside Lost Property)

DATE:

Wednesday 6th October
2010

TIME:

11.30am (for noon start)

*LIGHT REFRESHMENTS
WILL BE PROVIDED*

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

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WORDS FROM THE CHAIR

Will resume next month, after Katharina returns from CORE and Innotrans

LAND OF THE LONG WHITE MILK TRAIN – MAX MICHELL

The recent CORE 2010 conference had one very powerful draw card, quite additional to the usual excellent conference, and that was its location – New Zealand. So I took the opportunity to do a bit (well, quite a lot) of extracurricular travelling around reacquainting myself with the admirable narrow gauge rail system that I last experienced many years ago. A sufficiently long period ago in fact that little of the railway of old should have been recognisable, or so I thought.

The flight over to Auckland was supposed to be a 767, but was upgraded to a 747, and I was upgraded (for no reason I can determine) to the upper deck. Good start! Auckland has over the years developed a number of rather prominent motorways cleaving through the city and surrounds, but in general the railway remains as it was, with the notable exception of the extension to the city centre at Britomart. Track duplication and reconstruction of erstwhile rather dowdy stations is very apparent in anticipation of electrification but the most striking aspect is the revival of suburban train running from a near terminal situation some years ago.

Trains are now frequent and run every day – weekend running was only introduced relatively recently yet several times over the weekend I came across trains that were full and standing. The rolling stock is however from diverse sources – 19 two car railcar sets from Perth, made redundant by electrification there in the 1980's, and around 23 sets of former British Rail mark II cars fitted with air conditioning, double sliding doors and a driving cab at one end which run with a 1500 hp diesel permanently coupled to the other end. Some of these sets are being extended from four to six cars with a 2250hp loco to cater for peak hour loadings. A notable feature in Auckland is the number of stations that have

been closed or moved (some more than once) – at a guess there would be around 15 closed stations that are still evident to some degree on the ground, while there are a couple that were closed but later rebuilt nearby and reopened.

All trains, be they DMU, (Auckland), EMU (Wellington), loco (pulled or pushed) passenger, or freight are run with a single driver at the front end. Shunt locos on the other hand are mostly (all?) no man – drivers have a walk around power controller and can ride in/on the loco, any part of the shunt rake or on the ground as required.

Britomart is an underground dead end station with 5 tracks – effectively two double sided platforms each side plus a single sided platform in the middle. Despite the obvious limitations arising from conflicting moves at the station throat there are up to 18 arrivals and a similar number of departures per hour in the morning and evening peaks. Not surprisingly some very sharp working goes on – well worth observing for its slickness.

The Overlander, which runs a daylight timetable each way between Auckland and Wellington, is made up of heavily rebuilt cars that clearly are derived from the main line express cars of the 1950's and 1960's. Many a trip was made on the Limiteds and Expresses in both Islands in 1963, quite possibly in the 'same' cars that I rode in on the 'name' trains in 2010. They are now air conditioned, there are on board café facilities and there are 'viewing platforms' – very cleverly designed sections around 3 metres long which are open air - on all name trains. The Overlander also sports an enclosed observation section at the back of the train. Apart from the magnificent scenery on the run south there was yet another surprise – at Taihape mid afternoon a steam

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loco dropped on the front to run us through to Feilding, 100 km away. This loco, Wab 794, dates back to 1923 and was at one stage used on North Island Main Trunk (NIMT) working, despite being a tank engine – albeit a very beefy one. In 1963 it was shut away in a coal company shed at the bottom end of the South Island, seeing out its final days which fortuitously never came. Despite age the Wab went like there was no tomorrow, bringing back vivid memories of the large and highly competent K and Ka class 4-8-4's that used to dominate the Main Trunk. The reward for KiwiRail for this unusual bit of operation was almost 200 additional passengers on the train. It is apparently a regular event every second Sunday during the colder months.

Track work is alive and well in NZ (and the track certainly shows degradation as a result of several private owners prior to return to public ownership a few years ago) and we were twice crossed to the wrong road on double track to by-pass work sites. The second time resulted in us arriving in Wellington on the wrong line after running parallel to a rail grinder through the 4.3 km long Tawa No 2 tunnel.

The Wellington area is electrified at 1600 v DC, starting in 1938 on the Johnsonville line. A feature was (and still is to some extent) the use of wooden poles and portals for overhead support, in some cases with no insulators. Significant work is being done on the Johnsonville line (remnant of the original privately owned Main Trunk route from the city) to allow the newer larger outline EMU's to run on the line, while duplication and extension of electrification through to Waikanae (55 km north on the NIMT) is due for completion early in 2011. This will leave an 80 km gap between the Wellington 1600vDC and central NIMT 25kv AC electrifications – a tantalizing prospect!! New trains are being delivered (the first was made available for a walk through inspection) which should allow the original small profile English Electric EMU's to be retired. One feature of Wellington is the five daily diesel loco hauled trains to Masterton (through the 8.8 km Rimutaka tunnel) and the daily Capital Connect loco hauled train to Palmerston North. These are made up from the same original BR stock as the Auckland cars, but with end plug doors and no driving cabs (the locos need to run round, which is not the

easiest task at Wellington station). A new set of six cars has recently been formed with former Otira (South Island) electric locos top and tail to run additional peak services. Only the lead loco powers (there is apparently no through m.u. cabling) so acceleration is appallingly slow, the compensation being this train has very limited stops.

The original CORE program had a technical tour – Coal Through the Hole covering the most spectacular part of the South Island Midland line crossing the Southern Alps between Christchurch and Greymouth (in fact it was to run to Jackson, just a kilometer or two from the contact point of the Pacific and Australasian Continental Plates). The Christchurch earthquake on 4th Sept scuttled this – in the main to avoid overburdening the KiwiRail staff already heavily involved in recovery work, however I decided to retain my flight and accommodation bookings and take pot luck. On the previous Saturday a massive landslide came down across the railway and main highway south of Kaikoura on the route north from Christchurch to Picton, throwing further doubt on my plans. Plan B looked like turning into Plan C or even Plan D.

Kevin at the motel in Christchurch very kindly supplied transport to the station on the Thursday morning to catch the TranzAlpine to Greymouth – in this case comprising two locos and eight cars. There were several speed restrictions near Christchurch, one of which was where 36 metres of buckled rail had been replaced with 31 metres after the quake. The rumours are that air fares between Christchurch and Australia have been reduced now that the distance has been reduced by 5 metres!!

Right from departure from Christchurch snow capped Alps are visible to the west, looming larger until Springfield (around 70 km out) where the railway claws a most amazing route through the front range to find then follow the Waimakariri River – a wide ice blue glacier fed river that in the past I have swum in, and strongly recommend you don't!! In a matter of 16 km or so there are four high viaducts (up to 73 m high) and 16 tunnels. The viaducts all have wind fences to stop maintainers and for that matter trains being blown over

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from the extreme gully winds. Snow capped peaks and enormous gully landslides are apparent in all directions, with various alpine rivers periodically springing from side gorges. In the difficult section between Springfield and Arthurs Pass we crossed no less than three coal trains running from the west coast to the port at Lyttleton (Christchurch), each powered with two 3000hp GE locos with a 2500 tonne trailing load. The last was at Arthurs Pass along with the three front end bankers (same 3000hp loco type) which only ply the 13 km between Otira and Arthurs Pass over the 1 in 33 grade there. The exceptional feature is that 8.6 km of this extraordinarily steep section is in a tunnel (the oldest of the three 8 km tunnels in NZ). There are no special provisions for such severe working apart from a ventilation door and extractor fans at the Otira end. The train driver travels with the banker driver in the lead loco through the tunnel but otherwise it is all treated as very normal. It is reported that the tunnel has up to 22 trains every day, which is close to capacity, the majority being coal trains. The set of banker locos really must earn their keep.

The reason the passenger train has two locos is really to do with the return trip uphill through this tunnel, but other than closing the café (so passengers don't have to walk between cars) and viewing platforms, no special conditions appear to apply. NZers are very practical people! I like to think that if anyone from here showed their occupation as 'rail regulator' or 'rail bureaucrat' when trying to enter NZ that they would be refused entry!!! It would be a great shame if the 'can do' attitude over there was in any way to be corrupted by some of the bureaucratic excesses from over here. You only have to look at how they handled the earthquake, right from the instant it happened, and clearance of the Kaikoura slip to see the differences between NZ rail and here.

As late as Thursday evening there was no certainty about the line to Picton being cleared in time for the TranzCoastal on Friday. Never-the-less when Kevin drove me to the station at 06.30 next morning there was a short train and a few passengers – given that it had been cancelled most of the previous three weeks it is gratifying that there were passengers at all. A

southbound freight arrived just prior to our departure proving that the line had been restored – as it turned out by diverting the rails over the northbound lane of the highway past the partially cleared landslip. The site is between two tunnels (even the road has a tunnel) with what is tantamount to a cliff on one side and the ocean on the other.

Just north of Christchurch, at Kiaipoi, there was a stretch of nearly 5 km speed restricted to 10 km/h – the earthquake was very evident here with significant cracks in adjacent paddocks oozing grey mud brought up by soil liquefaction caused by the quake. The former near straight rail alignment had been severely distorted and I suspect was kept to a very low speed until the formation condition could be properly ascertained and remediated.

For around 100 km through Kaikoura the ocean is on one side while the twin snow clad Kaikoura Ranges are on the other, providing plenty of opportunities for the snow, sea and train shots from the viewing platform on the train. A few km north of Kaikoura, while bolting along at around 80 km/h, we passed a colony of seals no more than a road width from the train – reportedly at times the seals choose to relax on the road but apparently not on the railway. Curiously the Kaikoura section, joining two rather older sections of isolated railway was only completed in 1945, probably with no recognition at that time that it would become a key trunk route for NZR and its successors.

Despite late running (from speed restrictions) the ferry Kiatiki (previously Pride of Cherbourg) was held for connecting passengers. Although part of the KiwiRail fleet this ferry has no provision for rail. Despite strong winds and periodic driving rain the passage to Wellington was passable.

Next day was again on board the Overlander. This time steam power was absent but between Palmerston North and Hamilton we instead were given one of the 4000hp Brush 25kv AC electric locos which would hardly have noticed the featherweight train trailing along behind. Running was normal apart from an unusual move when we backed out of Ohakune and ran through

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the loop due to a points failure – those pragmatic Kiwis again!

The mountainous section ends at Te Kuiti, around 66 km south of Hamilton, allowing the electric to show its paces for a stretch – we averaged 90 km/h start to stop over this last section with a line speed of 100 km/h and quite a number curve restrictions below that.

There was enough time in Auckland next day (Sunday) to check out a bit of their suburban system, but once again fortune smiled – it was the day the line to Onehunga was reopened to passengers after being closed for many years. This and the new line to Manakau City are extensions that will form part of the upgraded and electrified Auckland system in the next few years.

Overall I have to say that the cheerful way that KiwiRail goes about its business, and the obvious 'can do' attitude was a breath of fresh air. There are no long hauls as we know them, relatively few bulk hauls to distract attention, so the railway is built on a broader (albeit thinner) traffic base than we are now used to. It is narrow gauge and to a very restrictive rolling stock outline (it has roughly twice as many tunnels as all of Australia put together). There are obvious signs of

capital starvation in the rolling stock and infrastructure. The youngest loco is 30 years old while the core fleet of Dc class locos originated a couple of rebuilds ago in the early 1960's. The track certainly shows the effects of accumulated underfunding during the privatized years, although there appears to be a lot of remedial work now under way.

Despite all this it is a very interesting railway with some worthwhile lessons for anyone willing to learn. There are the similarities - main lines with too much curvature and difficult grades, secondary lines and branch lines with thin traffic and limited prospects, the usual competition from a rampant road industry, tempered with the legacy of a failed alternative ownership model. But they also have terrain unlike anything we have here which has resulted in a railway that has no fear of high bridges (up to 97 metres high) and long tunnels (up to 8.85 km long) which they accept as a matter of course. Being at the active edge of two continental plates not only explains the terrain but also provides a raft of interesting situations that we know very little about – the recent earthquake and landslides being symptomatic of some of the issues. Indeed an admirable property that can undoubtedly show us a thing or two for those interested enough to observe.

COMING EVENTS

AUSRail 2010

AusRAIL this year will be held in Perth on 23rd and 24th November with a theme of The Rail Plan: Where? How? Why? As is usual there will be a full program including the Rail Constructors Panel late morning on first day, Road and Rail Discussion Panel and the CEO Forum on the second day. The usual four streams, led respectively by RTAA, RTSA, IRSE and ARIC, will fill the afternoon session on the 23rd. Full details and registration can be found at www.austrail.com

HIGH SPEED STUDY TOUR

This tour, set for May 2011, is intended to provide participants with an overview of High Speed Rail

developments in Asia, notably in the birthplace of modern high speed in Japan. Korea and Taiwan will also be on the agenda. China, which in a few years will be THE place for high speed, will be worthy of a full tour in its own right in a few years when the core network under construction is up and running, so it has not been included in this tour. The Expression of Interest Flyer has been sent from Canberra (EA Headquarters) to all RTSA members in the last week or so

This STORE will be two weeks long and will involve a less demanding schedule than the 2009 Metro Study Tour. Given that this is a study tour, a condition will be that all participants will produce a report of half a dozen

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pages on the technology, issues and application of the High Speed Rail visited to the Australian scene – all participants will choose from a list of specific topics so that a number of unique perspectives will be generated

All RTSA members have been circularised at the same time, so if you think you may be interested it would be a good strategy to register now.

EMINENT SPEAKER TOUR –REPORTER MALCOLM CLUETT

Professor Andrew McNaughton's speech covered all aspects of rail transport, and also its competitors in the form of the private car, the truck and the jet aeroplane. It was from a European perspective, but many of the urban transport issues could be directly transferred downunder. Likewise the high speed rail concept, which would be useful in the Sydney - Melbourne corridor (one of the world's busiest air traffic routes).

Some wider issues include the fact that the population is ageing (which has implications for provision of mobility aids), the growth and urbanisation of the world's population, and the future cost and availability of transport energy (particularly oil) in an era of climate change and carbon taxes.

The legacy railway system, which reflects the history of railways in the European context, may not be relevant to the desired origins and destinations of 21st century travellers. For example, parts of the Swiss mainline railway system were shown to follow transport corridors from the time of the Roman Empire. Maybe planners should start with a clean sheet of paper, when considering the construction of new railways.

The speaker was insistent that the needs of the railway need to be defined first, before one starts thinking of the technologies involved. Too often, politicians, planners and engineers focus on the hardware, and build something that may be a commercial success, or may be a white elephant. There was a pyramid diagram to reinforce this point. One should start by defining the needs and functions of the railway, and the rest should follow.

The speaker claimed that new rail vehicles were becoming heavier, when for many reasons (such as

energy consumption) they should be lightened as much as possible. The competition (road vehicles and aeroplanes) have definitely been optimised in terms of lighter weight during this period. Much of the weight gain in rail vehicles was to meet ever-more-stringent crash-worthiness requirements. On the other hand, there were optimistic signs of tramway technology being used to build lightweight passenger rail vehicles for operation both on-street and on heavy railways (in Germany). Signalling systems take into account the mix of traffic, while maintaining an acceptable safety margin. It was pointed out that light-weight vehicles are associated with minimal deterioration of the track structure, leading to fewer inspections and fewer possessions for repair.

Another problem for the railway industry is the lack of standardisation. This applies to lineside structures, vehicles and stations. Some European operators are now installing modular vandal-resistant stations for minimal cost, sweeping away heritage structures which are no longer relevant. Another example was a modular level crossing, pre-assembled and pre-wired up in the factory.

Automation can provide great advantages for rail operators, and replace some jobs which are fatiguing and stressful on the one hand, yet unfulfilling on the other. The hardware for automation is becoming cheaper, in comparison to other costs.

The design of stations is another point covered in the presentation. Some European rail operators aim to have railway stations as welcoming places which are busy whenever trains are running, including shops and cafes. Near-empty stations can be forbidding places which are prone to anti-social behaviour.

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On the subject of high speed rail, some of the findings of the speaker were rather staggering for an Australian audience. Some HS lines overseas can carry the equivalent passengers of a jumbo jet every 60 seconds, for example. To meet the high costs of providing HS rail infrastructure, there must be both high frequencies and large-capacity trains. In Europe, parts of Asia and North America, there is sufficient population density to make HS rail commercially viable. If the current users of motor cars can be persuaded to also travel by rail, it will

become even more profitable. It was pointed out that even in the UK, with its congested motorway system, the vast majority of travellers choose to do so by car.

The maximum speed record for rail thirty years ago is now less than the commercial speed on some HS systems. This demonstrates how fast the technology has developed.

SEPTEMBER MEETING – REPORTER MALCOLM CLUETT

This month there were two very interesting presentations by Young Engineers

Noise Mitigation on the Epping-Chatswood Rail Link, presented by Michael McCallum, Graduated in 2009, currently Project Design Manager, - Rolling Stock Design

The ECRL line is mostly underground, and has a gradient profile featuring a major dip under the Lane Cove River with a steep climb on each side. There is a considerable amount of slab-track construction, and also a lot of curvature. It was opened last year.

The CSIRO National Standard Laboratory at Lindfield, with sensitive acoustic equipment, is situated above the twin bores of the line.

Initial trials on the railway revealed excessive noise levels. This is most severe on board the older non-air-con rolling stock, which has opening windows and air gaps around the doors. (More modern rolling stock has plug doors and sealed windows.) The high noise level was an OH&S issue for crews and passengers. Complaints were received from customers and train crews. Initial services were restricted to OSCAR cars which had better sealing and noise-proofing for those inside.

A railway will generate both Air-borne noise and Ground-borne noise. (The former has higher frequencies). Ground-borne noise travels through the earth and is re-emitted as airborne noise inside houses (for example). This may be an issue for those living above the line.

Grinding-induced corrugations in the rail head were revealed to have been a significant cause of the noise levels. The characteristic pattern of grooving on the rail head causes vibration and noise to be emitted by the wheels, rails and track structure. The speaker gave an explanation of the actual noise mechanism, which is far from simple.

CityRail “K Set” – required vestibule noise levels
Av < 80 dBa
Peak < 85 dBa

A peak level of 89 dBa was noted before the attenuation measures were implemented.

Noise Level Standards were set by Transport Construction Authority (formerly TIDC).

Reps from:

- Heggies Environmental Consultants,
- TCA and
- RailCorp

jointly investigated the noise level problem and implemented solutions.

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Solutions:

Acoustic insulation in the 'four foot' area

Quietstone (48 kg/m³) was installed here. This achieved a reduction of 2 – 3 dBa.

Glass wool insulation (in a steel jacket) was installed on tunnel walls, for 23.9km out of the 29km of tunnel.

Test work was done by the Royal Melbourne Institute of Technology.

Objective – to reduce reverberation between the frequencies in the range 315Hz – 1000Hz.

The expected life of the wall fixing and panel life was required to be 25 years (as per other aspects of the new railway line, which is regarded as a corrosive environment).

A reduction of 2 – 3 dBa was attributed to the Glass Wool insulation.

Corus Dampers – fixed to rail web by means of spring-clips, and made of partially cured rubber and steel elements. There has been media attention on the rubber odour as these devices have been installed. These dampers must be removed during rail maintenance (such as future grinding) due to the fire risk. (a significant problem.)

Rail Web Dampers were not fitted to the floating track sections, or to crossings.

The noise reduction from these devices was 4dBa at frequencies above 70Hz.

This is the largest underground installation of rail web dampers in the world. (16.8 km)

Acoustic Grinding of corrugations – the common 40 – 50mm wavelength from normal rail grinding techniques corresponds to 440Hz, which is right in the middle of the

audible range for humans. A wavelength of 100 – 105mm is also present.

The speed of the rail grinder was increased – up to 30 km/h instead of the standard 8 km/h, which altered the wavelength of the railhead grinding pattern (and thus the acoustic signature at a particular train speed).

Head hardened rails were used on the ECRL. These don't bed down after initial train movements, and so the initial noise problem after grinding does not die away (as elsewhere on the network).

The RR64E Rail Grinding Machine produces a railhead signature which is clearly visible. Photographs were shown of this. 'Polish grinding' using the RR64E took place at an elevated speed of 30 km/h.

(This machine can't be used for turnouts and crossings – a mini-grinder is required here.)

There was some experimentation with different grinding stone pressures and textures.

The question of vertical displacement vs wavelength of the corrugations was discussed, with the aid of some diagrams.

The result was that acoustic grinding did offer a significant reduction in noise levels (3 – 4 dBa).

Currently there is no standard for corrugations on railway lines. Reference was made to ISO3095 *Railway applications -- Acoustics -- Measurement of noise emitted by railbound vehicles*. (This is a reference only – not a Standard.)

Summary

After all of the above devices have been installed, and the acoustic grinding of the rail heads, there was a significant reduction of 9 to 10dBa in a K set vestibule. This met the TCA's target.

R and S sets (non air-con cars with opening windows and vents in the doors) can now be used on the line for

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emergency diversions (for example, if the North Shore line beyond Chatswood is blocked).

The speaker's talk was illustrated with photographs of the various noise attenuation devices, the grinding signature of the rails, and diagrams showing before-and-after noise patterns vs frequency.

Questions and Answers

Q - Why grind new rails at all ?

Grinding of new rails is RailCorp policy, and a profile-adjustment grind was required. There is no standard for Rail Grinding Vs Noise – it is done for to achieve a certain rail profile.

Q - Why use Head Hardened Rail – isn't it only required for high axle loads ?

Also offers benefits in urban service, where maintenance windows are expected to be infrequent.

Q – Noise levels in other RailCorp tunnels – (for example there are high noise levels in the City Circle) ?
Yes but not as severe as on the ECRL. Speeds are lower on the City Circle.

Q What about other types of carriages –

The K set was chosen because it was the noisiest in the current fleet. (The R and S cars are expected to be withdrawn soon.)

Removal of rail web-dampers is planned when older rolling stock is withdrawn.

Q Was ballasted track considered ?

Not considered. The noise generation mechanism was explained. Ballast has no benefit on slab track. There was not enough space anyway. (The airport rail link had a single large-diameter bore for both tracks, providing more space at the invert for ballast.) The ECRL consists of two parallel bores which are separate apart from the crossover tunnels.

Q Why wasn't this problem discovered at the Design Phase, avoiding expensive post-construction measures ?

A Rail Corp was not involved in the early stages. TCA built this line. RailCorp was just an end user.

Writers note – readers with long memories will remember excessive noise levels when the Eastern Suburbs railway was first opened. Acoustic absorbent material inside steel jackets were affixed to the walls of tunnels, and the noise levels became acceptable. This line does not have slab track, so it differs from the ECRL in this respect. Acoustic insulation was also fitted in the Melbourne Loop when it first opened.

Second speaker – Adam Gaffney – works for KBR – Track Services Alliance as Design Interface Manager

Special project – Dunmore Loop extension from 500m to 2000m

Adam also made use of a Power Point presentation to illustrate his talk, and provide a view of the various features of the existing site, and the early stages of the work.

Dunmore is a crossing loop on the single-track section between Albion Park and Kiama, on the Illawarra line. Adam's job is to liaise with various parties involved in the 12-month programme to extend the loop.

This was TSA's second Capital Works project. (The first was the Eveleigh Stabling Yard, which was a design-only project.)

Manildra Ltd now plans for 800m trains (of grain and shipping containers). These trains are now the main freight carried on the line. (There are also ballast trains from Dunmore and Bombo quarries.) In addition there are frequent passenger services.

Adam's work covered:

- OHW
- Signalling

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- Earth works & Rock cutting (near school)

There will be a possible future relocation of Dunmore station to cope with urban growth. The new site (further North) will be closer to the Flinders St overbridge, and also to new housing estates.

The turnout at the UP end had to be located short of a transition curve, which provided a constraint on the length of the new loop. To accommodate signalling requirements, a run-out track and a dead end beyond the loop was provided in lieu of a longer loop track.

Ten culverts (some old and some new designs) – will be lengthened to accommodate two tracks and have standard RailCorp concrete headwalls fitted.

A short-span bridge – will also be widened to two tracks using standard precast box culverts. The majority of the works will not require possessions. A cutting will be provided with extra width for construction purposes (beyond what is required purely for train clearances) to allow for work while traffic passes.

Concrete sleepers are presently laid intermittently on the main line. In future the main line will be relaid using all-concrete sleepers, so the new loop will be 100mm higher than the existing main line to suit the future level of the main line.

Six OH wiring structures need to be removed and new structures erected.

Some of the new track will be laid on a swampy area. Therefore some geo-technical work will be required, and also some settlement calculations. There is the need to stable a heavy train in the loop after the track is laid, to stabilise it.

Project status – currently mobilising

Questions and Answers.

Q Why a 2km loop for freight trains that are only 800m long ? (Existing loop only 500m)

A A new station will be situated closer to the customer areas, to suit walk-up travellers. This is a constraint which determines the location of the UP end of the loop. Freight train length may be increased beyond 800m in future.

Q Will new station replace old station ?

A Yes, probably – though not decided at this time.

Q Why a side platform, rather than an island platform ?

A Easier to install on a working railway

Q What is the Project budget

A \$17 M (One of TSA's larger projects.)

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FUTURE MEETINGS AND EVENTS

Wednesday 3 November 2010 11.30 for 12.00	Automatic Train Protection Craig Stanfield Project Director ATP, RailCorp	Meeting Room Central Station Concourse Sydney
Wednesday 1 December 2010 11.30 for 12.00	Christmas Heritage Topic Rebirth of a Legend: 3801 in the 21st Century Craig Mackey (NSWRM) and Chris Hoskin (Halcrow)	Meeting Room Central Station Concourse Sydney

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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