

ONTRACK

New MetroRail Project Update

Premier heralds city tunnelling

Premier Geoff Gallop and Minister for Planning and Infrastructure Alannah MacTiernan speak to the media at the launch of the TBM

Southern Suburbs Railway map - inside this issue

Are you looking for a handy guide to where the Southern Suburbs Railway stations are?

Included with this issue of *OnTrack* you'll find your copy of the New MetroRail Pocket Map which illustrates where the Southern Suburbs Railway line goes and where the stations are located.

The map also contains other helpful and interesting information and facts about the Southern Suburbs Railway and the stations.

If you would like additional copies of the Pocket Map, contact Giselle on 9326 2623 or email info@newmetrorail.wa.gov.au



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Premier Geoff Gallop recently unveiled the new, purpose-built tunnel boring machine (TBM) that is tunnelling beneath Perth's CBD.

The tunnel will link the Esplanade Station, new station platforms at William Street and will connect up to the Joondalup Line.

"We are about to enter an exciting and challenging phase of the rail project," the Premier said.

"The tunnel boring and construction of new underground platforms at William Street is one of the most significant engineering tasks

ever undertaken in Australia."

The Premier said now, more than ever, Perth needed the New MetroRail Project.

"With petrol prices on the rise, the completion of the Southern Suburbs Railway will offer a faster, cleaner and economical alternative to car travel to residents in the south metropolitan region," he said.

"The start of tunnel boring means that we are that much closer to delivering on our pledge to double the size of Perth's urban rail system."

Groundbreaking event for Perth as tunnel boring makes history

In a major engineering milestone for the Southern Suburbs Railway Project and the first construction of its type and size in Western Australia, two tunnels will be bored under the Perth CBD.

The twin rail tunnels will be constructed using a highly-specialised tunnel boring machine (TBM), 60 metres long and almost seven metres in diameter, weighing 300 tonnes.

It is one of more than 1600 machines manufactured in Kobe, Japan, by Mitsubishi Heavy Industries, designed especially for Perth's soil conditions and shipped here in pieces earlier this year.

Though it is a unique and historic event for Perth, Hiroshi (Henry) Yamazaki, tunnel manager for construction contractor Leighton Kumagai Joint Venture, said the 770 metres of tunnel under Perth was similar to CBD tunnelling jobs in other parts of the world.

"In Japan, there is so much tunnelling and we have to go down very deep to avoid other subways and services," he said.

"One new line for the Osaka subway used 10 tunnelling machines to construct tunnels and 11 stations with some subway tunnels 20 – 30 metres below ground."

A civil engineer, Henry has worked on tunnel boring projects for Kumagai for 20 years, in the

US, Australia, Singapore and Thailand, and he has visited Taiwan, Hong Kong and China to investigate tunnelling work.

His Australian projects include the Sydney Harbour tunnel and the under-harbour tunnel in Port Hedland.

"The railway is WA's third tunnel boring project, with smaller tunnels bored for sewerage pipes in Subiaco over distances of 2-3 kilometres," Henry said.

"Technically, this project will be quite challenging and the first rail tunnel in Perth.

"The geotechnical investigation has been amazing — WA has such a good mining background, geotechnical people here are



The tunnel boring machine is assembled at the Esplanade launch site



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among the world's best."

Two huge cranes lowered the massive 8.5 metre-long steel shield that forms the front section of the TBM into the 14 metre-deep launch box at the Esplanade site.

The TBM will begin boring from the Esplanade Station site, following William Street north until it enters the site of the William Street underground platforms.

From there it will continue underground to the construction site beside Roe Street, near the current Perth-Fremantle rail lines.

A 400-tonne crane will then lift out the machine and it will be disassembled, taken back to Esplanade and reassembled ready to start again on the second tunnel.

The TBM will operate 24-hours-a-day, travelling approximately 10 metres each day.

How does it all work?

- The technology of the TBM is equivalent to a formula one racing car with more than 100 functions being automatically monitored as it cuts through the soil.
- These functions include hydraulic pressure and electrical loading which are monitored below the ground behind the machine and in an above-ground control room.
- The TBM is an earth pressure balance machine with a chamber at the front which is pressurised according to the soil and groundwater conditions to balance the external pressure and minimise settlement.
- A foam soil conditioning agent is injected into the soil from the front of the TBM to assist boring by making the soil more paste-like.
- Precast concrete ring segments will be laid by the machine as it progresses underground, forming the circular tunnel.
- A specially-constructed conveyor will operate behind the TBM to remove the soil excavated by the machine as it moves forward, pushing off the completed tunnel rings.
- Any movement above and below the ground is being constantly monitored with more than 2500 monitoring points including prisms, crack metres and tilt metres to measure building movements.

Joondalup tracks moved to make way for tunnel

If you travel to or from Perth on the Joondalup or Fremantle Lines, then you may have noticed a lot of construction work in the approach to Perth Station between Roe and Wellington Streets.

Activity has recently included moving the existing Joondalup tracks to accommodate the underground 'dive' structure where the Southern Suburbs Railway will eventually meet up with the Joondalup Line.

The existing southbound and northbound lines were recently lifted and slewed around six metres towards Wellington Street to make way for the construction of the dive structure connecting to the cut-and-cover tunnel and retrieval box for the tunnel boring machine.

In coming weeks, with excavation complete and the tunnel covered, the Fremantle tracks will be moved north towards Roe Street, to run over the top of the cut-and-cover tunnel.

To execute the temporary Joondalup Line move, a section of new track was built and a reconditioned turnout put in place to accommodate the changed track configuration.

Front-end loaders picked up around 300 metres of existing track and slewed it across to join on to the new track panels.

As well as the tracks, the overhead catenary must also be moved in a separate operation.

Once the new masts are in position, the wires are moved across and connected up.

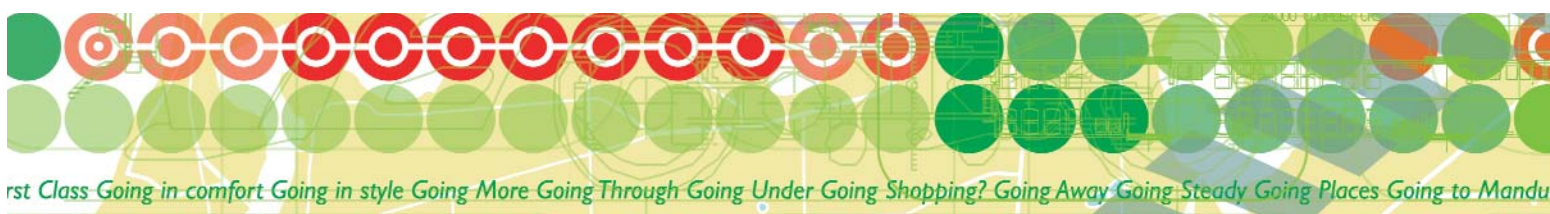
"It is too difficult to do both operations at once so, unfortunately, we needed the full two weekend days of shutdown for both lines," Project Manager Jock Henderson said.

"We need one day to relocate the track and one day for the overhead wiring and signalling."

After the slewing operation is complete, work will begin on sheet piling for the dive structure.



A weekend line closure is required to move the Joondalup Line



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Bridge girders lifted into place at Narrows

The first four of nine massive steel box-girders for the new central rail bridge being constructed between the existing Narrows traffic bridges have been lifted into place in two complex operations.

Weighing up to 99.5 tonne each the girders, which are an integral structural element of the bridge, were transported by low loaders from Structural Marine in Henderson.

Preparation for the installation has been under way for more than three months with Main Roads' and Leighton Contractors project teams working collaboratively to develop the safest way of lifting the girders into place, while managing impacts on the complex and busy freeway network.

The new rail bridge will accommodate the southbound railway. The northbound railway will run on the existing bus lane.

Main Roads' Narrows Bridge Project Manager Laurie Spagnolo said four girders were

successfully lifted within the time allocated over two Saturdays, demonstrating the team's strong commitment to delivering the works safely and efficiently.

"The remaining beams will be lifted on weekends during late October, November and early December," Laurie said.

"The works have been programmed this way to minimise the overall impacts on traffic and align the bridge pier construction with the manufacturing time for the remaining girders.

"Detailed planning showed that for safety, it was not possible to carry out the works at night or under high-wind conditions and, in order to minimise traffic impacts, could not be undertaken on weekdays."

As well as girder installations, work in the coming months will concentrate on constructing the bridge pilecaps, piers and final deck surface.

The bridge is expected to be complete early in the new year.



A massive steel girder is lifted into place at the Narrows Bridge

Showing off at the Royal Show

A new electronic display with four LCD screens and a handy pocket map of the Southern Suburbs Railway were features of the New MetroRail display at this year's Perth Royal Show.

Showgoers gathered to watch animated vision of the new train travelling the route from Mandurah to Perth, with New MetroRail people on hand to answer questions.

Enquiries centred around the completion date along with the route the train will take and comments like "We can't wait!", were common.

After the show, the electronic display was reassembled at Whiteman Park for the launch of the new Revolutions Museum.

Its next public appearance will be Senior's Have A Go Day at Burswood Park on October 25, followed by Peel Seniors Expo at the Mandurah Performing Arts Centre on October 26/27.



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Solid foundation for concrete city

Can you imagine how much concrete would be needed to pour 3200, average residential house slabs?

Or 400kms of two metre-wide footpath?

In both cases the answer would be around 80,000 cubic metres!

This massive amount is what's being poured on construction works for the New MetroRail City Project.

Works include:

- **Perth Yard:** around 9100 cubic metres (m³).
 - tunnel boring machine receival box — 5000m³
 - cut and cover / open dive tunnel — 4100m³
- **The William Street Underground Platforms:** around 27,500m³ — 16,000m³ of which has already been poured.
- **Esplanade Station:** around 10,000 m³ — with 5000m³ already poured.
- **Foreshore:** around 24,500m³ — around 9000m³ already used.
- **Bored tunnels:** 7800m³

Massive amounts of concrete are poured at the William Street platforms site



Train fan Kane will soon be able to ride on the trains

Three-year-old Kane Waters of Secret Harbour can't wait to ride on the new Southern Suburbs Railway when it opens.

A keen train fan, Kane visited the New MetroRail display for the first time last year at Warnbro Shopping Centre and again this year with his mum Rebecca at the Warnbro Community Library.

"Kane is watching the railway being built and every time we drive past he constantly asks when he can ride on a train," Rebecca said.

"His favourite place is the Hotham Valley Tourist Railway in Pinjarra.

Kane Waters and his mum Rebecca at Warnbro Community Library

"He loves trains so much that we can't visit the Waikiki Village Shopping Centre as there is a model train shop there and Kane wants to take them all home with him."

To find out when the New MetroRail display is in your area call our Infoline on 1800 110 075.

Community talks are also popular and are being given on a regular basis to school and community groups such as Rotary, Probus and Neighbourhood Watch.

If you would like to arrange a presentation on the New MetroRail Project for your school or group, call Giselle Satie – New MetroRail Community Information Officer on 9326 2623.

More information on the New MetroRail Project is available at www.newmetrorail.wa.gov.au



New trains keep Transperth young

More than half of the 93 new 'B Series' trains ordered as part of the New MetroRail project is now in service on the Transperth rail network.

Together with the 96 'A Series' railcars, the oldest of which began service in 1991, the new trains help make Transperth's railcar fleet the youngest of any in Australia.

All of Perth's suburban trains come from the same manufacturer, EDI-Bombardier, and have an excellent record of safety and reliability.

The newer B Series has a sleeker, fibreglass front but the same stainless steel body as its predecessor. The carpet and upholstery is the same in both, but the new trains have more forward and rear-facing seating, as well as fold-up seats to accommodate wheelchairs, prams and bicycles.

One of the more significant advancements in the new trains is below the carriages in the wheel traction system.

"Technically, the major difference is that the A Series has a DC traction system while its successor operates on AC traction," New

MetroRail Project Manager Railcars Elwyn Gearon said.

"The big operational improvement, though, is that the new traction system results in less wear and tear on brake components and reduced noise as trains pull into stations."

Another advancement is that the new railcars employ a re-regenerative braking system where the power generated when braking is fed back into the Western Power grid.

The net result is that the new railcars require 20 per cent less electricity to operate.

At the moment the new trains operate almost exclusively on the Northern Suburbs Railway (NSR) but ultimately will run all the way to Mandurah when the NSR and the Southern Suburbs Railway (SSR) are joined up into one 105 km line. On the southern section the new trains will travel at speeds of up to 130kph.

The flow-on benefits of the new trains are already being felt on the Midland and Armadale lines where more of the A Series trains have been assigned to increase the frequency and capacity of peak hour services.

During the next 18 months, all the original A Series railcars will undergo a total refurbishment of carpets and seating as well as a general spruce-up.

During the same period the older trains will also be fitted with the latest technology CCTV and a passenger announcement system that is triggered by satellite-based GPS.

So, regardless of whether it's an A or B Series train, Transperth passengers can be assured they are travelling on modern and well-maintained rail cars that employ latest-available technology.

Elanora Drive closure extended to December

A revised scope of works which includes building the Ennis Avenue underpass has resulted in the temporary closure of Elanora Drive at Ennis Avenue being extended until December.

Towards the end of the year, partial access will become available for vehicles to enter and exit Elanora Drive at the Ennis Avenue/Grange Drive intersection.

The temporary access roads between Milina Street and Woodbridge Drive, at Link Way and Mataitai Loop will remain open until the intersection is fully open in May 2006.

RailLink Joint Venture Manager Construction, Kevyn Brown said that residents, local business people and other road users had been extremely patient.

"Nobody likes having their normal travel routine interrupted and we appreciate the patience and cooperation the public is showing in these difficult circumstances," he said.

"We are sure that the benefits the railway will bring to the community will far outweigh the inconvenience in the long run."

For further information, please contact RailLink Joint Venture's Community Relations Officer on 9414 0430.



The old and the new - A and B series railcars at Nowergup Depot



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No turtles in danger at Turtle Swamp

A precautionary survey of a wetland area known as Turtle Swamp, just south of Anstey Road, Golden Bay, has revealed no apparent sign of turtles in the area.

The survey was carried out on behalf of New MetroRail by environmental scientist Jacqueline Giles prior to the area being reclaimed in a realignment of Fremantle Road to accommodate the Southern Suburbs Railway.

Jacqueline waded through rushes and set baited turtle traps to locate any turtles living in the swamp.

Though no evidence of turtle activity was found, Jacqueline was able to catch and relocate thousands of banjo frog tadpoles and one jilgi.

Turtle swamp is about 200 metres long and 30 metres wide at its widest point.

Jacqueline, who has a particular interest in turtle conservation, said it was a quality habitat and she was surprised, but pleased that no turtles were found.

"If I'd caught one or two I'd be worried that I'd missed some," she said.

"I feel I've done my best here and haven't seen any evidence of any turtle activity."

The turtle most commonly found in southwest Western Australia is the Chelodina

Jacqueline Giles looking for turtles at Turtle Swamp

oblonga, known as oblong or western long necked turtle.

"They are relatively common but are in trouble because of the process of urbanisation," Jacqueline said.

"We need to look after them before they become a threatened or endangered species."

New MetroRail's Environmental Manager Colin Stedman said that protecting the environment was a high priority for the project.

"New MetroRail is committed to responsible environmental management," Colin said. "Wherever possible we are preserving and maintaining any sensitive flora and fauna found in the vicinity of the railway reserve.

"Comprehensive environmental research and planning has been an integral part of the project since planning began. As the project evolves and we encounter new or unexpected environmental challenges, we will continue to adapt our plans and take steps to protect the natural environment."



Auditor endorses NMR management

In a report on the New MetroRail City Project, the Auditor-General has found that the contract was being managed well.

"The Auditor-General's key finding is a vote of confidence in the way the State Government is managing one of the biggest infrastructure projects Western Australia has ever seen," Planning and Infrastructure Minister Alannah MacTiernan said.

The Auditor-General found the Public

Transport Authority was capably managing the contract in terms of appointment of suitably qualified and experienced personnel; and appropriate systems, monitoring and relationships.

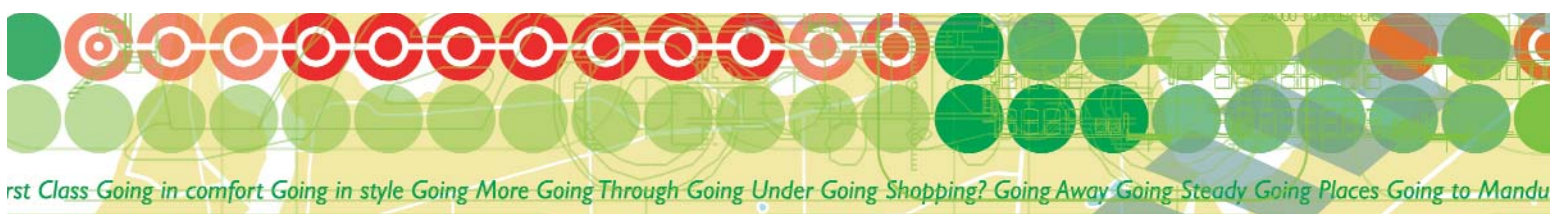
The City Project contract will see construction of a 770m twin-bored tunnel linking a new train station at The Esplanade and new underground platforms at William Street.

Ms MacTiernan said timetable and cost issues identified by the Auditor-General were already

being closely monitored by the Public Transport Authority contract team.

"As part of this program, in April this year I announced a revised timetable and budget which saw the city section's completion date extended to December 2006 and the project's contingency sum lifted by \$45million," Ms MacTiernan said.

"We are confident that existing timetables and budgets are on target and a further review will take place in the lead-up to next year's Budget."



New MetroRail Contact Details

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Thornlie opens in party atmosphere

Hundreds of locals took a ride to Perth on the first train from Thornlie Station

The opening of the Thornlie Railway Line and Station was celebrated by local residents and guests in a party atmosphere with Premier Geoff Gallop, Planning and Infrastructure Minister Alannah MacTiernan and Culture and Arts Minister Sheila McHale all taking an official role.

Ninety students from the local Yale Primary School performed two dances and two songs for the assembled crowd before the official opening.

During the ceremony, Minister MacTiernan said the Thornlie spur line and station was a significant engineering achievement.

"As well as the station building, car park and railway line, the project included construction of an electrical sub-station at Beckenham, the Kenwick Tunnel, the rail bridge over the Canning River, and the traffic bridge at Spencer Road," she said.

The Thornlie station precinct is a major transit node, accommodating a bus/rail interchange, car drop-off facilities, pedestrian and bicycle access, and parking for 450 cars.

The building itself was custom-designed, reflecting the rich heritage character of Thornlie.

It incorporates the latest technology, safety and security facilities, including the Transperth's world-leading CCTV surveillance system.

Along with the extension of the Northern Suburbs Railway to Clarkson, upgrades to rail services in the Victoria Park area and the manufacture of 93 new state-of-the-art



railcars, Thornlie was part of the New MetroRail project.

Train and bus services for the new line, which

connects to the existing Armadale line, are now fully operational with trains every 15 minutes.

OnTrack is produced by the Public Transport Authority's Corporate Communications Branch.
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