

Australian/New Zealand Tunnelling Update

The Australasian Tunnelling Society (ATS) is currently preparing for the **15th Australasian Tunnelling Conference** "*Underground space – solutions for the future*" to be held in Sydney from 17–19 September 2014.

Queensland



Legacy Way: With Legacy Way's road base now laid, work vehicles can now drive all the way along the tunnel. But the public will not be able to drive through the \$1.5 billion tunnel, linking the Western Freeway at Toowong and the Inner City Bypass at Kelvin Grove, until 2015. The tunnel is now 65 per cent complete, with mainly electrical and mechanical work left to be completed. The Legacy Way project

won the Major Tunnelling Project of the Year at the International Tunnelling Awards.

Brisbane's underground bus and railway project: The Queensland Government has announced that work will start on a new tunnel for buses and trains under the Brisbane River by 2015. The \$5 billion tunnel plans will revolutionise public transport travel in inner Brisbane with a 5.4km joint bus and train tunnel linking Dutton Park to Bowen Hills. The so-called Brisbane Underground will include a station at Woolloongabba for sports fans and another along George St to service the new entertainment and casino precinct, as well as the Queensland University of Technology. A third station will be built alongside busy Roma Street Station. The alternative tunnel route into the city will alleviate train congestion on the Merivale Bridge, which is near capacity during peak periods, and reduce the number of buses that regularly back up along Victoria Bridge.

Narrows Crossing: Santos GLNG's tunnel boring machine is now underneath The Narrows, having moved out of the intertidal zone. The tunnel now stretches more than 2.8 km towards the foreshore of Curtis Island, where the project's liquefied natural gas plant is being built. The tunnel being built by Thiess will encase the gas transmission pipeline used to link the mainland to Curtis Island. Once the tunnel has been constructed, Saipem the main contractor constructing the pipeline will pull the pipe through the tunnel

Tunnel link to Queensland State Parliament: The new tower being built for state government ministers and their staff is set to have its own private tunnel from 1 William Street to Parliament. Premier Campbell Newman has asked for more information on a possible link between the new Executive Building and Parliament. Stretching about 100m, the tunnel would provide underground access for ministers from the basement of 1WS to the parliamentary annexe carpark. Only those with security clearance would be able to use

the walkway, which would allow ministers to move between the two buildings undetected. The tunnel would also help ministers avoid the hectic traffic between the two buildings.

NSW

NW Rail Link: The \$8.3 billion North West Rail Link is Australia's largest public transport infrastructure project currently under construction and a priority rail project for the NSW Government. It will be the first fully-automated rapid transit rail system in Australia. The project will deliver eight new railway stations and 4,000 commuter car parking spaces to Sydney's growing North West. The 15.5km of tunnels between Bella Vista and Epping, the longest rail tunnels in Australia, are being constructed by the Thiess-John Holland-Drgados JV. As Australia's largest public transport project, 16 major North West Rail Link construction sites are being set up with four TBM's programmed to commence excavation in the second half of 2014.

Sydney CBD and South East Light Rail: Geotechnical work has commenced for the building of a light rail network which will connect the central part of Sydney to major sporting, education and health precincts in the city's southeast. Trams will run between the eastern suburbs and the city by crossing Moore Park in a tunnel. Transport for NSW had previously said there were two options for trams to move through Moore Park. One was a "cut and cover" tunnel, and the other a viaduct. After the tunnel proved more popular in consultations, the department has adopted the tunnel.

Pedestrian tunnel linking Wynyard to Barangaroo: The 180m-long, 9m-wide pedestrian tunnel beneath Clarence and Margaret Streets, is part of the \$306 million Wynyard Walk, linking the station to the Barangaroo waterfront and future commercial development on the western edge of the CBD. The 3.5m-high tunnel will begin at a new entrance to Wynyard Station on Clarence St. Work has already begun in the basement of the Heritage-listed Railway House and neighbouring Transport House, between Clarence and York Sts, to make the buildings safe for construction of the tunnel below. The "Clarence St Portal" will feature a spectacular three-storey futuristic glass and metal edifice. The project is on track to open in late 2015



St Helena Tunnel: The \$862 million project begun in May 2013. The project being constructed by Lend Lease is part of a 16.3km motorway. Tunnelling for the 434 m tunnels is expected to take 10-12 months and when complete in 2014, will accommodate three lanes of traffic in each direction.



F3 - M2 Link: The F3-M2 link will provide a continuous motorway between Western and South Western Sydney and the Central Coast and Hunter Valley. Environmental field investigations have been and are being carried out to identify environmental characteristics of the project corridor to be taken into consideration during the tender assessment, selection of the preferred design and the preparations of the Environmental Impact Statement. Three tenders for the design and construct of the proposed tunnel were submitted on 29 November 2013. They are now being assessed in terms of innovation, cost effectiveness and an environmentally responsible design. Roads and Maritime will then prepare a response to the submissions received. The Minister for Planning and Infrastructure will determine whether or not to approve the project and any conditions to be applied. Construction is planned to start in 2015. The important 8km missing link in Sydney's motorway network, the majority of which is to be constructed in tunnel, is planned to be completed by 2018.

WestConnex : WestConnex consists of three Stages as follows:

- Stage 1 – Parramatta to Haberfield (including dual 3 lane tunnels, each 5 km long)
- Stage 2 – Beverly Hills to St Peters (including dual 2 lane tunnels, each 6 km long)
- Stage 3 – Haberfield to St Peters (including dual 3 lane tunnels, each 8.5 km long)

The first stage to be developed will be Stage 1. This stage has been broken into two main components as follows;

- Stage 1A – Widening 7.5 km of the existing M4 to 2 x 4 lanes.
- Stage 1B – Widening 1 km of M4 and twin 3 lane tunnels, 5 km long, from Homebush Bay Drive to Parramatta Road and the City West Link

Construction is expected to commence in 2015 with the entire project completed by 2023.

Victoria

East-West Link - The East West Link is an 18 kilometre cross-city road connection extending across Melbourne from the Eastern Freeway to the Western Ring Road. Planning is currently underway for the first stage of the East West Link, a six kilometre roadway connecting the Eastern Freeway with CityLink. The Victorian Government has committed to building the East West Link Stage One, between the Eastern Freeway and CityLink. The formal planning study that we are currently carrying out also includes a connection from CityLink to the Port of Melbourne area. While there is not currently any commitment to build the connection to the Port, Linking Melbourne Authority will continue to explore opportunities for procuring this section of the project and potential timeframes. A proposed route connecting the Port area to the Western Ring Road has been developed.



Three consortia have been shortlisted to tender for Stage 1 linking the Eastern Freeway with CityLink which includes dual three lane tunnels, 5 km long. Tenders close in April 2014.

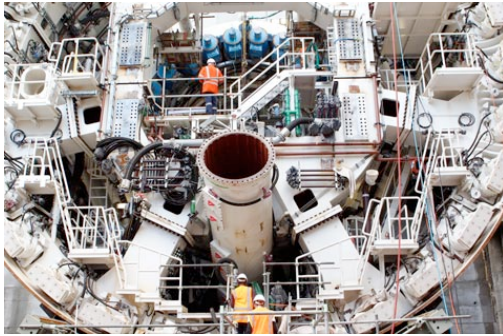
Western Australia

Perth City Link: The new pedestrian underpass was opened to Perth city commuters on Thursday, 19 December, six months ahead of schedule. Part of the Perth City Link rail project, the new underpass constructed underneath Wellington Street provides a seamless connection between Perth and Perth Underground stations to all platforms, and will save passengers time when transferring between services. By 2031, it is estimated more than 22,000 people a day will use the new underpass. The underpass provides direct access to platforms 5, 6/7, and 8/9 in Perth Station for Armadale, Fremantle and Midland line services. From Perth Station, passengers can enter the pedestrian underpass from all platforms to connect to Perth Underground for Joondalup and Mandurah line services. Access for passengers with a disability has greatly improved with three new lifts available. All platform upgrades inside Perth Station are now complete. over the new pedestrian underpass completes all work for the Perth City Link rail project. Work on the project commenced in March 2011 and included building the 600metre long Fremantle Line tunnel, a new island platform for special events, and the final piece of work, the new pedestrian underpass.

WA Airport tunnel: The WA Government has put forward a plan to build an underground tunnel linking the railway lines from Bayswater to the airport and out to Forrestfield. The proposed 12km underground tunnel would disappear at Forrestfield or Bayswater. The Government has chosen to make the new airport rail link its priority over the MAX Light Rail plan.

New Zealand

Waterview Connection:



TBM Alice was launched on 31st October 2013. The machine will bore two 2.4km tunnels, both wide enough for three lanes of traffic in each direction. It will spend the next year heading north at depths of up to 45m before being spun around for the return journey. As it progresses it will install more than 24,000 precast concrete segments that will line the tunnels. The tunnel is set to open in 2017. Instead of using 10

conventional reinforced concrete (RC) segments to make up a temporary ring, the Waterview team chose a combination of RC and steel segments to create the temporary rings. This reduced the overall weight of the combined ring and removed the need for additional temporary support measures for the upper two-thirds of the temporary rings. The innovation also eradicated the need for the usual large A-frame steel support structures, steel wire rope cables, internal and/or external arch systems.

Auckland Central Interceptor waste tunnel: The Central Interceptor is a new wastewater tunnel proposed to run between Western Springs and the Mangere wastewater treatment plant. The tunnel will be approximately 13 kilometres in length and will lie between 22 and 110 metres below the surface. It will cross the Manukau Harbour at a depth of approximately 30 metres below the seabed. Along the proposed route it will connect to the existing trunk sewer network to divert flows and overflows into the tunnel. The concept design of the Central Interceptor was completed at the end of 2011. Resource consent was granted in November 2013 and construction is scheduled to start in 2017, with completion expected in 2023. The tunnel provides a total storage capacity of approximately 200,000m³, and will achieve estimated cost savings of at least \$500 million over its main alternative solution.

Mt Victoria tunnel duplication: The NZ Transport Agency has released details of proposed mitigation measures for the Basin Bridge and plans of the proposed duplication of the Mount Victoria Tunnel and widening of Ruahine Street and Wellington Road. The projects form the southern section of the Wellington Northern Corridor Road of National Significance, which will improve economic productivity, ease congestion and improve safety throughout the Wellington region.

Terrace Tunnel duplication: The Terrace Tunnel Duplication project is part of the Wellington Northern Corridor project. Current highway tunnel capacity causes congestion during peak periods, restricting access to critical destinations, and forces traffic on to local routes, extending travel times and reducing trip reliability and city livability. The objectives of the



Terrace Tunnel Duplication project is to improve the efficiency of the main highway into and out of Wellington, and to improve route security and safety. To support a business case for the project, Jacob Associates and Beca are developing a scoping study and scheme assessment, including options evaluation, geotechnical characterization, conceptual design, and construction cost estimation for tunnel options being considered.