



TRANSCITY

TRANSCITY JV PROJECT (LEGACY WAY)

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As Brisbane's economy continues to expand, the Legacy Way project being delivered by Transcity will help accommodate Australia's most easterly city to grow along with it

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In the present century alone Brisbane's population has grown from 3.5 million to more than 4.5 million. That is projected to double by 2031 requiring at least 156,000 additional dwellings to be built. With this growth comes an inevitable increase in traffic congestion. A recent report found that 340 kilometres of Brisbane's roads are at or above or capacity, and estimates this will jump to 720 kilometres by 2031.

But congestion, itself caused by economic growth, stifles future growth. Realising that the area around Brisbane Airport is set to become one of the region's main economic generators, Brisbane City Council identified the need for a link between the Inner City Bypass (ICB) and the Western Freeway. In 2005 a pre-feasibility study identified and investigated five links to connect existing motorways and major arterials. It found the proposed Legacy Way (named in honour of the armed services support organisation Legacy Australia) would provide an important bypass for central Brisbane and the inner western suburbs. A business case analysis completed in 2008 concluded that the project could be both technically and financially feasible.

Transcity is the name of the joint venture company formed to deliver this ambitious decongestion project. It comprises Brisbane-based BMD Constructions, who has significant local knowledge and resources and two specialist international infrastructure firms. Ghella is an Italian company with an extensive background in tunnelling projects round the world while Acciona of Spain is recognised for its work in major construction projects worldwide. The contract for Legacy



TBM's Annabell and Joyce are commissioned prior to their delivery and assembly at the Legacy Way worksite

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Way was signed in January 2011, and Transcity started working at both ends in the second quarter of that year. Two Herrenknecht TBMs, each weighing approximately 2,800 tonnes and 110 metres in length, are being used to construct Legacy Way's 4.6 kilometre parallel tunnels between the Western Freeway at Toowong and the ICB at Kelvin Grove.

These machines are capable of cutting a 12.4 metre hole through the hard rocks that characterize the geology below Brisbane at an average rate of 21 metres day, though with a best day record of 49.7 metres. The machines also install the precast concrete segments that form the tunnel walls. Tunnelling work



Construction of Legacy Way's cross passages

started from the Toowong end in August 2012 – quite an achievement since it took four months just to assemble the TBMs there.

The machines have been given names – Annabell working to the south of her sister Joyce. The first TBM is named after Annabell MacKinney, the daughter of the late Lance

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Corporal Jared MacKinney who was killed in action in Afghanistan in 2010. The second TBM is named after Joyce Tweddell, a nurse during World War II who showed immense courage after being held as a prisoner of war in Sumatra for three years before going on to become Queensland's Chief Radiographer.

The pair of them are scheduled to break through close to the ICB around the middle of 2013, though they have been getting through their task at a spanking rate which anyone

can follow in real time on <http://transcityjv.com.au/the-project/tunnelling/tbm-tracker/>. At the time of writing they had each travelled 2.5 kilometres, and were crossing Guthrie Terrace, Paddington.

The machines work day and night, and each has a crew of 22 people to keep it operating. Both TBMs are averaging a rate of more than 150 metres per week, a world class standard for the industry - there are only a few projects worldwide that can show similar

“EACH MILESTONE WE REACH ON THIS PROJECT BRINGS US ONE STEP CLOSER TO BEING ABLE TO PROVIDE A FOUR MINUTE TRIP BETWEEN TOOWONG AND KELVIN GROVE”



Precast concrete segments at the western worksite



Precast concrete segment production

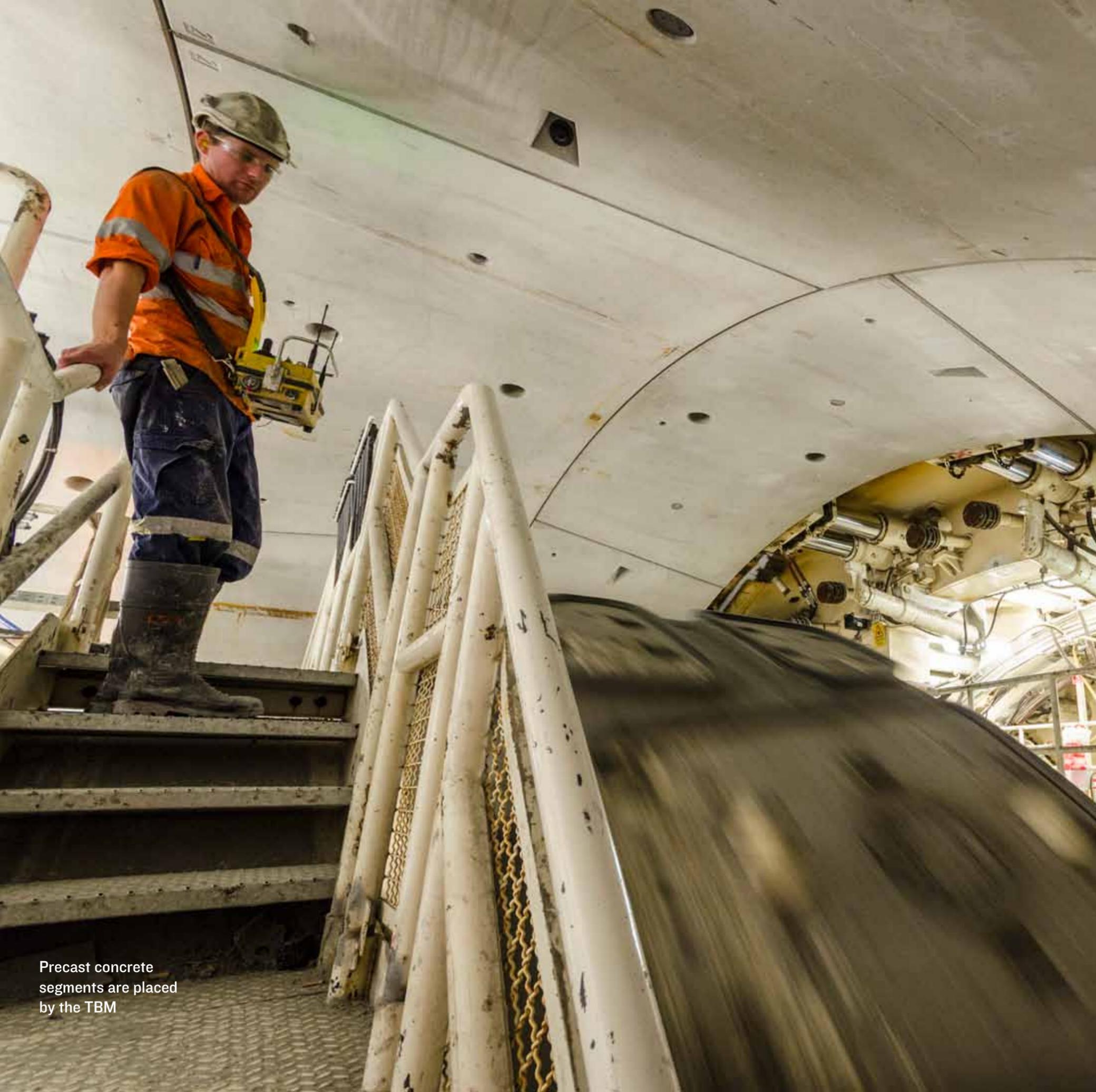
achievements using large diameter TBMs. Transcity Project Director Fernando Fajardo said he was proud of the team's outstanding efforts. "The team is setting records for our rate of excavation which is a credit to their global expertise, hard work and commitment to successfully delivering this project."

From the point of view of Brisbane City Council, what matters is that the Legacy Way tunnel will be delivered on time to residents and visitors by 2015. Lord Mayor Graham Quirk said the record speeds being set on the project, was a good indication. "Each milestone we reach on this project brings us one step closer to being able to provide a four minute trip between Toowong and Kelvin Grove," he said. "Legacy Way alone will cut the trip from Jindalee to Kelvin Grove from

30 minutes to 10 minutes and allow motorists to travel from the Ipswich Motorway to the Airport without one traffic light."

Annabell and Joyce's high productivity has meant an increased demand for precast segment production and a faster removal of spoil which is being transported via an underground conveyor to the Mt Coot-tha Quarry.

Nine interlocking segments are required to complete each ring, which spans the circumference of the tunnel. Approximately 4,300 rings are required to line the twin two lane tunnels: that adds up to 38,430 segments in all. The concrete segments are transported from a purpose built facility at Wacol, about 16 kilometres from the city and moved to the front of the TBM via a segment feeder. There they are positioned around the perimeter of



Precast concrete segments are placed by the TBM

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the excavated tunnel and held in place by the TBM's auxiliary thrust cylinders while they are bolted and grouted into place.

It has also caused pressure to move out the excavated material faster; but the good news is that Transcity planned a very smart and environmentally friendly solution. There's no trucking of spoil. All rock cut from the tunnel face is transferred via an underground conveyor from the western worksite into the Mt Coot-tha Quarry. The tunnelled conveyor is approximately 870m in length, of which approximately 530m is underground.

The spoil conveyor's innovative design provides significant benefits for the community including a decrease in noise and dust impacts during tunnelling operations. It also limits the need for almost 96,000 truck movements on the Western Freeway.

The 1,000,000 cubic metres of spoil excavated from the twin tunnels will be used to rehabilitate the quarry.

At the end of the project rehabilitation of the western worksite at Toowong will include an imaginative four hectare expansion of the Brisbane Botanic Gardens at Mt Coot-tha, with native vegetation restored and expanded to reflect the sub-tropical retreat for which the Botanic Gardens is famous. No mess, less noise and a haven of peace on top of a huge reduction in congestion with peak travel times between Centenary Bridge and the ICB almost halved – Legacy Way is a double win for Brisbane. **BE**

For more information about
Transcity JV Project (Legacy Way) visit:
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