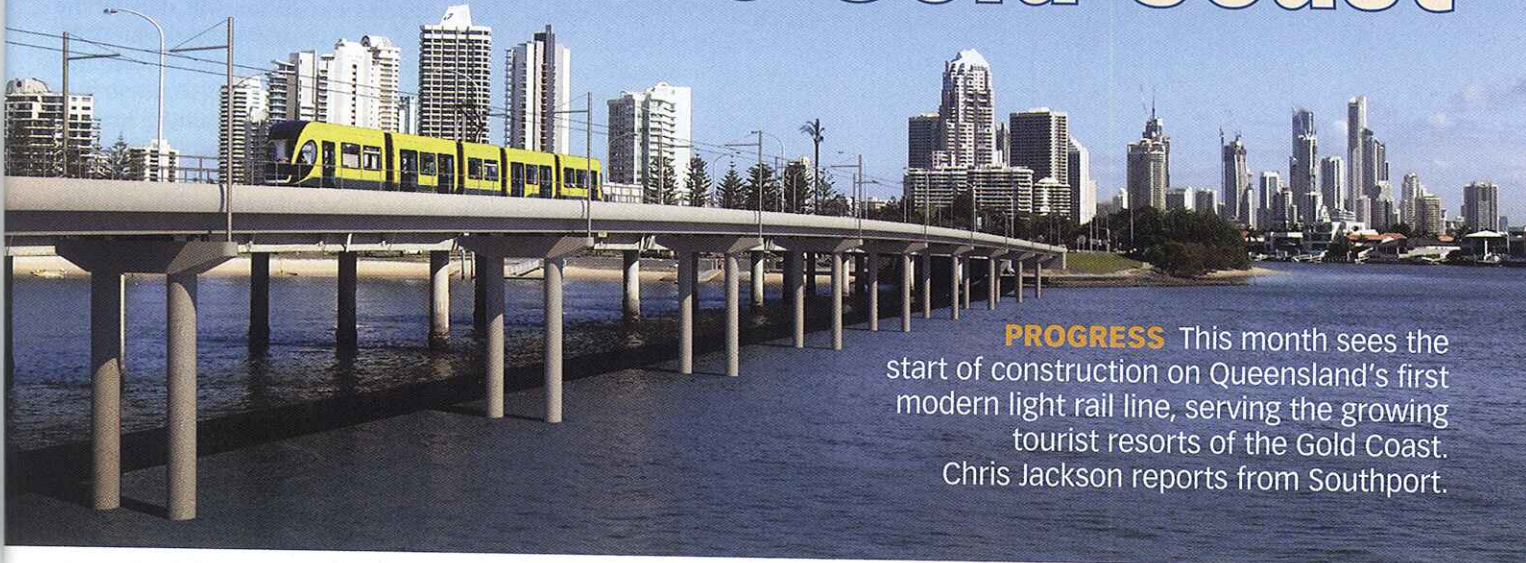


Flexity comes to the Gold Coast



PROGRESS This month sees the start of construction on Queensland's first modern light rail line, serving the growing tourist resorts of the Gold Coast. Chris Jackson reports from Southport.

Although road closures and temporary diversions have been evident for several months, work is finally getting underway on the long-planned light rail line serving the Gold Coast resorts along the Pacific coast of southeast Queensland. Being built under an A\$1bn PPP concession awarded in May 2011, the 13 km first phase linking the Gold Coast University Hospital to Broadbeach with 16 stops is on course to open in 2014.

With southeast Queensland's population expected to grow by 57% to reach 4.4 million by 2031, the number of inhabitants in the towns that make up the Gold Coast city region has been increasing rapidly, and could eventually top 800 000. As well as the string of resorts stretching from Southport through Surfers' Paradise, Broadbeach and Burleigh Heads to Coolangatta, development is also growing inland towards the Pacific Highway and Queensland Rail's electrified railway serving Helensvale, Nerang and Varsity Lakes.

Faced with this projected growth, the state government commissioned a review of public transport options, including light rail and bus rapid transit. This was followed by a feasibility study and public consultation, which found a clear preference for light rail.

Working with the Gold Coast

city council, the state government drew up a Concept Design & Impact Management Plan, and in December 2009 it invited expressions of interest for a 30-year PPP concession to finance, design, build, operate and maintain the line. Out of six responses, three were shortlisted for the tender stage. Final bids were submitted in November 2010, and the preferred bidder was announced in May 2011.

The winning GoldlinQ consortium includes KDR Gold Coast Pty Ltd, a joint venture of Keolis and Downer EDI Rail which currently operates the Yarra Trams network in Melbourne; McConnell Dowell Constructors; Bombardier Transportation; and

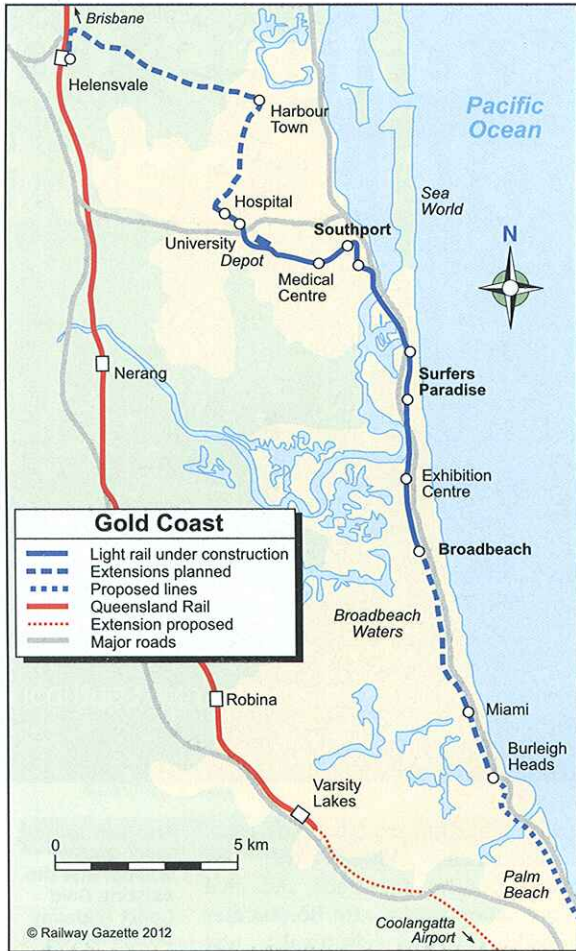
investment company Plenary Group.

McConnell Dowell will be responsible for the track and civil construction works, with Bombardier providing the electrical and mechanical systems including rolling stock, signalling and communications, power supplies and depot equipment. Bombardier will also be responsible for maintaining the vehicles under contract to KDR. The operator will be responsible for the remaining maintenance activities. Project Director Ian Corfield worked for Bombardier heading up the team that built the first phase of the Nottingham Express Transit network in the UK, which opened in March 2004.

The new Nerang River bridge will parallel the existing Gold Coast Highway bridge linking Southport and Surfers Paradise.

The Gold Coast LRVs will be the first seven-section versions of the Flexity 2.





five weeks later, which GoldlinQ CEO Phil Mumford put down to the advanced planning and detailed tender information, which provided a 'most comprehensive suite of project documents'.

Even before the concessionaire was selected, the city began to award contracts in August 2010 for preparatory works, including utilities diversion, road widening, site clearance and geotechnical surveys. Other advanced works include the underground station and bus interchange at the northern terminus, which has been built by the Lend-Lease PPP consortium constructing the A\$1.8bn Gold Coast University Hospital.

Event-driven city

GoldlinQ has embarked on an extensive community information programme, explains external relations manager Jason Ward. He says this will 'set expectations' about what is happening at different points along the route.

Both the city council and the concessionaires are keen to minimise the impact of construction, given the importance of the local tourist industry. This has been suffering from the global recession and the strength of the Australian dollar. It was also affected by the flooding which hit the state last year. Thus construction blockades have been agreed during the peak summer holiday periods, the

school leaving celebrations in mid-November, Christmas, and the Gold Coast 600 V8 Supercar motor racing festival each October. 'This is very much an event-driven city', comments Ward.

With civil works now getting underway, Corfield expects that systems installation will start by the end of this year or early in 2013. Construction and fit-out will continue in parallel through 2013, leading to the start of systems testing in early 2014. Following driver training, he expects that the line will be ready for a month of full ghost running in May 2014 ahead of the opening in June.

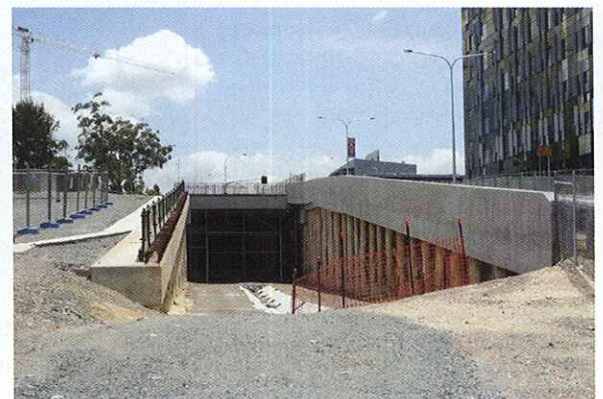
North to south

The northern terminus at University Hospital lies in a 200 m cut-and-cover tunnel which has already been built as part of the hospital development; escalators will lead up from the tram platforms to a new bus interchange on the surface. The next stop will serve the nearby Griffith University, after which the line will be carried on a viaduct over the Smith Street motorway to reach the depot. This is being built on the site of a former council refuse facility, which provides an extensive level area for the buildings and stabling sidings.

Crossing Kumbari Avenue, the line will run in central reservation along Queen Street and Nerang Street to reach the centre of Southport, where the main stop will serve the Australia Fair shopping centre in Scarborough Street. Heading southeast out of Southport, the line will be carried over the Nerang River on a new structure adjacent to the Gold Coast Highway bridge. After running on reserved track, the alignment crosses the highway to run on-street along Surfers Paradise Boulevard.

Rejoining the Gold Coast Highway south of Surfers Paradise, the light

The cut-and-cover tunnel for the underground terminus and bus interchange at University Hospital has already been built by the developers of the new PPP-funded hospital.



rail line will again run in central reservation to Broadbeach. Stops along this section will serve the local casino, the conference and exhibition centre and the Pacific Fair shopping mall. There will be no less than 52 road crossings along the route, but the trams will have priority at traffic lights.

Motor racing challenge

Quite apart from the need to suspend construction during the annual V8 Supercar festival, the event has also impacted on the design of the line. The motor racing circuit incorporates a section of the Gold Coast Highway, and impinges on the tram route just north of Surfers Paradise.

Such are the constraints of existing buildings and road curvature that it has not been possible to maintain a clear double-track alignment past the area occupied by the protection barriers and viewing stands. Thus one of the tracks will be blocked during the festival, and the trams will have to operate past the course using a 300 m long single-line section, for which provision is being built in the shape of permanent facing and trailing crossovers. Three of the turnouts will be sprung, and the special diverging turnout will be locked in position during the blockade.

Although the festival itself only lasts for three days in late October, two or three weeks are needed to set up the barriers and stands, and a similar period to clear them away. Corfield says the line will have to operate a special timetable for five or six weeks, as the single-line section will not accommodate the normal peak frequency. As the visibility is poor, a simple signalling system will be provided during the period of single-line working.

Systems specification

According to Technical Director Didier Leperou, the line will be electrified at 750 V DC using traditional single-wire overhead rather than catenary. Power will be taken from local generator Energex at 11 kV and fed to six substations. These are being procured from ABB, and the overhead line equipment from Balfour Beatty Rail. Contracts for other 'long-lead' items will be awarded over the coming 12 months.

Bombardier is responsible for sourcing the control and



communications systems, and for fitting out the operations control centre at the depot. The power supply network will be managed from here using Scada. Other than the temporary single-line working, there will be no signalling, as the whole route will be worked on line-of-sight driving. Only three powered turnouts are needed to give access to the depot; all others will be sprung.

An 'integrated communications workstation' will handle passenger information and public address as well as the wayside CCTV images. Vehicle location systems will drive the automatic departure indicators at each stop. The communications network will use Tetra radio, with six base stations to ensure good coverage along the whole route. The control system will be based on Bombardier's Iconix platform as used for the monorails in both São Paulo and Riyadh.

The depot will have a vehicle washing plant, sanding facilities, stabling area and a four-road workshop building for maintenance and servicing. This will be provided with an underfloor wheel lathe, lifting jacks and cranes, plus the equipment needed to service the modular traction packages and air-conditioning. There will also be a paint booth so that any damage to the livery can be easily repaired.

Surfboard racks

The line will be worked by a fleet of 14 seven-module Flexity 2 LRVs, similar to the five-module version

recently unveiled in Blackpool (RG 10.11 p82), but with enhanced air conditioning and a 'sexy' nose profile and livery to suit local requirements. The cars will be equipped with surfboard racks as well as the multi-function areas for wheelchairs and prams, which Bombardier believes is a world first. The 45.5 m long cars with 80 seats will be able to carry a crush load of up to 309 passengers, although typical peak loadings are expected to be around 250.

Although the Flexity 2 concept was developed at Bombardier's light rail centre in Wien, the Gold Coast cars are being styled by the company's industrial design team in Brisbane. They will be assembled at Bautzen, with cabs from Wien. The first vehicles are expected to arrive in Queensland by July 2013 for static commissioning, leading to the start of trial running between the depot

Advanced works and utilities diversion are well advanced along Queen Street between Southport Medical Centre and the depot site.

Geotechnical surveys in central Southport were nearing completion at the end of 2011.





LRVs will operate on-street along Surfers Paradise Boulevard to serve the heart of the popular tourist resort.

Artist's impression of the future Cavill Avenue station in Surfers Paradise.

and the university in August or September. The trams will be able to run at up to 70 km/h.

The line has been designed for 75 000 passengers/day, although Corfield says the concessionaires are expecting 50 000. The Concept Design envisaged up to 100 000 passengers/day, which could be achieved by operating at 3 min headways, although this would require more vehicles and additional substations. The concession agreement includes options to call off further cars at a fixed price for the first eight years.

GoldlinQ expects to operate a core service of 8 trams/h between

07.00 and 19.00 each day; trams will run every 15 min during the early mornings and late evenings. A 30 min service will be provided at night during the weekends, when the line will operate around the clock from 05.00 on Friday to 23.00 on Sunday. With an end-to-end journey time of 37 min, the timetable will require a maximum of 12 cars in service, leaving one for servicing and hot standby and one undergoing heavy maintenance or repairs.

Ticketing will be fully integrated with the Translink zonal smartcard scheme which already covers all rail and bus services in southeast

Queensland. This will be managed by the state agency, which will procure the necessary equipment from Cubic and issue it to the concessionaires for installation.

With the state setting the fares and taking the revenue risk, the PPP concession is based around a regime of availability payments, with bonuses based on quality indicators such as the level of service operated, performance reliability, cleanliness and customer feedback as well as penalties for unavailable equipment. Although the concessionaires are not held accountable for revenue, the contract requires them to 'support' ridership growth; Corfield says there is also the incentive of extensions if the line is successful.

Future expansion

Whilst GoldlinQ's contract covers construction and operation of the initial phase, discussions about potential extensions are already well in hand. Phase II envisages a northern extension running northwest from University Hospital to connect with QR at Helensvale and a southern extension from Broadbeach to Burleigh Heads.

The state government had originally envisaged that these would be completed by around 2024, although some work may be brought forward following the announcement in November 2011 that the Gold Coast had been selected to host the 2018 Commonwealth Games. This is most likely to prioritise the Helensvale link, although a second rail connection could be provided through a dedicated bus shuttle between Broadbeach and Nerang station. However, no decision is expected until after the state and local elections, which are likely to be held in March.

In the longer term, the city council would like to see the light rail line extended south from Burleigh Heads to serve Coolangatta airport, where traffic is expected to grow from 4 million passengers/year to 10 million by 2016. This would bring the total length of the Helensvale - Coolangatta corridor to around 40 km. However, the state government would prefer to extend the railway to the airport, in order to operate through Airport Express services between Coolangatta and Brisbane airports, and perhaps extend the light rail line inland to connect with an intermediate station. ☞



Image: Bombardier