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World launch for *Blackpool Tram*

Blackpool! Just the word brings back memories of summer holidays, donkey rides, the Pleasure Beach, and interminable Party Conferences.

But this seaside resort on Lancashire's Fylde coast is also the only town in Britain which still has its original first-generation tram system - or at least part of it. Dating back to 1885, the tram system runs from Starr Gate, south of Blackpool's Pleasure Beach, northwards along the coast to Fleetwood Ferry. A mixed collection of trams built over the last 90 years run on the route, some of them open topped, and there are even trams mocked-up to look like boats which are used in the popular "Illuminations" season.

Rebuilt tramway

However, in 2008 a plan was announced to rebuild the tramway, which had become a little run down, and to purchase a new fleet of 16 trams to bring the whole system into the 21st century. The £101 million project was mainly funded by the Government with contributions from Blackpool Council and Lancashire County Council. The entire route was to be refurbished, and a depot for the new trams built at Starr Gate.

Thus Blackpool became the first tram operator in the world to place an order for Bombardier's new *FLEXITY 2* tram. The first example was delivered in September 2011, with the entire fleet due to go into service at Easter 2012.

That is why, on 8 September, guests from tram operators around Europe, along with representatives from Blackpool Council, Lancashire County Council and Bombardier Transportation, gathered for the World Launch of *FLEXITY 2*. The doors of the pristine new Starr Gate Depot opened, and in a cloud of smoke, accompanied by music from the Siren string quartet, *FLEXITY 2* tram number 001 emerged in a rather damp and gloomy daylight. Looking resplendent in its purple and white livery, the crowd was suitably impressed and the press corps gathered round to take the first photos.

However, true to form, the rail engineer hung back from the throng and instead went around the back to find out more about this new tram, and why it is so important to Bombardier.

Logical development

FLEXITY 2 is a logical development of the original family of *FLEXITY* trams that Bombardier has manufactured in various forms since the mid 1990s and of which there are now over 1700 in service worldwide. However, while in the same family, many of the components have been upgraded or redesigned.

New cab, new body

The cab has been redesigned with improved impact protection according to EN 15227. The interior is based on an "Empty Room" so that the customer can design the vehicle to suit local needs. The 100% low floor arrangement makes this even easier. Large windows and a new ventilation system make it light and airy, while thinner side panels than on earlier designs give more interior space. Wide doorways (two doubles and two singles on each side) make for quicker boarding. Blackpool have opted for a layout that gives seating for 74 passengers and standing room for a further



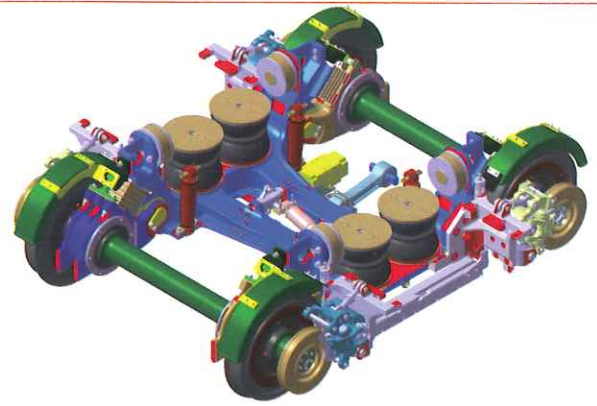
(Right) Driver's view of Blackpool Pleasure Beach.

Corrosion protection has been improved, a particular benefit to Blackpool where the sea air could otherwise cause problems. The body shell is manufactured from corrosion resistant carbon steel. The vehicle body design had to take into account the corrosive elements of the Irish Sea and remove all hollow spaces within the body structure to prevent an accumulation of water and dirt. To assist in this task all welding gaps were sealed. Underframes are coated with 'Tectyle', a protective wax. This is inspected during routine maintenance.

148. Two multi-purpose areas cater for wheelchairs and pushchairs, and there are large, clear information displays throughout. Entrance height is just 320mm above the top of the rail.

Overall, this launch version of the *FLEXITY 2* is 32.2 metres long, 3.42 metres high and 2.65 metres wide with five articulated sections. It weighs 40.9 tonnes empty, or 56.7 tonnes laden, with an axle loading of 9.6 tonnes maximum. Those six axles are in three new *FLEXX* Urban 3000 bogies, two powered ones and a central trailer bogie.





The FLEXITY 2 can even be fitted with Bombardier's novel PRIMOVE induction-loop catenary-less power acquisition system, although this is not part of the Blackpool specification.

FLEXX Urban 3000 Bogie.

Bogies

Like the whole tram, the FLEXX Urban 3000 is a natural development of earlier, well-established bogies. It has a short wheelbase at only 1,850mm which allows the tram to negotiate curves as tight as 25m in service (20m in the depot). To keep the whole bogie compact, and allow it to be fitted to 100% low floor trams, the water-cooled traction motors are mounted longitudinally on the outside of the bogie frames, one each side. These connect with bevel-gearboxes mounted on the outboard end of the axles. The 125kW motors are cooled from radiators mounted on the roof of the tram. There is a fully-integrated hydraulic brake system, as well as an electromagnetic track brake.

The FLEXX Urban 3000 is a modular design. Converting it from an inside frame type, as on the Blackpool tram, to an outside frame allows it to be used on metre-gauge systems while otherwise utilising the same components. Wheel diameters can vary between 560mm and 640mm (600mm in Blackpool). Primary suspension uses elastomeric springs. The secondary suspension also uses

elastomeric springs with lateral and vertical hydraulic dampers, although steel springs are available for some applications. The wheels have a rubber resilient strip between wheel and tyre, as on most trams, to give a smoother and quieter ride. Externally, the bogies are hidden behind side fairings.

Power and control

Power for the tram is taken from the 600V DC overhead system through a Stemann-Technik pantograph. Interestingly, Blackpool's heritage fleet ran on a non-standard 550V supply - it was only upgraded to 600V this year for these new trams.

Bombardier's own MITRAC 2 propulsion control technology is fitted. This includes a regenerative braking system which harvests electrical energy during braking. The size of the traction converters has been reduced, as well as the auxiliary converters that supply power for lighting, air-conditioning, information and control systems.

Starr Gate

The new depot at Starr Gate is primarily set up to house and maintain the new tram fleet. Some of the heritage trams will be serviced there, and one was sitting in the depot at the launch, but primarily they will be housed at the old Rigby Road depot. Once the full FLEXITY 2 fleet is in service, the heritage trams will continue to operate in regular service throughout the year, providing a peak time alternate service between the new trams. Otherwise the 21st century trams will run the route, resulting in a quieter and smoother ride, and a journey time that will be 15 minutes quicker from end to end.

Staying on a seaside theme, after the 16 new Blackpool trams have been delivered, the factories in Vienna, Austria, where the cabs are manufactured, and the assembly plant in Bautzen, Germany, will change over to making 7-segment trams for the next customer - Australia's Gold Coast Rapid Transit. 14 of the 45 metre long trams will be delivered "down under" by 2014. ■

