

Trackless and with rubber wheels, it may be

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Rubber wheels. Electric batteries. No overhead wires. This could be the future for Melbourne's trams.

By 2025, new trams will be cruising through the city's streets, thanks to a \$1.5 billion Andrews government injection to fund 100 "next-generation trams".

Nimble, low-floor and energy-efficient, the new vehicles will replace lumbering A and Z-Class trams built in the 1970s and 1980s.

Two manufacturers have been shortlisted to design and build the trams: French rail manufacturer Alstom – which acquired former tram manufacturer Bombardier – and a joint venture comprising Spanish rail maker CAF and UGL.

While much of the design work will be done during the tender process, some experts are calling for a radical transformation of Melbourne's tram technology that will bring the city's trams in line with China and Europe.

But others are calling for a measured approach, cautioning against reinventing the wheel on a system that has worked relatively well for more than a century.

At 25 metres long – about eight metres shorter than the newest E-Class trams – the next-generation trams will carry 150 passengers. This is fewer than the E-Class, which carry 210 people.

Despite the smaller size, seating will remain proportionally comparable with the E-Class, with 48 people or a third of passengers getting a seat on the new fleet.

When it comes to trams, size really does matter, with chronic overcrowding on busy routes creating a need for larger vehicles. (Bidders are being asked to provide an option for a 35-metre-long tram.)

But smaller-sized trams are being prioritised so they can run along tight curves on parts of the network that are inaccessible to E-Class trams.

They will also be lighter, avoiding the need for expensive bridge strengthening works, which was required when the heavier E-Class trams were rolled out.

Tram rides will be smoother, thanks to new technology that helps avoid collisions via on-board cameras and network mapping

THROUGH THE YEARS

A trackless tram in the Chinese city of Zhuzhou. Photo: Peter Newman



that warns drivers of obstacles and can automatically apply brakes.

They will also be powered differently. Instead of relying on power from overhead wires, which are expensive to maintain and vulnerable to faults, the new fleet will be the first in Melbourne to be partly powered by on-board batteries.

They will be equipped with "regenerative braking technology", which transfers the kinetic energy released by the

tram's brakes back into the tram's battery, which then helps to power the tram. This will mean a 40 per cent drop in power usage, while there will also be a cap on the amount of energy the tram can draw from overhead lines.






This is all about solving yet another problem that arose with E-Class trams: they used so much energy that new traction power substations were needed to power them.

While the trams' size and

technology can help smooth a ride, this ultimately depends on the quality of track. And according to Monash University's public transport chair Graham Currie, Melbourne's ageing steel tracks "have poor rider quality". Slips and falls on trams have increased in recent years. "We have a big issue with tram track quality which needs a long-term solution," Professor Currie said.

More hanging straps and hand rails were needed, said Public

our next generation trams

Introduced	Class	Capacity	Introduced	Class	Capacity
1951-56	 W-Class T856-T1020	75	2002-03	 D1-Class T3501-T3538	90
1975-84	 Z-Class T116-T230	70	2003-04	 D2-Class T5001-T5021	140
1984-86	 A-Class T232-T300	65	2008	 C2-Class T5103, T5106, T5111, T5113, T5123	180
1984-94	 B-Class T2003-T2132	110	2013-21	 E-Class T6001-T6085	210
2001-02	 C1-Class T3001-T3036	120	2021	 'Next generation trams'	150

Transport Users Association spokesman Tony Morton. The lack of handles and grab rails caused commuters to crowd around tram doors, making it difficult for people to get on and off.

Melbourne's newer trams were imperfectly built for people using wheelchairs and mobility aids and the new designs could bring vast improvements, said Martin Leckey, a committee member for the Disability Resources Centre.

But above all else, Mr Leckey

said the government must ensure all tram stops and trams were wheelchair-accessible — a project the Transport Department estimates would cost at least \$2 billion. By the end of next year, all tram stops must be accessible under federal law. But only 23 per cent of stops are accessible today.

So-called trackless trams, built and now operating in China, are battery-powered vehicles with rubber wheels that use sensors rather than steel tracks to run.

New South Wales and WA governments are looking to roll these trams out, with the Morrison government putting \$2 million into a business case for such trams in Perth.

Professor of Sustainability Peter Newman, who is leading research into these trams at Curtin University, said the vehicles can travel at high speeds while maintaining a ride so smooth that you could “put a cup of coffee on a table and it won’t move”.

But the trams would be better suited in growth areas such as Wyndham, he said, while Professor Currie and Mr Morton said they would be best used plugging gaps in the bus network.

“This is a wheel we don’t need to reinvent,” Dr Morton said of Melbourne’s trams. “As long as we have decent light rail infrastructure that has sufficient separation from traffic, accessibility built into stops and modern vehicles with good on-board information and all the safety features, that’s really the state of the art as far as getting people around on public transport goes.”