

# Ultra-light rail is moving right along

An Australian-designed rapid ultra-light rail system that combines the flexibility and comfort of car travel with the ease of an elevator is edging towards realisation. With low set-up, running and energy costs there is hope that it may be a feasible step toward greater public transport use in car-heavy cities. Better still, predictive transport software developed by CSIRO has shown it could run to minute-by-minute passenger demand, rather than a timetable.

The Austrans mass transit rail system is like no other. It will have the capacity to carry up to 10 000 passengers per hour. The vehicles each hold from nine to 18 passengers, travel just 15 seconds apart at 70 km per hour, and are quiet and comfortable. In fact, they can power along at up to 120 km per hour, if required.



The CSIRO RTSim software simulates transport networks and has proved a valuable decision-making tool. This graphic shows passengers boarding, alighting and waiting at a station, with colours indicating destinations.

Gladesville-based engineering company, Bishop Austrans, established by Dr Arthur E Bishop, a pioneer in vehicle steering technologies, and helped along by a \$14.3 million Federal Government grant, has invested heavily in R&D for its revolutionary automated people mover and things are beginning to fall into place. Prototype vehicles have been

designed and assembled, and a half-kilometre test track in Sydney is operating. Patents have been lodged for a high-speed rail switching mechanism that can alter the tracks in just one second, for grip wheels and for other crucial innovations.

‘The people mover will be outstanding value for money,’ says Commercialisation Manager, Piers Brogan. ‘In 19 out of 20 potential urban applications that we recently appraised in Queensland and New South Wales, the Austrans system could operate without subsidy if we had the same fare structure as conventional buses and trains. This is practically unheard of in public transport.’

Brogan says Austrans has a low infrastructure outlay and extraordinarily low operating costs because it requires no drivers. Fuel and crew for buses or trains usually make up about 40–50% of the total operating cost, but for the new people mover the figure is only 2%. In the seven best urban applications that the company appraised, the system would be profitable enough to pay off the capital investment for the infrastructure and vehicles.

According to the company, the people mover is more green-house-friendly than cars, trains and buses because it is such an ‘energy miser’. The electrically-powered vehicles are ultra light-weight and fleet size can be varied according to demand. In fact, the beauty of the system is that it provides a high-frequency service and flexible routing. During off-peak times it will be able to operate in ‘taxi mode’



Austrans vehicles are light, quiet, energy-efficient and will travel at up to 120 km per hour. ‘Down the track’, hydrogen fuel cells could be used in place of mains electricity. Inset: The Austrans experience – passengers taking a ride at the company’s test track in Chullora, Sydney.

Well-suited to Australia’s low-density urban areas, it could complement existing heavy rail or bus services by acting as a ‘feeder system’ – getting people to train or bus stations quietly and quickly. A passenger will typically have to wait no more than a couple of minutes for an Austrans car to arrive.

Computer software known as RTSim, short for Rapid Transit Simulation, developed by a team at CSIRO Mathematical and Information Sciences, has been used to help Austrans engineers explore how various design and operation scenarios affect the performance of their transport system. The software was developed to simulate passenger demand and the flow of vehicles around any transport network.

Dr Phil Kilby, who leads the CSIRO team, says RTSim finds the optimal way to deploy vehicles to best serve the needs of passengers and to make best use of a system’s assets. It demonstrates the feasibility of transport systems before incurring the expense of building them –

which can prevent costly mistakes.

A model called BASim, based on RTSim, shows that Austrans will be able to respond to passenger demand rather than running to timetables. That is, passengers can be accommodated in a way that optimises each journey, minimising the number of stops and finding the shortest possible route for each traveller on the network. The model can also investigate optimal vehicle speeds and numbers, how to deal with empty vehicles, and so on.

Austrans says its futuristic-sounding rapid light-rail system is no pipe-dream. Brogan reckons that if a government or business enterprise can show the colour of their money, Austrans could be up and running commercially within four years, whether in Australia or overseas.

• Steve Davidson

Contact:  
Piers Brogan,  
Bishop Austrans, 0412 564123  
Phil Kilby, CSIRO, (02) 6216 7051