Travelling to tomorrow's cities

'The VicHyper team's unique commuter pod design could cut travel time between Melbourne and Sydney to just 40 minutes.'

INFRASTRUCTURE INVESTMENT IS ABOUT TO GET A WHOLE LOT MORE INTERESTING THANKS TO THE FUTURE-FOCUSED MINDS AT RMIT UNIVERSITY.

Nearly 200 years after the first Australian railway line opened in Melbourne, the future of transport and city infrastructure is being pioneered just down the road from where rattling wheels first set out on creaking tracks. RMIT University, ranked among the world's top 100 universities in civil and structural, electrical, electronic and mechanical engineering, is driving innovation with breakthroughs in Hyperloop technology and smart city design.

Proposed by billionaire inventor Elon Musk, the head of SpaceX and Tesla Motors, Hyperloop is a high-speed transport system that shoots commuter pods through pneumatic tubing as fast as a passenger jet. Engineless, fuel-less and painless when compared with the hours-long commutes that many Australians currently face, Hyperloop technology is at the forefront of discussions about the future of our cities and transport.

Earlier this year, RMIT sent a team of its brightest aerospace engineering students to compete in Texas against 130 universities from around the world, and saw their unique travel pod design – made possible by Hyperloop technology – win a technical excellence award. Out of more than 1700 entries, fewer than 130 were selected to compete in Texas and RMIT's VicHyper was the only team chosen from Australia.

The team's unique pod design, which travels on cushions of air inside the vacuumed tube at speeds of 1200km/h, could cut travel time between Melbourne and Sydney to just 40 minutes.

Team leader Zachary McClelland believes the project could revolutionise transport. "Australia is an amazing platform for technology," he says. "RMIT is much more of a hands-on design university. Nearly all other teams that made it through to the final round designed purely to compete on the test track, whereas we designed for a pod that could be scaled to a full-scale working Hyperloop."

He adds: "We were more interested in something that would help change the world than in something that would win a competition."

After presenting their design to the panel of engineers from NASA, SpaceX and Tesla during the SpaceX Hyperloop Pod Design Weekend, the team is now hard at work building a prototype for the next event in January 2017. The fully solar-powered design would drastically reduce carbon emissions and be the safest mode of travel the world has ever seen.

Team engineer David Purser says VicHyper aims to create a mode of transport that is both faster and cheaper – descriptions that are usually mutually exclusive. "Reducing friction by hovering, or even using magnets to levitate, enables us to travel faster with less drag and it's possible to find a solution there," he explains.

VicHyper considers Melbourne-to-Sydney the best route on which to test the technology as it is the world's third busiest air route (according to recent Bureau of Infrastructure, Transport and Regional Economics data) and there are few physical construction obstacles for the track.

Entering the next urban age

While the Melbourne-to-Sydney route would definitely make an exciting proving ground for the VicHyper team, RMIT is hard at work on another project that could see the space used much sooner.

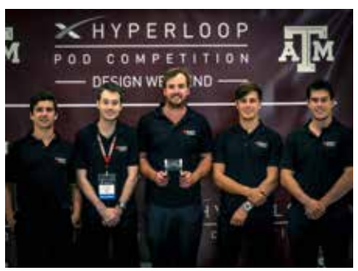
In July, the university hosted the launch of a plan for eight new 'smart' cities between Melbourne, Canberra and Sydney, to be linked by high-speed rail. The project, led by Consolidated Land and Rail Australia (CLARA), aims to build high-tech and sustainable cities along the rail line as a way of addressing the burgeoning overpopulation of Melbourne and Sydney.

With presences in Melbourne, Ho Chi Minh City and Barcelona, RMIT is adept at using the city as a laboratory for research and well understands the urban realm.

RMIT vice-chancellor and president Martin Bean CBE said at the launch: "Our researchers, teachers and students have a lot to offer this project – and a lot to gain in return, whether it is through work-integrated learning projects or research projects."

He continued: "Through our deep relationship with the UN Global Compact Cities Programme, RMIT has significant resources to contribute to the creation of brand-new smart cities along the train route."

Professor Martyn Hook, dean of RMIT's School of Media and Communication, said his Master of Architecture students and Master of Urban Design students will explore how a CLARA city could be implemented, including how it might generate its own power, harvest its own water and manage its own waste. "Ultimately the CLARA plan is about designing cities for people and Australian places to live," he explained. "For the first time since Canberra over a hundred years ago, we get a chance to design an inland city with a sustainable, liveable, walkable urban future with the benefits of a rural Australian lifestyle," he added.



L-R: *Matt O'Callaghan, Cameron Clanchy, Zachary McClelland, David Purser and Joel Kennedy make up the multidisciplinary VicHyper team*

Top: *Artist's impressions of the VicHyper pod crossing the Murray River and passing Uluru*