

BRUNCHA blue sports car is shown on a road, with a green wall in the background. The car is positioned in the middle ground, facing right. The road is paved and has a green curb on the left. The background is a bright, overcast sky. The overall scene is a stylized, possibly digital or miniature, representation of a road environment.

DRIVING THE FUTURE

THIS COULD BE OUR FUTURE, BUT IT'S TIME FOR
GOVERNMENTS TO REMOVE THE ROADBLOCKS

BY SOON WEILUN

IN the western fringes of Singapore, an experiment is being quietly rolled out. You might even call it a revolution. Hidden from view by hoarding, off a quiet road called Jalan Bahar, new roads are being paved. This 1.8-hectare circuit of roads, when completed in the second half of this year, will offer us a crystal-ball view of Singapore's transport future. Here, at a remove from the relentless surge of vehicles roaring down the nearby Pan-Island Expressway (PIE), cars, buses and road-sweeping vehicles will move around on their own. You might think that traffic on the PIE is bad, but wait till you see the craziness on this self-contained circuit. There, cars might blithely run red lights and jaywalkers might step out into traffic. It'll be a mess. And overseeing all this chaos will be Niels de Boer, a senior scientist who will also be the programme director in charge of this circuit – the rather long-winded Centre of Excellence for Testing and Research of Autonomous Vehicles – Nanyang Technological University (Cetran). >>>

DRIVING THE FUTURE

Here's what Singapore's transport landscape could look like by 2030.

>>> At Cetran, car manufacturers can test their driverless cars to see how they react to real-world situations, without real-world consequences.

"This is where the machines do the learning," Mr de Boer said when *The Business Times* visited his laboratory in nearby CleanTech One.

For example, "I can make a dummy dash across the road. What happens then? You can try this 10 times in 10 minutes; that's not something you can do on real roads," said Mr de Boer.

And with Cetran, which is jointly developed by government units Land Transport Authority and JTC, Singapore's multi-party push for young transport technologies will reach a key phase, where certification and regulatory regimes are key.

Industry experts say that government support is needed for such technologies – electric cars, driverless cars, or even flying taxis – to take off in the real world.

Take electric cars. Subodh Mhaisalkar, executive director of NTU's Energy Research Institute, expects them to make economic sense in five years. The key issue to tackle by then is charging infrastructure.

Corporate entities can only do so much, said Royal Dutch Shell's downstream director John Abbott. "You probably need fiscal incentives, or the government to invest in infrastructure."

Driverless cars will be next to come, experts say. Though we can see some of them being tested now, there's still uncertainty over how they function in real traffic.

"I think governments have a huge responsibility to say, 'Yes, we are completely happy with autonomously driven cars,'" says Jeff Mannering, managing director of Audi Singapore.

That's why test beds like Cetran are crucial in understanding how the technology evolves, says Alexander Erath, project leader at the Singapore-ETH Future Cities Laboratory.

"And then," he adds, "you can start thinking about how the technology can improve the transport system."

Government involvement can also smoothen out the kinks that a country may experience in the face of emerging technologies. Flying taxis may still be a thing of the future, but Singapore's Transport Ministry is already in talks with some companies to try out human-carrying drones here.

For something more immediate, JTC says that Cetran can help in designing industrial estates. "With the advent of emerging technologies in urban mobility, first-and-last-mile connectivity of our estates becomes increasingly important," says Leow Thiam Seng, group director for JTC's Cluster Group.

The government's involvement bodes well for Singapore's experimentation in transport technology, said Sumeet Puri, Solace Corporation's senior vice-president of engineering. Solace is involved in the next-generation Electronic Road Pricing (ERP) system, which should be in place by 2020.

"Elsewhere, you may be held back by lobby groups ... Singapore can do it quick. We can be the showcase for what is possible in the world."

NEXT-GENERATION ERP
By 2020, a satellite, distance-based Electronic Road Pricing (ERP) system will replace the current gantry-based one. Data collected from the new system can also be used to help with traffic management, says Solace's Sumeet Puri. "There are extreme possibilities for innovation."

BICYCLES
Conventional and power-assisted ones already figure in some Singaporeans' daily commutes, but more infrastructural planning is needed to encourage uptake, says Alexander Erath, project leader at the Singapore-ETH Future Cities Laboratory.

FLYING TAXIS
For now, they remain a distant point hovering on the horizon, but Singapore's Transport Ministry thinks the idea can fly by 2030. Airbus Helicopters hinted that it's working towards this goal. "There may be air taxis – that is something we are communicating actively on this level," says Jean-Brice Dumont, Airbus head of engineering for commercial aircraft.

MRT
Singapore's land and manpower constraints will result in a different transport landscape by 2030, Transport Ministry permanent secretary Pang Kin Keong has said. But MRT trains will still remain the core of its public transportation system.

AUTONOMOUS CARS
It may take up to a decade before we can see driverless cars in real-world traffic. They are already present in some commercial cars, like Audi's, but such systems need more testing to allay the public's and regulators' concerns. "Until you actually test it, you don't know. There's a lot of proving to show that the technology works," says Jeff Mannering of Audi Singapore.

ELECTRIC CARS
Give it five years, and you might see more electric cars on Singapore's roads. But just relying on industry-side improvements is not enough. Governments can help in charging infrastructure, says professor Subodh Mhaisalkar of NTU. They can consider opportunity charging, where batteries are charged frequently in one work cycle. This makes more economic sense for car owners.