

Future Shock: will driverless cars make LRT obsolete?

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By Peter Shawn Taylor

"Where the hell is my flying car?" sings country rocker Steve Earle in 21st Century Blues — a lament about the future's unfulfilled promises.

There's no telling if we'll ever get flying cars, however the prospect of earthbound cars without human drivers is slowly coming into focus.

And while the prospect of driverless cars seems a utopian delight, the transition from here to there won't be smooth or painless. And it threatens one of the biggest bets Waterloo region has ever taken on its future.

Can 19th century technology like LRT survive the 21st century's self-driving cars?

Last week the University of Waterloo was included in a provincial pilot project to allow road-testing of autonomous cars; our region is now the nexus for this game-changing technology.

"This is exciting step forward," says Steven Waslander, director of the university's Waterloo Autonomous Vehicles Laboratory, in an interview from Stanford University, where he's on sabbatical.

Waslander is thrilled the new rules allow testing of his school's driverless car on all local roads and in all weather conditions. With multiple sensors (lasers, cameras and radar) crammed onto their test car, researchers are looking for the best combination of software and technology that brings driverless cars up to the safety level of alert human drivers.

"We know we can rely on autonomous vehicles to make the right choices in standard driving conditions. The challenge now is to deal with all the weird and unusual scenarios that arise," Waslander says.

It's a big task. Simply driving down the street, he points out, entails a far more complex and uncertain decision-making process than what safety systems for nuclear reactors or commercial airliners must deal with.

"We are having a really hard time proving we can do the same kind of reliability as from an actual human driver," he admits.

While we wait for science to solve its technical problems, the rest of us can spend our time looking ahead at the impact driverless cars will have on our world.

In a fascinating recent report from the **Residential and Civil Construction Alliance of Ontario**, consultant Bern Grush sketches the most likely scenario for how and when driverless cars will appear. Warning: this is not a shiny white plastic future where everyone wears a unitard and looks like Tom Cruise or Scarlett Johansson.

Grush makes a convincing argument that the future of driverless cars will "take longer and be more painful" than most people expect. Waslander, who was consulted by Grush, concurs.

For reasons related to safety, embedded consumer habits and government inertia, Grush expects roads in the near future to be dominated by semi-autonomous cars. These vehicles can take control for routine tasks such as highway driving or parking, but still require a driver at the steering wheel. It will be four decades or more before our roads are taken over by fully-autonomous cars.

Semi-autonomous technology will make driving easier and more accessible. We can thus expect the number of privately-owned cars to grow. Congestion will worsen. Commuting distances will lengthen and sprawl will expand as people are able to live further from urban cores. (All of which conflicts with the designs of today's urban planners, but that's fodder for another day.)

While near-term growth in congestion might appear to strengthen the case for traditional transit, this is not the case.

To facilitate the changeover from semi-autonomous to fully-autonomous vehicles, Grush argues driverless technology will need to prove itself as safe, reliable and economical in some early-adopting segment of the transportation industry. The most likely bridgehead is public transit.

Within a decade or two, Grush predicts the business case for fixed route bus and rail systems will be overwhelmed by fleets of cheap, self-driving vehicles that can shuttle clients wherever they want to go. Driverless technology will do to conventional public transit what Uber did to taxis. Resistance is futile.

"If Uber caused regulators headaches in 2015, the disruption wrought by driving automation and robo-taxis in the 2030s will be many times worse, disrupting transit as we know it," writes Grush. "Local governments that fight robo-taxi fleets like some fought Uber will lose. The cost per passenger kilometre will be a tiny fraction of the same passenger kilometre on a traditional bus."

Who will want to walk to a bus stop to take a bus to a transit hub to wait for a train that will drop them off somewhere near their destination, when a driverless car can offer door-to-door service in less time and at less cost?

If Grush is correct, a dozen or so years from now, driverless vehicles will be scoring the first major victories in the autonomous driving revolution by putting conventional public transit out

of business. As exciting as this may seem on a global level, it's grim and ironic news for Waterloo Region taxpayers and our as-yet-incomplete \$818 million light rail transit system.

Having endured years of construction mayhem, we now wait patiently for the delivery of much-delayed rail cars. Meanwhile regional roads are becoming a laboratory for a technology that's going to make the entire system obsolete in a decade or two. Ouch.

Will we still be paying for LRT as driverless cars whisk us into the future?