GET UP AND GO WITH BETTER CONNECTED TRANSPORTATION

If you can describe your default transportation experience as cheap, smooth, and on-time, you’re luckier than most. Traffic jams, long commute times, and packed trains are a fact of city life for many. Jetting off on vacation is great, but getting to the airport, checking in, and security aren’t much fun. Neither are delays. Infrastructure is ageing and efficiency is low, so travelers suffer and businesses lose reputation and money. Digital transformation is needed to disrupt the transportation vertical into something faster, cleaner, and altogether more pleasant.

By Gary Maidment, Huawei
becoming more so. When reporting on New York’s decaying subway in June 2017, the New York Times points out how this affects transportation: “The major cause of subway delays is a factor that basically did not exist 15 years ago: overcrowding.”

More people also mean more pollution. In the UK, the health impact of NO₂ from diesel engines began making headlines in 2016, the year the European Environmental Agency reported that NO₂ had caused 11,904 premature deaths in the island nation in 2013. Across the Atlantic, regulators announced plans earlier this year to combat the deadly smog...
Pedal power

High-tech solutions are also being applied in green, low-tech scenarios. Connecting more than 6.5 million bicycles worldwide for more than 100 million subscribers, ofo is a burgeoning success in the use it when you need it sharing economy. With footprints in the US, Britain, Singapore, Kazakhstan and Thailand, the bike giant recently began applying Huawei’s NB-IoT solution to its smart locks. Sensors ensure that ofo’s bikes can be found at peak locations when commuter demand is highest. They also cut payments from 25 to 5 seconds and let users unlock a bike and ride off in less than a second.

that kills 1,300 people annually in Los Angeles, allocating a hefty US$15 billion to a 15-year project. And China, where car ownership has more than tripled since 2007, is famous for the airmageddons that blanket many of its cities with smog.

It’s not just overcrowding and pollution that impact quality of life. In its article “The Astonishing Human Potential Wasted on Commutes”, the Washington Post reported last year that people spend a cumulative 5 to 31 unproductive days commuting each year, “People hate commuting more than just about any other activity in their lives,” claims the writer, before explaining that it’s also killing us thanks to slow-burn health problems like obesity, cholesterol, and high blood pressure.

The seeds have been planted

Despite the commute that you hate and statistical doom and gloom, Bibop Gresta, founder of Hyperloop Transportation Technologies (HTT), is bullish about how transportation will improve over the next decade. His vision is a “seamless connected experience” that’s woven into the fabric of urban infrastructure, a connected everything powered by ubiquitous broadband, big data, analytics, cloud, IoT, and AI. These
NB-IoT has enabled ofo to optimize its services and how data is used. It has propelled the sharing economy forward.”

– Xue Ding, Co-founder, ofo

In July 2016, Huawei and cloud application developer Roiland teamed up on a next-gen solution for the Internet of Vehicles (IoV) that connects Roiland’s IoV cloud platform to Huawei Enterprise Cloud to achieve dual-active backup. According to Roiland CEO Tian Yunong, IoV is the most complex IoT scenario because it involves “interaction between people, vehicles, and sensors,” creating requirements that he describes as “extreme.” As traffic accidents are literally a matter of life and death, he’s not exaggerating. Physics holds that a collision takes place in 20 ms, so data collection and then transmission must happen in less than 20 ms to avoid a crash in driverless scenarios. In a fully connected V2X (Vehicle-to-Everything) model, connectivity must be ubiquitous and constant.

The Roiland project will advance driverless tech and the smart vehicle ecosystem, and complement other smart transportation solutions that utilize agile networks such as eLTE and GSM-R alongside cloud, big data, sensors, AI, and 5G. Functions like traffic signal control, ePolice, traffic flow data, traffic detection systems, and unified traffic command achieve fast emergency response, video surveillance, and rerouting by improving traffic flow dynamics. For people, this makes for a quicker,
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cheaper, and safer travel experience.

Away from roads, IP-based solutions for urban rail are responding to a surge in bandwidth-hungry applications by boosting efficiency, management, comfort, and safety. Successful system integration cases in Malaysia and Singapore, for example, have resulted in significant switching, transmission, bandwidth, and control gains – the things that get people where they need to be on time.

Looking to the skies, Hong Kong International Airport deployed Huawei’s green uninterrupted power supply solution, which saves 40,000 KWh of electricity a year and eliminates flight delays due to power outages like the one that took down Delta last year. In the US, flight delays cost stakeholders US$62.55 per minute.

But, with future-proofed digital solutions starting to pervade road, rail, and air travel, the stage is starting to take shape for the automated, seamless, and greener connected transportation experience that Gresta envisages.

And it can’t come too soon. Let’s think back to the overcrowding problem: The world’s population will hit 8.1 billion by 2025, which isn’t great news for core infrastructure or the environment.

Smart mover

As we accelerate into the next decade, increased AI in all areas of transportation, coupled with a shift to solar and electric solutions, will accompany a likely global decrease in car ownership, as autonomous tech and the on-demand model for getting from A to B matures.

Although less embedded in the public consciousness than driverless vehicles, Gresta believes that by 2025, Hyperloop journeys will be commonplace.

First conceptualized by Elon Musk and set out in a white paper by Space X engineers, the idea behind Hyperloop arose in part because of Musk’s disappointment that “the home of Silicon Valley and JPL... would build a bullet train that is both one of the most expensive per mile and one of the slowest in the world,” in reference to the high-speed rail project in California.
Musk believes that future transport should be “safer, faster, lower cost, more convenient, immune to weather, sustainably self-powering, resistant to earthquakes, and not disruptive to those along the route.”

Hyperloop ticks these boxes. With a theoretical top speed of 760 kph, Hyperloop comprises a bi-directional steel tube 2.23 meters in diameter that connects two cities. The tube would run about 6 meters above ground on concrete pylons spaced 30 meters apart, but it would also work underground. Solar-powered and electrically propelled, 40 capsules holding 28 people each would zip along the tube’s near-vacuum on a cushion of air.

In Musk’s example, the tubular system would get commuters from San Francisco to LA in just 35 minutes, compared with 12 hours by train. Departing every two minutes, a round trip would take just 80 minutes, including 5 minutes at each station. For entertainment and productivity, the windows would be interactive AR displays or super-res depictions of user-chosen scenery.

Crowdsourced from JumpStartFund, HTT is already progressing with Musk’s vision, with three projects scheduled for completion by 2020.

So, will Hyperloop make subways and rail obsolete? Not so, says Gresta, “Hyperloop isn’t about speed, it’s about efficiency. The goal of Hyperloop is actually to bring back profitability to in-ground transportation.” He points out that while infrastructure like the London Underground could be upgraded to Hyperloop, “history shows us that we never fully replace one system with another.” What it will do, he says, “is force the rail industry to actually innovate.” Digital solutions are helping rail companies to do just that.
As we progress through the 2020s, passenger journeys will be evolving towards a seamless experience that transitions between different modes.

Hyperloop would also have a potentially huge impact on cities, as people would no longer need to live in the city they work in. Complemented by IoV and autonomous transport, its capacity will also help reduce the congestion threatened by overcrowding.

**Enjoy the ride**

As we progress through the 2020s, passenger journeys will evolve in efficiency to move towards a seamless experience that transitions between different modes.

Your personal and predictive AI assistant may, for example, summon an electric driverless car – or more likely a single-occupancy pod – without needing any input other than knowing your habits. And retailers may push discount vouchers your way based on the patterns of your routes and stop points – something that’s already happening now.

As well as automating, accelerating, and arranging un-fun tasks like bookings, payments, and security, your AI assistant will start connecting your journeys where needed – data will flow from myriad sensors into algorithms that will predict your behavior to best manage your travel experience.

The transitions between different modes of autonomous transport or stations will dovetail nicely, “Because,” states Gresta, “We will know exactly what the passenger wants even before he reaches the station.” Autonomous transport won’t be confined to the ground either – in June 2017, Airbus started trialing its Optionally Piloted Vehicle (OPV), aka pilotless chopper.

Gresta believes that the way we do things now will soon come to an end: “It’s stupid to design travel that’s based on first class, second class, it doesn’t make sense. A journey will be based on your particular reason for traveling – with your boss, for work, for leisure, and so on.”

The experience will be fully personalized, tailored both on your current destination and objectives, as well as on your historical preferences. In the foreseeable future, you can expect any future autonomous travel mode, be it in an individual or mass transit scenario, to greet you by name, know where you’re going, and even what TV shows you like.

By 2025, the world of better connected transportation will have started to take shape. Ubiquitously connected tech is the enabler, but the experience will be all about you.