Industrial mobility: Moving stuff smarter

The future of autonomous passenger vehicles is already in our midst, as more carmakers unveil their visions of a world of automated travel. Meanwhile, however, another road is being paved: the automation of how we move things.

Robotics, 3D camera systems, sensors, software and artificial intelligence and the industrial Internet of Things (to name a few advancing technologies) are converging to open a new era of transport and logistics acquiring human-like capabilities abilities to see, learn, predict and decide.

Moving 16 billion tons

Indeed, autonomous transport could have staggering implications on transport and logistics networks and revolutionize how some 16 billion tons of goods and commodities are moved in the US. Not surprisingly, stakeholders of all stripes—from multinational industrials, start-ups and local and state governments—are ramping up efforts to pilot and deploy increasing degrees of autonomous transportation modes to move goods, including raw materials, parts and finished product.

Advancements in what PwC calls “industrial mobility” are being carried out on several fronts—both via private, in-plant applications, as well as on public land and space. And they include semi-autonomous and autonomous long-haul trucks, industrial drones (with ever-increasing payloads), mobile robots, and, increasingly, automated rail and marine transport.

Of course, these are prognostications, and the future is always a tricky thing to see. Naturally, much needs to be done before widespread adoption of industrial mobility is a reality, and it will likely play out incrementally and at different paces, depending on the transport mode. Certain modes, especially those used on privately-owned territory (such as hauling material mine pits, inspecting of assets, inventory and facilities) will likely advance more quickly along the adoption curve. On public roads, the adoption of autonomous vehicles continue to be piloted, advances in reliability and safety will sure dictate the pace, breadth and locations of adoption. States, including Michigan, California, Florida and Utah now permit automated trucks on public roads. Truck-makers including Peterbilt, Volvo and Daimler are developing autonomous truck technology. Meanwhile, Caterpillar has autonomous vehicles toiling away in mining pits.

Investments pouring into non-auto mobility start-ups

Such benefits in streamlining logistics have not been lost on investors in the industrial mobility space. A PwC analysis of US investments in private mobility companies over the last five years (2012-2017) found that a total of $6.8 billion has been invested in mobility start-ups, of which $4.2 billion targeted companies focused on broad-use, non-auto autonomous mobility technologies (e.g., mobile robots, unmanned aerial vehicles, autonomous forklifts, freight trains, marine vessels, etc.).

Smarter infrastructure—and workforce—key to smart mobility deployment

Looking ahead, it’s not just the vehicle-makers and legislators who will pave the road toward industrial autonomy. The infrastructure needed to support it—especially in the case of self-driving long-haul trucks—will need to be built out as well. As trucks—and autos, train and ships—rise up the maturity curve, smart transportation infrastructure will also need to advance on parallel tracks—most notably vehicle-to-infrastructure communications, including fitting roads, tolls, weighing stations, bridges, locks and docks, for example, with communications technology to “speak” to the vehicles. Indeed, according to a recent PwC survey, US manufacturers believe that investing in “smart infrastructure” is the most important technological initiative needed to operationalize autonomous transport of goods—followed by sensor, laser and radar technology, vehicle-to-vehicle technology and artificial intelligence.

As we move closer to a world of automated logistics, a burning question will persist: are our drivers/operators ready to adapt to the new technology? And what will the future look like for the 3.5 million truckers now on our roads? As autonomous systems first assist—then, in many cases, replace—humans, companies pivoting to industrial autonomy will need to prepare for a momentous talent shift—and in some cases—displacement. The learning curve will likely rise for drivers and operators as they become accustomed, by degrees, to driver-assisted technologies (already the case with some forklifts). Workforce skills to keep a forward-looking eye on would include safety skills, new workflow management software programming and human–robot collaboration. A diminished need for humans at the wheel, for example, could very well usher in a new generation of logistics technicians to oversee the software and algorithms that may be in the proverbial drivers’ seat of the future.

Autonomous vehicles: gaining traction in—and outside the factory

To get a closer look at how industrial mobility is being embraced by the manufacturing sector, PwC recently surveyed US manufacturers. What we found is that automated movement of goods is well on its way, with about one in ten manufacturers already having adopted some type of semi-autonomous or autonomous mobility within their operations, and another 10% expecting to do so in the next three years.

While the current adoption is still in nascent stages, manufactures seem bullish on the future of autonomous transport, with 65% believing that self-driving trucks will be mainstreamed within the next decade. While most manufacturers currently cite cost as the principal barrier to adopting autonomous transport technology, they nevertheless grasp future cost benefits. Nine in ten manufacturers believe fully autonomous vehicles could potentially slash 25% of their trucking costs, according to the PwC survey. A PwC analysis aligned with this estimate, forecasting that the mainstreaming of self-driving long-haul trucks could cut manufacturers’ transport costs by 30% through 2040, assuming aggressive adoption of autonomous trucking.

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