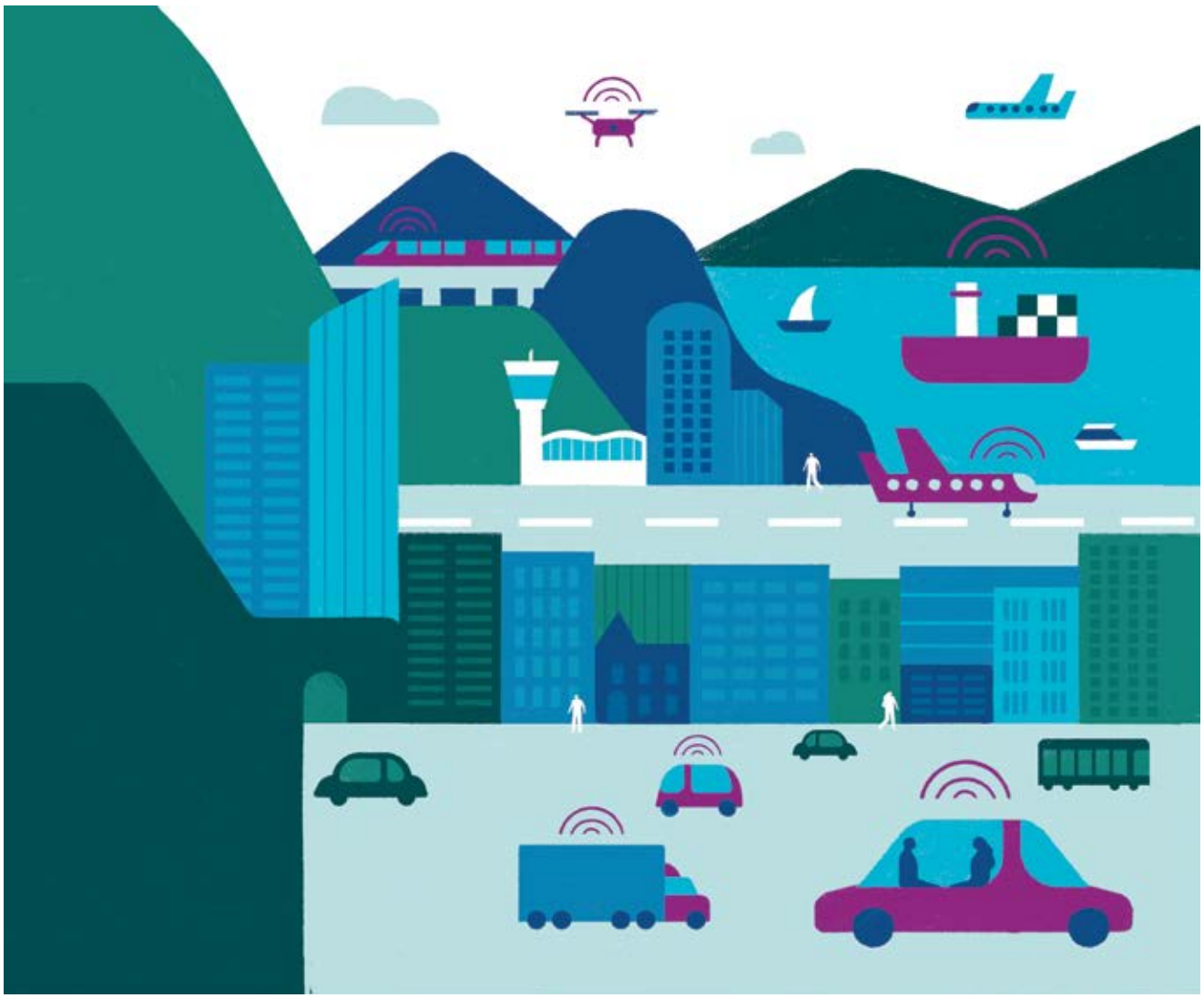


# THE LAST MILE TO AUTONOMY

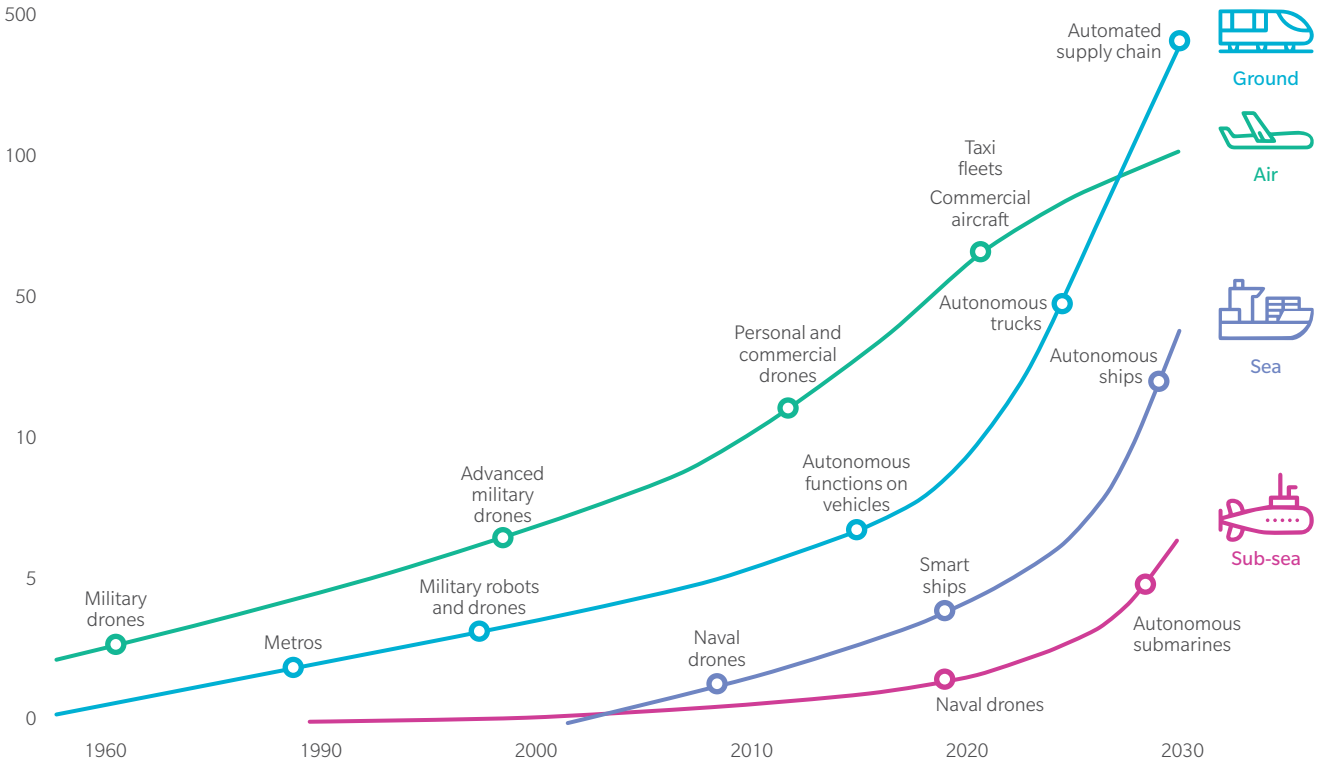
## Driverless vehicles arriving ahead of schedule appear to offer bigger opportunities than first imagined

Guillaume Thibault • Hanna Moukanas

IN TRANSPORTATION, there is probably no word more widely used and simultaneously more of a mystery than autonomy. Although autonomy's exact implications for mobility are hard to fully grasp today, the industry recognizes the technology offers so much more than the novelty of the self-driving, flying taxis being tested in Dubai or even an immediate game-changer like the driverless trucks that haul Frigidaire refrigerators along the Interstate 10 between Texas and California.

Consider autonomous vehicles alone. While today the market for autonomous vehicles consists primarily of unmanned military drones, our research shows that over the next 12 years it will transform into one that is 60 percent civilian; include ground, sea, air, and space transportation; and expand to €636 billion (about $739 billion) – more than 40 times its current size. According to our calculations, autonomous vehicles will make up 20 percent of the total vehicle market by 2030, and three out of four of them will be used as ground transportation.

**WITH EACH NEW GENERATION, THE AUTONOMOUS VEHICLE MARKET SIZE GREW**
ALGORITHMIC SCALE IN BILLIONS OF DOLLARS




**Source:** Oliver Wyman analysis

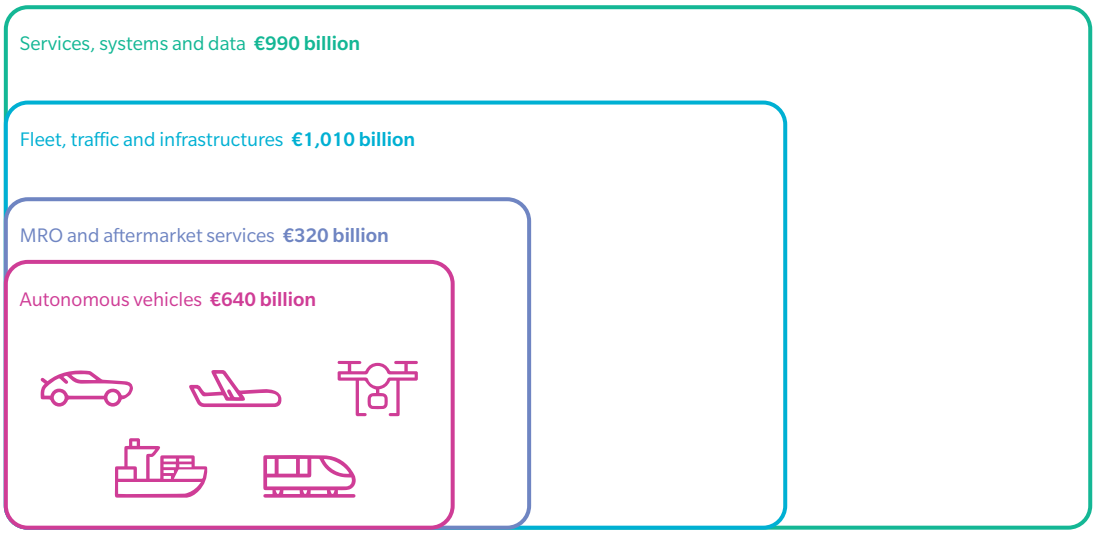
For the entire transportation and services sector – including public infrastructure; mobility services; traffic, fleet and data management; defense and security; and maintenance, repair, and overhaul – the arrival of autonomy means a fivefold increase in the market to almost $3 trillion. While the entire sector faces seismic shifts with the incumbent disruption, its players and myriad startups can expect outsized opportunities.

## The next internet-size disruption

Like the commercial effort to capitalize on the internet that began two decades ago, autonomy is changing the way we live – how we move from place to place, what we choose to own, and eventually the leaders in the transportation industry. With autonomy advancing more rapidly than initially predicted and now expected to reach a tipping point in 10 years rather than 20, General Motors Chief Executive Mary Barra got it right when she reckoned transportation would see more change over the next decade than in the last six.

In this transition, the value is moving from large, sophisticated, and expensive platforms to small, agile, and low-cost ones. For instance, 30 percent of the helicopter market will be threatened by small to midsize drones, such as the ones being developed by DJI, Delair Tech, and Parrot.

**AUTONOMY WILL GROW TO ALMOST €3 TRILLION BY 2030**
VEHICLES ARE ONLY A PORTION OF THE MARKET




**Source:** Oliver Wyman analysis

Rather than a plethora of new hardware, the emphasis will be on development of software, which will make up half of the systems on vehicles versus 30 percent today. Here, names like QNX, Nvidia, Intel, Google, Airware, and Kespry stand out. And finally, by 2030 shared ownership – a trend that will be further encouraged with the arrival of autonomous vehicles – will be five times higher than today. To respond to the move away from ownership, major car manufacturers have been partnering with on-demand ride services like Lyft and Gett.

## Beyond autonomous vehicles

But vehicles are only a small piece of the transformation spawned by autonomy. In the services sector, there will be similar disruptions. Take traffic management. Today, there are 300,000 aircraft in the general aviation fleet and five million drones sold annually. Given that traditional traffic management tools don't detect small unmanned vehicles, the size of the potential challenge is clear.

While discussions so far have focused on creating dedicated roadways or corridors for autonomous vehicles, NASA and Google have also been working to develop traffic management systems that would allow for the coexistence of manned and driverless vehicles. And besides traffic, there will be an array of other infrastructure overhauls required to accommodate autonomy – from parking, to servicing, to airports, to mass transit systems.

So who will be among the winners? We've already seen some companies that have positioned themselves astutely for the coming wave of autonomy. For instance, given that electric cars lend themselves to autonomous operation, Tesla – with its electric cars, emphasis on software and data collection, and remote upgrades and repair – has an advantage moving forward over car manufacturers that haven't strayed from internal-combustion engines.

## Challenges ahead

But even as more autonomous prototypes make their way toward commercialization, obstacles still exist. We're already seeing progress in battery technology, but more is needed. Still, the biggest roadblocks may be regulation and ultimately how comfortable the public is with cars driving themselves or pilotless aircraft. There was one survey that said only 17 percent of people would fly in a plane without pilots.

Gaining the certification to ensure the safety of the vehicles, as well as securing public infrastructure investment from debt-encumbered governments, will also be high hurdles. No doubt, there also will be pushback from labor in jeopardy of being replaced as well as from some incumbents uncomfortable with the pace of adoption.

Ultimately, autonomy and artificial intelligence are forces too big and too game-changing to be stopped. And we are already seeing companies capitalize on the opportunities. As Charles Darwin once said about another immutable force, "it is not the strongest species that survive, nor the most intelligent, but the most responsive to change." Autonomy may not give business the choice of not changing.

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