

Start me up: Where mobility investments are going

Our latest mobility start-up and investment tally shows the industry invested \$120 billion in the last 24 months as it prepares for the years to come.

by Daniel Holland-Letz, Benedikt Kloss, Matthias Kässer, and Thibaut Müller



The automotive industry is shifting into gear as a broader definition of mobility takes hold. Driven by the four ACES trends—autonomous driving, connected cars, electrified vehicles, and smart mobility—automotive OEMs, suppliers, and new entrants such as tech players and venture capitalists are attempting to build strongholds in the [emerging mobility ecosystem](#).

We estimate that securing a strong position across all four areas would cost a single player an estimated \$70 billion through 2030. It's doubtful any individual OEM could shoulder this level of investment alone, which is why partnerships and targeted acquisitions offer an attractive strategy for staying ahead of competitors.

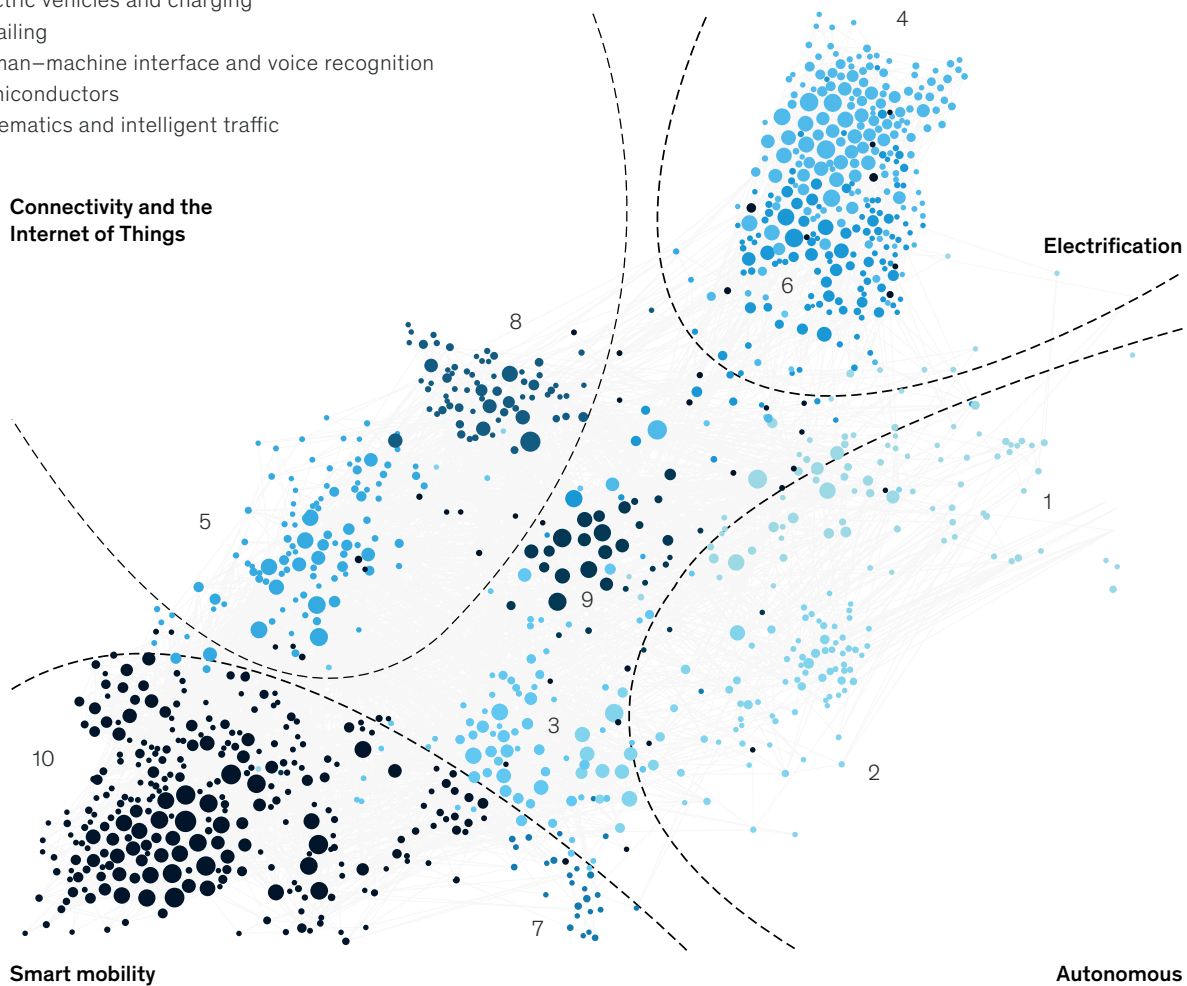
Investments continue to grow strongly

Investments in new mobility start-ups have increased significantly (Exhibit 1). Since 2010, investors have poured \$220 billion into more than 1,100 companies across ten technology clusters. Investors invested the first \$100 billion of these funds by mid-2016 and the rest thereafter. For this update on our Start-up and Investment Landscape Analysis (SILA) report, we have broadened our definitions, refined the analysis, and fine-tuned our approach (see sidebar, "Methodology," for more on what's changed since [our first article](#)).

Exhibit 1

Analysis on the mobility start-up and investment landscape shows activities across ten clusters.

- 1. Autonomous-vehicle (AV) sensors and advanced driver-assistance system (ADAS) components
- 2. AV software and mapping
- 3. Back end/cybersecurity
- 4. Batteries
- 5. Connectivity/infotainment
- 6. Electric vehicles and charging
- 7. E-hailing
- 8. Human-machine interface and voice recognition
- 9. Semiconductors
- 10. Telematics and intelligent traffic



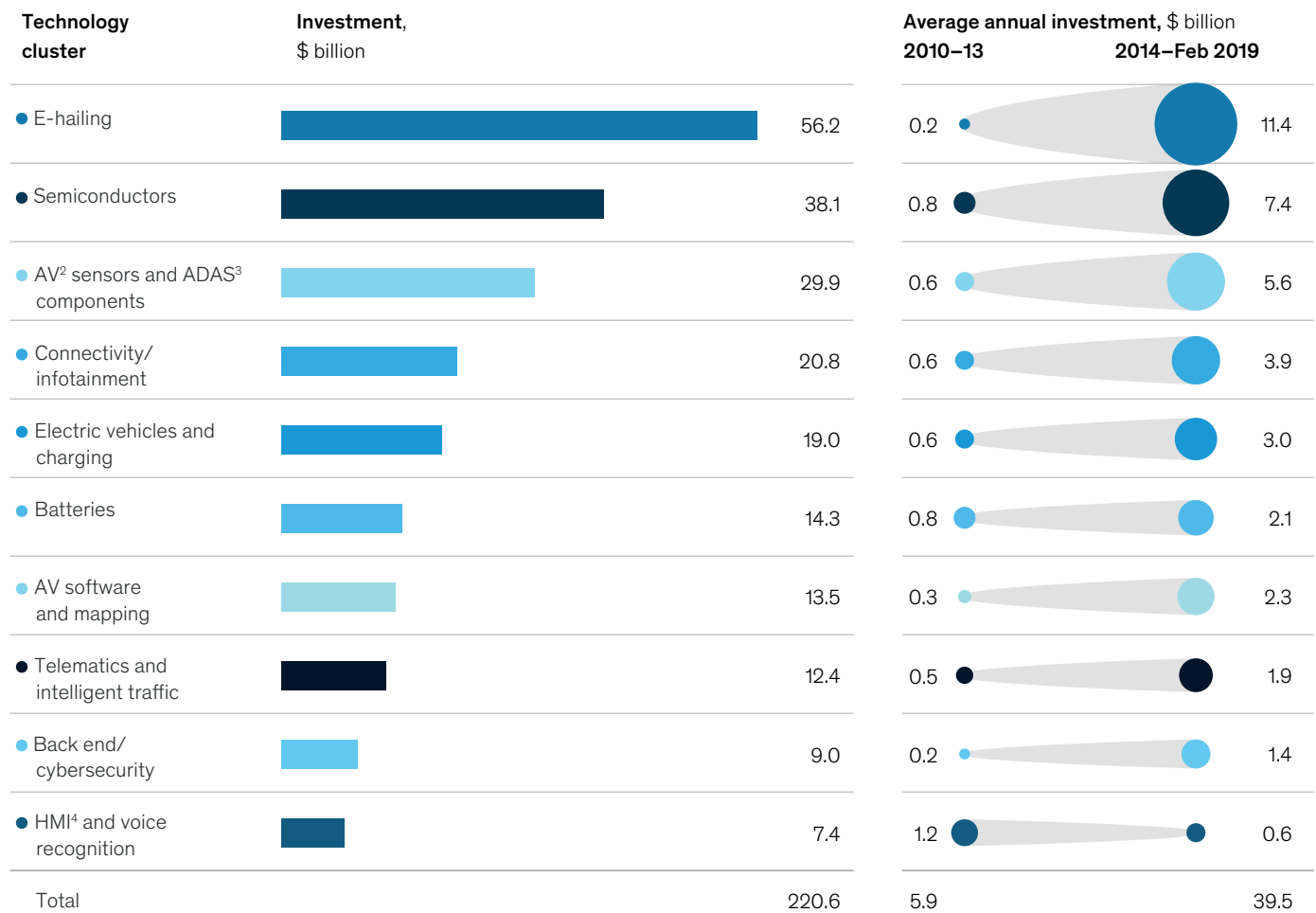
One measure of how dramatically investments have grown involves a comparison of the periods 2010–13 and 2014–18, when average investments across all technologies jumped sevenfold (Exhibit 2). Our analysis reveals that more than half of the investment

volume comes from large investments with transaction values greater than \$1 billion—these are industry-shaping moves and include the mergers and acquisitions (M&A) of established companies.

Exhibit 2

Investment activities accelerated, with a few industry-shaping moves.

Total disclosed investment amount since 2010¹



¹Sample of 1,183 companies. Using selected keywords and sample start-ups, we were able to identify a set of similar companies according to text-similarity algorithms (similarity to companies' business description) used by the Competitive Landscape Analytics team.

²Autonomous vehicle.

³Advanced driver-assistance system.

⁴Human-machine interface.

Source: CapitalIQ; Pitchbook; McKinsey analysis

Another clear trend is the tech-company challenge to incumbent automotive players on mobility: these nonautomotive players, together with venture capitalists and private-equity firms, are responsible for over 90 percent of the investments in the mobility space.

Furthermore, we identified another strong acceleration of investments in e-hailing players, mainly driven by large investments in top players. This indicates that investors expect a high return on investment. These investments, however, need to be seen in conjunction with those in autonomous driving (with a number of players active in both areas). [Autonomous driving](#) can be seen as the endgame of e-hailing, potentially also being the road to (greater) profitability of these solutions.

We also noted several other investment highlights in 2018. For instance, the latest transactions involving Cruise, the autonomous-driving unit of General Motors, reveal a post-money valuation (a company's value after it adds capital contributions and outside financing to its balance sheet) of \$14.6 billion. That alone is responsible for roughly a third of GM's overall valuation on the public market.

What's more, Cruise and Honda are collaborating on a purpose-built autonomous vehicle. Honda will devote \$2 billion to the effort over 12 years and make an additional \$750 million equity investment in Cruise. In May 2018, SoftBank Vision Fund made a \$2.25 billion investment in Cruise, split into \$900 million at closing and \$1.35 billion when GM is ready to deploy its autonomous cars for commercial use. Furthermore, SoftBank invested an additional \$0.94 billion in Nuro.ai.

But autonomous-driving firms were not the only ones to collect significant funds: Grab, a Southeast Asian ride-hailing service, received \$2 billion in new capital from investors including Toyota, which contributed \$1 billion, and SoftBank, which invested \$500 million. Grab's current value is north of \$10 billion.

What's new in the past 12 months—a few highlights

Beyond the overarching development, we have built on our existing analysis to deepen it in selected areas, for instance, considering patent activity, [shared micromobility](#), the rising cost of technology, regional expansion, and other topics.

- **Patent activity favors incumbents.** In addition to investments, which offer one lens on mobility-market dynamics but do not capture internal company outlays, we also examined technology patents along the ACES clusters (Exhibit 3). We found that battery and charging technologies account for about half of the relevant patents issued but only 20 percent of company investments. That probably means many large companies do this work in-house via their own research departments. Comparatively, e-hailing services show the lowest number of patents issued, likely because differentiation in this cluster is driven more by network effects and less by technology. Traditional automotive players make up less than 10 percent of all investments but issue about 85 percent of relevant patents—an indication they invest more in internal research and development than in inorganic growth.

Exhibit 3

Analyzing patents offers another lens on market dynamics.

Total number of patents since 2010,¹ thousand

● AV ² sensors and ADAS ³ components	9.1
● Electric vehicles and charging	9.0
● Batteries	5.7
● Telematics and intelligent traffic	3.1
● Semiconductors	2.5
● AV software and mapping	1.2
● Connectivity/infotainment	1.1
● HMI ⁴ and voice recognition	0.2
● E-hailing	0.1
● Back end/cybersecurity	0.1
Total	32.0

¹Sample of 1,183 companies. Using selected keywords and sample start-ups, we were able to identify a set of similar companies according to text-similarity algorithms (similarity to companies' business description) used by the Competitive Landscape Analytics team.

²Autonomous vehicle.

³Advanced driver-assistance system.

⁴Human-machine interface.

Source: CapitalIQ; Pitchbook; McKinsey analysis



- **Shared micromobility debuts.** Micromobility companies¹ increased their investments by a factor of more than five from 2014 to 2018. Total investments now significantly exceed \$1 billion, with an average investment of about \$100 million per transaction in 2018. That's comparable to the combined investments in telematics, intelligent traffic systems, and the peer-to-peer space, although the average investment amount is two to three times as high. This investment intensity could support a view that sees it as a supplement to the future e-hailing market (among others), driven by the transition from station-based vehicle sharing to free-floating services.
- **Technology is becoming more expensive.** The median investment amount for relatively smaller deals (less than \$100 million investment volume) has increased two- to threefold since 2013, suggesting that the average cost of technology increased in recent years. This could indicate a maturing of the technology toward industrialization and deployment, as well as an overall increase in the cost of participating in the race for ACES technology.

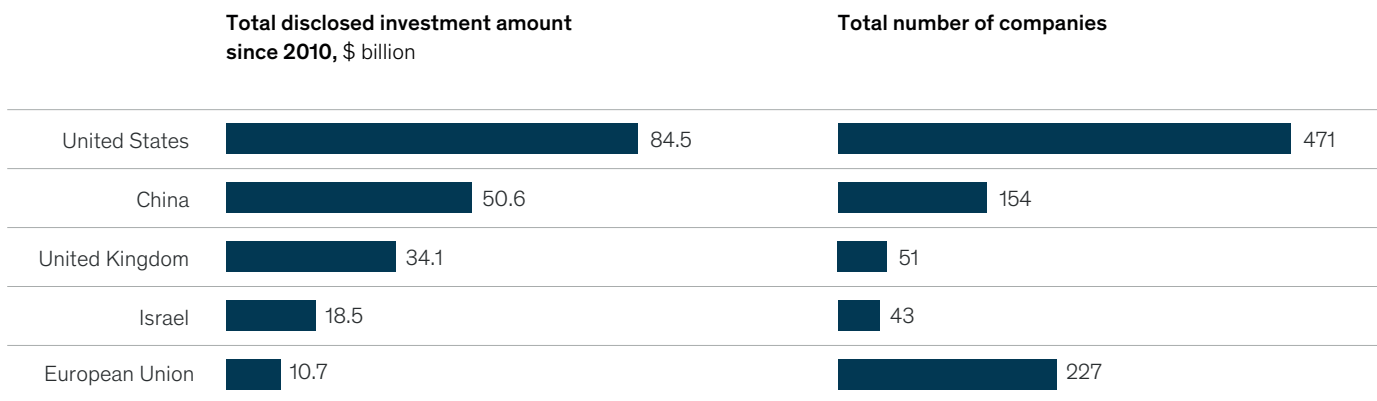
¹ We define shared micromobility as including electric bikes (e-bikes), scooters (e-scooters), and mopeds (e-mopeds).

- **The regional split is lopsided.** Over a third of the overall investment in mobility went to companies in the United States, followed by China (\$51 billion), the United Kingdom (\$34 billion), and Israel (\$18.5 billion, where \$17.4 billion comes from investments into Mobileye). The next-highest European country is France, in tenth position. Even though the European Union (EU), excluding the United Kingdom, receives only

5 percent of global funding, it contains 19 percent of all identified companies (Exhibit 4). Thus, average investment sums in Europe remain far behind those in the United States and China. This breakdown is similar when looking at the source of money as opposed to the recipients: the top investors come from the United States, Japan, and China, while the largest investor in the European Union is Germany, at only \$4 billion.

Exhibit 4

Investments show regional variations, with the greatest activity in China, the United Kingdom, and the United States.



Source: CapitalIQ; Pitchbook; Cipher; McKinsey analysis



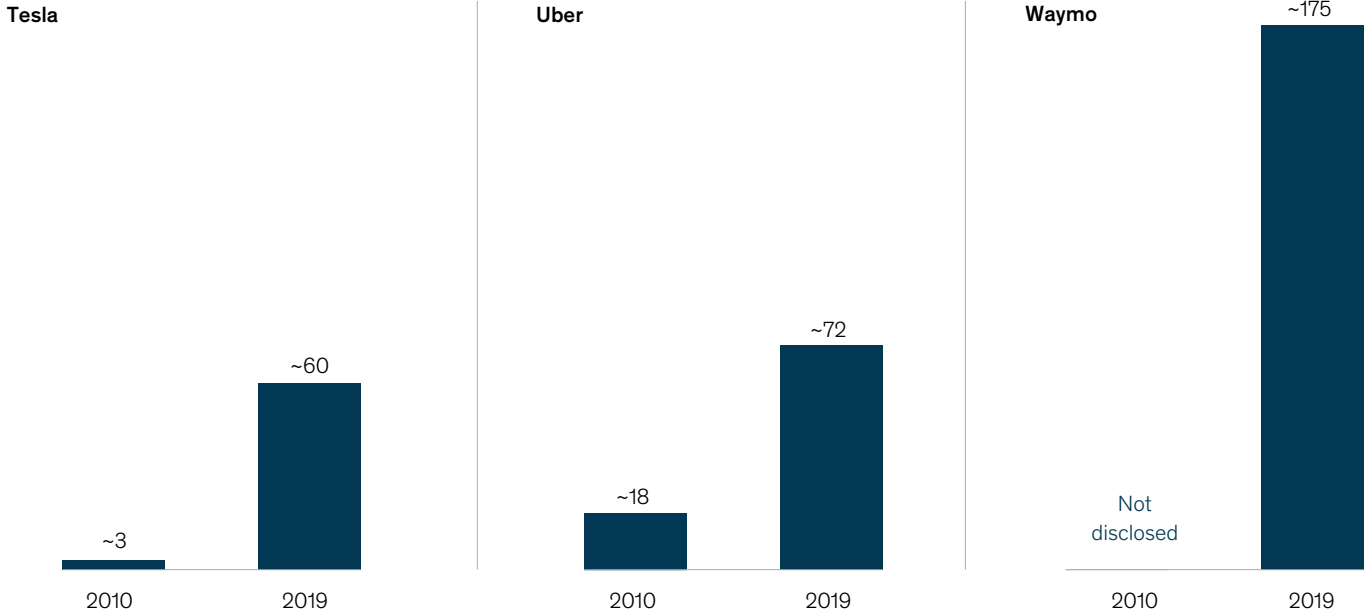
- **SoftBank is heavily invested.** Japanese tech player SoftBank has invested about \$30 billion in automotive ACES trends to date, with a focus on autonomous driving and e-hailing. With its recent investment in Cruise and Nuro.ai, SoftBank now has a stake of more than \$9 billion in autonomous driving, making it a strong player in the mobility space. An additional \$30 billion has been invested in the semiconductor business, with significant exposure to future-of-mobility topics, in particular the hardware to bring about autonomous driving.
- **Tech-company valuations outpace incumbents.** Comparing today's valuations to those of 2010 shows the total market capitalization of traditional OEMs decreased by more than 10 percent. Meanwhile, tech players in the

automotive space—such as Tesla, Uber, and Waymo—increased strongly and are now even higher than the valuations of traditional OEMs (Exhibit 5). Uber's recent valuation of more than \$70 billion makes it more valuable than traditional premium OEMs such as BMW or Daimler. And although traditional OEM invest less in inorganic moves, they still hold a strong position in the ACES trends based on their patents and massive R&D expenses.

Exhibit 5

New mobility providers valuation has risen tremendously.

Valuation, \$ billion



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Follow the money! As the mobility transformation gathers momentum, investors are clearly targeting the four ACES trends—autonomous driving, connectivity, electrification, and smart mobility—thus providing a concrete measure of the scale and scope of change on the horizon. Our analysis also

shows that tech players are significantly more active in external technology investments than established automotive players, who have traditionally made most of their technology investments in-house.

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Methodology

This study reflects findings from our 2019 update of McKinsey's analysis of the mobility start-up and investment landscape; see earlier analysis in our 2017 article, [“Analyzing start-up and investment trends in the mobility ecosystem.”](#) We have analyzed the investment landscape since 2010 along the four ACES trends: autonomous driving, connectivity, electrification, and smart mobility.

McKinsey's SILA tool reveals areas with the largest investment activity by using big data algorithms and semantic analytics. It leverages inputs from comprehensive private and venture-capital investment databases covering about two million companies. Furthermore, it analyzes developments over time and across geographies, and identifies implicit technological similarities among organizations. SILA displays output at the level of single investments or at an aggregated company view. Analysts can also tailor it to include analysis of specific technologies, use cases, subsets of companies, or types of companies.