

- ▶ This report is primarily for the U.S., market and focuses on mobility for people rather than cargo, food, or other commercial services. We stress that AVs are an emerging story and that the eventual industry structure, as well as the winners and losers, are far from certain.
- ▶ AV ride-hailing could dwarf the current nearly \$600 billion U.S. new-vehicle sales market. We estimate that in 2030, if all U.S. passenger miles were taken via ride-hailing at \$0.70/mile, mobility would be over a \$3.5 trillion market.
- ▶ In 2017, 78% of U.S. vehicle miles occurred in urban areas or on interstate highways. This suggests to us that Level 4 AVs could see wide adoption next decade, though probably late in the decade. Eventually, mapping can be expanded to suburbs and perhaps rural areas. People could then drive in rural areas off the interstate or in a Level 5 world, perhaps only drive when they want to.
- ▶ We think the fate of private vehicle ownership is by far the most important factor determining the fortune of the auto industry. Vehicle occupancy ratios, the percentage of U.S. households that do not own a vehicle, remaining low despite the emergence of firms like Uber, and commuting data lead us to think it's way too early to proclaim that private ownership is doomed. We do think that people who do not drive frequently, such as residents of dense city cores like Manhattan, are the most likely to give up owning a vehicle in a Level 4 or 5 world.
- ▶ We strongly disagree with the notion that autonomy implies that vehicles will be used 24/7. Traffic flow data shows Americans tend to use their vehicles at the same peak times during the week, and capacity utilization is about 50%. For vehicles to be needed all the time, people will have to drastically change their lives so that mobility is needed 24 hours a day nationally, which we do not see as likely because of sleep patterns.
- ▶ Our cost-per-mile math implies that AV ride-hailing needs to be available for around \$0.25-\$0.35/mile for it to be competitive with owning a paid-off mass market vehicle, such as a crossover or compact sedan. GM has talked about offering its AV ride-hailing through its Cruise subsidiary at rates well under \$1/mile by 2025, but that does not necessarily mean \$0.25/mile.
- ▶ AVs are a rare advancement in which regulators and the auto industry are on the same page. Both want AVs, but we think for different reasons. Automakers want to commercialize them and save lives, while regulators want to reduce or eliminate fatalities. There were 37,133 traffic deaths in the U.S. last year, and annual increases for 2015 and 2016 fatalities were the two highest on record since 1966. The National Highway Traffic Safety Administration estimates that 94% of all traffic fatalities are caused by human error. This convergence with regulators and industry is why we feel AVs are not a fad and will happen, though in a geofenced Level 4 form first.
- ▶ AVs will need to coexist for a long time with non-AVs, assuming legislation does not require all vehicles on the road to be autonomous. We estimate that turning the entire U.S. fleet could take over 22 years.
- ▶ If we are wrong, and private vehicle ownership radically changes, then we think the auto industry is in deep trouble. Exhibit 10 looks at scenarios where the U.S. light-vehicle fleet falls severely, to under 20% of its current size. This could occur only in a Level 5 AV world, and we think that even if this became reality it would not happen until the 2030s. If it did come to be, mass consolidation and bankruptcy of automakers, or at least a massive contraction in their size, would be the likely result, with the largest players such as GM, Toyota, and VW left standing.
- ▶ GM remains on our Best Ideas list, and we consider it to be a leading AV player. Validation of that opinion came recently with SoftBank and Honda investing in GM's Cruise business, and *Consumer*

Best Ideas

Company and Industry	Morningstar Rating	Fair Value Estimate	Current Price	Uncertainty Rating	Moat Rating	Price / Fair Value	Market Cap (B)	Analyst
Basic Materials								
Cameco (CCJ)	★★★★★	\$19.5	\$11.56	High	Narrow	0.59	4.58	Inton
Compass Minerals International (CMP)	★★★★	\$83	\$67.34	High	Wide	0.81	2.28	Goldstein
Martin Marietta Materials (MLM)	★★★★	\$260	\$162.75	High	Narrow	0.63	10.26	Inton
Communication Services								
BT Group (BT.A)	★★★★	GBX 360	GBX 244.85	High	Narrow	0.68	24.29	C. Nichols
China Mobile (941)	★★★★	HKD 100	HKD 77.85	Medium	Narrow	0.78	1594.02	Baker
Comcast (CMCSA)	★★★★	\$42	\$35.94	Medium	Wide	0.86	164.67	Macker
Telefonica (TEF)	★★★★★	\$13	\$6.97	High	Narrow	0.54	36.20	C. Nichols
Telstra (TLS)	★★★★	AUD 4.4	AUD 3.17	Medium	Narrow	0.72	37.58	Han
Consumer Cyclical								
Alibaba Group Holding (BABA)	★★★★	\$240	\$142.02	High	Wide	0.59	365.27	Hottovy
Bayerische Motoren Werke (BMW)	★★★★	EUR 117	EUR 75.13	High	Narrow	0.64	48.86	Hilgert
Expedia Group (EXPE)	★★★★	\$185	\$118.44	High	Narrow	0.64	17.70	Wasiolek
General Motors (GM)	★★★★	\$45	\$31.08	High	None	0.69	45.05	Whiston
Hanesbrands (HBI)	★★★★★	\$27	\$16.55	Medium	Narrow	0.61	5.97	Hottovy
InvoCare (IVC)	★★★★	AUD 16	AUD 12.36	Medium	Wide	0.77	1.36	Ragonese
Mattel (MAT)	★★★★	\$21.5	\$14.19	High	Narrow	0.66	4.88	Katz
Norwegian Cruise Line Holdings (NCLH)	★★★★	\$69	\$49.89	High	Narrow	0.72	11.05	Katz
Walt Disney (DIS)	★★★★	\$130	\$116.18	Medium	Wide	0.89	172.79	Macker
WPP (WPP)	★★★★	GBX 1500	GBX 1033	Medium	Narrow	0.69	12.98	Mogharabi
Consumer Defensive								
A2 Milk (ATM)	★★★★	AUD 14.6	AUD 10.31	High	Narrow	0.71	7.69	Fleck
G8 Education (GEM)	★★★★★	AUD 3.5	AUD 2.17	High	None	0.62	0.98	James
General Mills (GIS)	★★★★★	\$58	\$43.65	Low	Wide	0.75	26.03	Vora
Imperial Brands (IMB)	★★★★★	GBX 3700	GBX 2577	Low	Wide	0.70	24.58	Gorham
Kao (4452)	★★★★	JPY 8800	JPY 8115	Low	Wide	0.92	3955.42	Wei
Mondelez International (MDLZ)	★★★★	\$52	\$41.04	Medium	Wide	0.79	60.19	Lash
PepsiCo (PEP)	★★★★	\$122	\$107.93	Low	Wide	0.88	152.35	Vora
Procter & Gamble (PG)	★★★★	\$97	\$80.24	Low	Wide	0.83	199.73	Lash
Reckitt Benckiser Group (RB.)	★★★★	GBX 7300	GBX 6471	Low	Wide	0.89	45.75	Gorham
Energy								
Cenovus Energy (CVE)	★★★★	\$21	\$11.12	Very High	None	0.53	13.66	Gemino
Enbridge (ENB)	★★★★★	\$64	\$42.35	Medium	Wide	0.66	73.03	Gemino
Enterprise Products Partners (EPD)	★★★★	\$35.5	\$28.52	Low	Wide	0.80	62.06	Ellis
Royal Dutch Shell (RDS.B)	★★★★	\$83	\$66.75	Medium	Narrow	0.80	273.68	Good
Total (TOT)	★★★★	\$77	\$60.53	Medium	None	0.79	158.41	Good
Woodside Petroleum (WPL)	★★★★	AUD 46.5	AUD 36.17	High	None	0.78	33.86	Taylor