

Future of Autonomous Vehicles

Where we have come from

- 1939 • GM Futurama Concept - World's Fair – New York
- 1945 • Cruise control invented
- 1953 • RCA Labs test wire-guided miniature car
- 1963 • UK TRRL automatic vehicle guidance research project launched
- 1967 • Remote controlled car tested at Ohio State University
- 1968 • Vienna Convention on Road Traffic enforces driver control of car
- 1977 • First Semi-Automated Vehicle Test - Tsukuba, Japan
- 1980 • German Bundeswehr tests military robot vehicle
- 1987 • EU Eureka Prometheus Project launched
- 1991 • US Congress passes the ISTEA Transportation Authorization bill
- 1994 • Eureka Prometheus project robotic cars drive 1000km
- 1995 • Carnegie Mellon first US coast-to-coast autonomous drive 4500km
- 1995 • Mercedes S Class drives from Munich to Copenhagen using computer vision
- 1996 • Advanced Cruise-Assist Highway Research Association Demo – Japan
- 1997 • USDOT Automated Highway System Demo - San Diego, California
- 1998 • Google founded
- 1999 • Mobileye founded – Tel Aviv
- 2000 • Adaptive cruise control launched by Bosch

- 2003 • Tesla Founded
- 2004 • DARPA Grand Challenge – California
- 2005 • DARPA Grand Challenge – California
- 2007 • DARPA Urban Challenge – California
- 2008 • Rio Tinto launch Mine of the Future project
- 2009 • Google Self-Driving Car project launched
- 2009 • Uber founded
- 2010 • TUB self-driving vehicles demo in Germany
- 2011 • Nevada authorises AV testing
- 2011 • Peloton truck AV company founded
- 2012 • Florida authorises AV testing
- 2012 • Google completes 300,000 automated driving miles
- 2012 • Lyft founded as Zimride
- 2012 • Amazon acquires Kiva Systems for \$775m
- 2013 • FlixMobility founded in Germany
- 2013 • Port of Rotterdam launches automated guided vehicles
- 2013 • NuTonomy spun out of MIT
- 2013 • Caterpillar starts robotics trail
- 2013 • Google completes 500,000 miles of autonomous driving

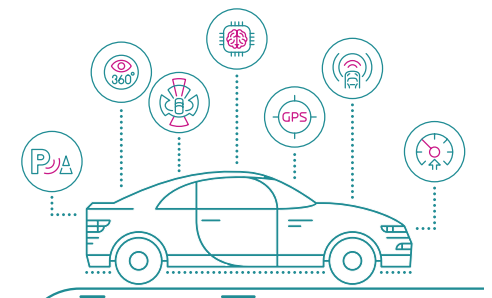
- 2014 • Amazon predicts drone deliveries within 5 years
- 2014 • Tesla announces Autopilot
- 2014 • UK Government allows AV testing
- 2014 • Oxbotica spun out of Oxford University
- 2014 • Mercedes S Class includes semi-automated features
- 2014 • Google fully automated prototype tested
- 2014 • NIO founded in Shanghai
- 2015 • Apple launches project Titan
- 2015 • Uber recruits key talent from CMU robotics centre
- 2015 • Tesla Autopilot capability introduced
- 2015 • Audi, BMW and Daimler acquire HERE for \$3bn from Nokia
- 2015 • Volvo launches Drive Me project in Sweden
- 2016 • Volvo pledges that by 2020 no one will be killed in a Volvo
- 2016 • GM invests \$500m in Lyft autonomous vehicle partnership
- 2016 • GM acquires Cruise Automation for \$1bn
- 2016 • Apple invests \$1bn in Chinese ride share Didi Chuxing
- 2016 • Ford and VC firms invest in NuTonomy
- 2016 • Qualcomm acquires NXP for \$39bn
- 2016 • Toyota and Uber announce partnership

- Google
- Baidu
- Tesla
- Lyft
- Uber
- Volvo

- 2017 • Lyft announces partnership with NuTonomy
- 2017 • Peugeot-PSA announces partnership with NuTonomy
- 2017 • Uber completes 2m miles in automated testing
- 2017 • Bosch and Nvidia announce AI partnership
- 2017 • Intel acquires Mobileye for \$15bn
- 2017 • Apple starts testing autonomous vehicles
- 2017 • Ford invests \$1bn in Argo AI
- 2017 • Audi and Nvidia announce AI partnership
- 2017 • Daimler and Nvidia announce AI partnership
- 2017 • Intel invests in HERE
- 2017 • Waymo spun off as separate company from Google
- 2017 • Amazon drone testing in Cambridge, UK
- 2017 • Tesla Autopilot completes 300m miles of operation
- 2017 • US Federal AV policy agreed
- 2017 • Pony.ai founded
- 2017 • Samsung acquires Harman Industries for \$8bn
- 2017 • Uber AV prototypes in San Francisco and Pittsburgh
- 2017 • Drive.ai spun out of Stanford University
- 2017 • Uber acquires Otto truck start-up

- 2018 • Starsky Robotics truck technology unveiled
- 2018 • Baidu announces Apollo AV platform and fund
- 2018 • US Federal AV policy 2.0 agreed
- 2018 • Ford Lyft partnership announced
- 2018 • Lyft partners with drive.ai
- 2018 • Waymo testing without a safety driver
- 2018 • NuTonomy acquired by Aptiv for \$400m
- 2018 • Tesla semi-truck announced
- 2018 • Beijing permits AV testing on public roads
- 2018 • US Federal AV policy 3.0 agreed
- 2018 • Waymo semi truck announced
- 2018 • Self-driving Uber car kills pedestrian
- 2018 • Baidu completes 140,000 km of self-driving in a year in Beijing
- 2018 • Volvo launches Vera autonomous platform
- 2018 • Lyft completes 5,000 self-driving car rides in Las Vegas
- 2018 • China permits city governments to issue AV road licences
- 2018 • Baidu begins mass production of Apollo self-driving bus
- 2018 • Uber shuts down AV truck project
- 2018 • Waymo completes 5m miles of testing

- 2019 • Didi Chuxing spins out self-driving car unit
- 2019 • Ford acquires Journey Holding and Quantum Signal AI
- 2019 • Baidu completes 1m miles of test driving
- 2019 • Toyota partners with Baidu's Apollo platform
- 2019 • Amazon announces launch of drone delivery for Prime
- 2019 • Apple acquires Drive.ai
- 2019 • Volvo and Uber launch self-driving production car
- 2019 • Lyft IPO
- 2019 • Uber IPO
- 2019 • Rio Tinto starts autonomous truck mining with Caterpillar Inc
- 2019 • Tesla 'Autonomy Day' announcements
- 2019 • Tesla driver killed in Autopilot mode
- 2019 • Port of Rotterdam tests autonomous navigation
- 2019 • California DMV grants permit to Waymo for testing
- 2019 • Apollo shuttle bus trial at Shanghai Expo
- 2019 • Waymo subsidiary established in Shanghai



2020 and beyond