

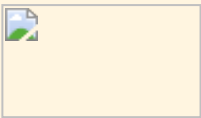
TOPIC GUIDE: AUTONOMOUS VEHICLES

"AUTONOMOUS VEHICLES WILL MAKE DRIVING SAFER"

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AUTHOR: JUSTINE BRIAN

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INTRODUCTION

In 2015 the UK's first self-driving pod - the LUTZ Pathfinder – was made public by the government-funded Transport Systems Catapult [Ref: [Transport Systems Catapult](#)]. This follows in the wake of the launch in 2010 of technology giant Google's Self-Driving Car project to "make driving safer, more enjoyable and more efficient." [Ref: [Google](#)] Google asked us to imagine a point where: "Deaths from traffic accidents—over 1.2 million worldwide every year—could be reduced dramatically, especially since 94% of accidents in the U.S. involve human error" [Ref: [Google](#)], and Transport Systems Catapult additionally suggest that we could see, "a marked reduction in congestion as well as...benefits to the environment" from autonomous vehicles [Ref: [Transport Systems Catapult](#)]. The idea of 'autonomous vehicles' isn't a new one [Ref: [Computer History Museum](#)], but the advent of these projects has caused both excitement and concern. Supporters of the new technology argue that: "The strongest case for self-driving cars is safety" [Ref: [Guardian](#)], whilst others are concerned that self-driving cars, "introduce a whole new category of road user...that entirely lacks an understanding that all those road users share" [Ref: [Slate](#)], and question how this new automated technology will integrate into a human-controlled and human-centred environment. Autonomous cars have hit the headlines recently following crashes [Ref: [Wired](#), [ABC News](#)] in the USA [Ref: [ABC News](#)] and the first fatality brought about as a result of this new technology [Ref: [Guardian](#)] has brought into focus the possible limitations of the technology, with some arguing that talk of automation and 'autopilots' "encourage people to think that the systems are more capable than they really are, and that is a serious problem." [Ref: [Scientific American](#)] So is the future of driving a safer, autonomous one, or is that still a futuristic dream? What are the pros and cons of this new technology?

For further reading use the menu bar on the right hand side.

DEBATE IN CONTEXT

This section provides a summary of the key issues in the debate, set in the context of recent discussions and the competing positions that have been adopted.

Safety first

One of the key motivations given for a move to autonomous cars is improving road safety. Cars that are able to anticipate risky situations and avoid them will, it is argued, reduce road-traffic accidents, “helping to make the roads safer for everyone.” [Ref: [Telegraph](#)] The small fleet of Google automated cars (both commercial makes and Google’s own prototype) have driven over a million miles within California since 2009 [Ref: [Telegraph](#)], but in February this year one of their vehicles had an accident and collided with a public transport bus [Ref: [Financial Times](#)], with Google admitting the computer made an “incorrect assumption about where [the bus] would go”, and that the crash would not be the last as “autonomy will always have some constraints” [Ref: [Daily Mail](#), [Daily Mail](#)]. The first fatality involving a self-driving Uber occurred in Arizona last year: the car never even hit the brakes [Ref: [Bloomberg](#)]. This incident prompted questions about the effectiveness of the technology involved and whether it can bear “some responsibility” for incidents [Ref: [Daily Mail](#)], as well as the safety of autonomous vehicles more broadly. Whilst future autonomous vehicles might be able to safely “navigate roads, they don’t think like humans”, and some question whether autonomous cars can really be safe in an environment where they need to interact with humans, and as such, it will be difficult for them to “cope with the uncertainty and complexity of human behaviour.” [Ref: [Popular Mechanics](#)] But others call for perspective, asking us to consider “the number of crashes that occurred on the same day that were the result of human behaviour.” [Ref: [BBC News](#)]

Man vs Machine

For writer Carl Franzen, “the biggest issue with self-driving cars lies in their inability to make moral and ethical decisions for which human drivers have so far been almost entirely responsible. Would-be autonomous carmakers might be uncomfortable programming such choices into their systems, but human drivers make such momentous split-second decisions with regularity.” [Ref: [Popular Mechanics](#)] The development of artificial intelligence (AI), including in transport, has led some to consider ethical and moral questions about introducing this new technology into our lives. Human drivers make constant judgements – practical and moral – especially about the safety of ourselves and those around us, but will computers be programmed to do the same, and if so what decisions will their algorithms make? [Ref: [Quartz](#), [Guardian](#)] “Here is the nature of the dilemma. Imagine that in the not-too-distant future, you own a self-driving car. One day, while you are driving along, an unfortunate set of events causes the car to head toward a crowd of 10 people crossing the road. It cannot stop in time but it can avoid killing 10 people by steering into a wall. However, this collision would kill you, the owner and occupant. What should it do?” [Ref: [MIT Technology Review](#)] Others contest that: “When machines take over, the work required of the human is typically not removed”, but rather our interaction with cars changes, and instead we will be a “monitor—one who constantly watches to detect and correct technology failures” and that we should welcome “a cooperative effort between humans and technology—one where the human plays a vital, active role in systems that optimize the interaction between the driver and the technology” [Ref: [Newsweek](#)]. Germany has introduced laws to this effect, instructing that drivers must be behind the wheel of autonomous cars and be alert: which then begs the question: why bother with a self-driving car if you still need a responsible human in the driving seat anyway? [Ref: [Reuters](#)]

Who takes responsibility?

One of the key questions in the debate about autonomous vehicles is who will be responsible in the event of an accident, and if we can hold a machine to account as we do people [Ref: [Huffington Post](#)]. The UK government - as well as several other EU countries - has already begun to put in place legislation to allow automated vehicles onto UK roads and to be insured under existing policies by 2020 [Ref: [Auto Express](#), [selfdrivingfutures](#)] and in 2017, Germany became the first country to publish a set of ethical guidelines for self-driving cars [Ref: [The Conversation](#)]. But some argue that even if the law and ethics of autonomous vehicles are resolved: “Insurers still need to make confident judgments

about risk, and this will be very difficult.” [Ref: [Atlantic](#)] To be able to make such judgements about risks, and responsibilities, the law currently requires someone, or something, to be ultimately accountable for decisions made. That raises the interesting idea of extending to robots ‘legal personhood’ which, argues one commentator, is “less about what is or is not a flesh-and-blood person and who/what is or is not able to be hauled into court.” [Ref: [Atlantic](#)] But British transport writer Christian Wolmar argues that our current focus on automation is misplaced and that even if the “legal, social, economic, political and practical” issues are resolved, an automated “takeover of the mainstream transport system is about as likely as the long-awaited arrival of the futuristic jet packs of 1960s comic books.” [Ref: [New Statesman](#)] Yet Google and other developers point to the prospect of the new technology opening up driving and mobility to many more of us, meaning, “everyone could get around easily and safely, regardless of their ability to drive. Ageing or visually impaired loved ones wouldn’t have to give up their independence. Time spent commuting could be time spent doing what you want to do.” [Ref: [Google](#)] So is a move to automation an unquestionable good for society, a threat to life, or a pipe dream?

ESSENTIAL READING

It is crucial for debaters to have read the articles in this section, which provide essential information and arguments for and against the debate motion. Students will be expected to have additional evidence and examples derived from independent research, but they can expect to be criticised if they lack a basic familiarity with the issues raised in the essential reading.

Where to? A history of autonomous vehicles [Computer History Museum](#) 2016

FOR

Waymo [Waymo](#)

waymo 15 January 2019

Safety first: the future of driving [Telegraph](#)

Tim Gibson [Telegraph](#) 15 January 2016

Self-driving cars: safe, reliable – but a challenging sell for Google [Guardian](#)

Jemima Kiss [Guardian](#) 6 October 2015

Driving should be illegal [Fusion](#)

Kevon Roose [Fusion](#) 5 October 2015

Google’s self-driving cars are ridiculously safe [Big Think](#)

Robert Montenegro [Big Think](#) June 2015

AGAINST

Arizona’s revolt against self-driving cars should be a wake-up call to the companies that make them [Los Angeles Times](#)

Jamie Court [Los Angeles Times](#) 11 January 2019

Franken-algorithms: the deadly consequences of unpredictable code [The Guardian](#)

Andrew Smith [The Guardian](#) 30 August 2018

Transport’s favourite myth: why we will never own driverless cars [New Statesman](#)

Christian Wolmar [New Statesman](#) 10 April 2016

The big question about driverless cars no one seems able to answer [Washington Post](#)

Brian Fung [Washington Post](#) 17 February 2016

Sorry to disappoint, but driverless cars will still need drivers [Newsweek](#)

Michael Nees [Newsweek](#) 10 May 2015

IN DEPTH

Who is behind the wheel? Self-driving cars offer huge benefits - but have a dark side [↗](#)

The Economist 1 March 2018

The next level of driverless cars: how to solve the problem of humans falling asleep [↗](#)

Nicola Davis **The Guardian** 15 February 2018

Statistically self-driving cars are about to kill someone. What happens next? [↗](#)

Martin Robbins **The Guardian** 14 June 2016

Why self-driving cars must be programmed to kill [↗](#)

MIT **Technology Review** 22 October 2015

The driverless car debate: how safe are autonomous vehicles? [↗](#)

Lauren Keating **Tech Times** 28 July 2015

Why self-driving cars aren't ready to share the road with humans [↗](#)

Carl Franzen **Popular Mechanics** 5 February 2015

The moral challenges of driverless cars [↗](#)

Keith Kirkpatrick **Communications** 2015

KEY TERMS

Definitions of key concepts that are crucial for understanding the topic. Students should be familiar with these terms and the different ways in which they are used and interpreted and should be prepared to explain their significance.

Artificial intelligence (AI) [↗](#)

Autonomous car [↗](#)

Google self-driving car [↗](#)

LUTZ Pathfinder [↗](#)

BACKGROUNDERS

Useful websites and materials that provide a good starting point for research.

Deadly Tesla crash exposes confusion over automated driving [↗](#)

Larry Greenemeier **Scientific American** 8 July 2016

Tesla 'Autopilot' crash raises concerns about self-driving cars [↗](#)

NPR 1 July 2016

Can self-driving cars cope with illogical humans? [↗](#)

Mark Prig **Daily Mail** 14 March 2016

Driverless cars pose worrying questions of life and death [↗](#)

Andy Sharman **Financial Times** 20 January 2016

Google's self-driving cars aren't as good as humans—yet [↗](#)

Alex Davies **Wired** 12 January 2016

How can we make sure that driverless cars are safe? [↗](#)

Matt McFarland **Los Angeles Times** 22 December 2015

Humans are slamming into driverless cars and exposing a key flaw [↗](#)

Keith Naughton **Bloomberg** 8 December 2015

Uber and out: is there a future for driving? [↗](#)

Battle of Ideas 17 October 2015

Tesla's cars now drive themselves, kinda [↗](#)

Molly McHugh **Wired** 14 October 2015

When humans and robots share the roads [↗](#)

Adrienne Lafrance **Atlantic** 9 October 2015

Future proofing: Mobility [↗](#)

BBC Radio 4 26 September 2015

Self-driving cars in the rain turn into sliding death traps [↗](#)

Michael Rundle **The Huffington Post** 4 December 2014

If a self-driving car gets in an accident, who—or what—is liable? [↗](#)

Alexis C. Madrigal **Atlantic** 13 August 2014

Driverless cars: increased road safety and efficiency or ‘lethal weapons’? [↗](#)

Oliver Balch **Guardian** 1 August 2014

The cars we’ll be driving in the world of 2050 [↗](#)

BBC 8 November 2013

No one understands the scariest, most dangerous part of a self-driving car: Us [↗](#)

Bianca Bosca **Huffington Post** 25 October 2013

The ethics of autonomous cars [↗](#)

Patrick Lin **Atlantic** 8 October 2013

The trollable self-driving car [↗](#)

Samuel English Anthony **Slate** 2012

Self-driving car project [↗](#)

Google

Self-driving pods [↗](#)

Transport Systems Catapult

ORGANISATIONS

Links to organisations, campaign groups and official bodies who are referenced within the Topic Guide or which will be of use in providing additional research information.

Google [↗](#)

Transport Systems Catapult [↗](#)

IN THE NEWS

Relevant recent news stories from a variety of sources, which ensure students have an up to date awareness of the state of the debate.

Tesla’s autopilot under investigation after fatal crash [↗](#)

ABC News 1 July 2016

Queen’s Speech sets out new driverless car legislation [↗](#)

Auto Express 18 May 2016

‘Someone is going to die’: experts warn lawmakers over self-driving cars [↗](#)

Guardian 15 March 2016

Google car crash ‘not a surprise’ - US transport secretary [↗](#)

BBC News 14 March 2016

Google self-driving car caught on video colliding with bus [↗](#)

Guardian 9 March 2016

BMW sees its future shift to ultimate self-driving machine [↗](#)

Bloomberg 7 March 2016

Ford boss claims the technology will become standard in just four years [↗](#)

Daily Mail 23 February 2016

Driverless cars: London wants Google vehicle trials [↗](#)

BBC News 6 February 2016

Autonomous vehicles will be safer, not perfect [↗](#)

Automotive News 10 January 2016

Self-driving vehicles expected on roads in next few years [↗](#)

China.org 13 April 2015

Driverless cars set to roll out for trials on UK roads [↗](#)

Guardian 11 February 2015

FBI warns driverless cars could be used as 'lethal weapons' [↗](#)

Guardian 16 July 2014

Google's driverless cars are 'safer' than human drivers [↗](#)

Telegraph 29 October 2013

AUDIO/VISUAL

Tesla 'Autopilot' crash raises concerns about self-driving cars [↗](#)

NPR 1 July 2016

Uber and out: is there a future for driving? [↗](#)

Battle of Ideas 17 October 2015

Future proofing: Mobility [↗](#)

BBC Radio 4 26 September 2015

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Tel +44 (0)20 3176 0827 - dm@theboi.co.uk | [admin logout](#)