

Starting up

- What are the advantages of driverless cars?
- What are the disadvantages?
- Would you like to own a driverless car? Why or why not?

Vocabulary 1 – making driverless cars

Match the pairs of sentences.

- 1 When you **rev up** your car's engine, you make it go faster. When a business revs up, it
a) hires new employees b) increases its activity c) produces cars
- 2 In the navy, the **flagship** carries the most important officer and flies a flag to show that.
A flagship organisation or product is
a) produced for the military b) usually kept secret c) very important in an industry
- 3 The words **robotaxi** and **robovan** are a combination of *robot* and *taxi*, and *robot* and *van*.
These vehicles are
a) driverless b) toys, not real vehicles c) used in cities around the world
- 4 **Cargo** means *goods that are carried in a vehicle*. The cargo version of a VW vehicle is designed for
a) large families b) use as a taxi c) businesses such as delivery companies
- 5 *Mini* means *small*. A **minibus** without seats can carry cargo, and with seats can carry
a) 10-15 people b) two or three people c) only the driver
- 6 An **algorithm** is a set of rules that a computer follows. Algorithms would allow computers to
a) feel emotions b) control a driverless car c) repair a flat tyre
- 7 Something that is commercial is connected with buying and selling. If you **commercialise** something, you
a) control it with a computer b) make money from it c) advertise it
- 8 **Autonomy** is the ability to make decisions freely and have control over yourself.
For a vehicle, this means
a) not having a human driver b) carrying only one passenger c) not working properly
- 9 A product that is **certifiable** can be legally approved for use. If a driverless car is certifiable, that means it has been proven to be
a) computer-controlled b) not too expensive c) safe

VW revs up efforts to take on driverless vehicle rivals

Volkswagen is to establish a flagship self-driving technology company in an attempt to take on the dominance of Silicon Valley rivals such as Google's Waymo.

Volkswagen Autonomy, or VWAT, will be in "the world's best-funded start-up", according to former Apple engineer Alexander Hitzinger, who will run the unit. His aim is to bring robotaxis and robovans to the streets of major cities by the middle of the next decade.

The venture, which will span three continents, will work with so-called Level Four technologies — which allow vehicles, often without steering wheels, to operate without human ¹**intervention** in specific environments.

The division's first project will be self-driving cargo and passenger versions of VW's ²**upcoming** minibus, the ID Buzz, developed in conjunction with the Volkswagen Commercial Vehicles brand.

If successful, ³**collaborations** with VW brands such as Audi and the spun-off truckmaker Traton could follow.

VWAT's broader task will be to test algorithms developed by Argo AI — the American software business into which Volkswagen ploughed \$2.6bn earlier this year and which is also backed by its carmaking rival Ford.

The unit aims to "commercialise full autonomy — make it product ready," said Mr Hitzinger, who did not rule out making the software available to VW's competitors.

VW's plan involves absorbing Audi's Autonomous Intelligent Driving unit into what will become Argo AI's European headquarters in Munich.

VWAT will also be located at VW's headquarters in Wolfsburg, Germany, and have a Silicon Valley branch, with a Chinese subsidiary to follow in the next couple of years.

But the new unit faces ⁴**regulatory** uncertainty, as countries draft laws for autonomous vehicles amid mounting concerns about their safety in ⁵**built-up** locations.

Nonetheless, VWAT will work to create a "certifiable product" and a "fully industrialised and ⁶**validated** self-driving system", Mr Hitzinger said, which the carmaker hopes will satisfy regulators.

"Europe is a little bit more complicated," he added, referring to the ⁷**legal frameworks** that need to be put in place. "China could be potentially very fast."

Efforts by the German carmaker to develop autonomous vehicles are widely viewed as ⁸**lagging behind** those of decade-old Alphabet subsidiary Waymo, which is considered to be leading the race, as well as the General Motors-owned Cruise.

"At the moment it looks like Waymo is still ahead," admitted Mr Hitzinger, "but we are all far away from a real commercial, ⁹**viable** product".

He added that VW was "in a rush, but not in a panic", and that autonomous driving was a "complex problem that requires so much investment, that most of these start-ups will not make it, they will either get bored or go bust".

Earlier this month, a survey carried out in the US, EU and China by Accenture found that almost half of drivers would consider giving up their own car if autonomous alternatives were available.

"The transition from car ownership to mobility-as-a-service seems inevitable, so traditional auto manufacturers will be at great risk of losing customers to new mobility service providers that can establish mature offers," said Axel Schmidt, a director at Accenture.

For now, VWAT will focus only on the "special purpose vehicles" sector — namely autonomous taxis and vans that move passengers and products around cities. However, a ¹⁰**retail offer** may not be too far behind.

"At a certain point the cost will be low enough to make [autonomous cars] viable for personal ownership," Mr Hitzinger said.



Reading 1

Are these statements true or false, according to the article?

- 1 Volkswagen is planning to buy a self-driving car company.
- 2 VW intends to produce autonomous vans first.
- 3 The software that VW will use is completely secret and not shared outside the company.
- 4 Some of VW's driverless vehicles have already been certified.
- 5 At the moment, VW is not the leading the way in the development of driverless cars.

Reading 2

Choose the best word or phrase to complete each sentence.

- 1 When does Alexander Hitzinger expect VW to be producing and selling autonomous vehicles?
a) probably after 2027 c) by about 2025
b) by the end of 2021
- 2 What does VW need to do next?
a) software testing c) market research
b) investment planning
- 3 Where will Volkswagen Autonomy be located?
a) Silicon Valley c) Europe
b) Germany, the US and China
- 4 What does Alexander Hitzinger say start-ups will need to develop driverless cars?
a) Volkswagen's technology c) skilled engineers
b) a lot of money
- 5 In theory, how big is the market for autonomous vehicles?
a) about 50% of all drivers c) very small at the moment
b) impossible to say
- 6 What type of autonomous vehicle will VW produce first?
a) family cars c) vehicles for businesses
b) buses for public transport

Vocabulary 2 – vocabulary in context

Choose the correct meaning of the bold words in the article.

- | | |
|------------------------------------|------------------------------|
| 1 a) involvement | b) knowledge |
| 2 a) recent | b) happening soon |
| 3 a) competitions | b) joint projects |
| 4 a) related to rules and laws | b) related to money |
| 5 a) busy, with a lot of buildings | b) quiet |
| 6 a) inexpensive | b) approved, proven |
| 7 a) rules and laws | b) roads |
| 8 a) supporting | b) being less developed than |
| 9 a) living | b) useful, effective |
| 10 a) a consumer product | b) special price |

Grammar 1 – zero, first and second conditionals

Choose the correct expressions.

- 1 If a computer *is / will be* driving your car, you don't have to use the controls.
- 2 The car *didn't / doesn't* move if there's a pedestrian in the way.
- 3 In 2025, when they start producing them, driverless cars *won't be / aren't* certified if the technology isn't safe.
- 4 If *you're / you were* disabled and can't drive, you'll be able to use a driverless car to get around.
- 5 Unless the costs *were / are* reduced, driverless cars won't become popular.
- 6 If *I had / I'll have* a driverless car right now, I'd be able to make some phone calls.
- 7 What *happens / would happen* if the computer made a mistake?
- 8 If VW *made / will make* an inexpensive driverless car, it would be incredibly popular.

Further discussion

Work together to answer these questions.

- 1 Drivers often communicate with other drivers and with pedestrians. Can you think of some examples of this?
- 2 Is it important for safe travel? Why or why not?
- 3 How do these issues relate to driverless vehicles?

ANSWER KEY**Starting up**

Possible advantages: could reduce road accidents; allows 'driver' to make use of time doing other things (reading, making phone calls, etc.); could allow disabled people the ability to use a car

Possible disadvantages: computer failure could cause an accident; hackers could break into the computer and take control of the car; they're very expensive

Vocabulary 1

- | | |
|-----|-----|
| 1 b | 6 b |
| 2 c | 7 b |
| 3 a | 8 a |
| 4 c | 9 c |
| 5 a | |

Reading 1

- | | |
|-----|-----|
| 1 F | 4 F |
| 2 T | 5 T |
| 3 F | |

Reading 2

- | | |
|-----|-----|
| 1 c | 4 b |
| 2 a | 5 a |
| 3 b | 6 c |

Vocabulary 2

- | | |
|-----|------|
| 1 a | 6 b |
| 2 b | 7 a |
| 3 b | 8 b |
| 4 a | 9 b |
| 5 a | 10 a |

Grammar 1

- | | |
|------------|----------------|
| 1 is | 5 are |
| 2 doesn't | 6 I had |
| 3 won't be | 7 would happen |
| 4 you're | 8 made |

Further discussion

Possible answers:

- In city traffic, drivers and pedestrians often communicate with eye contact and with gestures. A driver might wave a pedestrian across the road, or simply nod. In traffic, cars sometimes signal with flashing headlights or by sounding the horn. The signal may mean *watch out* or it may mean *you may pass in front of me*. It depends on the context.
- This sort of communication is very important for safe travel.
- A driverless car probably won't be able to communicate in the same way. It's possible that driverless vehicles will communicate with one another computer-to-computer, but probably not with pedestrians or with cars that have drivers. If a driver or pedestrian attempts to communicate with a driverless vehicle, communication may not take place, and this could be dangerous.

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