



CONNECTED AND DRIVERLESS VEHICLES

Sustainable mobility

Connected Mobility

Connected vehicles, driverless vehicles, new mobility needs: a revolution is under way in the world of transport. These new smart transport methods explained.

- [What is a connected vehicle?](#)
- [The advantages of connected vehicles](#)
- [What does the future hold for connected vehicles?](#)
- [Driverless vehicles](#)



WHAT IS A CONNECTED VEHICLE?

It is a vehicle equipped with technology that connects it to the outside, enabling it to receive and send information.

A vehicle is connected when it is fitted with wireless connectivity systems enabling it to collect information that it can then use: music stored on a smartphone via Bluetooth⁽¹⁾, film stored in the Cloud thanks to 4G LTE, remote information with radar connectivity, geolocation data with GNSS⁽²⁾, etc.

Connected vehicles **also communicate information to the outside**, particularly about other vehicles and infrastructures, via a unit fitted with a SIM card that sends usage data to the Cloud⁽³⁾.

All **these data are used to offer drivers a variety of services**, ranging from real-time traffic information to the calculation of energy consumption, via usage-related insurance services such as *pay-as-you-drive* and *pay-how-you-drive*.

« We are moving towards vehicles that provide more and more services, to such an extent that the very characteristics of the product will become secondary. »

Gilles Corde, Connected Mobility Program Manager

Connected vehicles to improve air quality

Do you want to reduce the environmental footprint of your journeys? Download the **Geco air free mobile app**, developed by IFPEN with the support of the French Environment and Energy Management Agency (Ademe), from [iTunes](#) or [GooglePlay](#). A **veritable barometer of clean mobility**, Geco air encourages users to drive in an eco-responsible manner by:

- estimating emissions relating to their journeys (CO₂, NOx, fine particles, carbon monoxide),
- indicating the practices they should adopt at the wheel,
- encouraging them to favor soft transport modes wherever possible.

Definitions:

Bluetooth : Technology enabling two-way data exchange over short distances using UHF radio waves, thereby doing away with the need for wired links.

GNSS : Global Navigation Satellite System.

Cloud : Storage space managed by a remote server to which users connect via a secure Internet link in order to access a variety of content.

THE ADVANTAGES OF CONNECTED VEHICLES

Connected vehicles offer a number of benefits, both for the owner and in terms of addressing transport-related problems more generally.

Fuel consumption and the environment. By optimizing journeys, connected vehicles can help owners reduce fuel consumption and thus their environmental impact, with lower CO₂ emissions.

Time savings: thanks to better knowledge of real-time conditions and the outside environment – thereby overcoming the problem of obsolete information -, connected vehicles save drivers time by enabling them to take quieter routes, thereby limiting road congestion.

Safety: connected vehicles collect real-time information concerning traffic congestion, road works, accidents, weather-related incidents, etc. Driving thus becomes safer both for the driver and for other vehicles in the vicinity.

Insurance and maintenance: vehicle and driving data will make it possible to tailor insurance premiums and vehicle maintenance.

A well-equipped connected vehicle is more comfortable and safer to drive; as vehicles evolve towards greater autonomy over time, they will become a new space for exchange, work and relaxation.

WHAT DOES THE FUTURE HOLD FOR CONNECTED VEHICLES?

Currently, **connections are primarily dependent on the driver's smartphone**. Soon, **the electronics of the vehicle's dashboard** will be directly connected; these electronics will send information to the outside and **will also be the mirror (*mirroring*) of the smartphone**. All of the smartphone's functionalities will be present and connectivity will be guaranteed.

The European Commission now requires car manufacturers **to equip all their new vehicles with an automatic emergency call system** known as **eCall** or **eCall112**. The *eCall* system should cut emergency call-out times by 50% in rural areas and up to 60% in urban areas. This should make it possible to save hundreds of lives every year, and also reduce the seriousness of the consequences of injuries.

Connected vehicles are already a reality. By 2020, it is estimated that 80% of the fleet will be connected. But in order to achieve this large-scale roll-out, it is important to ensure the population accepts the technology by allaying fears relating to the risk of hacking and the use of personal data.

The challenge for connected vehicle designers thus lies in the introduction of secure solutions (firewall software, data use charters) in order to ensure these changes are accepted by motorists.

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DRIVERLESS VEHICLES

Connected and driverless (autonomous) vehicles are frequently confused, but the technologies involved and realities are entirely different.

Driverless or driver-assisted vehicles use **onboard electronic technologies (sensors, cameras, radars)** that mean **the vehicle is neither "blind nor deaf" and is capable of taking decisions previously taken by the driver on the basis of the information it receives** (braking, overtaking, parking, etc.).

Unlike the connected vehicle, and for safety reasons, **the vehicle can operate completely autonomously, independently of the network**, which can occasionally encounter problems.

There are five levels of driver assistance, with level 5 representing full automation. Driver assistance technology is being developed for tricky maneuvers (parking) or to reinforce safety (emergency braking). But fully driverless vehicles, 100% of the time, remain a long-term option

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(1) *Technology enabling two-way data exchange over short distances using UHF radio waves, thereby doing away with the need for wired links.*

(2) *Global Navigation Satellite System*

(3) *Storage space managed by a remote server to which users connect via a secure Internet link in order to access a variety of content*



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Link to the web page : [Connected and driverless vehicles](#)