Volvo Trucks. Driving Progress

Guide: Cooperative Intelligent Transport Systems (C-ITS)

What is C-ITS?

Cooperative Intelligent Transport Systems (C-ITS) use wireless technology to enable real-time vehicle-to-vehicle and vehicle-to-infrastructure communication. This in turn enables far greater coordination between road users and allows the creation of safer and more efficient traffic flows.

What will C-ITS enable?

C-ITS is likely to be introduced in three phases:

Phase one will be systems that deliver warnings. For example, if a vehicle experiences a slow-moving vehicle ahead, road works or a traffic jam, it can communicate this message to all other vehicles heading in its direction. Or a vehicle could receive warnings on changing road rules or speed limits.

Phase two is sensory, where vehicles will collect data from different signals and read the traffic situation. It will then alert the driver if an action should to be taken.

Phase three is about collaboration between vehicles. It involves continuous vehicle-to-vehicle and vehicle-to-pedestrian connectivity which enables effective warning and improved response times to potential accidents.

What will C-ITS mean for truck owners?

The accumulative effect of all these services will be more efficient traffic management, with smoother flows, less congestion and fewer accidents. The primary benefit for truck drivers is that their jobs will be safer due to a reduced risk of accidents. It will also mean less unplanned downtime due to fewer collisions. Productivity should increase as smoother traffic flows will enable trucks to travel faster and also avoid heavily congested roads. This will have the added benefit of reducing fuel consumption and carbon emissions.

C-ITS in practice today

Several truck OEMs, including Volvo Trucks, have been developing and testing CIT-S technologies in applications like platooning. In 2016 platooning technology was demonstrated during the European Truck Platooning Challenge where various brands of semi-automated trucks drove in columns on public roads from various European cities to the Netherlands.

In Europe, the partly EU-funded C-Roads project has seen the creation of C-ITS equipped roads across the continent. These are being used to trial and test C-ITS services including warnings for slow/stationary vehicles, road works, emergency brake lights, emergency vehicles approaching, weather conditions, traffic jams and other hazards. There are also tests on services for in-house signage (where drivers are informed of road signs and speed limits), and a Green Light Optimal Speed Advisory (GLOSA) service where traffic lights can communicate light phase schedules to vehicles in order to optimize their speed.

What is involved in making a vehicle C-ITS ready?

C-ITS technology is relatively mature and uses many components that are already equipped in new vehicles as standard. This includes cameras, sensors and antennas. In its essence a C-ITS system is a communications box that uses standard WiFi to send and receive messages. It also requires a human-machine interface in order to convert messages into driver instructions.

How long before vehicle manufacturers adopt C-ITS technology?

Many OEMs are already investing in the development of C-ITS services, and in some cases are evening implementing it in their vehicles. In October 2019, Volkswagen announced that it's 2020 Golf will feature its Car2X technology as standard. Meanwhile Ford has also announced that its C-V2X will be released in early 2022.

What are the main hurdles for the adoption of C-ITS technology?

For C-ITS systems to be truly effective and most beneficial, it is vitally important to have a common platform and legal framework for the whole industry. All vehicle makes and models need to be able to communicate with one another regardless of brand. Transport authorities and infrastructure providers also need to be on board. It is important to have a consensus on the base technology used as many OEMs are eager to invest further in C-ITS services but are reluctant to commit until there is an agreement on which technical solutions will be adopted.

What is the 5G vs. WiFi debate in the EU?

The automotive industry has been split for years on whether to use Wi-Fi or 5G in connected vehicles. Proponents of WiFi argue that this is a tested technology already available today while supporters of 5G technology say that it presents a wider range of applications in entertainment, traffic data and general navigation since the standard can be used in cars and devices in the surrounding environment.

In July 2019, 21 of the European Commission's (EC) 28 member states voted against the EC's proposed regulations on C-ITS. This was due to a disagreement over whether such services should use WiFi or 5G networks. The European Commission had elected to use WiFi since it is proven technology that is readily available and this will enable a faster roll-out of C-ITS services. But then the European Council of Ministers quickly reversed the position to a neutral one by letting car manufacturers and operators decide what standard use for connected vehicles. The Council of the European Union is now likely to ask the Commission to redraft the legislation and return it to be voted on by the end of year.

The Volvo Group believes that adopting WiFi technology now will not prevent the adoption of 5G later on when the technology matures.

What is the EU doing to enable the further development of C-ITS?

In recent years the European Commission has been attempting to harmonize and coordinate efforts to develop C-ITS services within the EU. This includes establishing a regulatory and legal framework, and co-funding testing and development through the C-Roads project.

The EC's motivation for investing in C-ITS is that it believes the technology has huge potential for improving traffic safety and reducing accidents. As part of its 'Vision Zero' strategy, EC wants to halve road fatalities by 2030.

What's next?

The European Commission, and many OEMs, remain committed to developing C-ITS technology, and a number of OEMs – including the Volvo Group – are collaborating together to help establish common platforms. However, without a legally binding framework, development work will inevitably be hindered.

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