



# Call for help

Automatic emergency call systems are starting to become commonplace and being mandated in more parts of the world. What's the best way to implement the technology?

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**IMAGES** GM, RESCUE RELIANCE, MERCEDES-BENZ, FORD, BMW

If victims of a vehicle crash need to go to hospital, they should get there as soon as possible – ideally within 60 minutes, or the golden hour as it is known by emergency responders. But there can be a delay if the victims are unconscious or too injured, confused or lost to report the incident in detail or at all. Knowing that your car can call the emergency services on your behalf is reassuring, and such technology is offered by OEMs including BMW, Ford, GM, Lexus, Mercedes-Benz and Toyota.

Despite their many similarities, there are important differences between the systems offered. One is that some mediate calls through the OEM's own call center, while others route calls directly to the emergency services.

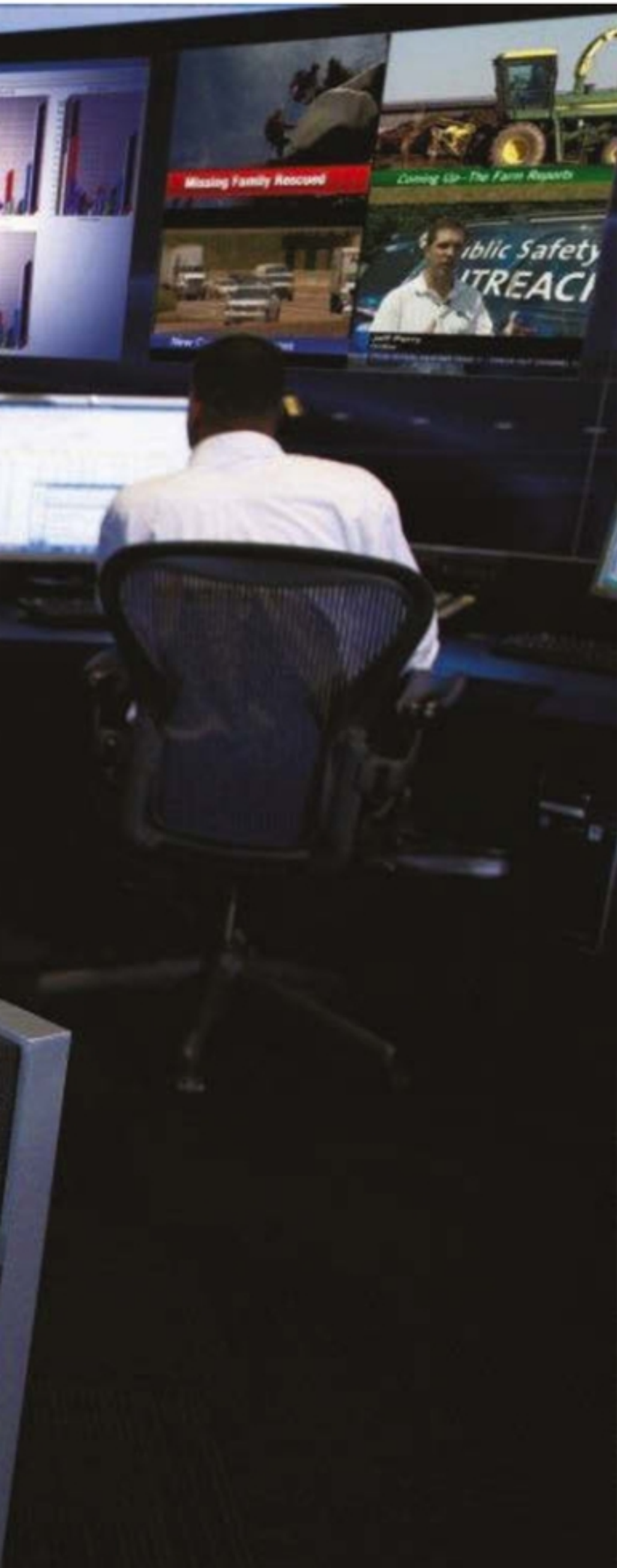
## Call centers

With GM's OnStar, if the occupants can press the red emergency button – often in the overhead console – they'll immediately be put through to a call center. In a situation where the airbag is deployed, a signal is triggered

automatically and two GM people become involved. One of these people calls the car to ascertain the condition of the people on board, while the other calls the emergency services. The staff are medically trained not only to offer first-aid advice, but also to act as calming influences.

GM says its around-the-clock service already has seven million customers in the USA, Canada, China and Mexico. On average it receives two calls every second and responds to nearly 5,000 car crashes every month.





## Knowledge is power

Brothers and firefighters David and Paul Smart are developing a handheld device to help rescue workers locate hazardous items that could otherwise hamper their efforts and endanger the lives of both rescuers and those trapped in a crashed vehicle.

"Rescue Reliance would enable first responders and extraction teams to ascertain the year, make and model of the vehicle, while schematics would show the location of all hazards, therefore greatly cutting the rescue time," explains David Smart. "People are going to stop dying because firefighters are searching for these hazards unnecessarily."

Hazards include the battery power supply, which can be difficult to locate because batteries are found in many places in modern cars – not just under the bonnet.

"It's important to disconnect or cut the power to the battery so that we can start the clock on when the airbags and seatbelt pre-tensioners become safe," said deputy chief William Ludlow of the Liberty Corner Fire Department in New Jersey, USA. "In hybrid vehicles, high-voltage battery cables can run

from the trunk to the engine and if you cut into one of those lines someone's going to get hurt."

Mark Rosenbaum, president of Liberty Corner EMS, also sees potential for medical information. "If EMS responders had a conveniently sized device we could carry to a crash scene with information about medicines, it would help us enormously in deciding how best to treat a patient, and what kind of report to give to the hospital, enabling definitive care to be provided more quickly," he comments.

David Smart says there is no current database with all this information. "It's a huge guessing game," he says. He believes his device will eradicate the guesswork, and is now seeking investment partners to "ensure product quality, reliability and total accuracy".



The call center approach enables GM to pass on detailed information to the emergency services about the nature and severity of the incident, gathered not only from talking to the victims, but also from the vehicle's sensors. OnStar users can also report other incidents on the road, and count on assistance in the event of severe weather and natural and man-made disasters.

### Availability

From October 2015, the OnStar network is set to expand as GM rolls it

out across Europe for its local brands Vauxhall and Opel. It will be offered as part of a bundle of wider products and services, including 4G in-car wi-fi and concierge services accessed via the vehicle's blue in-car button.

In the UK, the system will be offered free for the first year. It will be fitted as standard on the majority of Vauxhall's 2016 range, and as a cost option on some derivatives.

Benjamin Oberkersch, who represents connected car and infotainment communications at

[Main] An OnStar Command Center

[Top] David Smart, co-inventor of Rescue Reliance

[Above] OnStar users can call the Command Center at the touch of a button

Mercedes-Benz, believes the brand was one of the first to bring an emergency call system into its cars with Tele Aid in 1997. Within the company's Comand Online package there is a telematic communication unit (TCU), which has a built-in SIM card and is constructed to resist crashes. When there is a crash in which the airbags or seatbelt tensioners are deployed, the GPS position of the vehicle and the vehicle identification number are sent by text message to Bosch's emergency call center. The location data is



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transmitted via dual-tone multi-frequency signaling. Even if those involved in the crash are unconscious or don't know where they are, the communication center will still have enough information to let the emergency services know quickly.

Oberkersch says all new Mercedes-Benz cars are equipped with the system, which is free of charge for the life of the vehicle. "Even if they are in a foreign country, there won't be any costs for our customers," he says. "Mercedes takes care of the roaming fees."

With Mercedes-Benz's system, the call is made in the language selected by the driver in the Comand system. One potential issue with the call center approach, especially in a linguistically diverse region such as Europe, is the need to support many languages.

This factor has influenced the choice of location for GM's new European OnStar call center. GM has chosen Luton, just outside London, UK, reckoning it will be able to recruit speakers of numerous languages from the cosmopolitan capital city.

### Direct call

Another approach is to call the emergency services directly. Ford's offering – Emergency Assistance (EA) – takes this tack. It is available as part of Ford's widespread Sync in-car

software. It uses the occupant's Bluetooth-paired and connected cell phone to make a hands-free call in the event of a vehicle crash in which an airbag is deployed, or when the fuel pump shut-off is triggered. EA calls the appropriate public safety answering point for that country – for example, dialing 112 in Europe and 911 in the USA – direct, without what Wulf-Peter Schmidt, director of sustainability, advanced regulations and product conformity at Ford, considers "the delay of going through a third-party call center".

Schmidt says weaknesses with these systems include a reliance on the customer connecting their smartphone to the vehicle and stowing it somewhere safe, as well as the subscription fee model, as subscriptions can easily lapse. EA is provided free of charge for the life of the vehicle.

### More details please

Louis Lombardo, a USA-based automotive safety researcher and principal at Care For Crash Victims, still thinks more can be done. He wants more detailed information to be passed to emergency response centers in a simple way to cut the time taken for the right people and equipment to get to crash scenes – he wants a minimum federal safety standard.







(Far left) All new Mercedes-Benz cars come with Tele Aid

(Left) Ford's EA is part of its Sync software

(Below) BMW offers an emergency call function as part of the ConnectedDrive system

## ITS's role in optimizing emergency response

» In April 2014, two fire department trucks responding to emergencies collided at an intersection in Monterey Park, California, USA. The incident highlighted the need to address how multiple priority requests at intersections can be processed safely within an ITS.

A possible solution to this conundrum was put forward at the 21<sup>st</sup> ITS World Congress in Detroit, Michigan, USA, in September 2014. Econolite – in cooperation with the University of Arizona, Savari and Arizona's Maricopa County Department of Transportation SMARTDrive Program – showcased a V2X-based multimodal intelligent traffic signal system.

This demonstrated how several simultaneous high-priority requests, such as emergency vehicles, public transit and pedestrians, could be accommodated safely at an intersection, using existing technologies.

"Because they have airbags, all vehicles have sensors that tell you the principal direction and magnitude of force, and whether or not the vehicle rolled over," he says. "An algorithm can calculate automatically, within seconds, what the probability is that this crash has incurred a serious injury. If you're

an emergency medical worker wouldn't you want to know that right away? Currently, when a call comes into the dispatch center, they might send a police officer – but he or she might feel unqualified to judge, so they call for EMS who might arrive and say, 'How I am supposed to help this patient when I can't even get to them?'"

Lombardo says NHTSA can help. "They should be able to come up with minimum performance standards," he says. "Suppliers and auto makers can do different things to make their system better or cheaper than others. The algorithm would need to calculate the data and make it comprehensible for rescue workers. Perhaps there could be a simple red, yellow and green coding system to indicate the likelihood of serious injuries. This could also be used to justify calling air medical services if serious injuries are likely and the accident happened a certain distance from a hospital."

### Progress

Regulatory progress has recently been made in Europe. After years of debate, in April 2015 the European Parliament voted in favor of making an automatic emergency call system mandatory on all new vehicle types in Europe from April 2018. The chosen system is called eCall. It uses Qualcomm's data over voice technology to send a minimum set of data from the car – including the location and time of the crash, plus the direction of travel – directly to the emergency services.

It's a positive step that will give more people access to this life-saving technology, whatever new car they decide to buy. ◀

