Are driverless fire truck in our future?

Couple the fast pace of technological developments with the hazards of driving a fire apparatus, and the idea may not be so crazy

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Can you imagine a future where firefighters hop on the rig, sit back and let the truck do the driving? It could be possible soon thanks to technology being developed by Mercedes-Benz.

The company's commercial division unveiled its Future Truck 2025, which features autonomous driving technology that it says will allow drivers to take their hands off the wheel to manage other tasks while an autonomous Highway Pilot takes control.

Using a collection of radar sensors and cameras based on those already employed on some Mercedes-Benz automobiles, the truck can tap into proposed vehicle-to-vehicle and vehicle-to-infrastructure communications systems, while connecting to the Internet, and safely drive itself at speeds currently as high as 50 mph.

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Private transportation is not the only sector looking at driverless technology for moving important cargo more safely, effectively and efficiently. The U.S. military is also moving forward with technology to make truck convoys in hostile environments safer for its personnel.

Under an initial $11 million contract in 2012, Lockheed Martin developed a multi-platform kit that integrates low-cost sensors and control systems with Army and Marine tactical vehicles to enable autonomous operation in convoys. According to Lockheed, Autonomous Mobility Appliqué System also gives drivers an automated option to alert, stop and adjust, or take full control under user supervision.

In demonstrations at Fort Hood, Texas in January 2014, the U.S. Army Tank-Automotive Research, Development and Engineering Center and Lockheed Martin demonstrated the ability of AMAS, which gives full autonomy to convoys to operate in urban environments. In tests, driverless tactical vehicles were able to navigate hazards and obstacles including pedestrians, oncoming traffic, road intersections, traffic circles and stalled and passing vehicles.

DRIVERLESS FIRE APPARATUS

Admittedly, this is an exercise in forecasting. However, nothing positive in the fire service has ever come without someone asking, "What if?" Look at today's PPE, breathing apparatus, portable radios, thermal imaging cameras, etc., for proof of that. Here's a look into my crystal ball for eight possible applications.

1. They will avoid traffic collisions caused by civilian driver errors such as poor reaction time, tail gating, rubbernecking and other forms of distracted or aggressive driving.

2. They will avoid traffic collisions caused by lack of drivers experience in operating large vehicles like fire apparatus.

3. They won't be subject to the adreneline rush and tunnel vision even the most experienced drivers fall prey to.

4. The fire trucks would receive dispatch coordinates for the location of a call before the crew gets onboard.

5. Backing accidents would become a thing of the past as the truck carries out the operation completely using its exterior cameras and sensors that provide real-time 360-degree input to the vehicle controller.

6. Accidents involving the elevation and placement of aerial devices would be alleviated through similar real-time, 360-degree input from cameras and sensors on the aerial devices.

7. Off-road vehicle crashes would be eliminated because the vehicle's movements would be based solely on its processing of terrain, slope and grade, and surrounding obstacles.

8. Support vehicles — tenders, mobile command posts, hazmat units, multiple casualty incident units, etc. — response would not be dependent upon having a human driver available.

CURRENT STATE OF DRIVERLESS TECHNOLOGIES

Driverless vehicles detect surroundings using radar, lidar, GPS, odometry and computer vision. Advanced control systems interpret sensory information to identify appropriate navigation paths, as well as obstacles and relevant signage.

Autonomous vehicles have control systems capable of analyzing sensory data to distinguish between different cars on the road, which is very useful in planning a path to the desired destination.

In the United States, the National Highway Traffic Safety Administration has proposed a formal five-level classification system for automated vehicles.

Level 0
The driver completely controls the vehicle at all times.

Level 1
Individual vehicle controls are automated, such as electronic stability control or automatic braking.

Level 2
At least two controls can be automated in unison, such as adaptive cruise control in combination with lane keeping.

Level 3
The driver can fully cede control of all safety-critical functions in certain conditions. The vehicle senses when conditions require the driver to retake control and provides a "sufficiently comfortable transition time" for the driver to do so.

Level 4
The vehicle performs all safety-critical functions for the entire trip, with the driver not expected to control the vehicle at any time. As this vehicle would control all functions from start to stop, including all parking functions, it could include unoccupied vehicles.

Driverless fire apparatus may seem like something only the writers for the Jetsons dreamt up. Yet that far-fetched concept may not be as far off in the future as we think.

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