The future transportation

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Head-up displays, or HUDs, project turn-by-turn directions and other vehicle information onto a windshield or reflector screen, and the technology is quickly making its way into new vehicles.

They pair with GPS hosted either by a car's own system or a driver's smartphone to display everything from simple directions to blind-spot detection, pedestrian recognition and collision warnings. The idea behind HUDs is to communicate critical data without diverting the driver's eyes from the road. BMW claims its HUD system allows drivers to process information 50% faster than when it is served up by a dash-mounted multimedia screen.

Though they were pioneered by General Motors in the late 1980s, HUDs were only found in 2% of new cars sold last year, according to industry analysis firm IHS Automotive. But by 2020, IHS expects that percentage to rise to 9% – more than 9m vehicles worldwide. Right now, most HUD technology pick-up comes from luxury brands, but mid-range models and after-market offerings are starting to take off as well.

Garmin recently introduced a portable HUD model that pairs with a smartphone via Bluetooth to display turn-by-turn directions on a small, transparent film on the windshield or reflector attached to the device. Aside from regular navigation, the unit indicates which lanes allow turns at intersections, if the vehicle has exceeded the speed limit and where traffic cameras are located.

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A report released earlier this year by TechNavio, a technology research firm, noted that HUDs would gain popularity over the next few years as the technology was introduced into more mid-range models, which would in turn lower system prices. Mazda has apparently received that memo; the company announced in June that its new 2014 Mazda 3, a compact vehicle, will have an optional HUD unit.

The end game of HUD technology reaches much deeper than the current navigation or collision warning features might suggest. The technology is already pointing toward what carmakers and futurists call augmented reality. Through sensors and cameras, HUD systems can be programmed to recognize real-world landmarks and locations and then display information about them on the windshield.

Mercedes is working on such a programme called the Dynamic and Intuitive Control System (DICE), which pairs gesture-command controls with projected, dynamic information. Pioneer also manufactures an HUD “ augmented-lite” system that uses cameras to recognise roadside objects and project information about them onto an in-car screen using – what else? – lasers.

IHS has noted that automakers could eventually turn the entire windshield into an augmented reality screen. The safety implications, of course, are unknown, but if HUDs are truly an antidote to mounting evidence that digital multitasking behind the wheel is hazardous, it would greatly ease their acceptance. by zuha nihan naseer