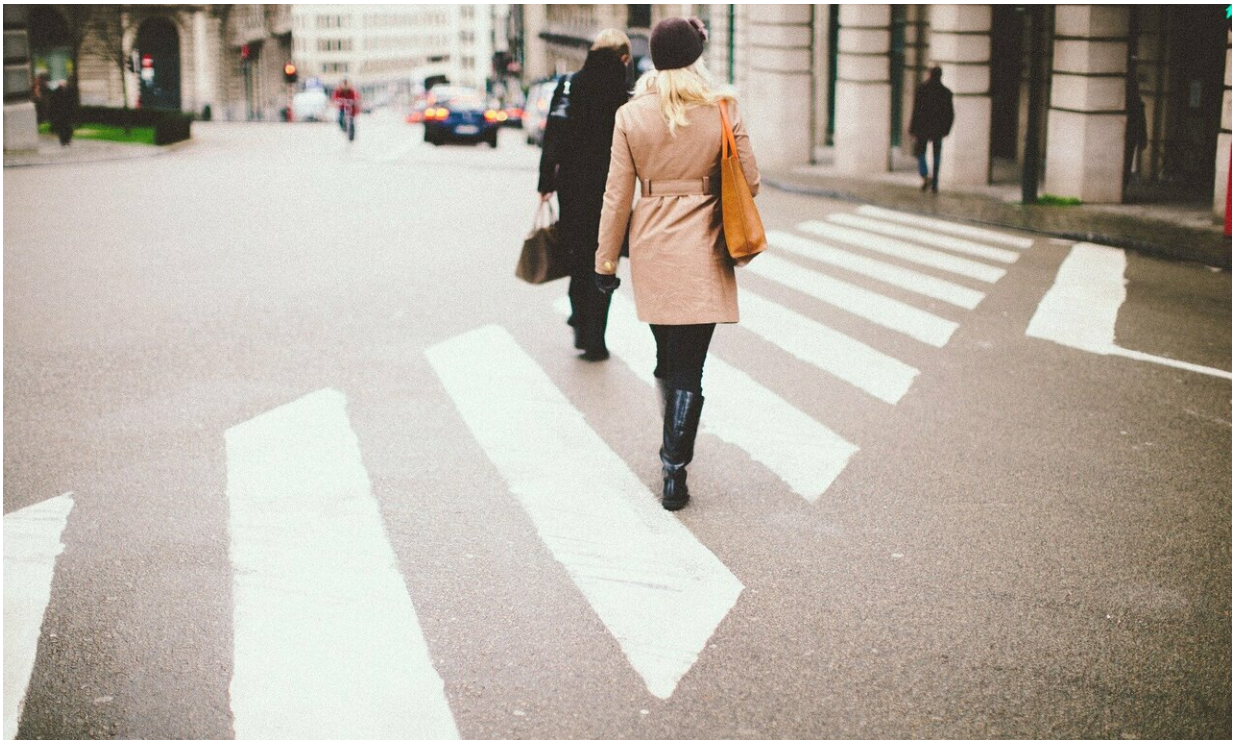


# Blinking ground lights developed to ensure pedestrian traffic safety

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The Korea Institute of Civil Engineering and Building Technology (KICT, President Seung Heon Han) has announced the development of its "next-generation pedestrian traffic accident prevention system." The system induces motor vehicles approaching crosswalks to reduce their speed, thereby reducing pedestrians' traffic accidents.

Pedestrian safety at crosswalks is an area that needs immediate improvement, especially given that 52.9 percent of the pedestrian [traffic](#) accident deaths over the last five years occurred at crosswalks. It is difficult for motor vehicle drivers to respond promptly to the sudden appearance of pedestrians on roadways based on visual identification alone. Ensuring [pedestrian safety](#) is even more difficult at night, when visibility is low, and in the case of children and the elderly, who may be limited in their ability to judge [oncoming traffic](#). Recently, there has been a rise in the number of traffic accidents involving pedestrians crossing the street while looking at their smartphones. In fact, a new term "phone-rani" (smartphone + gorani, which loosely translates as "deer in the headlights") has been coined to describe such pedestrians.

A research team led by Dr. Jong Hoon Kim at the KICT has developed a system to prevent pedestrian traffic accidents that notifies motor vehicle drivers of pedestrians, and also notifies pedestrians of oncoming traffic.

The system uses warning lights and electric signs to notify drivers of pedestrians in the crosswalk. Thermal imaging cameras used in the system are less sensitive to changes in intensity of illumination during day and night than other cameras, and are excellent for identifying people and objects. When the system recognizes a pedestrian approaching the crosswalk, high-intensity crosswalk-embedded LED lights embedded in the pavement on both sides of the crosswalk are activated. These LED lights maintain a brightness level of  $220 \text{ cd/m}^2$ , which are visible from 50 meters away, but not bright enough to disrupt a driver's field of vision. When a vehicle gets within 30 meters of the crosswalk, an electronic sign (VMS) blinks to alert the driver once again that a pedestrian is crossing.

Testing approximately 1,000 vehicles at the system test site showed that 83.4 percent of vehicles, including those that came to a complete stop at the crosswalk, became aware of pedestrians and reduced their [speed](#). In

roads where the speed limit is 50 km/h, as the vehicles were approaching to the crosswalk with pedestrians, the average speed of vehicles was reduced to 26.8 km/h, indicating that the drivers were decelerating to just about half the speed limit. Compared to the average speed of 32 km/h of vehicles approaching the same crosswalk before the system was installed, the system assisted in reducing the average vehicle speed by nearly 20 percent.

The system also alerts pedestrians about approaching vehicles using a three-way alarm system. When a [vehicle](#) traveling 10 km/h or faster is approaching the [crosswalk](#), a projector (logojector) projects a warning image on the ground. An auditory alarm system goes off, and a smartphone application warns the user through the vibration and alarm notification. This three-way warning system is expected to be especially effective for the elderly, who often look down at the ground as they walk, children, who are less aware of oncoming traffic, and pedestrians using smartphones.

Dr. Jong Hoon Kim of the KICT, who is in charge of the research project, said, "We expect outstanding results when the system is installed at crosswalks without traffic signals and crosswalks on rural highways, where the rate of [pedestrian](#) accidents is high. We intend to continue to develop the system so that drivers can be notified of upcoming crossings via their navigation apps, and vehicles can automatically slow down when dangerous circumstances are detected."

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