Understanding
the distracted brain

WHY DRIVING WHILE USING HANDS-FREE
CELL PHONES IS RISKY BEHAVIOR
White Paper April 2012

Driving risks of hands-free and handheld cell phones

We now understand how our brains have difficulty juggling multiple cognitive tasks that demand our attention. Next we will discuss specific risks that cell phone conversations bring to driving, with an overview of crash risks and driver errors most often associated with both hands-free and handheld cell phones.

Inattention Blindness – Vision is the most important sense we use for safe driving. It's the source of the majority of information when driving. Yet, drivers using hands-free and handheld cell phones have a tendency to "look at" but not "see" objects. Estimates indicate drivers using cell phones look at but fail to see up to 50 percent of the information in their driving environment.[48] Cognitive distraction contributes to a withdrawal of attention from the visual scene, where all the information the driver sees is not processed.[49] This may be due to the earlier discussion of how our brains compensate for receiving too much information by not sending some visual information to the working memory. When this happens, drivers are not aware of the filtered information and cannot act on it.

Distracted drivers experience inattention blindness. They are looking out the windshield, but do not process everything in the roadway environment necessary to effectively monitor their surroundings, seek and identify potential hazards, and to respond to unexpected situations. Their field of view narrows.[50] To demonstrate this, Figure 4 is a typical representation of where a driver would look while not using a phone. Figure 5 shows where drivers looked while talking on hands-free cell phones.[51]

Drivers talking on hands-free cell phones are more likely to not see both high and low relevant objects, showing a lack of ability to allocate attention to the most important information.[52] They miss visual cues critical to safety and navigation. They tend to miss exits, go through red lights and stop signs, and miss important navigational signage.[53] Drivers on cell phones are less likely to remember the content of objects they looked at, such as billboards. Drivers not using cell phones were more likely to remember content.[54]

The danger of inattention blindness is that when a driver fails to notice events in the driving environment, either at all or too late, it's impossible to execute a safe response such as a steering maneuver or braking to avoid a crash.[55]

To explore how cell phone use can affect driver visual scanning, Transport Canada's Ergonomics Division tracked the eye movements of drivers using hands-free phones, and again when these drivers were not on the phone. The blue boxes in Figures 4 and 5 show where drivers looked.[56] In addition to looking less at the periphery, drivers using hands-free phones reduced their visual monitoring of instruments and mirrors, and some drivers entirely abandoned those tasks. At intersections, these drivers made fewer glances to traffic lights and to traffic on the right. Some drivers did not even look at traffic signals.[57]

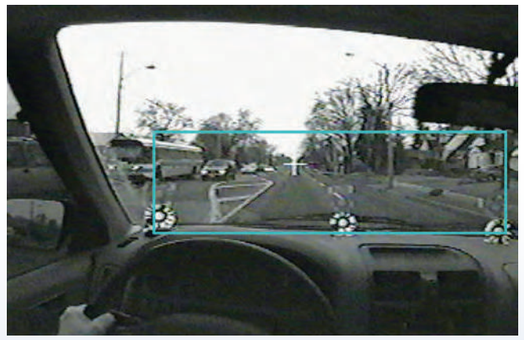

Figure 4. Where drivers not using a hands-free cell phone looked.
Source: Transport Canada

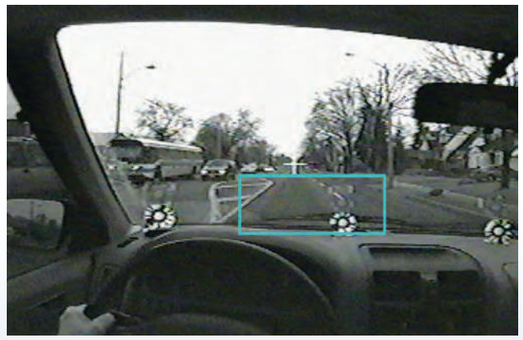

Figure 5. Where drivers using a hands-free cell phone looked.
Source: Transport Canada

In-Road Crosswalk System

The **LaneLight in-road** crosswalk system significantly enhances pedestrian safety by creating a highly visible barrier of bright, flashing LED lights directly within the driver's line of sight. By embedding these lights into the pavement at crosswalk locations, the system provides a clear and immediate warning to approaching vehicles, especially in low-light conditions or when drivers are distracted. This direct visual cue dramatically increases driver awareness, compelling them to yield to pedestrians and effectively reducing the risk of accidents at crosswalks.

- Ideal for mid-block crosswalks
- Ultra-bright > 3.5 million candela / m^2 output
- 3000 foot daytime visibility
- Targets the tunnel vision of a distracted driver
- Low Profile: Snowplow Safe / Bicycle Safe
- Standard or enhanced flash patterns
- Passive activation options available
- Solar or AC power configurations
- Self cleaning design / Near Zero maintenance
- Various signage options are available, including LED enhanced, advanced warning, and custom-designed signs


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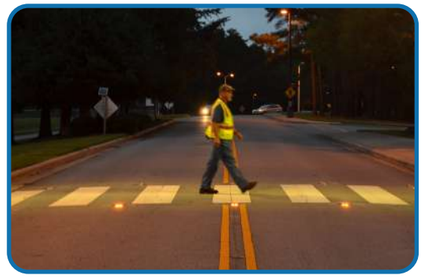
W11-1



PUSH BUTTON

Improve accessibility at crosswalks and beyond with the most durable push button on the market.

- POLARA™ BULLDOG
- POLARA™ APS
- Other manufacturers available
- Sustainable operation in solar- and off-grid installations due to low power draw.
- Strong design, little maintenance, even in tough climates.
- ADA, MUTCD, and Buy America compliant; independently tested and certified to meet or exceed industry standards.

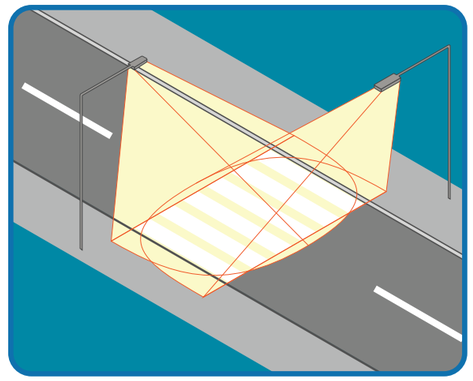
TOUCHLESS ACTIVATION PHOTO BOLLARDS

These photo bollards offer a touchless activation system, capturing nearly all pedestrians and cyclists passing between them. Eliminating physical contact, the system activates based on presence or movement within the sensor's zone, ensuring reliable pedestrian detection. Configurable for uni-directional or bi-directional travel, and with optional LED illumination, they're ideal for busy crosswalks near schools, hospitals, and airports. This touchless technology effectively addresses compliance issues associated with traditional pushbuttons, enhancing safety and accessibility.

CROSS-LIGHT

With a CROSS-LIGHT ILLUMINATED WARNING SYSTEM, pedestrians gain significantly enhanced visibility at crossings, thanks to being laterally illuminated for the approaching traffic. Pedestrians become optimally visible due to their contrast against the background created by the laterally shed light.

- Solar or AC
- Sealed LED unit
- Value option with spotlights available
- Energy saving thanks to the use of high-power LEDs
- Optimized thermal management ensures long LED life
- Ambient light-based activation – only activates when pedestrians cross after dark



Nothing compares to a LaneLight IRWL crosswalk system in the eyes of a distracted driver.