

# Rethinking Light

## Motion Sensors Approved by City Council

By Bryan Purcell

**ARE THE** lights on, but nobody's literally home? Motion sensors can save energy – and dollars – by dimming lights when an area is not in use and quickly lighting things up when a user arrives. However,



until recently, motion sensors were only allowed in spaces like laundry and storage rooms, which excluded most of the common area lighting in condominiums. That changed in late August when Toronto City Council passed an amendment to the property standards code to allow the use of motion sensor-controlled lighting in parking garages and corridors as well.

### ■ A Brief History

Motion sensor technologies have been available for decades, and are commonly used in many other jurisdictions around the world. The Ontario Building Code was revised in 2006 to allow motion sensor lighting – in fact, new buildings are actually *required* to have automated

lighting controls. But this conflicted with the Toronto Municipal Code, which required mandated light levels to be maintained at all times (inadvertently prohibiting motion sensors).

After two years of consultation with building owners, Toronto Fire, Toronto Police, and other stakeholders, the City has developed and passed an amendment to the Municipal Code to allow the use of motion sensor-controlled lighting. Under the revised code, the only common areas where motion sensors are still not allowed are stairwells and lobbies.

Recognizing that the security and comfort of building users is of prime importance, the new bylaw includes a number of provisions, some of which go above and beyond those in the Ontario Building Code. Key requirements include:

- An average standby lighting level of at least 10 lux (1 footcandle) is still required in corridors and garages even when no motion is detected
- Motion sensors must reliably activate full illumination within two seconds of any movement

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- Full lighting must be maintained for at least 15 minutes following the detection of any motion

While some people's first impression may be that motion sensor lighting will leave residents in the dark, a well-designed motion sensor system will ensure that this never happens because the standby lighting level required by the bylaw ensures that the lights are never completely off. Moreover, in a corridor, the motion sensors should trigger full lighting for the entire hallway before residents even step outside their front door.

### ■ Best Practices – Underground

One of the best fits for motion sensor lighting is usually in parking garages. For small- to medium-sized garages, motion sensor systems can be designed so that residents are completely unaware of them. Scout sensors outside garage entrances restore full lighting before they even enter the garage, while sensors within the garage ensure the lights stay on as long as someone is there. In larger garages, it is often better to separate the garage into different zones, with standby lighting in empty zones and full lighting in occupied zones. Done right, this approach can even enhance residents' feelings of safety by alerting them to the presence of others in the garage.

A survey of residents in a building recently equipped with motion detectors in its underground garage reported, for example, that their sense of personal safety was positively impacted by the fact that motion sensors were being used and no one expressed concern at the lower levels of light when motion had not been detected." As one resident explained, "I feel much safer in the garage now because if someone's down there, you know – even if you can't see them. The old lights don't move, so you just wouldn't know."

Because the change from standby to full lighting happens almost instantaneously (in two seconds or less), residents never find themselves in a minimally lit area and have plen-

ty of time (15 minutes) before further movement needs to be detected for lighting levels to remain high. In most cases, residents will actually have long since moved through an area before the lights dim again. In the words of one surveyed resident "There's plenty of time. They don't just click on and off. They stay on for a while."

Meeting the new Municipal Code standards does, however, create some technical challenges and, unfortunately, it is not as simple

as buying a few motion sensors and having your electrician install them. You'll need a qualified contractor to design and install a motion sensor system that works for your building(s). You should also make sure that your contractor(s) is familiar with the new motion sensor regulations and has a plan to make sure your building will be in compliance.

If your building's emergency lighting is provided through a separate emergency lighting circuit, then



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keeping this circuit separate from the motion sensor system should provide the standby lighting level required by the new bylaw. Alternatively, you can use dimmable or dual-level light fixtures or low-voltage powerline communication to leave some fixtures on while others are turned off.

In some cases, your existing light fixtures may not be compatible with motion sensor technology. This doesn't necessarily mean you can't take advantage of the new rules however. Consider upgrading to newer more efficient light sources

(such as LEDs or T8 fluorescents) at the same time as you install a motion sensor lighting system. This will get you the deepest energy savings, and in many cases will still provide a very attractive return on investment.

The Toronto Atmospheric Fund recently completed two pilot projects using motion sensor lighting in the parking garage of two multi-unit residential buildings. For these pilots, the existing high pressure sodium lighting systems were replaced with high-efficiency T8 fluorescents with bi-level ballasts,

and motion sensors were installed throughout the garage. The overall result was a 70% reduction in the electricity used to illuminate the garage, with a retrofit payback of under four years (without taking into account electricity conservation incentives!).

Over and above paying for itself, the project will provide an additional 167% return on investment through energy cost savings over 10 years. Moreover, our survey of residents revealed that they overwhelmingly preferred the new lighting system.

So motion sensors are definitely worth taking a look at, especially if you are considering an upgrade to your lighting system. Just make sure you and your contractor(s) do your homework so you end up with a motion sensor system that is safe, reliable, affordable, and in compliance with relevant bylaws and codes. ■

*Bryan Purcell is with the Toronto Atmospheric Fund. He can be reached at [bpurcell@tafund.org](mailto:bpurcell@tafund.org).*

*Fanshawe College is pleased to announce our recent partnership with the Association of Condominiums of Ontario (ACMO) and will proudly be offering the educational part-time program for those working towards their Registered Condominium Manager (R.C.M) designation. Classes are set to begin in Fall 2010.*

**For more information contact:**

Jason Kerr  
 Program Consultant  
 519.452.4430 x4097  
[jkerr@fanshawec.ca](mailto:jkerr@fanshawec.ca)