



BY LEON WASSER

Greening Your Parking Facility

Canadian facility managers are increasingly turning their focus to issues relating to sustainability. Formal programs such as BOMA's Go Green Plus, the Canadian Green Building Council's LEED® AP programs and sector specific green certification initiatives are all testaments to a growing focus across the property management sector to green strategies in all types of facilities. While each building sector has its own focus, most incorporate the common goals of reducing a building's carbon footprint by better management of solid wastes, reduced water consumption, reduced use of volatile cleaning solvents and other innovative eco-friendly measures. For many building owners and managers, however, the single most important environmental preoccupation today is reducing energy consumption and containing upwardly spiralling energy costs.

Parking operators have some unique challenges in greening their operations due to the constraints imposed by the limited dimensions of their operations. While parking professionals can consider incorporating bike parking facilities or integrating car-share programs into their locations, managers with a mandate or interest in greening their operations appear at first glance to have few viable options, as will be shown below, this in fact is not the case.

■ ENERGY CONSERVATION OPPORTUNITIES FOR PARKING OPERATORS

For most parking facility operators, energy costs are among the largest variable expenses in their operating budgets. In addition, in recent years, energy costs have begun to grow quickly, but these cost increases pale in comparison with the energy price escalation expected in the very near future. In addition, the rapid deployment by utilities of "smart meters",

"time of day pricing strategies" and a growing number of energy system surcharges will further escalate energy costs for most businesses.

In addition, tenanted parking operations can expect to face additional downloaded energy costs from their landlords as building owners increasingly implement "smart sub-meters" and other pricing mechanisms to mitigate their own escalating energy costs.

For all these reasons, managing energy costs should become an increased focus for all bottom-line oriented parking facility managers. Thankfully, however, parking operators now have a growing arsenal of energy options to deploy to better control their costs and protect their profit margins. It is recognized that each type of parking facility has its own characteristic energy consumption profile depending on a number of key design and operating factors. These energy consumption profiles help determine what energy solution is best suited to the facility.

■ SURFACE PARKING LOTS

For surface parking lots, night-time flood lighting is the dominant energy factor. Flood lights are very energy intensive, but operate only during night time hours. Fortunately, power costs are now generally at their lowest at night time so these operators are partly protected from rising energy costs. Operators should understand that different lighting systems have different design power requirements so there may be an opportunity in these locations to implement a control system at a minimal cost to reduce voltage supplied to the flood lights to a design threshold which reduces power costs without significant effect on illumination.

■ UNDERGROUND GARAGES

Underground parking facilities require lighting during all operating hours, which

often is 24 hours, 365 days a year. Depending on operational demands and code requirements, they may not require full lighting all of those hours, so the implementation of a lighting control system can significantly reduce power consumption in underground facilities.

■ PARKING STRUCTURES

Determining the lighting requirement for a multi-level parking structure is a more complex matter, which requires special attention and study. To a large extent, the power and lighting demands for multi-tier parking structures is determined by the amount of ambient light available within the facility during daylight hours. In fact, the opportunity to "harvest daylight" is a major preoccupation in the design of all new Green Buildings. Because lighting demand can change rapidly over the course of the day and season, the ability to incrementally control a parking structure's lighting system can yield significant savings to a parking structure operator.

■ LIGHTING RETROFIT PROJECTS

One of the surest ways to reduce lighting system's power consumption is to retrofit the lighting system with more energy efficient options where practical. In interior facilities, many parking operators have already converted from HID lighting to florescent systems such as T8. One of the key challenges with any lighting retrofit is that it can be both costly and labour intensive since most require conversion of lighting fixtures, and some require rewiring of the lighting system, either way, to incorporate a new deployment pattern for the fixtures, and sometimes difference voltage or wattage requirements. In any case, a lighting review is required whenever a wholesale retrofit is contemplated.

■ LIGHTING CONTROL SYSTEMS

Another approach to lighting system energy conservation is through the continued employment of the existing lighting system infrastructure enhanced by the implementation of an effective lighting control or management system. Toronto Eaton Centre's Yonge Street Parkade (parking structure), Manulife Centre (underground garage) and a variety of surface lots use a customized solution that reflects the following lighting system design characteristics:

- Lighting technology (e.g. metal halide, mercury vapour, fluorescent etc.)
- Total number of fixtures
- Individual bulb wattage & total wattage
- System voltage
- Lighting system operating hours
- Load balance between phases

The system's savings opportunity comes from reducing the voltage fed to lighting fixtures down to their threshold design requirements, since excess voltage often does not contribute additional lumens to a lighting system and is therefore wasted power. In addition, a programmed lighting control system allows operators to automatically reduce lighting levels when not required by regulation or for operations. In general, more control over the lighting system provides operators far more savings. One attractive feature of a lighting control system is that because it is designed as a retrofit kit the lighting system control panel can be relatively easily added to any existing lighting system adjacent to the parking facility's lighting panel, so installation work is limited and shutdown time is minimal.

■ PAINTING PARKING GARAGES

One further measure that can be used in conjunction with lighting system upgrades is to paint garage facility walls and ceilings with reflective paint. Painting a facility with a

highly reflective, usually white, paint helps maximize a facility's illumination from the lighting system.

■ ELECTRICALLY HEATED RAMPS

One major energy demand that is more common in Canada than perhaps in other jurisdictions is the use of electrically heated ramp systems. It should be acknowledged that using electricity for heating is fairly costly and inefficient, which is why electrical heating systems in new commercial buildings have become less and less common.

Heated embedded electrical ramp heating systems do however make great sense in our unpredictable winter climate, and the combination of safety improvement, convenience and reduction of salt consumption make embedded ramp heating systems an attractive option for environmentally exposed parking ramps. Perhaps the best to manage the power consumed by these systems is through an innovative and unique new ramp heater control system. The control panel for the ramp heating system is easily mounted and programmable to meet the specific requirements of the parking facility using a variety of set points, timers and algorithms. This offers the facility manager far more control over the power used by the ramp heaters.

■ GREEN ENERGY

One additional energy opportunity has emerged in recent years as the Canadian energy sector has increasingly deregulated. In some jurisdictions, facility operators are now permitted and indeed encouraged to produce "green renewable energy" through the use of solar photovoltaic (PV) panels, windmills and solar thermal panels. Ontario's new "Feed in Tariff" program offered through the Ontario Power Authority (www.powerauthority.on.ca), for instance, offers facility managers long term

guaranteed contracts for supplying green renewable electricity produced at the facility. In addition, parking managers can also incorporate solar thermal panels to generate hot water either for domestic use in washrooms or kitchens, or for thermal heating systems. This new opportunity is highly complex, both from a technological perspective and due to complex regulatory requirements, so the help of a consultant is essential to ensure a successful green energy project.

■ ENERGY STUDIES & PLANS

The best place for a parking manager to initiate an energy strategy may be by engaging a consultant to review a parking facility's operations and design features to identify opportunities for energy conservation and, in some cases, where the facility can incorporate green energy potential. In many jurisdictions there are specific incentives for studies and other project elements.

■ CONCLUSION

Energy should become a greater focus of attention for parking facility managers as power costs continue to escalate, and as the deployment of intelligent meters by both utilities and landlords increase. Some of the best energy conservation options include lighting retrofit projects, the installation of a lighting control system and installation of a ramp heater control system where appropriate. Parking operators that have multi-level parking structures extending to roof-level can also exploit the opportunities for generating green energy. Incentive funding is available to defray the cost of energy studies, energy conservation projects or green renewable energy projects in different parts of Canada. Investing time and effort in reviewing energy options for parking facilities makes more sense than ever, and is the environmentally correct thing to do today. ■

Leon Wasser MBA, P.Eng. is the President of Wasser Resources Inc., a consultancy in the fields of corporate sustainability, green buildings, energy conservation and green energy. Leon can be contacted by email at Leon@WasserResources.com or by phone at (416) 638-1353.

