



Parking Guidance System Technology Leads to Smarter Garages

Ken Wagner, National Market Development Manager,
Carlo Gavazzi, Inc.

Parking guidance system technology guides drivers to open spaces in parking garages. Photo courtesy of Carlo Gavazzi, Inc.

New and emerging technologies are affecting today's parking facility in ways barely imaginable just a few years ago. Exciting technologies like LED lighting and demand-based ventilation are generating tremendous results in the areas of energy conservation and management. These innovations are saving appreciable amounts of money through reduced energy usage while helping owners meet sustainability and "green" initiative benchmarks and goals.

One emerging technology of the "In-Garage" technology revolution benefits not only the owners and operators, but the actual users—the parkers. This new technology is known as parking guidance system technology, or PGS.

How PGSs Work

PGSs are microprocessor-based control systems that rely on a network of software, signs, and sensors to intelligently guide drivers to open spaces. Dynamic signs are strategically placed within the garage and near main entrances to visually communicate an accurate number of open spaces available to parkers and directional arrows that lead the way. Vehicle detection sensors are installed above the individual parking spaces. Most sensors use an ultrasound technology for sensing vehicles, similar to the principal that bats use for finding flying insects.

Drivers look for super bright red and green LED lights above each space. It immediately indicates if a space is occupied or open. These indicators are viewable from wide angles hundreds of feet away and serve as beacons to drivers seeking an open space. Other LED color variations can be freely incorporated based upon need for handicapped accessible spaces as well as special purpose parking spaces such as jurors, day surgery, VIP, etc. Imagination is the limit.

SOFTWARE

A tremendous tool for owners and operators of the parking garage is software. PGS software provides real-time status of every space and level in the garage. There are also alarm functions that can be programmed to alert the garage operators of abandoned vehicles, critical shortages of handicapped spaces, and just about any other garage condition.

In addition to knowing the real-time status of a facility, PGS software also collects detailed data for further analysis. This data can be presented and viewed in simple raw spreadsheets or in graphic representations.

MOTIVATIONS

The common goal behind deploying PGS technology is to get drivers parked as quickly and as efficiently as possible. This goal is consistent throughout the industry. However, the motivations behind this common goal vary.

Sometimes deploying a PGS solution is simply customer satisfaction. This is especially true in hospitals where the overall patient experience is highly valued. First and last impressions are strongly formed by the time spent parking.

Another reason behind PGS technology is to gain a competitive advantage. A good example is the system installed at Baltimore/Washington International Airport (BWI). This airport serves the Baltimore and Washington, D.C., metropolitan area, a market also served by Washington Dulles, Reagan National, Harrisburg (Pennsylvania) International, and Philadelphia International. Competition is fierce. The PGS at BWI improves the customer experience. With other factors being similar or equal among the competing airports, the benefits from such a system can positively impact the flying public's choice of venue.

In addition to competitive pressure and customer benefits, parking guidance technology can be used to directly affect profits. Higher space utilization and repeat customers translates into more revenue. The average monthly cost of a parking space exceeds \$400 in mid-town Manhattan and \$390 per month in Boston that eclipse \$4,000 per year. If spaces can be booked, or “turned” more efficiently, revenues increase accordingly.

Green Initiatives and Sustainability

PGS is also a great compliment to “green” initiatives because these systems get the cars parked with the engines off up to 30 percent faster, according to some studies. This reduces the amount of exhaust gas and the amount of time that ventilation fans have to be operated in order to clean the air of harmful exhaust fumes.

Frank Nagle, principal and founder of Nagle Energy Solutions, LLC based in Menlo Park, California, is a leading expert for the intelligent control of parking garage ventilation systems using a patented algorithm for demand control variable flow ventilation.

“Nagle Energy Solutions has achieved no less than a 93 percent kWh savings for all of our clients, reducing their peak kW demand by no less than 95 percent. In two instances, we achieved a 97 percent kWh savings¹,” he said.

Green Parking Council (GPC), an organization immersed in the greening of parking garages, works at the intersection of parking, green building, clean technology, renewable energy, Smart Grid infrastructure, urban planning, and sustainable mobility. It encourages exceptional industry transformation through partnerships, creativity, and ingenuity by challenging the industry to collaborate and create open-sourced, sustainable best practices.²

No matter the motive or the reason, parking guidance technology leads drivers to the open available spaces more quickly, more efficiently, and more easily than signs alone.

Looking Ahead

The infrastructure that comes along as an integral element of an installed PGS brings much opportunity for future innovation. Once wire and cable is installed, this same “backbone” can be used to add necessary and desired building automation functions as technology needs arise.

A great example of this would be the inclusion of occupancy motion sensors that interface with a controller to turn off

lights if no movement or activity is detected after a certain amount of time and turn them back on immediately upon sensing people entering the garage. This can present an enormous benefit in energy cost savings.

Duress or emergency call stations can also be placed throughout a garage where needed for people in trouble or need. These stations can easily utilize the existing infrastructure of the PGS for the call station system making for a much less expensive and faster installation.

Another key development is with interoperability and intercommunication. Several organizations, in a joint endeavor funded by the U.S. Department of Transportation’s Research and Innovative Technology Administration (RITA), developed a protocol that manufacturers of transportation equipment can use to communicate across brands and across devices.

This is known as the National Transportation Communications for Intelligent Transportation Systems Protocol (NTCIP). The organizations involved in this development are:

- NEMA
- American Association of State Highway and Transportation Officials
- Institute of Transportation Engineers

Progressive manufacturers of PGSs, message displays, and other traffic management concerns are adapting the capability of their equipment and systems to work seamlessly with the NTCIP standard. This will allow space available and count data to be shared with the larger macro transportation systems in use by federal, state, and local transportation entities.

In addition to PGSs, NTCIP is in wide use by companies involved with traffic signal systems, variable message signs, and environmental sensor stations. Learn more at www.ntcip.org.

PGS technology is making a tremendous contribution toward the advancement of more efficient and sustainable parking facilities and helps to foster very real mutual benefits for parking owners, operators, and users of these facilities alike. ☺

Mr. Wagner (kwagner@carlogavazzi.com) is actively involved with the advancement of parking guidance technology and energy management systems. In addition to participation in NEMA 3TS, he is involved with the International Parking Institute, National Parking Association, and other technical and trade organizations.

¹ www.nagle-energy.com

² www.greenparkingcouncil.org