

## THE WEBSITE FOR THE ROAD TRAFFIC INDUSTRY

### INDUSTRY PROJECTS



## HOBOKEN GARAGE AUTOMATIC PARKING SYSTEM - NEW JERSEY, USA

The Hoboken Garden Street Garage Automated Parking System opened in October 2002 (although operating fully automated since May 2002). The Hoboken Parking Authority spent \$6.2 million on this facility. The Robotic Parking System accommodates 312 cars; a conventional ramp style garage accommodates 90 cars. The automated parking system facilitates the movement of cars throughout a 312-position, seven storey residential parking garage. The development is on a 100ft<sup>2</sup> lot, standing 56ft high (7.5ft from level to level). It allocates parking spaces for the incoming cars, retrieves parked cars as requested and monitors the whole system for preventive maintenance.

Using the same methodology, just in reverse, the system retrieves the pallet and the vehicle. Notably, the vehicle never leaves the pallet to which it is initially assigned at any time.

### AUTOMATED PARKING SYSTEM

Robotic Parking™ Automated Parking System is an advancement on the original mechanical models. The automated parking process offers a patented Modular Automated Parking System (MAPS). This system uses the latest electronic and automation technology.

The system is extremely safe and convenient for users. The risk of any vehicle damage is minimal, and theft and the risk of personal injury or robbery that occur in regular parking lots is non-existent; drivers remain safely outside the building at all times.

### MOTION CONTROL SYSTEM AND ROBOTS

A GE Fanuc integrated motion control system manages 35 independently operating robots. These robots transport vehicles from an entrance bay into an open parking space, utilising the automated system to move pallets, lifts and carriers. Notably, each axis of motion employs a pair of servo systems sharing the load. Either motor can independently supply adequate power to move vehicles during required maintenance, due to the servos being sized to accommodate this.

### CIMPLICITY SOFTWARE

The GE Fanuc hardware is linked to CIMPLICITY software, an open system framework that provides a

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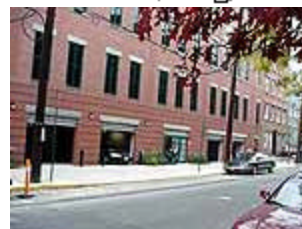
**The Robotic Parking System accommodates 312 cars; a conventional ramp style garage accommodates 90 cars.**

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**Benefits of the automatic parking**

powerful, graphical environment to monitor and control the automation system. Additionally, CIMPLICITY collects and compiles data from the parking system and provides a graphical interface with real time displays. CIMPLICITY generates maintenance and diagnostics reports to increase troubleshooting, efficiency and to enable a quick response to system problems.

### **BENEFITS OF AN AUTOMATED PARKING SYSTEM**

Benefits of the automatic parking system include: optimization of space utilization, security (vehicle and personal), convenience (all ground level access), lower garage owner's liability insurance, greater depreciation schedule, lower lighting and ventilation requirements (no cars driving around inside; no people go inside), and lower emissions and less pollution (clean parking system).

### **PARKING AND RETRIEVAL PROCESS**

The Hoboken Garage is a monthly garage only for local residents. Each patron has a card, similar to an E-Z pass. As the patron drives to the garage, the card (positioned in their windshield) is detected by the sensor and signals to the computer that a patron is approaching. A green light at an available bay indicates entrance for the patron. They proceed into the open bay, position their car, get out and push a button to initiate the parking process.

The central computer system guides a carrier on steel rails along an open aisle-way to a position adjacent to the arrival station and the pallet. An additional rack entry module moves above the upper surface of the carrier and is inserted beneath the pallet; the pallet and the vehicle are then transferred to the carrier. Under the direction of the computer, the carrier (with the pallet and the vehicle inside) is moved from the arrival station to a multilevel lifting device; the pallet and the vehicle are then transferred to the lift. When the lift reaches the designated parking level, the pallet and the vehicle are transferred to another carrier. This carrier transports the pallet and the vehicle to the designated parking slot. Lastly, the pallet and the vehicle are transferred into the parking slot by the rack entry module. This system design enables multiple independent motions simultaneously thus dramatically increasing reliability and speed of transactions.

When retrieving their car, the patron goes to the lobby and enters a pin number into a keypad. Their car is automatically located and retrieved - in a forward drive position - to an available bay. The patron's name is displayed on a marquee indicating which bay their car will be brought to. The vehicle is retrieved and is placed in the bay in one and half to two minutes. Once the car arrives, the patron can simply

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**As the patron drives to the garage, the card (positioned in their windshield) is detected by the sensor and signals to the computer that a patron is approaching.**



**A patron proceeds into the open bay, positions their car, gets out and pushes a button to initiate the parking process.**



**Robotic Parking was contracted to provide a**

drive away.

### **CONTRACTORS**

Robotic Parking was contracted to provide a modular, fully automated parking system. GE Fanuc provided an integrated motion control system that manages 35 independently operating robots. CIMPLICITY software is linked to the GE Fanuc hardware.

**modular, fully  
automated parking  
system.**