

## **Parking Guidance and Management System**

The number of cars on road is increasing day by and available parking space is not able to keep that pace, resulting in finding a suitable place in parking. To use the available space more people are employed to manage the parking space effectively. Our parking guidance system provides the right solution to manage parking space intelligently, reducing the man power. It gives a pleasant experience to car driver as he is quickly guided to the nearest parking slot right from the entrance. The Parking Guidance system is fully automatic with fuzzy logic and uses 8 bit / 32 bit processor at every step and it is fully wireless so that there no wiring hassle reducing the down time.

### **Advantages to Parking Area Management**

- Increase in Car Park Capacity - Due to reduction of circulation space.
- Increase in Lot Utilization - Lots in hidden / obscured areas get used.
- Reduces Congestion and Improves Traffic Flow - Drivers know where to go.
- Vast improvement in the image & ambience of the Car Parking area.
- Faster Turnaround of Cars into the Car Parking area.
- Self-Diagnostic Features - Convenient for management.
- Customer Satisfaction - More likely to return.
- Statistical Information - Trends can be monitored.
- Increased Security within the Car Parking area.
- Increase in Revenue
- Less pollution
- Cost Effective Solution

### **Advantage to Car driver.**

- Shorter Waiting Time at Car Park Entrance
- Guided to Nearest Available Parking Space
- No Need to Search, Less Stressful
- Saves Fuel and Reduces Tyre Wear
- Gains Precious Time, More time to Shop or Dine
- Prevent Drivers Fighting over Parking Space
- Car Parking – A pleasant experience for the motorist

### **How it works**

Ultrasonic parking guidance system provides visual indication to driver while searching for a vacant parking space: ultrasonic sensor at each space monitors real-time occupancy and reports by changing color of individual lighted space indicator. When a car enters a parking lot, available parking space will be displayed and signage LED display will guide the driver to nearest empty parking slot. A flashing green light signifies that the space is vacant while a red light indicates that the space is already occupied. The availability information will be accordingly updated on decision point with Center LED display. No more guess work for the driver as to which parking level has available spaces for parking. Parking guidance system consists of various components and depending on number of parking space and sophistication required components can be chosen.

### **System Components**

Ultrasonic Detector - This state of the art vehicle detection device uses the latest ultrasonic technology and is widely used in central parking systems. This device is placed right above the parking bay and identifies any vehicle that has entered in the slot. On successful detection, the detector relays information to display LEDs in the various sections of the parking lots which updates the number of vacant spaces. A similar output is also sent to the parking management software which notifies the parking monitoring office.

**Basic LED Lamp** - The two color LED lamp is one of the most important components of the parking guidance system. It is placed above the parking slot and shows a green light if it is vacant and a red light if it is occupied. This LED lamp is visible from far away and notifies the driver if there is empty space in a particular lane or not. This prevents unwanted movement and congestion in the parking lot due to visitors looking out for parking spaces.

**Intelligent LED lamp** – The function of the Intelligent Lamp is similar to Basic LED Lamp, however it is much more intelligent. It is connected with ultrasonic sensor and updates the slot status (vacant or occupied) to zone control unit wirelessly. The zone control unit in turn lights up the lamp according to traffic control protocol stored in Zone control unit. The Intelligent LED lamps are able to diagnostic like fault in ultrasonic detector, pixels of the LED lamp, communication failure etc. These faults are conveyed to Zone control unit / Central control unit, for easy maintenance. The lamp will be at the half intensity when there is no car moving in the area to reduce the power consumption and increase the LED lamp life.

Indication of the LED Lamp.

RED FULL ON – Slot is occupied.

GREEN FULL ON -

GREEN FLASHING – Slot is available. It will flash only when car enters the lane

RED FLASHING – The car is parked for more than specified time

ORANGE FULL ON – Slot is reserved

ORANGE FLASHING – Ultrasonic detector or LED Lamp pixel or communication failure

**Zone Control Unit**- The large parking guidance system can be divided in zones for effective management. The zone control unit based on a 32 bit microprocessor, with ample data storage. Fuzzy logic for traffic flow control requires intensive calculation. Every zone controller is connected to multiple ultrasonic detectors and Intelligent LED lamps wirelessly. One zone control unit can accept signal from maximum 100 parking slots. The zone control unit gets the status of parking slots in one particular zone, and drives the LED lamp according to traffic control protocol. The traffic control protocol is based on fuzzy logic and learns the traffic pattern and accordingly guide the car to nearest empty slot quickly, avoiding congestion in parking area.

**Signage LED Display** – The Signage LED display is mounted near the entrance of the parking lane, and guide the car to appropriate lane. It will indicate the availability of space in a lane with green arrow and non availability of space by a red circle with cross. These are driven wirelessly by zone control unit. The lamp will be at the half intensity when there is no car moving in the area to reduce the power consumption and increase the LED lamp life. You can have as many as Signage LED display located at convenient positions.

**Counter LED Display** – The Counter LED display are large 3 digit numeric display to show the available parking space. These displays are driven by Zone control unit or central control unit wirelessly or by RS485 bus if the distance is large. The lamp can be switched off when there is no car moving in the area to reduce the power consumption and increase the LED lamp life. These displays are also mounted at the entrance to show the current parking space availability.

**Central Control Unit** – The central control unit is required if there are more than 1 zone control unit. The Central control unit is connected with Ethernet to all the zone control unit. The Central control can also be connected to internet for sending the mail and storing statistical on cloud for future management. The data from zone control is processed here and various reports and logs are generated. The data from Central control unit can be accessed from PC, Laptop, and tablet by using any standard browser.

**Following Reports can be generated at Central Control Unit.**

- Current Parking status like occupied, vacant, defective, and time since when parked
- Total cars in and out with time during hour, shift, day and month.
- Parking slot utilization data with time
- Statistical reports
- Diagnostic report.
- Revenue Reports
- Email selected reports to management

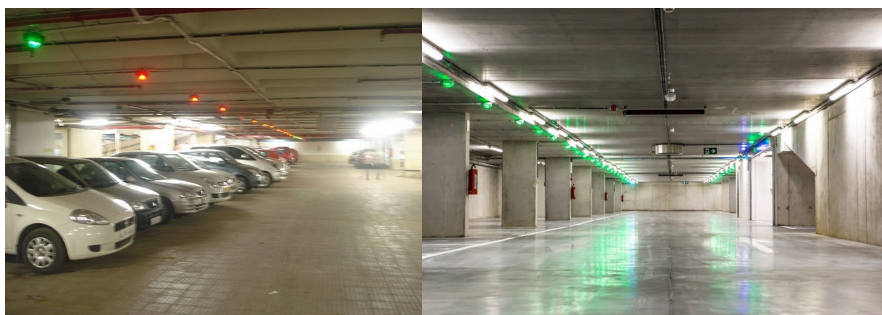
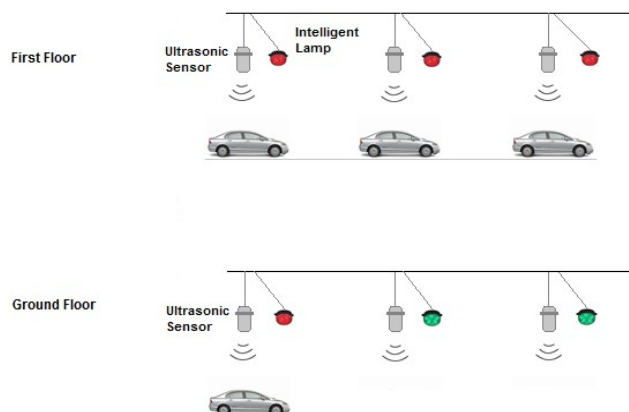
**Classification.**

The car parking requirement can be broadly classified as following

**Option:1**

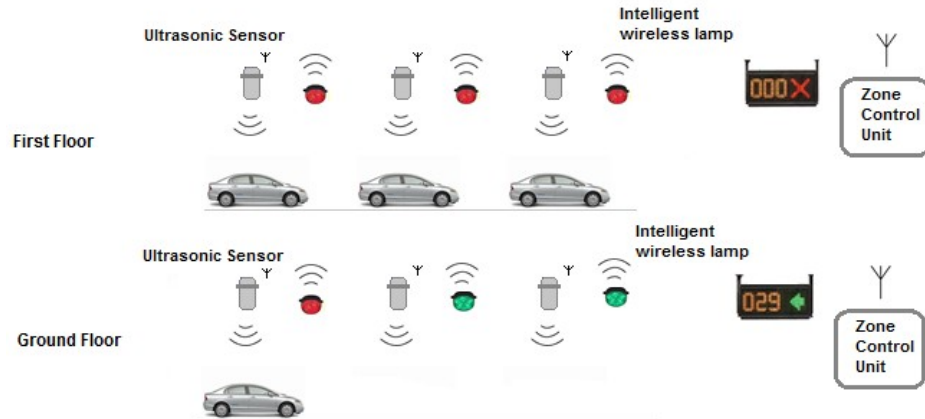
**Parking Indicator System**

This is basic system this displays the status of parking slot either it is full or empty.



### Option:2

**Parking Guidance System-** This fully automated an intelligent system with signage and counter indicator.



### Option:3

#### Parking guidance and management system

This fully automatic and intelligent with various reports and including email and cloud storage facility.

