

# Parking Management for College Campus

**Rohan A. Zade**  
PG Student

Department of Civil Engineering  
G. H. Raisoni College of Engineering, Nagpur (India)

**Prof. V. K. Gajghate**  
Assistant Professor

Department of Civil Engineering  
G. H. Raisoni College of Engineering, Nagpur (India)

## Abstract

G.H. RAISONI college of Engineering, Nagpur have different courses “Engineering, MBA, MCA” under a single campus. GHRCE has an initial enrolment of 4566 students of all courses and staff members are 550 so the total members are 5116. GHRCE has maximum number of off campus student of 70% and including staff members 74% are off campus, rest of 26% are reside in campus of ghrce. So this paper describes the design of parking for ghrce with the help of stack parking system and two different types of sensors that are nedap sensit system and Pir sensor. By the use of stack parking system parking capacity can be doubled for the same parking area for cars and by the use of nedap sensit system and Pir sensor reduces the human effort, time and electricity of a basement parking area of GHRCE college campus.

**Keywords: Nedap sensit system, Pir sensor, Stack paring**

## I. INTRODUCTION

Now a days there are different type of modern parking system like stack parking, puzzle parking and tower car parking but for the ghrce campus stack parking is adopted because of its less cost and easy to handle doesn't requires expert to handle it. By the use of stack parking the capacity of a car can be doubled. so as per the survey of campus there should be the basement parking for the ghrce campus. Underground parking area will be constructed and will be separated for student of different courses and one side reserved parking for a staff members of ghrce. Overall the parking space of campus will be increased by 2 times as compared to the current parking area. There will be different types of wireless sensors used for guidance to the empty space in a parking lot. Some sensor will be used for saving the electricity in underground parking for overcoming irrelevant wasting of electricity. It will be working on the bases of sensing the heat or movement in parking space as it sense the human heat or any moment then the lights will glow and it will also show the number of empty space available in a parking area of campus.

## II. THEORETICAL CONSIDERATION

### A. Study Area

Area selected for the design of advance parking system is ghrce campus of digdoh heals Nagpur Maharashtra. This campus is most important place to develop advance parking system because it doesn't have a proper parking place and lack of open area. Hence it causes various problems like generating of shock waves improper management parking of vehicles. So on Main Street generates problems to the vehicle moving on Main Street.



Fig. 1: Study area

There is different data that has to be collect to complete the parking demand

1) Population growth

For ghrce as predicted there will be 6% increase in population till 2025. student and faculty population till 2025.

Faculty = 550 + 6% growth in population = 583 faculty.

Students = 4566 + 6% growth in population = 4840 students.

By this prediction for 2025 there will be total population of 5423 so the growth will be 307 as compared to the present population of ghrce.

2) Parking demand

The ghrce campus nearly needs a parking demand for 3675 bikes and 70 cars at a present year. But increase in a parking demand after 9 year 2025 will be 3896 bikes and 117 cars. An area required for the predicted parking demand at 2015 for bikes is 6137 sq.m and for car is 1463 sq.m

3) Open area in campus

calculating the open area of campus and selecting proper places to develop a underground parking area. Finding the reduce level of campus surface area. Which will help to develop a parking area.

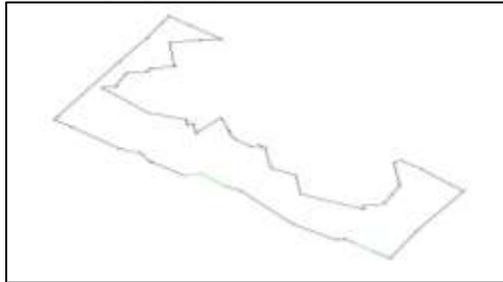


Fig. 2: Open area to develop parking system

Open area of a college campus is 5850 sq.m. But to park the total vehicles need approximately 7000 sq.m.

4) Number of student and staff

Once a number of student and staff members are known we can find the number of vehicle will be parked in campus and from this we gets the area required by all the vehicles so we can develop a parking area to satisfy the need.

### III. METHODOLOGY

As the space is not sufficient so the use of modern techniques are done

- 1) stack parking
- 2) nedap sensit system and pir sensor

**A. Stack Parking:**

it is so reliable in congested area as it doubles the parking capacity of parking area.as there will be parking of cars one above the other by the means of stack. It is very simple to handle it, need very low maintenance, and it can be raised and lowered mechanically when there is power cut. It is more affordable then the other techniques like puzzle parking and tower car parking.

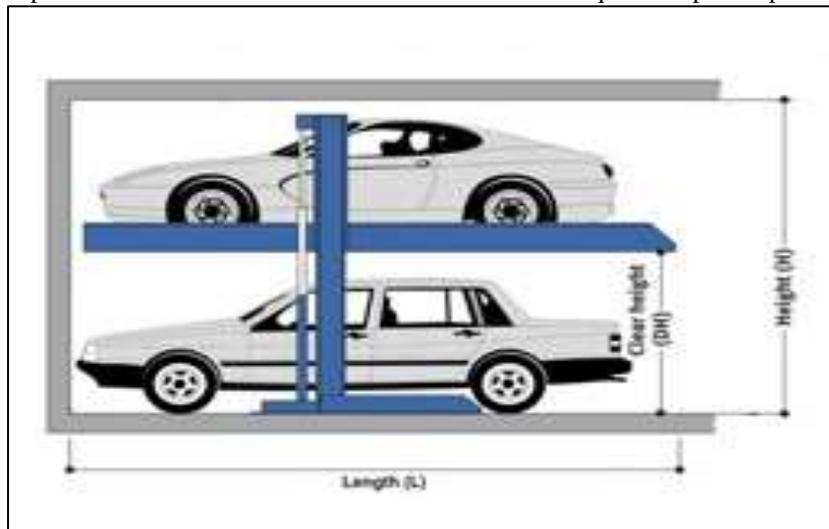


Fig. 2.1: Stack Parking

**B. Nedap Sensit System and Pir Sensor:**

nedap sensit system is a wireless sensor used for parking occupancy detection at parking zone. As it is fully automatic make it more useful on on-street or rusher area for getting information about the number of parking space available. A passive infrared sensor (PIR SENSOR) is electronic sensor which measures the infrared light radiation. As it detects the infrared light of hear generating object it gives output and the light turns on.

**IV. RESULT AND DISCUSSION**

A good parking system plays an important role in any campus. As by the application of a stack parking the capacity is doubled for the car parking 1463 sq.m as one above the other car is placed and it is reliable and easy to handle. By the use of pir sensor consumption of energy can be reduced, consumption of energy in watt per day is reduced from 490 watt per day to 125 watt per day, operational hours is reduced from 12 hours to 3 hours per day and the light glows when the heat is sensed by sensor so the power use by one tube light is reduced to 3.7 kw from 14.3 kw per day and the most important it reduces the time for searching the parking place by near about 10-15 min.

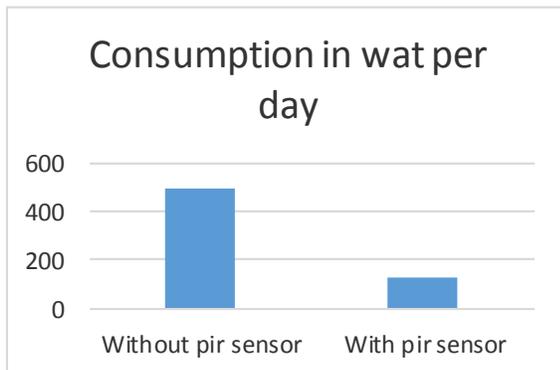


Fig. 3: Pir sensor

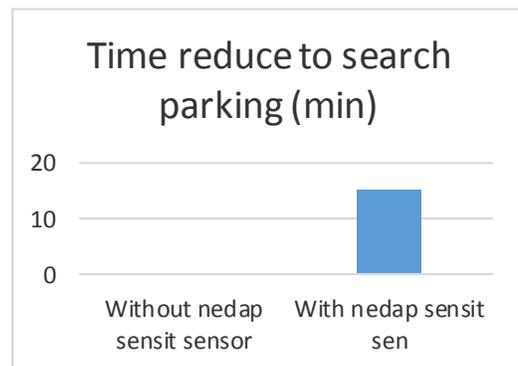


Fig. 4: Nedap sensit sensor

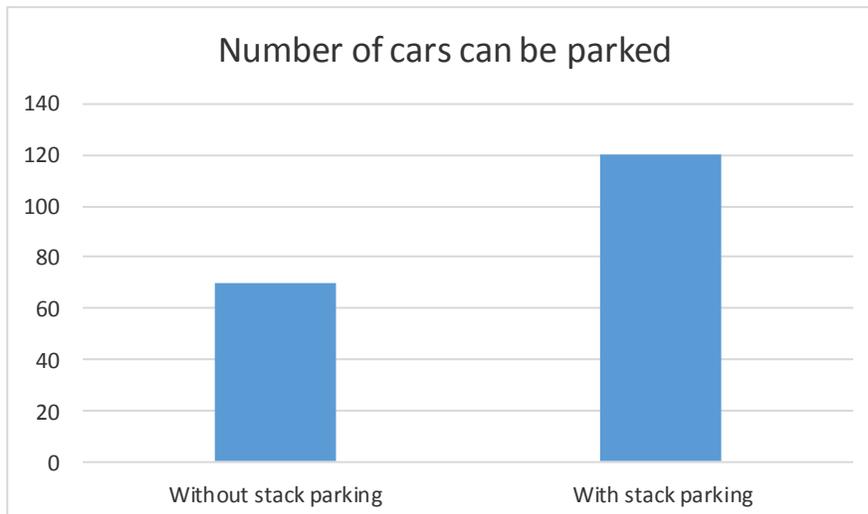


Fig. 5: Stack parking

**V. CONCLUSION**

This modern techniques using of stack parking, nedap sensit system and pir sensor provides the human a comfort in parking the vehicles and reduces the human effort. With the help of stack parking the conjunction problem is reduced and a proper parking can be maintained by this the damages occurs to car in a parking zone can be maximally reduced. It doesn't requires the expert person to handle it can be operated by any one and it works manually also in case of power cut. Pir saves near about 4 time's electric energy in basement parking. And it turn on the light with any human activity or an object that releases heat is detected by a pir sensor and nedap sensit system reduces the human effort as it guides the driver to a vacant place in a parking zone and gives the information about the number of parking space available in a parking zone.

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