

## **Parking Sensor (placeholder name)**

### **Team Members:**

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### **Project Overview:**

Too much time and effort are spent by those looking for a place to park in one or more garages in downtown Coeur d' Alene. Commuters would benefit greatly from a system that indicates whether there are spaces available for parking within a parking garage. The Parking Sensor (placeholder name) will allow people to find open parking spaces, and hopefully provide this information before they enter the garage. The means of indication will be via LEDs; a green light means there is an open stall, where a red means the stall is currently occupied by another vehicle. This is not the complete functionality of the system, but rather a level of abstraction for the consumer; the data that is measured/collected, will be distributed from device to device via a mesh network, then sent through a gateway where it will be received at The Den as a means of data collection for possible further research. A companion app may or may not be added if necessary.

### **Specifications:**

#### **Hardware and Physical Description:**

- 5 prototypes will need to be made; 3 for inside the garage, 1 for the entrance and 1 for the exit. The rest of the project will be simulated.
- Units will be roughly no larger than 4" X 4" X 4" but may be smaller if possible.
- Each unit needs to be able to last for at least 1 year via battery power.
- The medium used for vehicle detection can be any type of sensor, or other device capable of detection, so long as it meets the rest of the project requirements.
- The medium used for communication between devices/server, can be any type, so long as it is wireless, and meets the rest of the project requirements.
- The units need to be affixed to the garage via some means of adhesion that is non-permanent.
- Each unit should have a way of being reset, for maintenance, error occurrence, etc.
- Units will need to have the ability of a deep sleep mode, waking via hardware interrupt, or set intervals.

#### **Software and Networking:**

- Data sent/received by each unit should, at the very least, maintain integrity and authentication; confidentiality of data is not needed.
- Units will need to rotate the position of "gateway", to maintain reliability, and an equal distribution of power consumption throughout the system.
- Units will interact with each other via a mesh network.

The validity of the project will be simulated using the data collected from the 5 prototypes within a replicated environment, to show an accurate representation of what the final scope of this project would look like, i.e. if a unit was placed in every stall of the parking garage.

