Please provide the following information to be shared with on capstone information exchange platform:

1. **Project number**: s17-07

2. **Project title (as will appear on the poster)**: Queue-based Traffic Control via PIR Sensors

3. **Team members**: Hussein Gandhi, Kaustav Mukherjee, Dylan Patel, Ramon Ghossain

4. **Adviser(s) name(s)**: Waheed Bajwa

5. **Up to 10 keywords that will help to classify the project**:
   Optimization, traffic control, queueing theory, sensors, cost efficiency, algorithmic, simulations, modelling, extrapolation, stochastic

6. **Project abstract (up to 200 words) to be shared with judges**:
   The goal of our project is to implement a traffic control system using non-intrusive, inexpensive sensing hardware. The first part of our project is focused on optimizing flow at an isolated, 4-way intersection. We physically simulate the intersection using remote-controlled cars and LED lights of 3 different colors (yellow, green, and red). The second part of our project involves extending these concepts to urban arterial roads and closed networks of various sizes. We use the traffic simulation software PTV Visum to calculate delay times and flow rate using the optimized queue length found in the first part of our project. We simulate traffic using readily available traffic data and existing probability models. We experiment with arterial roads with \( n \) intersections of varying sizes and grid networks consisting of \( n \times n \) intersections. We vary the spacing between the intersections and see how delay times are affected. We compare our queueing model to existing traffic models (platoons, dispersion, etc.). Finally, we calculate the expected savings of our method over a period of time and the expected costs of implementing such a system in real life.