Documentation for the POC

**Name of the POC: Traffic Management System**

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**Special thanks to Parikshit sir, Suraj sir, Srinath, Rishabh and Uttkarsh for their help and guidance.**

**Overview: The objective is to build a computer vision system which can perform following tasks:**

1. **Vehicle detection**
2. **Vehicle classification ('car', 'motorbike', 'bus', 'truck')**
3. **Track detected vehicle**
4. **Vehicle counting (incoming and outgoing traffic)**
5. **Average density calculation**
6. **Peak hour calculation**
7. **Speed estimation of detected vehicles**

**Steps Involved:**

1. Object detection and classification was done by Yolov4
2. Object tracking was done by Deepsort
3. ROIs were created for vehicle counting and speed estimation
4. Custom functions were created for average density calculation, peak hour calculation and speed calculation
5. Peak hour information was presented with the help of line chart and bar chart
6. A dashboard was created with Resoluteai.in logo and all analysis were shown on the dashboard

**Challenges faced during the POC:**

* Finding a good object tracking method
* Finding an IP free video to test the model
* The model was not calculating speed

**How did you tackle the challenges:**

* Different object tracking algorithms were tested and Deepsort was finalized based on the result
* Uttkarsh had recorded 3 videos from Dubai traffic and I had recorded 2 videos from Bhubaneswar traffic. We could not use Dubai traffic videos as major parts in videos were blocked by elevator window frames. Hence a video from Bhubaneswar traffic was selected as it had good perspective of the traffic without and blockage. Then we got videos from the client.
* The logic of speed calculation was changed and syntax of the code was rectified.