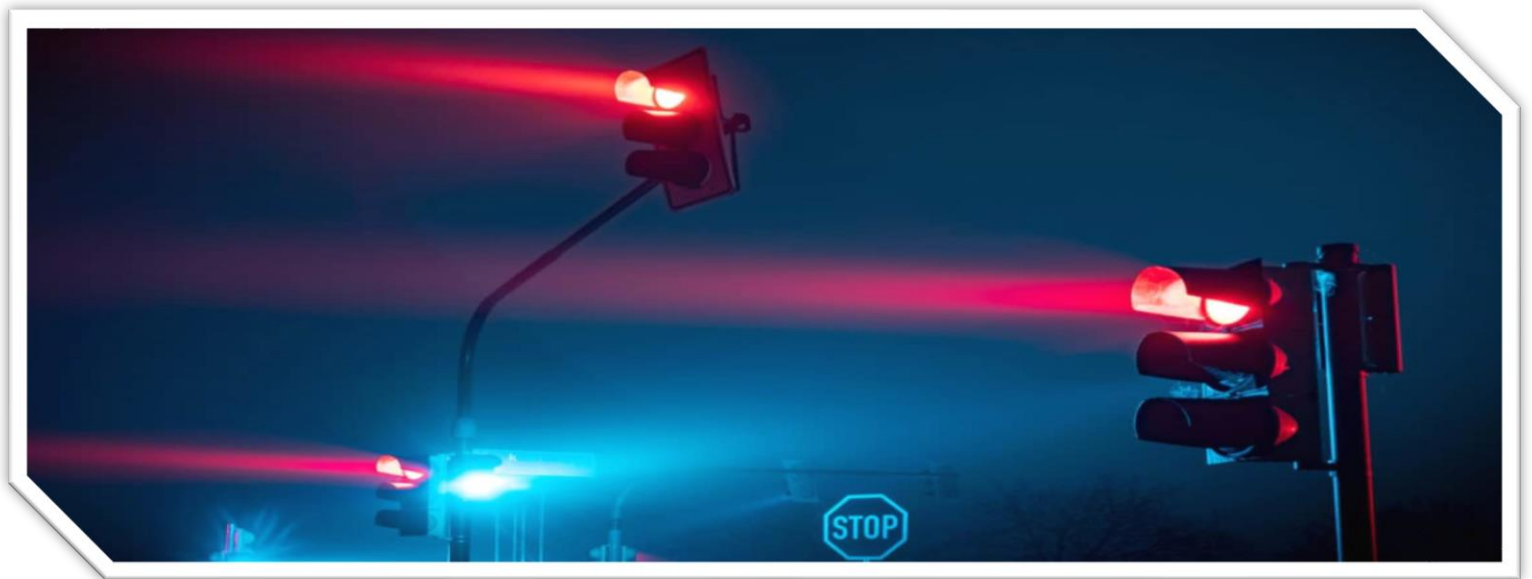# PROJECT- CAMERA OPERATED TRAFFIC MONITORING SYSTEM (COTS)

(CATEGORY- WELFARE TECHNOLOGY)

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INTRODUCTION

Let's start with a fact about traffic rule violations in Chandigarh city, the number of challans in the year 2019 was the highest in the past 4 years. Now, think

of this number for the entire India and then for the whole world. There could be various reasons for such violations but the primary reason is our incompetence to handle such a hefty load of traffic in our growing cities. Due to the increasing industrialization and modernization of the world, the **traffic level** has increased significantly.

Moreover, most of our traffic management system is manual-based and the role of technology is less than it should be. Today's **periodic functioning** traffic light system, being **inefficient in time management** makes it difficult for traffic personnel to handle traffic load single-handedly and non-cooperative people make it worse.

To solve this problem, we come up with the idea of the COTS system, based on an electrically coordinated and combined system of the Long-range and High-speed cameras to control traffic lights and keep a check on speeding vehicles breaking rules
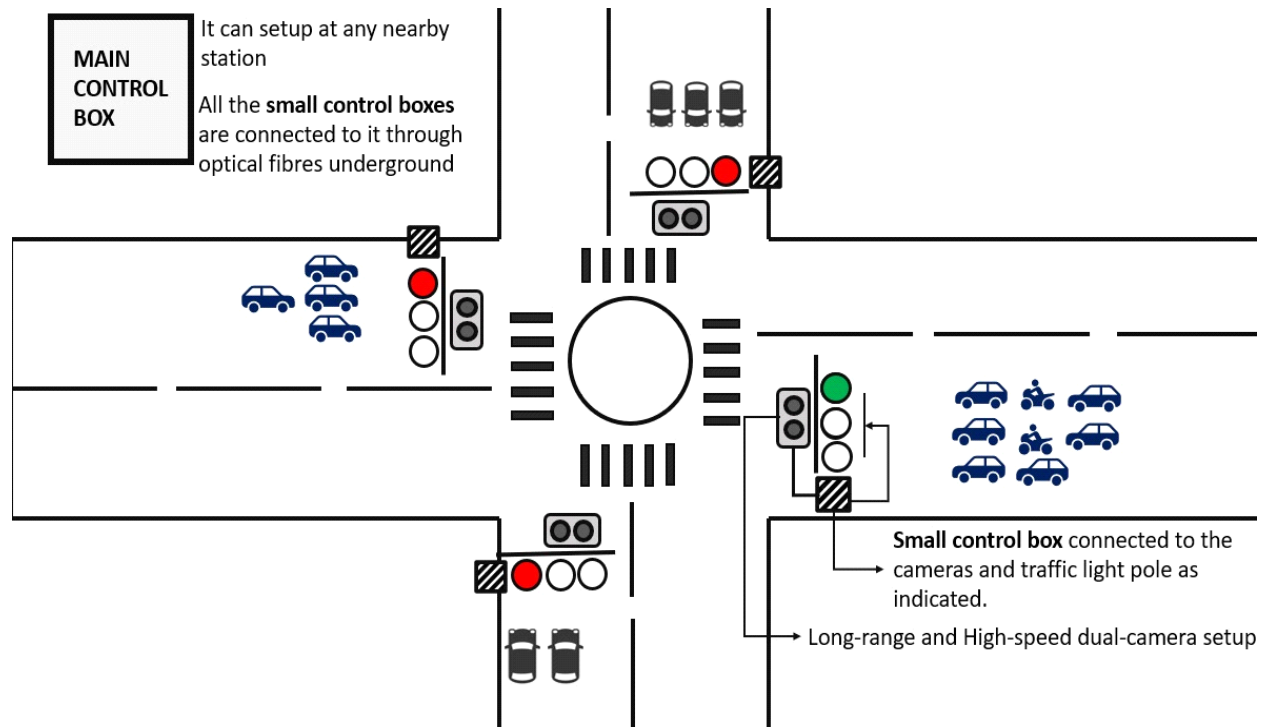
BRIEF OVERVIEW

COTS is a type of automatic traffic light monitoring system designed to ease the work of our traffic police personnel in controlling the heavy traffic areas. The main **objective** of this system is to

minimize traffic congestions and release the heavy traffic lanes in minimum time. Thus, reducing waiting time and making **traffic flow** more flexible Also, it can be easily operated from a Main station away from the actual area. Being connected through Optical fibre technology, the system operates almost instantly thus maintaining **time efficiency**.

WORKING AND FEASIBILITY

The setup contains a separate set of a **combination** of a Long-Range Video Camera and High-Speed Camera for each traffic light pole (in extension with it) around a roundabout. A **small control box** is wired to the traffic light pole internally to control the lights.

MAIN CONTROL BOX

It can setup at any nearby station

All the **small control boxes** are connected to it through optical fibres underground

Small control box connected to the cameras and traffic light pole as indicated.

Long-range and High-speed dual-camera setup

All the small control boxes are connected to the **Main control box** (which would be set up in nearby police station or control station) through optical fibres underground. Now, the **Long-Range Camera** is a high pixels video surveillance camera specially programmed (using softwares like OpenCV YOLO3 and deep learning based on python) for video image processing for the **object (vehicle) detection**. And the **High-Speed Camera** detects the **speed** of the vehicle to keep a track of speeding vehicles and quickly takes snapshots of their nameplates for challans.
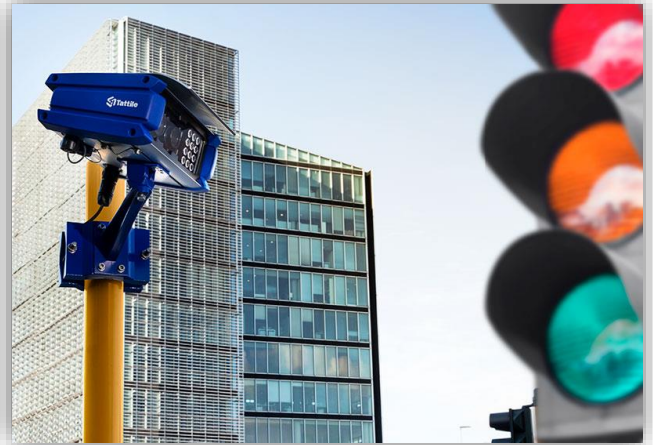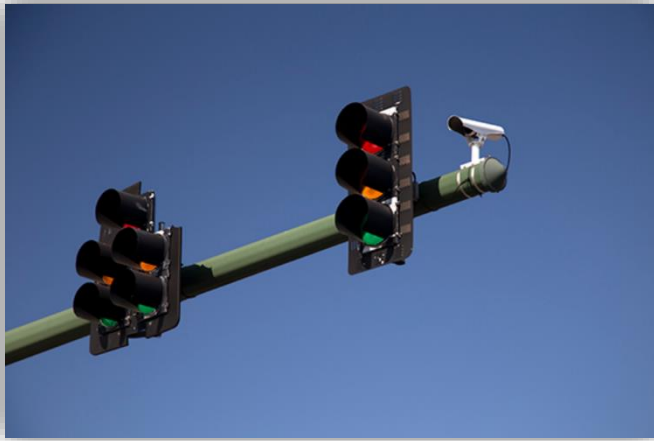
TRAFFIC LIGHTS WITH HIGH SPEED CAMERA

As this dual-camera setup is connected to the small control box, the camera data is transferred to these boxes which in turn is transmitted to the main control box at the station for processing. The main control box analyzes the data of each separate lane and **compares** their data to configure the **high to low** levels of traffic on different lanes. According to these levels, the main control box **instructs** each small control box attached to traffic lights to **change their colour** and release the traffic (like highest traffic lane is set to green first). The High-speed cameras' data however can be transmitted in form of challan messages through Main control as per existing procedure.

HIGH SPEED CAMERA   **LONG RANGE CAMERA**

APPLICABILITY

Applicability of any such project mainly depends on its **cost-effectiveness** and **durability.**
The main control setup being under official safety and wiring (with hard fibres) being underground, this setup is quite durable.

Starting such project in good infrastructure areas like **metro cities** makes it easy to check its efficiency in the long run and different scenarios which can be extended to smaller cities later.

It can be an effective solution in **reducing load** of

traffic personnel and pollution by decreasing **waiting** time in densely populated cities.

Moreover, as this system of **vehicle detection** is combined with existing speed camera **challan system**, it can further reduce the overall cost as compared to two separate setups.