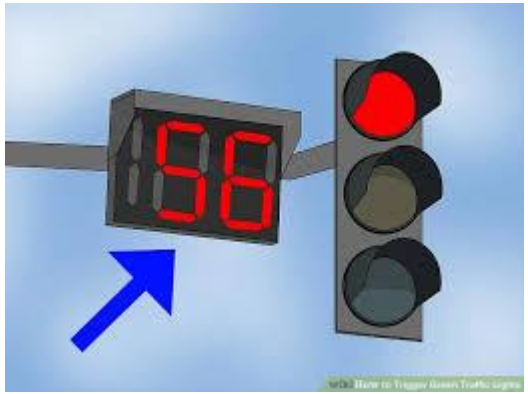
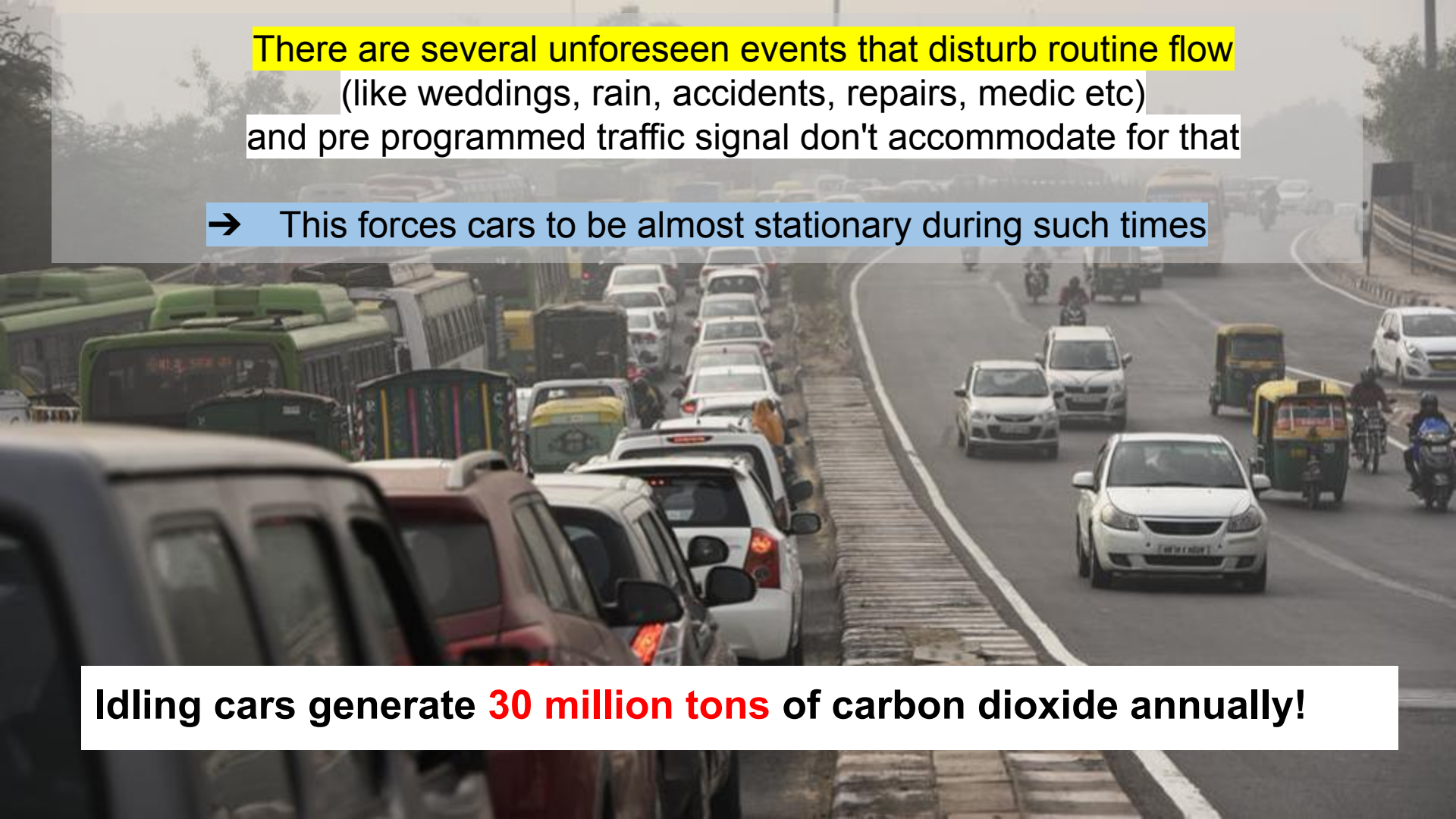
Plaksha University Pitch Contest - Future Mobility

AI based Traffic Controller

Monitoring Density With Machine Vision
Smart IOT Control

Objective: To design an automated traffic-light control system that switches the signals based on the density of vehicles on a particular road


98



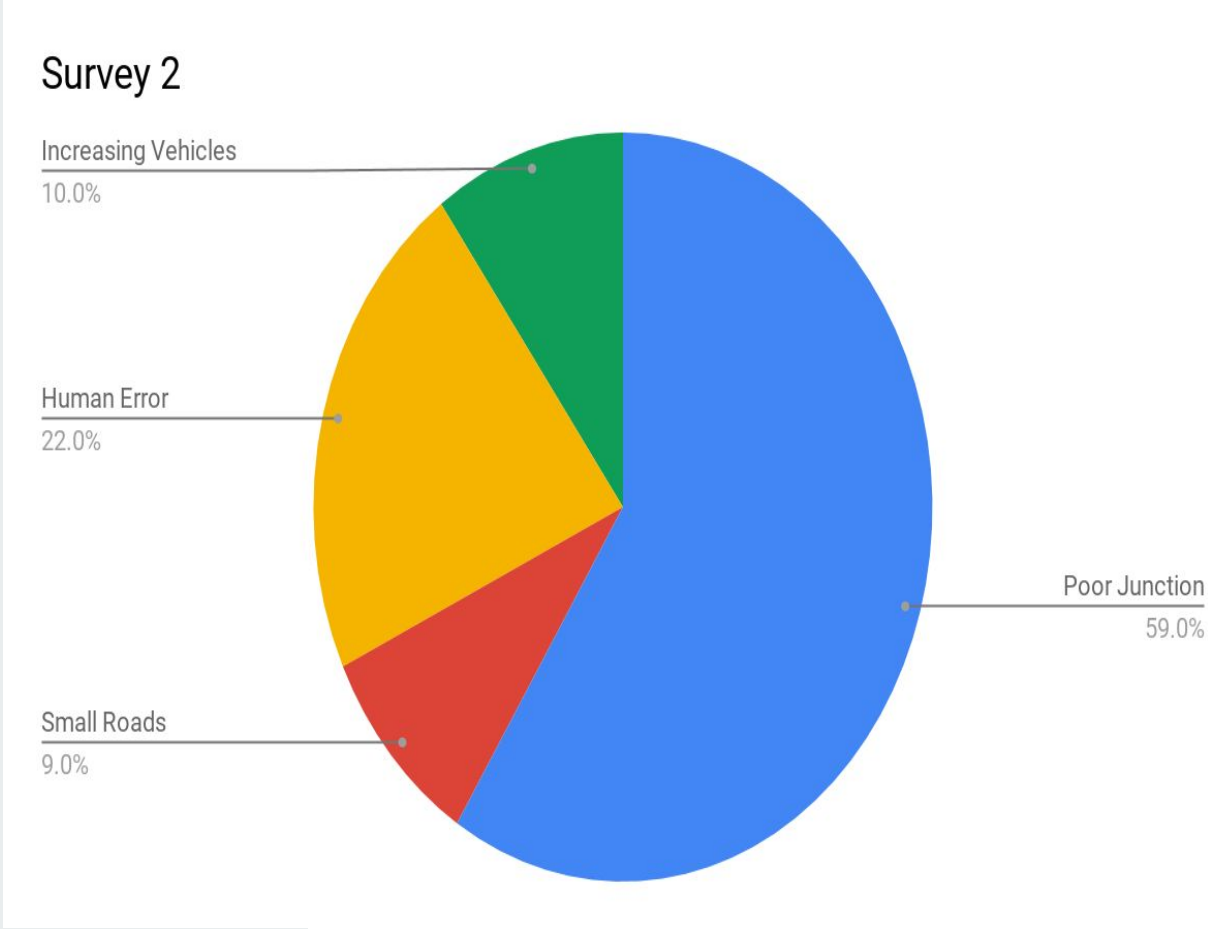
There are several unforeseen events that disturb routine flow
(like weddings, rain, accidents, repairs, medic etc)
and pre programmed traffic signal don't accommodate for that

➔ This forces cars to be almost stationary during such times

Idling cars generate 30 million tons of carbon dioxide annually!

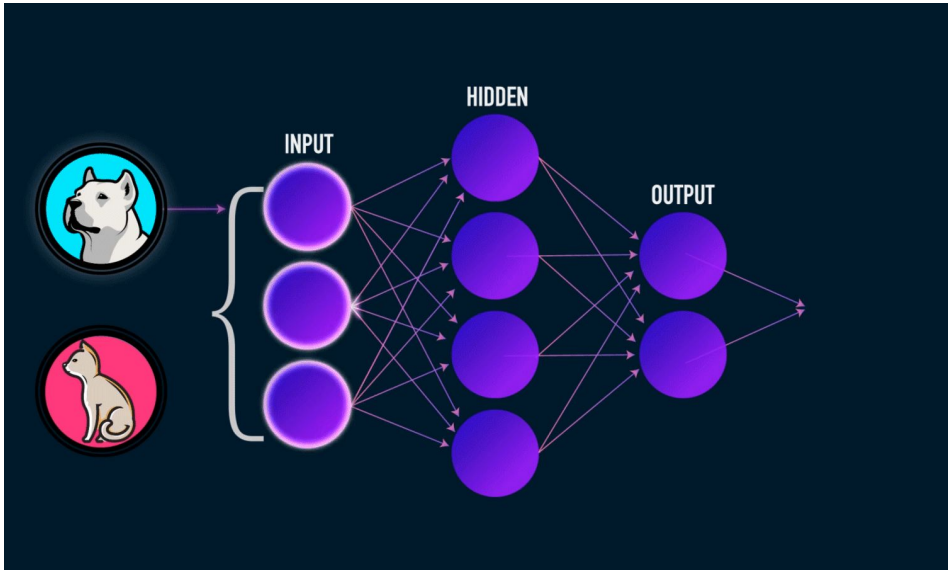
We also conducted a survey

It indicates that junction signals is a major cause for traffic jams



We needed to have a predictive model to estimate vehicle density at the traffic junction

We used a classifier based on an neural network architecture to count vehicles in the image



What is an AI network?
It is computing system vaguely inspired by the biological neural networks that constitute animal brains.

How is it programmed?
Such systems "learn" to perform tasks by considering examples, generally without being programmed with task-specific rules

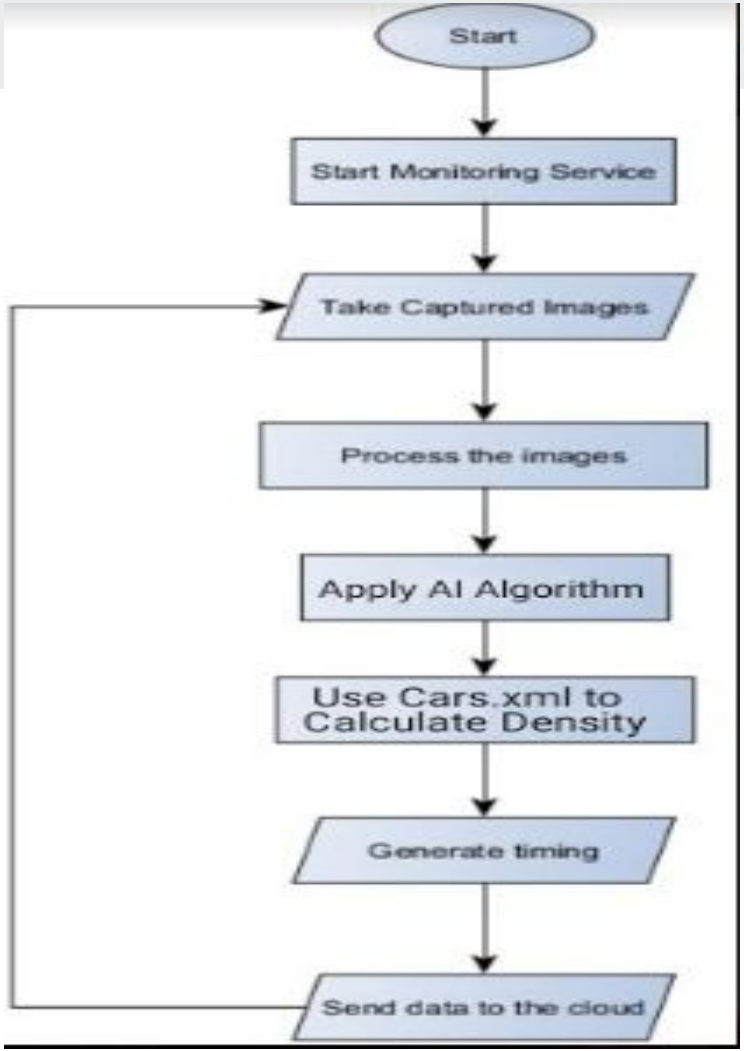
Our classifier can now identify cars in a live image from the camera

Live image before detection

After Detection

4 cars have been identified

Flow Chart


Start
Start Monitoring Service
Take Captured Images
Process the images
Apply AI Algorithm
Use Cars.xml to Calculate Density
Generate timing
Send data to the cloud

The control changes the timing of the green light based on the traffic condition

Green LED Timings

Normal = 3 secs

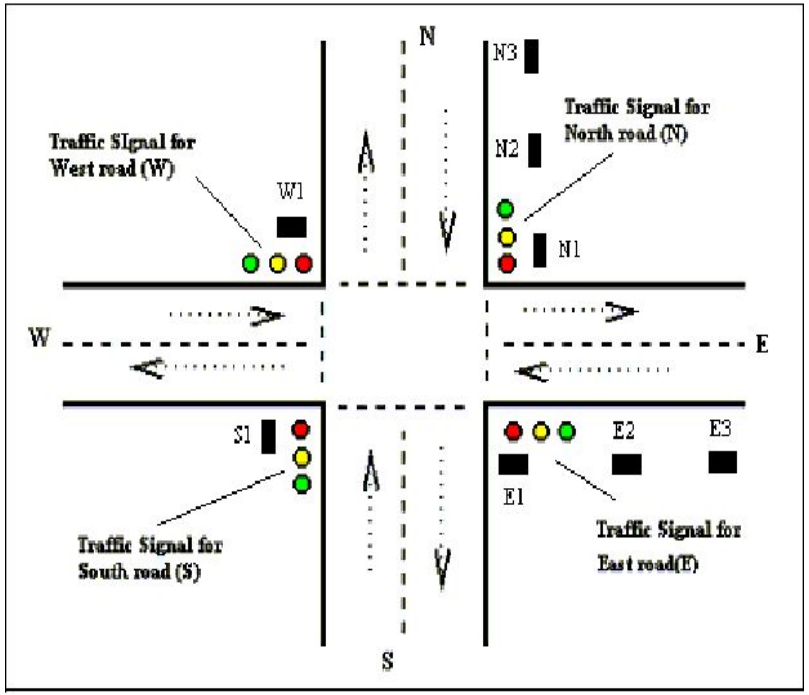
Medium = 5 secs

Heavy = 15 secs

Existing Solutions In The Market :

Working of “IR” Sensors :

The first module regarding the IR sensors where, there are four IR sensors placed after a minimum distance from the traffic signal in a four- way traffic signal system. We can place any number of IR sensors according to the length of the road. Traffic on the road with loads of vehicles can be controlled by using the Wireless Sensors Networks which are plotted along the road and also at the traffic junctions . It senses the amount of density of a particular road. IR sensor consists of IR transmitter and receiver sensing the density of the road and produces an output signal. The output IR signal is provided as an input to the microcontroller. Throughput of the traffic is measured using loop detectors.



Our Target Investors :

Government

The larger impact

2.5 lakh litres of fuel wastage everyday*

Costs the economy Rs 1.47 lakh crore annually**

Estimated Cost

Item / System	Cost per item (in INR)	Cost per junction (in INR)
Infrared Imaging System	20,000-25,000	80,000-1,00,000
**Setup/installation		20,000
Total Cost (Per junction)		**1,00,000**

Four cameras per junction

** Including processing units

Cost can be reduced by using lower-resolution thermal camera and more efficient processing

Source: FLIR Cameras (http://www.flir.in)


Thank you