



Intelligent Transportation System and Road Safety

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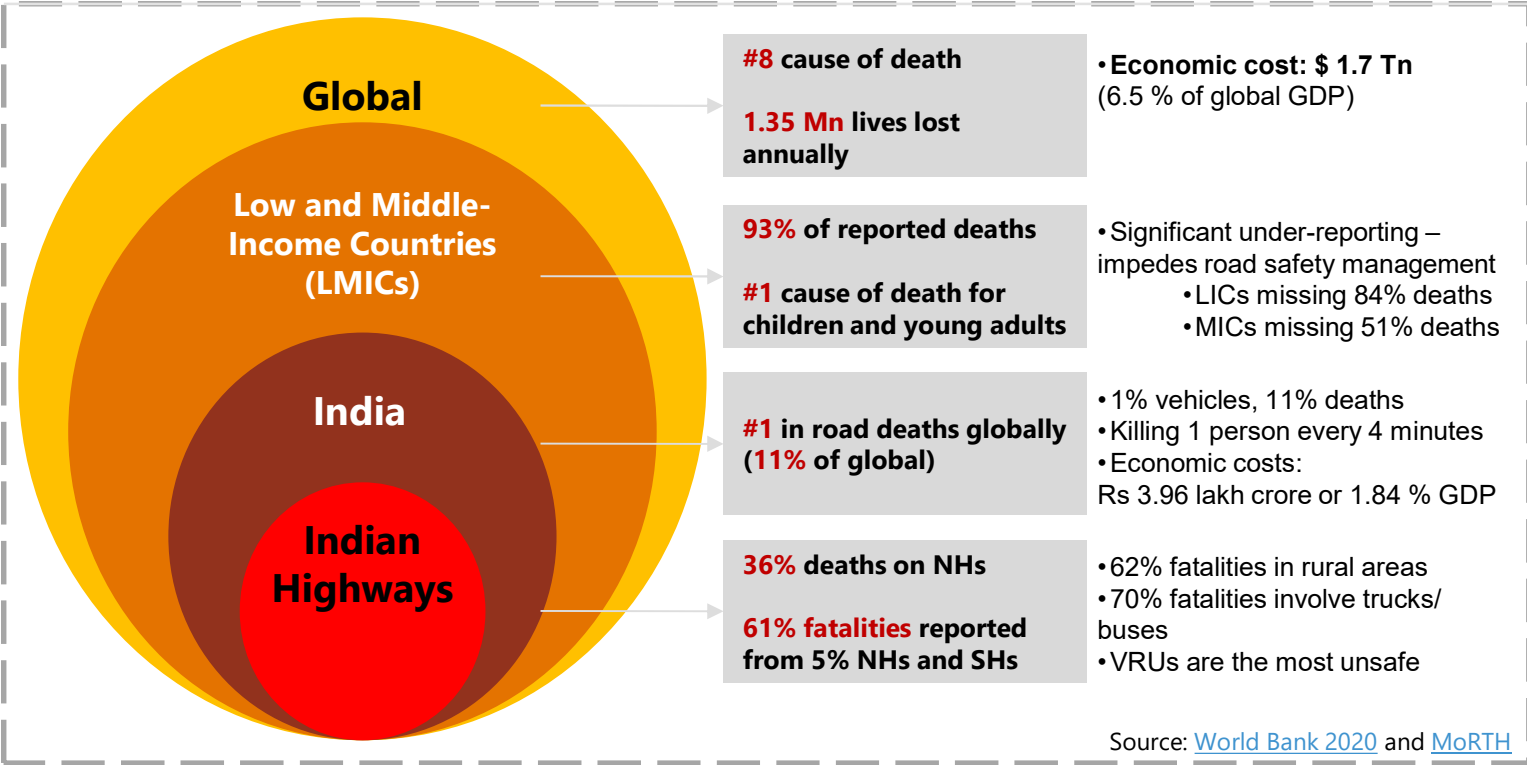
World Economic Forum

Fatalities in Road Traffic Injuries (RTIs)

A key development challenge impairing young & productive population in developing economies

Fatalities in Road Traffic Injuries (RTIs)

Challenges



- ✓ **Under-reporting:** The actual burden of road crashes is unknown.
- ✓ **Limitations of interventions:** Data availability impacts every aspect of road safety management including resource allocation, advocacy, intervention selection, and prioritization of resources.

Technologies offer opportunities to improve the situation and save precious lives.

Diagnosis of Road Safety



India's Road Profile

- 2nd largest road network across the world - 6.2 million Km
- 5% of the total road network are highways
- Transports >60% of all goods
- Transports 85% of total passenger traffic.

Categorization of reasons for road crashes

>80%

Human errors

- Over-speeding, overloading, wrong lane driving, signal jumping,
- Stress, fatigue, Poor driving skills, non-awareness of rules
- No Helmet, Seatbelt

Road design errors

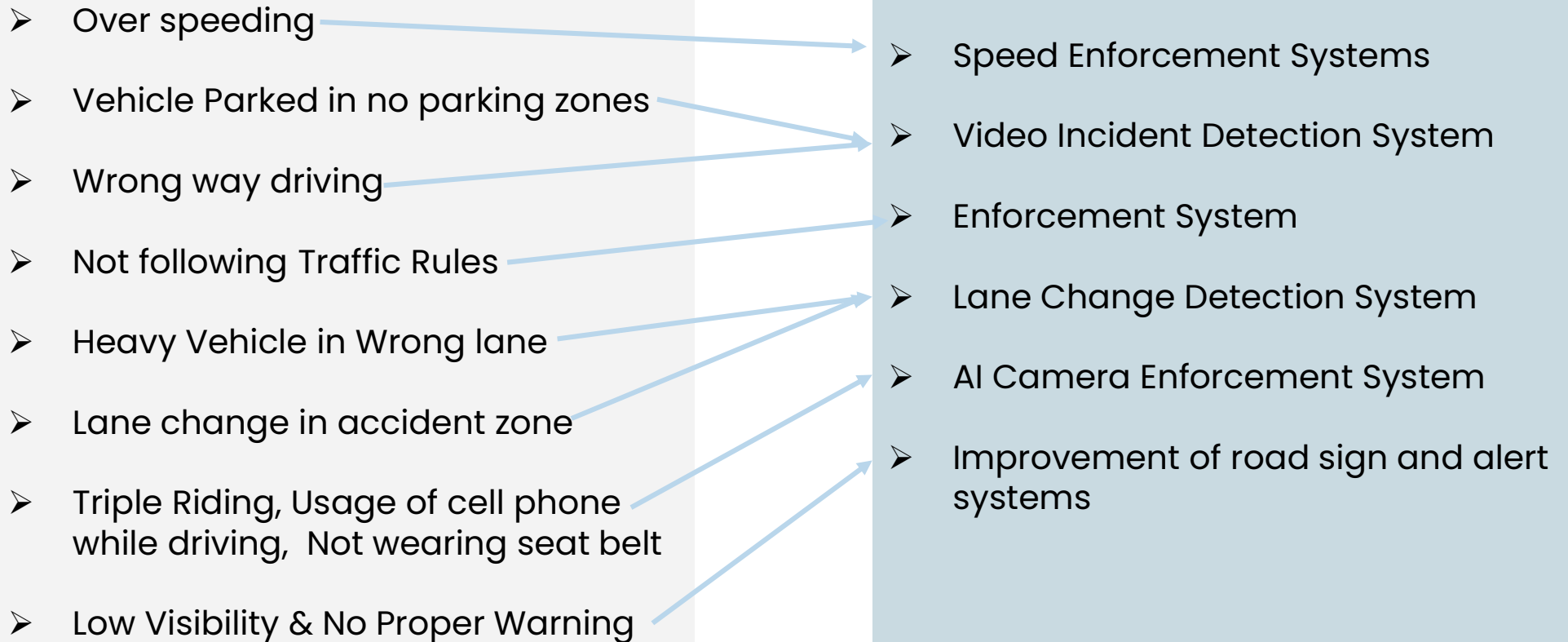
- Black spots due to poor engineering
- improper entry-exit to highways
- lack of signals, road markings, zebra crossing

Vehicle issues

- Vehicle manufacturing
- Lack of safety features in vehicles

Good post-accident care along the highways would also have a high impact on saving lives.

Reasons for Road Accidents & ITS Solution



Four measurable factors

Among many factors contributing to road injuries and deaths four risk factors have a significantly measurable effect

1.4 million people die each year, and up to 50 million are injured by RTIs.

Road accidents reduce countries' annual GDP by a range of 1–3%

As per the WHO report 04 measurable risk factors

- Speeding,
- Drunk driving, careless driving
- Non-use of Helmet, and
- Non-use of Seatbelt or child restraint.

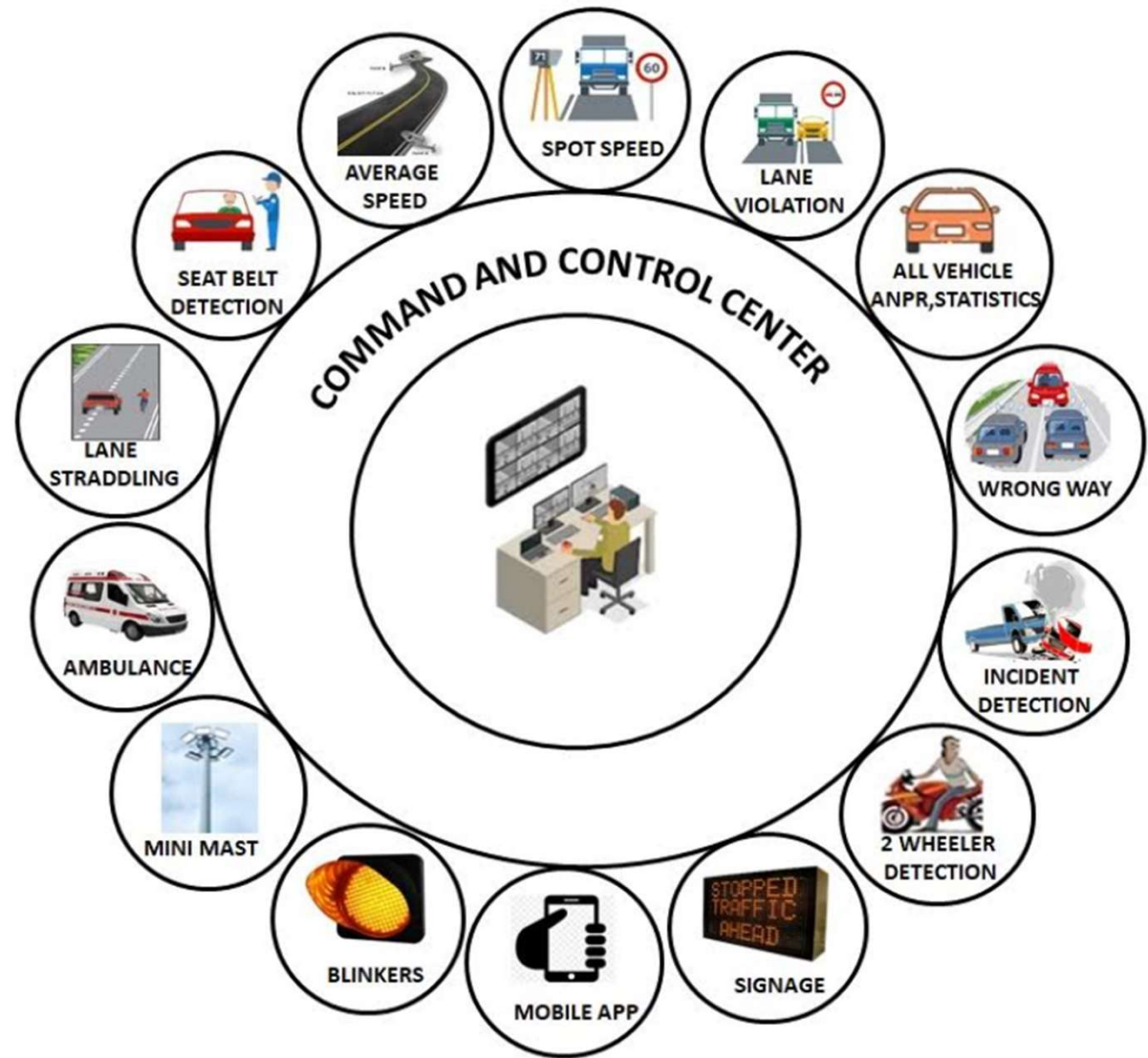
According to a study published in “The Lancet Health Journal”

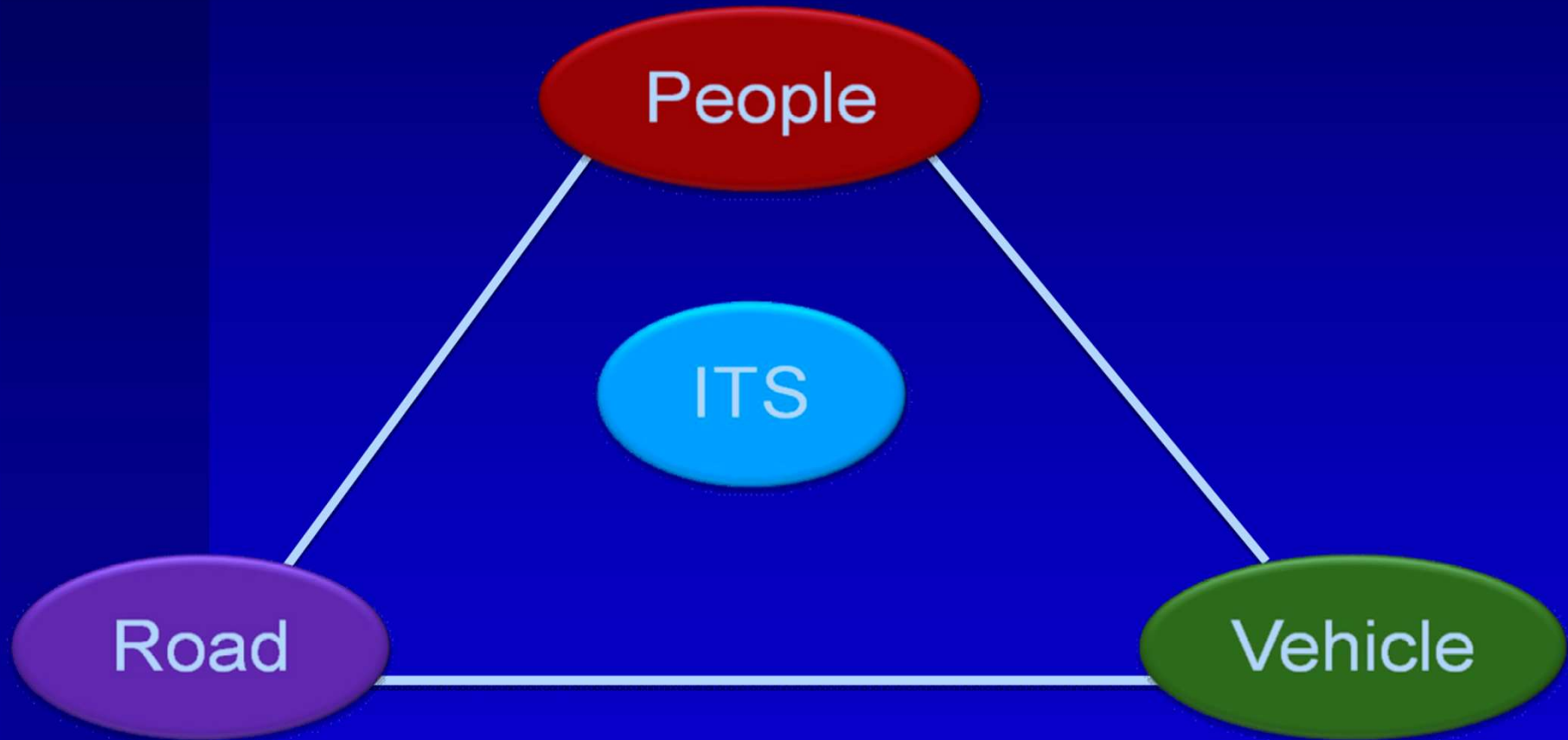
At least 30,000 lives in India could have been saved just by the implementation of simple road safety measures to prevent these four.

- ➔ 20,554 lives - by checking the speed,
- ➔ 5,683 lives - by wearing helmets and
- ➔ 3,204 lives - by use of seatbelts
- ➔ No data for Drunk & careless driving

Good post-accident care along the highways would also have a high impact on saving lives.

ITS offers a Gamut of solutions for Road Safety





Types of ITS applications

Broadly:

- Within the vehicle
- Out of vehicle

Out of vehicle ITS Applications

- For Urban Area – ITS will focus on congestion & smooth traffic flow
- For Highways - Safety is paramount

Next Generation ITS....

Road Safety 2.0

Leveraging technology to save lives on roads & developing a human-centric road ecosystems

Road Safety 2.0: Theory of change

Technology can compensate for human limitations.

Leveraging technologies in road safety ecosystem to save lives and developing a human-centric approach

- Drivers
- Vehicle
- Road
- Emergency care & Insurance Settlement
- Enforcement

Encourage technology adoption in the entire road safety ecosystem

More focus on positive Enforcement through Incentives rather than negativity of punishment

Converting safe driving behaviour into measurable scores (SDS) using IoT

SDS should be popularized and mandated like CIBIL scores by link SDS with Insurance,, fuel, vehicle workshop and wayside amenities

Implementation of ITS based Enforcement system on PPP model

ADAS in the vehicles, Star rating of vehicles on safety measures

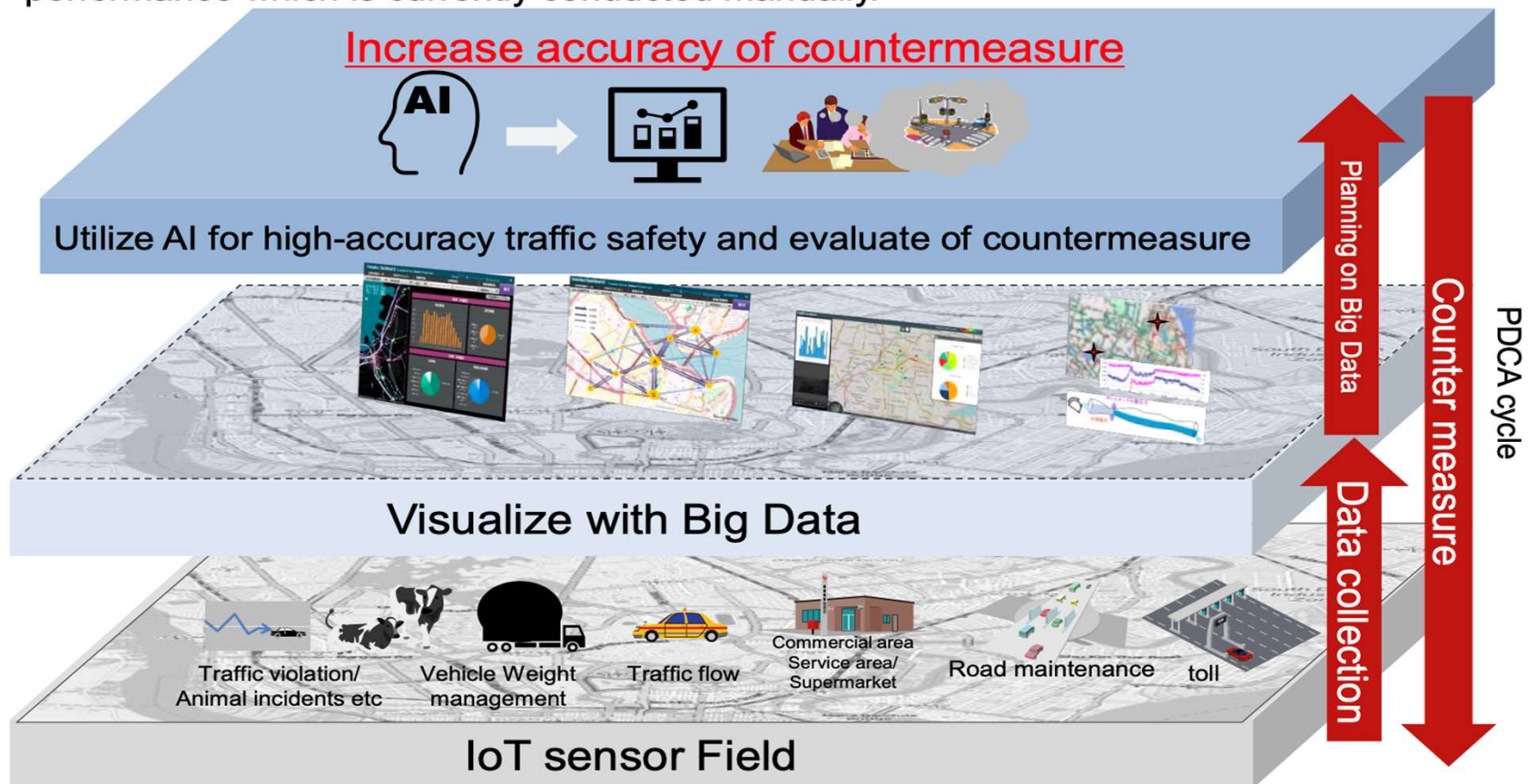
Integrate all road related Databases to a single Digital platform to ensure traceability and convenience to commuters

Integrated Emergency care system with insurance claims

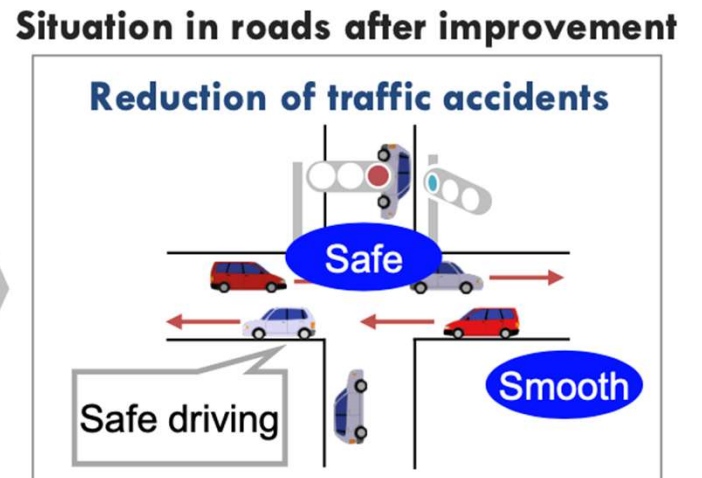
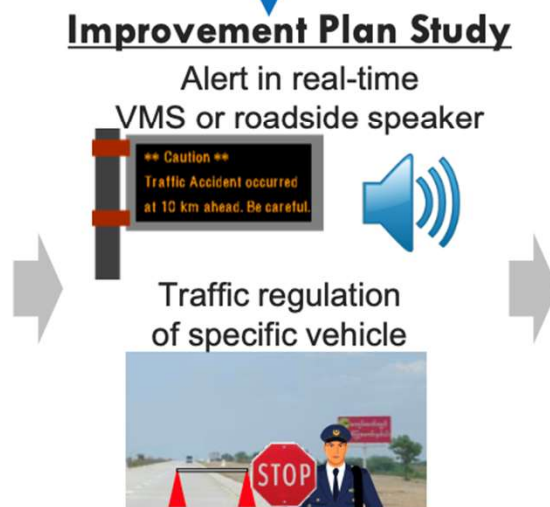
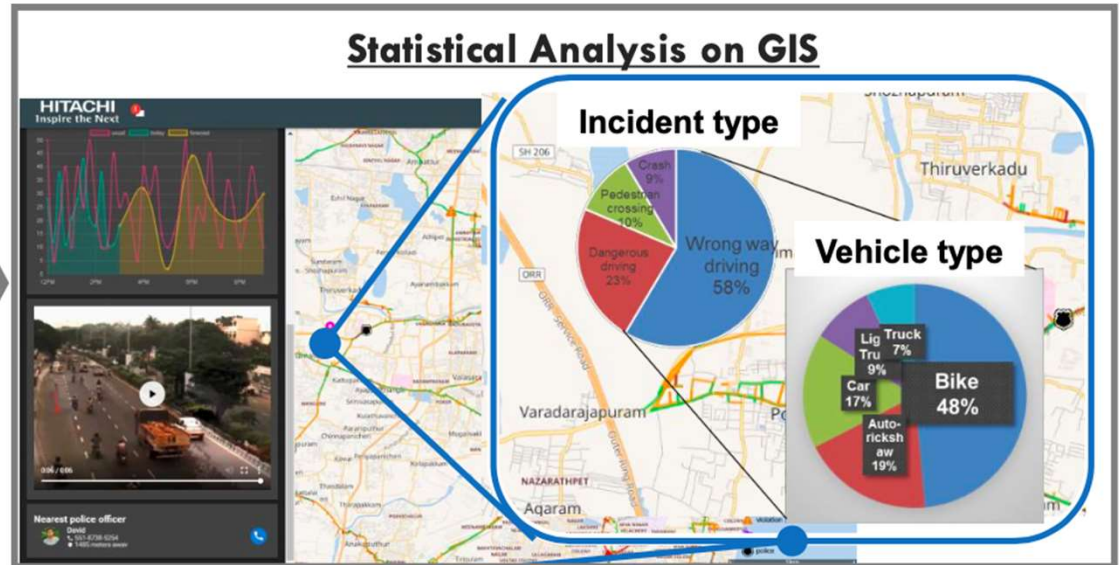
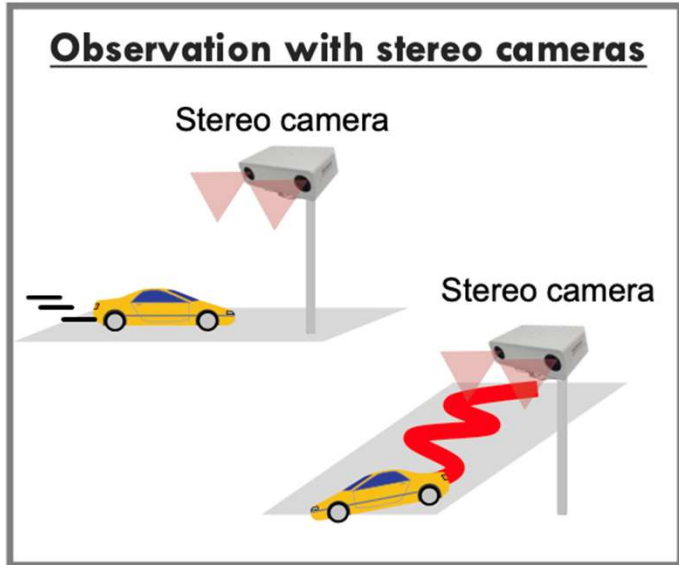
Focused awareness scaling for children and drivers

Next Generation ITS....

- Visualization and centralized-management big data from IoT sensor. Support to plan real-time and speedy countermeasure.
- Accumulating and analyzing results of countermeasures to drastically improve the its performance which is currently conducted manually.



GIS in ITS....



AI in ITS....

AI Camera – For City Implementation

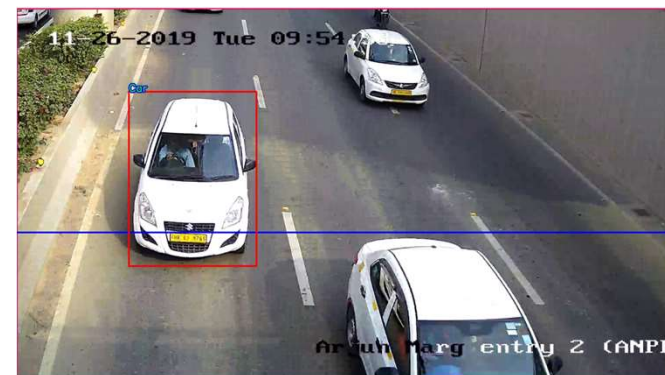
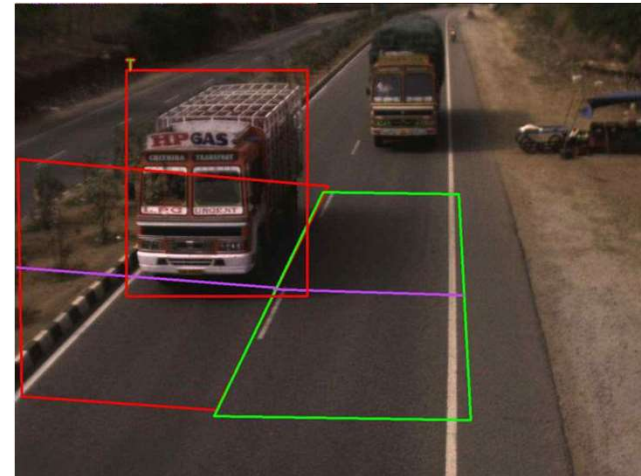
- No Helmet Detection
- No Seat Belt Detection
- Mobile phone usage detection
- Triple Riding
- Other VAHAN DATA based violations



AI in ITS....

Video Incident Detection – Smart Area Surveillance

- Video Incident detection Systems allows to understand traffic violations which cause hindrance to proper vehicle movement and there by causing accidents
- The set of analytics include
 - Parking In no parking zone
 - Wrong way driving
 - Stopped Vehicle
 - Congestion alert
 - Heavy Vehicle on fast lane
 - Lane Straddling

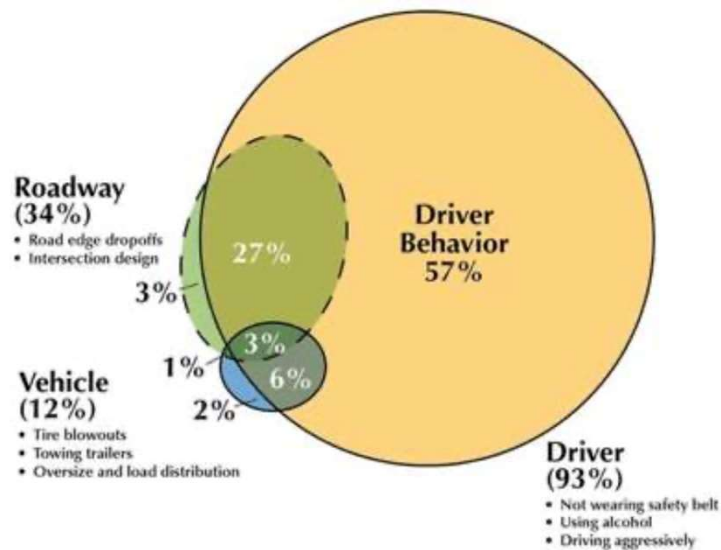


Zone 1 - Car Count (Top to Bottom): 2021
Jan 22, 2020, 8:54:12 PM

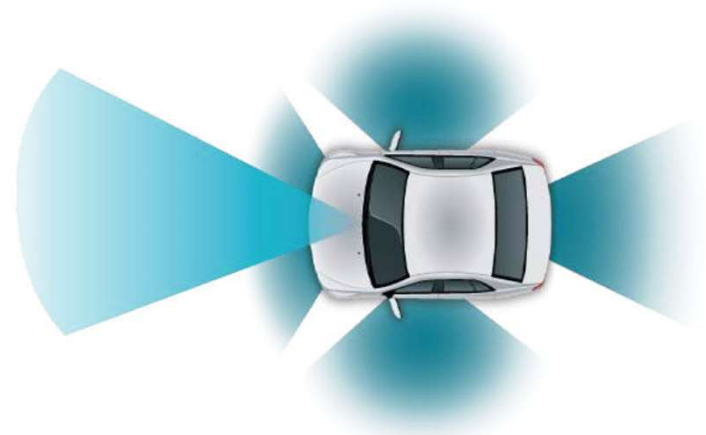
Low

TELEMATICS: Edge Based Camera Solution

MAJOR CAUSES OF ROAD ACCIDENTS

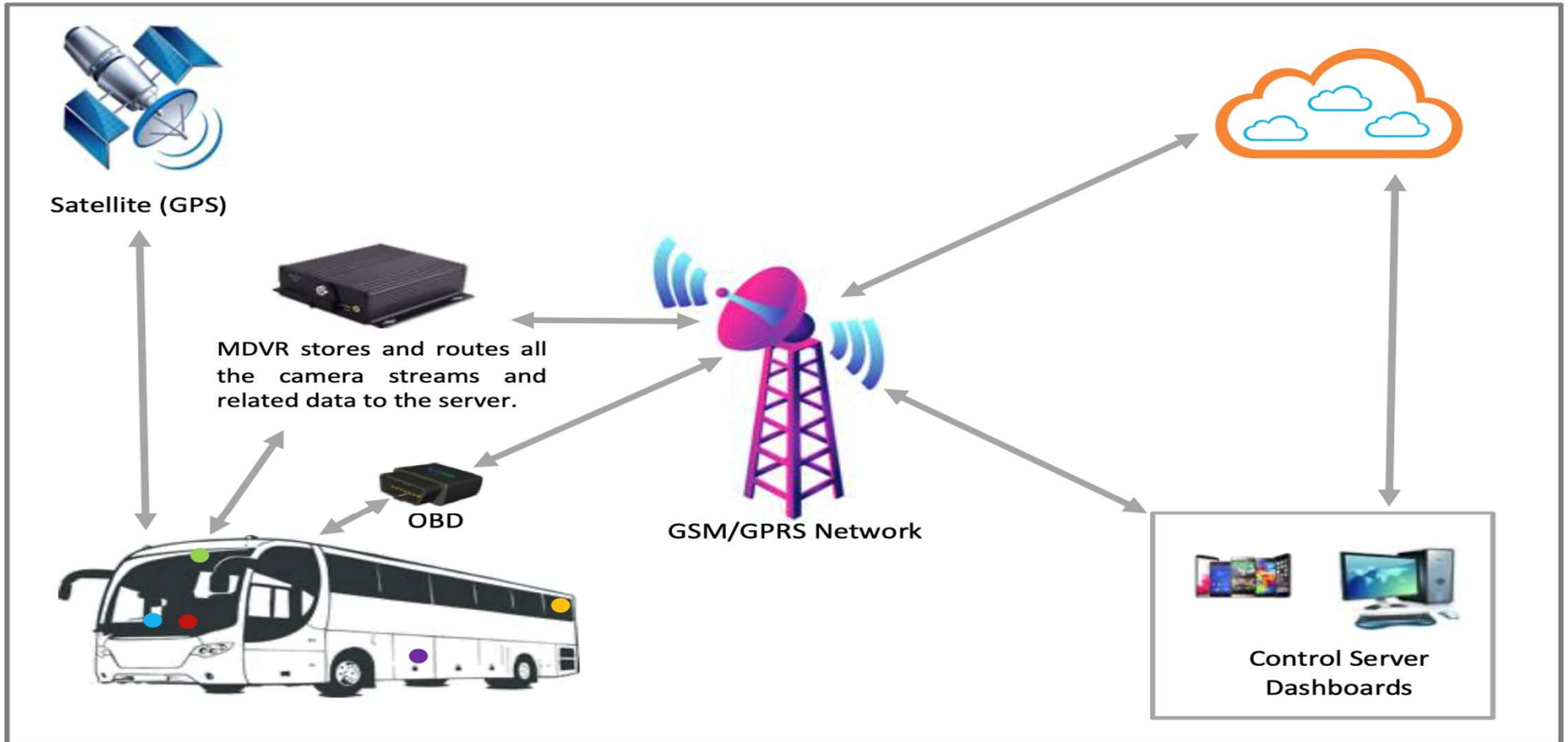


- *93% due to human error*
- *A third of these due to driver fatigue and/or distraction*

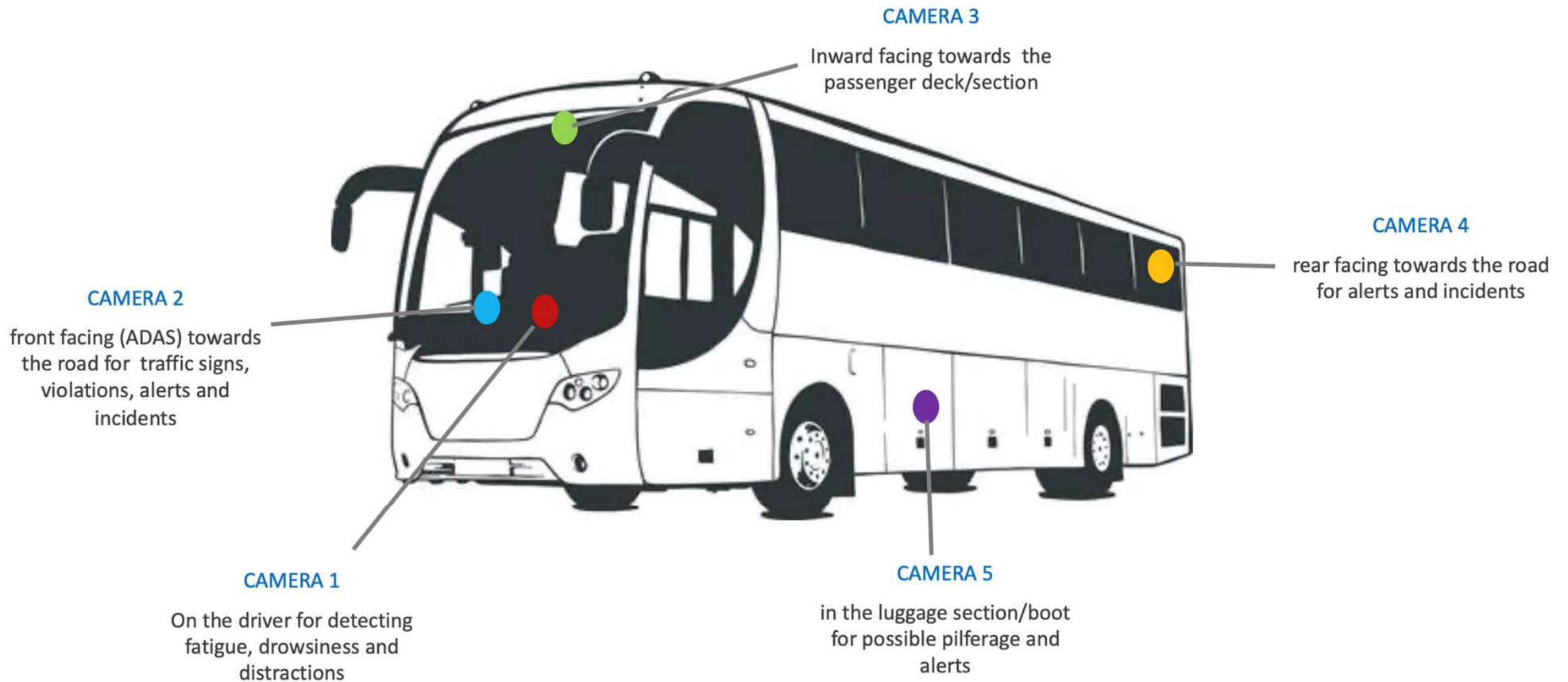


ISafety Solution uses **edge based high definition camera** to ensure safety of the passengers, the drivers, goods and the vehicle. The platform comes with facial recognition and object detection capabilities, powered by AI & ML system that analyses patterns and reports emergency situations

TELEMATICS: Edge Based Camera Solution

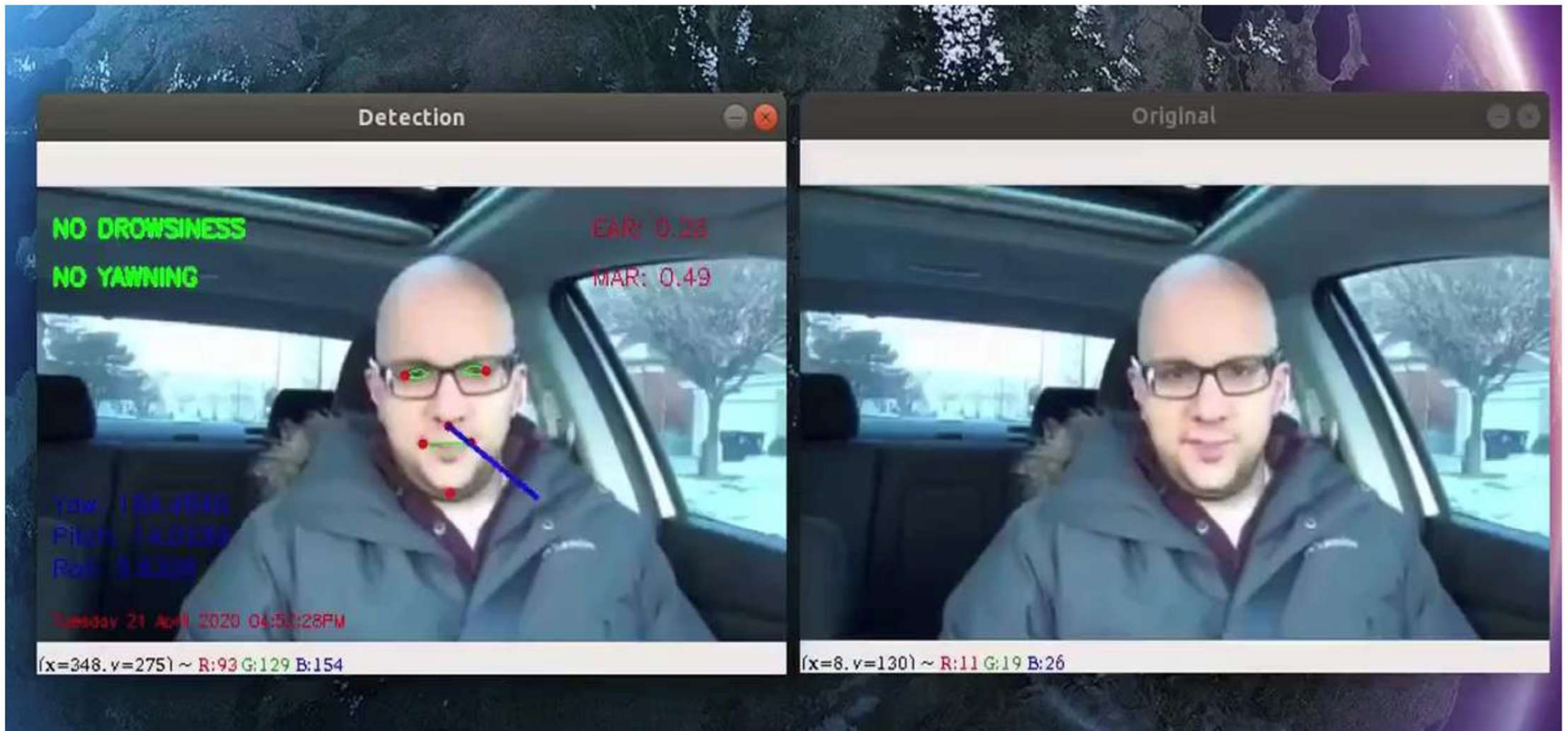


ADAS: Edge Based Camera Solution



**the number of cameras and configuration can be customized as per requirement*

ADAS: Driver's Drowsiness Detection System



Thank You