Leveraging Technology to Make Roads Safer

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Fast Tracking Road Safety through 5E's

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Safety focused 'Highway Design'

- Highway design standards have evolved within a design paradigm that is **deficient for the purpose of road safety**.

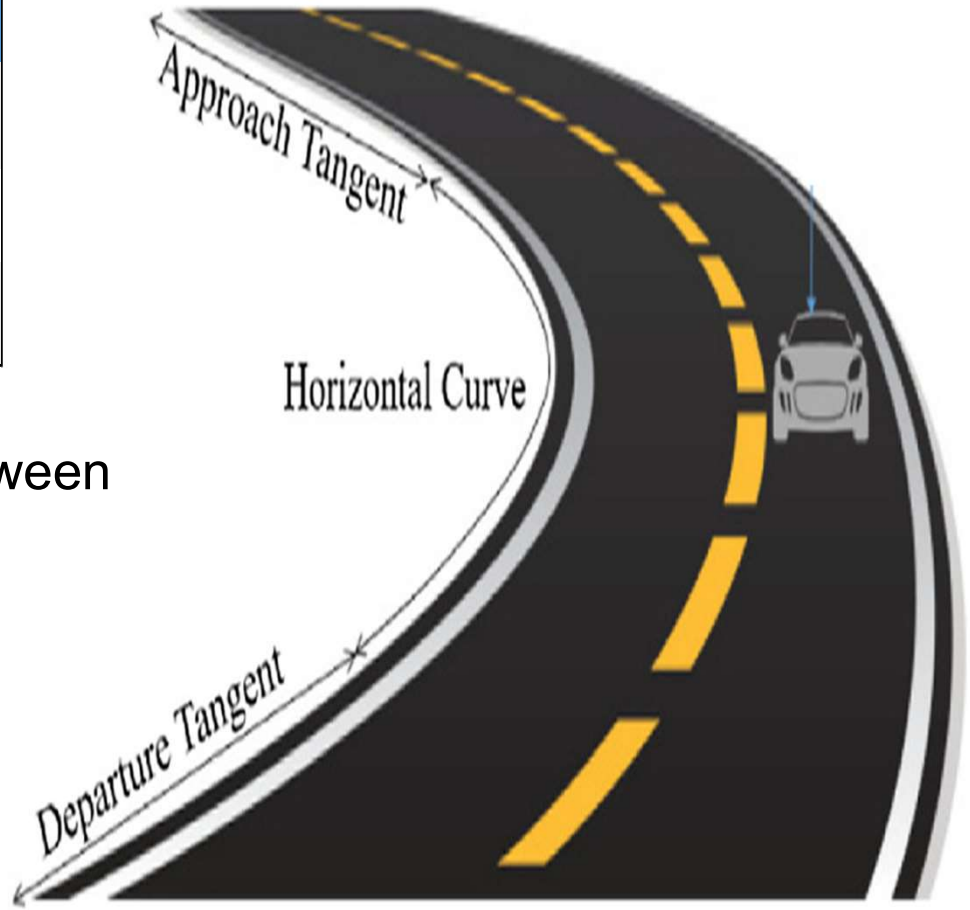
- These are based on surrogate **concepts of failure**, not on the frequency or **severity of crashes**.

- **Safety** as an essential **Design Control**

Speed Differential & Safety

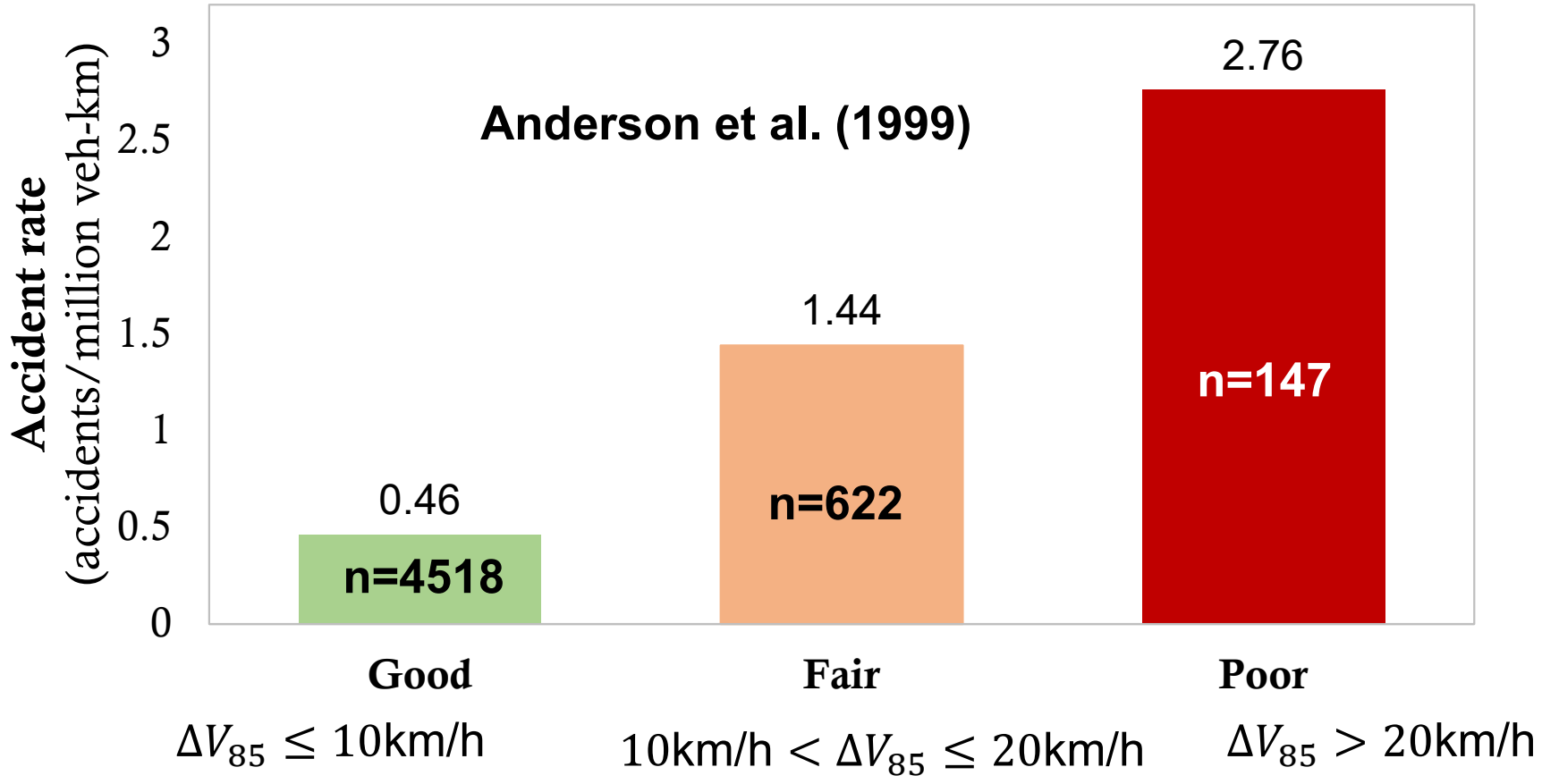
- **Design Speed** should preferably be uniform along a given hill road.
- **Larger** the speed differential, **higher** will be the crash frequency

Design safety levels (Lamm et al., 1988)	
Good	$\Delta V_{85} \leq 10$km/h
Fair	10km/h $< \Delta V_{85} \leq 20$km/h
Poor	$\Delta V_{85} > 20$km/h



ΔV_{85}=Difference in 85th percentile speed between successive geometric elements (km/h)

Speed Differential on Accident Rates



n= number of horizontal curves considered in the study

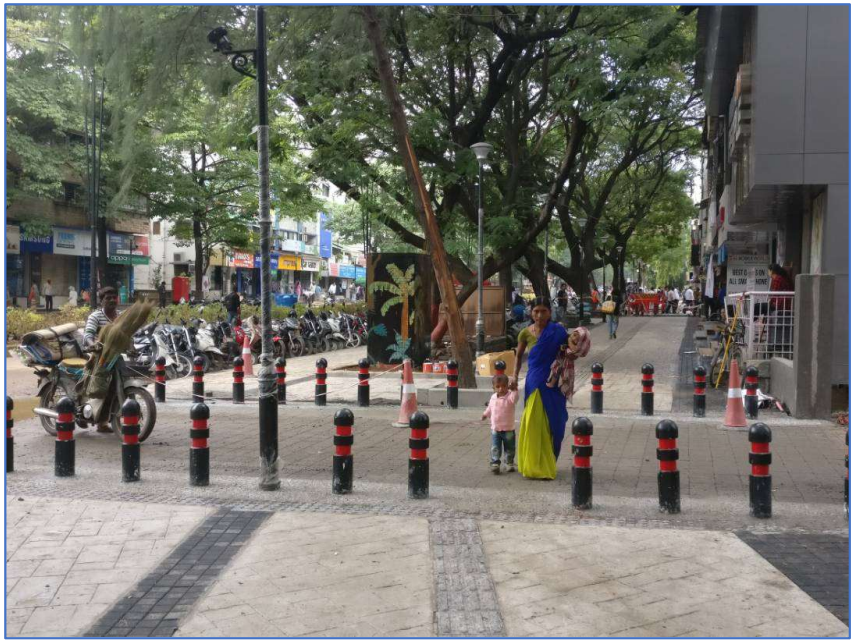
6 times as that of $\Delta V_{85} \leq 10\text{km/h}$
Twice as that of $\Delta V_{85} = 10 - 20\text{km/h}$

Revised Design Speeds

Sl. No	Class of Urban Road	Type of Terrain		
		Plain	Rolling	Mountainous and steep
1	Arterial Road	60	50	40
2	Sub Arterial Road	60	50	40
3	Collector Street	40	40	30
4	Local Street	30	30	20

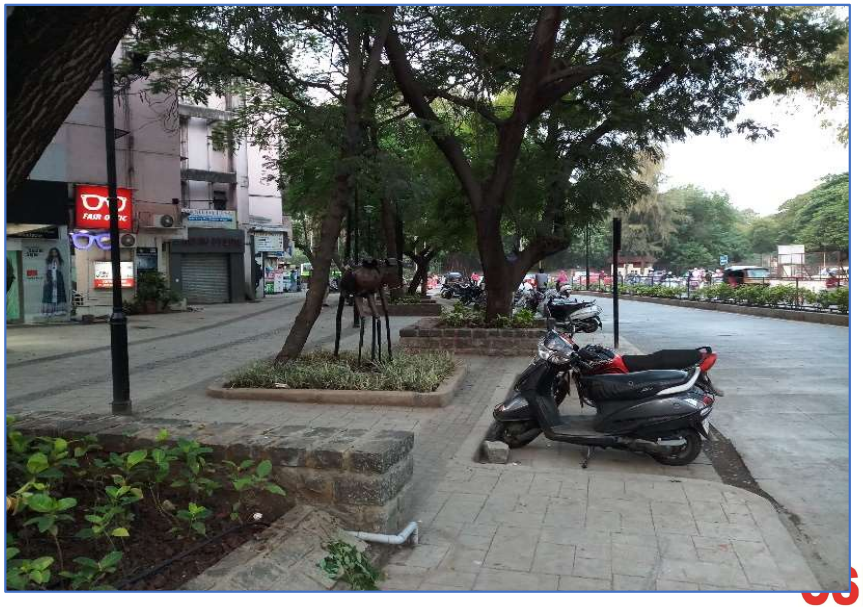
- **The design speed of Arterial Road is reduced to 60kmph (IRC 86- 2018) from 80 Kmph (IRC 86-1983)**
- Lower value compared to that designated in Table may be adopted for **posted speeds.**
- The sudden change in posted speeds along a stretch of road should be avoided **(in steps of 10kmph**)

NMV Infrastructure - Pedestrian Facilities



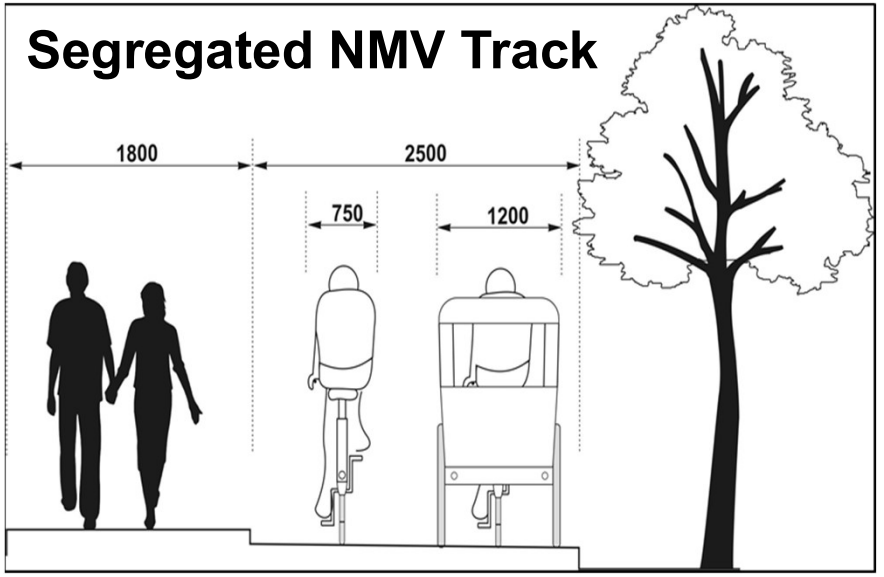
Street Design works under Smart Cities in Metro and bigger cities with focus on

- Pedestrian Safety
- Wider pedestrian facilities
- Road aesthetics
- Universal accessibility
- Street Furniture

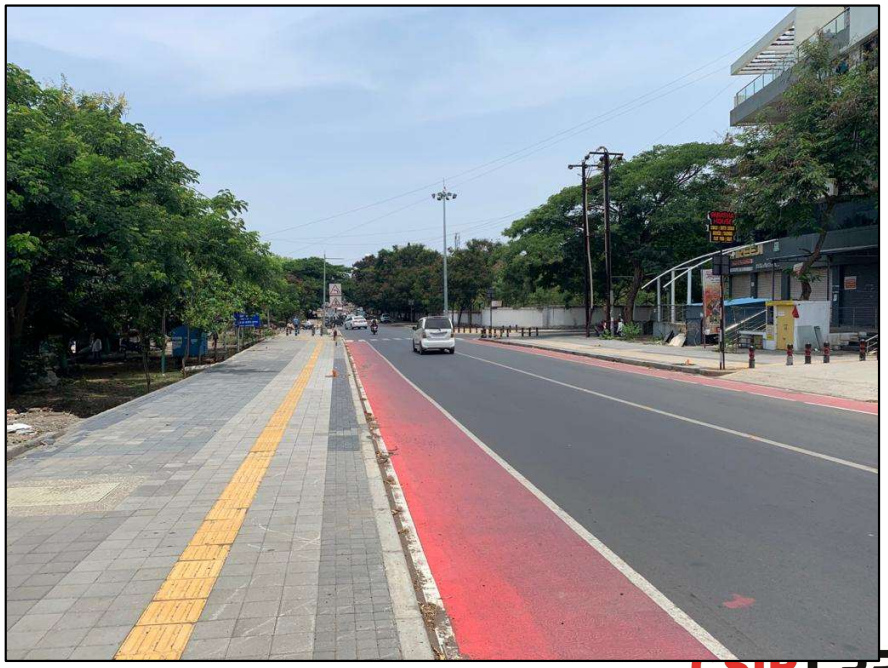


NMV Infrastructure - Bicycle Tracks

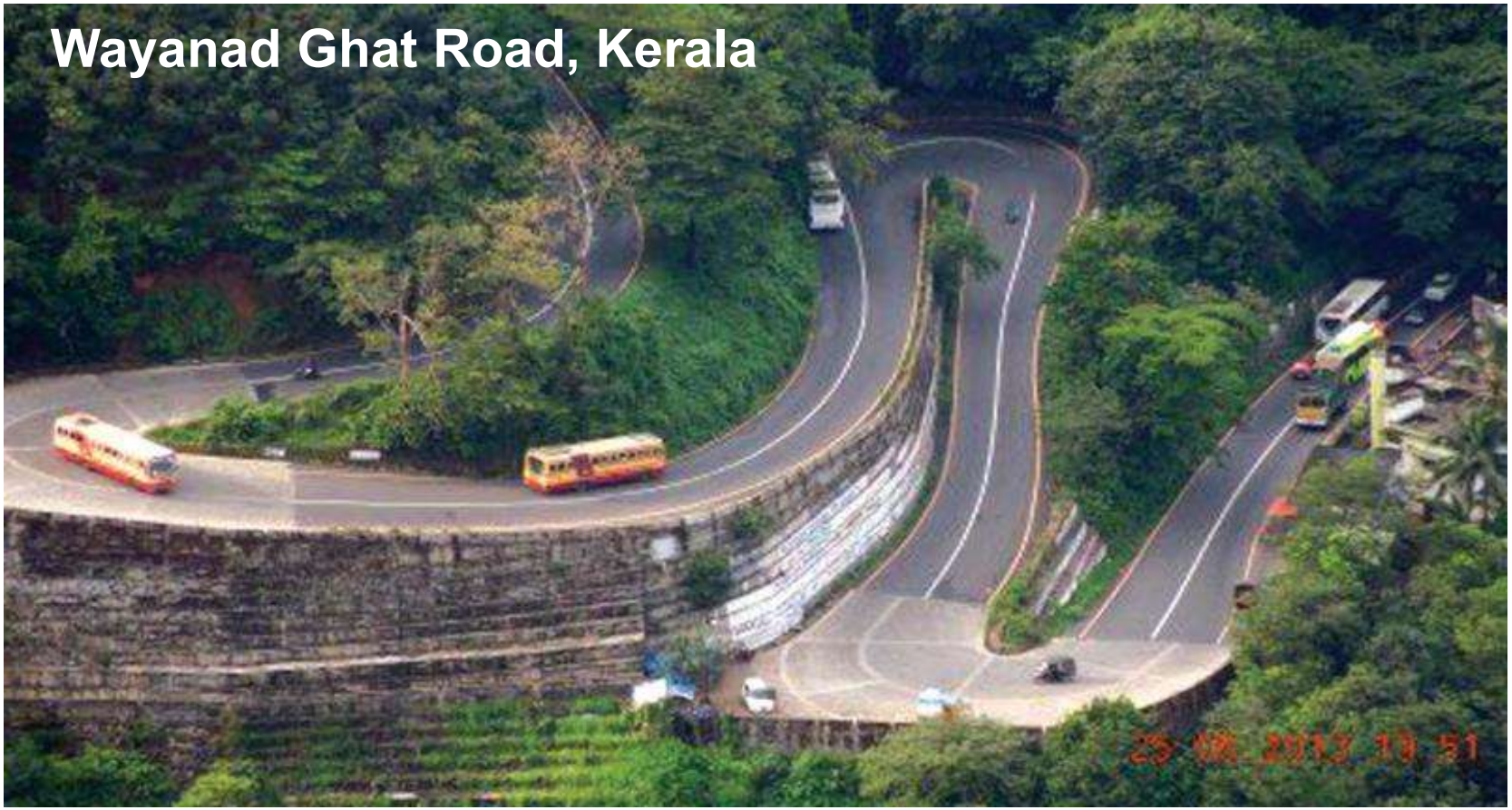
Well planned Segregated NMV track as part of Street development in smaller cities and towns focusing on Pedestrian facilities and road aesthetics with new materials



Segregated Bicycle Track Bhopal BRTS

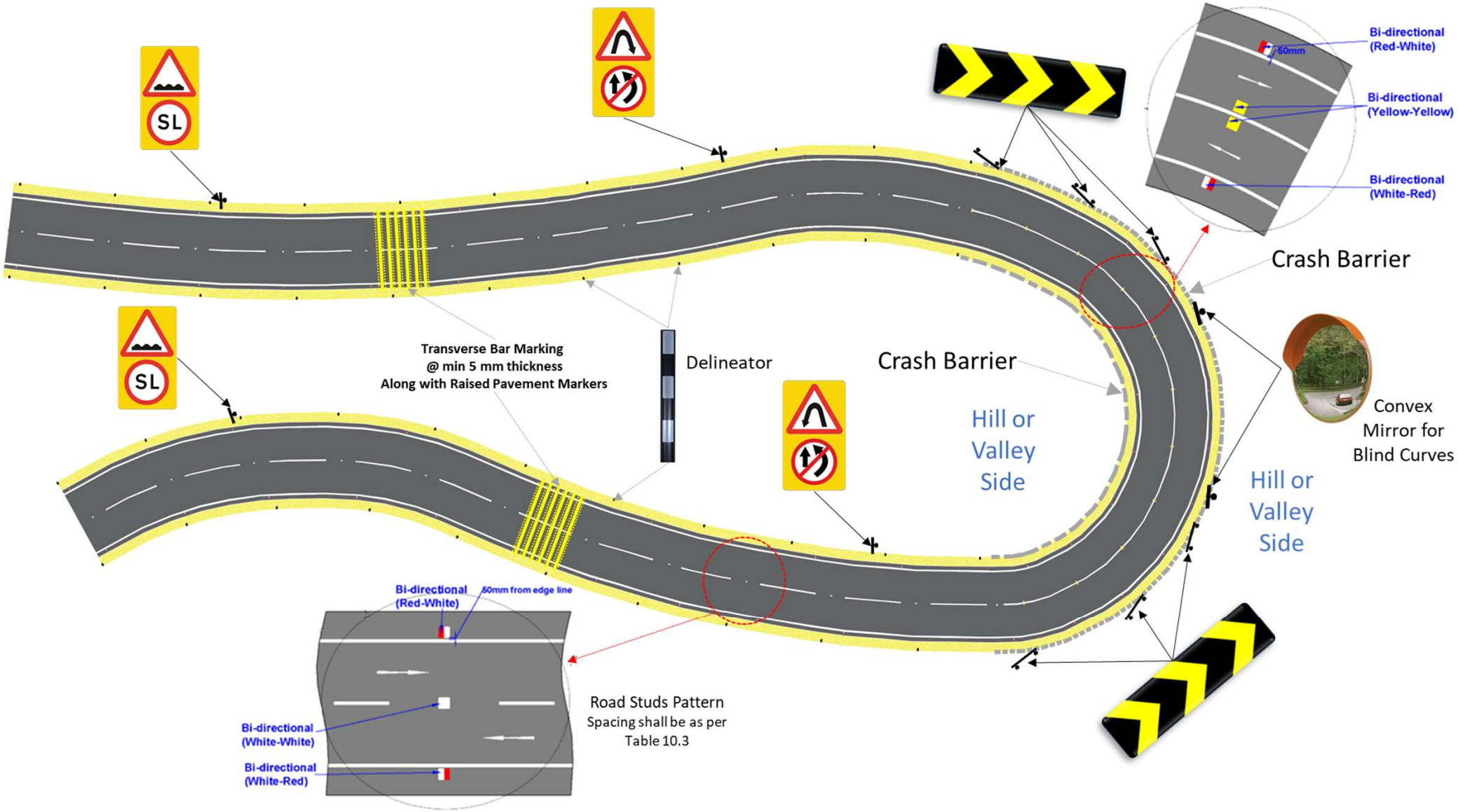


Hair-pin bends

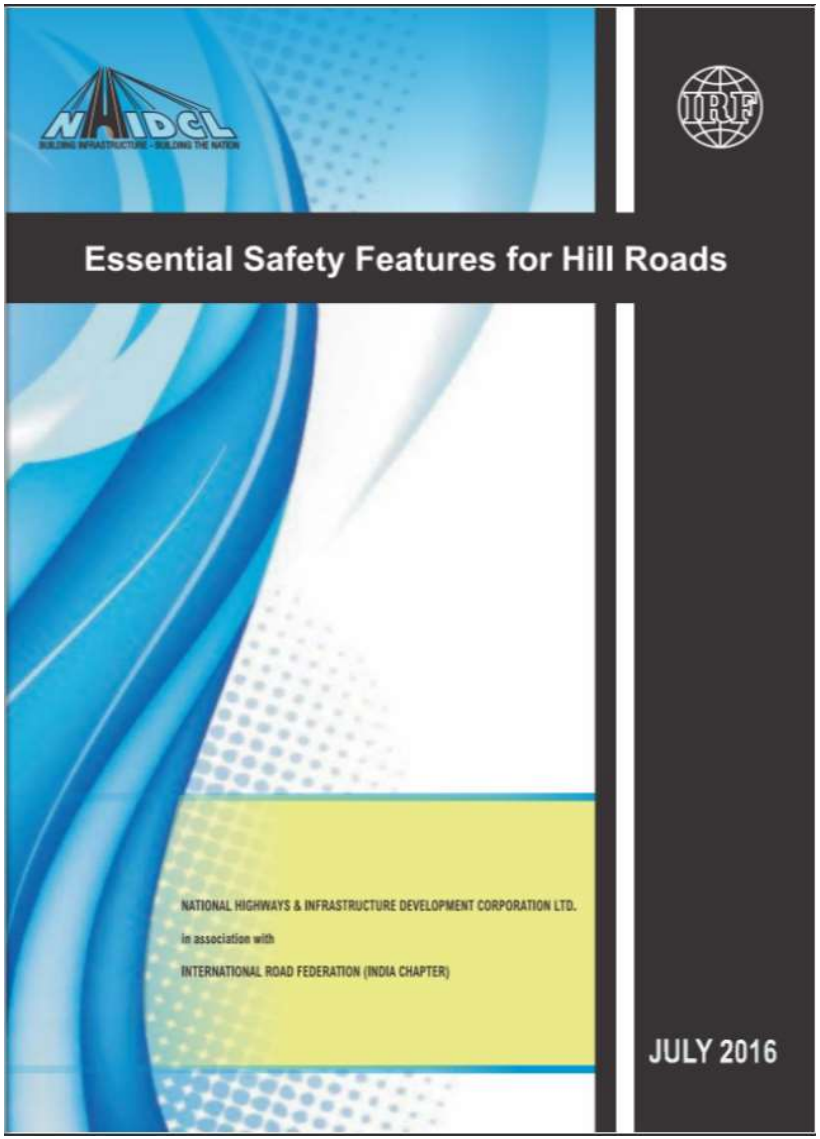


- Motorists travelling between Karnataka and Kerala are usually **unaware of the poor conditions**
- More than **24 major and minor accidents occur on the Ghat road stretch every month**

Hair-pin Bends Safety Treatment



Typical layout of Hairpin bends


NHIDCL
BUILDING INFRASTRUCTURE - BUILDING THE NATION
IRF
Essential Safety Features for Hill Roads
NATIONAL HIGHWAYS & INFRASTRUCTURE DEVELOPMENT CORPORATION LTD.
in association with
INTERNATIONAL ROAD FEDERATION (INDIA CHAPTER)
JULY 2016

Update Standards and Guidelines

- The standards and guidelines are to be **updated ensuring safety** is duly incorporated into the road design.

- Standards and guidelines to be **updated regularly** for improving them based on experience about their performance.

- Standards are to be updated based on **research findings**.

Intelligent Technologies

Electronic Toll Collection System

Advanced Parking Guidance System

Traveler Information System

Emergency Vehicle System

Automatic Road Enforcement

Collision Avoidance System

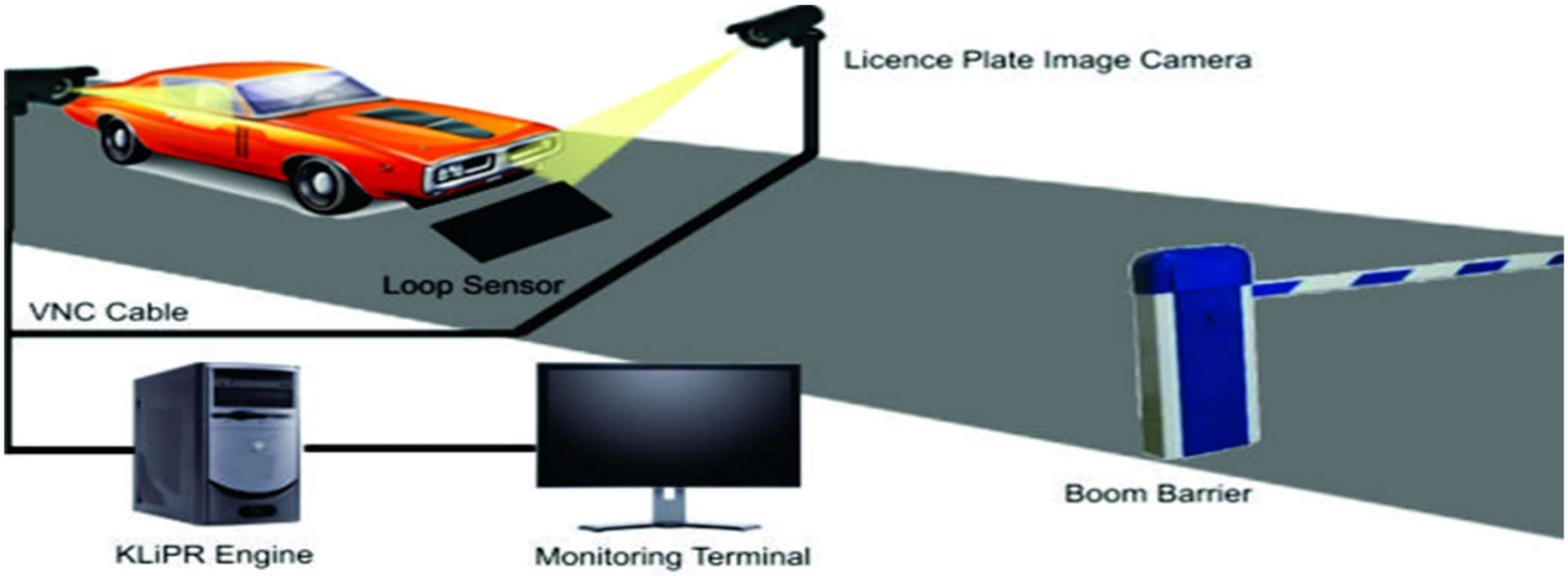
Traffic Management Centers
Integrated Command Control Center (ICCC)

- In India, cloud-based integrated control and command centers established for SMART Cities
- The integrated control and Command Centers (ICCC) Integrates IT systems of different stakeholders to enhance safety, security, and providing better public services in the cities.

ITS for Law Enforcement

- The ITS can be effectively used to ensure enforcement of traffic laws by the road users. Some of the most popular ITS applications for Law enforcement are

- **Automatic Number Plate Recognition :** *optical character recognition on images to read vehicle registration plates.*

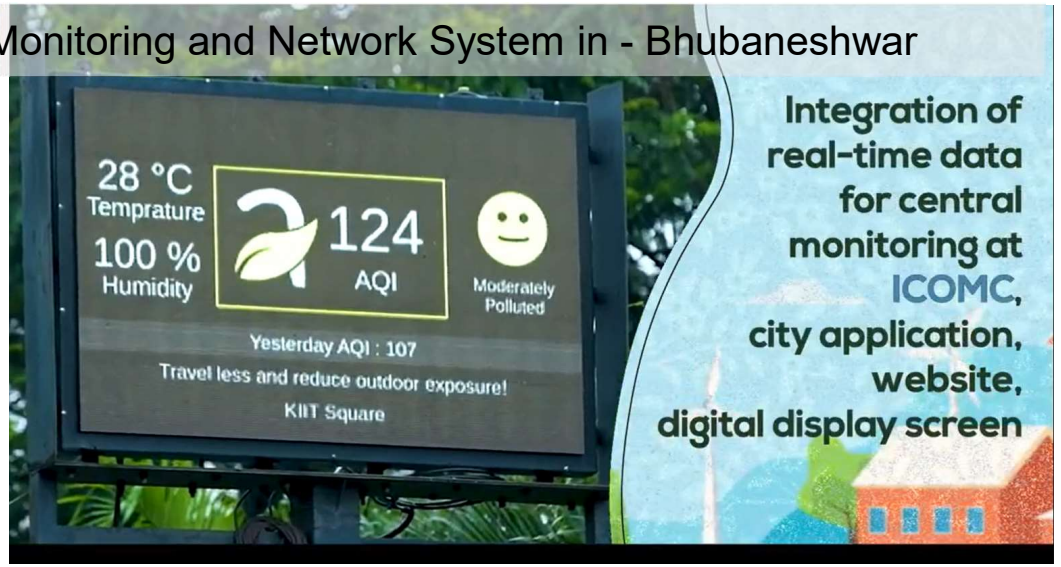


Automatic number plate recognition

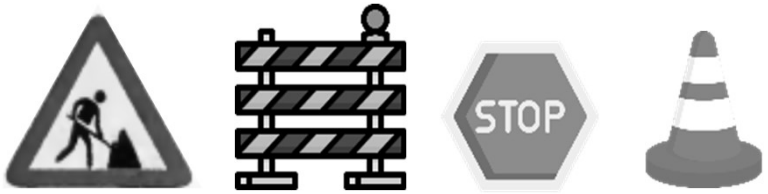
Variable Message Signs (VMS)

Estimated Arrival Time to Given Destination- Pune City

Environmental Monitoring and Network System in - Bhubaneshwar

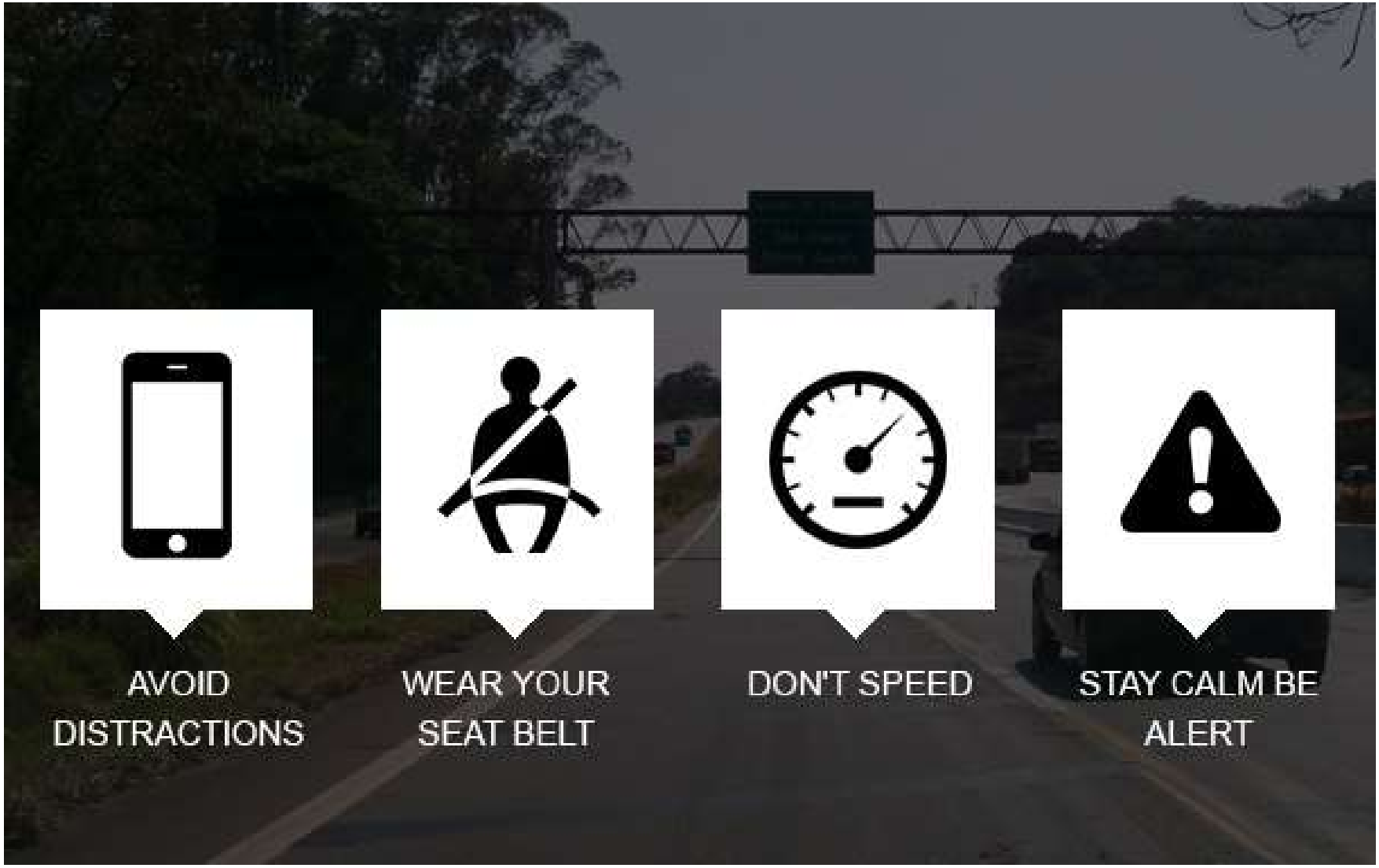


Traffic Control Devices



Portable Variable Message Sign

THANK YOU


AVOID DISTRACTIONS
WEAR YOUR SEAT BELT
DON'T SPEED
STAY CALM BE ALERT