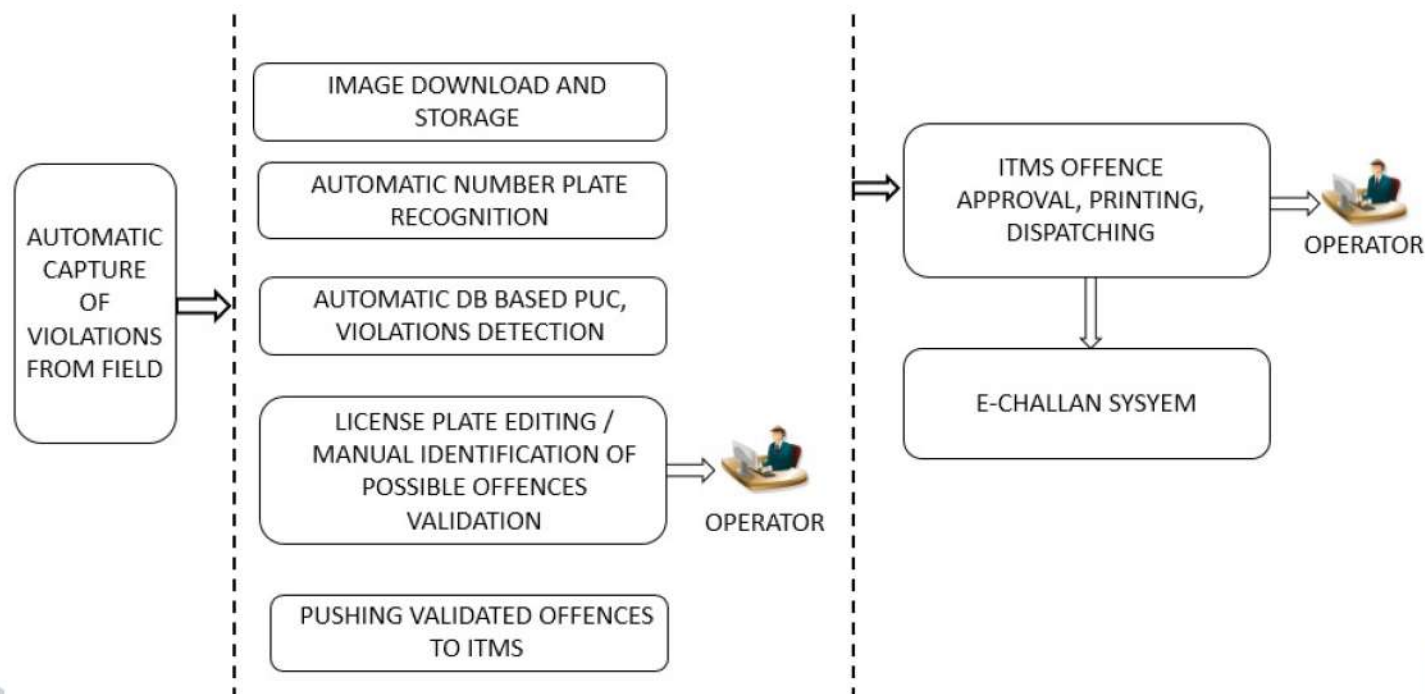


VIOLATION CHALLAN PROCESS



OVERSPEED VIOLATION DETECTION SYSTEM WITH ALL-VEHICLE ANPR CAPABILITY

Model KEL-SVD

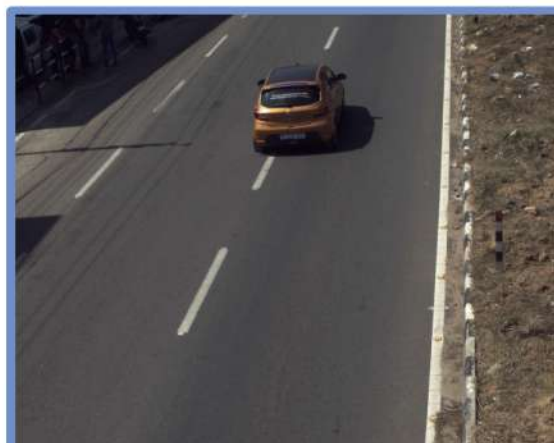
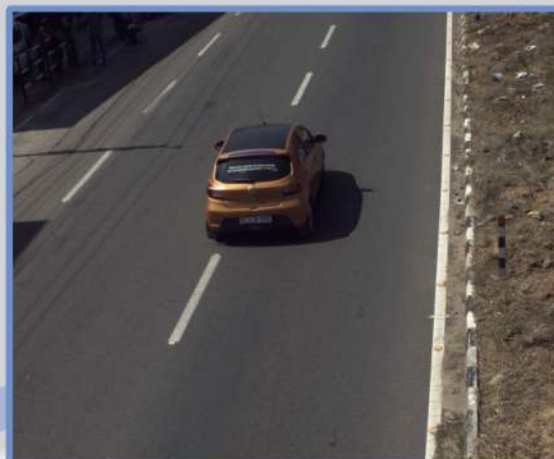
3 IN ONE SYSTEM

- ◆ Spot speed enforcement using state-of-the-art 3D Radar
- ◆ Average (section) speed enforcement
- ◆ All vehicle capture system (All vehicle ANPR system)

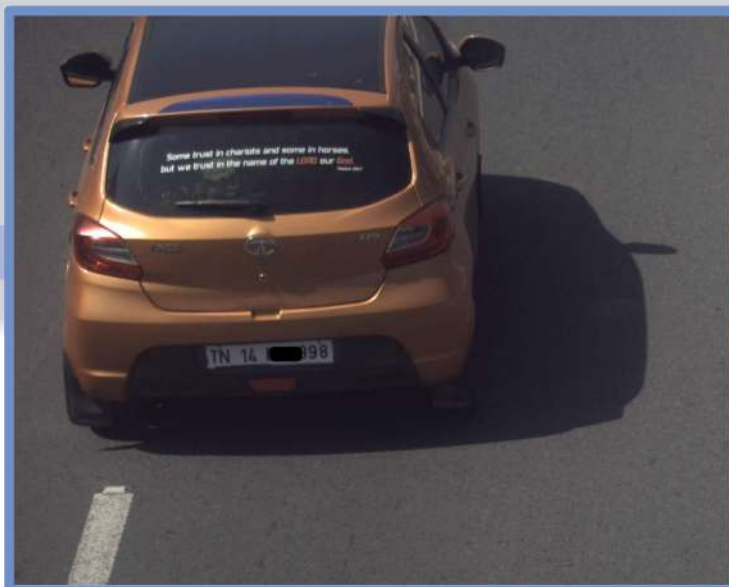
KEL - SVD SYSTEM USES 3D TRACKING DOPPLER RADAR TO DETECT AND CAPTURE IMAGES / LICENCE NUMBER OF ALL TYPES OF VEHICLES MOVING ON ROAD, WITH SPEED INFORMATION. SYSTEM WORKS FULLY AUTOMATICALLY DURING DAY AND NIGHT CONDITIONS.

- ☞ Speed accuracy 98% using 3D Doppler Radar
- ☞ Single radar covers multilane and multi vehicle tracking possible.
- ☞ International speed calibration certification for Radar
- ☞ 2 MP high resolution ANPR/LANE camera
- ☞ Court evidence wide angle camera
- ☞ Capable of capturing images of vehicles (including 2 Wheelers) at Day & Night
- ☞ Capable to capture both retro & non-retro reflective license plates.
- ☞ Very high vehicle detection accuracy compared to Video analytics
- ☞ Uses global shutter camera with synchronized high power IR flash
- ☞ Lightning protection, on-line health monitoring
- ☞ Motorized zoom lens for perfect focus during day& night
- ☞ Software feature – Challan processing and payment management software / ITMS - e-challan system
- ☞ Software supports clustering of servers for 24 x 7 fail safe operation
- ☞ All sub system designed to work up to 55 deg C
- ☞ Spot speed and average speed capture capability.
- ☞ AI based vehicle classification
- ☞ Light sensor for all round image quality

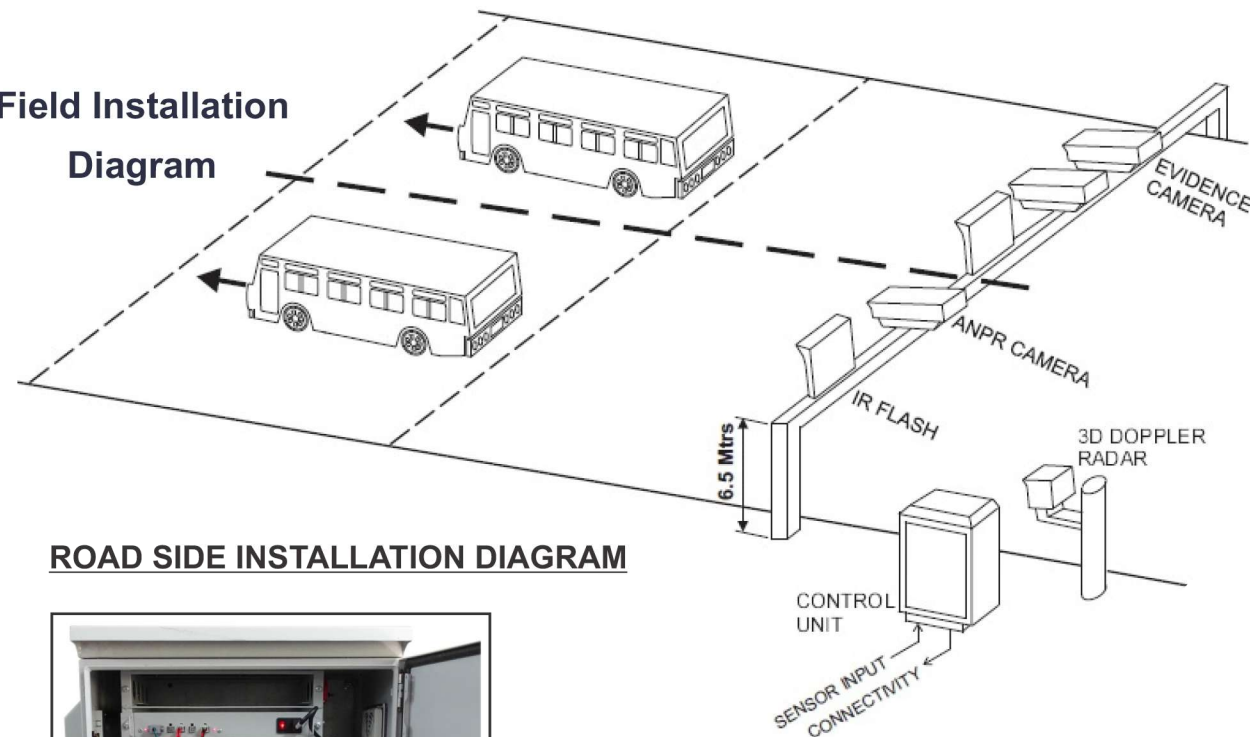
EVIDENCE CAMERA IMAGE



ANPR CAMERA IMAGE



Field Installation Diagram



ROAD SIDE INSTALLATION DIAGRAM



Specification:

Technology	KEL - SVD system uses 3D Doppler radar to detect and capture images / license number of all types of vehicles moving on road, with speed information. System works fully automatically during day and night conditions. Useful for all vehicle number plate capture for crime investigation and also for speed enforcement.
Road side hardware	
Image Capture subsystem	
Primary Speed Sensing / Vehicle detection (one per road)	3D/4D Tracking Doppler Radar, Detects and measures speed of vehicles, up to 240 Km/hour, multi lane operation. Speed Accuracy better than 97%.
ANPR Camera (ANPR camera one per lane) (Model: K-ANPR-GS-2M-L)	Sensor: 2 Mega pixel resolution, CMOS Global shutter sensor Sony Pregius Sensor, 3.45µm, >50dB SNR, Exposure time 1ms - 10µs, (1:1000 – 1:100,000) On board Video processor, 10/100 base T Ethernet, JPEG compression, Trigger in, Flash strobe out Lens :Motorized zoom, focus lens.IP 66 Outdoor enclosure, IEC 60950-1 certification
Evidence Camera(One per road) (camera one per road) (Model: K-ANPR-GS-4M-E)	Sensor: 4 Mega pixel resolution, CMOS Global shutter sensor, Exposure time 1ms - 10µs, (1:1000 – 1:100,000) On board Video processor, 10/100 base T Ethernet, JPEG compression, Trigger in, Flash strobe out, wide angle lens IP 66 Outdoor enclosure

Infrared Flash Illumination(One per lane) (Model: K-IRILM-250W)	Infrared flash for image capture at night, Synchronized flash with global shutter of camera, Peak pulse power > 250 watts, Average power < 10Watts, Wavelength: 850 nm, Flash power sufficient to capture vehicle images at night. Capability to capture retro reflective and non-reflective number plates. IP 66 Outdoor enclosure
Light sensor for Exposure control	Light sensor (5 decade measuring range) to be used for adjusting camera parameters (Exposure time, Gain) to get optimum image quality under all conditions.
Vehicle image Capture	Evidence camera capture wide angle shot of full road and surroundings with minimum 2 images of vehicle moving on the road, also along with LANE image of the vehicle. Records 24 x 7 ANPR grade video
Operating Modes	
Speed Enforcement Method	Spot speed enforcement : ANPR camera captures vehicle image / Licence plate number based on trigger from Radar sensor with time stamp and speed information. Violated vehicles are marked on image for identification Average (Section) Speed enforcement: with NTP server / GPS synchronized time
Vehicle speed accuracy	Speed measurement beyond 240 Km/hour with accuracy of 97%
All Vehicle - ANPR capture mode	Captures all vehicles passing through the installed location. All vehicle images and numbers are kept in data base for real time alerts/ search for crime analysis. Vehicle images are captured even without number plates
ANPR Accuracy	Better than 90% for standard / near standard number plates
Vehicle detection rate	TYP 95% of all vehicles captured under all condition irrespective of number plates quality in free flow traffic conditions(System should be installed on free flow stretches to obtain above accuracy
Other features	
Road side processing Hardware and Software	Road side embedded hardware, network switch. Onsite LCD display for local status monitoring, 256 GB Local storage, industrial grade network switch (0-60 deg. C) 10/100 Base T, system controller, protection circuits, conformal coating for high humidity environments (95%RH)
SVDS Configuration	1 or 2 road, with 2 / 3 /4 lanes per road
Power supply	On line DC UPS for road side hardware with min 3 Hr back up, and also soft shutdown of Hardware in case of power failure with auto restart. Utility power supply with power meter
Health Monitoring and control	Temperature, battery , UPS, Mains voltage status, power supply working status, vibration sensor, (Anti tamper with siren) camera status, remote control of reset, shutdown
Protection	Protection against lightning, under/over voltage, Low power standby mode for long period mains power failure condition
Remote notification methods	Cloud based remote notification in addition to main connectivity.
Field Enclosure	Pole mounted outdoor type, with Rain canopy etc.
Camera mounting	Gantry or cantilever option
AI based Analytics	Classify different type of vehicles like bus, car, truck, auto, two wheeler etc. seat belt / helmet detection (option)
Data Encryption	Advanced Encryption Standard (AES)