



Vehicle Location Trackers: Certification & Deployment AIS 140 Standard

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Presentation Outline...

- History of ITS in India
- Passenger Safety :AIS 140 Standard for Tracking Device
- VLT Validation and Reliability
- Applications of AIS 140 device
- Government Initiatives-Electric Vehicles
- Cyber Security for Connected Vehicle



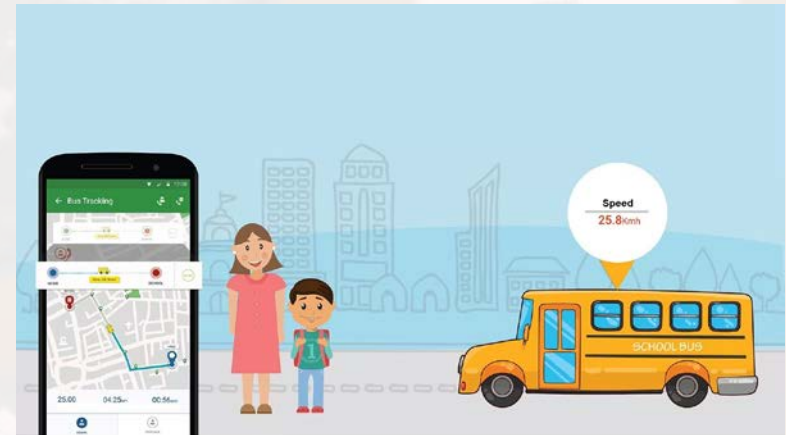
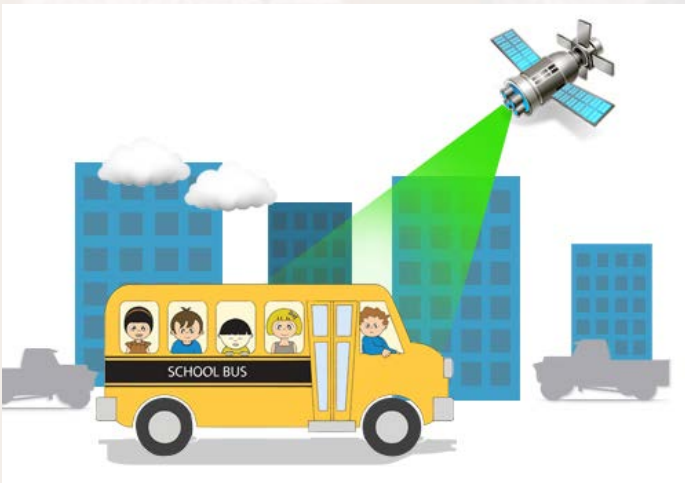
Key Features – ITS

- Multiplex of wiring to Simplify, Remove Fuses & Relays
- Communication with Control Center :Wifi and GPRS

- **Vehicle Health Monitoring and Diagnostics System (VHMD)**
- **Single Driver Console : Driver Display**
 - Route selection, security cameras, vehicle location information system,
 - Pop up warnings on console
- **PIS inside and outside integrated with audio announcement system: LED Displays**
 - Display and announcement of Location based information , pre-recorded message, Special signs
- **Security Camera Network**
 - Inside bus camera, Camera for Rear view, Recording in panic situation

- 2014: To ensure safe transportation of children, Central Board of Secondary Education (CBSE) has made it compulsory to install GPS in all school buses. The Global Positioning System which will help track school buses will be approved by Automotive Research Association of India (ARAI) according to the new guidelines issued by CBSE.

Again issued guidelines in 2017



ITS-India History :Transportation of hazardous goods requires Vehicle Location Tracking Device



- **Fare collection Technologies : Delhi Metro**

- **Intelligent Signalling**

Mumbai, Delhi

- **Telematics**

Public transportation management using telematics at Koyambedu, Chennai bus terminal

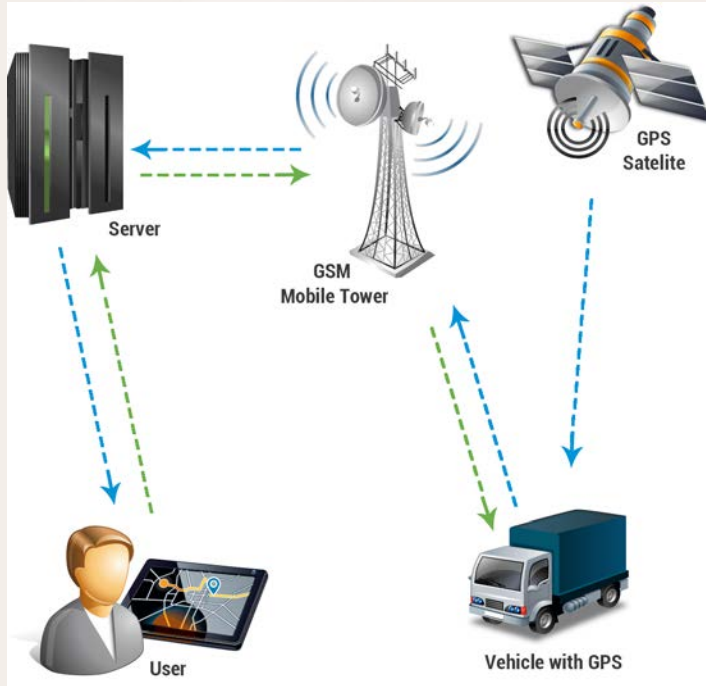
ITS project is underway for public transport management in Mysore city

- **Highway Traffic Management**

Some experiments in vehicle counting, number plate recognition, incident management and lane control

- Mandatory vide S.O 5454(E) Implementation is mandatory for new public service vehicles registered from **1st Jan 2019**





System is GNSS Receiver with **Support to IRNSS (Indian Regional Navigation Satellite System) and GAGAN** is must along.

In addition it can have hybrid constellation (GPS, GLONASS, Baeidu, Galileo)

GNSS Chipset Requirement

	GPS	IRNSS
Cold Start	< 120 sec	
Warm Start	< 60 sec	
Hot Start	< 10 sec	
Acquisition Sensitivity	-145 dBm	-140 dBm
Tracking Sensitivity	-160 dBm	-153 dBm

	Cold Start	Warm Start	Hot Start
Previous Position	Erase	Keep	Keep
Time	Erase	Keep	Keep
Almanac	Erase	Keep	Keep
Ephemeris	Erase	Erase	Keep

- L and/or S band NAVIC/IRNSS , GAGAN, the Indian SBAS supported device.
- Position accuracy of 2.5 m CEP or 6 m 2DRMS
- Input/Output supported by Device : 4 Digital, 2 Analogue , 1 Serial Communication
- Data sent to 2 IP address (1-primary server , 2- Emergency server)
- Data sending frequency configurable: -5 sec to 10 min
- Device shall have an Embedded eSIM.
- Device sleep mode current ≤ 20 mA with Internal back-up battery support: 4 hours
- 3 axis accelerometer and gyroscope
- Indicative data message format - Normal Operation, Emergency Situation, in Alert condition.
- Emergency button disconnection between switch and controller should be detected through Alert.

Configuration of Device Parameters Over the Air (OTA)

- Setting/ Change of the Primary or Secondary IP and port number
- Setting/ Change of the APN
- Set configuration parameter like sleep time, overspeed limit, harsh braking, harsh acceleration, rash turning threshold limits etc.
- Emergency control SMS Centre Number(s)
- Configuring the vehicle registration number
- Configuring the frequency of data transmission in normal / Ignition state / OFF state sleep mode/ Emergency state, etc.
- Configuring the time duration for Emergency state
- Capability to reset the device
- Command to get the IMEI of the device

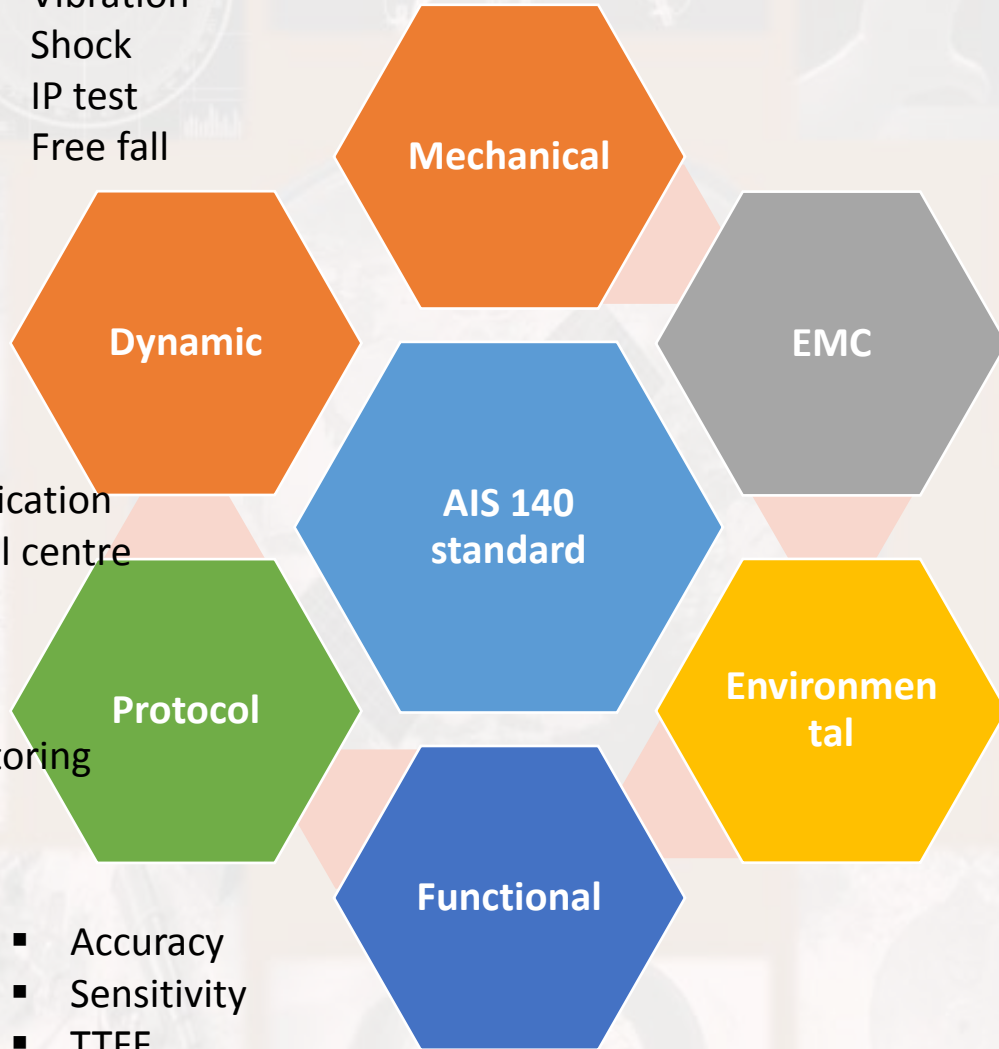
VLT Validation Flow

- Vibration
- Shock
- IP test
- Free fall

Vehicle Test

- NMEA data communication with back end control centre
- OTA configuration
- SMS data
- Alert ID.
- Vehicle Health Monitoring

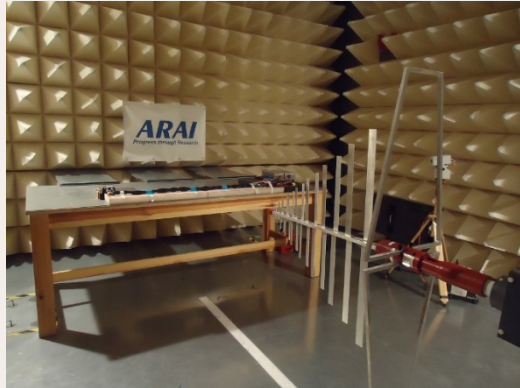
- Accuracy
- Sensitivity
- TTFF



- AIS 004 Part 3
- High Voltage Test
- Load Dump Test
- Reverse Polarity Protection
- Over Voltage Protection
- Insulation Resistance
- Battery Back up

- Dry Heat / High Temperature Test
- Cold Test
- Damp Heat Test
- Temperature shock Test
- Slat Spray Test.
- Flammability

Reliability : EMC and Environmental Testing



EMC-ALSE Chamber



ESD



Conducted Immunity



ENV Chamber



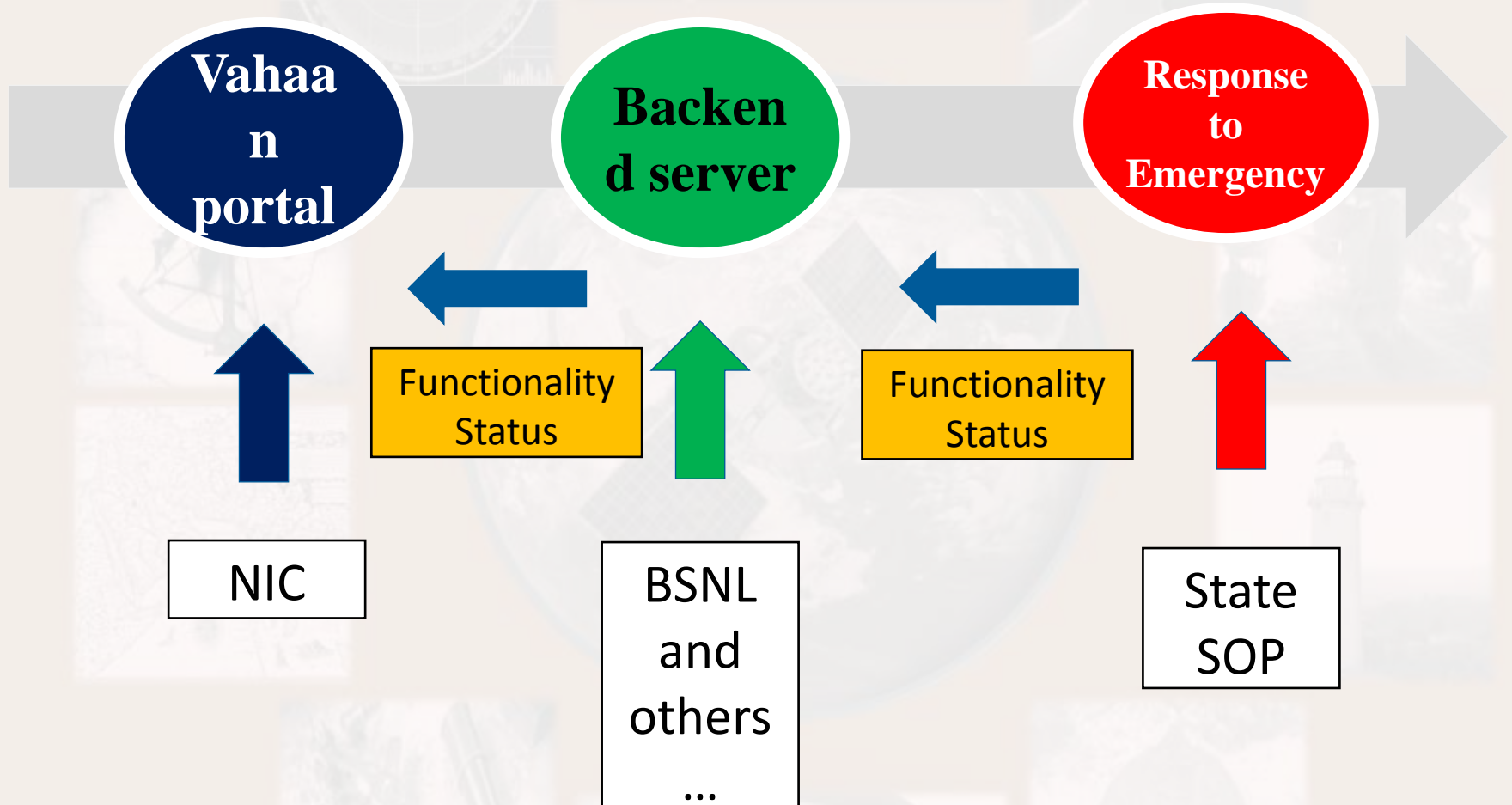
Cyclic Temp./RH



HALT/HASS

- Certification of VLT devices from any of the test agencies
- After the type approval, NIC shall issue a unique username and password to each VLT Device manufacturer for uploading the Type approval data on VAHAN portal.
- State or Union Territories to ensure fitment and functional status of the VLT device in the public service vehicles at the time of checking of the vehicles for fitness certification.
- VLT manufacturers shall register the devices along with details of vehicle on the corresponding backend systems in real-time.
- VLT device manufacturers shall get their devices tested for conformity of production every year after the first certification, from the testing agencies.

Steps Required



■ Data to be uploaded by VLT Devices Manufacturers in VAHAN portal:

- a) VLT Device make and model
- b) Type Approval Certificate (TAC) and / or Conformity of Production Certificate (COP) as applicable
- c) IMEI Number
- d) Icc ID Number
- e) Unique identification number as per format displayed in next slide:

Four alphanumeric characters	Two alphanumeric character One alphabetical character for Test Agency	Four numerical digits	Eight numerical digits
For name of Manufacturer	For name of the model [A] - Automotive Research Association of India [C] - Central Institute of Road Transport [I] - International Centre for Automotive Technology [V]- Vehicle Research & Development Establishment [F] - Central Farm Machinery Training & Testing Institute [P] - Indian Institute of Petroleum [G] - Global Automotive Research Centre, Chennai	For month and year of manufacture in format MMY Y	For Production Sr. No.



**ARAI Approved GPS Only Devices= 28 Nos.
ARAI Approved IRNSS Devices =52 Nos.**

