

# Commercial in Confidence Sensorise Proprietary

Presentation to:

4th National Summit on 100 Smart Cities

Subject:

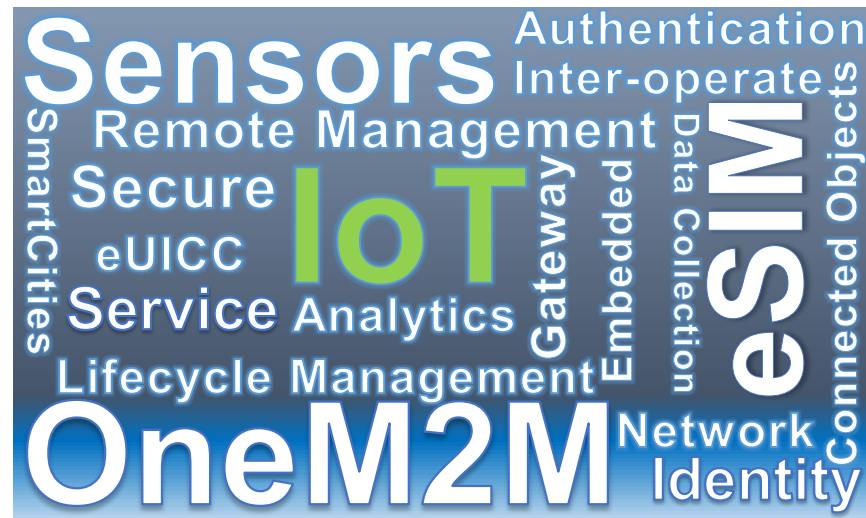
A perspective on standardization and developments in Intelligent Transport Solutions (ITS)

Presentation By:

Sharad Arora, Founder & MD, Sensorise Digital

Date:

24Aug2018



**SENSORISE**  
Connect & Serve



# Presentation Theme

## *Theme*

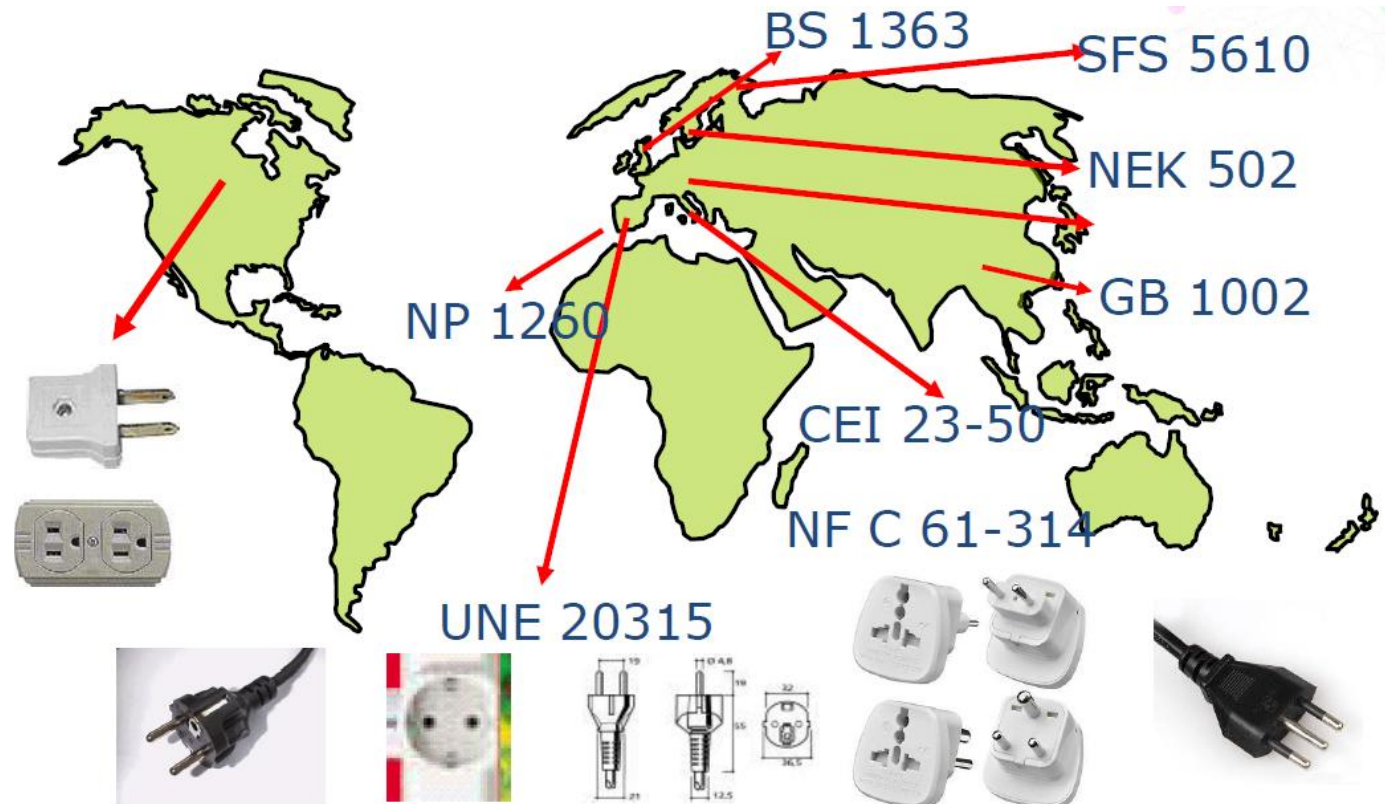
- *A perspective on standardisation and developments in Intelligent Transport Solutions (ITS)*

## Agenda

- *Standardisation: A European Perspective*
- *Indian ITS: A different problem set*
- *Heroes of the Indian ITS movement and its Heroes*
- *Minimum Requirements for a sustainable ITS program*



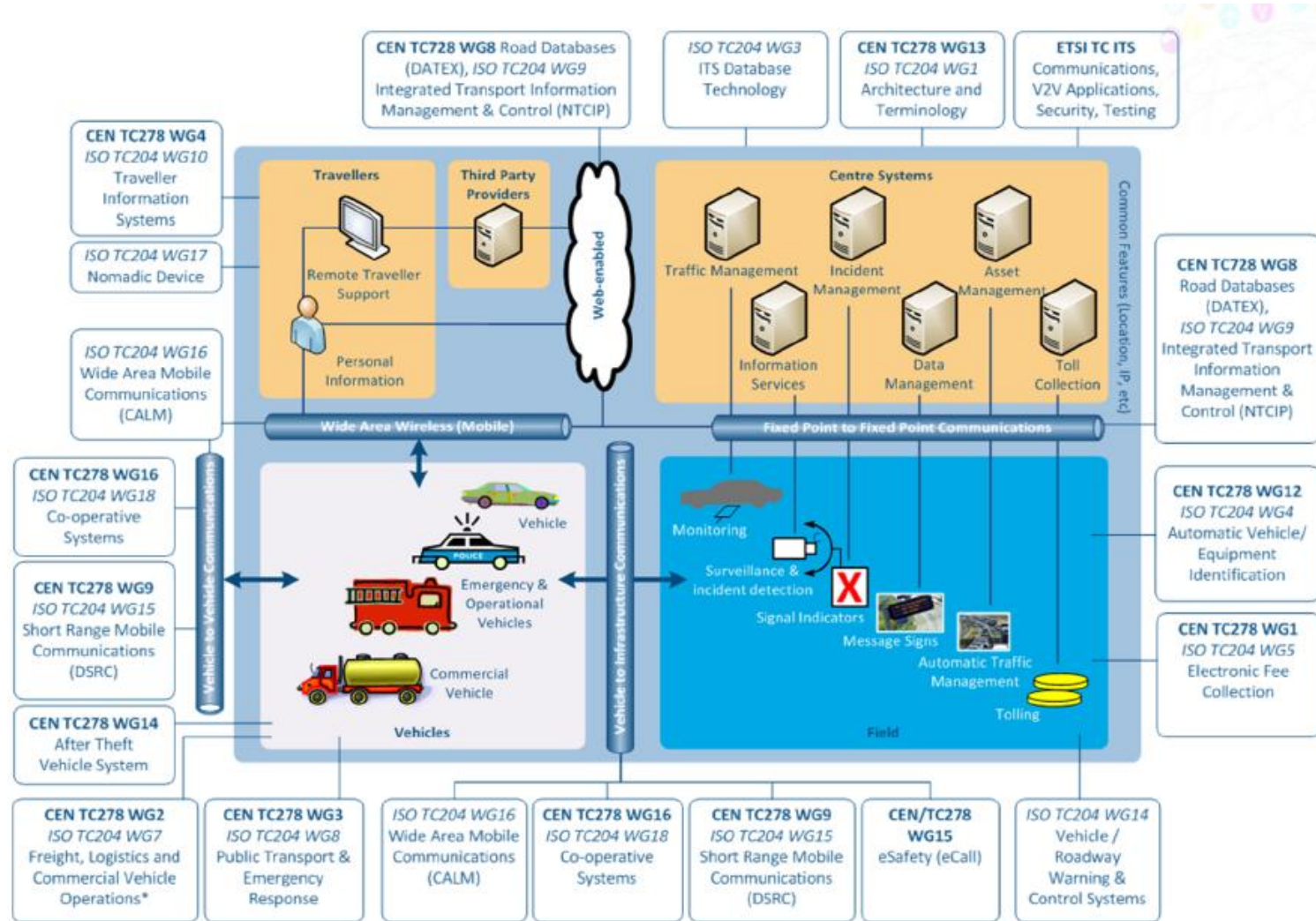
# The Challenge of Standardisation



Imagine the cataclysmic disaster if the example of electrical plugs was to follow for ITS



# The ITS Standardisation threat is real!

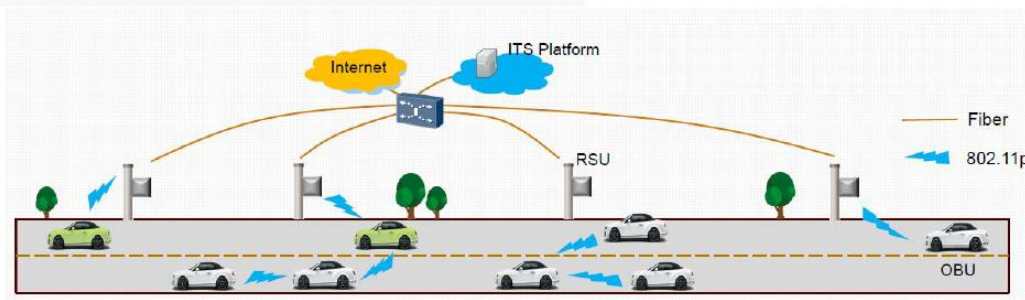
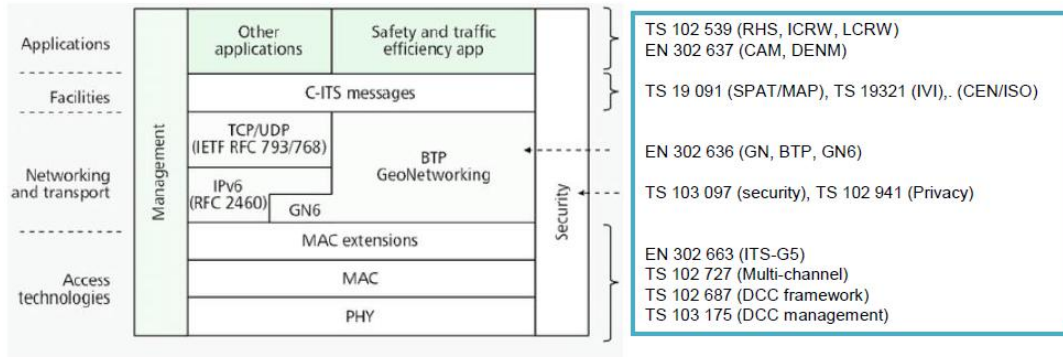




# ITS Standardisation from the Telecom Prism

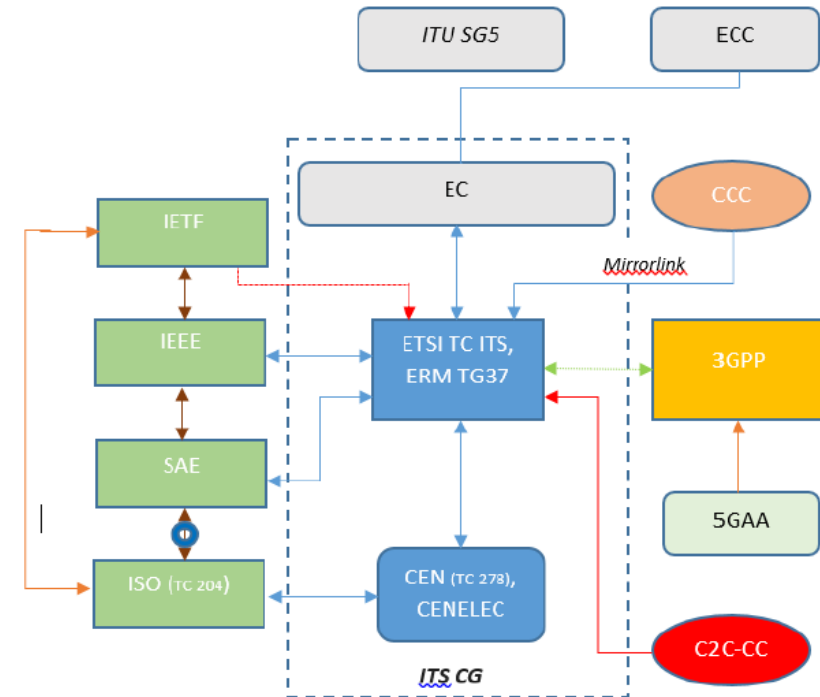
ITS Standardisation: A European Perspective

- Global Harmonisation of Standards
- Coordination across ETSI, IEEE, SAE, ISO, IETF
- Involvement of 3GPP, CCC, C2C-CC, 5GAA



Courtesy: Presentation by Adrian Scrase, CTO, ETSI, 3<sup>rd</sup> Indo European Conference on Standards and Emerging Technology

## ITS: Intelligent Transport Systems



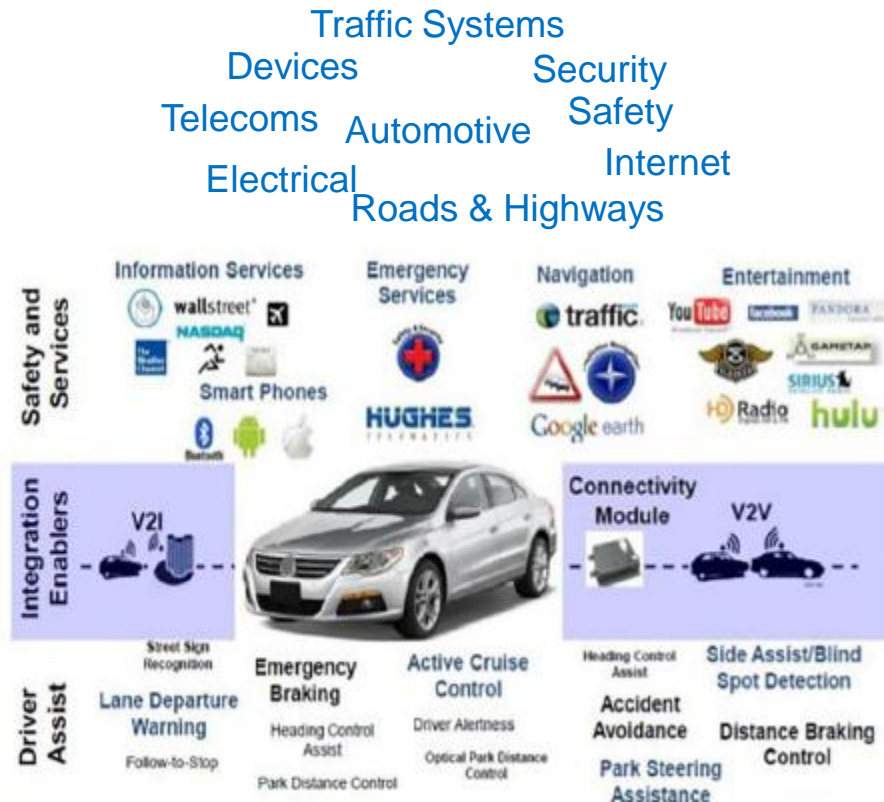
CCC: Car Connectivity Consortium

C2C-CC: Car 2 Car Communication Consortium

5GAA: 5G Automotive Association



# ITS Applications | Many Stakeholders



- The Basic Set of ITS Applications are grouped as below
  - Road Safety
  - Traffic Efficiency
  - Cooperative Local Services
  - Global Internet Services
- ITS Safety Services will use the band 5875-5905 MHz to realise the V2X and I2X communication
- Telco stakeholders are working on a solution for the use of 5.9 Ghz band for LTE-V2X communication (PC5)

Courtesy: Presentations, 3<sup>rd</sup> Indo European Conference on Standards and Emerging Technology



# ITS – Applications: Day 1 List

1. Emergency electronic brake light
2. Emergency vehicle approaching
3. Slow or stationary vehicle(s)
4. Traffic jam ahead warning
5. Hazardous location notification
6. Road works warning
7. Weather conditions
8. In-vehicle signage
9. In-vehicle speed limits
10. Probe vehicle data
11. Shockwave damping
12. GLOSA / TTG
13. Signal violation/Intersection safety
14. Traffic signal priority request by designated vehicles
15. Off street parking information
16. On street parking information and management
17. Park & Ride information
18. Information on AFV fuelling & charging stations
19. Traffic information and smart routing
20. Zone access control for urban areas
21. Loading zone management
22. Vulnerable road user protection
23. Cooperative collision risk warning
24. Motorcycle approaching indication
25. Wrong way driving

Courtesy: Presentation by Antonino Pirrotta, AP Crono, 3<sup>rd</sup> Indo European Conference on Standards and Emerging Technology

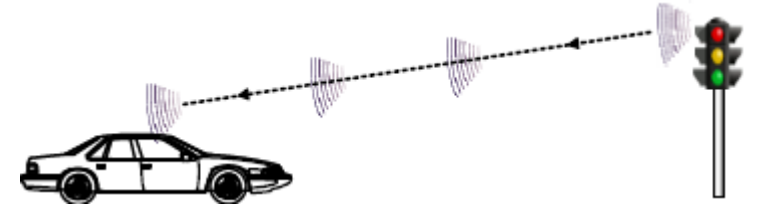


# C-ITS Vision

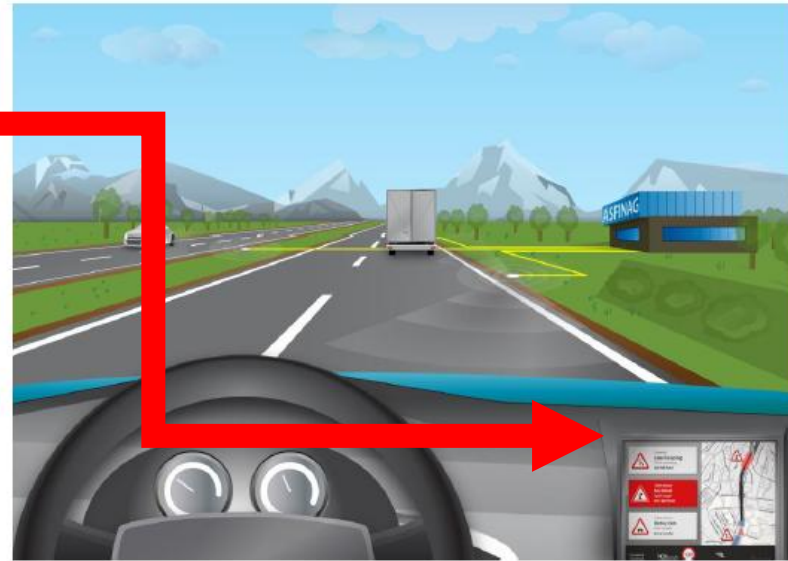
ITS Standardisation: A European Perspective



- In Vehicle Information
- Intersection Safety
- Other Events



Driver's perspective today



Driver's perspective tomorrow

- In EU, Starting 2019
- One New Vehicle = One Connected C-ITS OBU
- 16 Mn new cars / year



Courtesy: Presentation by Antonino Pirrotta, AP Crono, 3<sup>rd</sup> Indo European Conference on Standards and Emerging Technology

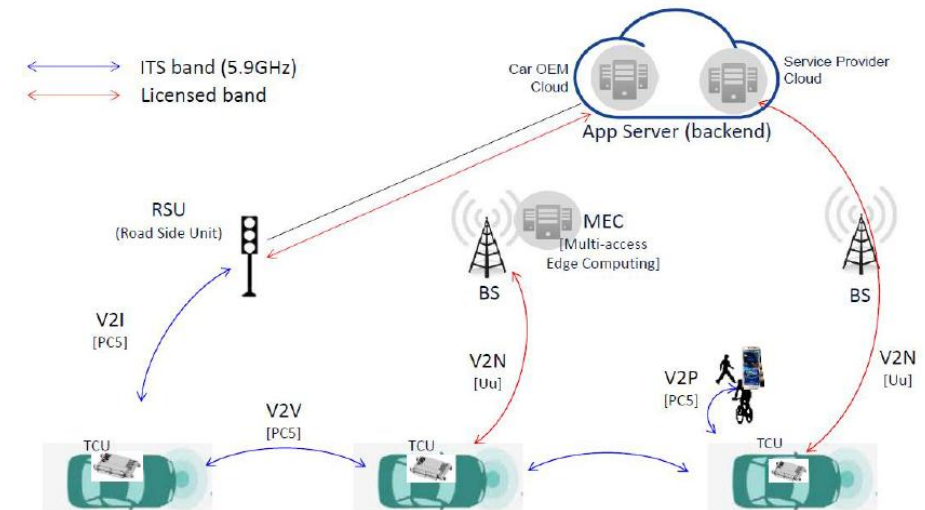




# C-V2X Technology



- V2N, V2V, V2I, V2P but also V2N2V, V2N2I, V2N2P
- PC5: LTE Site Link Interface
- Uu: LTEeNB to UE Interface



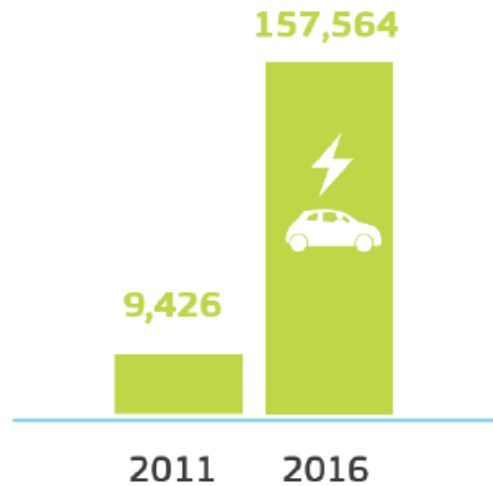
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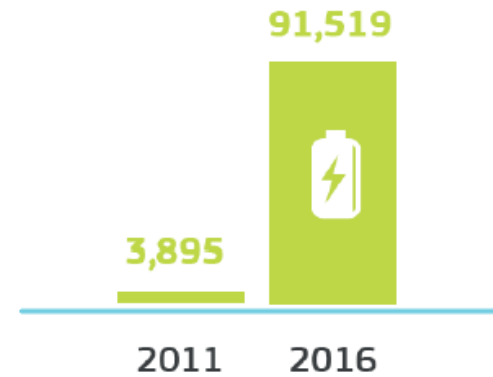
# Electric Vehicles and related Ecosystem

## Development of electric vehicles and charging points in Europe

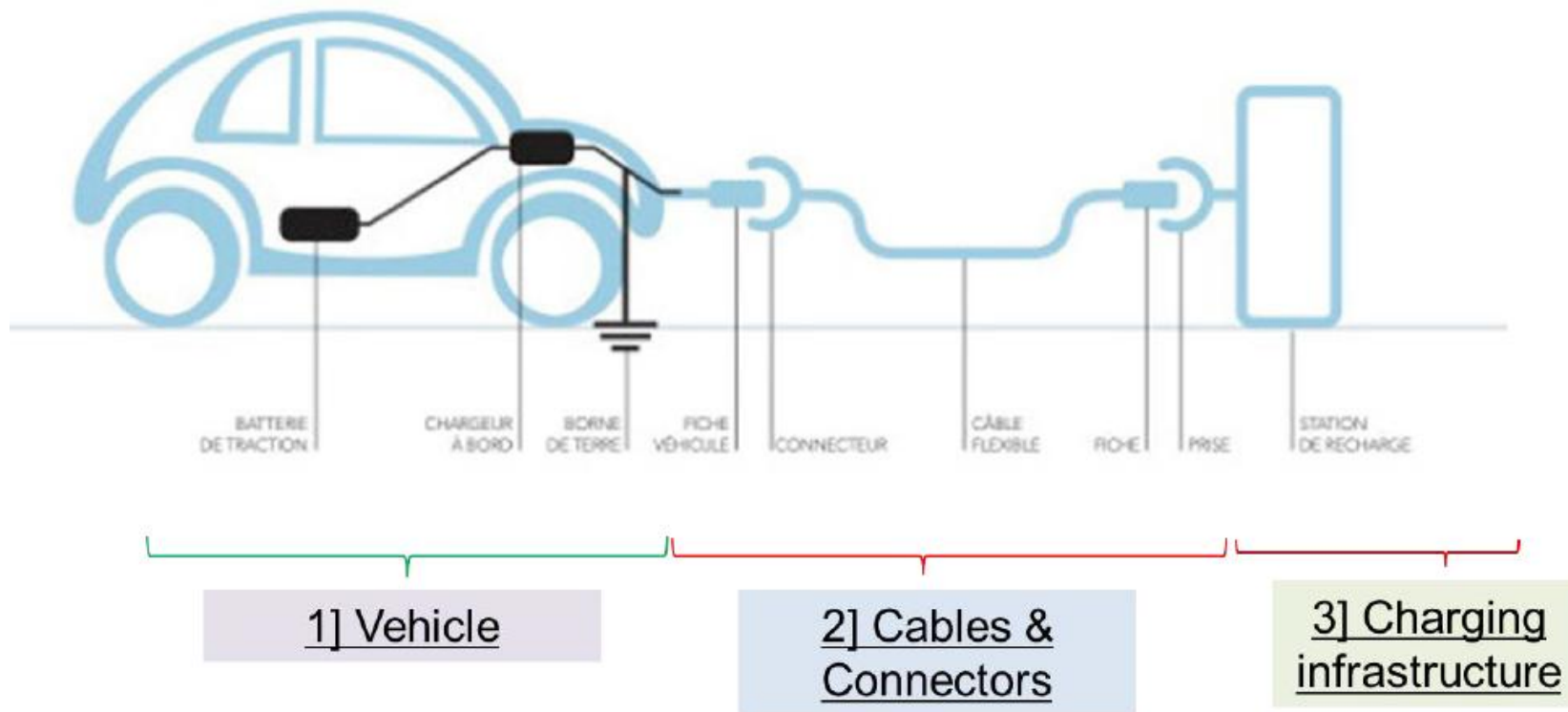
New registrations of plug-in electric passenger cars:



Number of publicly accessible electric charging positions



# Electric Vehicles | Standardisation Areas



# 16 May 2018: EC Completes its agenda for safe, clean and connected mobility



European Commission - Press release

## Europe on the Move: Commission completes its agenda for safe, clean and connected mobility

Brussels, 17 May 2018

**The Juncker Commission is undertaking the third and final set of actions to modernise Europe's transport system.**

In his [State of the Union address of September 2017](#), President **Juncker** set out a goal for the EU and its industries to become a world leader in innovation, digitisation and decarbonisation. Building on the previous 'Europe on the Move' of [May](#) and [November 2017](#), the Juncker Commission is today putting forward a third and final set of measures to make this a reality in the mobility sector. The objective is to allow all Europeans to benefit from safer traffic, less polluting vehicles and more advanced technological solutions, while supporting the competitiveness of the EU industry. To this end, today's initiatives include an integrated policy for the future of road safety with measures for vehicles and infrastructure safety; the first ever CO2 standards for heavy-duty vehicles; a strategic Action Plan for the development and manufacturing of batteries in Europe and a forward-looking strategy on connected and automated mobility. With this third 'Europe on the Move', the Commission is completing its ambitious agenda for the modernisation of mobility.

- This third Mobility Package delivers on the new industrial policy strategy of September 2017 and completes the process initiated with the 2016 Low Emission Mobility Strategy and the previous Europe on the Move packages from May and November 2017.
- Today's package consists of:
  - A Communication outlining a new road safety policy framework for 2020-2030
  - Two legislative initiatives on vehicle and pedestrian safety, and on infrastructure safety management
  - A dedicated communication on Connected and Automated Mobility to make Europe a world leader for autonomous and safe mobility systems
  - Legislative initiatives on CO2 standards for trucks, on their aerodynamic, on tyre labelling and on a common methodology for fuels price comparison
  - Strategic Action Plan for Batteries
- Measures reaffirm EU's objective of reducing greenhouse gas emissions from transport and meeting the Paris Agreement commitments
- Two legislative initiatives establishing a digital environment for information exchange in transport
  - A legislative initiative to streamline permitting procedures for projects on the core transEuropean transport network (TEN-T)
  - Supported by a call for proposals under the Connecting Europe Facility with €450 million available to support projects in the Member States contributing to road safety, digitisation and multimodality
  - The call will be open until 24 October 2018.

Planning Horizon:

2020

2030

2050







# ITS – INDIAN Perspective



Our Challenges are Different!





# Smart City Solutions | ITS is a key area

ITS – Indian Perspective



# The Road Safety Agenda

Road traffic deaths	Vulnerable road users	Legislation
<b>1.25 million</b>	<b>Almost 50%</b>	<b>17 countries</b>
people die each year on the world's roads	of the people who die each year on the world's roads - pedestrians, cyclists, and motorcyclists	have amended their laws to bring them into line with best practice on one or more key risk factors for road traffic injuries between over the past 3 years
Number of Road Traffic Deaths	Distribution of Traffic Deaths by Road User	Existence of child restraint legislation

90% of the world's fatalities on the roads occur in low- and middle-income countries, even though these countries have approximately 54% of the world's vehicles.

India and China contribute > 0.5 Mn deaths per annum over the global total of ~1.25 Mn



# 5G India Vision | 23 Aug 2018

“5G technology has the potential for ushering a major societal transformation in India by enabling a rapid expansion of the role of information technology across manufacturing, educational, healthcare, agricultural, financial and social sectors. India must embrace this opportunity by deploying 5G networks early, efficiently, and pervasively, as well as emerge as a significant innovator and technology supplier at the global level. Emphasis should be placed on 5G touching the lives of rural and weaker economic segments so as to make it a truly inclusive technology”





# 5G India Mission

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## Participants

### High Level Forum Members

Ms. Aruna Sundararajan	Secretary, DoT	Chairperson
Mr. Ajay Prakash Sawhney	Secretary, Melty	Co-Chairperson
Prof. Ashutosh Sharma	Secretary, DST	Co-Chairperson
Mr. Prabhash Singh	Member (T), DoT	Member
Mr. N. Sivasailam	Special Secretary (T), DoT	Member
Mr. M P Singhal	Sr. DDG (TEC), DoT	Member
Mr. R B Prasad	Wireless Advisor, DoT	Member
Prof. A J Paulraj	Professor, Stanford University	Member
Dr. G Deshpande	Chairman, Sycamore Networks	Member
Prof. B Ramamurthi	Director, IIT Madras	Member
Prof. Abhay Karandikar	Professor, IIT Bombay	Member
Prof. U B Desai	Director, IIT Hyderabad	Member
Prof. Anurag Kumar	Director, IISc Bangalore	Member
Prof. Ramgopal Rao	Director, IIT Delhi	Member
Mr. S Mashruwala	MD, Reliance Jio	Member
Mr. G Vittal	MD & CEO, Bharti Airtel	Member
Mr. A K Muniswamy	Chairman, IESA	Member
Mr. K A Krishnan	VP & CTO, TCS	Member
Mr. Vipin Tyagi	ED, C-DoT	Member
Mr. Rajiv Sinha	DDG (NT), DoT	Member
Mr. G Narendranath	DDG (SA), DoT	Member
Mr. Anupam Shrivastava	CMD, BSNL	Member
Mr. T V Ramchandran	President, BIF	Member
Mr. R K Pathak	DDG (IC), DoT	Member Secretary

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# National Digital Communications Policy



सत्यमेव जयते

Department of Telecommunications  
Ministry of Communications  
Government of India

- Released on 1 May 2018
- Open for Public Comment

## Inviting Public comments on Draft National Digital Communications Policy – 2018

The objective of a national policy on digital communications is to prepare the country and its citizens for the future. Achieving these goals would require that the key stakeholders – namely the Centre, the States, local governments and agencies, Telecom Service Providers, Internet Service Providers, handset and equipment manufacturers, the academic community, the innovators and start-ups come together to forge a coalition to deliver this national policy and its missions.



# ITS Standardisation / Projects activity

- National M2M Roadmap, 2015
- TEC Technical Report on ITS released May 2016
- TEC Technical Report on V2X and Embedded SIM released Nov 2015
- Standard for Tracking of Public Transport Vehicles Notified vide G.S.R. 1095(E) dated 28 Nov 2016; Implementation deadline of 1 Apr 2018 subsequently revised to 1 Apr 2019
- DoT Connected Device Certification related rules released 5 Sep 2017
- TRAI Guidelines on M2M released 6 Sep 2017, address e-SIM and E-Call Pilot
- DoT M2M SIM Instructions released 16 May 2018
- TSDSI is transcribing OneM2M Standards for adoption in India
- Niti Aayog ITS Working Group is preparing policy recommendations for transformational impact

- IS 16490 : 2016-LED Destination Board System for Buses
- AIS 140: Vehicle Location Tracking Device with Emergency Button
- IS 16833 : 2018 -ANNEX B: Electronic Fare meter with Integrated ATD and an integrated emergency system
- IS 16833 : 2018 -ANNEX C/D: CCTV system with an integrated emergency system

## Ongoing Projects

- Consultations for readying the norms for back-end Emergency Response Centres for Alarms initiated from AIS-140 Connected Vehicles
- AIS-140 related State-wide Project implementation activities initiated in Kerala
- AIS-140 related Auto-Rickshaw Enablement Project implementation activities initiated in Andhra Pradesh
- Automotive OEMs of Public Transport Vehicles readying for the AIS-140 Implementation in new vehicles
- BSNL Smart Cities
- ITI Smart City Initiatives
- C-DoT initiatives for Standardisation and Common Service Layer

ITS – Indian Perspective



# What is AIS-140?



Abhay Damle- JS, MoRTH

- Mandate to provide a uniform capability Vehicle Location Tracking (VLT) Unit in every Public Transport Vehicle for PUBLIC SAFETY
- Certification of VLTs by ICAT/ARAI
- Position-Velocity-Time data from every vehicle every 10s while moving
- Device Health / Security Monitoring data
- High QoS, Secure, Embedded, Multi-network Connectivity with SMS Fall-back
- Alerts
  - Emergency
  - Tamper
  - Parameter Changes
  - Ignition Off
  - Rash Driving
  - Battery Disconnection / Low battery
- Integration with Back End Command and Control Centres for Emergency Response

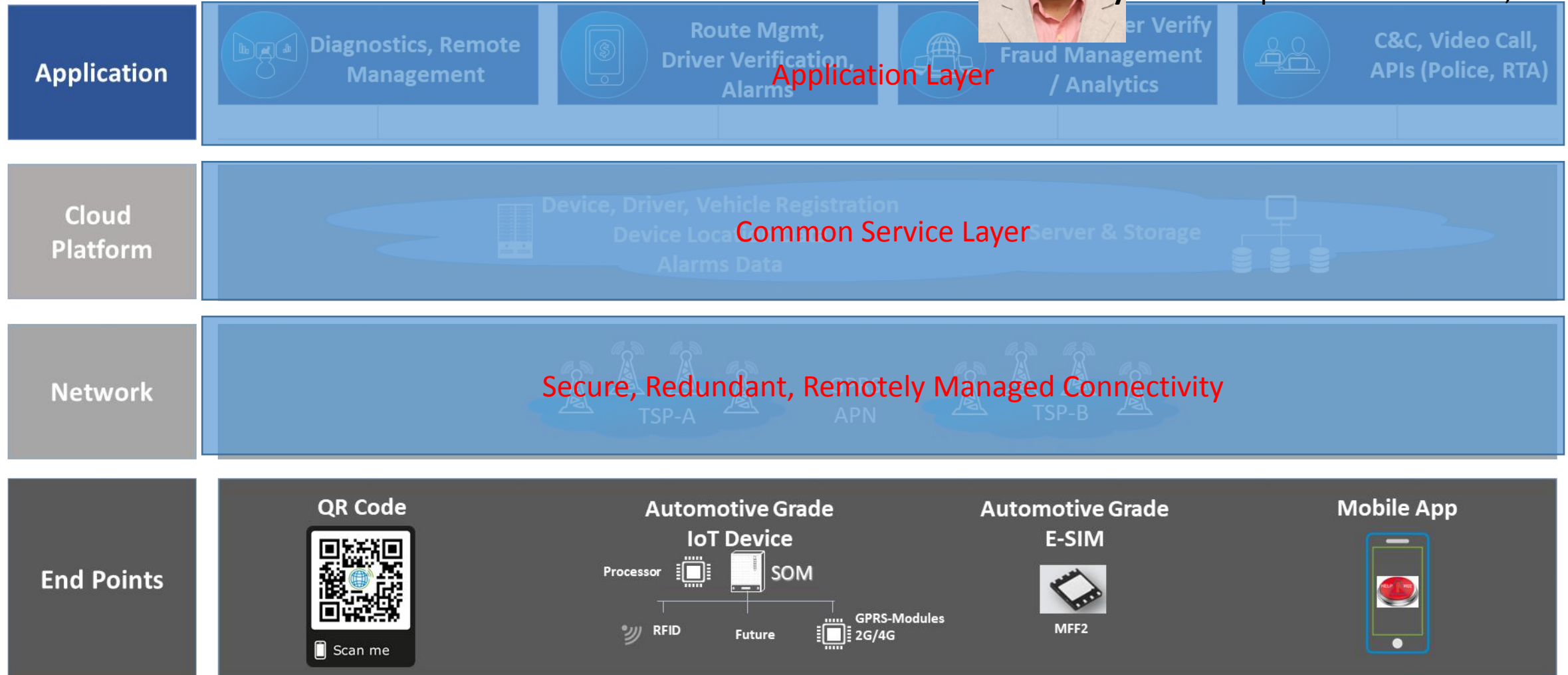




# Abhaya Solution Rendition



N Bala subramanyam - Transport Commissioner, AP



# What is required for sustainable deployment?

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## Safety & Security

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### Identity

Know the Connected Device, the Machine, The Custodian and that it is safe

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Inability to tell between genuine and rogue

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## Availability and QoS

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### Redundancy

Ensure that the Connected Object is reachable and manageable all the time

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Absence of assurance of QoS

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## Scalability and Inter-operability

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### Continuity

Ensure that the Users have a reliable service that is assured for business continuity

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Coverage, Technology & SP Gaps

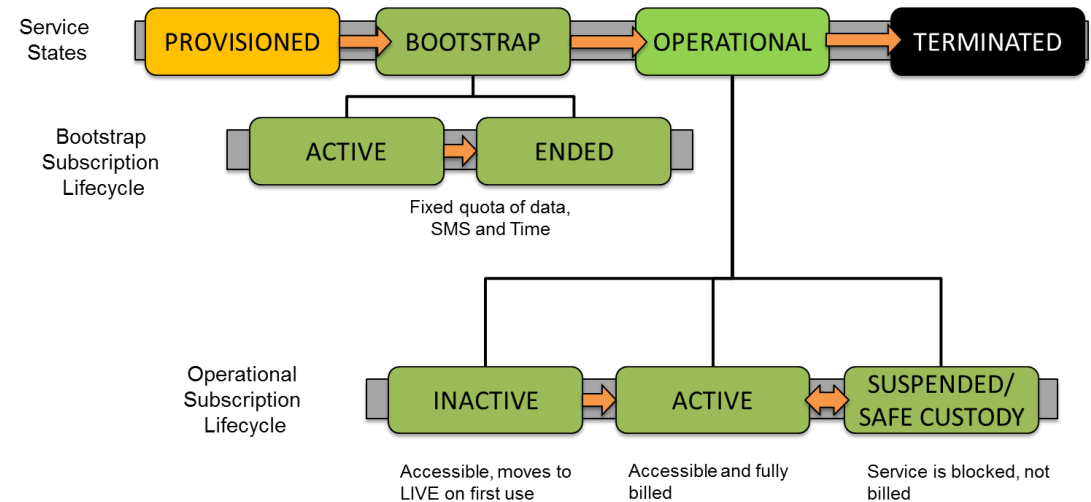
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# Sensorise Intervention

- Telco and SIM agnostic
- Solderable IC form factor SIM for machines – extends the proven identity and security to machines
- Industrial grade and tamper resistant
- Factory fitment possible
- Multi-Profile SIM - Automatic Network Switching
- Remote Provisionable



# Summary and Thanks

- Sustainable development requires Standardisation and interoperability
- A committed Quality of Service of the Connected Objects is critical to offering Security and Manageability
- A layered architecture for the management of Smart City Objects is critical to Safety, Security, Privacy
  - A redundant connectivity layer that makes the use case reliable
  - A layer to register and identify devices and their custodians
  - A layer to capture the Data from the Devices
  - Making Applications and Analytics independent of the Registration and Data Layer





**Thank You**  
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