In the framework of SESEI

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AUTOMOTIVE SECTOR, E-MOBILITY AND ITS

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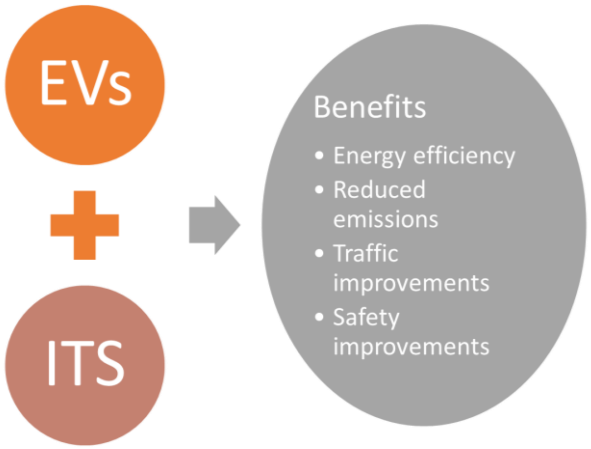
btc European Business & Technology Centre
Enabling Europe India Collaboration

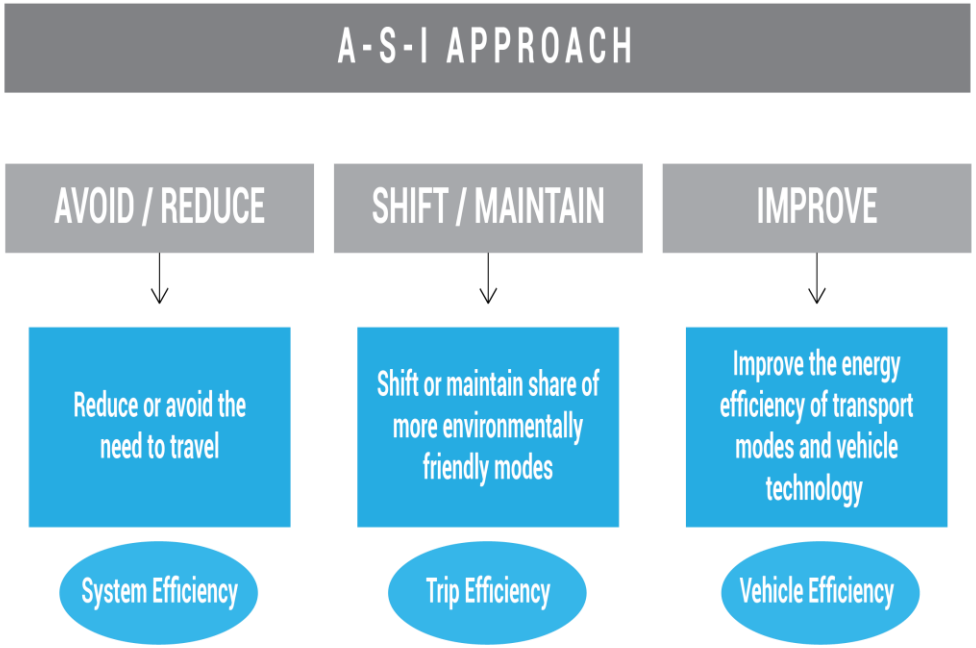
STRUCTURE OF THE REPORT

- Introduction
- ITS
- E Mobility
- Policy Initiatives and Standardization
- Opportunities and Challenges
- Conclusions and Recommendations

INTRODUCTION

- Problems
- Possible Solutions
  - The Avoid-Shift-Improve(ASI) paradigm of transport planning aims to achieve Greenhouse Gas emissions (GHG),





INTRODUCTION

- Necessary for
  - Provide guidelines to development of technologies
  - Regulation
  - Interchangeability of components

A "standard" is "a document, established by consensus and approved by a recognised body, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievements of the optimum degree of order in a given context." (**ISO & IEC**)

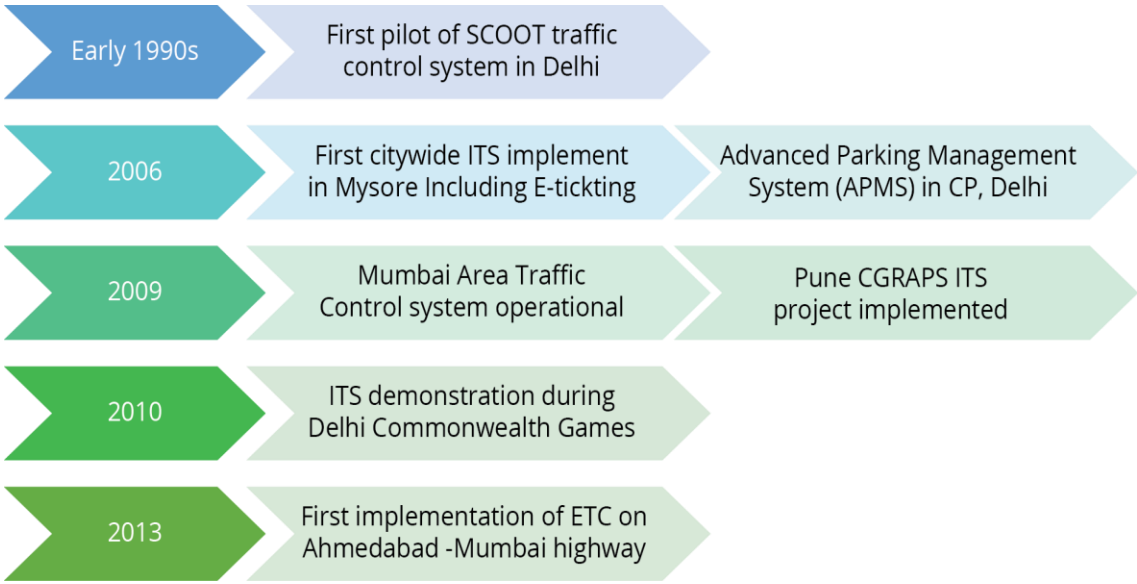
- Caveat
  - Technologies are in constant evolution and revision
  - Strict adherence without cognizance to these changes may impede further technological evolution

INTELLIGENT TRANSPORT SYSTEMS(ITS)

- Applications of ICT in transport fall under the aegis of ITS
- Advanced sensors, computers, electronics, and communications technologies and management strategies in an integrated manner providing travel information
- Increase the safety, efficiency, reliability and sustainability of the transportation system
- Elements of ITS
  - Traffic Management Center (TMC)
  - Advanced Traffic Management System (ATMS)
  - Road/Weather Information Systems (RWIS)
  - Traffic Cameras
  - Variable Message Signs (VMS)

ELEMENTS OF ITS

- Main Applications
  - ITS for Public Transport Systems
  - Signalization and Traffic Management
  - Electronic Toll Collection
  - ITS for enforcement and surveillance
  - Parking Management



CHALLENGES OF ITS-INDIA MARKET

- Challenges in implementing ITS in India
  - Awareness is needed, but understanding is critical
  - Sound transportation policy framework and institutional base
  - Setting up comprehensive interoperability standards
  - Integration is essential
  - Budgeting and procurement

ITS

- Standardization landscape

ISO (International Organization for Standardization)
- Technical Committee 204 is responsible for is responsible for the overall system aspects and infrastructure aspects of ITS

CEN (The European Committee for Standardization)
- TC 278 "Road transport and traffic telematics" is responsible for ITS

IETF (Internet Engineering Task Force)
- IETF Working Groups, such as MEXT

ETSI (European Telecommunications Standards Institute)
- TC ITS Working Group - focused on wireless communications for cooperative ITS (V2V and V2R)

3rd Generation Partnership Project (3GPP)
- Smart Cards, Connected Cars, V2V

International Telecommunication Union (ITU)
- Cooperative ITS based on the Internet of Things

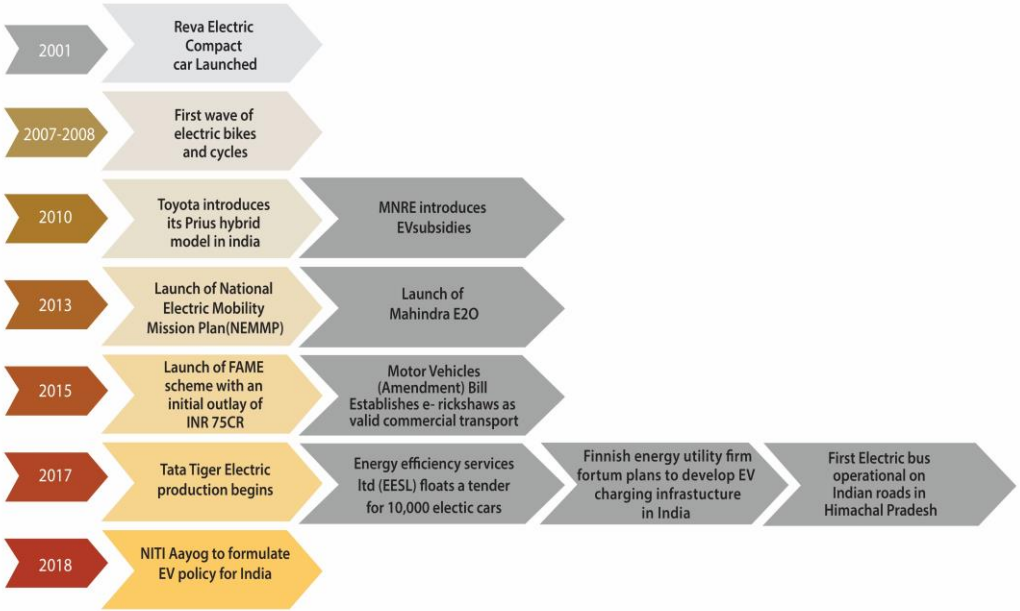
oneM2M
- creates requirements and specifications for M2M and iOT technologies

BIS (Bureau of Indian Standards)
- TED 28 group on ITS

ARAI (Automotive Research Association of India)
- Documents on ITS specifications for public transport

ELECTRIC MOBILITY

- Enable a healthier living environment by
  - Reducing dependency on fossil fuels (of traditional Internal Combustion Engines (ICE))
  - EVs are either partially or fully powered by an electric motor.



- India
  - 2/3-wheelers – IPT
    - E-rickshaws
    - Bikes
  - Hybridization
    - An important step towards full electrification
  - Charging Infrastructure
    - Lack of charging infrastructure a hurdle for EV implementation

ELECTRIC MOBILITY- MARKET POTENTIAL

- Growth of the EV market
  - Rapid rise of fuel prices
  - Desire to be at par with the rest of the world in terms of emission
- Original Equipment Manufacturers (OEMs)
  - A great opportunity but also pose a threat, as
  - Technology could change the contours of the industry and render large parts of the value chain that has been created over the last decades worthless

ELECTRIC MOBILITY

- Standardization landscape

IEC (International Electrotechnical Commission)

- IEC TC 69 (Electric Road Vehicles and Electric Industrial Trucks)
- IEC TC CISPR (International special committee on radio interference)

ISO (The International Organization for Standardization)

- Technical Committee 22 is responsible for road vehicles; its Sub-Committee 21 (ISO TC22 SC21) is dedicated to electric road vehicles.

CEN (The European Committee for Standardization)

- TC 301 is responsible for electric road vehicles
  - WG1: Measurement of performances
  - WG4: Liaison and dialogue between vehicle and charging station
  - WG5: Safety - Other aspects

CENELEC (The European Committee for Electrotechnical Standardization)

- TC69X is responsible for electric vehicles
  - WG1: Charging-Design and operation
  - WG2:Charging-Environmental aspect
  - WG3: Safety

ANSI (American National Standards Institute)

- Electric Vehicles Standards Panel

BIS (Bureau of Indian Standards)

- TED 27 (Electric and Hybrid Vehicles)

ARAI (Automotive Research Association of India)

- Publication of various standardization documents

SAE (Society of Automotive Engineers)

- Hybrid-EV Steering Committee and Vehicle Battery Standards Steering Committee

POLICY INITIATIVES - EV

- 2010 – MNRE Subsidies
- 2013 – National Mission for Electric Mobility
- FAME (Faster Adoption of Manufacturing of Electric Vehicles in India) scheme
  - Demand incentives and technology creation
  - Four focus areas – Technology development, Demand creation, Pilot projects and Charging infrastructure
- Urban Green Mobility Scheme 2017
  - 103 cities over the periods of 7 years (2018-19 to 2022-23)
- Private sector initiatives

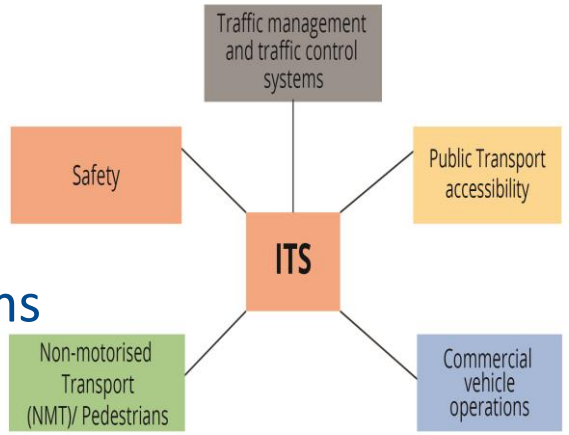
POLICY INITIATIVES - ITS

- NITI Aayog has set up a national-level committee
  - Aim to reduce urban traffic congestion, improve parking for vehicles in cities, road safety and the security of passenger and goods traffic
  - Subjects covered under the panel's purview would include traffic management, parking management, electronic enforcement of traffic rules and fleet management
  - Also include monitoring and encouraging pilot projects
- International Road Federation (IRF) and NITI Aayog working on a policy framework for ITS
- Smart Cities mission
  - Focussed on technology driven solutions including Public Bike Sharing (PBS), signal improvements along critical corridors and coordination and control using central command centres

OPPORTUNITIES

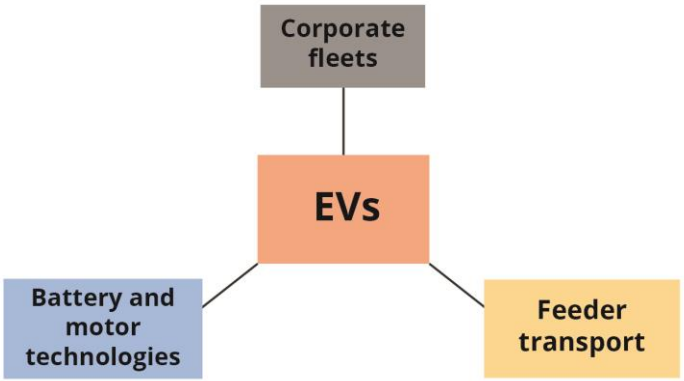
ITS

- Traffic management and traffic control systems
- Accessibility of Public Transport
- Commercial vehicle operations and fleet management
- ITS for NMT and pedestrians
- ITS for Safety



E Mobility

- Electrification of corporate fleets
- Provision of electric feeder services
- Battery and motor technologies



CHALLENGES - ITS

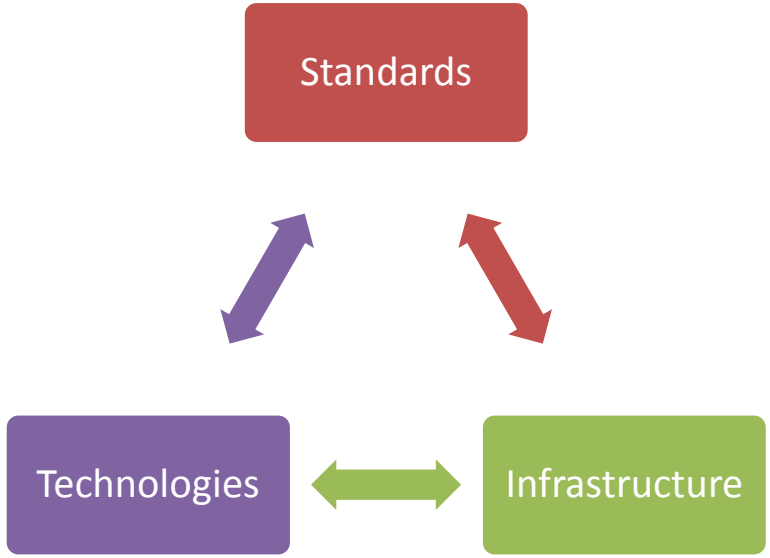
- Replication Issues
  - Adapt technologies to the conditions of India
  - Heterogenous traffic, enforcement issues, literacy (?), language
- Contractual and procurement issues
  - Contracts still evolving
  - Procurement issues crop up
- Technical issues
  - Lack of O &M
  - Lack of skilled staff
  - Interoperability
- Coordination and planning
  - Lack of foresight can cause issues with implementations
  - Improve coordination, planning and dissemination among agencies

CHALLENGES - EVs

- Lack of charging infrastructure
  - Only 100-odd charging stations across India
  - Mostly private initiatives
- Consumer acceptance and price sensitivity
  - Not economical enough for Indian consumers
  - Battery prices the crucial element
- Supplier Base and lack of local manufacturing
  - Local manufacturing has to develop – to reduce dependency on imports
  - Supplier base has to develop – difficult in a growing ICE market
- Financing challenges
  - Financing support is a challenge – throughout the supply chain

WAY FORWARD

- Technologies will flourish
- Infrastructure for electric mobility and ITS
- Standards to ensure interoperability, bring economies of scale and hence the affordability



WAY FORWARD- TECHNOLOGIES

- Smart Cities
- Digital India

- Smart Cities
  - Area based development and pan-city development
  - Improvements based on smart city proposals
  - Many improvements include aspects of EVs
- ITS components
  - Public Bike Sharing
  - ITS components in public transport

WAY FORWARD- INFRASTRUCTURE

- Smart Cities
- FAME
- Green Urban Mobility scheme
- FAME (Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles)
  - Phase I on-going till September 2018
- Four focused areas:
  - Technology development,
  - Demand creation,
  - Pilot projects, and
  - Charging infrastructure

WAY FORWARD- STANDARIZATION

- Indian standardization community - BIS, TSDSI, TEC
  - Active engagements with ETSI, 3GPP, oneM2M. ISO/IEC/JTC1, ITU
- Project SESEI
  - Project co-funded by five European partners (EC, EFTA, CEN, CENELEC & ETSI), operating from New Delhi, India
  - Mission
    - Increase the cooperation between Indian and European standardization bodies and
    - Support European and Indian companies facing standardization issues in India
- India-EU ICT Standardization Collaboration
  - 5G, ITS and NFV/SDN

THANK YOU!

DISCUSSION POINTS

- Do you think the heterogenous/mix transport in India will pose a challenge in implementing certain ITS technologies like or is it an opportunity? and how do you think standardization can help?

- Considering the unique nature of the transport systems in India, what do you think should be the biggest focus areas for ITS?
  - Public transport
  - Pedestrians
  - Commercial vehicle operations
  - Anything else?

DISCUSSION POINTS (CONT'D)

- Does India's highly dense urban environment present a challenge to development of EV charging infrastructure? Can standardization facilitate this process?

- Do you feel the rapidly expanding Indian automotive market, especially passenger cars, are ripe enough for a change to EVs? Or is the transition too soon? Or is this an opportunity to leapfrog technology?

- India is a market where infrastructure is being built rapidly. Do you think this can be leveraged to build in aspects of EV and ITS in a way that cannot be in developed nations? How?