AUTOMOTIVE AND COMPONENT TRADE WITH INDIA

Insights on standards, homologation, and imports

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ABOUT THIS PUBLICATION

This publication was funded by the German Federal Ministry for Economic Affairs and Energy as part of its Global Project Quality Infrastructure (GPQI). GPQI facilitates political and technical dialogues with partner countries. Its goal is to reduce technical barriers to trade, enhance product safety, and strengthen consumer protection. The dialogues focus on opportunities and challenges related to standardisation, conformity assessment and accreditation, and market surveillance. They include relevant line ministries, regulators, public agencies, accreditation and standards bodies, industry associations, companies, technical and scientific institutions. wThe Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH – the German Agency for International Cooperation – has been commissioned by the German Federal Ministry for Economic Affairs and Energy to support the implementation of GPQI in Brazil, China, India and Mexico.

In India, the German Federal Ministry for Economic Affairs and Energy and the Indian Ministry for Consumer Affairs, Food & Public Distribution have established the Indo-German Working Group on Quality Infrastructure to strengthen bilateral collaboration. The Working Group brings together representatives from relevant ministries, including the Ministry of Commerce and Industry (MoCI), Ministry of Electronics and Information Technology (MeitY), Ministry of Heavy Industries and Public Enterprises (MoHI), Ministry of Road Transport and Highways (MoRTH), Ministry of Power (MoP) as well as experts from the Bureau of Indian Standards, industry, associations and accreditation bodies. The mutually agreed work plan reflects key areas of the economic relations between both countries. It covers topics ranging from automotive, electric vehicle and charging infrastructure, machinery safety, Industry 4.0, IT security and data protection to market surveillance. The Indian country component of GPQI supports the implementation of the mutually agreed annual work plan of the Working Group.

This publication is a result of activities of the Indo-German Working Group on Quality Infrastructure. It was prepared in collaboration with expert members of the German Association of the Automotive Industry (VDA), and on the basis of in-depth interviews with vehicle type approval and homologation experts from leading automotive and component manufacturers, including BMW, Volkswagen, MAN Trucks, Mercedes, Siemens and the Charging Interface Initiative e.V. (CharIN). The study also involved interviews of experts from the Automotive Research Association of India (ARAI). The preparation of the publication was supported by PricewaterhouseCoopers Private Limited, India and Dr. Kari Hiepko-Odermann.

The presentation of the material in this publication does not imply the expression of any opinion whatsoever by the German or Indian Government. The publication was produced without formal editing from the German Federal Ministry for Economic Affairs and Energy or any Indian Ministry.

FOREWORD

The automotive industry is key to the economies of India and Germany. Today, there are 560 passenger cars for every 1,000 inhabitants in Germany. In India, there are about 24 passenger cars for every 1,000 inhabitants. This share is expected to rise substantially and provides great opportunities.

The automotive industry is transforming fast. Around the world, demands are rising for safer cars, lower emissions, and smarter mobility concepts. Standards, regulations, as well as testing, inspection, and certification fulfil essential tasks to meet such demands.

Germany and India decided to move forward together in the automotive industry. We are working jointly to expand our bilateral economic relations, find innovative solutions, and contribute to safer, cleaner and more efficient transport.

Germany and India engage in a political and technical dialogue on standards, conformity assessment, accreditation, market surveillance, and product safety. This dialogue takes place between the Indian Ministry of Consumer Affairs, Food & Public Distribution, and the German Federal Ministry for Economic Affairs and Energy within the bilateral Working Group on Quality Infrastructure.

The Working Group reduces technical barriers to trade, strengthens product safety, and ensures consumer protection. It involves relevant ministries – including the Ministry of Road Transport and Highways, Ministry of Heavy Industries and Public Enterprises, Ministry of Commerce and Industry, and the Ministry of Electronics and Information Technology – as well as regulators, industry associations, companies, and technical and scientific institutions.

I very much appreciate the close collaboration with Indian ministries and the German Association of the Automotive Industry (VDA) for this study. It will contribute to deepening the Indo-German collaboration in the automotive industry, for the benefit of the citizens in both countries.

Stefan Schnorr

Director-General
Digital and Innovation Policy
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Germany

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LIST OF ABBREVIATIONS

ACMA	Automotive Component Manufacturers Association
ADR	Australian design rules
AEO	Authorised Economic Operator
AIS	Automotive industry standards
AISC	Automotive Industry Standards Committee
ARAI	Automotive Research Association of India
BEE	Bureau of Energy Efficiency
BIS	Bureau Indian Standards
BOE	Bill of Entry
BNCAP	Bharat New Vehicle Safety Assessment Programme
BS	Bharat Stage
CAFE	Corporate average fuel economy
CBEC	Central Board of Excise and Customs
CBU	Completely built-up
CFMTTI	Central Farm and Machinery Testing & Training Institute
CEV	Construction equipment manufacturers
CHA	Custom House Clearance
CIRT	Central Institute of Road Transport
CMVR	Central Motor Vehicles Rules
CMVR-TSC	Central Motor Vehicles Rules-Technical Standing Committee
CONTRAN	Conselho Nacional de Trânsito (National Traffic Council; Brazil)
COP	Conformity of production
DGFT	Directorate General of Foreign Trade
DHI	Department of Heavy Industry
DPIIT	Department for Promotion of Industry and Internal Trade
DIS	Draft Indian standard
DoT	Department of Telecommunications
DRL	Daytime running lamp
ECE	Economic Commission for Europe
EMC	Electromagnetic control
EMS	Electronically managed system
ESC	Electronic stability control
EU	European Union
EV	Electronic Vehicles
Exim	Export-Import
FAME	Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India
FE	Fuel economy

FMVSS	Federal Motor Vehicle Safety Standards
FTP	Foreign Trade Policy
GHz	Gigahertz
GRB	Groupe De Rapporteurs Bruie (Wp.29 Noise)
GRPE	Groupe De Rapporteurs (Wp.29 Pollution and energy)
GSR	General Safety Regulation
GTR	Global Technical Regulations
ICAT	International Centre of Automotive Technology
IEC	Importer exporter code
IIP	Indian Institute of Petroleum
IS	Indian Standard
ITC-HC	Indian trade clarification based on harmonised system of coding
ITU	International Telecommunication Union
JASO	Japanese Automotive Standards Organisation
JIS	Japanese industrial standards
MoEF&CC	Ministry of Environment, Forest and Climate Change
MoHI&PE	Ministry of Heavy Industries & Public Enterprises
MoPNG	Ministry of Petroleum and Natural Gas
MoRTH	Ministry of Road Transport & Highways
MVA	Motor Vehicles Act
NATRiP	National Automotive Testing and R&D Infrastructure Project
NCTF	National Committee on Trade Facilitation
OEM	Original equipment manufacturers
RPAS	Reverse parking alert system
RTO	Regional Transport Office
SCOE	Standing Committee on Implementation of Emission Legislation
SIAM	Society of Indian Automobile Manufacturers
SLD	Speed Limiting Device
SLF	Speed Limiting Function
SMVR	State Motor Vehicle Regulations
TAP	Type approval procedure
TED	Transport Engineering Division
TMA	Tractor Manufacturers Association
TPMS	Tyre pressure monitoring system
TUV	Technischer Überwachungsverein
UNECE	United Nations Economic Commission for Europe
UTAC	Union Technique de l'Automobile du Motocycle et du Cycle
VCA	Vehicle Certification Agency
VRDE	Vehicle Research Development & Establishment
WVTA	Whole vehicle type approval

DEFINITIONS AS PER CMVR

(i) Category L1 means a motorcycle as defined in sub -section (27) of section 2 of the Act, with maximum design speed not exceeding 45 km/ hour and engine capacity not exceeding 50 cc, if fitted with a thermic engine.

(j) Category L2 means a motorcycle as defined in sub -section (27) of section 2 of the Act, with maximum design speed exceeding 45 km/hour and engine capacity exceeding 50 cc, if fitted with a thermic engine.

(k) Category M means a motor vehicle with at least four wheels used for the carriage of passengers and their luggage.

(l) Category M1 means a motor vehicle used for the carriage of passengers and their luggage and comprising no more than eight seats in addition to the driver's seat.

(m) Category M2 means a motor vehicle used for the carriage of passengers and their luggage and comprising more than eight seats in addition to the driver's seat and having a maximum mass not exceeding 5 tonnes.

(n) Category M3 means a motor vehicle used for the carriage of passengers and their luggage and comprising more than eight seats in addition to the driver's seat and having a maximum mass exceeding 5 tonnes.

(o) Category N means a motor vehicle with at least four wheels used for the carriage of goods.

(p) Category N1 means a motor vehicle used for the carriage of goods and having a maximum mass not exceeding 3.5 tonnes.

(q) Category N2 means a motor vehicle used for the carriage of goods and having a maximum mass exceeding 3.5 tonnes but not exceeding 12 tonnes.

(r) Category N3 means a motor vehicle used for the carriage of goods and having a maximum mass exceeding 12 tonnes.

EXECUTIVE SUMMARY

India is one of the leading automotive manufacturing countries in the world with end-to-end capabilities for design, development and manufacturing of all kinds of vehicles. Ranked 6th in the world, it manufactures approximately 24 million vehicles of which 3.6 million vehicles are exported[1]. India is the world's number one market for two-wheelers[2], number three for the passenger car market[3], and number five for the commercial vehicle market.

Policy makers have taken up ambitious targets to make mobility in India safer, cleaner, efficient and convenient. By 2030, India aims to reduce its greenhouse gas emissions by 33–35% from 2005 levels and increase forest cover by five million hectares[4]. In addition, initiatives have been taken by the government for reducing the number of road accidents and fatalities in the country by 50% by 2020[5].

Historically, India has been orienting towards European standards and technical regulations. Adoption of these standards and technical regulations has not only saved a considerable amount of time and effort for India but has also given access to emerging technologies and innovation. In certain cases, India adopts the European standards and how compliance should be assessed after customising them to India-specific requirements leading to a time lag in the adoption of these standards. Hence, Indian standards and technical regulations may not be entirely in line with European or international ones. Especially with regards to new technology where the United Nations Economic Commission for Europe (UNECE) is taking the lead in developing and implementing regulations for new technologies.

For manufacturers from Germany this lack of harmonisation of standards and technical regulations requires them to undertake additional cost and time to comply with India-specific requirements. Therefore, to facilitate trade and reduce technical barriers between India and Germany, harmonisation of standards and technical regulations becomes important. Technical harmonisation between both countries could further accelerate trade for German companies as well as increase India's exports to European markets on the other hand. It would provide the necessary boost to local manufacturing, thereby supporting initiatives such as 'Make in India'.

The study has been conducted to identify challenges and suggestions on technical market access of the German automotive industry in India. An important part of the study is to help understanding the regulatory framework of the automotive sector in India and suggest regulatory changes which support current policy initiatives.

1. Regulatory landscape – standards, homologation and imports

The Ministry of Road Transport and Highways (MoRTH) acts as a nodal agency for formulation and implementation of various provisions of the *Motor Vehicles Act (MVA), 1988*, and *Central Motor Vehicle Rules (CMVR), 1989*. To involve all stakeholders in regulation formulation, MoRTH has constituted three committees to deliberate and advise the ministry on issues relating to safety and emission regulations, namely:

1. CMVR - Technical Standing Committee (CMVR-TSC)
2. Standing Committee on Implementation of Emission Legislation (SCOE)
3. Automotive Industry Standards Committee (AISC)

CMVR-TSC and AISC advise and deliberate with MoRTH on safety-related regulations, whereas SCOE caters to emission-related regulations. CMVR-TSC, AISC and SCOE advises MoRTH

[1] Make in India • Statistics
[2] SIAM • CAAM • Statistics
[3] OICA • Data • PV
[4] Paris climate change treaty • India
[5] MoRTH • press release • June 2016

on various technical aspects related to CMVR. These committees consist of representatives from various other ministries and industry bodies.

Vehicle and automotive component import in India is regulated by the Ministry of Commerce and Industry which acts as the nodal agency for formulating and implementing Foreign Trade Policy (FTP). The policy is governed under section 5 of *Foreign Trade (Development & Regulation) Act, 1992*. The Director General of Foreign Trade (DGFT) and Central Board of Excise and Customs (CBEC) are involved with controlling and implementing policies related to imports and exports.

The regulatory landscape section (Chapter 3 and 4) also describes in detail the major functions of the main regulatory bodies and the process followed by these bodies to draft, release and amend standards. The section covers the policies and requirements related to imports of vehicles and components.

2. Challenges of German Automotive Companies

In the later sections, as a part of this study, multiple stakeholder interviews were conducted with various manufacturers and automotive bodies in India to understand **issues and prioritise top challenges related to technical harmonisation and innovation**. The study identified the following as the top challenges facing the industry:

Introduction or modification of standards without appropriate lead time

Indian standards often tend to be uncertain as there are multiple revisions done by authorities due to various policy changes by the government and other such factors. These iterations by the authorities increase the time for releasing standards. The lead time given to manufacturers to cope with the revisions is also not sufficient. The final version of the standard which is to become a regulation, deviates from the first draft.

Lack of harmonisation of Indian standards with international standards

Indian standards are usually drafted by referring to UNECE standards with modifications to suit Indian conditions. These changes, at times, create a substantial variation in standards when compared to UNECE. India, not being a signatory to the UNECE 1958 agreement for the adoption of harmonised technical regulations, is not obligated to implement the technical regulations as mentioned. These unique India-specific requirements make European manufacturers spend additional time and effort to accommodate the changes and thus experience a delay in the launch of vehicles.

Additional cost and time for homologation process

As India is not a signatory of the UNECE 1958 agreement, it does not accept type approval certification from other countries and mandates type approval as per Indian regulations. As a result, launching vehicles which comply with these standards and certification is both a costly and time-consuming process. This situation exists both for vehicle-level type approval as well as component-level certification.

Challenges related to licensing of radio frequencies for automotive applications

Allocation of radar frequencies in India for automotive radar-based applications is not harmonised with the frequencies used globally. The Department of Telecommunications (DoT) has not yet delicensed frequency bands 24.05–24.25 GHz, 77– 81 GHz which are required for advanced driver assistance and vehicle safety features. The lack of harmonisation of radar-based frequencies pushes manufacturers to force fit radar-based features in the motor vehicle system with limited India-specific frequencies, which adds to the cost and time for manufacture of vehicles.

Need for creation of focused process and committee for introducing new technologies in the Indian market

To keep pace with the current rate of evolution in the automotive industry, it is essential to have a shorter response time for introducing new technology to the market. Lack of a defined structure or process for introducing new technology and the absence of standardisation of the required

infrastructure and resources for the adoption of such technology cause delays and makes it difficult for manufacturers to bring new technologies to the Indian market.

3. Suggestions for Addressing Challenges

The challenges mentioned in the previous section were analysed in detail to uncover the reasons behind them. Suggestions for improvement were then developed and deliberated with stakeholders and subject matter experts. To address the above-mentioned challenges, a three-point solution has been proposed which majorly focuses on building a clear vision for the automotive industry in India, strengthening the regulatory structure and improving the current processes for standards development and homologation. The infographic below describes the proposed solution.

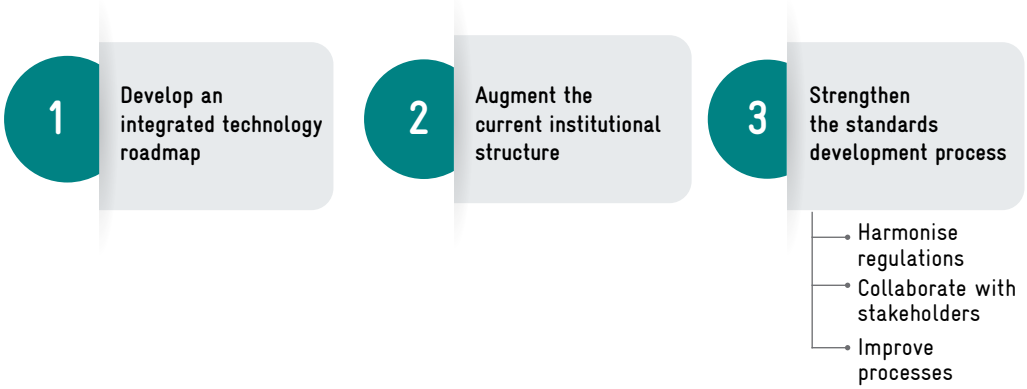


Figure 1 - Proposed solution for addressing challenges

The three-point solution and the various interventions that form a part of it are described below.

Develop an integrated technology roadmap

Based on the current state of safety incidents, carbon footprint, pollution and India's targets to curb these, the government can create an integrated technology roadmap defining technology changes to be adopted in the short, medium and long term. As suggested by the draft National Automotive Policy (February 2018), this roadmap development can be undertaken by the proposed nodal body for the automotive industry. Such a roadmap can make use of a detailed analysis of accident, emission and pollution data. After sharing, discussing and agreeing on the roadmap between various stakeholders it can form a common vision for the country. The draft National Automotive Policy developed a two-tiered structure of an apex body, supported by the National Automotive Council[6]. In addition to this structure, it is further proposed to constitute a technical committee of experts and officials which monitors the roadmap implementation and suggests course corrections based on technology trends.

Augment the current institutional structure

To promote innovation and the introduction of new technology in the automotive sector, a separate group could be created for new technology introduction through a structured process. In addition to the draft National Auto Policy recommendations, it is advisable to constitute this separate group to be a part of the proposed new technical committee. The function of introducing new technology via a structured process could be undertaken by this group. This committee for new technology introduction would focus on the mid to long-term technical and functional requirements, thereby developing near-term standards (more than a year) for new technologies, whereas CMVR-TSC would continue with its current function of standards development for the current requirements (within a year).

Setting up a dedicated committee and process would ensure adherence to the roadmap and speed up introduction of new technology, as there would be two separate groups that would focus on both near- and long-term agendas.

[6] DHI • National Automotive Policy • February 2018

Strengthen the standards development process

a) Harmonise regulations

Recognising equivalent or higher test certificates from UNECE member countries and mandating only India-specific requirements

At present, more than 70% of safety regulations in India are either partially or fully aligned with UNECE regulations[7]. India can leverage this overlap in regulations and consider accepting equivalent or higher UNECE certification for whole vehicle and component level specifically for regulations that are aligned with UNECE. This would make the homologation process faster and eliminate additional costs for repetitive testing, thereby improving trade between India and other countries. MoRTH, with consultation from the Automotive Research Association of India (ARAI), should take a decision on the exemption of tests which are adopted from UNECE regulations.

Harmonisation of radio frequencies with International Telecommunication Union

There is a need for harmonising radio frequencies for automotive applications with the ones recommended by the International Telecommunication Union (ITU) for automotive safety applications as these frequencies are in line with the evolving demands related to automotive safety applications. For this MoRTH can liaise with DoT to get frequencies delicensed. Additionally, DoT could consider speeding up the process of delicensing radio frequency for cases which have high societal benefits, improve trade, promote technology innovation and do not involve frequency interference concerns.

Delicensing of radio frequencies for automotive safety features would complement the Indian government's agenda to reduce road accidents and fatalities to 50% by 2020.

Adoption of eco-innovation scheme as approved in the EU to promote innovation

An innovation approved under the EU eco-innovation scheme has carbon credits associated with its adoption. Moreover, the adoption of an approved innovation does not require re-demonstration of the innovation through testing and accepts prior certification. Hence, India may consider adopting the eco-innovation scheme as this would not only facilitate faster entry of new technologies into the Indian market but also support the achievement of the emission target set by the government.

b) Collaborate with stakeholders

Improve communication and consultation with stakeholders during the standard development process

In order to counter the problem of variations in the standard discussed during the meetings held among the stakeholders and the draft standard finally released, an approach used by UNECE can be adopted. According to this all the minutes of meetings held for the release of a standard are displayed in the public domain. Even the communication process from the US regulation could be referred to, where all the regulation-related documents are uploaded on a common online platform for transparency and review from various individuals and organisations across the globe. This mechanism also ensures that there is a proper review of the proposal and the precision of the final regulation is increased.

Improved communication and consultation with stakeholders during the standard development process would catalyse the timely implementation of safety and emission critical technology changes in India. Moreover, it would foster better collaboration and synergy between industry and the government and also reduce the effort spent by government agencies in the development of standards.

Accepting third-party test certificates to fasten type approval process and/or setting up an online booking system for scheduling tests at the certification agencies

Indian automotive authorities may consider appointing third-party testing agencies for various tests for type approval. These third-party type approval agencies could be continuously

[7] DHI • National Automotive Policy • February 2018

monitored by the appropriate authorities to ensure conformity to applicable regulations. Indian automotive authorities can also consider setting up an integrated online slot booking mechanism for scheduling tests of vehicle and components, which would provide visibility of capacities for testing in ARAI, the Vehicle Research Development & Establishment (VRDE) and the Central Institute of Road Transport, Pune (CIRT).

c) Improve the standards development process

Develop the draft standard first and then determine the lead time for its implementation

Improve adherence to the conventional process of releasing standards wherein a proposal for amendment with a draft standard is first released to the public for views and comments. After considering the views from multiple stakeholders, a subsequent draft standard is released which later becomes a notification, followed by the release of the final standard.

An additional improvement to the above process could be to conduct detailed research and analysis at the proposal stage to ensure that the stated objective would be met by making the proposed amendment. For example, in Japan, a detailed proposal for the amendment of a regulation is submitted to an expert committee which deliberates on the proposal. This committee is led by government agencies and supported by experts from research institutions. The proposal clearly defines the problem statement, includes relevant supporting data and analysis, and provides a cost and benefit analysis to further justify the viability of the proposal.

The above defined recommendations are aligned with the government plans to achieve targets around reducing accidents, carbon footprint and faster introduction of electric vehicles in the Indian market.

Define functional requirements instead of stating technical specifications for implementing standards

An approach followed in UNECE and other countries for amending standards or introducing new requirements in a vehicle or components is to state the functional requirement of a system or technology to be implemented instead of stating the exact technical specification to be complied with. The former approach promotes innovation as the manufacturers can develop technologically innovative ways to meet the functional requirement, whereas the latter approach is more prone to frequent changes in regulations in light of technological advancements.

Indian automotive authorities could benefit from using the above approach as it entails reduced effort on drafting technical standards. Moreover, it would facilitate a faster turnaround in specifying functional requirements vis-à-vis defining technical standards and would also foster innovation in the industry.

INTRODUCTION

Indian automotive regulations require all vehicles (manufactured or sold) to comply with the Central Motor Vehicle Rules (CMVR). The regulations under CMVR specify the Automotive Industry Standards (AIS) and Indian Standards (IS) from the Bureau of Indian Standards (BIS) that the vehicles and components should comply with. It also states the requirements for certifying a vehicle or component that meets the regulatory standards and specifications. This process is popularly known as homologation or 'type approval certification' for vehicle and components.

Historically, Indian regulations are mostly oriented towards the UNECE regulations, and therefore, there is a lot of overlap between the European and Indian standards. However, the regulations in India are often customised to suit India-specific requirements and are adopted with a certain time lag. This lack of technical harmonisation along with the repeated testing and homologation procedures in India creates challenges for European companies with respect to the launch and sale of vehicles in the Indian market.

Objective of the study

The objective of this study is to develop an in-depth understanding of the automotive regulatory landscape in India, identify gaps in the regulatory framework, and arrive at the key challenges in trade and homologation of vehicles and components. Subsequently, the aim is to develop possible solutions and recommendations through further analysis of the challenges.

Approach and design for the study

The study was conducted using a three-step methodology, starting with a baseline examination of the Indian automotive regulatory framework to identify key challenges. In the following phase, an in-depth exploration of the key challenges revealed the probable causes of the challenges. In the third step, recommendations were made to address these challenges. A detailed explanation of the three steps and methodology are listed below.

1. Baseline
   This step comprised formulating the as-is framework of Indian automotive regulations, detailing the roles and responsibilities of various regulatory authorities, and taking a high-level view of the drafting process and considerations. As the next step, an initial list of challenges in the current regulatory landscape was identified with a focus on technical harmonisation, the import/export inspection process, and the safety and homologation process of products, including new technologies. The gaps in the implementation of regulations and standards were also identified. The approach used for the baselining phase was a combination of desk research and expert interviews of individuals from various regulatory authorities, and vehicle and component manufacturers.

2. Analysis
   The key challenges identified in the previous step were prioritised to arrive at the top five challenges based on the extent of their impact on trade practices. The top five challenges were then analysed in depth. Based on the analysis, possible solutions to address the challenges were developed and subsequently validated by a second round of expert interviews.

3. Recommendations
   Recommendations were developed after validation of the possible solutions. The recommendations specific to Indian regulations detail out the necessary regulatory interventions required and the institutions to be approached for implementation. Certain recommendations highlight the best practices from UNECE and other countries for possible adoption in the Indian context.

Application and expected impact of implementing the study

The study could serve as a guidance document for the future work of the Indo-German Working Group on Quality Infrastructure, with the aim of reducing technical barriers to trade and increasing product safety. Implementation of the recommendations in the study could further facilitate trade between India and Germany and also support India in meeting its technology, safety and emission targets.

The next section explains the Indian automotive regulatory framework in terms of the institutions, rules, regulations, guidelines, and standards. The regulatory landscape determines the roles and responsibilities of various authorities, and explains at a high-level the standard development process, the homologation requirements for vehicles and components, and an overview of practices related to imports, testing of imported vehicles and components, and duty rates.

Regulatory landscape – standards and homologation

Overview of regulatory landscape in India

The 1958 UNECE agreement is a multilateral agreement between countries for the adoption of uniform technical prescriptions for four-wheeler vehicles, equipment and parts which can be fitted and/or used on wheeled vehicles. These prescriptions are mutually recognised by all signatories for the type approval process. India is not a signatory to the 1958 Agreement and hence there is no compulsion for India to accept, adopt and apply the ECE Regulations. However, India is a signatory of 1998 WP.29 agreement and actively participates in formulations of Global Technical Regulations (GTRs) since 2006.[8]

The 1958 Agreement signatories mutually accept the type approvals of vehicles of the signatory countries. Some countries outside of Europe such as South Africa, Tunisia, Australia, New Zealand, Japan, the Republic of Korea, Malaysia and Thailand are signatories to the 1958 Agreement and directly accept the vehicles having European type approvals, whereas countries like India, the USA, Canada, and China have signed the 1998 Agreement and have their own standards for compliance. This creates a setback for European vehicle manufacturers selling vehicles in India, which are primarily designed as per ECE Regulations. Such vehicles have to specifically adhere to Indian standards even though the Indian standards are generally derived from UNECE standards.

Historically, the first act for motor vehicles in India was the *Indian Motor Vehicles Act, 1914*. This was followed later by the *Motor Vehicles Act, 1939*. Significant changes in road transport technology, road infrastructure and the modes of movement of passengers and freight necessitated a review of the *Motor Vehicles Act, 1939*, to make relevant changes moving forward.

A Working Group was constituted in January 1984 to review the Act by the then Ministry of Shipping, Road Transport & Highways, Government of India, consisting of bodies such as the Central Institute of Road Transport, Pune (CIRT), the Automotive Research Association of India, Pune (ARAI), and other transport organisations, manufacturers and the general public. State Governments offered their comments on the recommendations of the Working Group. This led to the Parliament passing the *Motor Vehicles Act, 1988* (and subsequent amendments to the Act have taken place).

The *Motor Vehicles Act, 1988*, empowers the Central Government, through the Ministry of Road Transport & Highways (MoRTH), to make Rules under Section 27 and thus, the *Central Motor Vehicle Rules (CMVR) 1989* were framed (with subsequent amendments to the Rules from time to time). Section 28 of the *Motor Vehicles Act (MVA), 1988*, empowers the State Governments to make State Motor Vehicles Rules for local conditions in areas other than the *Central Motor Vehicle Rules.*[9]

[8] UNECE • UN Transport Agreements and Conventions
[9] MoRTH • Acts/Rules/Notifications

MoRTH acts as a nodal agency for formulation and implementation of various provisions of the *MVA 1988* and *CMVR 1989*.

In order to involve all stakeholders in regulation formulation, MoRTH has constituted three committees to deliberate and advise the ministry on issues relating to safety and emission regulations, namely:

1. CMVR - Technical Standing Committee (CMVR-TSC)
2. Standing Committee on Implementation of Emission Legislation (SCOE)
3. Automotive Industry Standards Committee (AISC)

CMVR-TSC and AISC advise and deliberate with MoRTH on safety-related regulations, whereas SCOE caters to emission-related regulations. CMVR-TSC, AISC and SCOE advise MoRTH on various technical aspects related to CMVR. These committees consist of the following representatives:

Ministries and Subordinate Organisations

» MoRTH
» Ministry of Heavy Industries & Public Enterprises (MoHI&PE)
» Bureau Indian Standards (BIS)

Testing Agencies

» Vehicle Research Development & Establishment (VRDE)
» Automotive Research Association of India (ARAI)
» Central Institute of Road Transport (CIRT)

Industry Representatives

» Automotive Component Manufacturers Association (ACMA)
» Society of Indian Automobile Manufacturers (SIAM)
» Construction Equipment Manufacturers (CEV)
» Tractor Manufacturers Association (TMA)

State Transport Departments

Major functions of the committees are:

» Technical clarification and interpretation of the CMVR
» Recommend international standards which can be used in lieu of standards notified under the CMVR and permit use of components, parts or assemblies complying with desired standards
» Recommend technical issues relevant to the implementation of the CMVR
» Recommend new safety standards for various components for notification and implementation under the CMVR
» Recommend lead time required for implementation of safety standards
» Recommend amendments to the CMVR on technical issues considering changes in automobile technologies

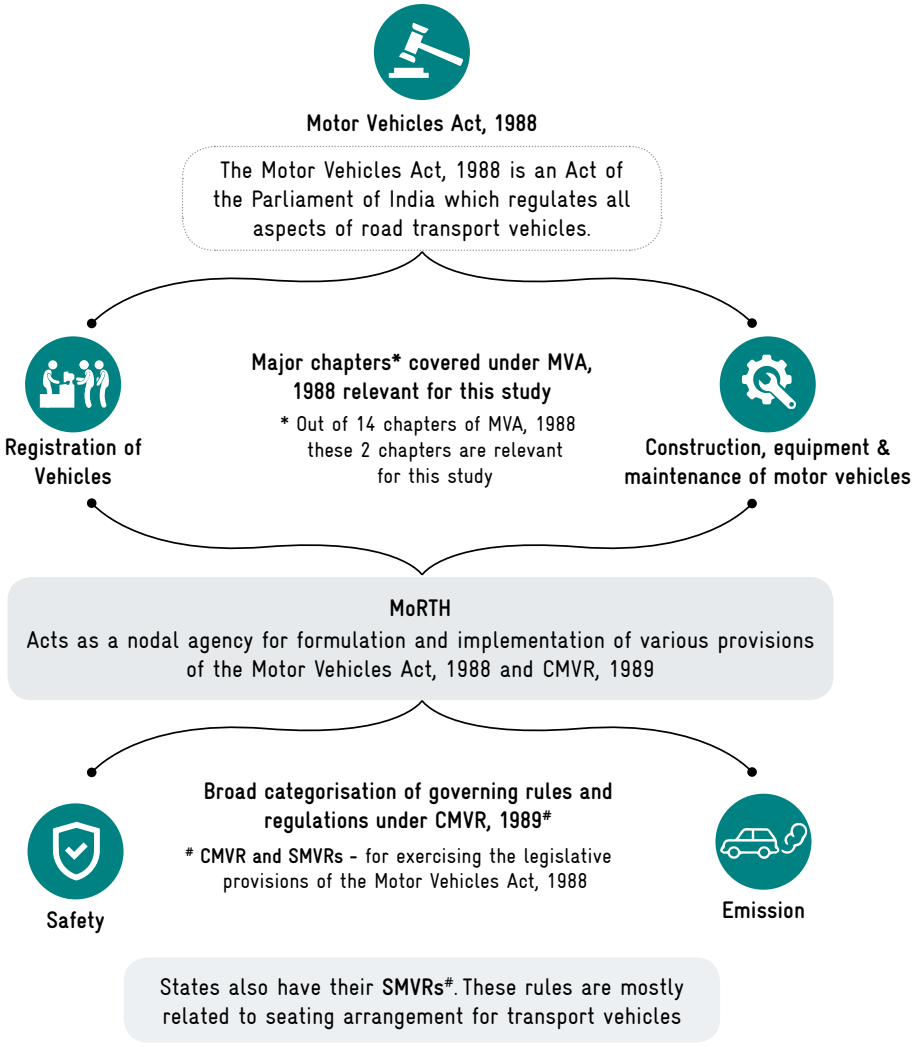


Figure 2 - Acts and rules governing the Indian automotive industry

Out of the total 8 chapters and 164 rules under the CMVR 1989, the following are relevant to this study:

- Rule 2 – Definitions – the types of motor vehicles are defined
- Chapter III – Includes various rules for trade certificates, registration of motor vehicles, certificate of fitness, registration of vehicles belonging to the state government for defence purposes, state register of motor vehicles, special provision for registration of motor vehicle for diplomatic officers, and the fee
- Chapter V – Construction. Equipment and Maintenance of Vehicles. Rules 91 to 138. These rules give the Automotive Industry Standards (AIS) and Indian Standards issued by BIS that need to be complied with for vehicle and occupant safety, exhaust emissions, noise, anti-theft systems.
- Rule 126 of the CMVR 1989 under Chapter V requires that the prototype of every motor vehicle be subjected to test and issued with a CMVR Certificate of Compliance by any of the following test agencies:
- The Vehicles Research & Development Establishment (VRDE), Ahmednagar
- The Automotive Research Association of India, (ARAI), Pune

- The Central Institute of Road Transport, (CIRT), Pune
- The International Centre of Automotive Technology, Manesar
- Rule 138 of Chapter VI in CMVR 1989 – includes guidelines for signals and additional safety measures for motor vehicles[10]
- AIS are applicable for components supplied by OEMs. However, components sold through aftermarket network are required to comply with BIS standards.

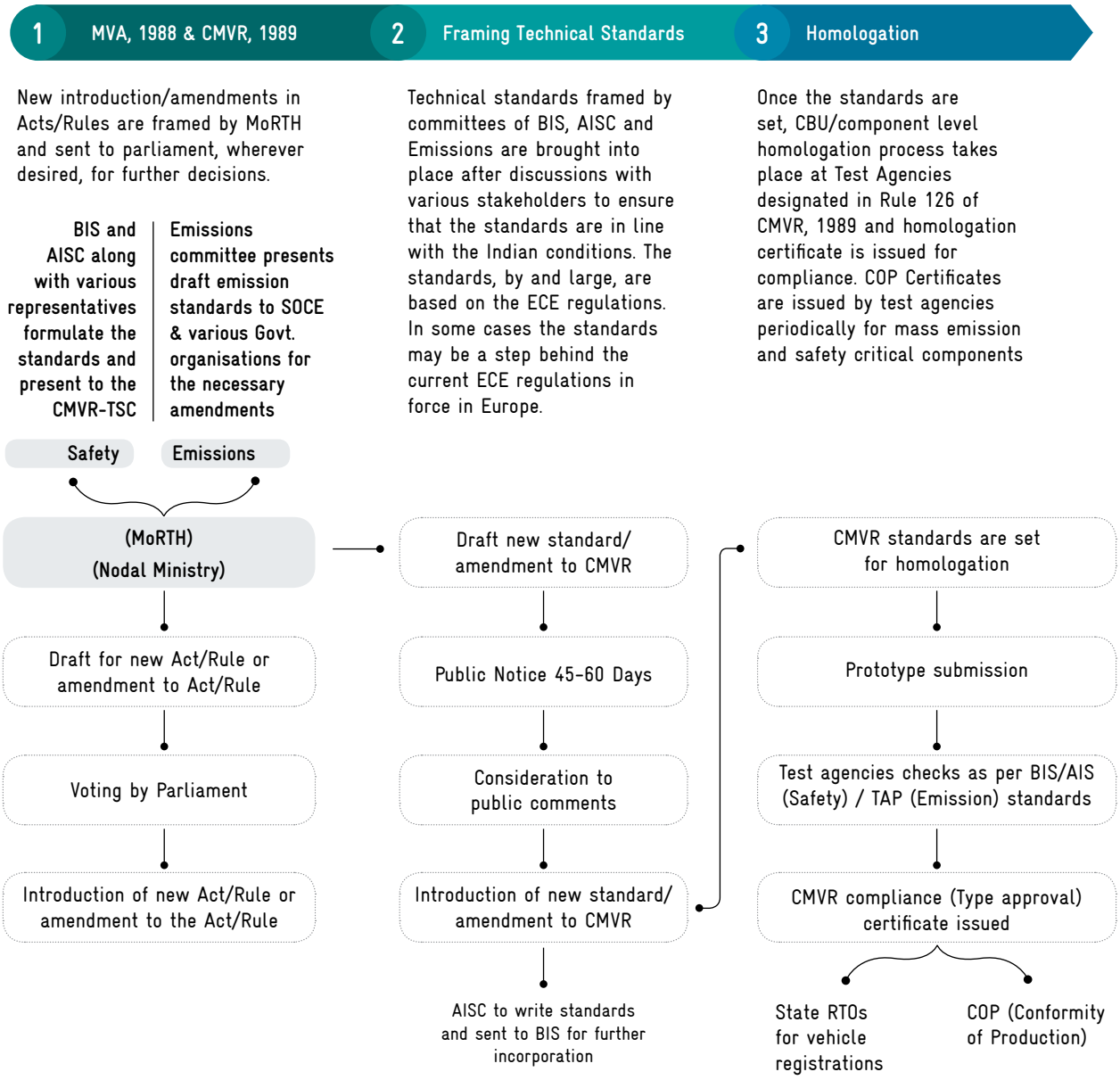


Figure 3 - Flow chart for introducing new Act/Rule or making amendments to existing Act/Rule

[10]MoRTH • Acts/Rules/Notifications • CMVR, 1989

The type approval process certificate, which captures all homologation requirements, mandates the fulfillment of the following key areas:

» General - anti-theft, masses and dimensions
» Vehicle level - mass emission, noise, brake
» System level - seats, anchorage, under run protection, forward vision
» Component level - horn, mirror, safety glass

MoRTH is the nodal agency for the development and implementation of safety and emission regulations. ARAI and other agencies mentioned in CMVR are authorised to issue type approvals and Conformity of Production certificates. The Standing Committees on implementation of legislations have been constituted by MoRTH under the Chairmanship of the Joint Secretary-MoRTH, to advise the nodal agency on implementation. The functions of the Standing Committees under the Chairmanship of the Joint Secretary-MoRTH advise the ministry on implementation of legislations in general, and particularly:

» Type Approval (TA), Conformity of Production (COP), testing system and procedures - formulating, monitoring and controlling policy and actions
» Implementation of the emission legislation – coordinating all activities
» Dealing with certification, withdrawal and restoration of TA
» Dealing with other technical, administrative or legal matters

Conformity of production (COP) period and selection of random sample

After TA, a series of processes are conducted to ensure COP at component and vehicle level. Depending upon the production quantity, the testing agencies select random samples as per specified periodicity and conduct tests to ensure compliance of safety and emission standards in the production of vehicles. Rule 126 (section 110 of MV Act) of CMVR mandates test agencies to undertake testing and ensure COP of vehicles.

For BSIII 4W engine and vehicles, the COP frequency is once in a year.

More than 70% of the safety regulations in India are either partially or fully technically aligned with GTRs and UNECE regulations. Efforts are made to further align with international safety regulations. An overview of the safety standards setting process is outlined by way of mapping responsibilities assigned to different committees under MoRTH.

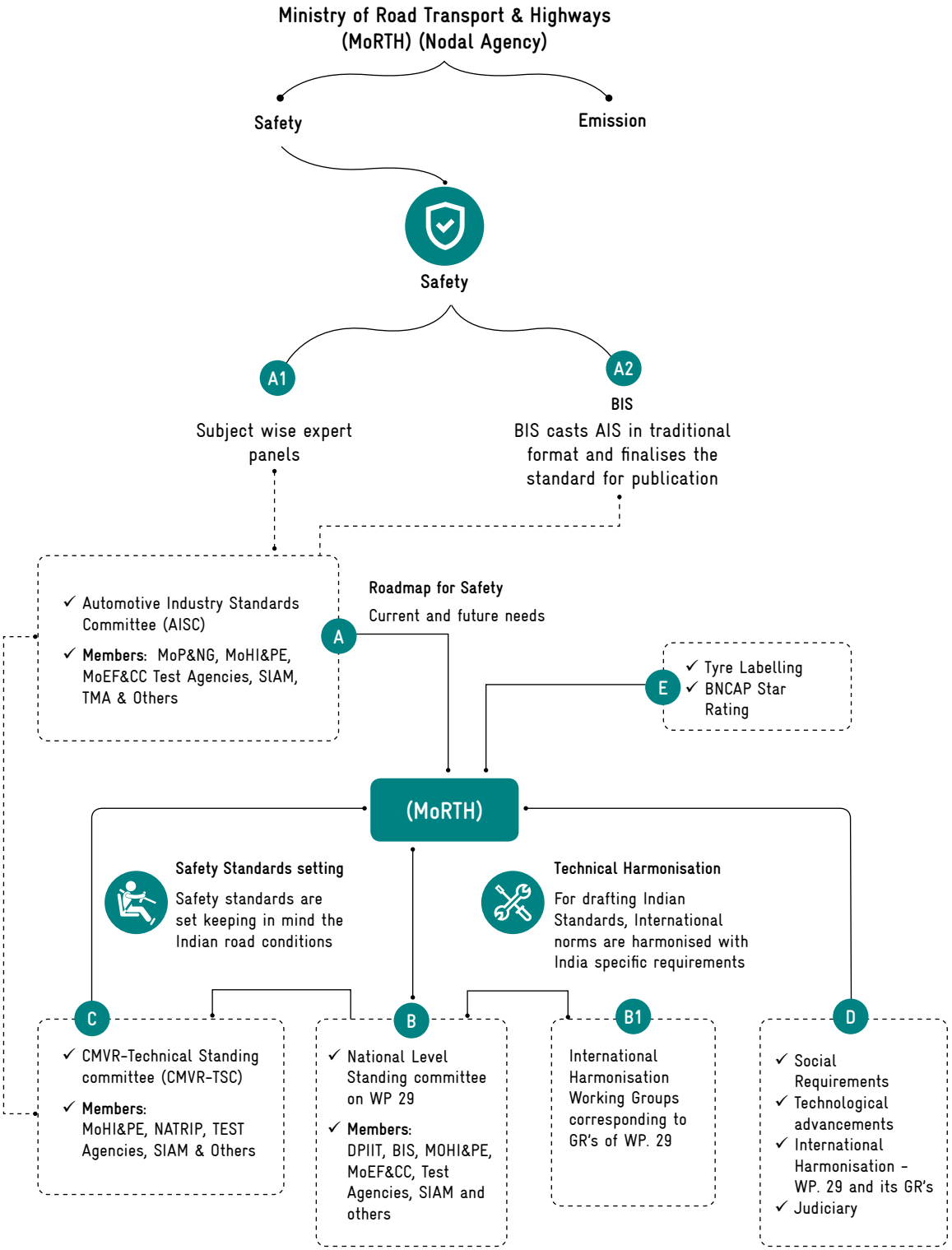
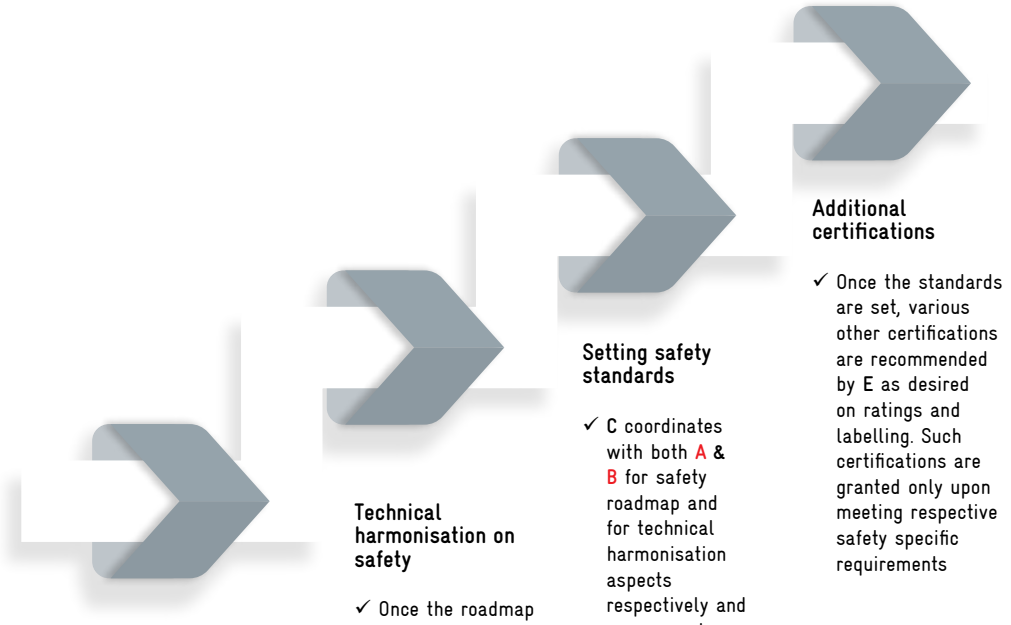


Figure 4 - Flow chart for making standards for safety related aspects

As a first step, committee A (chaired by director ARAI) sets the roadmap for safety standards and related requirements keeping in view the social, technological and judicial requirements in India and considering future needs. During this activity, AISC takes inputs from CMVR-TSC before recommending a roadmap. Once the roadmap is set, committee B (chaired by Joint Secretary MoRTH) evaluates comparable international norms for safety (as per UNECE) considering the feasibility to technically harmonise with Indian conditions. This committee recommends international standards which can be adopted by incorporating changes, if any, to suit Indian conditions. Thereafter, committee C (chaired by Joint Secretary MoRTH) sets the standards considering Indian road conditions and testing requirements to adopt safety aspects in vehicles. CMVR-TSC recommends MoRTH for required amendments to existing standards for safety or new standards in line with requirements. AISC drafts the standards as desired and notifies the same to BIS to metamorphose into broader Indian standards.



Roadmap for safety standards

- ✓ In order to have a planned approach, committee A takes up the initiative for setting up the roadmap for safety standards by taking inputs from A1, A2 and D
- ✓ CMVR-TSC, part of group C committee, which mainly looks after setting safety standards, also participates in setting up the safety roadmap so that the standards are well synchronised with the roadmap
- ✓ This roadmap is reviewed from time to time to align with the changing environment and new regulations formulated under UN WP. 29

Technical harmonisation on safety

- ✓ Once the roadmap is set, appropriate international norms are considered by B & B1 which are then further recommended to MoRTH
- ✓ B & B1 help in harmonising international standards with Indian standards with some minor changes wherever desired to suit Indian conditions

Setting safety standards

- ✓ C coordinates with both A & B for safety roadmap and for technical harmonisation aspects respectively and recommends standards for safety related aspects

Additional certifications

- ✓ Once the standards are set, various other certifications are recommended by E as desired on ratings and labelling. Such certifications are granted only upon meeting respective safety specific requirements

Figure 5 - Sequence for making standards for safety related aspects

Responsibilities across various committees

	Roadmap for safety	Technical Harmonisation	Safety Standard Setting
AISC	✔		
ARAI	✔		
BIS	✔	✔	
CMVR-TSC			✔
DPIIT	✔	✔	
International Harmonisation working Groups	✔	✔	
Judiciary	✔		
MoEF&CC	✔	✔	✔
MoHI&PE	✔	✔	
MoP&NG	✔		✔
MoRTH	✔	✔	
National Level Standing Committee on WP 29		✔	✔
NATRiP			✔
SIAM	✔	✔	✔
Test Agencies	✔	✔	✔
TMA	✔		

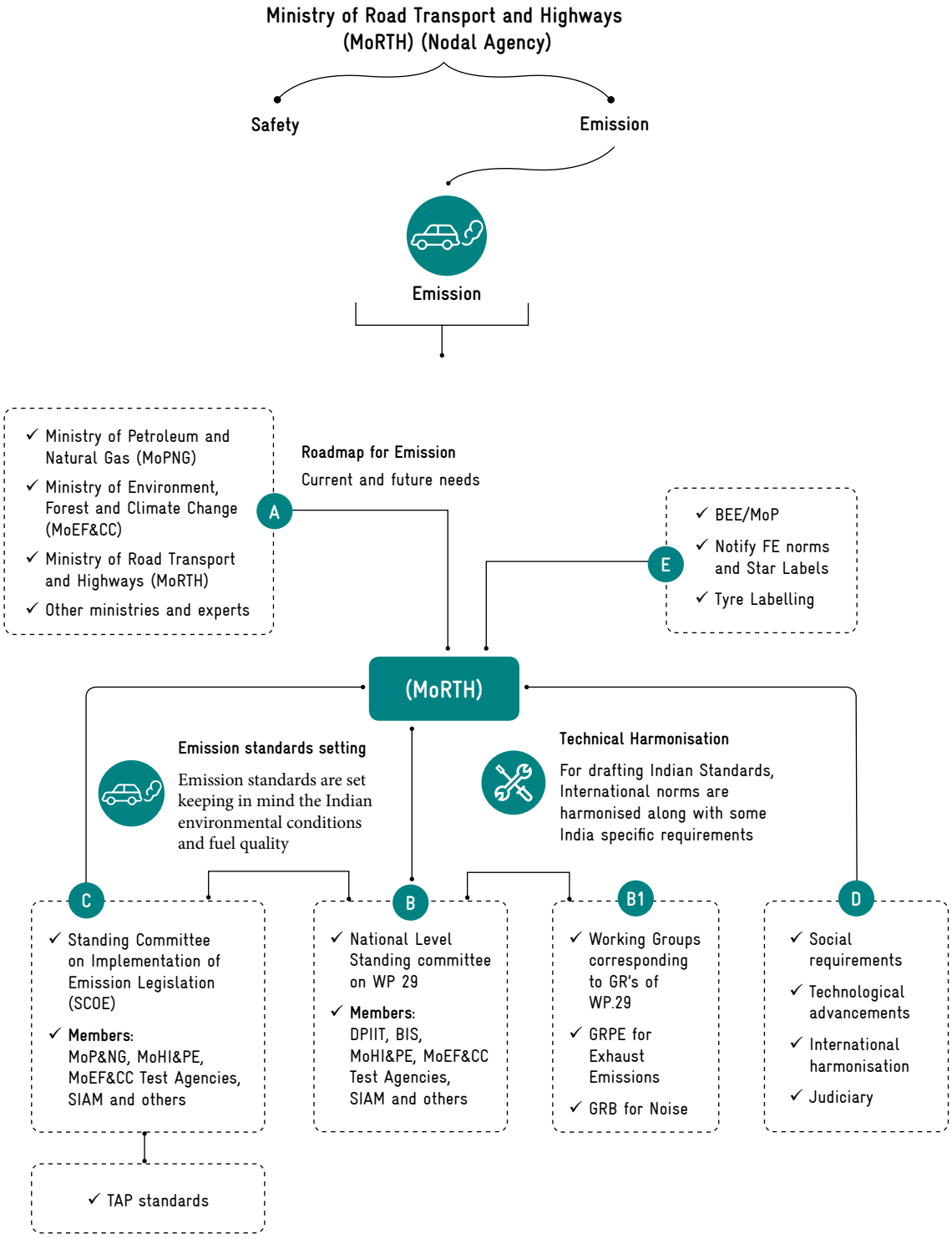


Figure 6 - Flow chart for making standards for emission related aspects

As a first step, committee A sets the roadmap for emission standards and related requirements keeping in view the social, technological and judicial requirements in India and considering future needs. Once the roadmap is set, committee B (chaired by Joint Secretary MoRTH) evaluates comparable international norms for emissions (as per UNECE) considering the feasibility to technically harmonise with Indian conditions. This committee recommends international standards which can be adopted by incorporating changes, if any, to suit Indian conditions. Thereafter, committee C (chaired by Joint Secretary MoRTH) sets the standards considering Indian conditions and testing requirements to adopt emission aspects in vehicles. SCOE recommends MoRTH for required amendments to existing standards for emission or new standards in line with requirements. Standards for type approval procedures (TAP) are drafted (in consultation with SCOE) and notified to BIS to metamorphose into broader Indian standards.

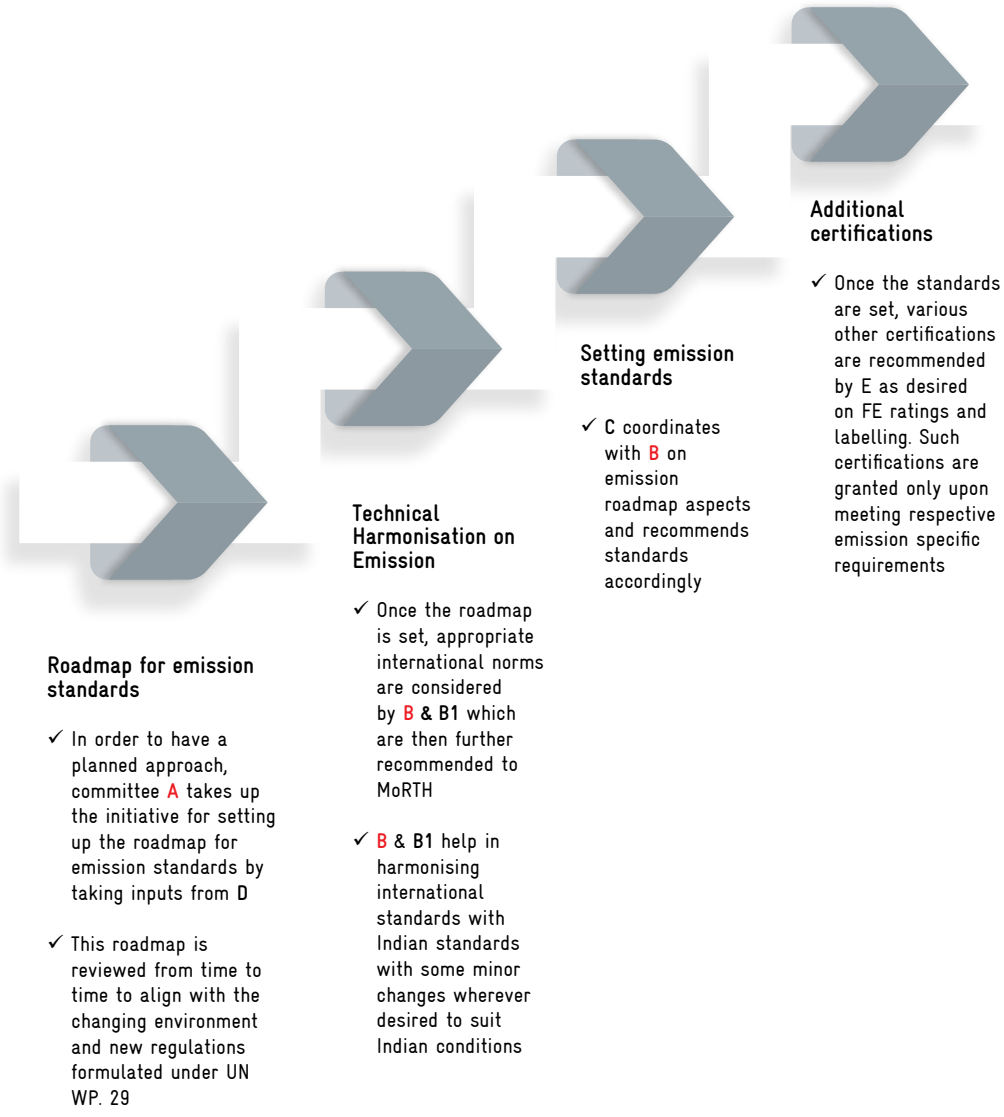


Figure 7 - Sequence for making standards for emission related aspects

Responsibilities across various committees

	Roadmap for Emission	Technical Harmonisation	Safety Standard Setting
BIS		✔	
MoPNG	✔		✔
Ministry of Power	✔	✔	
GRB for Noise		✔	
GRPE for Exhaust Emission		✔	
Judiciary	✔		
DPIIT	✔		
MoEF&CC	✔	✔	✔
MoHI&PE		✔	✔
MoRTH	✔	✔	✔
National Level Standing Committee on WP 29		✔	
Other expert bodies	✔		
SCOE			✔
SIAM		✔	✔
Test Agencies		✔	✔
Working Groups corresponding to GR's of WP.29		✔	

Process for introducing new standards or making amendments to existing standards related to safety and emission

Formulating the Indian Standards generally takes many years due to the involvement of several governmental bodies, the industry and public participation. In order to catch up with developed countries in automotive technology, MoRTH, in the 1990s, empowered the AISC to formulate the Automotive Industry Standards (AIS) applicable to only the automotive industry. However, BIS takes care of all standards, including the automotive and non-automotive sectors.

The AIS are formulated with the participation of the test agencies and various other representatives from the automotive industry (SIAM and ACMA, BIS-Director, ARAI is the chairperson of the AISC).

The AIS are first notified for implementation by MoRTH. Subsequently, BIS casts the AIS in its traditional format, holds meetings of its Standards Committee within Transport Engineering Division (TED) and finalises the standard for publication. Once the IS is published, a subsequent notification by MoRTH replaces the AIS with a corresponding IS for compliance from a notified date.

For amendments to standards, existing standards are looked through and changes are made to the same after discussion with various stakeholders. For new standards, MoRTH sends a proposal to the CMVR-TSC to deliberate the need for a new standard.

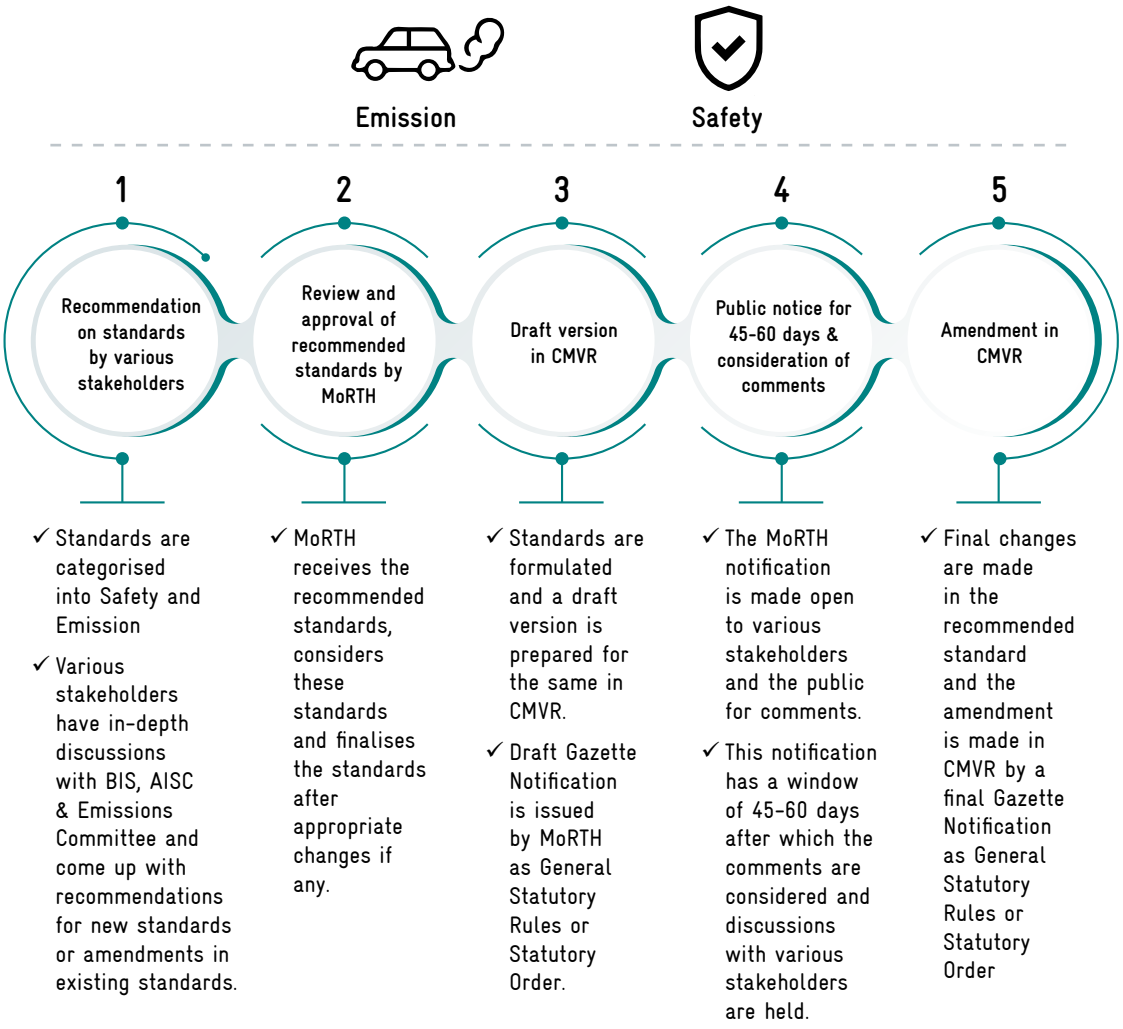


Figure 8 - Flow chart for amendments to technical standards for emission and safety

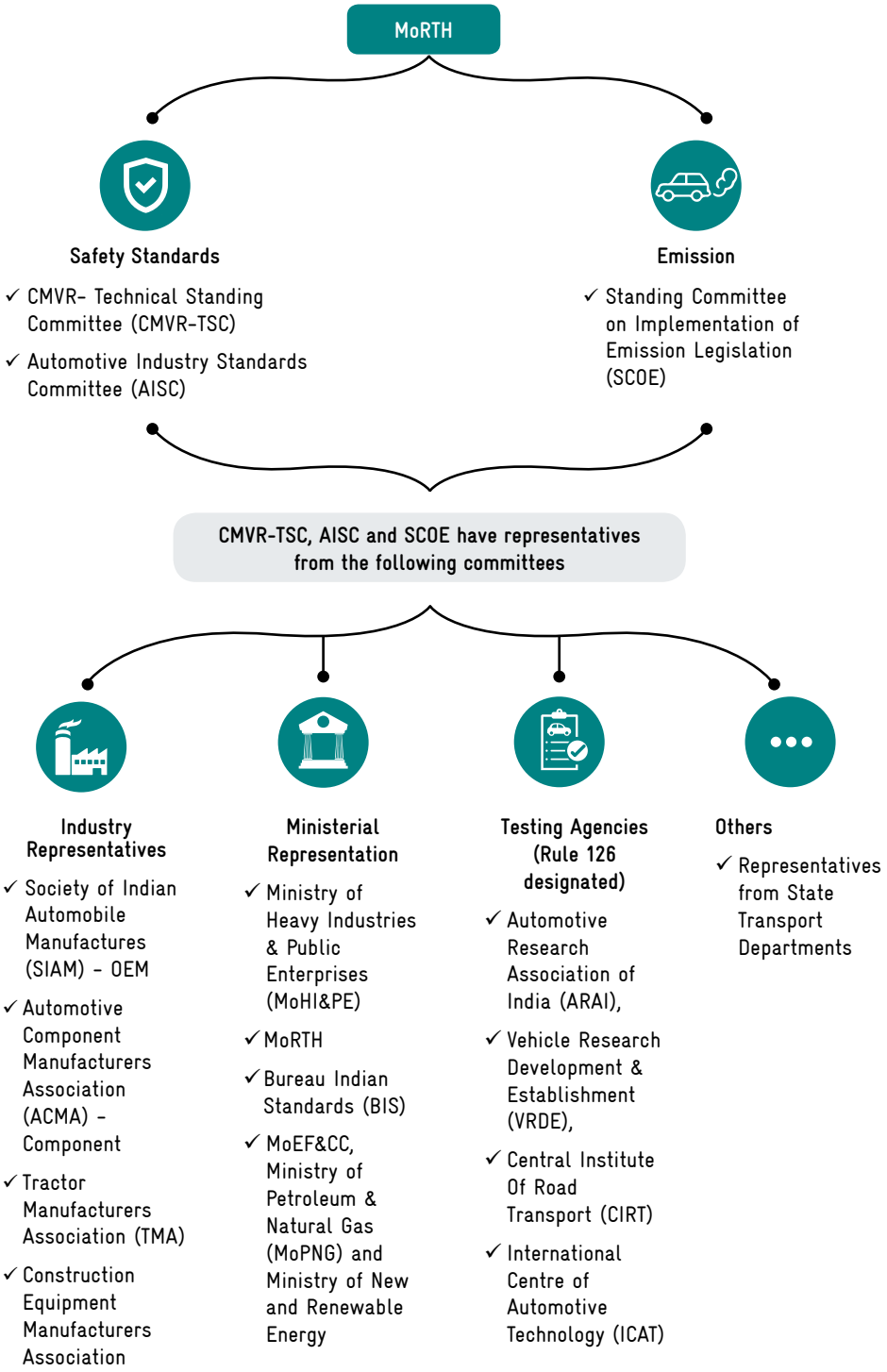


Figure 9 - Key stakeholders involved in making standards for safety and emission

Process of homologation

The term 'homologation', as used in Europe, means the compliance of the vehicle, systems and components to various Directives and Regulations. The compliance is checked after conducting the specified tests in the Directive and/or Regulation by 'Technical Services' such as TÜV in Germany, UTAC in France and VCA in the UK. The documents are submitted by the Technical Services to the transport ministry of the European country for issue of the type approval certificate. Once the type approvals are granted for the various vehicles, systems and component tests for a particular vehicle, these approvals are collated and submitted to the transport ministry of the European country for the vehicle type approval. This process is known as homologation. While this system of homologation was followed earlier, the Whole Vehicle Type Approval (WVTA) system is now fully established and the type approval is to be done for the complete vehicle itself.

The notification issued by MoRTH invites attention to affected rule number and describes what needs to be complied with, on what date the compliance is to be put into effect and the standards (BIS or AIS) that need to be complied with by the vehicle, system, component and other similar aspects.

The notified standard details the applicability of the standard to the vehicle, system or component type or category, lists the inclusions and exclusions of the vehicle, system or component types, describes the test procedures and the limits to be met for the compliance.

In general, the CMVR certificate is granted for the vehicle model and is akin to the WVTA in Europe.

There is a move to go in for international WVTA, mooted by Japan and supported by Europe to cover all countries throughout the world so that all countries follow the same norm. However, more time is needed for all nations to come together to support this move. The 1998 Agreement at UNECE, Geneva, is a step in this direction for all major countries, including the USA (FMVSS), Australia (ADR), India (AIS & BIS), Japan (JIS & JASO), Brazil (CONTRAN), China, Korea, and other nations, in this context to develop the GTRs at an accelerated pace and accept, adopt and apply them for their type approvals. Once such an agreement is in place, there will be acceptance of the vehicle without the need for further tests based on the type approval granted by the country of origin.

With respect to Conformity of Production (COP) for emissions, the test agencies listed under Rule 126 are authorised to conduct emission tests as per the frequency given in Rule 126A, follow administrative procedures detailed in TAP 115 document stated in Rule 115 and issue the COP Certificate. In the event of failure, MoRTH is intimated to deal with the vehicle manufacturer. Under Rule 124(4), certain safety components listed have to undergo component type approval and COP following the procedures detailed in AIS 037-2004.

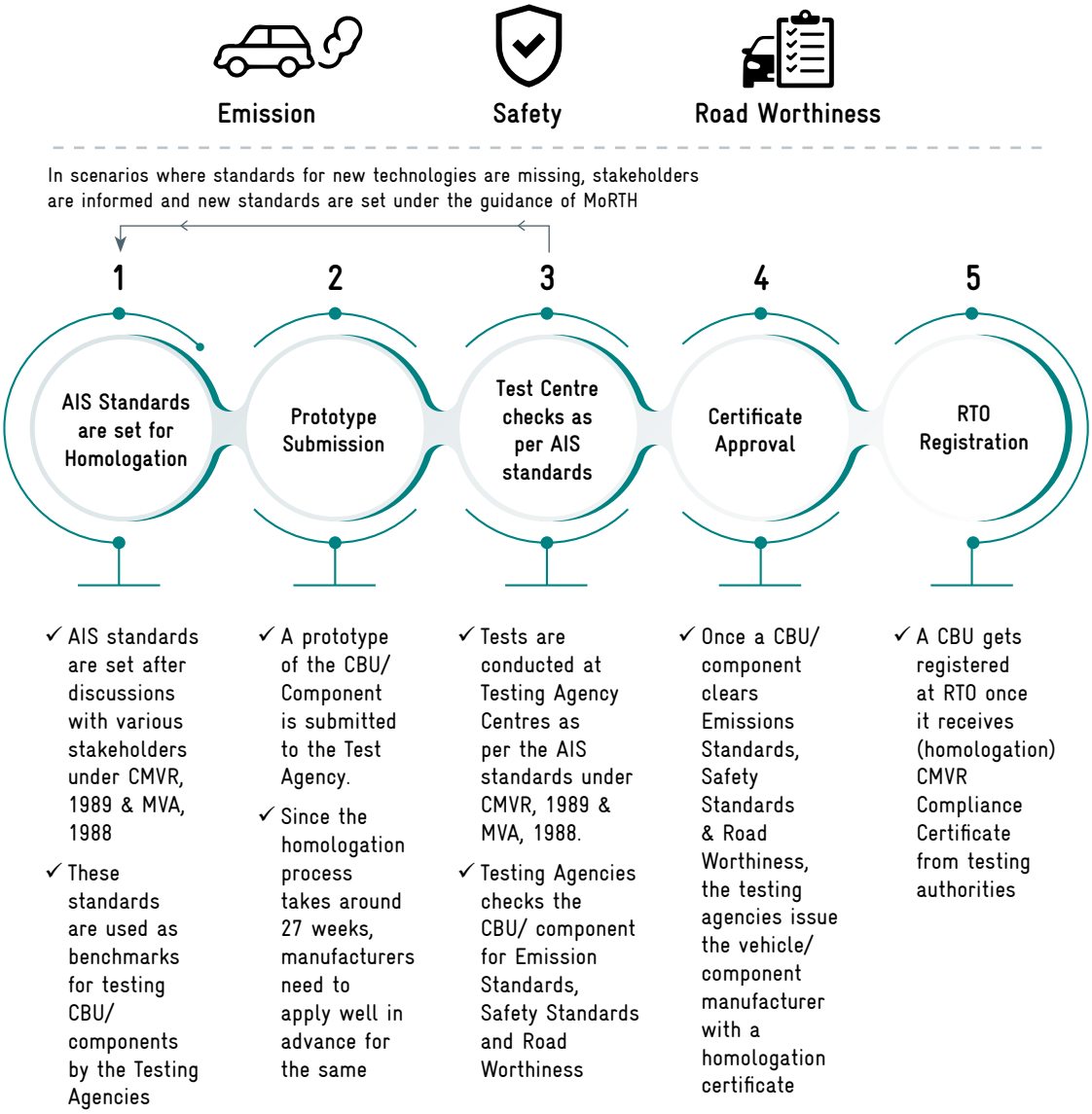


Figure 10 - Flow chart for amendments to homologation

Key stakeholders involved in making amendments to homologation

- Testing agencies (Rule 126 designated)
- Automotive Research Association of India (ARAI)
- Vehicle Research Development & Establishment (VRDE)
- Central Institute of Road Transport (CIRT)
- International Centre of Automotive Technology (ICAT)
- National Automotive Testing and R & D Infrastructure Project –NATRiP
- The Central Farm and Machinery Testing & Training Institute (CFMTTI), Budni
- Northern Region Farm Machinery Testing & Training Institute, Hissar
- Indian Institute of Petroleum (IIP), Dehradun

Process for making amendments to existing standards

Amendments to existing standards (AIS) are made after due deliberations with the TED of BIS. These amendments range from minor editorial changes to changes in test requirements/ test procedures or major changes that may call for a revision of the standard. In general, the BIS Secretariat seeks opinions for revision once every five years in which case the year preceding the number of the standard gets a current date of adoption. In case there are no changes, the standard is 'reaffirmed'. While a new Indian standard is in the making and is in wide circulation, it is given a draft designation and is known as Draft Indian Standard (DIS) number.

The AISC Secretariat brings to the notice of the AISC the need for an amendment. The framing of new standards may be dictated due to the advent of new technologies in vehicles, vehicle safety systems or safety components. This could range from the introduction of Electronic Stability Control (ESC), airbags in addition to safety belts, electric vehicles, hybrid vehicles, new standards on crash, changes to emission limits, introduction of new driving cycles for emission measurements.

A lead time is generally given for the new models to meet the standards on a notified date. Older models may be given additional lead time by the notification. The lead time is discussed in AISC/Emissions Committee meetings and is then deliberated to CMVR-TSC, SCOE before the draft notification is introduced by MoRTH. Comments received during the notice period of 30 days (or more) are reviewed by MoRTH before the final notification is issued. The lead time for amendments could be different for vehicles, systems and safety components, depending on the complexity of the technology, availability of better-quality fuels (in case of tighter emission limits) or designing for crashworthiness or other similar aspects.

Process for setting new standards for introducing new technology in vehicles/components

Ever since the CMVR, 1989, was introduced, it has been amended several times—that is, almost every year or two years if not earlier. To ensure that new notifications are not sporadic, which they used to be in the early years of CMVR, 1989, after due deliberations with CMVT-TSC, AISC and SCOE, it was decided that the notifications would be sent twice a year on 1 October and 1 April. This was a positive step for the industry to plan their models and for test agencies to test and issue compliance CMVR certificates.

The process to release new standards to introduce vehicles with new technologies is through safety and emissions roadmaps deliberated with the AISC, CMVR-TSC and SCOE. The status of the existing IS and AIS standards and Emission Type Approval Procedures (TAP) is compared with the EU Directives and UNECE Regulations for adoption. Discussions with AISC or Emissions TAP Committee may lead to recommendations respectively for CMVR-TSC (safety) or SCOE (emissions). The recommendations may either be on direct adoption of the EU directive or regulation with a reasonable lead time or adoption of earlier versions.

Some examples of lead times for adoption are

» Crash standards for frontal offset, lateral collusion and rear collusion were discussed and finalised in 2012 and notified for implementation in 2018

» Pedestrian protection was discussed and finalised in 2012 and notified for implementation in 2019

Validity of standards and processes for renewal

Generally, a standard does not expire on its own. Based on discussions with the respective committee (CMVR-TSC or SCOE), a standard is reserved or withdrawn if it is found to be obsolete or irrelevant. Further, it could also get replaced by a newer version of the same standard.

In general, the BIS Secretariat seeks opinions for revision of the standard once every five years, in which case the year preceding the number of the standard gets a current date of adoption. In case there are no changes, the standard is 'reaffirmed'. A similar process is followed by the AISC with

respect to the AIS. The matter is then tabled for final discussion with the CMVR-TSC or SCOE and then taken up for notification.

AIS standards

The AIS in the draft stage are hosted on the ARAI website. Not only the AIS committee members but other stakeholders such as vehicle and component manufacturers themselves or through their associations with SIAM, ACMA, TMA and other test agencies can send their comments to the AISC Secretariat. The last date for the submission of comments is also made known in the draft AIS and in the AISC minutes of the meeting.

BIS standards

BIS follows a structured procedure in framing the standards - draft standards to final standard with ample time for wide circulation of the draft standard, receipt of comments and final discussion in the BIS committee meeting based on the circulated agenda. The finalised standard then gets an approval from the committee for printing.

MoRTH notification

In addition to the stakeholders - namely, the vehicle and component manufacturers and their associations including SIAM, ACMA, TMA, governmental bodies and public - can comment on the draft notification issued by the Government of India.

Regulatory landscape – Imports

Imports of automotive vehicles and components in India

The Government of India notifies and gives powers to the Ministry of Commerce and Industry, the nodal authority for formulating and implementing Foreign Trade Policy (FTP) in all matters related to imports and exports of goods and services. The policy is governed under section 5 of *Foreign Trade (Development & Regulation) Act, 1992.*[11]

The Director General of Foreign Trade (DGFT) and Central Board of Excise and Customs (CBEC) are involved in controlling and implementing policies related to imports and exports.

The DGFT prepares, formulates and implements Export-Import (Exim) policies, issues import export codes, defines import and export trade operations, customs and trade promotions, controls the Duty Entitlement Pass Book (DEPB) rates (export incentive schemes) and formulates ITC-HS codes. It also releases a handbook of procedures including Aayat Niryat forms and processes useful for exporters and importers for implementing FTP.

The CBEC, which comes under the Ministry of Finance, controls custom duties and tariffs. It publishes Indian customs tariff codes, regulates imports and protects the domestic market. Other key responsibilities of CBEC include protecting the Indian industry from undue competition through various legal provisions.

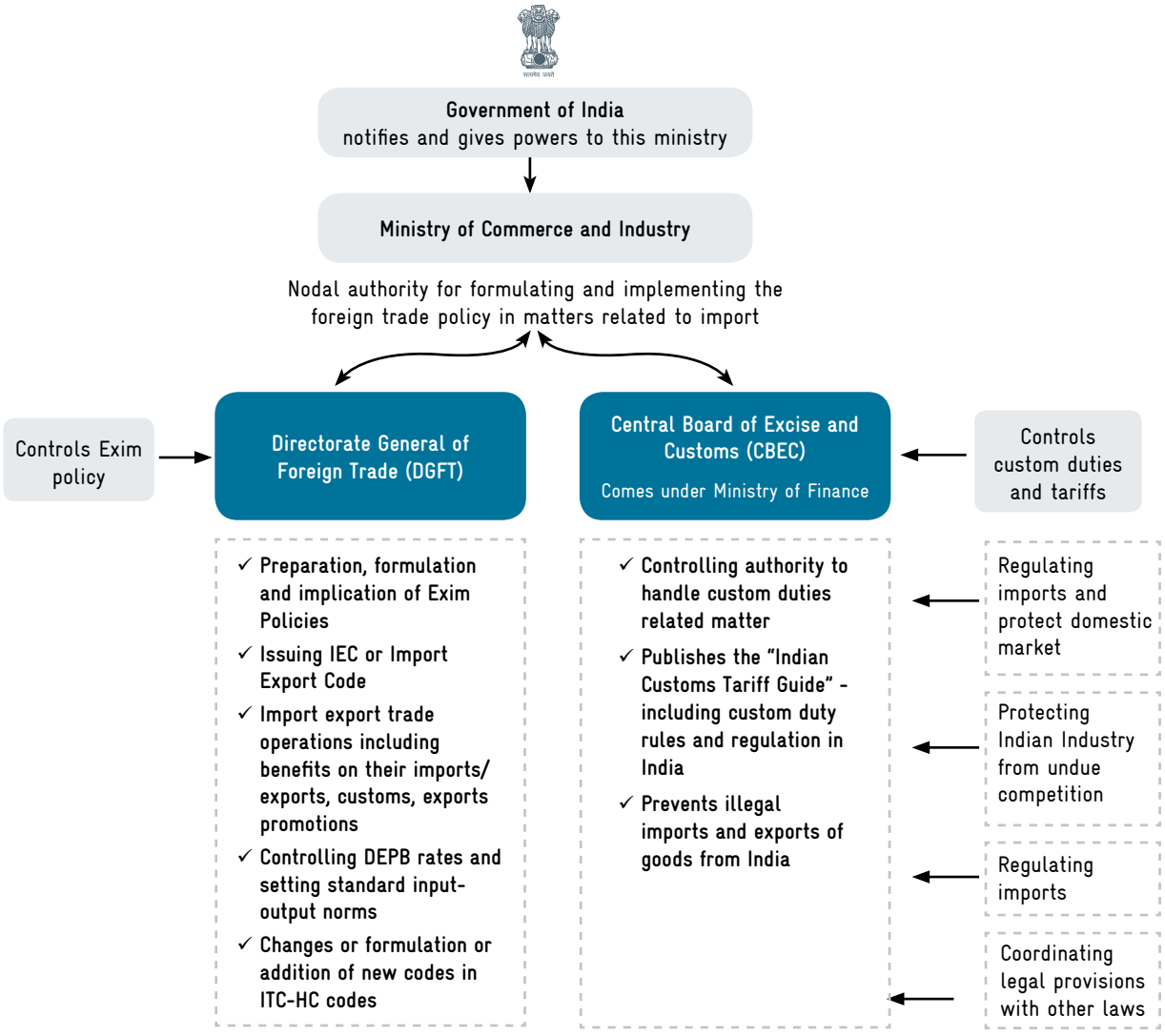


Figure 11 -Regulatory overview for importing automotive vehicles and components

[11] DGFT • FTP Act,1992

Exim policy and ITC-HC Codes

The Exim policy sets out guidelines and instructions for export and import of goods. The changes or amendments to this policy are made by the Ministry of Commerce and Industry in coordination with the Ministry of Finance and DGFT. The policy regulates the import of automotive vehicles and components into the country with customs duties. The policy also states the following for imports of automotive vehicles:

- Should not be registered or used in any country before importing to India
- Not been sold or loaned or leased prior to importing to India
- Should be imported from the country of manufacture
- Should comply with CMVR rules after importing to India[12]

To suit international trade requirements, ITC-HS codes were adopted by India. The broad categories of HS codes are divided into two schedules:

Schedule I – Rules and guidelines related to import. The HS codes are divided into 21 section and each section is further divided into 98 chapters

Schedule II – Rules and regulations related to exports. The HS codes are divided into 97 chapters

Duty rates on automotives

The 2018 Budget brought about several changes regarding automotive customs duties. The increase in customs duty rates for automobiles and automotive parts are summarised below:

Increase in BCD rates	Old rate	New rate
Import of motor vehicles (CBU) for commercial purposes	20%	25%
Import of motorcycle, vehicle or cars (CKD) for commercial and passenger vehicles	10%	15%
Parts of motor vehicles, cars or motorcycles	7.5%/10%	15%

A social welfare surcharge is now levied on the import of goods at a rate of 10% of the customs duty. This will not be levied on Integrated Goods and Service Tax (IGST) and compensation cess.[13]

GST on the import of goods: In the pre-GST era, a person who imported goods to India had to pay customs duty, countervailing duty and special additional duty. Countervailing duty is levied at a rate equivalent to the rate of excise on goods if they had been manufactured in India. Special additional duty is equivalent to VAT on the goods in India.

However, in the current GST regime, IGST is to be paid in place of countervailing and special additional duty. The general rate of IGST on the import of automobiles is 18%/28%.

The import duties are levied on the goods as per schedules included in *The Customs Tariff Act, 1975.*[14]

Broad areas considered for duties are:

- Import through sea
- Basic duty

[12]DGFT • FTP 2015-2020
[13]CBEC • Union Budget 2018-2019
[14]CBEC • The Customs and Tariff Act, 1975

» Additional customs
» Special additional duty
» Anti-dumping duty

Imports of new vehicles

The policy states that new imported vehicles should meet the following conditions:

» Should not be registered or used in any country before importing to India
» Not been sold or loaned or leased prior to importing to India
» Should be imported from the country of manufacture

Subject to having

» Speedometer with speed in KMPH
» Right hand steering and controls
» Headlamps photometry to suit 'keep-left' traffic

The new vehicle shall also conform to the provisions of MVA, 1988 on the date of import.
The importer in India shall have the following documents at the time of import of the vehicles:

» Valid certificate of compliance under rule 126 of CMVR, 1989 issued by any of the testing agencies
» Responsible for all the provisions assigned to the manufacturer as per rules 122 and 138 of the CMVR, 1989 and for issuing Form 22, as per provisions of the CMVR, 1989
» Compliance to COP as per rule 126A of CMVR shall be submitted within six months of the imports. Failure to do so will lead to no further import of that vehicle model

The import of new vehicles shall be permitted only through the customs ports in Mumbai, Calcutta and Chennai.[15]

Custom clearance of imported goods

For an importer an Importer Exporter Code (IEC) number (issued by DGFT) is mandatory for importing goods unless goods are imported for personal use. All goods imported in India undergo customs procedures and need proper assessment, examination and evaluation to allow authorities to charge correct tax and ensure checks against illegal imports.

Broad areas which are considered during clearance are:

» Bill of entry (BOE)
» Amendment of BOE
» Green channel facility
» Payment of duty
» Prior entry for shipping bill or BOE
» Specialised schemes
» Bill of Entry and warehousing

A CHA (Custom House Clearance) is licensed to act as an agent for the transaction of any business relating to:

» Entry or departure of conveyances
» Import or export of goods at a port or airport

[15] DGFT • Policies • ITC(HS) Schedule 1 Import Policy 2017

The key activities undertaken by a CHA/clearing and the forwarding agent are:

» Preparation and processing of bill of entry, shipping documents, bills of lading, import and export declarations, etc.
» Booking of shipping space or air freighting and advice on related costs
» Arrangement for loading/unloading of goods and local transport
» Undertaking end-to-end customs clearance processes, etc.[16]

Trade facilitation measures

» **Green channel facility:** This facility allows major importers to undertake clearance without routine examination of goods ensuring speedy clearance. The importers need to make a declaration; however, appraisement of consignment is done as per normal procedure except that it does not undergo a physical examination.

» **Authorised Economic Operator (AEO) programme:** This programme is a trade facilitation scheme providing tangible benefits like faster customs clearances and simplified procedures to business entities which demonstrate strong internal controls and ensure compliance with customs and other relevant laws.

An entity with an AEO status can, therefore, be considered a 'secure' trader and a reliable trading partner. Various benefits are provided to AEOs depending upon their categories (tier 1, tier 2, and tier 3). Some of the key benefits to AEOs are:

- Faster cargo clearance
- Self-certification
- Reduced/no bank guarantee
- Reduction in dwell time and consequent cost of doing business

» **Ease of doing business**

- Various Electronic Data Interchange (EDI) and e-governance initiatives implemented with the objective of reducing the physical interface of the importer with the government department, thereby reducing transaction costs.
- Application for advance ruling for determination of any question of law can now be filed by any person holding a valid IEC, foreign supplier or any person with a justifiable cause. The time limit for the issuing of an advance ruling order has been changed from six months to three months.
- Time limit for adjudication of a show cause notice is now fixed as six months/one year.[17]

Figure 12 - Implementation mechanism of trade facilitation

[16]CEBC • Customs Manual 2015
[17]DGFT • FTP 2015-2020

Testing of imported vehicles

Imported vehicle is submitted to one of the following testing agencies in India for securing test certificate:

- VRDE, Ahmednagar
- ARAI, Pune
- CFMT, Budni
- Any notified testing agency

Import samples include following:

- Consumer goods
- Consumer durables
- Prototype of engineering goods
- High-value equipment
- Machineries (including agricultural machinery) and their accessories

India is also a signatory to the 1952 Geneva Convention to facilitate the import of commercial samples and advertising materials, hence they are exempted from import duties ensuring smooth flow of trade.

After developing an in-depth understanding of the regulatory landscape in India in terms of technical standards, homologation process and imports, a list of gaps and challenges in the current framework was identified. This was accomplished by conducting comprehensive interviews with representatives of various automotive authorities, and vehicle and component manufacturers. The challenges identified were prioritised to top five based on the extent of impact each challenge had on the trade practices in the country. These challenges were later analysed in detail to uncover key reasons behind these challenges. Suggestions for improvement were then developed and deliberated with stakeholders and subject matter experts. The next section of the report focuses on the five key challenges and recommends a list of interventions to address them.

KEY CHALLENGES AND RECOMMENDATIONS

Challenge 1: Introduction or modification of regulatory standards without appropriate lead time

Often, Indian regulatory standards tend to be uncertain as they go through multiple rounds of revision due to various policy changes by the Government of India. These iterations, which are made by government authorities, prolong the release time of the standards. The lead time given to vehicle manufacturers to cope with multiple revisions is not sufficient. Further, the final version of the standard (which becomes a regulation) tends to deviate considerably in comparison to its first draft.

MoRTH has a process for introducing, implementing and amending automotive standards. This process has been in place for several years. In case of amendments to standards, sufficient lead time is usually given to manufacturers to incorporate the changes. However, in the last few years, there have been instances where manufacturers believe that the lead time provided to implement the standards has not been sufficient. Below is a list of examples with cases when manufacturers found the timelines to implement regulatory requirements insufficient:

Example 1: Requirement of Speed Limiting Device (SLD) or Speed Limiting Function (SLF) for all commercial use vehicles.

CMVR, 1989, rule 118, requires an SDL to be installed on all commercial purpose vehicles. The primary function of this device is to control fuel feed to the engine to limit the speed of the vehicle to a specific value without affecting the other performance parameters of the vehicle in any manner. As per CMVR, SLDs must have a maximum pre-set speed of 80 km/h. This standard is not applicable to personal use passenger vehicles.

In April 2015, MoRTH amended the CMVR, 1989, to exempt certain categories of vehicles from being fitted with SLDs and had been providing extensions from time to time. In February 2016, the Karnataka High Court indicated these exemptions to be illegal. Following the court order, in May 2016, MoRTH issued a draft notification for the amendment of CMVR to include M1 category of vehicles. However, the speed limit to be set in the device varied from state to state. This variation led to a delay in the finalisation of the speed limit to be set for SLD installation. The hurried decision and the complication of the variable speed limit to be set up gave little time to manufacturers to implement the changes. As a result, the sales of certain vehicles suffered. The draft rule was finalised in May 2017 (see Annexure 2).

Initially, there was a lack of clarity among manufacturers regarding the installation of SLDs as it was hard to distinguish a passenger vehicle used for commercial purposes at the manufacturing stage. In order to deal with the issue, the installation of SLDs was shifted to the distributors or dealerships.

Example 2: Speed alert system – a system which alerts drivers when their speed exceeds the specified limit, governed by AIS-145.

The CMVR amendment on the speed alert system was first released in October 2016. This amendment required a speed alert device to be installed in vehicles by manufacturers to warn drivers about over-speeding from 1 April, 2018. The notification required the system to warn a driver when the vehicle exceeded a speed of 80 km/h and also provide a continuous audio alert for speed over 120 km/h. However, the corresponding AIS standard is still not finalised.

The first draft of AIS-145 was released on 25 March, 2017, providing only 27 months until July 2019 for manufacturers to undertake the implementation of the speed alert system. This was considered a very short time span, especially when the standard itself was not finalised.

For example, as per the second draft released on 6 April, 2017 the specifications of the alert were:

> *'The audible warning shall* ***warn the driver at least once when vehicle speed indicated in the***

> ***speedometer exceeds 80 km/h*** *(primary level) and continuously or intermittently with frequency not less than 1 cycle/2 sec when the vehicle speed indicated in the speedometer exceeds 120 km/h (secondary level).'*

These specifications were in line with the original draft notification of March 2017, however, the alert specifications were completely different in the final draft released on 5 October, 2017.

> *'The audible warning shall* ***warn the driver with frequency not less than 1 cycle/2 minute when vehicle speed indicated in the speedometer exceeds 80 km/h*** *(primary level) and continuously or intermittently with a frequency not less than 1 cycle/2 sec when the vehicle speed indicated in the speedometer exceeds 120 km/h (secondary level).'*

This change came as a surprise to various manufacturers as most of them had already started designing the audible warning system to earlier specifications. This led to wasted effort at the manufacturers' end and also left them with very little time to implement the standard. Following the multiple changes, the implementation date got extended to April 2019, which further got extended, and as it stands today, to July 2019 (see Annexure 3).

Causes

» **India's priority to curb road accidents and improve road safety in an accelerated timeline**

As per a report released by MoRTH titled 'Road accidents in India 2015', the number of accidents in 2014 were almost 500,000 resulting in 146,000 deaths and leaving 438,000 individuals injured. Research shows that drivers are, more often than not, responsible for road accidents. In 2015, 77.1% of road accidents occurred due to drivers, out of which over speeding accounted for 62.2%. In the past, the government has taken various initiatives to curb over-speeding by imposing stricter penalties and announcing several technical changes to vehicles.

With rapid urbanisation and road network expansion, India's roads are simultaneously used buy motorcycles, cars, trucks and other vehicles, bullock carts, and animals. At times, even pedestrian tracks are taken over by traffic, leading the safety of pedestrians to also become a concern.

As road safety worsens, **MoRTH has promised to take initiatives to reduce the number of road accidents and fatalities in India by 50% by 2020, which is an aggressive target to achieve, especially given the large number of accidents already recorded in India**[18]. Various measures are being taken in this direction, including steps like improving safety standards for automobiles, incorporating engineering solutions at the design stage, proper trauma care and generating public awareness.

In order to address the issue of road safety as a priority, the government is taking immediate steps to improve safety standards for automobiles, thereby pushing manufacturers to incorporate the changes suggested at the earliest.

» **Non-adherence to the existing process for release of standards**

The established process for releasing a new standard or making amendments to an existing standard is to first release a proposal for amendment with a draft standard to the public for view and comments. Taking into consideration comments from various reviews from multiple stakeholders, subsequent versions of a standard are released in the form of drafts, which become a notification and lead to the release of a final standard. This structured process was mutually accepted and adhered to. However, in the recent past, a reversal in the process for releasing standards has been observed by vehicle manufacturers. Some of the reasons for such non-adherence to the process may be associated to the authority's urgent agenda of improving passenger safety or bringing technological innovations and other related issues. In the reversed process, a notification is usually issued first with a mention of the deadline for incorporating the amendment. There seems to be varying degree of incorporation for public views and

[18] MoRTH • press release • June 2016

comments (refer to the below figure to understand the process in detail). For example, as per AIS -145, the reverse parking alert system will be mandated for M1 category motor vehicles from 1 July 2019. The standard is later released with multiple versions of standards involving major changes in each revision, thus making the implementation process cumbersome for manufacturers.

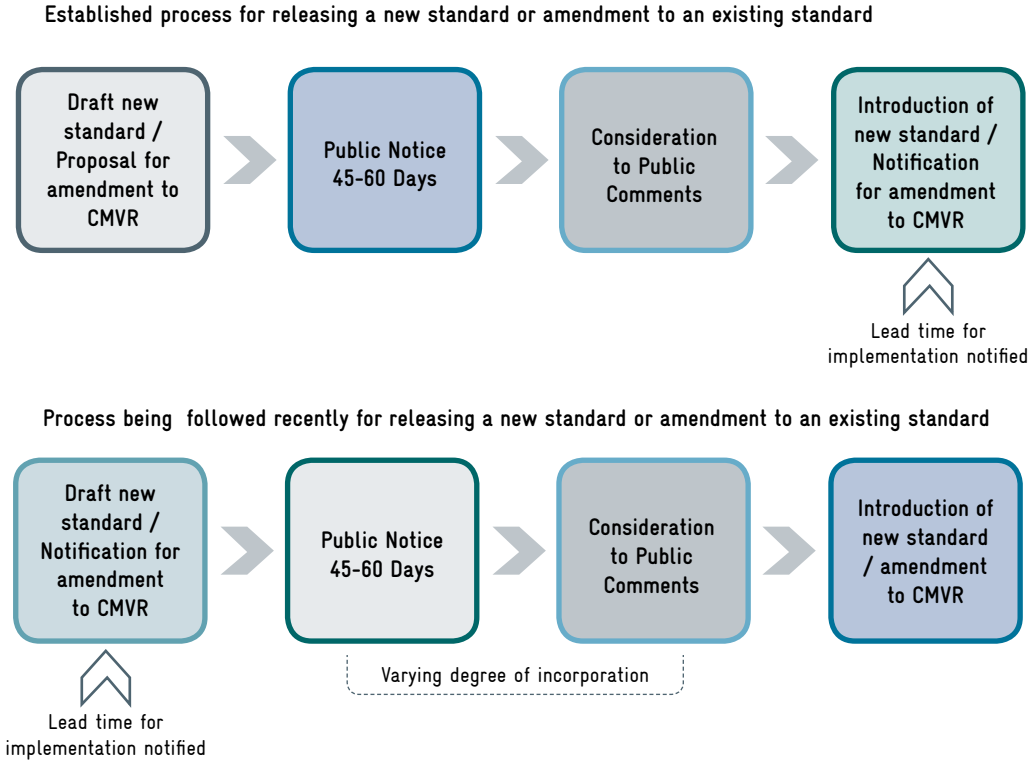


Figure 13 - Difference between established and the recently followed process for releasing a new standard or amending an existing one

Moreover, it is observed that the first crucial step to amend or release a new standard is not being followed diligently. This does not allow enough deliberation on the subject, thereby notifying amendments without clear visibility of the outcome. This reduces manufacturers' confidence towards accepting the amendment.

» **Judicial mandates on topics of safety and emissions**

On topics of safety and emissions specifically, it has been observed that judicial intervention shapes the nature of standards and the timeline by which they need to come into play. This creates some level of uncertainty in planning timely implementations. The need for such an intervention could be due to the lack of a well laid out roadmap for the automotive industry which forces the judicial system to take decisions hastily. Such situations put manufacturers under pressure to either adopt new regulations or let their business take a hit. For example, the regulation for installing speed limiting device in all M1 category commercial vehicles led to a halt in the sales of vehicles of various OEMs since there was not enough lead time provided for implementing the change.

» **Multiplicity of participating authorities and multi-step process of making standards**

The standard setting process is consultative in nature and usually considers aspects regarding the feasibility of implementation by the industry while meeting the needs of the impacted stakeholders. While MoRTH is the nodal agency for formulating the standards and regulations governing the automotive industry, recent examples show the involvement of other ministries, which at times works separately on drafting regulations that impact the automotive industry. This renders the standard setting process incoherent at times and also makes it slow. For example, Corporate Average Fuel Economy (CAFE) norms proposed by the Ministry of Power, in conjunction with the Bureau of Energy Efficiency (BEE).

Furthermore, various feasibility checks in terms of implementation, monitoring, administration, business dynamics, financial impact, and production are also done before releasing a standard. Hence, the consultation of multiple stakeholders and various feasibility checks for setting up standards make the process inherently slow. A large proportion of time is devoted to setting a standard, while manufacturers are left with little time for adopting it.

Possible suggestions to deal with the challenges

» **Development of an integrated long-term technology roadmap**
Based on the current state of safety incidents, carbon footprint, pollution and India's targets/ aspirations to curb them, the government can create an integrated technology roadmap with technology changes that can be adopted in the short, medium, and long term. As suggested by the draft National Auto Policy, this roadmap development can be undertaken by the proposed nodal body for the automotive industry. The roadmap could be based on a detailed analysis of accident, emission and pollution data and could be shared, discussed and agreed upon by various stakeholders. It could create a common vision for the country. This roadmap would need to be detailed enough to provide clear direction to government authorities involved in standard setting, as well as to the industry in order to enable the planning out of changes in a streamlined manner. The roadmap approach would also bring together views from various non-automotive ministries, thereby reducing multiplicity in decision-making bodies for release of standards. This would also help to improve inter-ministry coordination and reduce time lag in the decision-making process.

The draft National Automotive Policy, which was released in February 2018, suggested a two-tier apex body, supported by the National Automotive Council. In addition to this structure, it is further proposed to constitute a technical committee of experts, across ministries, who will support the apex body and the National Automotive Council for the development and on-going monitoring of the roadmap. This committee would develop the roadmap and its focus will be more on forward-looking growth and shaping up the vision for the Indian automotive industry.

Key functions of the proposed technical committee

1. Gather data and conduct research and foundational study for future measures (new technology, safety regulations, harmonisation of standards)
2. Evaluate and assess future measures
3. Prioritise measures based on impact assessment
4. Determine the timeline for implementation of key measures
5. Monitor the implementation and recommend course correction

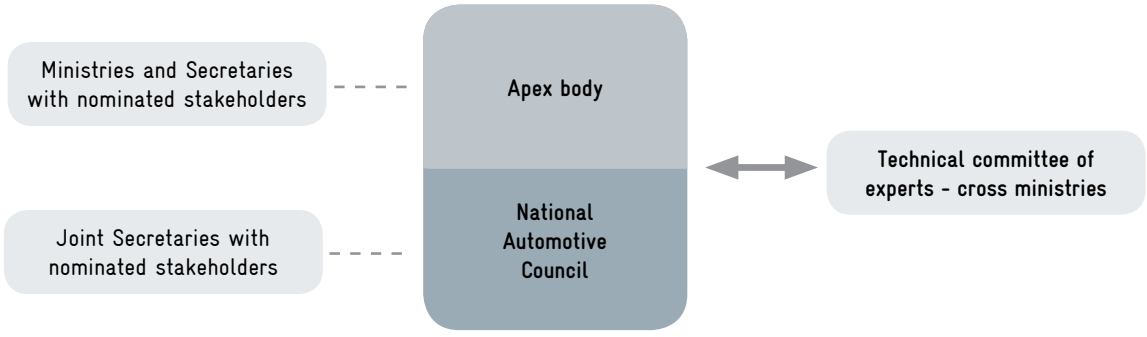


Figure 14 - Interaction mechanism for the proposed technical committee

A four-step methodology may be used as a reference to develop an integrated technology roadmap (Refer to Figure 15). Adoption of the proposed methodology for the development and implementation of a roadmap will provide a definite structure to the process and will ensure adherence.

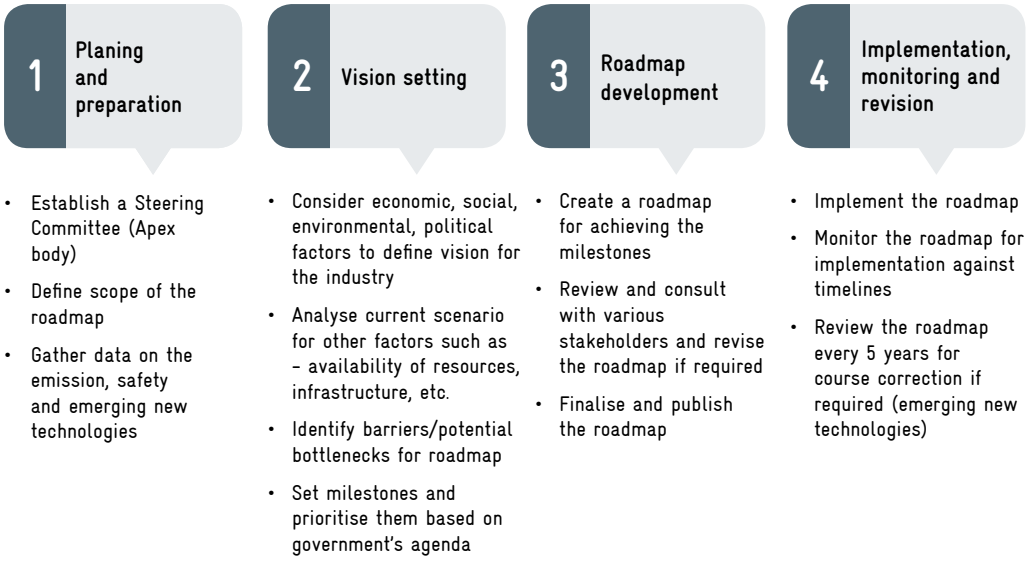


Figure 15 - Methodology for the development of a roadmap

Through an integrated technology roadmap, India would be well poised to achieve safety and emission targets, coupled with increased alignment of government and industry objectives.

» **Improve communication and consultation with stakeholders during the standard development process**

Manufacturers have observed that in the process for releasing standards, often a substantial variation exists in the standard discussed during the meetings held among the stakeholders and the draft standard finally released. Such changes create an uncertain situation for manufacturers and deters them to plan for design and manufacture until the standards are finalised.

To counter the problem, an approach used by UNECE can be adopted in the standard release process wherein all the minutes of meetings held for release of a standard are displayed in the public domain. Such transparency provides consistent communication to industry participants and keeps them aligned to design and manufacture well in advance. It also helps to prepare for the upcoming meetings and improves the quality of discussions. Moreover, given the experience in the development of technologies, further consultation with manufacturers can add value to the development of standards.

Some of the good practices followed for communication to stakeholders are listed below.

US	Japan
✓ Documents including all proposals, working documents, final rules and notices issued are available online without any charge ✓ Unified agenda of the regulatory and deregulatory action can be viewed online every April and October ✓ The agenda contains a brief description of the new rule that will be published as proposal or as final rule in the coming twelve months ✓ The existing regulations that are likely to be reviewed are also mentioned.	✓ Schedule of the various upcoming meetings is published on the website well in advance ✓ Reports of deliberation of various sessions are available on the website ✓ Result/conclusion of the meetings are published on the website.

Enhancing communication, transparency and consultation in the standards development process can add value and help eliminate surprises to all stakeholders involved in the process, thereby improving the lead time for the development of standards.

Improved communication and consultation with stakeholders during the standard development process would catalyse the timely implementation of safety and emission-critical technology changes in India. Moreover, it would foster better collaboration and synergy between the industry and government and also result in reduction of effort spent by government agencies in the development of standards.

» **Define functional requirements instead of stating technical specifications for implementing standards**

An approach followed by UNECE and other countries for amending standards or introducing new requirements in a vehicle or its components is to state the functional requirement of a system or technology to be implemented instead of the exact technical specification to be complied with. The former approach promotes innovation as manufacturers can develop technologically innovative ways to meet the functional requirements, whereas the latter approach is more prone to frequent changes in regulations in light of technological advancements. The functional requirements are stated in performance terms. Compliance with such standards can be achieved using a variety of designs, thereby giving manufacturers the flexibility to design their vehicles and components.

Indian automotive authorities could benefit from the above approach as it entails reduced effort spent on drafting technical standards. Moreover, it would facilitate a faster turnaround in specifying functional requirements vis-à-vis defining technical standards and would also foster innovation in the industry.

» **Develop the draft standard first and then determine the lead time for its implementation**

Manufacturers often need a minimum of 6–12 months for allocating budget and then a minimum of 2-3 years for adapting to changes prescribed by the government. The conventional process followed for releasing a standard is to first release a proposal for amendment with a draft standard to the public for views and comments. Taking into consideration comments from various reviews from multiple stakeholders, a subsequent version is released in the form of a draft standard which later becomes a notification and the release of the final standard. This process gives sufficient time and clarity for manufacturers to prepare themselves for implementing the changes since the scope of the standard gets finalised before the lead time for implementation is determined.

An additional improvement to the above process could be to conduct detailed research and analysis in the proposal stage so as to ensure that the stated objective would be met by bringing the proposed amendment. For example, in Japan a detailed proposal for amendment of a regulation is submitted to an expert committee which deliberates on the proposal. This committee is led by government agencies and supported by experts from research institutions. The proposal clearly defines the problem statement, provides relevant supporting data and analysis and also provides a cost and benefit analysis to further justify the viability of the proposal.

Challenge 2: Harmonisation of Indian standards with international standards

Indian standards are usually drafted taking reference from UNECE standards, with modifications to suit Indian conditions. Such decisions can at times become more bureaucratic than technical. As a result, designing and manufacturing a vehicle which complies with these standards may be a time-consuming process.

The UNECE World Forum for Harmonization of Vehicle Regulations is a unique worldwide regulatory forum within the institutional framework of the UNECE Inland Transport Committee. UN regulations for vehicles, parts and their systems contain provisions related to active and passive safety, general safety and environmental aspects. These regulations are highly advanced in nature owing to intensive research work done during the course of their formulation. The inputs from various working party meetings held between the member countries add to the

innovation quotient of the research work. Before they are released, the regulations are tested for application. This makes UNECE vehicle regulations one of the preferred regulations for adoption in different countries.

Indian standards, though drafted taking reference from UNECE standards, are adopted after making certain changes to suit Indian requirements, which, at times, create a substantial variation in standards when compared to UNECE standards. India, not being a signatory to the agreement concerning the Adoption of Harmonized Technical United Nations Regulations for Wheeled Vehicles, Equipment and Parts, 1958, is not obligated to implement the regulations as mentioned. These unique India-specific requirements make European manufacturers spend additional time and effort to accommodate the changes, leading to delays in the launch of vehicles.

Below are a couple of examples which show cases where Indian standards are not synchronised with European standards.

Example 1: *Reverse parking alert system (AIS-145) – indication to the driver while in reverse gear about the objects in the rear monitoring range*

The Indian Government has been taking several initiatives to curb accidents and enhance road safety in India. Making the reverse parking alert system mandatory is one such initiative which is aimed at reducing incidences of children being overrun while vehicles are reversing. In countries with more advanced vehicle designs, the rear camera system is considered a helpful mechanism to take care of blind spots vis-à-vis reverse park sensors, even though they are liable to errors of estimation in certain conditions. In India, the feature is considered more a convenience feature than a feature for road safety.

However, from 1 July, 2019, AIS-145 is expected to be implemented for M and N category vehicles. A reverse parking alert system will be introduced to reduce the possibilities of accidents by maximising visibility in blind spots, especially during reversing for parking of cars (see Annexure 4).

Example 2: *Spare wheel requirement in vehicles*

German manufacturers faced a challenge with regard to the introduction of run-flat tyres in India—a concept well-accepted in European markets. Cars with run-flat tyres, by virtue of the run-flat tyre technology, do not require a spare wheel. The run-flat tyre is capable of travelling long distances and at high speed even after getting punctured. Considering the proven technology, European regulations do not mandate the provision of a spare wheel for vehicles with run-flat tyres. India, on the other hand, owing to poor road conditions in certain parts of the country considers the provision of a spare wheel both as a safety as well as a utility feature. Hence, CMVR requires a spare wheel to be mandatorily included in every vehicle. Manufacturers had to struggle with the homologation and introduction of vehicles with run-flat tyres without spare wheels before the rule was amended to accommodate the technology.

UNECE also had a similar spare wheel regulation; however, the use of a spare wheel has been drastically reduced ever since run-flat tyres were introduced. The need for having a spare wheel on normal tyres was made optional as run-flat tyres could travel for 80 km with a speed of 80 km/h. In this case, it would have been ideal if Indian regulatory authorities would have considered the developments in the European market and would have made proactive changes to harmonise Indian regulations. This would make the introduction of new technologies and homologation processes much easier (see Annexure 5).

Causes

- **India is not a signatory to the UNECE, 1958, agreement**

  The 1958 UNECE agreement is a multilateral agreement between countries for the adoption of uniform technical prescriptions for four-wheeler vehicles equipment and parts which can be fitted and/or used on wheeled vehicles. These prescriptions are mutually recognised by all signatories for the type approval process. India is not a signatory to this agreement and as a

result, there is no compulsion for India to accept, adopt and apply the ECE Regulations[19]. However, since 2006, India has been a signatory to the 1998 WP.29 agreement and actively participates in GTR formulations through data and subject matter expertise and has its own standards for compliance[20]. This creates a technical barrier for European manufacturers who want to sell their vehicles in India, which are primarily designed as per ECE Regulations. Such vehicles have to meet the Indian standards given in the CMVR even though the Indian standards are derived from the ECE Regulations.

- **India adopts UNECE regulations with a time lag**

  With the advent of globalisation, the needs of customers in India have evolved and they have become more aware about the latest technologies in automobiles. Manufacturers, however, face an issue while catering to the demands of such customers as there is a time lag present in developing Indian standards with respect to UNECE standards because by the time a vehicle is homologated and launched in India, a new model of the vehicle has already been launched in Europe. Over the years, the time lag in adopting to a certain UNECE standard has reduced from approximately five years to approximately two years; however, this time lag still acts as a technical barrier for various manufacturers to meet customers' expectations. For example, India had released a standard, AIS-018 on SLDs in the year 2001, the corresponding UNECE standard, Addendum 88/Regulation no. 89, from which AIS-018 was derived was released in 1993.

- **Standards are made considering India-specific requirements**

  AIS standards are usually referred from UNECE regulations with customisations to suit Indian road and environmental conditions. European manufacturers have to spend considerable time and effort to address India-specific requirements, and in case where the volumes are substantially low, the viability of the additional time and effort versus the business benefit is often questioned. For example, Indian road conditions are such that run-flat tyres would not be of much benefit in case of punctures as the uneven Indian roads result in disturbing the wheel alignment and bents making it mandatory for motor vehicles with non-run-flat tyres sold in India to have spare wheels. UNECE regulations also had the mandatory rule for spare tyres; however, over time, technology has evolved and with the introduction of run-flat tyres the provision for spare tyres became optional as per UNECE.

Possible suggestions to deal with the challenges

- **Develop a roadmap for the complete alignment of technical standards and test requirements with UNECE (this should also be integrated with India's technology roadmap proposed under the earlier challenge)**

  In the draft National Auto Policy released in February 2018, India stated the need to harmonise technical standards and mutually recognise type approval certification[21]. To materialise this agenda, India has proposed to define a roadmap for harmonising key standards and testing methods with global benchmarks over a period of five years. It has been observed that more than developing a roadmap, the adherence and implementation of it is a challenge. Further analysis on this suggests that the unavailability of a defined structure is the most important cause for implementation failure of the roadmap.

  The above issue could be addressed by the earlier suggestion of having a technical committee that supports the apex body and the National Automotive Council for the development and on-going monitoring of the roadmap. As stated in the key functions of the technical committee, it will study the UNECE regulations for India-specific requirements and arrive at a plan for the harmonisation of technical standards. The three key functions of the technical committee specific to harmonisation are listed below:

  1. Study the UNECE regulations for India-specific requirements.
  2. Evaluate and prioritise the regulations to be harmonised based on the overall integrated roadmap for technology.
  3. Determine the timeframe for the harmonisation of regulations.

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[19] See: http://www.unece.org/trans/maps/un-transport-agreements-and-conventions-18.html
[20] See: http://www.unece.org/trans/maps/un-transport-agreements-and-conventions-20.html
[21] See: http://dhi.nic.in/writereaddata/UploadFile/DHI-NAB-Auto%20Policy%20Draft%20Document_vDRAFT.pdf

Harmonising regulations with UNECE's requirements will help to make Indian-made vehicles easily acceptable in the European market, thereby boosting Indian exports and 'Make in India'. At present, Europe receives the highest share or 35% of India's total auto components exports worth 10.9 billion USD.[22]

In the past, India had laid out a safety roadmap up to 2012 which was prepared by SIAM and test agencies. However, the absence of a roadmap thereafter resulted in uncertainties relating to policies and standards in the automotive industry and also resulted in the lack of coordination between the concerned authorities. For example, BS IV was introduced by the government but at the same time refineries were not able to provide appropriate grade of fuel for BS IV, resulting in the failure of the plan.

- **Recognising equivalent or higher test certificates from UNECE member countries**

  As stated in the draft National Automotive Policy, more that 70% of safety regulations are either partially or fully aligned with UNECE regulations. Also, since most other AIS standards are derived from UNECE regulations, India can consider accepting equivalent or higher UNECE certification for entire vehicles and component-level certifications. This would make the homologation process faster and eliminate additional cost for repetitive testing, thereby helping boost trade between Indian and European countries.

Challenge 3: Additional cost and time in the homologation process

India is not a signatory to the UNECE 1958 agreement which enables the technical harmonisation of automobile vehicles and components and acceptance of test certifications. Though India takes reference of UNECE regulations for defining standards, it customises the standards to suit Indian conditions. Also, India does not accept type approval certification from other countries and mandates that type approvals be taken as per Indian regulations. As a result, launching vehicles which comply with these standards and certifications is both a cost- and time-consuming process.

This situation exists both for vehicle-level type approval as well as component-level certification. While the regulations in India are derived from UNECE regulations, the Indian homologation process requires a number of tests to be re-done to obtain homologation for India. Many of these tests are expensive and time consuming and do not add value to the process of homologation as they are repeated. The cost and time of homologation varies based on the number of tests and activities required for different vehicle models.

The following table indicates key tests that are repeated in India despite being derived from their UNECE counterpart.

(Annexure 6 has a complete list of tests with indicative charges.)

Sr. No	Tests	Indian standard	Referred UNECE regulation	Indicative test charges (INR)
1	Offset frontal crash test	AIS-098	ECE R 94	1,300,000
2	Side crash test	AIS-099	ECE R 95	1,100,000
3	Head form impact test	AIS-096	ECE R 12	140,000
4	Pedestrian protection AIS	AIS-100	ECE R 127	900,000
5	Interior fitting test	IS: 15223	ECE R 21	150,000
6	Seat, head-restraint, strength and performance	IS: 15546	ECE R 17	200,000
8	Safety belt anchorage test	IS: 15139	ECE R 14	200,000
Total				**3,990,000**

The above table indicates that an additional 40 lakh INR (approx 50,000 EUR) is typically

[22] DGCIS • Foreign trade statistics

spent for the homologation of one vehicle, when the same has already been tested and certified under UN regulations from which Indian regulations are derived. The additional time and cost spent on homologation of vehicles act as barriers for German manufacturers to introduce newer/higher technology vehicles, which, in turn, slows down the pace of technology accelerations in the Indian market. Easing the process on this front could lead to faster introduction and development of technologically advanced vehicles in India.

Manufacturers also believe that vehicle- and component-level tests required for type approval certifications are quite expensive and defeat the business viability, specifically in cases where the volumes of vehicles are very low. Displayed below are the indicative test charges required for vehicle- (Example 1) and component-level testing (Example 2) of an M1 category of vehicle.

Example 1: *Sample costing and number of tests required for an M1 category vehicle (vehicle-level testing cost details)*

Sr. no.	Category of tests	Indicative test charges (INR)
1	Active safety	692,800
2	Calibration testing of instrumentation	19,900
3	Documentation	125,100
4	Electrical/electronic testing	930,000
5	Emissions testing	834,300
6	Passive safety	3,100,800
7	Pedestrian safety	907,300
8	Powertrain and emissions testing	70,800
9	Road noise	27,800
10	Static test	9,600
11	Vehicle dynamics	429,900
12	Vehicle security	700,000
13	Vehicular interiors	150,000
14	Others	25,000
Total		**8,023,300**

Example 2: *Sample costing and number of tests required for M1 category components (cost details)*

Sr. no.	Category of tests	Indicative test charges (INR)
1	Windscreen laminated safety glass	79,800
2	Side window/door safety glass	11,900
3	Back light/rear toughened safety glass	11,900
4	Reflex reflector	79,800
5	Horn	46,100
6	Single filament	28,900
7	Double filament	56,700
8	Colour durability for automotive bulbs	223,000
9	Hydraulic brake hose	165,700
10	Hydraulic brake fluid	138,100
11	Fuel tank (metallic)	8,300
12	Fuel tank (plastic)	607,800
13	Wheel rim	96,200
14	Door latches and hinges	95,000
15	Head lamp assembly (with glass lens)	90,100
16	Head lamp assembly (with Plastic lens)	497,300
17	Signalling devices (fog/direction indicators/stop/position/reversing lamps, etc.)	29,700
18	Rear view mirror	88,700
19	Warning triangle	165,800
20	Tyre	139,600
Total		**2,660,400**

Causes

Along with India not being a signatory to the UNECE 1958 agreement, the following are the other causes:

- **Majority of test certifications done at either ARAI, ICAT or VRDE**

  In India, homologation takes around 20 weeks for components and 27–30 weeks for an entire vehicle. Since India is one of the major markets for various automobile players, a number of new models are released in a short span to meet the evolving needs of customers. The lack of a sufficient number of test agencies for homologation certifications increases the time needed for introducing new models to the Indian market. Though the manufacturers apply for various certifications well in advance, there are still occasional mismatches in the capacity available for testing and the models to be tested. These mismatches become more relevant if manufactures have a notifications deadline that has to be met.

- **Unavailability of an online slot booking system with real-time information about the availability of slots**

  There is no online system in place to check the availability of time slots with Indian automotive testing authorities. An online slot booking system would give a clear visibility of future slot availability, thereby helping manufacturers to plan their testing well in advance. It would also help in improving the utilisation of testing facilities.

Possible suggestions to deal with the challenges

- **Mandating only India-specific requirements tests while exempting other tests**

  In the same way that Indian standards are adopted from UNECE standards, with customisations for India-specific requirements, testing can also be conducted using a similar approach. Tests which validate the India-specific requirements could be mandated for the homologation process and for the rest of the requirements which match with UNECE, those tests can be exempted and certificates from UNECE can be accepted. MoRTH, in consultation with ARAI, could take a decision to exempt tests which are adopted from UNECE regulations.

  The following test requirements have been derived from UNECE regulations and can be exempted.

Sr. no.	Tests	Indian standard	Referred UNECE regulation	Indicative test charges (INR)
1	Offset frontal crash test	AIS-098	ECE R 94	1,300,000
2	Side crash test	AIS-099	ECE R 95	1,100,000
3	Head form impact test	AIS-096	ECE R 12	140,000
4	Pedestrian protection AIS	AIS-100	ECE R 127	900,000
5	Interior fitting test	IS: 15223	ECE R 21	150,000
6	Seat, head-restraint strength and performance	IS: 15546	ECE R 17	200,000
8	Safety belt anchorage test	IS: 15139	ECE R 14	200,000
Total				**3,990,000**

- **Accepting third-party test certificates to expedite the type-approval process and/or setting up an online booking system for scheduling tests at certification agencies**

  Indian automotive authorities can consider appointing third-party testing agencies for various tests for type approval. These third-party type approval agencies could be continuously monitored by the appropriate authorities to ensure conformity to applicable regulations. Indian automotive authorities can also consider setting up an integrated online slot booking mechanism for scheduling tests of vehicles and their components, which would provide visibility of capacities for testing in ARAI, VRDE and CIRT. The system would also give real-time availability of slots for testing, thereby helping manufacturers to plan their future testing requirements well in advance.

Challenge 4: Requirement of de-licensing certain radio frequencies for automotive applications

The allocation of radar frequencies in India for automotive radar-based applications are not harmonised with the frequencies used globally. In December 2016, Department of Telecommunications delicensed the 76 GHz radio frequency band required for advanced driver assistance systems (ADAS) which offers features such as adaptive cruise control, blind spot monitoring and lane departure warning.

The deployment of other radar-based systems including driver assistance and traffic safety requires the following frequency bands: 24.05–24.25 GHz, 77–81 GHz for vehicle radar. As 24.05–24.25 GHz and 77–81 GHz bands are not delicensed by the Department of Telecommunications, manufacturers would not be able to introduce advanced driver assistance and safety features in the market. The unavailability of the mentioned radar bands also restricts the manufacture of vehicles for export purposes with features working on 24.05–24.25 GHz and 77–81 GHz bands since vehicles would have to be tested before export to the destination country.

The lack of harmonisation of radar-based frequencies pushes manufacturers to force-fit radar-based features in motor vehicle systems with limited India-specific frequencies. This adds to the cost and time required for the manufacture of vehicles.

Causes

- **Dependency on the Department of Telecommunications for decisions on delicensing**

  The process of delicensing of radar frequency requires acceptance and consultation from the Department of Telecommunications (DoT). Radar frequency is widely used in defence applications and is hence a subject of national security. Therefore, to prevent any potential threat, DoT is wary about delicensing radar frequencies. Moreover, coordinating with DoT and bringing it on board on the subject is difficult and time consuming. The lack of awareness about the importance of vehicle safety features makes the process even more challenging.

Possible suggestions to deal with the challenges

- **Harmonisation of radio frequencies with the ITU**

  Radio frequencies for automotive applications could be harmonised with the ones recommended by the International Telecommunication Union (ITU) for automotive safety applications. The frequencies recommended by the ITU are in line with the evolving demands related to automotive safety applications. The harmonisation of radio frequencies with the ITU will not only enhance road safety but would also aid in improving exports to countries that are party to the ITU treaty.

  MoRTH could liaise with DoT to get frequencies delicensed, which are required for automotive applications and are primarily used for developing safety aspects such as pedestrian safety, driver assist/warning systems. Additionally, DoT may consider expediting the process of delicensing radio frequencies for cases which have high societal benefits, improve trade, promote technology innovation and do not involve frequency interference concerns.

Delicensing of radio frequencies for automotive safety features would complement the Indian government's agenda to reduce road accidents and fatalities to 50% by 2020 and also improve road, driver, and pedestrian safety.[23]

Challenge 5: Lack of a defined framework for introducing new technologies in the Indian market

To keep pace with the current rate of evolution in the automotive industry, it is essential to have a shorter response time for introducing new technology to the market. Today, CMVR-TSC, along with AISC, works on a reactive basis on the safety and emission priorities that emerge from day-to-day incidents. This leaves them with no room to focus on new technologies for the future. Moreover, CMVR-TSC is entrusted to work on the development of standards for both new technology and current requirements, thereby leaving them with limited bandwidth and resources to focus on, and prioritise, new technology introduction.

Additionally, the lack of a defined process and a dedicated committee for introducing new technology results in delays and makes it difficult for manufacturers to bring new technologies to the Indian market. The other major reason creating a hindrance for introducing new technology is the unavailability and lack of standardisation of the required infrastructure and resources for the adoption of the technology. For example, the lack of standardisation for charging infrastructure creates difficulty in the introduction of Electric Vehicles (EVs) in India, unavailability of clear standards on charging connectors for EVs, upcoming EU6 RDE technology cannot be introduced as the fuel quality required is different than Indian specifications, are some of such examples.

Example 1: *Introduction of EV technology in the Indian market*

The Indian automotive industry is witnessing a shift from conventionally fuelled automobiles to EVs. A change of such an order needs to be strongly supported by aligned government policies and infrastructure development. DHI has come up with the FAME policy for electric vehicles; however, there is a huge involvement of other ministries (mainly non-automotive) such as the Ministry of Power and Ministry of New and Renewable Energy in the decision-making process. For example, decisions on charging facilities for EVs are not solely dependent on one or two ministries, rather such decisions need cohesive approach from other ministries and this tends to affect the decision-making process. Such a structure in the decision-making process gives an uncertain picture of the upcoming policies and standards to automotive manufacturers. The absence of clarity on the policies and standards, lack of readiness of testing infrastructure and the unavailability of charging stations are the major deterrents towards the production of EVs as manufacturers are not certain about the specific requirements the government would have in the future. Some manufacturers have quoted that approximately 80% of the standards for EVs are clear, whereas the rest are open to assumptions.

1. Consensus on charging standards
   Manufacturers are currently facing a challenge in proceeding with the design and manufacture of EVs as consensus on standards for charging infrastructure is still emerging. Also, the formal homologation process for EV components has just started in India and is yet to be finalised.

2. Lack of business model specification for charging stations
   Another major gap in the current EV ecosystem is the unavailability of clear regulations and laws by the government on the distribution of power for electric vehicle charging stations. This acts as a barrier for various power-selling companies to enter the EV charging space.

There have been instances when manufacturers have gone ahead with the design and manufacture of certain technologies based on the policies rolled out by the government; however, due to changes in these policies, manufacturers have had to start the design and manufacture process again.

[23] MoRTH • press release • June 2016

Example 2: *Adoption of eco-innovation technologies to reduce CO2 emissions from passenger cars and light commercial vehicles*

The EU has defined regulations for setting emission performance standards for new passenger cars and light commercial vehicles wherein specific emission targets are assigned to each manufacturer based on the average specific emission for each new passenger car or light commercial vehicle registered in the preceding calendar year. The regulation provides the possibility for manufacturers to take into account CO2 savings from innovative technologies or 'eco-innovations' in order to meet their specific CO2 emission targets.

In India, currently, no legal framework and technical guidelines are available for the application of eco-innovation. This leaves no incentives for manufacturers to contribute to innovative technologies to reduce CO2 emissions. Moreover, it does not provide a structure or system for introducing necessary standards, testing infrastructure and type-approval certifications for new technologies.

Policies released by the government are a way of promoting innovation in the automotive industry. However, when these policies are not successfully implemented and enforced, the overall benefit from the policy cannot be reaped. For example, in 2015, the CAFÉ policy was launched for reducing the carbon footprint of the automobile industry. Although the policy was launched, there were no penalties imposed for overshooting carbon footprint limits making the policy seem to be a mere declaration for manufacturers.

The lack of appropriate polices for reducing manufactures' carbon footprint and promoting innovation not only hinders manufacturers from innovating but also interferes with the sustainable growth of the country.

Causes

- **Lack of a roadmap defining the new technology introduction plan for the country**

  With the current rate of evolution in the automotive industry, a number of new technologies are emerging. The pace of adoption of these technologies globally is also increasing at high rate. This creates a push on the Indian automotive industry to keep up with technological advancements. However, the unavailability of a clear roadmap/plan to introduce these technologies does not give sufficient time to regulatory bodies to come up with clear policies, standards, testing infrastructure, etc. for the technology.

- **Lack of a dedicated committee and defined process for proactively introducing new technology**

  The current regulatory system does not include a dedicated team and a stated process for introducing new technologies to India. This creates an ambiguous situation with clear starting point for introducing a new technology.

- **Dependency on various ministries for decisions on new technology introduction**

  The decision to introduce a new technology is not only dependent on MoRTH and requires consent of other ministries too. Coordinating with all the ministries and getting them on board can be challenging and time consuming. This pushes back the agenda further for new technology introduction.

Possible recommendations to overcome the challenges

- **Creating a working group under the new proposed technical committee for introducing new technology through a structured process**

  To promote innovation and the introduction of new technology in the automotive sector, a separate group could be created for new technology introduction. In addition to the National Auto Policy recommendations, it is recommended that this separate group to be a part of the new proposed technical committee. The function of introducing new technology via a structured process could be undertaken by this separate group. This committee for new

technology introduction would focus on long-term technical and functional requirements, thereby developing near-term standards (more than a year) for new technologies. Further, CMVR-TSC would continue with its function of standards development for the current requirements (within a year). The introduction of new technologies also comes from a reactive need to introduce safer and greener vehicles or from responses to requests raised by other ministries/committees or the public at large. A separate process could be set up to create a path for identification and implementation of new technologies.

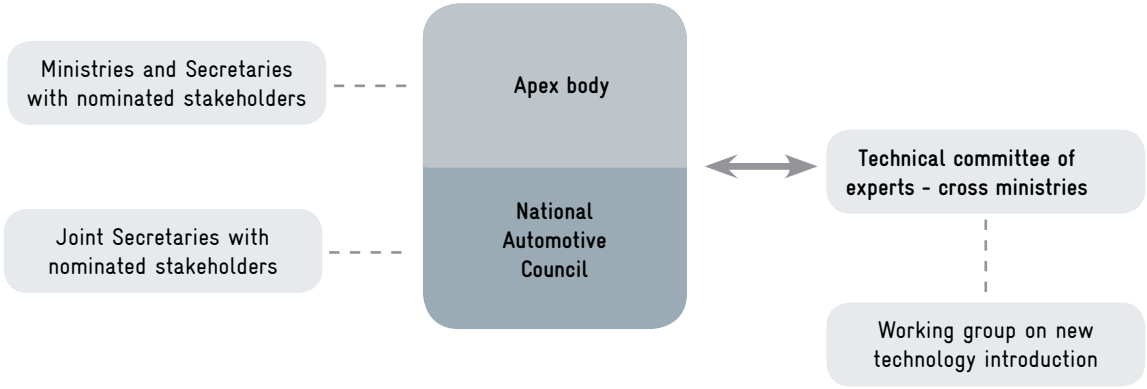

Figure 16 - Proposed structure for new technology introduction

Setting up of a dedicated committee and process would ensure adherence to the roadmap and expedite the process of introducing new technologies as there would be two separate groups that would focus on both near- and long-term agendas.

- **Adoption of an eco-innovation scheme, as approved in the EU, to promote innovation**

  The eco-innovation scheme has 12 applications which have been approved by the EU[24]. The adoption of eco-innovation applications will provide carbon credits to automotive manufacturers up to a certain defined limit. The adoption of a scheme suitable to the Indian market would facilitate fast entry and adoption of new technologies as it does not call for the re-demonstration of innovation through testing and accepts certification. This will help in the structured introduction of new technologies in automotive and also promote innovation.

[24] EU • Technical guidelines for the preparation of application for approval of innovative technologies

RECOMMENDATIONS

This study based on the in-depth exchanges with vehicle type approval and homologation experts, proposes the following three recommendations to further intensify trade in the automotive sector between India and Germany:

1. Develop an integrated automotive technology roadmap,
2. Augment the current institutional structure in the sector, and
3. Strengthen the standards development process.

The findings suggest that an integrated automotive technology roadmap along with a technical body which implements and monitors the roadmap is the need of the hour. This will enable India to further grow its automotive sector. To stay abreast with technology, a dedicated and future-oriented committee would help to introduce new technologies in the Indian market such as integrated connected vehicles. Continuing with its work towards harmonising Indian standards and technical regulations with international standards, a process of accepting test certificates for the standards which are already completely harmonised with UNECE standards without variation also need to be looked at as it would decrease the burden on the manufacturers without compromising on local safety and emission requirements. This report further suggests considering good practices adopted by the UNECE and other countries relating to the drafting of technical standards, the active involvement of and consultation with stakeholders and the adoption of eco-innovation schemes according to local needs in India.

As a next step, the Indo-German Working Group on Quality Infrastructure could take the findings of this report and propose them to MoRTH and other relevant authorities for further discussion and to develop solutions which are tailored to the Indian context. The progress of such discussions could be reviewed in the annual meeting of the Indo-German Working Group on Quality Infrastructure.

ANNEXURES

Annexure 1: Matters on which MoRTH makes rules and regulations

The MoRTH makes rules regulating the construction, equipment and maintenance of vehicles and trailers with respect to all or any of the following matters:

- Width, height, length and overhang of vehicles and of the loads carried
- Size, nature, maximum retail price and condition of tyres, including embossing thereon of the date and year of manufacture and the maximum load carrying capacity
- Brakes and steering gear
- Use of safety glasses, including the prohibition of the use of tinted safety glasses
- Signalling appliances, lamps and reflectors
- Speed governors
- Emission of smoke, visible vapours, sparks, ashes, grit or oil
- Reduction of noise emitted by or caused by the vehicle
- Embossment of chassis number and engine number and the date of manufacture
- Safety belts, handle bars of motor cycle auto dippers and other equipment for the safety of drivers, passengers and other road users
- Standards for the components used in the vehicles as in-built safety devices
- Provision for the transportation of dangerous or hazardous goods
- Standards for the emission of air pollutants
- Installation of catalytic convertors in the class of vehicles to be prescribed
- Placement of audio-visual or tape recorder type of devices in public vehicles
- Warranty after sales of vehicles[25]

Annexure 2: Speed limiting device/function: To control fuel feed of the vehicle to limit vehicle speed up to a maximum fixed value – details of drafting/revision of standards along its lifecycle

AIS-018 is an automotive standard formulated by ARAI that specifies the requirements, method of tests and procedure for type approval for the SLD and SLF.

Indian automotive standards are usually formulated using UNECE standards as reference with some customization suiting the Indian conditions. UNECE Reg. 89 / Ad – 88, 1993 is used as a base regulation for drafting AIS-018. The purpose of this regulation is to limit to a specified value the maximum road speed of passenger carrying and heavy goods vehicles. The said objective is achieved by a speed limitation device or speed limiting function in a vehicle system whose primary function is to control the fuel feed to the engine.

The table below mentions the Indian automotive standard number (title) along with the reference UNECE regulation number used for drafting the Indian standard. The table later explains the various revisions that AIS-018 went through over a period of time before it got released as the final standard for industry to follow.

[25] MVA, 1988

Standard: AIS-018		
Reference UNECE regulations: Reg. 89 / Ad – 88, 1993. Speed limiting device exists in vehicles and drivers can change the speed limit as per their convenience.		
Version	**Date of release**	**Highlights**
Base version	July-2001	This standard version covers the speed limitation devices both as: a) Separate unit to be installed on a vehicle. b) As an add-on or on-board system built in the vehicle
A1	June-2002	Deletion of the following line from earlier version: Vehicle means any motor vehicle of category M3 with a maximum authorised mass exceeding 100 kN (10 tons) intended for use on the road having at least four wheels and a maximum design speed exceeding 25 km/h. Change details: Certain vehicles of category M3 removed from the purview of this standard
A2	August-2008	**Inclusion of Speed limiting function:** This version of the standard specifies the requirements, methods of test and procedure for type approval for the Speed Limitation Device (SLD) and Speed Limiting Function (SLF). These may be a separate unit to be installed on the vehicle and an add-on or on- board system built in the vehicle. Speed limitation function (SLF), means a function to control the fuel feed of the vehicle or engine management in order to limit the vehicle speed to a fixed maximum value. Change details: Speed limitation function was also added to the standard along with the necessary requirements and specifications for type approval
A3	August-2013	Changes in the guidelines to be used by test agency for extending Type approval issued to SLD/SLF installed in a vehicle for considering extension to another vehicle under the consideration-Vehicle Type means vehicle, which do not differ in such essential respect as: i) Make and type of the SLD / SLF fitted ii) Maximum Engine Power to unladen weight ratio less than or equal to the tested vehicle iii) Set speed /speeds iv) Highest ratio of the engine to vehicle speed in top gear less than or equal to that of the tested vehicle v) Method used to control the fuel feed of the system vi) Fuel of the vehicle vii) Vehicle model and vehicle category Every modification of the vehicle type shall be notified to the test agency which approved the vehicle type. The test agency may then either – a) Consider that the modification made are unlikely to have an appreciable adverse effect and that in any case the vehicle still complies with the requirements or, b) Require a further report from the technical service.

Version	Date of release	Highlights
A4	May-2014	The following addition for Type Approval and Conformity of production was made; a) The manufacturer / applicant shall take all appropriate steps to ensure that the components continue to comply with the requirements of the AIS-037:2004, as amended from time to time. b) With regards to approval of Speed Limitation Device (SLD) and Speed Limiting Function (SLF), Type Approval Certificate / Conformity of Production / test reports / extension reports shall be issued by same agency who has issued Type Approval.
Draft A5	2017	The SLD shall conform to the performance requirement of Electro-Magnetic Compatibility (EMC) as per AIS: 004 (Part 3), as amended from time to time.

Annexure 3: Speed alert system to alert driver in case of over speeds. The system alerts the driver while over speeding the vehicle beyond specific speed limits governed by AIS-145.

AIS-145 is an Indian automotive standard formulated by ARAI that specifies the requirements for additional safety features for four wheeled vehicles that are aimed to enhance vehicular and road safety. The requirements of this standard are applicable to M1 category vehicles in respect of the following:

1. Speed alert system to alert driver in case of over speeds
2. Driver seat belt reminder
3. Manual override for central locking system
4. Driver airbag

The requirements of vehicle reverse parking alert system of this standard is applicable to all M and N category vehicles.

There is no reference available in UNECE regulations for the standard.

The table below explains the various revisions AIS-145 went through concerning the 'speed alert system to alert driver in case of over speeds', over a period of time before the final draft of the standard was released for the industry to follow.

Standard: AIS-145		
UNECE regulations: No reference found		
Version	**Date of release**	**Key highlights**
Base consideration		Formulation of this standard focuses on following areas relevant to M1 category vehicles: • Speed alert system to alert driver in case of over speeds • Driver Seat belt reminder • Manual override for central locking system • Driver Airbag • Reverse Parking Alert system
D1	Not Available	

Version	Date of release	Key highlights
D2	6th April-2017	• The audible warning shall warn the driver at least once when vehicle speed indicated in the speedometer exceeds 80 km/h (primary level) and continuously or intermittently with frequency not less than 1 cycle/ 2 sec when the vehicle speed indicated in the speedometer exceeds 120 km/h (secondary level). • The alert system cannot be stopped by other means except by controlling speed by the driver. • While testing the vehicle, a tolerance of 8% be given on speed indicated on speedometer for both primary and secondary levels.
D3	18th May-2017	No relevant changes for speed alert system was mentioned
Final Draft	5th Oct-2017	• The audible warning shall warn the driver with frequency not less than 1 cycle/ 2 minute when vehicle speed indicated in the speedometer exceeds 80 km/h (primary level) and continuously or intermittently with frequency not less than 1 cycle/ 2 sec when the vehicle speed indicated in the speedometer exceeds 120 km/h(secondary level). • Exemptions to the following M1 category vehicles was added: (i) Police vehicles (ii) Ambulances (iii) verified and certified by a testing agency specified in rule 126 to have maximum design speed of not more than 80 km/h (iv) fitted with speed governor (speed limiting device or speed limiting function) at pre-set speed of 80 km/h or less **Change details**: Changes in the specifications of audible warnings were made and certain M1 category vehicles were also exempted from this standard

Annexure 4: Reverse parking alert system that indicates the driver while in reverse gear about the objects in the rear monitoring range

AIS-145 is an Indian automotive standard formulated by ARAI that specifies the requirements for additional safety features for four wheeled vehicles that are aimed to enhance vehicular and road safety. The requirements of this standard are applicable to M1 category vehicles in respect of the following:

1. Speed alert system to alert driver in case of over speeds
2. Driver seat belt reminder
3. Manual override for central locking system
4. Driver airbag

The requirements of vehicle reverse parking alert system of this standard is applicable to all M and N category vehicles.

There is no reference available in UNECE regulations for the standard.

The table below details out the requirement of standards in each version of standard released for "Reverse alert system" for M and N category of vehicle, while there is no such mandatory system requirement as per UNECE regulations.

Standard: AIS-145		
UNECE regulations: No reference found		
Version	**Date of release**	**Key highlights**
Base consideration		• Formulation of this standard focuses on following areas relevant to M1 category vehicles: • Speed alert system to alert driver in case of over speeds • Driver Seat belt reminder • Manual override for central locking system • Driver Airbag • Reverse parking alert system
D1	Not available	
D2	6th April-2017	a) Reverse Park Alert Systems (RPAS) uses object-detection devices (sensors) or camera based displays in order to provide the driver with information about obstacles in specified zone while reversing the vehicle. b) The Rear parking alert system shall give an acoustic signal to warn the driver on the obstacles detected in the monitoring range. c) The system may have optical warning as supplementary alert to warn the driver. d) In case of camera based systems, obstacle within monitoring range shall be visible to driver. Additionally, Vehicle manufacturer may provide acoustic warning, or optical warning or both. Activation/De-activation criteria for RPAS A. For M1 and M2 category: The system is activated/deactivated automatically according to the driving situation ON: Activation Criteria – Reverse Gear OFF: 1. It may be allowed to deactivate the system while the parking brake is engaged. 2. On vehicles with automatic transmission the system may be deactivated if the P (parking) gear position is selected. The system may have on / off switch or push button to override automatic (de) activation. **B. For other category:** ON: The RPAS shall be automatically activated whenever reverse gear is selected and the ignition switch is in ON condition. OFF: 1. The RPAS system shall be automatically deactivated whenever a gear position other than reverse gear is selected. 2. On vehicles with automatic transmission the RPAS shall be deactivated if any gear position other that R (reverse gear) is selected. It shall not be possible to disable the RPAS by simply switching it off.

Version	Date of release	Key highlights
D3	18th May-2017	In case of camera based systems, obstacle within monitoring range shall be visible to driver. Additionally, Vehicle manufacturer may shall at least provide acoustic warning, or additionally optical warning or both may be provided.
Final Draft	**5th Oct-2017**	**No relevant change for RPAS was mentioned**

Annexure 5: Spare wheel requirement in vehicles

AIS-110 is an Indian automotive standard formulated by ARAI stating the requirement of temporary-use of spare wheel/tyres and run flat tyres. The standard applies to the approval of vehicle categories M1 and N1 with regard to their equipment which may include a run flat system, run flat tyres, a spare wheel and tyre unit intended for temporary use in the event of damage to the wheel and tyre unit fitted to the vehicle for normal, long term, road use.

UNECE regulations: Reg. 64 / Ad – 63, 2017 is used as the base regulation for drafting AIS-110. The regulation applies to the approval of vehicles of category M1 and N1 when equipped with:

1. A temporary use spare unit
2. Run flat tyres and/or a run flat system
3. Tyre pressure monitoring system

As per this regulation it is not mandatory to have spare wheel in a vehicle as a flat run tyre can run for 80 km at a constant speed of 80 km/h.

The table below details out the requirement of standards and the changes in each version of standard released for AIS-110.

Standard: AIS-110		
UNECE regulations: Reg. 64 / Ad – 63, 2017: Uniform provisions concerning the approval of vehicles with regard to their equipment which may include: a temporary use spare unit, run-flat tyres and/or a run-flat system, and/or a tyre pressure monitoring system		
Version	**Date of release**	**Key highlights**
Base consideration	May-09	This standard applies to the approval of vehicles of category M1 and N1 with regard to their equipment which may include run flat tyres, a run flat system, a spare wheel and tyre unit intended for temporary use in the event of damage to the wheel and tyre unit fitted to the vehicle for normal, long term, road use.
A1	December-2013	Tyre Pressure Monitoring System (TPMS) was introduced along with testing guidelines for the same. TPMS gives the driver a warning an optical warning signal as per defined process.
Draft A2	November-2017	Warning symbol mentioning the max. speed of 120km/h was added to type 4 of the temporary use spare unit on M1 category vehicle. Type 4 –"An assembly in which the tyre is a normal tyre (as defined in paragraph 2.4.1) where the size designation of the wheel or the tyre or both, differ from those of the wheel or tyre fitted in the same axle position for normal operation of the vehicle".

Annexure 6: Vehicle level indicative test charges

Sr. no	Description	Indicative charges for test (INR)
1	Coast down test	82,500
2	ABS Brake Testing	307,200
3	Foundation Brake test	170,100
4	Parking Brake/Gradeability Tests	14,600
5	Pass-by Noise Test	27,800
6	Speedometer Calibration	19,900
7	Vehicle Weightment (Laden/Unladen)	2,900
8	Turning Circle Diameter & TCCD	11,100
9	Steering Torque Measurement	31,800
10	Hoodlatch Testing	16,500
11	TPMS testing	56,700
12	Temporary spare wheel testing	56,700
13	Tell Tale Symbols & Control	8,500
14	Wheel Guards	8,500
15	External Projections	7,300
16	CMVR Complete Check	21,800
17	Photographs of the Vehicle	7,500
18	Foot Controls	6,700
19	Measurement of Ground clearance	6,700
20	Mass Emissions (V3 tests)	188,600
21	OBD II	300,000
22	Engine power & Smoke test	70,800
23	Evaporative Emission – Gasoline Vehicles	645,700
24	EMI / EMC Testing	630,000
25	"Vehicle Alarm systems (VAS) & Immobilizers"	600,000
26	Additional safety checks	0
27	Defrost & Demist testing	184,500
28	Driver's Field of Vision	49,200
29	Horn Installation Test	7,600
30	Accelerator performance test	6,600
31	Wheel Nut Testing	10,400
32	Headlamp Vertical Orientation	23,000
33	Lighting Installation Test	25,400
34	Headlamp cleaning performance	8,000

Sr. no	Description	Indicative charges for test (INR)
35	Wiping performance test	32,300
36	Rear View Mirror Installation Test	30,100
37	Protective devices against unauthorized use	100,000
38	Offset Frontal Crash Test	1,300,000
39	Side Crash Test	1,100,000
40	Head Form Impact test	140,000
41	Pedestrian Protection	900,000
42	Interior Fitting test	150,000
43	Seat, Head restraint Strength and performance	200,000
44	Safety Belt Anchorage Test	200,000
45	CRS Installation	17,100
46	Bumper Impact Test	143,700
47	Document Verification and PSL CMVR Clearance	21,600
48	Document Verification and SHL CMVR Clearance	28,000
49	Document Verification and ECL CMVR Clearance	19,100
50	Document Verification and AED CMVR Clearance	20,000
51	Document Verification and AED CMVR Clearance	10,000
52	Apex Certification per Base Model	7,100
Total		**8,033,600**

Annexure 7: Eco-Innovation Regulation (EC) No 443/2009 and Regulation (EU) No 510/2011[27]

The European Union came up with the regulation (EC) No 443/2009 with the objective for setting emission performance standards for new passenger cars registered in the community, which forms part of the Community's integrated approach to reducing CO2 emissions from light duty vehicles.

The introduction of the regulation was an outcome of the United Nations Framework Convention on Climate Change, which was approved on behalf of the European Community by council Decision 94/69/EC of 15 December 1993, requires all parties to formulate national and, where appropriate regional programmes containing measures to mitigate climate change. In this context the Commission proposed that the European Union should pursue the objective of a 30 % reduction of greenhouse gas emissions by developed countries by 2020 (compared to 1990 levels). One of the implications of this commitment was to reduce significantly emission from passenger cars as road transport is the second largest greenhouse gas emitting sector in the union and its emission continues to rise.

With an aim to reduce the greenhouse gas emission from the transport sector the EU legislation has set binding emission CO2 targets for new passenger car (M1) and light commercial vehicle (N1) fleets. In 2015, newly registered cars were allowed to emit no more than an average of 130 grams of CO2 per kilometer (gCO2/km), which was expressed as fleet average per car

[27] EU • Technical guidelines for the preparation of application for approval of innovative technologies

manufacturer. The objective for all new cars is 95 grams of CO2 per kilometer by 2021. Light commercial vehicle (N1) fleets are also required to meet average fleet target of 175 gCO2/km by 2017 and 147 g CO2/km by 2020.

There is a two-step technical procedure to assess the CO2 performance of cars and vans in Europe. As a first step the traditional driving cycle used for type approval measures the CO2 emissions under reference conditions, i.e. the New European Driving Cycle (NEDC). As the NEDC is inadequate in terms of simulating the actual vehicle performance, additional procedures – called the eco-innovation scheme have been defined to assess the performance of technologies whose effects cannot be quantified or observed properly while driving the vehicle on the laboratory cycle. As per the procedure for applying for eco-innovation, applications may be submitted by both vehicle manufacturers and suppliers. The application should enclose the necessary evidence that confirms the eligibility criteria are fully met. The application should also include a methodology for measuring the CO2 savings from the innovative technology. The decision for approval of the technology as eco-innovation shall be taken by Commission wherein it shall specify the information required for the certification of the CO2 savings and it may be used by manufacturers for the purpose of certifying the CO2 savings as part of the type approval process. The maximum savings that a manufacturer may take into account for reducing the average emissions in a given calendar year is 7 g CO2/km.

List of the approved eco-innovation technologies:

Sr. no	Eco-innovative technology	Applicant
1	LED lighting	AUDI AG
2	Efficient alternator	Valeo Equipments Electriques Moteur
3	Engine compartment encapsulation	Daimler AG
4	Navigation-based preconditioning of battery state of charge	Robert Bosch Car Multimedia GmbH
5	LED lighting	Automotive Lighting Reutlingen GmbH
6	Efficient alternator	Denso Corporation
7	Battery charging solar roof	Webasto Roof & Components SE
8	Efficient alternator	Robert Bosch GmbH
9	LED lighting	Daimler AG
10	Battery charging solar roof	Asola Technologies GmbH
11	Efficient alternator	Mitsubishi Electric Automotive Europe BV
12	Coasting	Porsche AG

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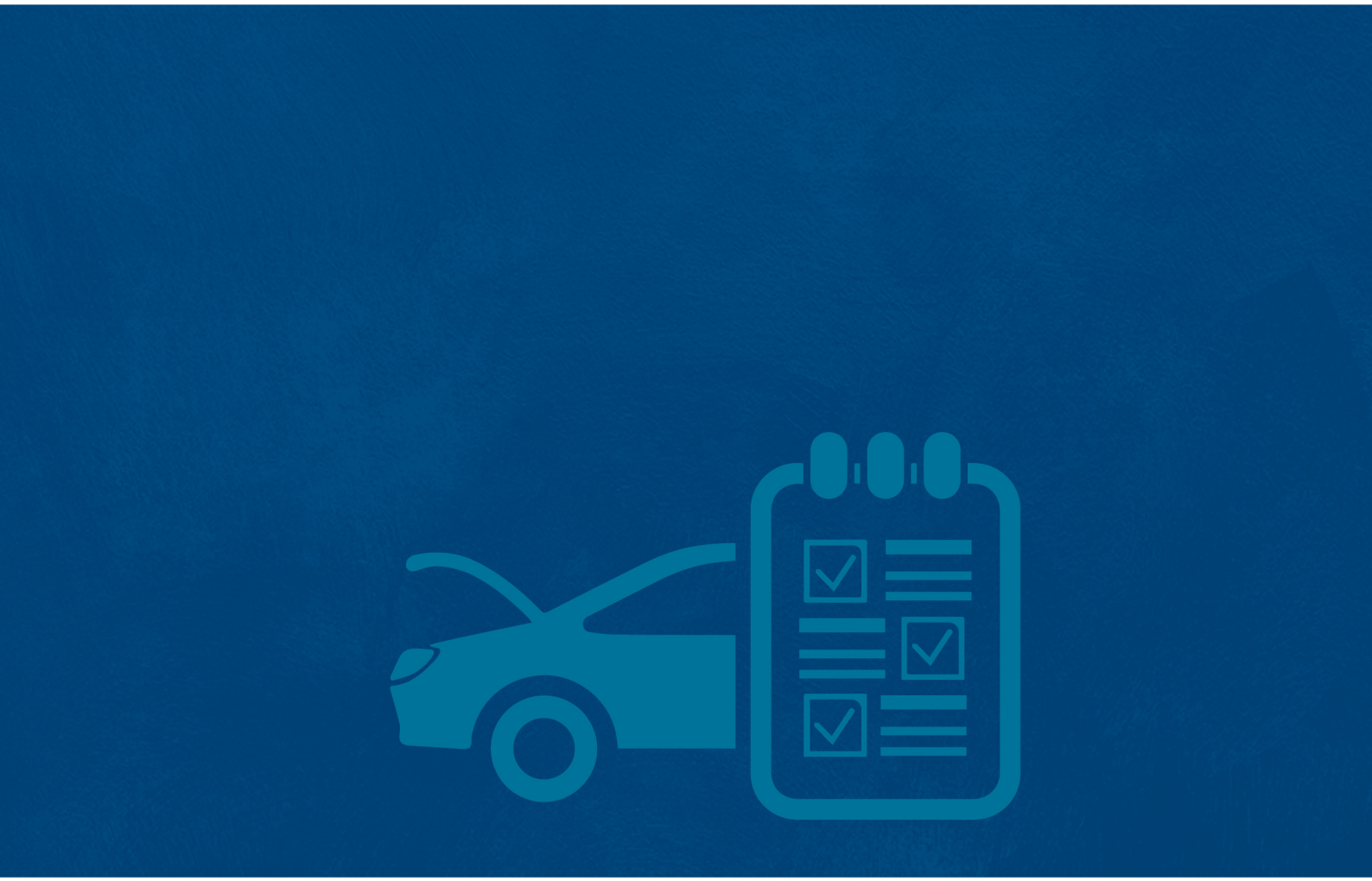

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