

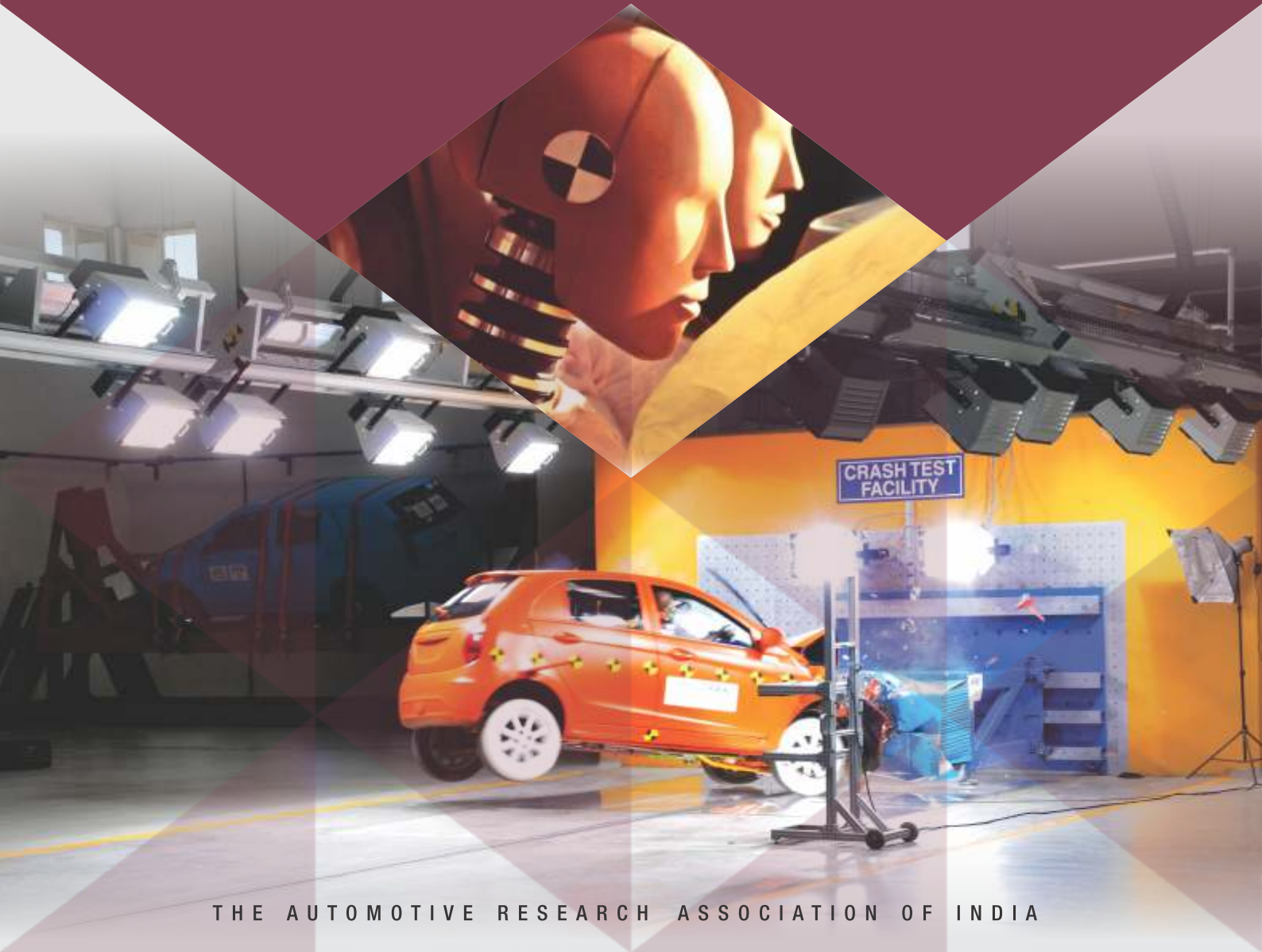


YEARS OF BUILDING AUTOMOTIVE EXCELLENCE  
1966 - 2016

**ARAI**<sup>®</sup>  
Progress through Research

# PASSIVE SAFETY LABORATORY

Partner for Safer Mobility



THE AUTOMOTIVE RESEARCH ASSOCIATION OF INDIA

## About Us:


India's premier test centre for passive safety evaluation with more than 17 years of experience and competent manpower.

## Vision:

To become world leader in providing service support for passive safety certification, research and development to automotive industry and support the drive towards safer mobility.

## Full Vehicle Crash Test Facility



- **India's first public domain crash test facility**
- **Facility validated and extensively used by leading OEMs**
- Full-fledged homologation testing as per Indian & UNECE crash standards viz.
  - Full Frontal (IS: 11939, ECE R12)
  - Offset Frontal (AIS098, ECE R94)
  - Side Impact (AIS099, ECE R95)
  - Rear Impact (AIS101, ECE R34)
- Development Testing Facility for
  - Various NCAP rating tests alongwith **proposed Bharat NCAP**
  - Pole Side Impact
  - Crumple Zone Optimization
  - Airbag ECU Calibration
  - Post-Crash Fuel Leakage Evaluation
  - Benchmarking Tests
- Crash Lab with state-of-the-art facilities comprising of
  - Instrumented crash test dummies and in-house dummy calibration facility: Hybrid III AF5, AM50 and AM95; ES2, ES2-Re and SID-IIs; BioRID-II; Q-Series child dummies alongwith P3 dummy 
  - Onboard Data Acquisition Systems : 300 channels
  - Miniature on-board / off-board high speed cameras: 16 Nos.
  - Advanced Injury Analysis and Motion Analysis software
  - Various crash sensors and 3D CMM with scanner attachment
  - Dedicated photopits for underbody structural deformation study
  - Dedicated client vehicle preparation rooms



## Advanced Deceleration Sled Test Facility



- Deceleration sled with bending bar brake system - sled pulses with multiple peaks possible
- Maximum trolley payload of 1000 kg, maximum speed of 80km/h and maximum deceleration of 60g.
- Fully equipped to conduct following types of homologation & development tests viz.
  - Seats & restraint system (IS 15546, ECER17, ECE R80 and AIS 023)
  - Luggage retention tests
  - Interior fitting systems tests (ECE R21 Annex. 8)
  - Dynamic testing of CRS (AIS072 / UN ECE R44)
  - Laden tests with instrumented / ballast dummies as per customer specifications
- **Facility validated & accredited by major OEMs and recommended as preferred test center**

## Pedestrian Protection & Occupant Protection Test Facility (Universal Impactor Test System)

- Universal Impactor Test Facility for evaluation of pedestrian protection systems, interior fittings systems and restraint systems
- Pedestrian protection tests with TRL Legform, adult & child headforms (AIS100, ECE R127, GTR No.9)
- Body block test and Head impact tests with linear and pendulum impactor (IS 11939, IS 15223, ECE R12, ECE R17 and ECE R21)
- Development testing for deployable or active hood systems, knee form impact, FMVSS headform impact, window glass ejection mitigation & NCAP rating tests etc.
- Facility equipped with dedicated data acquisition systems, high speed cameras & other measurement systems
- Facility fully accredited by VCA, UK for above mentioned AIS & UN ECE standards
- Proposed upgrade: FlexPLI



## Dedicated Test Center for Testing & Type Approval of Safety Belts



- Full-fledged homologation testing of safety belts (IS 15140 and ECE R16)
- Test center recognized for Conformity of Production (CoP) testing for Indian and ECE approval
- All testing facilities for safety belts including static test rigs, 6-station retractor durability test rig, climatic chambers, dust chambers and deceleration type bungee sled facility with TNO10 dummies available under one roof
- **In service since 2003 and experience of conducting more than 14000 sled tests**

## Airbag Deployment Test Facility



- Test facility for deployment testing of airbag modules as per SAE J1630 and customer specific test standards
- Facility equipped with 1m<sup>3</sup> climatic chamber, high speed cameras and measurement systems
- Proposed Facility upgradation with 8m<sup>3</sup> climatic chamber with infra-red heating system for testing of
  - Full size instrument panels & IP mounted airbags
  - Seat integrated side airbags
  - Curtain airbags
- Firing tests of airbags on half-cut BIWs
- Long duration ageing tests of instrument panels with sun load simulation

## Child Restraint System Test Facility




- Child Restraint System (CRS) test facility for type approval of CRS (AIS072, ECE R44)
- Universal category CRS Gabarit for installation testing and type approval (AIS072, ECE R16)
- ISOFIX Child Restraint Fixtures (CRF) for installation tests and homologation (ECE R14, ECE R16)



## Side Door Intrusion & Bumper Testing Facility



- Quasi static side door testing (IS 12009, FMVSS 214)
- Testing of bumpers using moving barrier (IS 15901 and ECER42) 



Facilities accredited for ISO-17025 (Accredited by NABL, India)



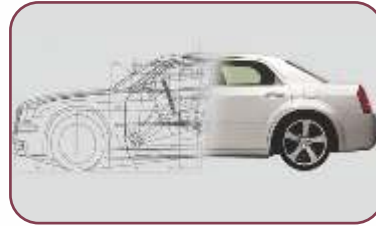
Test facilities located at ARAI HTC Chakan

## Commercial Vehicle Testing & Certification Facilities



- Facility for testing of cabins of commercial vehicle cabins (AIS029, ECE R29)
  - Frontal impact, roof strength & rear wall strength tests
  - Frontal Impact facility equipped to perform 55 kJ impact test
- Tilting platform test facility for
  - Testing of passenger buses for strength of superstructure / rollover testing (AIS031, ECE R66)
  - Tilt stability testing of buses ( AIS052, ISO 16333)
- Facility for measurement of center of gravity of buses / commercial vehicles
- Facility for testing of underrun protection devices (Front, Rear and Lateral UPDs)
  - Lateral UPDs (IS 14682, ECR R73)
  - Rear UPDs (IS 14812, ECE R58)
  - Front UPDs (AIS069, ECE R93)
- Component fitment and installation tests (AIS023, AIS047, AIS052, AIS063)

## Anthropometry Database, Digital Benchmarking & Ergonomics Studies



- Advanced 3-D Whole Body Scanner available for anthropometric studies
- SIZE INDIA Database–Anthropometry database of Indian driving population (5000+ volunteers)
- Benchmarking Services for measurement of motor vehicle dimensions, Interior dimensions, cargo area measurement and standardization as per SAE J1100
- Facilities for ergonomic evaluation and simulation of vehicles using
  - HPM-I for occupant packaging studies
  - Pressure mats, pedal force and gear shift force sensors
  - Software packages like CATIA integrated RAMSIS
  - Full field 3-D scanner for vehicle digitization and digital benchmarking

## High Speed Photography, Data Acquisition and Onsite DAQ & Testing



- Professional high speed photography and multi-channel data acquisition services for impact testing
- 2-D and 3-D image analysis from high speed photography and data analysis services using advanced software packages
- Onsite data acquisition & high speed photography projects executed for premier R&D organizations

**ARAI**<sup>®</sup>  
Progress through Research



**The Automotive Research Association of India**  
(Affiliated to Ministry of Heavy Industries & Public Enterprises, Govt. of India)

Regd. Office :  
Survey No. 102, Vetal Hill, Off Paud Road,  
Kothrud, Pune - 411 038, INDIA  
Tel. : +91-20-3023 1350/1360, Fax : +91-20-3023 1104  
E-mail : [director@araiindia.com](mailto:director@araiindia.com)  
[mannikar.psl@araiindia.com](mailto:mannikar.psl@araiindia.com)  
Website : [www.araiindia.com](http://www.araiindia.com)