MOBILITY: INTELLIGENT AND SMART

DR ARUN JAURA
Board of Directors,
SAE International

With nine billion habitants predicted on the planet by 2050 and a 2.2 bn vehicle parc, the need for smarter and shared mobility is rather urgent. In the last about 200 plus years, the distance travelled per person per day has expanded 1,000X. From personal conventional mobility, the ecosystem is expanding to XEVs, autonomous vehicles and shared ownership of mobility. The ecosystem is moving to more autonomy in transportation.

Smart mobility tends to be innocuously equated to autonomous driving and that can be risky. An intelligent vehicle is equated to a smart vehicle but in reality they are very different. Over the years, intelligent features in a vehicle have grown due to driving behaviour, technological gizmos, safety and efficiency norms and the increasing number of vehicles. Smartness in few of the features has been implemented but there are many waiting to go.

The advent of better infrastructure has translated into high speed transportation and more number of private and public vehicles on the roads. This necessitates ensuring safety for vehicles and pedestrians, and protection of the infrastructure. OEMs have changed the design paradigms with intelligent product design specifications to meet newer customer demands and stringent regulations. Vehicles are being designed with intelligence to meet better ergonomic, emissions and stricter safety requirements.

Vehicles are being developed to deliver adaptable and flexible solutions for customers. Features such as automatic climate control, seat adjustment for different drivers, driver interfaces, maintaining driving distance between vehicles, while on cruise control, and other features are just not intelligent but also smart. Many of these features sense the environment and make necessary adjustments. Most importantly, active and passive safety features are implemented smartly to aid the driver and occupants.

Many of the flexible powertrain features have been in place for a long duration. The multi-fuel powertrains, the XEVs and non-conventional fuels have created an ecosystem that is intelligent. Powertrains are partially smart in hybrid vehicles; they can switch to an electric mode when required, and back to engine-assisted driving. However, the charging infrastructure is yet to get smart though it is intelligent. Vehicles are yet to be smart enough to suggest driving modes to the naive driver, based on the driving environment around them. The virtual transferring of power in an engine for up-scaling or downsizing remains a fantasy.

Intelligent materials that retain memory and adapt to the torso of occupants for ergonomic seating are yet to gather mass market traction although few of the memory materials have slowly percolated in vehicles.

With more digital travellers, smart vehicles will be a natural choice. The post-millennium Generation Z's demands are pretty radical. They demand access to data, perennial con-

nectivity on wheels and location services. Vehicle-to-Vehicle and Vehicle-to-Remote connectivity will be mandatory to serve big data needs. Though some telematics features were first introduced in vehicles in the 90s, the rapidity of acclimatising to digital with big data in the backdrop is still to catch up.

Many autonomous vehicle projects in mature markets are in the pipeline of research and development. On the contrary, is India ready for autonomous vehicles? There are many aspects to be addressed in the ecosystem before autonomy on the main streets or expressways can be unleashed. Of course, autonomous vehicles for niche applications are under development in the country and some are being used for specific requirements.

Going forward, smart mobility will be the norm. For mobility practitioners, its expansion to shared smart sustainable mobility will be the winning solution to celebrate.