



## Demand for Advanced Driver Assistance Systems

**For Prelims:** Advanced Driver Assistance Systems, [Autonomous Driving](#)

**For Mains:** Landscape of Self-Driving Cars in India, Automation of Transport and challenges

[Source: IE](#)

### Why in News?

As [autonomous driving](#) gains momentum globally, India emerges as a surprising yet significant market, with a surge in demand for **Advanced Driver Assistance Systems (ADAS)**.

### What is Advanced Driver Assistance Systems (ADAS)?

#### ▪ About:

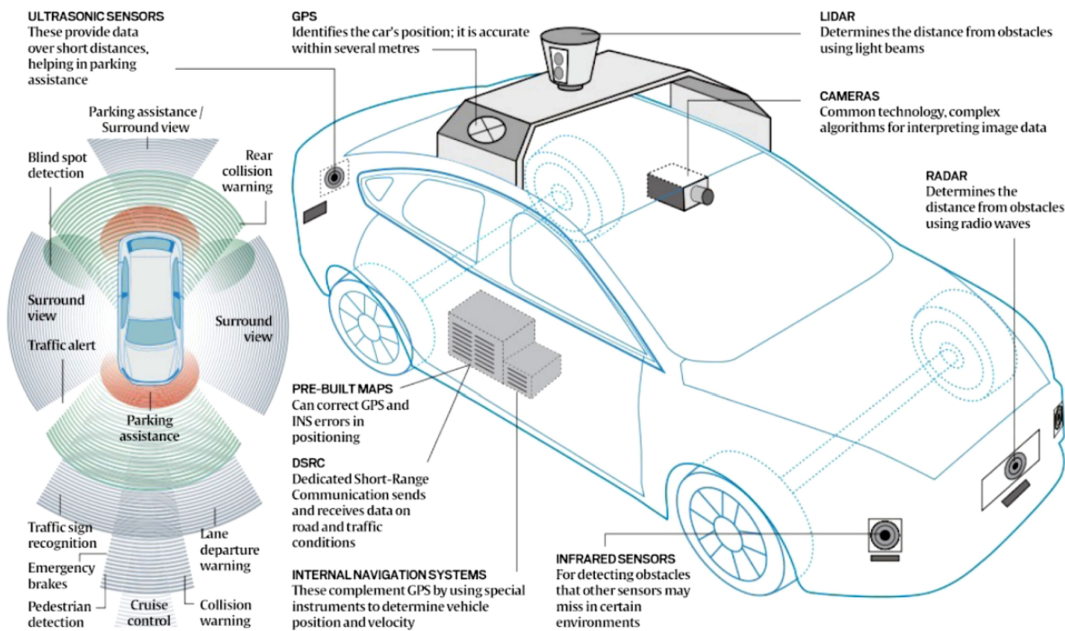
- Advanced driver assistance systems (ADAS) can be defined as in **vehicle digital technologies** that help drivers in routine navigation and parking without fully automating the entire process but instead **leveraging computer networks** to enable more data-driven and safer driving experiences.
  - ADAS systems use sensors, cameras, and radar to monitor the environment around a vehicle.
  - They can provide active safety information, driving interventions, and assistance with parking.
- The goal of ADAS is to **reduce the incidence and severity of automotive accidents** that cannot be avoided so that deaths and injuries can be prevented.
  - These devices can give important data about traffic, road closures and blockages, congestion levels, advised routes to avoid traffic, etc.

#### ▪ Popular ADAS Features:

- The ADAS suite includes features such as **automatic emergency braking**, forward collision warning, **blind spot collision warning**, lane-keeping assist, **adaptive cruise control**, and more.

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## HOW AUTONOMOUS VEHICLES SEE AND HEAR



### ▪ Reasons for Surge in Demand in India:

#### ◦ Progressive Democratization:

- India is witnessing a progressive democratization of autonomous driving tools. Car manufacturers are increasingly offering **ADAS as standard features on mid-segment vehicles**, contributing to the heightened demand for advanced driver assistance technology.

#### ◦ Road Safety Concerns:

- Despite India's infamous road conditions and traffic patterns, there is a growing emphasis on road safety. Car manufacturers are integrating ADAS features to **enhance safety and provide consumers with advanced driver assistance tools**.

### ▪ Challenges in India for ADAS Systems:

#### ◦ Road Infrastructure Challenges:

- India is considered **one of the most challenging driving environments globally**.
  - The country has the **world's deadliest roads**, with crashes killing and maiming over **800,000 people annually, according to the World Bank**.
- India's diverse road conditions, from **well-maintained highways to poorly constructed rural roads**, pose challenges for ADAS systems for consistent road markings and infrastructure.

#### ◦ Diverse Road Users:

- Indian roads host a mix of pedestrians, cyclists, and non-motorized vehicles alongside motor vehicles, creating complexity for ADAS adaptation.
  - A study by the **World Resources Institute (WRI) India** revealed that **nearly 50% of urban trips in India are made on foot, bicycle, or cycle-rickshaw**, emphasizing the **importance of considering non-motorized road users in ADAS design**.

#### ◦ Connectivity and Data:

- ADAS systems require **real-time data updates and reliable connectivity**, which might be an issue in remote or poorly networked areas of India.

#### ◦ Vulnerable to Hacking:

- One major concern consumers and experts have about ADAS Systems is their **vulnerability to cyberattacks**.
  - Hacked vehicles are extremely dangerous and might lead to accidents.

#### ◦ Driver Behaviour:

- ADAS systems' success relies on responsible driving behaviour. A survey by the **Institute of Road Traffic Education (IRTE) in India** found that **only 44% of**

drivers were aware of ADAS technology, highlighting the need for widespread education on its benefits and usage.

## What is Autonomous Driving?

### ▪ About:

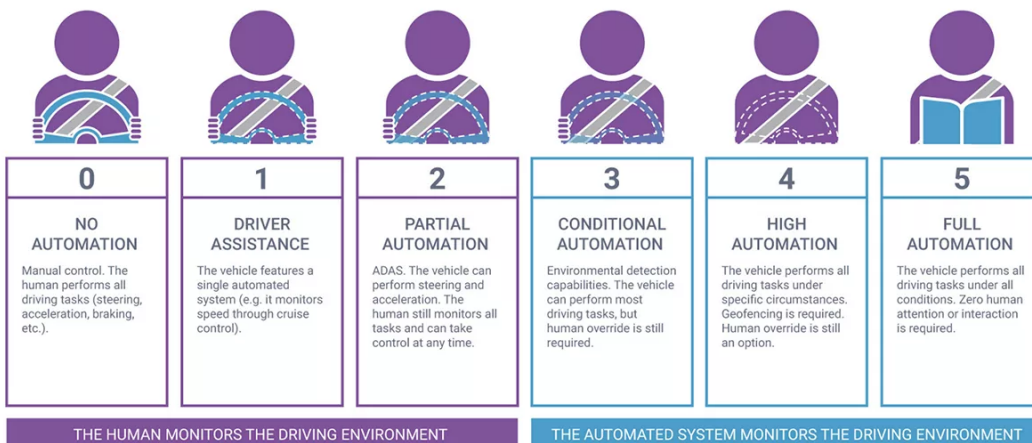
- Autonomous driving is the **ability of a car to drive itself with limited or no human intervention**. Autonomous vehicles are equipped with technologies like ADAS that can sense their surroundings and adjust their speed and course without human input.
  - **Autonomous driving can also refer to self-driving vehicles.**

### ▪ Levels of Autonomous Driving:

- The **Society of Automotive Engineers (SAE)** defines 6 levels of driving automation ranging from 0 (fully manual) to 5 (fully autonomous).
- Car manufacturers in India are currently focusing on offering **Level 2 functionality**.
  - Despite the increasing adoption of ADAS, Level 2 seems to be the current limit for most carmakers. **Full autonomous driving (Level 5) remains a distant goal**, with challenges ranging from technical limitations to regulatory concerns.

SYNOPSIS®

### LEVELS OF DRIVING AUTOMATION



## UPSC Civil Services Examination, Previous Year Questions (PYQs)

**Q. With the present state of development, Artificial Intelligence can effectively do which of the following? (2020)**

1. Bring down electricity consumption in industrial units
2. Create meaningful short stories and songs
3. Disease diagnosis
4. Text-to-Speech Conversion
5. Wireless transmission of electrical energy

**Select the correct answer using the code given below:**

- (a) 1, 2, 3 and 5 only  
(b) 1, 3 and 4 only  
(c) 2, 4 and 5 only

(d) 1, 2, 3, 4 and 5

Ans: (b)

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