Advanced Driver Assistance Systems (ADAS)

Why in news?

Car manufactures have started providing ADAS which could create a safe traffic environment resulting in reduced accidental death.

What is advanced driver assistance systems (ADAS)?

- **Electronic system** - Advanced Driver Assistance Systems (ADAS) is an electronic system of automated vehicle safety features.
- The System uses innovative sensor technology to provide information, warnings, and assistance to the driver while they are driving.
- **Prevent death** - The role of ADAS is to prevent deaths and injuries by reducing the number of car accidents and the serious impact of those that cannot be avoided in road.
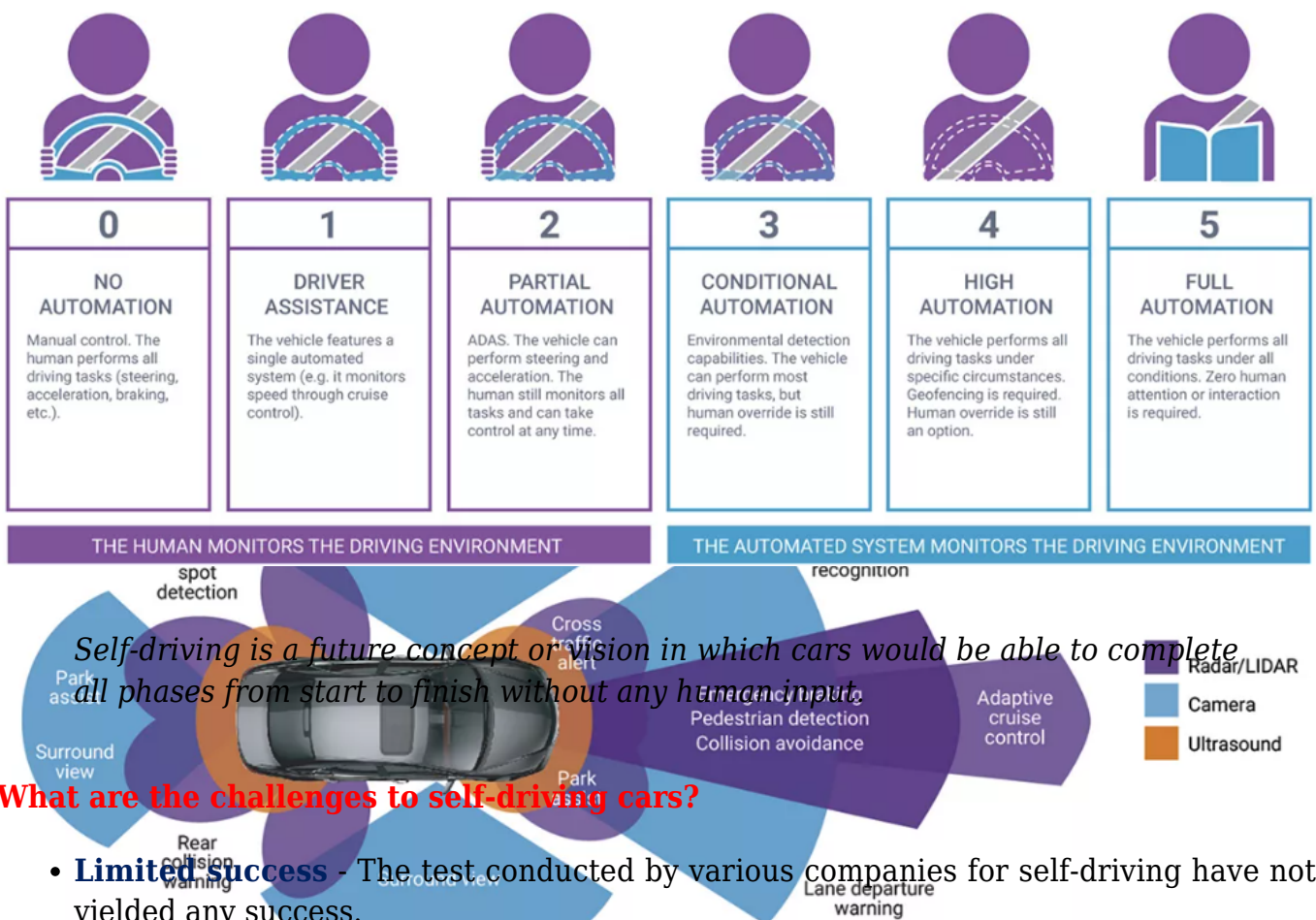- **Applications** - Some applications of ADAS are

1. Adaptive Cruise Control	5. Autonomous Valet Parking
2. Glare-Free High Beam Light	6. Navigation System
3. Adaptive Light Control	7. Night Vision
4. Automatic Parking	8. Unseen Area Monitoring

- **Autonomous driving** - Many of the features that are included in an ADAS system are essential for autonomous driving.

What is autonomous-driving?

- Autonomous driving is the ability of a vehicle to drive itself.
- There are different levels of autonomous driving, each with its own set of requirements and capabilities.

LEVELS OF DRIVING AUTOMATION

0	1	2	3	4	5
NO AUTOMATION	DRIVER ASSISTANCE	PARTIAL AUTOMATION	CONDITIONAL AUTOMATION	HIGH AUTOMATION	FULL AUTOMATION
Manual control. The human performs all driving tasks (steering, acceleration, braking, etc.).	The vehicle features a single automated system (e.g. it monitors speed through cruise control).	ADAS. The vehicle can perform steering and acceleration. The human still monitors all tasks and can take control at any time.	Environmental detection capabilities. The vehicle can perform most driving tasks, but human override is still required.	The vehicle performs all driving tasks under specific circumstances. Geofencing is required. Human override is still an option.	The vehicle performs all driving tasks under all conditions. Zero human attention or interaction is required.

THE HUMAN MONITORS THE DRIVING ENVIRONMENT | THE AUTOMATED SYSTEM MONITORS THE DRIVING ENVIRONMENT

Radar/LIDAR
Camera
Ultrasound

Self-driving is a future concept or vision in which cars would be able to complete all phases from start to finish without any human input.

What are the challenges to self-driving cars?

- **Limited success** - The test conducted by various companies for self-driving have not yielded any success.
- **No consensus** - While few companies choose cameras for self-driving whereas few companies uses combination of technology such as include LIDAR, radar, sensors and

camera.

- **Prediction** - The available technology at present do not have the capacity of the humans to predict and take decision in the complex traffic scenario.
- **Lack of government support** - Only the private companies are investing in the self-driving technologies and there is lack of support from the government.

Reference

1. [The Indian Express│ Challenges To Self-Driving](#)