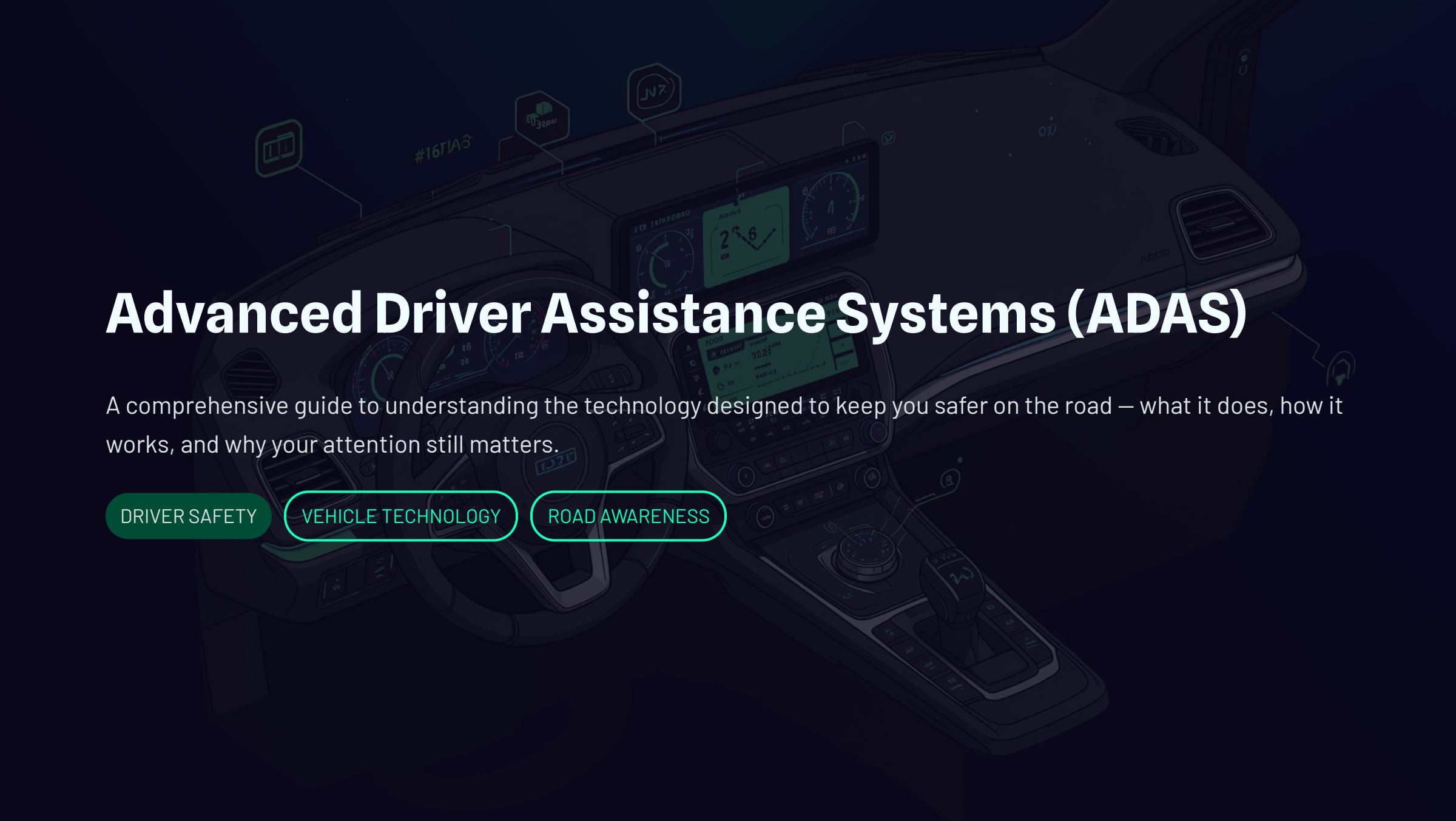




Advanced Driver Assistance Systems (ADAS)

A comprehensive guide to understanding the technology designed to keep you safer on the road — what it does, how it works, and why your attention still matters.

DRIVER SAFETY

VEHICLE TECHNOLOGY

ROAD AWARENESS

What is ADAS?

Advanced Driver Assistance Systems (ADAS) are a suite of electronic technologies integrated into modern vehicles to help drivers operate more safely. These systems use sensors, cameras, radar, and software to monitor the road environment and assist with driving tasks in real time.

What ADAS Is

- A collection of safety technologies built into your vehicle
- Designed to monitor, warn, and assist the driver
- Uses cameras, radar, ultrasonic sensors, and lidar

What ADAS Is Not

- A replacement for an attentive driver
- Fully autonomous driving technology
- Infallible in all weather or road conditions



ADAS assists — it does not drive for you. The driver remains responsible at all times.

Core ADAS Features at a Glance

Modern vehicles may include several ADAS features working together. Here are the most common systems you are likely to encounter.



Lane Keeping Assist (LKA)

Gently steers the vehicle back into lane if it detects unintentional drifting without a turn signal.



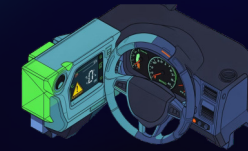
Adaptive Cruise Control (ACC)

Automatically adjusts speed to maintain a safe following distance from the vehicle ahead.



Automatic Emergency Braking (AEB)

Detects an imminent collision and applies the brakes automatically to avoid or reduce impact.



Blind Spot Monitoring (BSM)

Alerts the driver when another vehicle is detected in a blind spot zone beside or behind the car.

Lane & Speed Assistance Systems

Lane Departure Warning (LDW)

LDW monitors lane markings and issues an audible, visual, or haptic warning if the vehicle begins to drift out of its lane without signaling. Unlike Lane Keeping Assist, it warns but does not steer.

Traffic Sign Recognition (TSR)

TSR uses a forward-facing camera to detect road signs — particularly speed limit signs — and displays them on the dashboard or heads-up display, keeping the driver informed.

Intelligent Speed Assistance (ISA)

ISA helps drivers stay within speed limits. **Advisory systems** alert the driver when the limit is exceeded. **Intervening systems** can actively limit vehicle speed. Both types work together with TSR to promote legal, safe speeds.



Advisory ISA

Warns the driver but does not intervene

Intervening ISA

Can actively limit vehicle speed

Collision Prevention Systems

These systems are designed to detect potential collisions and either warn the driver or take action to prevent or mitigate an impact.

Forward Collision Warning (FCW)

FCW monitors the road ahead and triggers an alert when the system detects a risk of crashing into a vehicle or obstacle. It warns the driver but does not apply the brakes automatically.

Automatic Emergency Braking (AEB)

Building on FCW, AEB takes action if the driver does not respond in time. The system applies the brakes automatically to avoid or reduce the severity of a collision. AEB is now a standard safety feature in many new vehicles.

Turning Assist

Turning Assist helps detect pedestrians or vehicles when turning at junctions, particularly when making left or right turns across oncoming traffic. The system can warn the driver or apply emergency braking if a collision risk is detected during the maneuver.



Detect

Warn

Act

These three stages work together to give drivers the best chance of avoiding a collision – first by detecting the hazard, then warning the driver, and finally intervening automatically if no response is made.

Driver Monitoring & Fatigue Detection

ADAS technology doesn't just watch the road — it watches you too. Driver monitoring systems are designed to detect signs of fatigue or distraction and prompt you to take a break.



Driver Attention Monitor

Monitors steering patterns, lane position, and driving behavior to detect signs of fatigue. When tiredness is detected, the system issues a warning suggesting a rest break.



Fatigue Detection Systems

Advanced systems use cameras to track eye movement and head position, providing a more accurate assessment of driver alertness levels in real time.



Speed Limiter

A speed limiter sets a maximum vehicle speed chosen by the driver, helping prevent unintentional speeding and reducing the risk of speed-related accidents.

Parking, Stability & Visibility Aids

Parking Assistance

Parking assist systems use ultrasonic sensors and cameras to help with parallel and reverse parking. Some advanced systems can steer the vehicle automatically while the driver controls the pedals.

Electronic Stability Control (ESC)

ESC detects and reduces loss of traction, helping prevent skidding and loss of control – particularly in emergency maneuvers or slippery conditions.

Responding to Warnings

When any ADAS warning activates, drivers should immediately check mirrors and surroundings, reduce speed if necessary, and be prepared to take full control of the vehicle.



Parking Assist

Parallel & reverse parking aid



ESC

Prevents skidding & loss of control

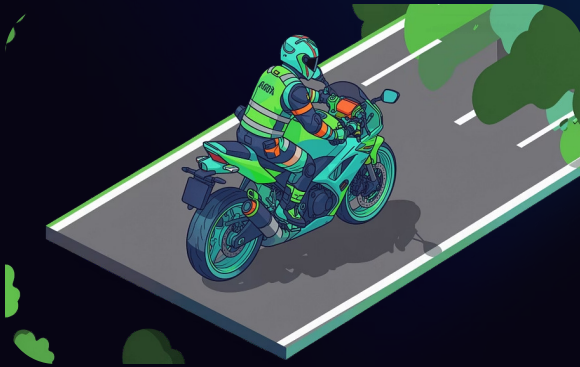


Surround View

360° camera for visibility

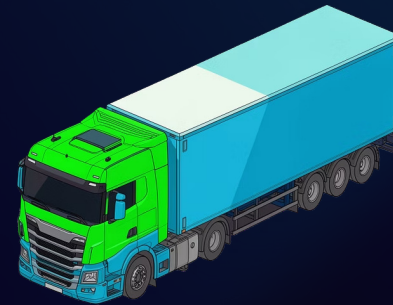
ADAS in Motorcycles & Large Vehicles

Rider and HGV assistance systems apply the same safety principles to two-wheeled and heavy vehicles, with adaptations for their unique dynamics.



Motorcycle Rider Assistance

Often called **rider assistance systems**, these include **Cornering ABS** (considers lean angle and speed to prevent wheel lock while turning), **Traction Control** (activates when wheels lose grip to prevent wheel spin), **Wheelie Control** (prevents the front wheel from lifting), and **Blind Spot Detection** (alerts the rider to vehicles in blind spots).



HGV Blind Spot Detection

Large trucks have significant blind spots around the cab. HGV blind spot detection systems monitor these areas — particularly the nearside — and alert the driver to cyclists, pedestrians, or vehicles that may not be visible in mirrors.

Limitations, Risks & Driver Responsibility

Know the Limitations

- ADAS performance degrades in poor weather – rain, snow, and fog can impair sensors
- Not all vehicles are equipped with ADAS
- System errors and false readings can occur
- Over-reliance on ADAS is a leading cause of misuse

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Key Risks

Over-reliance, system errors, and poor weather performance

Your Responsibilities as a Driver

- You must always follow road rules – ADAS does not exempt you from legal obligations
- If ADAS fails or behaves unexpectedly, stay calm and take full control immediately
- Check dashboard indicators to confirm ADAS is active
- Never assume the system will react in time – stay alert

- ⊗ The driver is **always** responsible for the vehicle, even when ADAS is active or when a system failure occurs.

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Golden Rule

The driver is always ultimately responsible

Key Takeaways

ADAS technology represents a significant leap forward in road safety — but only when understood and used correctly. Here is what every driver should remember.

1 **ADAS Assists — It Does Not Replace You**

These systems are designed to support attentive drivers, not substitute for them. Stay engaged and in control at all times.

2 **Know Your Vehicle's Systems**

Familiarize yourself with which ADAS features your vehicle has, how to identify when they are active, and how to respond to their warnings.

3 **Understand the Limitations**

Weather, road conditions, and system errors can affect ADAS performance. Never rely on technology alone — your judgment is irreplaceable.

4 **Responsibility Always Rests With the Driver**

Whether ADAS is functioning perfectly or has failed entirely, you are responsible for driving safely and following all road rules.

ADAS improves safety, reduces crashes, and increases driver confidence — but an informed, attentive driver is the most important safety feature of all.