

THE INTELLIGENCE SAFETY

THINK SAFETY. THINK PROTON

PART 2



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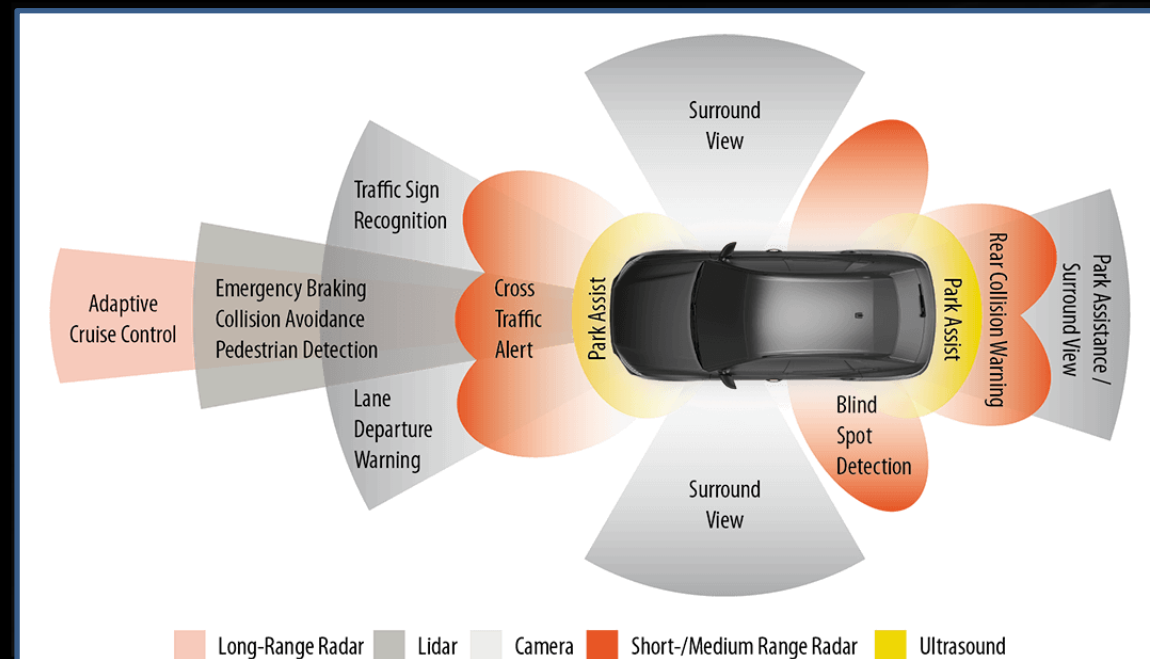
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PROTON

WHAT IS ADAS ?

- An advanced driver-assistance system (ADAS) is electronic technology that assists drivers in driving



HOW DOES ADAS WORK ?

- ADAS works by alerting the driver to danger or even taking action to avoid an accident. Vehicles can sense the environment around, process this information quickly and provide the correct output to the driver.

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ADVANCE DRIVER ASSIST SYSTEM (ADAS)

Guided by Volvo Standard to Build 5+ Star Safety.

The X70 features a 3D Holographic Detection System composed of 2 sensors + 5 cameras + 9 radars.



Customer Benefits:

- Protect occupants, the vehicle and pedestrians in an all-round way in different driving scenarios.



SAFETY LEVEL

PART 1

PASSIVE SAFETY



PROTECTION
During Accident

- Does not do any work until it is called to action.
- These features become active during an accident.
- Minimize damage and reduce the risk of injury during impact.

ACTIVE SAFETY



PREVENTION
Before Accident

- It works to prevent an accident.
- These systems always stay active while you drive, and continuously work to keep you from getting into an accident.

PART 2

COGNITIVE SAFETY



PREDICTION
Way Before Accident

- Designed to remove human error when driving.
- ADAS systems will assist the driver during driving and thereby improve drivers' performance.



LEVELS OF DRIVING AUTOMATION



0

NO AUTOMATION

Manual control. The human performs all driving tasks (steering, acceleration, braking, etc.).



1

DRIVER ASSISTANCE

The vehicle features a single automated system (e.g. it monitors speed through cruise control).



2

PARTIAL AUTOMATION

ADAS. The vehicle can perform steering and acceleration. The human still monitors all tasks and can take control at any time.



3

CONDITIONAL AUTOMATION

Environmental detection capabilities. The vehicle can perform most driving tasks, but human override is still required.



4

HIGH AUTOMATION

The vehicle performs all driving tasks under specific circumstances. Geofencing is required. Human override is still an option.



5

FULL AUTOMATION

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

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ADAS SYSTEM



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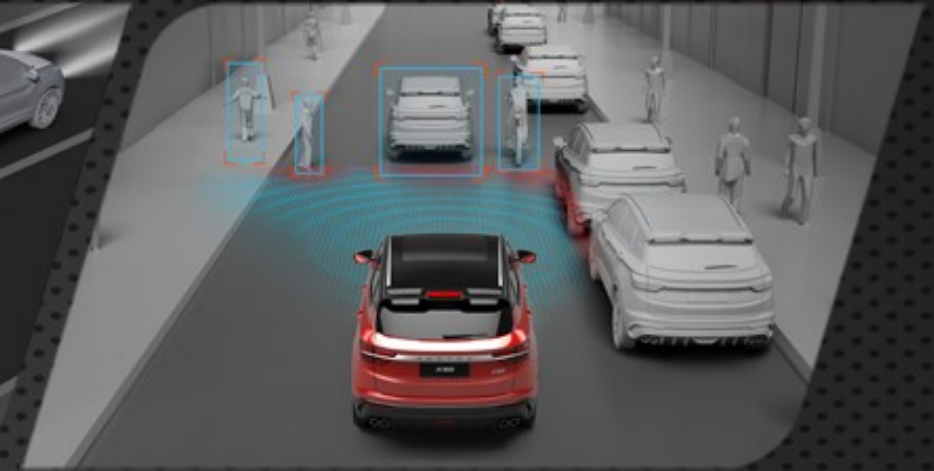
- Blind Spot Information System



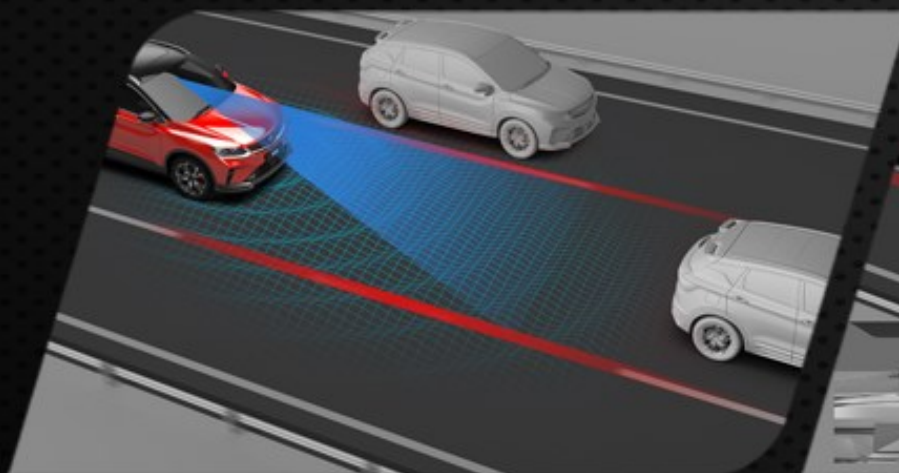
- Intelligent High Beam Control



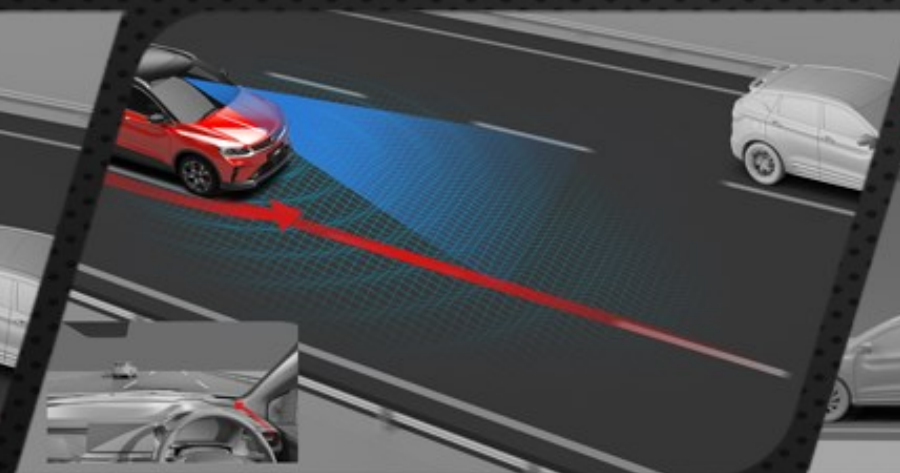
- Forward Collision Warning



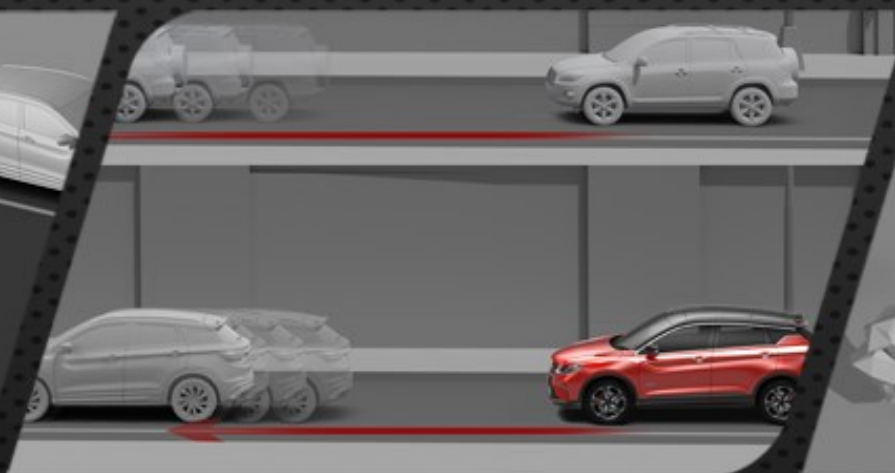
- Autonomous Emergency Braking with Pedestrian Detection



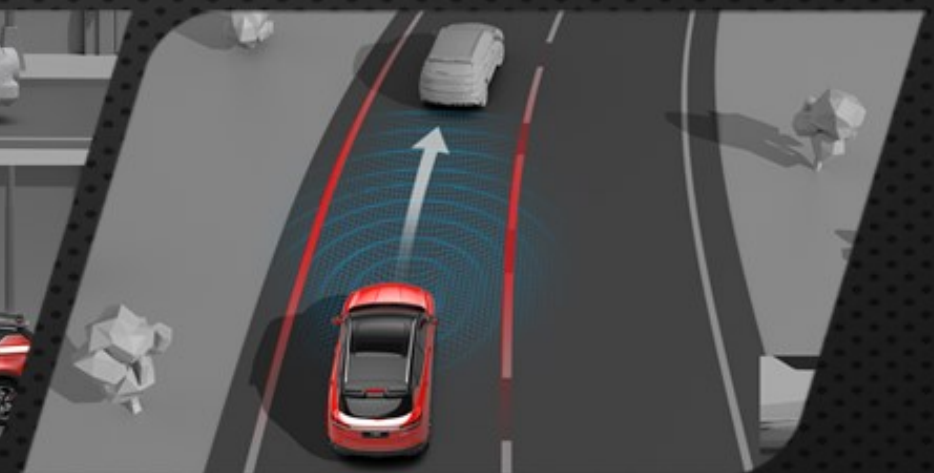
- Lane Departure Warning



- Lane Keep Assist



- Adaptive Cruise Control with Stop & Go



- Intelligent Cruise Control

- Detects the vehicles on the rear sides and alerts the driver of the incoming vehicles in the blind zone by flashing the yellow light in the side mirror or A-pillar.

Monitors the road and keeps you alert

- BLIS has 2
warning levels:

Level 1:

When the target vehicle is detected in the blind spot zone, a visual warning via the outside rear-view mirror LED will lit continuously

Level 2:

When the target vehicle is detected in the blind spot zone and the turn signal is switched ON, an audible warning and blinking visual indicator will be activated



Feature Highlights:

- Able to detect a 4-meter-wide and approx. 20-meter-long blind zone range on both sides of the vehicle;
- Enhanced safety with a combination of radars and cameras

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INTELLIGENT HIGH BEAM CONTROL



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- **Designed to help drivers see more of what's ahead at nighttime without dazzling other drivers.**
- **Uses in-vehicle camera to help detect the headlights of oncoming vehicles and taillights**

- IHBC is automatically activated when vehicle speed is more than 40kph and when there is low illuminance of ambient light
- The headlamps adapt to your driving situation by automatically switching between high and low beam when there are other vehicles nearby
- Enhanced safety for other road users during night driving



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FORWARD COLLISION WARNING



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- Designed to alert the driver to a hazard ahead so that you can brake or swerve in time.
- Forward collision warning alone will not automatically brake for you

- FCW consist of three features: Safe Distance Alarm, PCW and AWB
- Three sensitivity levels available: Low, Medium and High.

Customer Benefits:

- Assist driver in avoiding or mitigate crash
- Intelligent safety



1. Scan

2. Be Alert

3. Prepare to Brake



• Acute Warning Brake (AWB) - brake jerk (1.0s)

• Pre-Collision Warning (PCW) - audio (1.5s) visual warning

• Safe Distance Alarm - visual warning (2.5s)



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AUTONOMOUS EMERGENCY BRAKE



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- Uses sensors to track cars ahead and automatically slam on the brakes in an impending crash.
- This feature be paired with forward collision warning. If you don't react in time, automatic emergency braking quickly slows down your car or can even bring your car to a stop.

- System will activate and apply AEB if the driver does not respond timely to FCW and activates Emergency Brake Assist if the driver brakes insufficiently

Moving Pedestrian

70kph

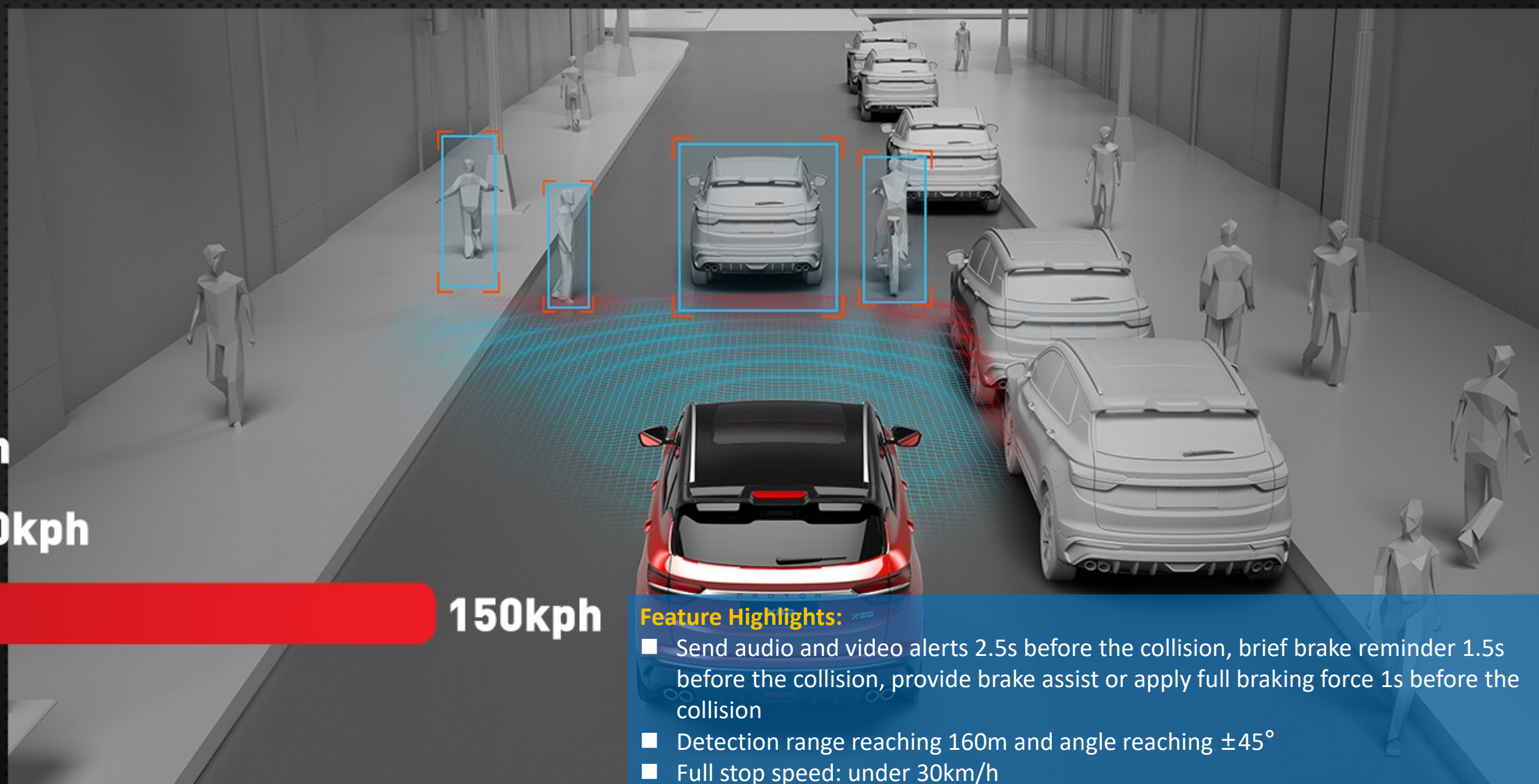
Stationary Vehicle

80kph

4kph

Moving Vehicle

150kph



Feature Highlights:

- Send audio and video alerts 2.5s before the collision, brief brake reminder 1.5s before the collision, provide brake assist or apply full braking force 1s before the collision
- Detection range reaching 160m and angle reaching $\pm 45^\circ$
- Full stop speed: under 30km/h

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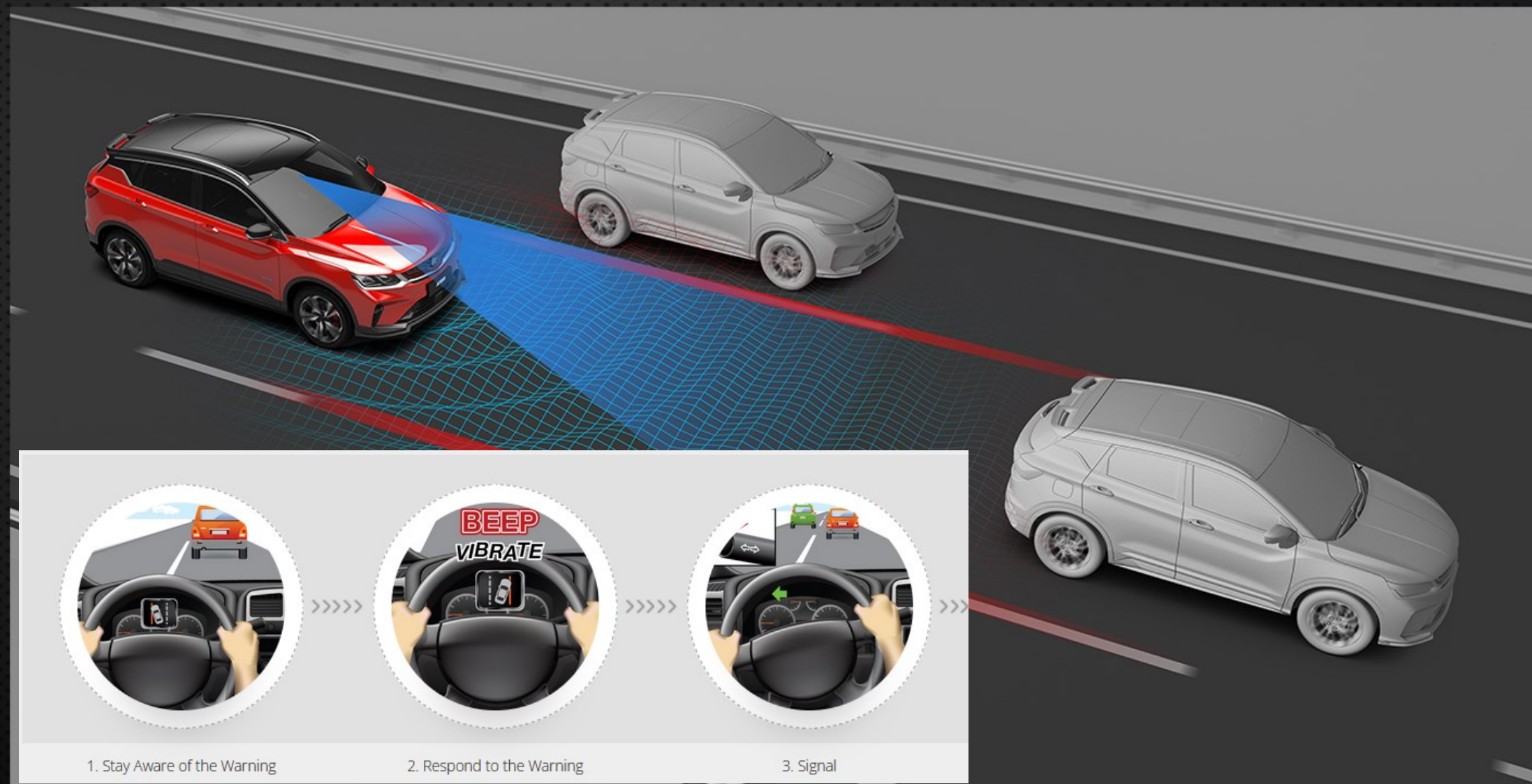
LANE DEPARTURE WARNING



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- Lane departure warning systems alert you if you're drifting out of your lane using visual, vibration (X50) or sound warnings.
- This feature can help alert you to drive back to the center of your lane if you mistakenly drift, helping to prevent you from being in a crash.

- System monitors the position of the vehicle with respect to the lane boundary and alert the driver by audio or steering vibration when an unintentional lane departure has occurred or about to occur



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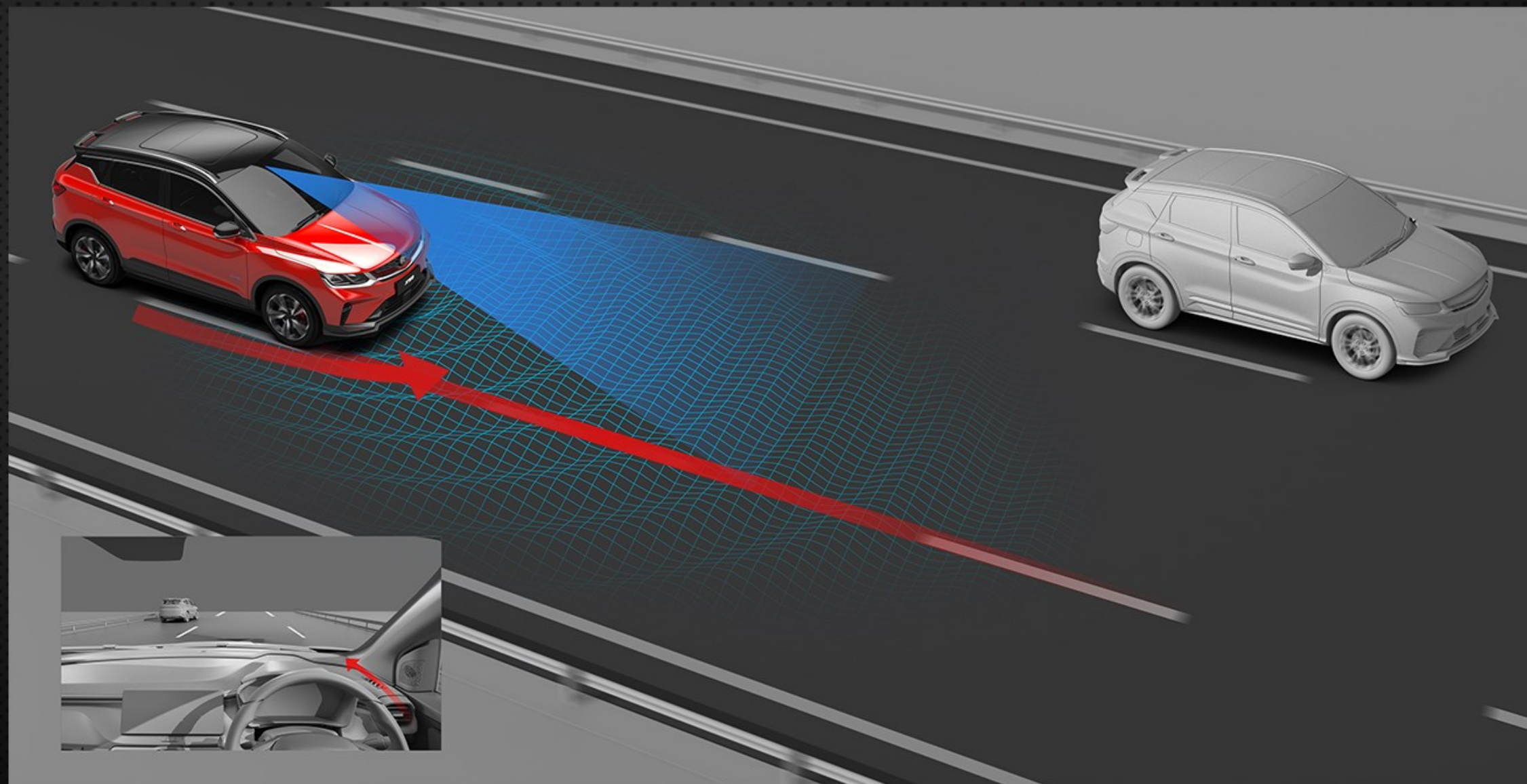
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LANE KEEP ASSIST



- This feature can help return to your lane if you drift out. This could help prevent a crash.
- System relies on painted lane markings to operate. Turning your wheel will override this feature after it activates.

- Combination of Lane Departure Warning and Lane Departure Prevention
- The system actively controls the vehicle to return to the lane through EPS torque control



- Proactively correct the direction and keep driving within the lane line (>60km/h)

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ADAPTIVE CRUISE CONTROL



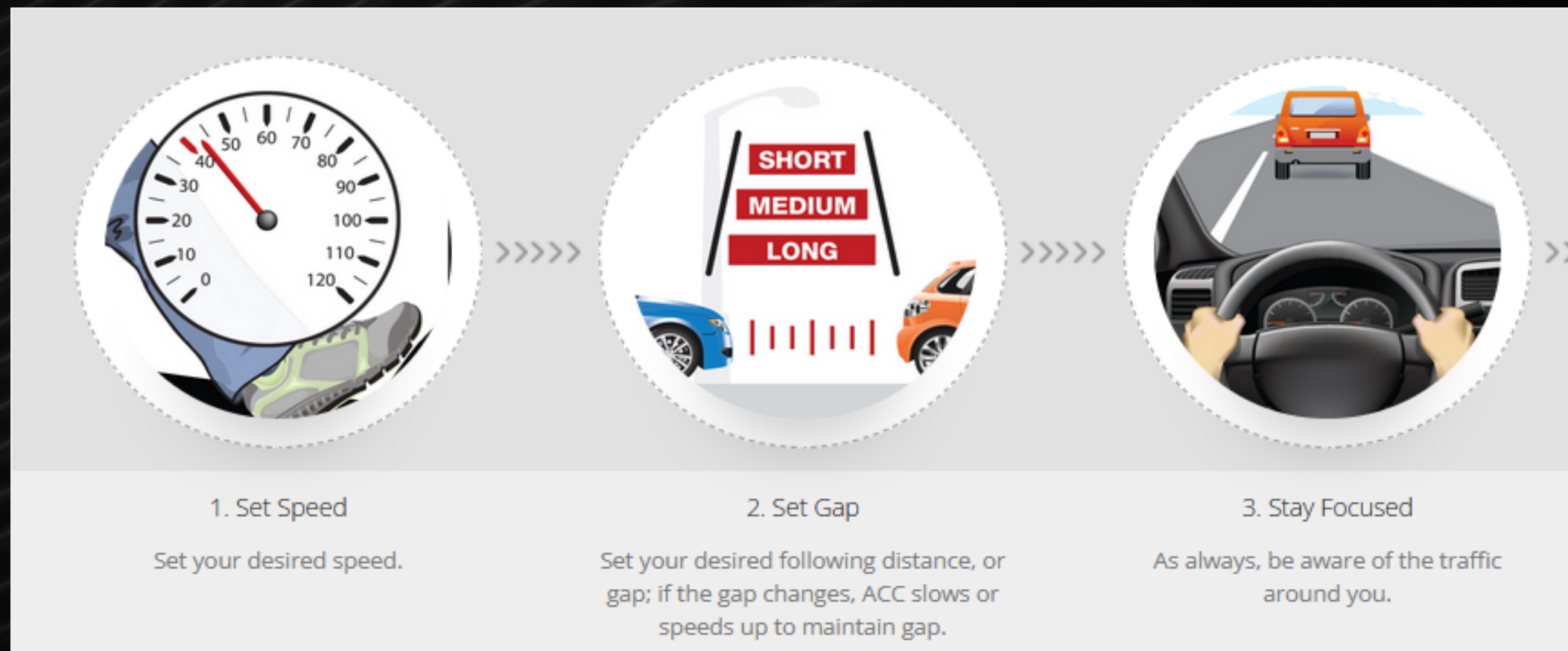
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- Automatically speeds up and slows down your car to keep a set following distance relative to the car ahead. Provides some braking.
- X50 comes with stop and go function



It can maintain a constant distance from the front vehicle by detecting the distance from it in real-time.



Feature Highlights:

- Working Speed Range: 30 - 150km/h; detecting distance of 160m
- 3 adjustable time intervals from the front vehicle: 1s, 1.5s, and 1.9s

- Proactively correct the direction and keep driving within the lane line (>60km/h)

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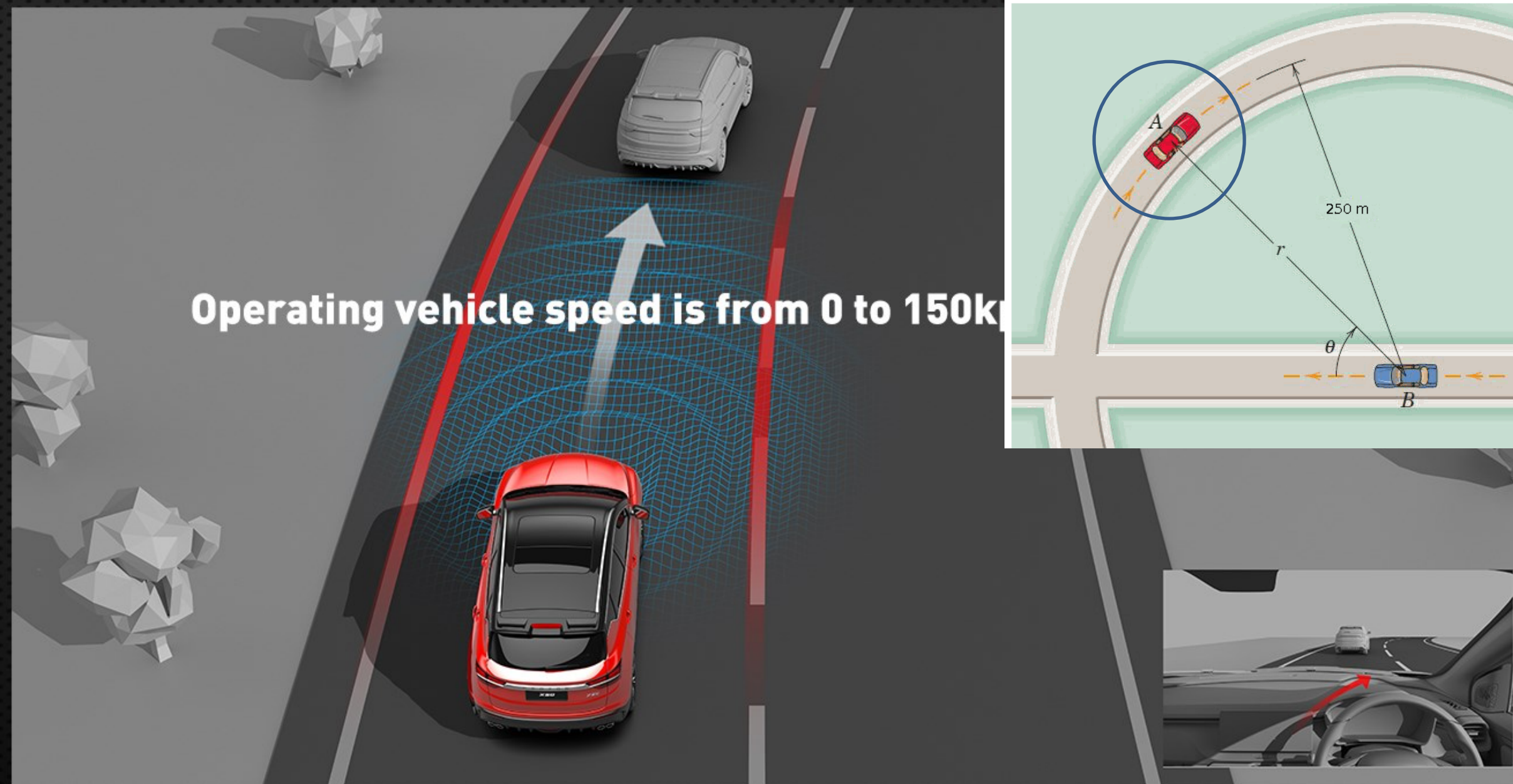
INTELLIGENT CRUISE CONTROL



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- Works with ACC to provide steering assistance to keep your vehicle in the center of the lane.

- Longitudinal control by ACC
- Lateral control by LKA and lane centering
- Audio visual warning activated if driver hands-off detected



*Auto steering is only function with the radius of the corner which is greater than 250m

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PROTON

**'DRIVING ASSISTANCE
& CONVENIENCE'**

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DRIVING ASSISTANCE & CONVENIENCE



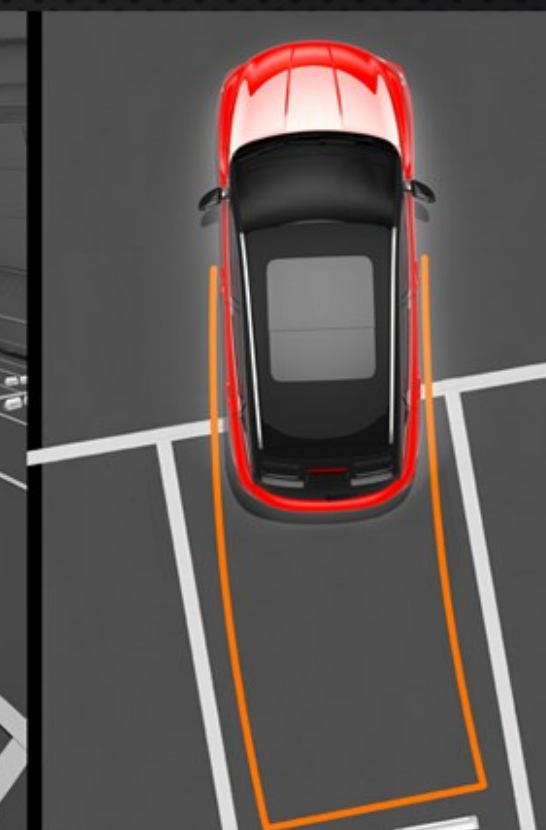
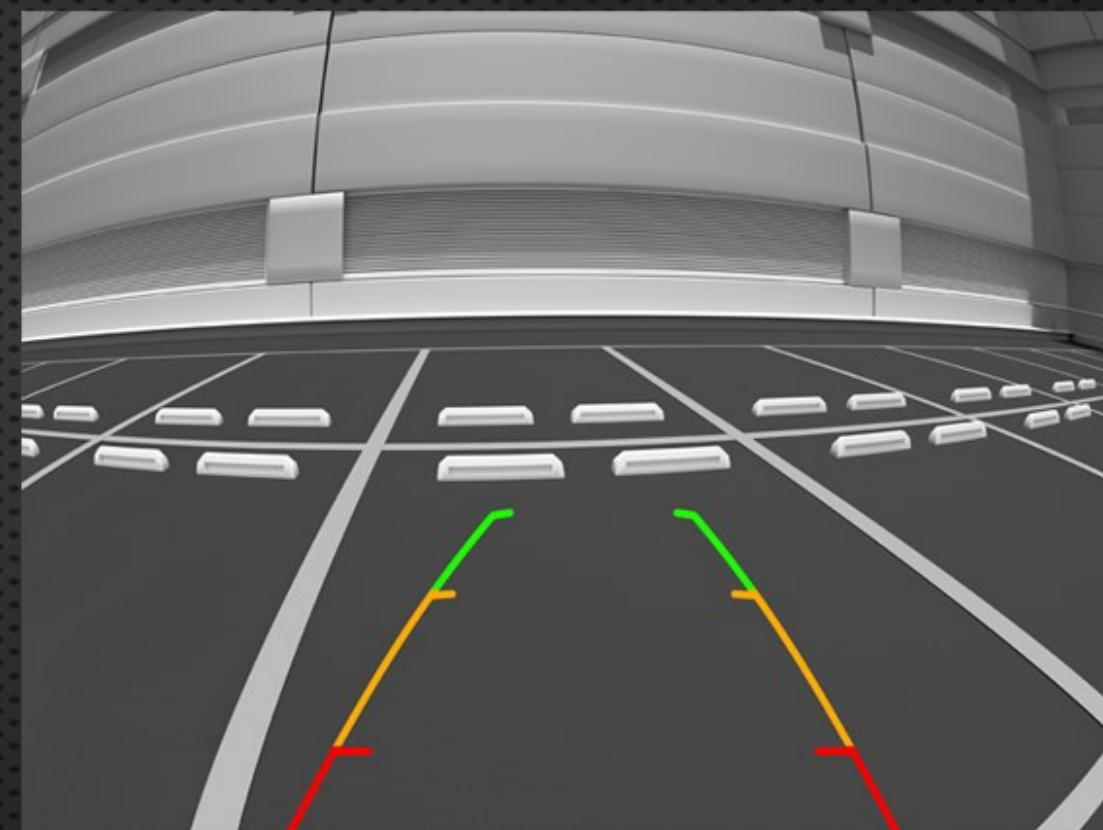
PROTON



- **Tyre Pressure Monitoring System**
Monitors real-time tyre pressure and temperature to provide peace of mind

Feature Highlights:

- Real-time dual monitoring of tyre pressure and temperature
- Warning on pressure >300kpa (43 psi) or <165kpa (24 psi)



- **360 Camera**
4 cameras surrounding the car to provide 360 field of view for parking convenience

Activate at 30km/h and below

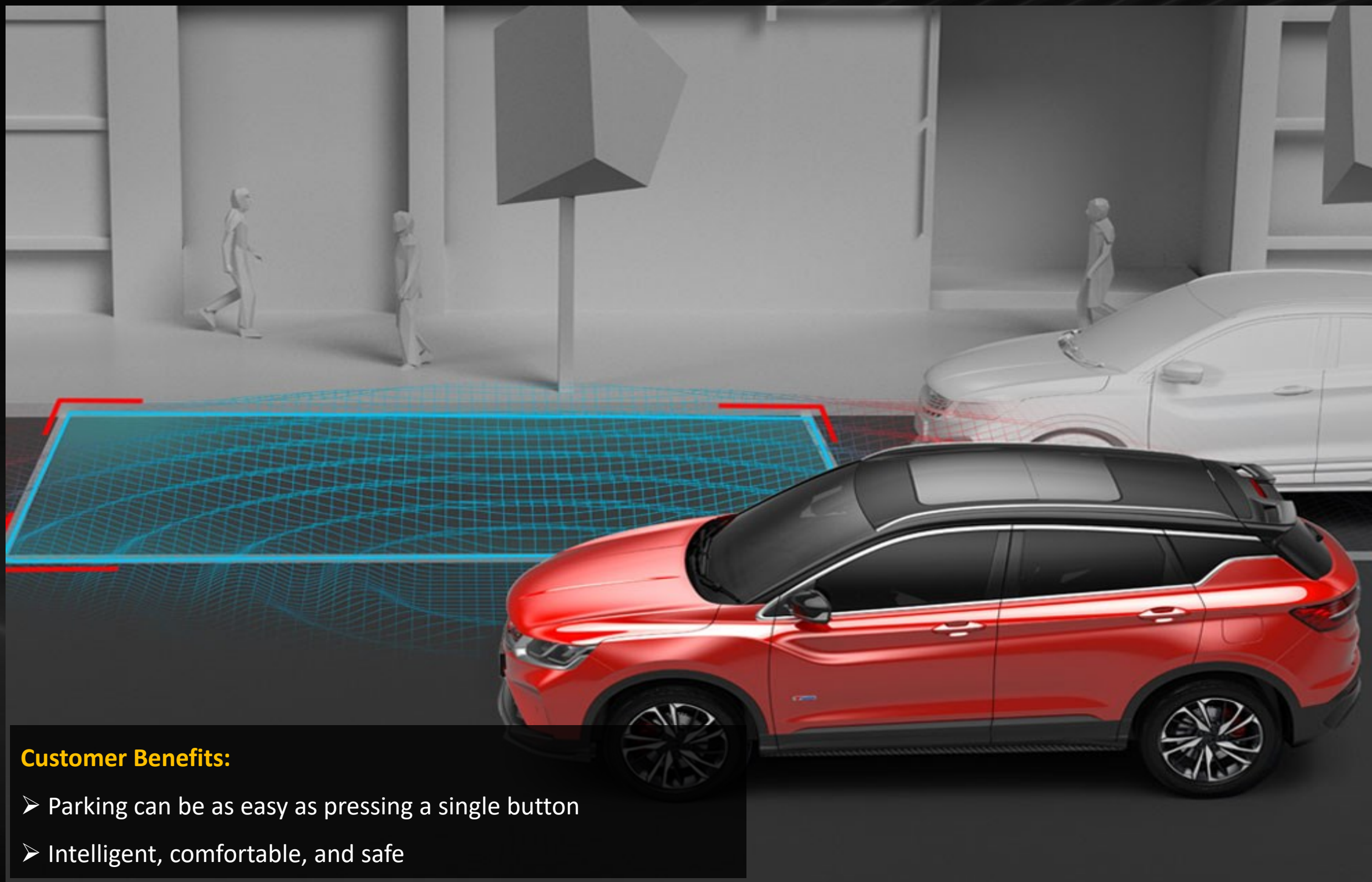
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DRIVING ASSISTANCE & CONVENIENCE



PROTON



Customer Benefits:

- Parking can be as easy as pressing a single button
- Intelligent, comfortable, and safe



Feature Highlights:

- 1 push button parking
- 3 parking modes
- Fully auto parking

Feature Not Function:

- Speed limit > 30 km/h
- Not fasten seatbelt
- Door was ajar
- Space not enough min. 1 meter
- ICC is on mode

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