

Nissan's vision for the future of EVs and autonomous driving

At the Tokyo Motor Show 2015, Nissan unveiled a concept vehicle that embodies its vision of the future of autonomous driving and zero emission electric vehicles (EVs): the Nissan IDS Concept.



Presenting at the show, Nissan president and CEO Carlos Ghosn said: "Nissan's forthcoming technologies will revolutionise the relationship between car and driver, and future mobility."

After leading the development and expansion of EV technology, Nissan once again stands at the forefront of automotive technology. By integrating advanced vehicle control and safety technologies with cutting-edge artificial intelligence (AI), Nissan is among the leaders developing practical, real-world applications of autonomous drive technology.

In August 2013, Ghosn said that by 2020 Nissan plans to equip innovative autonomous drive technology on multiple vehicles. Progress is well on track to achieve this goal.

Next-generation vehicles

Nissan Intelligent Driving is Nissan's concept of autonomous drive technology and represents what Nissan believes next-generation vehicles should be. "Nissan Intelligent Driving improves a driver's ability to see, think and react. It compensates for human error, which causes more than 90 percent of all car accidents. As a result, time spent behind the wheel is safer, cleaner, more efficient and more fun," continued Ghosn.

The Nissan IDS experience

Some have compared a future with autonomous drive to living in a world of conveyer belts that simply ferry people from point A to B, but the Nissan IDS Concept promises a very different vision of tomorrow. Even when the driver selects Piloted Drive and turns over driving to the vehicle, the car's performance - from accelerating to braking to cornering-imitates the driver's own style and preferences.

In Manual Drive mode, the driver has control. The linear acceleration and cornering are pure and exhilarating. Yet behind the scenes, the Nissan IDS Concept continues to provide assistance. Sensors continually monitor conditions and assistance is available even while the driver is in control. In the event of imminent danger, Nissan IDS Concept will assist the driver in taking evasive action.

In addition to learning, the Nissan IDS Concept's AI communicates like an attentive partner. From information concerning traffic conditions, the driver's schedule to personal interests, Nissan IDS Concept's AI has what is needed to help create a driving experience that is comfortable, enjoyable and safe.

Design - Together, we ride

"A key point behind the Nissan IDS Concept is communication. For autonomous drive to become reality, as a society we have to consider not only communication between car and driver but also between cars and people. The Nissan IDS Concept's design embodies Nissan's vision of autonomous drive as expressed in the phrase together, we ride," says Mitsunori Morita, Design Director.

Two interiors enable two ways for the driver to enjoy the experience.

Together, we ride is clearly demonstrated in the interior design. "The Nissan IDS Concept has different interiors depending on whether the driver opts for Piloted Drive or Manual Drive. This was something that we thought was absolutely necessary to express our idea of autonomous drive," says Morita.

Even though it is a hatchback, the Nissan IDS Concept's long wheelbase enables comfortable seating space for four adults. But the cabin becomes even more spacious when the driver selects Piloted Drive. In this mode, the steering wheel recedes into the center of the instrument panel and a large flat screen comes out. Various driving-related operations are handled by AI, voice and gestures from the driver. The interior, which is comprised of natural materials such as mesh leather, is illuminated by soft light. All four seats rotate slightly inward, facilitating easier conversation. It's like relaxing in a living room.

When the driver selects Manual Drive, the roomy interior transforms to put the driver in control. All seats face forward. The steering wheel, which takes styling cues from reins for horse riding, appears along with driving meters and a heads-up display that shows route and other driving information. Interior lighting switches to blue, stimulating the ability to concentrate. Nissan's use of hollow-structure A-pillars helps ensure excellent visibility by reducing blind spots and also contributes to the feeling of open space.

"In every situation, it is about giving the driver more choices and greater control. And the driver will remain the focus of our technology development efforts," Ghosn said at the show.

The transformation to Manual Drive can be carried out with ease through a switch between the front seats called the PD Commander. This is the only control the driver can physically operate when the car is in Piloted Drive: when the driver is ready to take over driving, a physical action should initiate the change.

Communication that creates confidence and harmony

For autonomous drive to be widely accepted, people need to fully trust the technology. Through its innovative communication capabilities, the Nissan IDS Concept promotes confidence and a sense of harmony for those outside the car as well. Various exterior lights and displays convey to pedestrians and others the car's awareness of its surroundings and signals its intentions. The car's silver side body line, for example, is actually an LED that Nissan calls the Intention Indicator. When pedestrians or cyclists are nearby, the strip shines red, signaling that the car is aware of them. Another electronic display, which faces outside from the instrument panel, can flash messages such as "After you" to pedestrians. This natural, harmonious system of communication signals a new future with cars.

Advanced aerodynamic performance for greater driving range

Design Director Mitsunori Morita says: "By the time Nissan Intelligent Driving technology is available on production cars, EVs will be able to go great distances on a single charge. Getting to this point will, of course, require the further evolution of batteries, but aerodynamic performance is also very important. We incorporated our most advanced aerodynamic technology in the design of the Nissan IDS Concept."

The height of the full carbon fiber body was constrained to 1,380 mm, sharply minimising aerodynamic drag (Cd). Positioning the tires close to the corners of the body maximises interior space while enabling a wrap-around cabin design. Nissan selected large-diameter wheels for high-performance and sportiness, but used very thin 175-size tires to minimise air and roll resistance. The wheels have a layered design suggestive of thin fins that create tiny vortexes of air flow on the wheel's surface. This design further contributes to smooth air flow.

The icicle pattern on the Nissan IDS Concept's grille symbolises a pure and clean design - perfect for an EV. Shaped like a stack of ice blocks, the grille pattern appears transparent. The car's bluish satin silver body color heightens the impression of a comfortable and secure cabin space.

Highly evolved EV technology for long-distance driving

At Nissan's annual shareholders meeting in June, Executive Vice President Hideyuki Sakamoto said: "Our zero emission strategy centers on EVs. We are pursuing improved electric powertrain technologies, such as motors, batteries and inverters, which will enable us to mass produce and market EVs that equal or surpass the convenience of gasoline-powered cars."

The Nissan IDS Concept is fitted with a high-capacity 60 kWh battery, and thanks to its outstanding aerodynamics, low stance, flowing form and reduced weight due to its full-carbon-fiber body, the vehicle is designed to also meet the need to drive long distances. Other technologies on the Nissan IDS Concept include Piloted Park that can be operated by smartphone or tablet, and wireless charging technologies. Through these, the driver can leave parking and charging to the car.

Nissan's targets - Zero traffic fatalities and zero emissions

In order for our car-based society to be sustainable, complex issues ranging from sustainable energy supplies to climate change, air pollution and traffic safety must be addressed. At Nissan, we have set zero fatalities and zero emissions as aspirational targets in our mission to help create a sustainable car-based society.

Over 90% of traffic accidents are caused by human error. Nissan IDS Concept's extensive system of sensors and AI are designed to provide enhanced safety performance compared to a human driver. This technology brings us a step closer to the goal of zero traffic fatalities.

EVs produce no CO₂ emissions and their batteries can store energy from renewable sources and turn it into electricity for homes and buildings. As the number of EVs increases, entire communities will be able to harness their power as part of a sustainable energy plan. Then, as EVs come to play a central role in energy supply, we will come that much closer to becoming a zero-emission society.

Nissan believes that the Nissan IDS Concept will evolve into a leading innovation for next generation mobility and our quest for making these "two zeroes" a reality.

Featuring Nissan's most advanced safety, driving-control and EV technology - all taken to a new level by AI - the Nissan IDS Concept is a compelling showcase of a promising future.

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