

TRAFFIC SAFETY

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Traffic Safety Policies and Philosophy

convenience and the pleasure of driving. In recent years, the automotive industry has made significant advances, particularly in autonomous driving technologies and driver-support solutions. The world is also undergoing major structural shifts due to aging populations and the rapid progression of urbanization. Technological innovation in the automotive sector is expected to help realize societies with less urban traffic congestion and more ways for senior citizens to move about safely.

Nissan designs and engineers cars that embody the pleasure and richness of driving while prioritizing a high level of safety. More than 90% of traffic accidents are caused by human error. Our goal is "zero fatalities": reducing the number of deaths from accidents involving Nissan vehicles to virtually zero. To this end, we continue working to enhance the safety of our vehicles, partly through the development and adoption of autonomous driving technologies. We also conduct a wide range of other activities to help build a safer and more pleasant mobility society, including educational initiatives to raise safety awareness among drivers, pedestrians and others in the community.

Traffic Safety Management

Nissan's goal of "zero fatalities" means aiming for virtually no fatalities due to traffic accidents involving Nissan vehicles. Since 2004, our R&D department has been striving to develop technologies based on our unique Safety Shield concept of "vehicles that help protect people". Many different types of Nissan vehicles are already equipped with the results of this work, including technologies to help prevent collisions or reduce the damage when a collision is unavoidable. Today, we are working toward the implementation of autonomous driving as the next advancement among our safety technologies and driver-assist features.

To help people gain a better understanding of traffic safety, we are committed to educational activities to boost safety awareness and support activities to improve drivers' skills.

We are working alongside government and municipal authorities, universities and other companies to help realize a safer and more pleasant mobility society.

The automobile has transformed people's lives, bringing mobility,

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Goal of Nissan's Activities to Improve Traffic Safety

Nissan's approach to safety is focused on the real world and aims to help create a society with virtually zero avoidable traffic accidents. In 2020, there were 2,839 fatalities in Japan caused by traffic accidents. While this is 376 fewer than in 2019, there are still more than 2,000 deaths per year due to traffic accidents. According to the World Health Organization (WHO), approximately 1.35 million people die each year in traffic accidents globally. Unless significant steps are taken, traffic accidents could become the seventh leading cause of death worldwide by 2030.

We set the target of reducing the number of fatalities involving Nissan vehicles to half their 1995 level by 2015, and worked toward achieving the high target of halving this number once again in Japan, the U.S. and the U.K. by 2020. We reached this target in Japan, but additional activities are necessary in the U.S. and the the U.K. Nissan's ultimate goal is a world with virtually no fatalities resulting from traffic accidents and we will continue implementing activities to help achieve this goal.

Nissan's ultimate goal: Virtually zero fatalities involving Nissan vehicles

To help reduce traffic accidents and achieve this zero-fatality goal, it will be necessary to develop and deploy effective safety technologies in as many vehicles as possible. Comprehensive efforts are needed, encompassing individuals and the driving environment as well. We take a triple-layered approach, targeting vehicles, individuals and society to contribute to the creation of a truly safe automobile society.

Nissan's approach:

A triple-layered approach, targeting vehicles, individuals and society



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Traffic Safety Achievements

Vehicles: Developing Safety Technologies

To promote safe and enjoyable driving, as well as ensuring that all our brands comply with laws and regulations addressing automobile safety, Nissan is working to develop automotive technologies that can help minimize risk to vehicle occupants to the extent possible based on its unique Safety Shield concept.

Our Safety Shield concept divides the conditions surrounding a vehicle into the six phases of "risk has not yet appeared", "risk has appeared", "crash may occur", "crash is unavoidable", "crash", and "post-crash," and guides the development of various technologies in which the vehicle can help protect people in each phase. This concept is the basis of our efforts to develop safety technologies.

Enhancements to Nissan's Safety Technology and External Ratings Received

In January 2015, we expanded Intelligent Emergency Braking to more models. By the end of fiscal 2015, the technology was available on nearly all vehicle categories sold in Japan, including electric vehicles and commercial vehicles, and standard on all major models. In North America, it is now available on nearly all models and standard on several models including the Pathfinder, Altima and Rogue. In Europe, it is available on the Juke, X-Trail, Qashqai, Micra and other key models.

Our vehicles have earned high safety ratings on many public and governmental tests held in various regions. In particular in Japan, from fiscal 2020 JNCAP*1 has introduced a comprehensive assessment in its "Car Safety Performance 2020" evaluations encompassing the three criteria of collision performance ratings, preventative safety performance ratings, and automatic accident emergency call devices. To receive the highest score of five stars, high scores must be achieved in each criteria (automatic accident emergency call devices is, fitment requirement). In the overall ratings, the Nissan DAYZ was the only "kei" minicar to receive five stars, a testament to its overall high safety. Furthermore, a certification system for advanced safety technology was launched by the Ministry of Land, Infrastructure, Transport and Tourism in fiscal 2018. In fiscal 2020, the scope of cars and devices subject to this system was expanded and 9 models and 25 types equipped with intelligent emergency braking and pedal misapplication prevention devices (Nissan DAYZ, Nissan ROOX, Note, Serena, Nissan LEAF, March, Clipper series) were approved.

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Major External Safety Ratings (Based on 2020 Assessments)

Regions	External Assessments	Models	Rating
lanan	JNCAP*1	Nissan DAYZ	5★
Japan	Car Safety Performance 2020	Nissan Kicks	4★
		Nissan LEAF, Nissan LEAF Plus,Murano, Altima, Maxima, Sentra,Versa, Rogue Sport	5★ Overall Rating (2021 model year)
U.S.	NCAF 2	INFINITI QX80, Frontier (Crew Cab), TITAN (Crew Cab), Rogue, Nissan Kicks	4★ Overall Rating (2021 model year)
	1110*3	Maxima, Altima, Rogue, Murano	2021 Top Safety Pick+
		Sentra	2021 Top Safety Pick
China	C-NCAP	Altima(Chinese name Teana)	5★

*1 JNCAP: The Japan New Car Assessment Program. An automobile assessment program run by the Ministry of Land, Infrastructure, Transport and Tourism and the National Agency for Automotive Safety and Victims' Aid (NASVA).

*2 NCAP: The U.S. National Highway Traffic Safety Administration's New Car Assessment Program.

*3 IIHS: The U.S. Insurance Institute for Highway Safety.

Aiming for Virtually Collision-Free Cars

Our Safety Shield concept supports the safety of vehicle occupants in a variety of scenarios from a comprehensive perspective, from accident prevention and avoidance to occupant protection.

For example, during normal driving or parking, sensors and cameras can monitor vehicles and pedestrians that may be difficult for drivers to see; this supports drivers and allows them to drive with peace of mind. In times of potential danger, the vehicle can judge in an instant how to help avoid or lessen the danger.

We have set ourselves the goal of providing optimal mobility worldwide. We are committed as an automobile manufacturer to swift and widespread popularization of our safety technologies.



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Risk has not yet appeared ProPILOT/ProPILOT Assist ProPILOT Park Intelligent Distance Control Navigation-enabled Intelligent Cruise control with full- speed range following capability Adaptive Front-Lighting System (AFS) Intelligent Around View Monitor Intelligent Rear View Mirror	Helps the driver drive with peace of mind
Risk has appeared Intelligent Forward Collision Warning Lane Departure Warning Intelligent Lane Intervention Blind Spot Warning Intelligent Blind Spot Intervention Intelligent Back-up Intervention Intelligent Driver Alertness Rear Cross Traffic Alert	Helps the driver avoid or lessen the severity of an accident
Crash may occur Intelligent Emergency Braking Anti-lock Braking System (ABS) Vehicle Dynamics Control (VDC) Emergency Brake for Pedal Misapplication	
Crash is unavoidable ■Front Pre-Crash Seatbelts	
Crash Zone Body Construction SRS Airbag Systems Pop Up Engine Hood	Helps reduce injuries when a collision is unavoidable
Post-crash ■Automated Airbag-Linked Hazard Lamps ■SOS Call (HELPNET)	

Latest Safety Technologies*

*All terminology and functionality as seen in the Japan market.

Risk has not yet appeared

ProPILOT/ProPILOT Assist

ProPILOT/ProPILOT Assist is a driver assistance system that can help speed control, lane centering and brake assist functionalities. ProPILOT 2.0/ ProPILOT Assist 2.0 offers a wide range of support for drivers traveling on a multi-lane highway by setting their destination in the navigation system to set a predefined travel route, such as hands-off driving while cruising in a given lane and lane changes for passing and branching off. The new ProPILOT2.0 also enables hands-off driving while cruising in a given lane. When the vehicle approaches a road divide, or when passing a slower vehicle is possible, the system judges the appropriate timing of branching off or passing based on information from the navigation system and 360-degree sensing. Intuitive audio and visual guidance is given to the driver, who is prompted to put both hands on the steering wheel and confirm the start of these operations with a switch.

ProPILOT Parking

Steering, acceleration, braking, shifting, and the parking brake can be controlled automatically by the system and assist the driver until parking is completed. Drivers are able to choose the parking style from among rearfacing, forward, and parallel parking depending on the scene.

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Intelligent Around View Monitor (with Moving Object Detection Function)

The system displays a bird's-eye view of the vehicle which shows the vehicle and parking space orientation and aids the driver in smooth parking. The system can also detect moving objects around the vehicle and warn the driver of detected objects to help support safe maneuvers when parking or departing from a parking space.

Intelligent Rearview Mirror

When the switch is turned on, the Intelligent Rearview Mirror shows the view through a rear-mounted camera, helping provide clear rearward visibility. Any cargo or vehicle occupants inside the vehicle do not impede the mirror's rearward view. Additionally, the sensitivity of the camera can be increased at night or in other low-light conditions, providing the driver with a clear rearward view in a variety of circumstances.

Risk has appeared

Lane Departure Warning (LDW) / Intelligent LI (Intelligent Lane Intervention)

LDW can alert the driver with a warning display in the instrument panel and an audible alarm if the vehicle is likely to move out of the lane. In addition, the intelligent LI generates a force to help bring the vehicle back toward the center of the lane for a short period of time, helping the driver to move the vehicle back into the lane.

Blind Spot Warning (BSW)

When the system detects a vehicle driving in an adjacent lane approaching

the rear of the driver's vehicle, it alerts the presence of this vehicle to the driver. When the driver has the turn signal indicator on, visual and audible warnings are provided.

Intelligent Blind Spot Intervention (I-BSI)

When the system detects a vehicle driving in an adjacent lane approaching the rear of the driver's vehicle - a common blind spot area, it notifies the driver with an indicator light. If the driver then begins to change lanes, the system warns the driver while applying slight braking force to help avoid a collision with the vehicle in the adjacent lane.

Intelligent Driver Alertness (Erratic Steering Warning)

While driving at a high speed (60kph/37mph or higher), a visual warning in the meter display and an audible signal urge the driver to take a break when this system detects via the driver's steering activity that driver alertness may be reduced.

Rear Cross Traffic Alert (RCTA)

This system warns the driver with an audible alert when there is risk of collision with a detected vehicle crossing the rearward direction of the reversing vehicle.

Crash may occur

Intelligent Emergency Braking

When the front-mounted camera detects a vehicle or pedestrian ahead and the risk of collision increases, visual warnings appear in the meter display and an audible signal warns the driver to take appropriate action. If the driver

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does not reduce speed appropriately, braking is applied to help avoid or reduce the severity of a frontal collision.

Emergency Assist for Pedal Misapplication

This technology uses sonar to detect walls and other obstacles in the direction of travel. For example, when the accelerator pedal is depressed too strongly or the system determines that there is a risk of collision, audio and visual warnings alert the driver as the system reduces engine or motor output and brakes to prevent or reduce the severity of a collision. According to our accident analysis, pedal misapplication is not restricted to parking lots and similar spaces but also often occurs on the road. Our latest system can support the driver in a wider range of situations in that it can detect vehicles and pedestrians with a front-mounted camera installed in the upper portion of the windshield when traveling at speeds of up to 25 km/h.

Dissemination of Advanced Driver Assistance Technologies: ProPILOT/ ProPILOT Assist

ProPILOT/ProPILOT Assist was originally brought to market in 2016. In September 2019, ProPILOT2.0/ProPILOT Assist2.0 was equipped as standard in the all-new Nissan Skyline hybrid. The technology is highly acclaimed, winning Best Innovation Award in the 2019-2020 Japan Car of the Year awards and the RJC Technology of the Year at the RJC Car of the Year awards. Going forward, the technology will be introduced in a growing number of models, including the electric SUV ARIYA. We are progressively deploying ProPILOT/ ProPILOT Assist globally in a wider range of vehicle types. So far, in Japan, has been available in the

Serena, Nissan LEAF, X-Trail, Nissan Kicks, and Note. In the U.S. and

Canada, ProPILOT/ ProPILOT Assist is available in the INFINITI QX50, Rogue, Rogue Sports, Altima, and Nissan LEAF. In Europe, it is available in the Nissan LEAF, Qashqai, X-Trail and Nissan Juke. And in China, it is offered on the Altima, X-Trail, Qashqai and INFINITI QX50. The new Nissan DAYZ, was the first "kei" vehicle to offer this feature and its now also offered in the Nissan ROOX, and in total, more than 1,110,000 vehicles equipped with ProPILOT/ ProPILOT Assist have been sold as of the end of March 2021. We intend to deploy the technology in 20 models for sale in 20 markets by the end of fiscal 2023, when the number of ProPILOT/ ProPILOT Assist-equipped vehicles sold annually is expected to reach 1.5 million.

From Preventive Safety to Autonomous Driving

We are enhancing our preventive safety technologies to support the four basic steps in avoiding accidents: sensing, cognition, judgment and action. Today we are developing autonomous driving technologies as the next step in our approach to driving safety. We believe that autonomous driving could help reduce traffic accident - more than 90% of which have human error as a contributing factor - and help realize a society with virtually no traffic accidents.

Autonomous driving vehicles equipped with millimeter-wave radar, laser scanners and cameras continually monitor their surroundings in every direction. If they approach other vehicles or objects, artificial intelligence selects the appropriate action based on the information stored in its knowledge database. The goal is an autonomous driving vehicle that can correctly assess the situation, make decisions and drive safely even in complex traffic environments, such as crossroads with no traffic lights or when passing parked vehicles.

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Nissan implements field-testing of autonomous driving on a global basis. In 2019 the U.K. Human Drive Project, an autonomous driving vehicle ran for 370km over the wide-ranging and unique driving environment in the U.K. including suburban roads, highways and city streets.

In a society facing issues including aging populations and urban congestion, autonomous driving technologies may one day be able to help reduce traffic accidents, providing peace of mind to drivers and increased mobility to the rapidly growing number of senior citizens. We believe that autonomous driving technologies are a major breakthrough offering new mobility value. We are proactively developing these technologies and working to bring them to market.

Nissan's Traffic Safety Activities: Involving People

To create a better mobility society, it is important for as many people as possible to share an understanding of traffic safety, from drivers and vehicle occupants to pedestrians. We take part in educational activities to help boost this safety awareness, including measures to improve driving skills and a range of other safety promotions.

Initiatives in Japan

Traffic accidents are statistically more likely to occur during the dusk hours from 4:00 to 6:00 p.m. As part of the Hello Safety Campaign, Nissan's Omoiyari Light Promotion urges drivers to turn on their headlights earlier in the evening. We have been involved in this campaign since 2010 and promote civic activities with two-way communication to raise public awareness of traffic safety.

Furthermore, we launched a traffic safety project* in 2018 together with a research department in Niigata University. One of the outcomes from these efforts is the "Wheel Spinning (Guru-Guru) Exercise", developed in March 2020, which promotes and encourages safe driving among senior drivers. Furthermore, in March 2021, in collaboration with Niigata University, Kitasato University and Sagami Women's University, we established a virtual laboratory called the Traffic Safety Future Creation Lab. We are engaged in a wide range of activities with the aim of realizing a mobile society with zero traffic fatalities, that embraces diversity and leaves no one behind. We stand by the members of society who are at a social disadvantage including in the area of transportation, such as small children,

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the elderly, foreign visitors and those cut off from public transportation because of depopulation.

* Traffic Safety Project

ToLiTon (Town, Life and Transportation) Safety Initiative

This project was named to promote proposals to town, life, and transportation that are not bound by past conventions

Omoiyari Light Promotion

On November 10, designated "Day of Good Lighting", we supported people in nine regions in taking the initiative to encourage drivers to turn on their headlights before dark. In addition, the TRY-LIGHT ONLINE forum was held on December, 2020 to promote safety in a fun way befitting the Omoiyari Light Promotion. Participants in the forum nationwide had discussions

including journalists. This event was a great opportunity to promote horizontal connections and further enhance activities. This event was also streamed, and we received comments from viewers in support of the movement.

Throughout the year, the Global Headquarters Gallery hosts daily presentations at dusk about the Omoiyari Light Promotion during which Nissan's "Miss Fairlady" PR staff members hold up signboards





Nationwide voluntary participation in the campaign to turn on headlights

encouraging drivers to turn on their headlights. By urging greater awareness of, and action on, safety among corporations, nonprofit organizations, car-lovers and other stakeholders, these activities have helped our Omoiyari Light Promotion steadily



TRY-LIGHT ONLINE forum

gain broad acceptance among the public.

Traffic Safety Future Creation Lab

by elderly drivers, which has become a major social problem. Previous research has shown that driving errors are related to a decline in cognitive ability and basic physical functions such as muscle strength and vision. The laboratory will take on the challenges of accurately understanding this relationship, tracing these declines back to lifestyle, culture, and community, and using the results of this research to create traffic safety solutions that will allow elderly drivers to drive safely and in good health for a long time. Therefore, the researchers who will participate in the laboratory will come from a wide range of fields such as biomedical engineering, medicine and hygiene, lifestyle and apparel design, and social design, and we will find a wide range of partners such as local governments, medical institutions, educational institutions, and community development organizations. This

The laboratory will prioritize reducing the number of traffic accidents caused

approach of integrating various fields of expertise, regions, and generations known as the "diversified innovational method" is one of the characteristics of this laboratory.

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Researchers are already working on research themes that are currently being planned. In addition, the laboratory will work to disseminate the "Wheel Spinning (Guru-Guru) Exercise" co-developed by Nissan and Niigata University nationwide.





Measuring driving characteristics with an actual car Measuring visual functions with a driving simulator

Society: Working Together with Society

We believe we can help create an even safer mobility society by using information from the traffic environment surrounding vehicles on the road. In collaboration with a wide range of governmental agencies, local authorities, and companies, we are participating in various projects aimed at realizing a safer, more pleasant mobility society for all.

Installation of SOS Call (HELPNET) Advanced Automated Reporting System

SOS Call (HELPNET), an advanced automatic accident reporting system that enables data and voice communication to a dedicated operator in case of emergencies such as a traffic accident, sudden illness, risk of an accident, tailgating and other forms of road rage, is now installed in the Nissan DAYZ, the first in minicar segment in Japan. We will be gradually expanding the number of models where the system is available. There are two types of notifications: automated notification when the airbag is triggered in a traffic accident, etc., and manual notification using the SOS call switch. After the call is made, a dedicated operator uses the information obtained from the vehicle to quickly contact the fire command center or the police, and supports the driver for example by arranging for ambulances.

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Applying NASA Technology to Develop AI for Autonomous Vehicles

To realize fully autonomous city driving, we are developing the Seamless Autonomous Mobility system (SAM). SAM will be able help cars safely navigate unforeseen situations like accidents, road construction and other obstacles. When autonomous decision-making is difficult, a remote operator draws up an ideal route to manage the situation and sends it to the vehicle for execution.

Field Operation Test of Smart city

On February 2, 2021, three local governments and eight companies, including Nissan, signed an "Agreement on Collaboration for Community Development Using New Mobility in the Hamadori Region of Fukushima Prefecture".

The purpose of this agreement is to work together with local residents for community development of the future with dreams and hopes, utilizing the resources, advanced technologies and know-how of each company, for the reconstruction from the Great East Japan Earthquake and the future community development of Namie Town, Futaba Town and Minami-Soma City. Specifically, the companies will collaborate in the areas of community revitalization and resilience, as well as the creation of mobility services that will provide a new means of transportation and low-carbon initiatives through the use of renewable energy, with the aim of realizing sustainable community development. The town of Namie conducted a field operation test, the "Namie Smart Mobility Challenge", using a shuttle service and other means of transportation using EVs, which are a completely new means of transportation, useful for business and tourism, and also friendly to the elderly and other "mobility disadvantaged" people. Shrinking access to public transportation due to depopulation and aging is a common issue in

Japan's regional cities. By providing new mobility services that are safe, secure, and convenient, we will work to help solve these issues and become a model case for better community development.

