

Making Safe Vehicles

Our Approach

Subaru Group believes that a car is more than just a means of transport, but rather a partner that enriches people's lives by understanding and meeting their expectations.

SUBARU's DNA comes from our origin as an aircraft manufacturer, and has a focus on people. We think about what is important to people who use cars, and develop products with the necessary functions and performance.

"Focus on people. Think about what is important to people who use cars. And create new value with cars." We believe that this is what SUBARU-ness means.

Having roots in the aircraft industry, we have, for more than half a century, consistently engaged in automotive manufacturing with maximum emphasis on safety performance, attaching particular importance to protecting lives in order to ensure that each and every one of our customers experiences "Enjoyment and Peace of Mind." In our pursuit of vehicle safety performance from all perspectives, we are honing our unique safety technologies in the four areas of Primary Safety, Active Safety, Preventive Safety, and Passive Safety, plus Connected Safety, based on SUBARU's overall safety philosophy, which focuses on delivering the world's highest standard of safety and peace of mind for all passengers. In the future, we will further evolve this intelligence and combine advanced sensing technologies with the judgment capability of AI, improving safety in all situations.

Our mid-term management vision "STEP" describes our efforts to enhance safety and peace of mind by setting a target of achieving zero fatal traffic accidents by 2030.^{*1} As such, we are engaged in the development of vehicles that will enable us to eliminate traffic accident deaths.

^{*1} Reducing to zero the number of fatal accidents occurring while a driver or passenger in a SUBARU vehicle and the number of fatalities among pedestrians, cyclists, and the like arising from collisions with a SUBARU vehicle.

Management System

In order to further accelerate its new technology development, including safety technology and electrification for making products more environmentally friendly, SUBARU has changed its development systems based on SUBARU's overall safety philosophy, which focuses on delivering the world's highest standard of safety and peace of mind for all passengers. In this change, it has pivoted from a system based on functional organizations (e.g. vehicle bodies and power units) to an organic combination along value and functional axes.

* For more details regarding SUBARU's car manufacturing systems, please see Environmentally Friendly Automobiles: Management System.

→ [Environmentally Friendly Automobiles: Management System](#)

Aiming for Zero Fatal Traffic Accidents by 2030

SUBARU has four safety areas. Primary Safety involves design that allows for a good field of vision and does not make the driver or passengers feel tired. Active Safety is controllability that allows a driver to avoid an obstacle that is in front of them, and to continue driving after avoiding it. Preventive Safety refers to pre-crash breaking, as represented by EyeSight. And Passive Safety involves damage mitigation to protect the driver and passengers in the event that an accident does occur. By polishing these four safety areas, we intend to achieve a low rate of fatal traffic accidents in the real world.

SUBARU's intention does not lie in changing everything automatic, but in "Respect what humans are good at and leave what humans are not good at to automobiles for safe transportation." With this idea, SUBARU has polished our driver assist technology.

Going forward, the evolution of Advanced Driver Assistance System (ADAS) will make it possible to slow down and avoid collisions in high-speed zones and on large bends, which is expected to be of further assistance in preventing and mitigating accidents. At the same time, we still face an issue that around 30% of fatal accidents primarily caused by the no-fault accidents are expected to remain under the current situation.

Facing these problems, SUBARU is aiming to achieve zero fatal traffic accidents by 2030 by applying our intelligence technologies in the fields of Primary Safety, Active Safety, Preventive Safety, and Passive Safety, plus Connected Safety.

Respect for
Human RightsQuality:
Automotive BusinessQuality:
Aerospace BusinessMaking Safe
VehiclesHuman
Resources

Customers

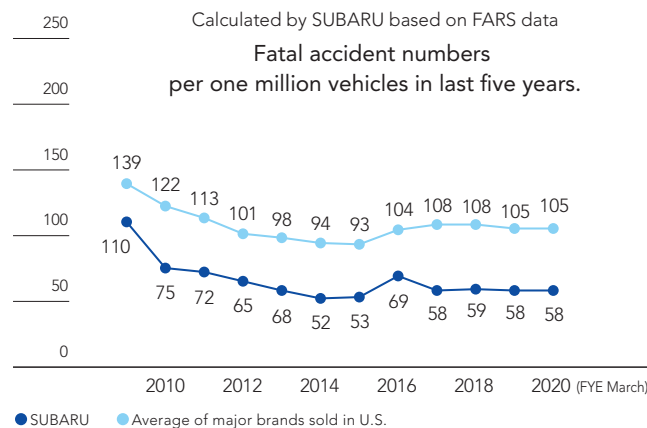
CSR
ProcurementCommunity
Engagement

Achieving a Low Rate of Fatal Traffic Accidents in the U.S. and Japan

From FYE March 2009 to FYE March 2020, we carried out an investigation on the number of fatal traffic accidents involving SUBARU cars sold in the U.S. and domestically in Japan. In the U.S., SUBARU cars have maintained a rate of fatal traffic accidents that is lower than the average for major selling brands in the U.S. for 12 consecutive years.*² Domestically in Japan, SUBARU cars also

Facts about Fatal Traffic Accidents in the U.S.

(Number of accidents)



Calculated by SUBARU based on FARS data
Fatal accident numbers per one million vehicles in last five years.
Average of 13 major brands sold in U.S., including SUBARU (excluding trucks and large SUVs)

show a rate of fatal traffic accidents that is lower than the average for domestic auto manufacturers for 12 consecutive years.

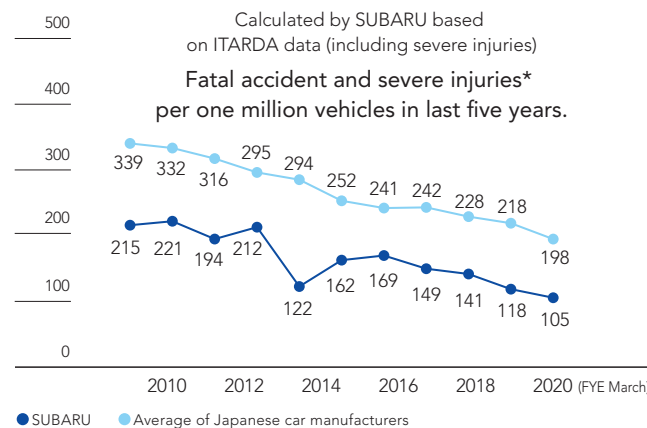
*² These calculations were made independently based on data from the Fatality Analysis Reporting System (FARS) of the U.S. and the Institute for Traffic Accident Research and Data Analysis (ITARDA) of Japan.

□ EyeSight for 2030 (Japanese version only)

→ Six Priority Areas for CSR: TOPICS 03 - Peace of Mind

Facts about Fatal Traffic Accidents in Japan

(Number of accidents)



Calculated by SUBARU based on ITARDA data (including severe injuries)
Fatal accident and severe injuries* per one million vehicles in last five years.
Average of 8 Japanese car manufacturers, including SUBARU (including light vehicles but not trucks)

* Fatal accidents: Incidences where the victim died within 24 hours of the initial event.
Severe injuries: Includes general cases of severe injury.

Initiatives

Primary Safety

SUBARU's predecessor was an aircraft manufacturer. With aircraft, it is necessary to pursue "accident-free vehicle" design, as even a slight error in operation or judgement can cause a severe accident. Inheriting the philosophy of safety, SUBARU focuses on the primary design such as surface and operation, thereby we pursue clear, useful and comfortable space where the driver can concentrate on driving easily.

■ Visibility Optimized for Every Condition

Early detection of danger can help avoid accidents. SUBARU has concentrated efforts on minimizing blind spots and improving visibility even under difficult conditions such as driving in rain or at night.

■ Optimal Driving Position

Optimal driving position allows drivers to move naturally, reducing fatigue and helping to improve safety and comfort while driving. It also helps the driver to steer the car precisely for taking evasive action when the risk of an accident occurs. SUBARU's cockpit is designed to be adjusted so that every driver can find their optimal driving position.

■ Intuitive Interface

Drivers can sometimes have a lapse in concentration when checking the navigation screen or adjusting the air conditioning. To prevent this from happening, SUBARU has designed an

interface layout that is easy to use. For example, the navigation screen is placed so that the driver does not need to shift their line of vision too far, while the air conditioning system and audio controls use switches that allow for intuitive operation so that drivers do not have to take their eyes off the road.

 [Technology: Primary Safety \(Japanese version only\)](#)

Active Safety

For SUBARU, “driving” means more than simply delivering enjoyment. It is an important factor in increasing safety.

To make it possible to avoid the situation safely if an accident occurs. To be able to drive safely in various weather conditions and road services, the same way as during normal conditions. SUBARU has fine-tuned all the basic functions of a vehicle—driving, turning and stopping—to develop vehicles that offer exceptional stability and predictable control in the most challenging conditions, which makes cars safer and more trustworthy.

■ Driving Stability

On the foundation of outstanding core performance, SUBARU tempers the body and suspension of its vehicles along with employing vehicle control devices that increase drivability, creating stable driving that provides peace of mind to drivers and passengers.

■ Traceability

Imagine being able to drive into a slippery corner on a snowy or rainy day without unpredictable car movement, turn exactly as intended through the corner, and head out of the corner smoothly. SUBARU includes a number of functions that make smooth cornering a reality.

■ Braking Performance

Braking performance is directly related to a car's safety, particularly its hazard avoidance capabilities. SUBARU goes beyond polishing such performance, also placing great focus on peace of mind. Brakes that provide peace of mind work as predicted every time. SUBARU repeatedly tests in all environments and on all road surfaces in our quest to deliver brakes that are easy to operate regardless of weather and that react quickly at the critical moment.

 [Technology: Active Safety \(Japanese version only\)](#)

Preventive Safety

Our ultimate goal is to eliminate traffic accidents. To achieve this goal, SUBARU has spent more than 20 years developing driver assistance systems. The inexpensive and highly practical EyeSight has become widespread in markets around the world, pioneering advanced safety technology. Last year, EyeSight was reborn to help aid our goal of zero fatal traffic accidents in 2030.

■ EyeSight Core Technology

We have revamped our stereo cameras at the core of EyeSight's driver assistance. In this upgraded system, viewing angles are wider and image recognition is improved, giving it better-than-ever capabilities to distinguish cars, pedestrians, road lines, and other elements while driving. Also, thanks to improved control performance, driving SUBARU cars is now smoother and safer than ever before. Furthermore, with these new stereo cameras as a core driver and combined with four radar sensors on the front and rear of the vehicle, plus rear sonar, our system can monitor the car's entire surroundings. This offers support to drivers in a greater variety of situations and a higher level of safety.

■ Collision Avoidance Support

Our next-generation EyeSight system greatly expands the usable scope of pre-crash braking. Now, it helps drivers avoid collisions at intersections with a high incidence of traffic accidents. It protects drivers and passengers in tense situations on the road, like oncoming vehicles, crossing pedestrians, or crossing bicycles during a turn, or vehicles approaching from the front. Approximately 40% of vehicle-to-vehicle accidents occur in situations like these. We believe our system will significantly mitigate these traffic accidents.

■ Reducing Operating Burden

SUBARU believes that reducing operating burden leads to greater safety.

In 2020, EyeSight X was born, an evolutionary advance from our EyeSight system. This new system combines high-precision 3D maps and satellite positional data to recognize road conditions well ahead of the vehicle, beyond the detection range of stereo cameras and radar. These high-precision 3D maps constitute an important element technology at the heart of next-generation driver assistance. SUBARU was one of the first among automotive companies to apply this technology and bring it to market. It helps reduce driver burden especially on long hauls, offering a luxurious touring experience. It does this through a variety of features, including speed control at optimal levels just before curves and toll booths, active lane change assistance, and assistance during traffic congestion, including hands-off and start-and-stop support.

■ Support for Safe Driving

We have introduced a new Driver Emergency Support System. If the driver's hands come off the steering wheel for a long time while Active Lane Keep is active, or when the system detects a distracted or drowsy driver while hands-off congestion driving assistance is active, it will warn the user. If the driver's hands stay off the steering wheel even after the warning, the system determines that an emergency situation is underway, activating hazard lights and the car horn to inform nearby vehicles of the situation and gradually slowing the vehicle to a stop.

■ Improving Visibility

We have created a digital Multi-View Monitor reducing the size of blind spots around the vehicle. By displaying high-resolution video on a 11.6-inch monitor, drivers are given clearer visual information in situations like when reversing, pulling over at a curb, and at intersections with poor visibility. We have improved the size and resolution for our digital Smart Rear-View Mirror, offering support for safer rear-view confirmation.

 [Technology: Preventive Safety \(Japanese version only\)](#)

Passive Safety

Since the time of "Subaru 360" when we launched mass production, SUBARU has positioned safety as one basic function that cars should have. Also, we have been performing our own original damage mitigation tests that include protecting pedestrians since the 1960s—a time before thinking regarding damage mitigation had yet to be fully instilled. SUBARU's damage mitigation functions take into consideration not only the driver and passengers, but also pedestrians. They have received high evaluations both in Japan and around the world.

■ New Ring-Shaped Reinforcement Frame

SUBARU has a uniquely safe body design. In the cabin, the pillar and frame combine to form a "cage." The purpose of this is to protect from deformation regardless of the angle from which the vehicle is struck. A relatively crushable zone is provided to disperse and absorb the shock of a powerful impact. This gives SUBARU vehicles high collision absorption performance against impacts from any direction.

■ Front-end/Rear-end Collisions

Even small components can become as deadly as weapons when receiving the powerful force of a collision. Based on that fact, SUBARU equips its vehicles with a horizontally-opposed engine, which has the advantage of being able to effectively absorb the energy from a collision. During a front-end collision, not only can it easily slip under the floor, but the frame that absorbs the shock can extend symmetrically as well as straight. Each component of the cabin is made of shock absorbing materials in order to protect lives.

■ Front-end/Offset Collision/Rollover

To protect the driver and passengers during a side collision, an extremely rigid side door beam is installed in the door. In addition to that, the new high-rigidity Ring-Shaped Reinforcement Frame protects the cabin space during a collision or rollover. Further, several kinds of airbags and energy absorption materials line the entire car, protecting every person inside the cabin.

■ Protecting Pedestrians

SUBARU strives to protect not only our drivers and passengers, but also pedestrians.

For example, our horizontally-opposed engines have a wide

energy absorption space between the front hood and engine unit. This reduces damage from being struck by the top of the hood, which is a highly probable head injury for pedestrians. Furthermore, our cars are designed to absorb the shock from components such as the hinge and hood stay. SUBARU's four safety areas, which take into consideration all forms of safety, can be found in all of our designs and initiatives, such as becoming the first Japanese automobile manufacturer to install Pedestrian Protection Airbags.

■ Safety Recognized around the World

SUBARU's damage mitigation features have received high evaluations in safety assessments from countries all around the world.

 [Technology: Passive Safety \(Japanese version only\)](#)

Connected Safety

We use connection technology and data based on SUBARU's four safety areas of Primary Safety, Active Safety, Preventive Safety, and Passive Safety, and develop new technologies and services to further pursue safety. SUBARU's mass market car models are equipped with the Driver Monitoring System, which attentively watches over the state of the driver. It detects when the driver looks away or shows signs of sleepiness, and sends an alert. Going forward, we will couple it with various controls.

Car Assessments

SUBARU undergoes safety performance testing and assessment of public organizations in and out of Japan including JNCAP in Japan, IIHS^{*1} in the U.S., Euro NCAP^{*2} in Europe, and ANCAP^{*3} in Australia, and has gained the highest rank of assessment in most of them.




In FYE March 2021, the new Levorg won the JNCAP Five Star Vehicle Safety Performance 2020 Award, the highest rating in the Japan New Car Assessment Program (JNCAP).

*1 IIHS: The Insurance Institute for Highway Safety

*2 Euro NCAP: European New Car Assessment Programme, a safety information disclosure program for automobiles in Europe

*3 ANCAP: The Australasian New Car Assessment Program, a safety performance assessment program conducted since 1993 by an independent organization created by Australian and New Zealand transit authorities

FYE March 2021 Commendations

Assessed Automobiles	Assessment Organization	Assessment
Levorg	 JNCAP, Japan	JNCAP Best Award 2020 JNCAP Five Star Award 2020
2021 models of the Crosstrek Hybrid, Forester, Legacy, Outback, and Ascent	 (U.S. models only) IIHS, U.S.	2021 TSP+ award*
2021 models of the Impreza (sedan and 5-door), Crosstrek, and WRX (all with optional EyeSight and specific headlights)	 (U.S. models only) IIHS, U.S.	2021 TSP award*

* In the IIHS's publication of vehicle safety information, TOP SAFETY PICK (TSP) award is given to vehicles that earned the rating of "Good" in all test results including the Offset Frontal Test, the Driver-side Small Overlap Front Test, the Passenger-side Small Overlap Front Test, the Side Crash Test, the Rear Impact Test and the Rollover Test and the rating of "Acceptable" or higher in the Headlight Evaluation, as well as the rating of "Advanced" or higher in the vehicle-to-vehicle and vehicle-to-pedestrian tests. In addition to these ratings, vehicles which have been installed the headlights which earned the rating of "Acceptable" or higher in the Headlight Evaluation as a standard equipment are awarded the TOP SAFETY PICK+ (TSP+).

Safety Is Our DNA

Since its founding, the core of the Subaru Group, an organization with roots in the aircraft industry, has been to put people first and to engage in people-oriented manufacturing. We believe that safety is the most critical basic function for cars. Since the launch of Subaru 360 more than half a century ago, we have passed this belief on as an element of our company DNA, making relentless efforts in every era to perfect the most essential functions of a car—driving, turning, and stopping—reflected in our unique engineering know-how, including all-around safety performance. Looking to the future, SUBARU will continue to engage in automotive manufacturing with a philosophy of "All-Around Safety" and maximum emphasis on safety performance.

[SINCE 1917]

Ensuring Safety for Pilots

■ Our DNA of Safety is Inherited from Aircraft Development
At the core of SUBARU's safety development expertise lie traits acquired from developing aircrafts. With aircraft, the implementation of ideas and countermeasures within the vehicle's basic structure prevents the onset of danger. One indispensable safety feature of aircrafts is the ability for the pilot to be able to secure an all-around unobstructed line of sight. This approach to safety has not diminished even after SUBARU moved into automobile manufacturing.

Respect for
Human RightsQuality:
Automotive BusinessQuality:
Aerospace BusinessMaking Safe
VehiclesHuman
Resources

Customers

CSR
ProcurementCommunity
Engagement

[SINCE 1960]

Ensuring Safety for Drivers

■ Going ahead of the Times: Developing a Vehicle Body for Collision Safety Based on All-Around Safety

Subaru 360 had played an important role in expanding the popularization of automobiles during the period of high economic development. SUBARU has dedicated itself to developing vehicle bodies for collision safety following the principle of All-Around Safety—effectively absorbing shock from collisions in all directions and protecting the driver and passengers with a cabin structure of robust strength—since that period. SUBARU pushed forward independent research on car body structure and how it affects human body, and pursued superior collision safety technologies ahead of the times.



Subaru 360

[SINCE 1970]

Ensuring Safe Driving, Turning, and Braking

■ Developing Proprietary Technologies for Enhanced Driving Safety

Fundamental automobile performance in terms of driving, turning, and braking differs significantly depending on the location of the center of gravity and the type of drive train. A low center of gravity and a drive train that delivers power to all of the wheels give constant stability when driving.

In 1966, we launched the Subaru 1000—a FWD vehicle with a horizontally-opposed engine—and, in 1972, the 4WD Subaru Leone. Since that time, SUBARU has continued to pursue safe and stable driving performance with our proprietary technologies.

Horizontally-opposed
engine (Boxer engine)

4WD



4WD Subaru Leone



Subaru 1000

[IN THE 1980s & 1990s]

Ensuring Safety for Drivers and Passengers

■ Legacy Launched. Development of Driving Assistance Systems

Our flagship Legacy model set a world speed record in January 1989 for 100,000 km of continuous driving, demonstrating both reliable driving performance and mechanical endurance. Furthermore, SUBARU commercialized Active Driving Assist (ADA), a driving assistance system using stereo cameras which was the predecessor of our current EyeSight technology.

[IN THE 2000s & 2010s]

Ensuring Safety for Everyone

■ Commercialized EyeSight
Made the Latest Advanced Safety Features Standard
Equipment on All Vehicles

SUBARU commercialized our EyeSight technology, featuring stereo cameras constantly surveying the area forward of the vehicle and warnings and pre-crash braking functions for mitigating damage from accidents. In 2017, we began fitting vehicles with the new Touring Assist function, extending the minimum speed at which Lane Keep Assist can operate from 60 km/h to 0 km/h.

Moving forward, SUBARU is engaging in development for even more leading-edge technologies.

■ SGP (SUBARU GLOBAL PLATFORM)

→ Six Priority Areas for CSR: TOPICS 01 - People-oriented Car Culture

[FROM THE 2020s]

■ Next-Generation EyeSight, EyeSight X

→ Six Priority Areas for CSR: TOPICS 01 - People-oriented Car Culture

Initiatives in the Aerospace Business

In recent years, reduction of CO₂ emissions has become a major environmental issue on a global basis, and this also encompasses aircraft. At the same time, electrification has garnered attention as a way to reduce environmental burdens. The Aerospace Company is active as a Steering Committee member of the Electrification Challenge for Aircraft (ECLAIR) Consortium, spearheaded by the Japan Aerospace Exploration Agency (JAXA), a national research and development agency. The Company has also formulated a future vision for the electrification of aircraft and created a technology roadmap with the goal of developing electrification technology that will drastically reduce environmental burdens, such as CO₂ emissions. Also, with the "Roadmap toward Air Mobility Revolution" announced by the Ministry of Economy, Trade and Industry in December of 2018, Japan is increasing its momentum for a major advancement toward the development of flying



Flight demonstration for unmanned aircraft

□ Test of technology that allows unmanned aircraft to automatically avoid danger (Japanese version only)

cars. However, it is necessary to generate rules, including a great deal of legislation, to ensure traffic safety in the sky. SUBARU is proposing a public and private sector conference to consider the creations of these rules.

Also, drones are seeing a remarkable rise in use recently. To further improve safety for these and other aircraft, we are working with the New Energy and Industrial Technology Development Organization (NEDO), a national research and development agency, and four other organizations. Also, we

succeeded in a flight demonstration for our technology that allows unmanned aircraft to automatically avoid danger, even in times of emergency. The test was conducted off the coast of Mikawa Bay in 2019, with cooperation from Aichi Prefecture, Toyokawa City, and Tahara City. Going forward, SUBARU will continue working on initiatives to ensure the safety of airspaces and to reduce its environmental burden.

