7 Safety

Material Issues
- Reducing traffic fatalities
- Applying automation and information technologies to everyday life
Toward a Collision-Free Mobile Society

As exemplified by the words of the Company’s founder Soichiro Honda that “as long as we are handling a mode of transportation, we are entrusted with human lives,” Honda is, on the basis of the concept of “Safety for Everyone,” aiming at a collision-free mobile society, where not only drivers and riders, but indeed everyone sharing the road, can safely and confidently enjoy the freedom of mobility.

Honda has a long history of engagement in safety initiatives dating back to the 1960s. Back then, in the period of development of motorization in Japan when there was not even a clear concept of “driving safety,” Honda started driving safety promotion activities, the first of their kind for motorcycle/automobile manufacturers. Later, the Company developed various technologies including the driver-side SRS airbag, the world’s first pedestrian dummies*1 and the Advanced Compatibility Engineering (ACE) body structure*2 that helps to protect occupants of both vehicles in a collision. In 2000, Honda built the world’s first omni-directional crash test facility, making it possible to conduct tests that better reflect real-world crash configurations.

Safety technologies developed as described above have been aggressively applied to various products. As for pedestrian dummies, in order to enhance safety for the traffic society as a whole, their use is not only limited to the development of Honda’s products. They are also leased to other companies and research institutions, widely contributing to studies on pedestrian protection.

Honda is actively working on traffic safety, giving attention to the actual conditions of traffic issues that exist in each period and regions.

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*1 Anthropomorphic models used to reproduce the human body’s kinematics during vehicle-to-pedestrian collision with the aim of identifying parts of the vehicle body most often resulting in injuries and reducing pedestrian head injuries during the collision with a vehicle. The current third-generation dummies have more “realistic” neck, back and thighs in addition to the head, thus offering more accurate pedestrian kinematics after a collision and allow realistic collision analysis.

*2 A safety body structure that efficiently distributes and absorbs frontal crash energy through the engine room. It offers significantly greater occupant protection and reduces damage to the other impacted vehicles.
Direction of Activities

Honda is conducting safety promotion activities in three areas: “Human (Safety Education),” “Technology (Vehicle Technologies)” and “Communication (Telecommunication Networks)” with the aim of realizing a collision-free mobile society.

However, issues concerning the traffic environment are diverse and vary from region to region, such as the over-concentration of traffic or poor infrastructure. Against this backdrop, Honda is rolling out initiatives that combine the three areas of “Human,” “Technology” and “Communication” in line with the actual conditions existing in each region.

In Thailand, for example, safety measures are an urgent challenge due to the high percentage of motorcycle riders among the number of traffic fatalities in particular compared with other parts of Asia. In response, Honda decided to conduct a detailed investigation from 2016 to 2020 to collect and analyze information on around 1,000 traffic accidents in Thailand. The investigation, still ongoing as of the end of FY2020, first pinpoints the fundamental cause of each accident. Based on the knowledge accumulated, Honda plans to develop activities to promote more suitable safe driving practices in the area of “Human” and connect this to the development of more effective safety-related technology in the area of “Technology.” This initiative is being expanded gradually in the respective regions of Asia and Oceania.
In 1970, Honda established the Driving Safety Promotion Center in Japan and subsequently a department dedicated to promoting activities overseas within the Center in 1972. Since then, Honda has been reinforcing its efforts overseas by establishing Traffic Education Centers* in various countries and cooperating with local dealers. As of 2019, Honda is carrying out driving safety promotion activities in 41 countries and regions throughout the world including Japan.

Honda's activities are based on the ideas “To pass on safety education from person to person” by conveying the importance of driving safety directly to customers at dealers and “To provide a participatory hands-on education program” under the guidance of expert instructors.

In Japan, Honda has provided traffic safety education and training for drivers and riders to more than 6.57 million customers to date in cooperation with Honda Traffic Education Centers, motorcycle and automobile dealers, local corporations and schools.

Overseas, the Company has established Traffic Education Centers in various countries to play a key role in its efforts and encourage collaboration with dealers, while its subsidiaries lead a broad range of activities. Emerging countries in particular contain areas where regulations, traffic rules and road infrastructure are not yet ideal despite the fact that motorization is rapidly progressing. As such, an increase in the number of fatal traffic accidents has become a social issue. Therefore, Honda is undertaking activities matched to the traffic situation of each country while collaborating with local governments and relevant organizations.

* Honda facilities where internal and external instructors on traffic safety are trained and driving safety education is provided to corporations, schools and individual customers.
Initiatives in the Area of Human (Safety Education)

Collaboration with Overseas Offices

Honda holds a meeting of managers in charge of promoting driving safety education at respective overseas offices. The 2019 Safety Driving Managers Meeting was attended by 21 managers from nine countries and regions mainly in Asia and representatives from each Traffic Education Center in Japan.

Nurturing Instructors at Traffic Education Centers in Japan

From many years of various motorcycle and automobile riding/driving safety promotion activities, Honda’s Traffic Education Centers in Japan have accumulated a pool of advanced safe riding/driving techniques and instruction know-how. For promoting safety practices globally, Honda intends to pass on this pool of knowledge to instructors of overseas offices to invigorate and instill activities in their own countries.

In Japan, these Centers regularly provide training to instructors of overseas offices. Since 1997, Honda has also been hosting the annual Safety Japan Instructors Competition. A total of 75 participants, 38 from Traffic Education Centers and business sites in Japan and 37 from eight countries and regions, participated in the 2019 competition.

Collaboration with Traffic Education Centers

In Japan, Honda provides participatory hands-on education matched to the needs of companies, organizations and individuals. Specifically, Honda’s seven Traffic Education Centers across Japan offer training to traffic safety instructors. They also provide participatory hands-on education mainly to companies, organizations, schools and individual customers to improve their riding/driving skills and facilitate their safety driving awareness and understanding. In 2019, Honda provided education to some 90,000 persons (as of December 31).

Conducting Training in Japan to Nurture Instructors to Lead Driving Safety Promotion Activities in India

Honda Motorcycle & Scooter India Pvt. Ltd. (HMSI), a Honda subsidiary in India engaging in production and sales of motorcycles, has been nurturing motorcycle and automobile chief instructors. The effort aligns with its preparation to operate a Traffic Education Center in cooperation with the state government in the future. In March 2019, 10 trainees from HMSI received 11-day training at the Suzuka Circuit Traffic Education Center. During the training that involved lectures, practical training and role playing, they developed an internal instructor training schedule of HMSI, made plans for motorcycle riding lessons and served as instructors in a mock training setting. For reducing the number of traffic accidents in India, Honda will continue to play its part in strengthening and instilling riding/driving safety activities in the country.
Collaboration with Local Communities

In Japan, Honda offers educational programs and teaches instruction techniques to traffic safety instructors, employees of partner companies and other persons responsible for conveying traffic safety in each local community.

For traffic safety instructors in local communities, Honda holds a study session on traffic safety educational programs every year since 2015. In 2019, 30 instructors from 19 districts participated in the session and jointly created an educational program.

For our partner companies, Honda provides training to nurture Honda Partnership Instructors. Instructors who have received training at Honda work to promote traffic safety within their own companies and in surrounding areas, thereby conducting various activities, including parent-child traffic safety lessons.

Collaboration with Relevant Organizations

In Japan, Honda proactively fosters collaboration with members of organizations and industries engaging in driving safety promotion activities in order to reduce traffic accidents.

As an example, Honda’s Safety Map, released to the public in March 2013, was created based on information provided by local residents. It can be used freely by all road users, including drivers, riders, pedestrians and cyclists, via personal computers and smartphones. In addition to personal use, more companies and organizations are now using the map for the purpose of preventing traffic accidents.

Honda has also cooperated in running the Driving School Instructors Competition, 2019 Motorcycle Safety Driving Competition and driving safety seminars for high school students and elderly drivers.

Development of a Program for Upper Grade Elementary School and Junior High School Students

In 2019, Honda developed the “For the children who will star in the societies of the future” program targeting upper grade elementary school and junior high school students in Japan. Following rules and maintaining good manners as well as turning the practice into a habit are a basic necessity in leading an enriched social life. The program thus embraces Honda’s desire to let children, who will lead the next generation, to regard traffic safety as a matter having significance to themselves and avoid traffic accidents.

The program consists of an introductory part and main part. The main part is made up of three video materials respectively dealing with “walking,” “riding bicycles” and “traffic signs.” These can be taught individually so that traffic safety instructors can freely combine them according to the needs of a school or the duration of a session. The program is also characterized by its interactive nature, allowing instructors to proceed by asking questions to children for each example situation.
Development of Educational Equipment

In Japan, Honda leverages its driving safety know-how accumulated over the years and provides educational equipment and software programs, including simulators, for use at various driving safety education opportunities. These equipment and programs are constantly upgraded in keeping pace with the changing needs of society.

Example driving safety educational equipment developed by Honda include the Honda Riding Simulator for virtual motorcycle hazard prediction training difficult to conduct on the road; Honda Bicycle Simulator that reproduces actual traffic conditions and allows the user to simulate bicycle riding on the street; Honda Safety Navi, a simple simulator that allows hands-on learning of various traffic conditions; and Honda Movie KYT that uses computer graphics to improve hazard prediction abilities, including instant cognitive and judgment skills.

Activities in the Welfare Field

In Japan, Honda offers training opportunities and venues for persons with disabilities who want to drive again. In this capacity, the Company provides its know-how to hospital and driving school personnel in charge of evaluating the driving competence of these persons. It also offers support for the creation of a local collaboration environment in which driving school instructors and occupational therapists exchange information and opinions.

As a means to evaluate the driving competence of those wishing to resume driving, Honda provides the Safety Training Program for Disabled Drivers*1 that provides training using a simulator and actual vehicle. Additionally, in collaboration with NPOs and welfare-related companies, Honda uses its Safety Training Program for Drivers with Disabled Passengers*2 to encourage welfare facility drivers providing pickup and drop-off services to gain driving skills that give due consideration to their passengers.

*1 A program offered at Honda Traffic Education Centers as a means to evaluate the driving competence of people with higher cerebral dysfunction wishing to resume driving. It is used to check their current ability to drive an actual vehicle and train them to overcome the identified issues.

*2 A program offered at Honda Traffic Education Centers for welfare facility drivers providing pickup and drop-off services. It provides advice on preventing accidents during these services as well as training to facilitate an understanding of the importance of giving due consideration to their passengers.
Technology (Vehicle Technologies)

Honda’s Approach

Honda has engaged in the development of safety technology focusing on real traffic and collisions involving multiple types of road users. The Company is dedicated to developing safety technology, setting higher targets often exceeding requirements in a spirit that “if it does not exist, we will make it.” The Company has been developing and commercializing safety technologies one after the other. In 1998, Honda developed the world’s first pedestrian dummies, while it built the world’s first omni-directional crash test facility in 2000. In 2003, Honda developed the crash-compatibility body and the world’s first Collision Mitigation Braking System (CMBS).

In 2014, the Company announced “Honda Sensing/AcuraWatch,” new advanced safety and driver-assistance technologies using sensors and a camera. To accommodate the versatile functions of these sensing devices, Honda has added a greater data processing capability to the system. It recognizes the driver’s intention and the vehicle’s conditions along with the surrounding environment and applies collaborative control over the braking system, steering wheel and other vehicle components. The system assists the driver from normal driving to risk avoidance in an emergency by providing both vehicle speed/following distance controls and lane keeping control.

Overview of the Honda Sensing System
Installed on the New Fit Compact Car Released in February 2020

The system adopts the latest high-speed image processing chip to enable the measurement of the distance to an object with a monocular camera instead of the millimeter-wave radar used previously. This front wide-view camera quickly detects when a pedestrian steps into the street from the side on a general road or when another vehicle cuts into the lane on an expressway. The sonar sensors installed on the front and rear of the vehicle support the system’s false start prevention function, false reverse-start prevention function and short-distance collision mitigation braking function (called the City-Brake Active System).

Notional image of the detection range
The "Honda Sensing/AcuraWatch" advanced safety and driver-assistance system continues to be used in an increasing number of models since its launch in the three regions of Japan, the United States and Europe in 2015.

In Japan, Honda has installed this system in more models in the mini-vehicle and compact vehicle categories, such as the N-BOX, Grace and Shuttle, and has been increasing the number of models offering the system as a standard feature. For the new Fit released in February 2020, Honda Sensing was adopted as standard in all available models*.

In the United States, Honda aims to install Honda Sensing/AcuraWatch as a standard feature in all vehicles sold in the country by 2022. In FY2020, the system was newly fitted on the Civic Type R.

Also, Honda has been working to steadily increase the use of the system in Europe and China. The system was equipped for the first time on the Honda e in Europe and the Envix and Breeze in China.

* A version without Honda Sensing is also available in some types.
Safety Initiatives

Held an Event to Introduce Honda’s Safety Initiatives and Technologies to the U.S. Media: Showcasing for the First Time a Locally Developed, Original and New Airbag Design to Enhance Protection in an Angled Collision

Honda R&D Americas, Inc. (HRA) in the United States has been engaging in research and development of safety technologies matched to the traffic conditions and accident characteristics in the country.

On August 23, 2019, HRA’s safety center in Raymond, Ohio, hosted a press event to announce a new airbag design.

Designed to protect the passenger, the new airbag has been developed based on traffic accident surveys in the United States and Honda’s long-accumulated knowledge on collision safety performance. The new airbag seeks to enhance protection in various accident scenarios, including crashes between vehicles or between a vehicle and another object, and reduce the risk of traffic injuries and fatalities.

The new airbag features four major, separate components, including a “sail panel.” This panel catches the passenger forced forward in an accident and cradles his or her head by pulling the two side chambers inward, mitigating the potential for head injury and risk of brain damage.

Compared with conventional airbags, the new airbag is more closely fitted to a passenger and thus expected to provide better protection in an angled frontal collision. Honda plans to offer the airbag on the new Acura TLX slated to be released in the United States in 2020.

Honda operated a booth at the 26th ESV 2019 held in the Netherlands in June 2019 and presented to motor vehicle safety engineers around the world the outcome of research concerning its new approach toward safety technologies.

The approach seeks to realize a new caring safety technology attuned to each driver by providing a combination of “integrated safety technology” and “relief creation technology.”

Through improvement of the integrated safety technology, Honda will provide advanced safety tailored to each driver and surrounding conditions. The technology uses a camera and sensors to omni-directionally monitor both inside and outside a vehicle, including all occupants as well as pedestrians and cyclists in the surrounding environment, thereby preventing accidents.

In the relief creation technology, the vehicle monitors the driver’s conditions through its camera and other sensing devices, while augmenting his or her abilities to recognize and respond to any risk and understand other vehicles and motorcycles in a mutual manner. Through the technology, Honda intends to deliver to each driver a sense of security and confidence in driving.

At the 4th ESV held in 1973, Honda showcased for the first time its experimental safety vehicle equipped with anti-collision measures and four-wheel antilock braking system (ABS). Showing to engineers around the world the future of safety technology development, Honda has since been working to put the technology into practical use.

At the ESV 2019, Honda again presented its direction of technology development along with the outcome of its research and gained the understanding of motor vehicle safety engineers and policymakers in each country.

Honda will continue to focus on technology development for the future while exchanging views with vehicle safety professionals across the world.

* An international conference held every two years sponsored by the U.S. Department of Transportation and the National Highway Traffic Safety Administration (NHTSA)
**Safety Initiatives**

**Communication (Telecommunication Networks)**

**Honda’s Approach**

In 1998, Honda started to offer “Internavi,” a car navigation system equipped with communication functions that provides information on traffic congestion through the use of driving data gathered from Honda vehicles. In addition to the usefulness mentioned above, Honda started to offer weather information in 2004 and disaster information in 2007. By utilizing the telematics service that integrates communication and information, the Company has started to provide drivers with information that will help them drive more safely and more comfortably.

In Japan, as one form of progress from these initiatives, Honda has created a “Safety Map” currently used by many people. Various information, such as emergency braking applied by cars, information on traffic accidents provided by the police and local governments, traffic information provided by local residents and other relevant information, is integrated and analyzed to generate the Safety Map. The Map tells local residents and drivers in advance about places on the road that require special caution.

In addition, Honda is currently focusing on building a system to integrate Honda Sensing/AcuraWatch technologies and the telematics service. The system will provide information on traffic conditions and traffic accidents risks on a real-time basis using wireless communication such as Wi-Fi to connect vehicles equipped with sensors or GPS and smartphones carried by people in the surrounding areas. Honda is striving to realize “a collision-free mobile society” where everyone sharing the road can safely and confidently enjoy the freedom of mobility.
Honda joined a project consigned by Japan’s Ministry of Internal Affairs and Communications (MIC). The project performs surveys on the feasibility of advanced systems utilizing probe information in the United States. Under a public-private partnership, Honda has been conducting feasibility tests using its connected car technology to support repairs of aging roads in the country.

The project is being promoted by companies requested by MIC, namely Honda, NEXCO-West USA, Inc. (a U.S. subsidiary of West Nippon Expressway Co., Ltd.), Pacific Consultants Co., Ltd., Oriental Consultants Global Co., Ltd., SoftBank Corp. and ZENRIN DataCom Co., Ltd.

Honda provides the HR-V fitted with specialized measuring equipment, with its on-board computer performing real-time analysis of the data collected from the vehicle stability assist (VSA) sensors.

The on-board computer performs analysis of the data from the VSA sensors and generates surface conditions information.

The on-board communication module sends the information.

The data center centrally collects the information on road surfaces that need repairing.

Honda is proceeding with the development of a technology to centrally collect the information at a data center via the on-board communication module and facilitate identification of areas needing repairs.

In the future, Honda seeks to achieve safer mobility through the use of its connected car technology by swiftly providing information on road surface conditions that need repairing to local governments and road management organizations.
Honda’s Approach

Many of Honda’s models have achieved high safety assessments from NCAP*1 in various regions. In Japan, the N-BOX was evaluated as "ASV+++"*2, the highest rank, in the preventive safety assessment of JNCAP*3.

**N-BOX Receiving the Highest Rating in the JNCAP’s Preventive Safety Assessment**

The N-BOX, which was released in October 2019 after undergoing minor remodeling for performance improvement, achieved the highest rating in the JNCAP’s FY2020 Preventive Safety Assessment (ASV+++).

The remodeling involved an improvement of the performance of “Honda Sensing” advanced safety and driver-assistance system to support accident prevention. The N-BOX now has an improved Collision Mitigation Braking System (CMBS) capable of avoiding bicycles crossing the street and a better ability to detect pedestrians at night without street lighting.

In addition, the second-generation N-BOX won the Crash Safety Performance Assessment Five Star Award, which is the highest rating, right after its release in 2017. Accordingly, the vehicle has been highly esteemed in both preventive safety and crash safety.

### Results of Key Third-Party Evaluations (Tests Conducted in FY2020)

<table>
<thead>
<tr>
<th>Country / Region</th>
<th>Third-party evaluation</th>
<th>Model</th>
</tr>
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<tbody>
<tr>
<td>Japan</td>
<td>JNCAP</td>
<td>5★</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CR-V / Insight / Accord / N-WGN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ASV+++</td>
</tr>
<tr>
<td>China</td>
<td>C-NCAP</td>
<td>5★</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Performance not evaluated in FY2020</td>
</tr>
<tr>
<td>China</td>
<td>C-IASI*4</td>
<td>GGG</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Performance not evaluated in FY2020</td>
</tr>
<tr>
<td>U.S.A.</td>
<td>NCAP</td>
<td>5★</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CR-V / Passport</td>
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<tr>
<td></td>
<td></td>
<td>TSP+</td>
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<td></td>
<td></td>
<td>Insight / RDX</td>
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<tr>
<td></td>
<td></td>
<td>TSP</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Accord / CR-V / Civic (2 doors, 4 doors, 5 doors)</td>
</tr>
<tr>
<td>Australia</td>
<td>ANCAP</td>
<td>5★</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Performance not evaluated in FY2020</td>
</tr>
<tr>
<td>Southeast Asia</td>
<td>ASEAN NCAP</td>
<td>5★</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Accord / City</td>
</tr>
<tr>
<td>Latin America</td>
<td>Latin NCAP</td>
<td>5★</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Performance not evaluated in FY2020</td>
</tr>
</tbody>
</table>

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*1 This refers to New Car Assessment Program. This is a program that tests and evaluates the safety performance of cars, which is performed by public organizations in various regions. Testing and evaluation methods are different for each region. Ratings range from 0★ to 5★ (5★ is the highest rating in some regions).

*2 This refers to Advanced Safety Vehicle. Advanced safety performance, which includes the technology for braking when a collision is not avoidable, is tested and evaluated. The four levels of ASV: ASV+, ASV++, and ASV+++ are used to assess the vehicles.

*3 This refers to Japan New Car Assessment Program, which is conducted jointly by the Ministry of Land, Infrastructure, Transport and Tourism and the National Agency for Automotive Safety & Victim’s Aid (NASVA).

*4 This refers to China Insurance Automotive Safety Index. It tests and assesses the safety performance of vehicles, in which the four grades of G (excellent), A (good), M (general) and P (poor) are used. The purpose of the assessment is to improve the safety of vehicles and reduce the insurance premium.

*5 The organization conducts the car assessment that tests and evaluates the safety performance of various cars. IHS only awards TSP and TSP+ to vehicles that achieved excellent test results. TSP refers to Top Safety Pick.