

This is a translation to English for reference purpose of JNCAP test method which is originally prescribed in Japanese language.

Please be sure to refer to the Japanese test method if you need to be precisely correct.

Autonomous Emergency Brake System [for Pedestrian at night] Performance Test Procedure

Created: April 1, 2018

Revised: April 25, 2023

March 23, 2022

March 31, 2020

1. Enforcement Date

This test procedure is enforced as of April 1, 2018. The test procedure revised as of April 25, 2023 is enforced as of April 25, 2023.

2. Scope of Application, etc

This test procedure applies to the vehicles exclusively used for carrying passengers with riding capacity of less than ten (10) persons and the vehicles used for carrying cargo with gross vehicle weight 2.8t or less equipped with the Autonomous Emergency Brake System [for Pedestrian at night] as part of the tests conducted under the new car assessment program by the National Agency for Automotive Safety and Victims' Aid (hereinafter, referred to as "NASVA").

3. Terms

Throughout this test procedure, the following terms are used:

- (1) **"AEBS (Autonomous Emergency Braking System)"** refers to a system that automatically operates brakes to avoid collision with a crossing pedestrian or reduce the collision speed.
- (2) **"FCWS (Forward Collision Warning System)"** refers to the warning using a combination of either "audio and visual information" or "audio and haptic information" for the purpose of urging the driver to operate brakes depending on the degree of risks of colliding with a crossing pedestrian.
- (3) **"AEBS Activation Point"** refers to the time when the deceleration by AEBS first crossed 0.3m/s^2 .
- (4) **"FCWS Activation Point"** refers to the time when the warning using audio information by FCWS started.
- (5) **"Test Target"** refers to the test device that simulates crossing pedestrians (adult and child) as indicated in Annex A.
- (6) **"CPF (Car-to-Pedestrian Far-side)"** refers to a test scenario in which the Test Target crosses

from the right side of the travelling direction of the test vehicle.

- (7) **“CPFO (Car-to-Pedestrian Far-side Obstructed)”** refers to a test scenario in which the Test Target crosses from the right side of the travelling direction of the test vehicle with screening vehicles as shown in Annex B placed just short of the Test Target.
- (8) **“Standard Crossing Line”** refers to a target course at which a side edge of the Test Target (on the side where the test vehicle approaches) passes.
- (9) **“Standard Track”** refers to a target course for the test vehicle to run, which is set to be perpendicular to the Standard Crossing Line.
- (10) **“TTC (Time To Collision)”** refers to the remaining time to the Standard Crossing Line, assuming the test vehicle maintains the current speed.
- (11) **“Target Interference Area”** refers to an imaginary rectangular parallelepiped that surrounds the outermost of the Test Target that is used to judge collision with the test vehicle. (Diagram 1)

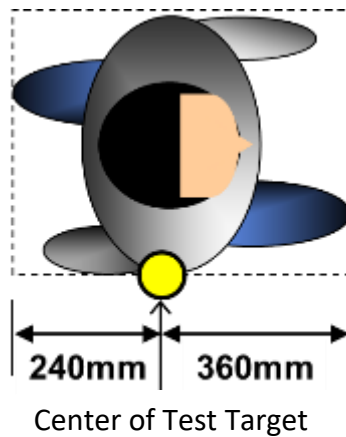


Diagram 1: Definition of Target Interference Area

- (12) **“Approximate Bumper Line”** refers to a line that approximates the shape of the front bumper of the test vehicle that is used to judge collision with the Test Target. The Approximate Bumper Line is indicated by a line segment that is obtained by connecting intersections of each of the parting lines that are obtained by dividing the overall width less 50mm on each side equally into six parts on the bumper. (Diagram 2)

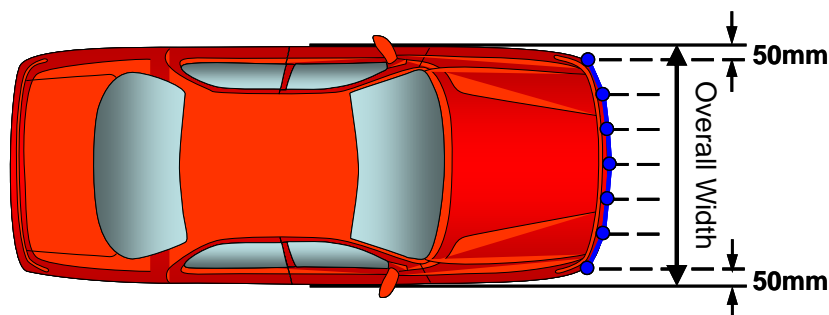


Diagram 2: Definition of Approximate Bumper Line

- (13) **“Collision”** refers to a condition under which the Approximate Bumper Line of the test vehicle

enters the Target Interference Area.

- (14) **“Collision Speed”** refers to the running speed at which the test vehicle and the test target are traveling at the moment of the Collision.
- (15) **“Initial Speed”** refers to the running speed of the test vehicle at the AEBS Activation Point for the AEBS Test and at the FCWS Activation Point or the AEBS Activation Point, whichever occurs the first, for the FCWS Test.
- (16) **“Velocity Reduction Amount”** refers to a value obtained by subtracting the Collision Speed from the Initial Speed.
- (17) **“Velocity Reduction Rate”** refers to a value obtained by dividing the Velocity Reduction Amount by the Initial Speed.
- (18) **“Lateral Position”** refers to the lateral distance to the Standard Track at each of the front edge center of the test vehicle and the Test Target. (Diagram 3)
- (19) **“Offset Amount”** refers to the difference in the Lateral Position of the test vehicle and the Test Target.(Diagram 3)

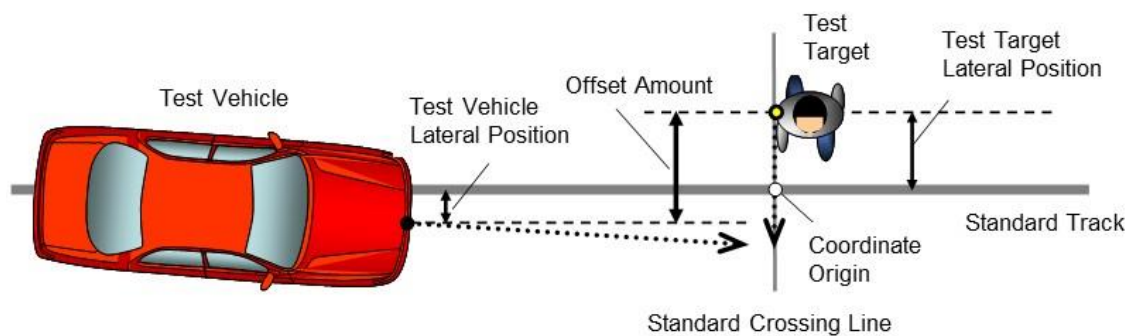


Diagram 3: Definition of Lateral Position and Offset Amount

- (20) **“Wrap Rate”** refers to a value obtained by dividing the difference between the Lateral Position of the right edge of the test vehicle and the Lateral Position of the Test Target by the total width of the test vehicle, expressed in percentage terms.
- (21) **“Set Collision Point”**, which is set for each test scenario, refers to a value obtained by converting the Lateral Position of the Test Target when the test vehicle running in the Standard Track reaches the Standard Crossing Line without the AEBS activated into the Wrap Rate.
- (22) **“Expected Collision Point”** refers to a value obtained by converting the Lateral Position of the Test Target in 4.0 seconds after measurement start (when TTC reaches 4.0 seconds) into the Wrap Rate.
- (23) **“Nighttime Test with surrounding light”** refers to those tests that are conducted to evaluate the performance of the systems at nighttime with surrounding light.
- (24) **“Nighttime Test without surrounding light”** refers to those tests that are conducted to evaluate the performance of the systems at nighttime without surrounding light.
- (25) **“Standard Evaluation Test”** refers to the evaluation tests conducted for every test speed using the following combination of setup conditions in the CPF and CPFO test scenarios:

① Set Collision Point: 50%

② Test Target speed: 5km/h

(26) **“Partial Evaluation Test”** is an evaluation test that is conducted using one of the following setup items changed from the Standard Evaluation Test of the CPF conditions and at Representative Speed only.

① Set Collision Point : 25% and 75%

② Test Target speed: 8km/h

(27) **“Representative Speed”** refers to the velocity condition at which the social loss amount shown in Annex C becomes the largest within a scope of velocity condition at which Velocity Reduction Amount of 5km/h or more is obtained in a Standard Evaluation Test. When every Velocity Reduction Amount in a Standard Evaluation Test is lower than 5km/h, it shall be the velocity condition of the largest Velocity Reduction Rate.

(28) **“Brake Pedal Stroke”** refers to the amount of the brake pedal stroke of the test vehicle.

(29) **“Accelerator Stroke”** refers to the amount of the accelerator pedal stroke of the test vehicle.

(30) **“Mass at Vehicle Delivery”** refers to the condition of the test vehicle loaded with the fuel, lubricants, coolants and the like in the engine and the fueling system, and equipped with onboard tools, a spare tire and standard accessories.

(31) **“Brake Temperature before Braking”** refers to the higher of the average temperature of the left wheel or the right wheel of each axle when the temperature of the brake lining or pad of each wheel is measured, pursuant to the procedures of JIS D 0210, immediately before the start of each run for braking with the vehicle in fixed position.

(32) **“Brake Temperature Check Unit”** refers to a device to check the Brake Temperature before Braking of the test vehicle by thermocouple measurement.

4. Test Conditions

4.1 Provision of Data from Vehicle Manufacturer, etc

Vehicle manufacturers, etc shall provide NASVA with the following data required for test preparation (Attached Table 1).

4.2 Test Vehicle Status

The test vehicle shall be in the following status:

(1) Load Condition: The mass of the test vehicle with one driver and including the measurement equipment shall be the Mass at Vehicle Delivery + 200kg ($\pm 1\%$). Front axle/rear axle weight distribution (%) shall be on a par ($\pm 5\%$) with that of the Mass at Vehicle Delivery.

If the preceding requirement is not met, parts may be removed or installed within a scope of not affecting the performance. Parts to be installed to increase weight should be securely fitted.

(2) Tire: The tires installed at the time of purchase of the test vehicle shall be used. Tire running-in shall be performed in conjunction with the brake conditioning stipulated in section 5.1. In addition, the tire air pressure shall be set before running (normal temperature) on a level surface at the value for ordinary run as described in the specification sheet, etc.

- (3) Brake system: The brake discs, drums and linings that are installed at the time of the purchase of the test vehicle shall be used. The brake system shall be adjusted properly without any impact of abnormal heat history, getting wet or the like.
- (4) Drive axle: When the drive axle can be selected, choose the one(s) normally used.
- (5) AEBS and FCWS setup: When the driver can set up the timing of activation of AEBS and/or FCWS, use the median of the scope that is allowed to be set up. When there is no median (when the setup options are even number), choose the value that is closest to the median on the side on which the timing of activation start will be later.
- (6) Protection devices: When passenger protection devices or pedestrian protection devices are installed, set such devices not to be activated.

4.3 Test Track

The test track shall meet the following requirements:

- (1) The test track shall be flat, clean paved road surface without any leaves, dirt or the like, and dry.
- (2) The test track shall have friction coefficient of about 0.9 under dry condition. The measurement procedure in this case shall comply with ASTM E1337, test tires ASTM E1136, test load $4586 \pm 67\text{N}$, tire air pressure $241 \pm 3\text{kPa}$, and the speed $64 \pm 0.8\text{km/h}$.
- (3) During testing, there shall be no obstacles within a lateral distance of 3.0m to either side of the Standard Track and with a longitudinal distance of 30m ahead of the test vehicle when the test ends. In addition, there shall be no road paint or marking at the points where AEBS activation or deceleration by braking after FCWS is expected to take place.
- (4) There shall be no strong artificial light source or reflection object in the Standard Track ahead of the vehicle that have impacts on testing.

4.4 Weather Conditions

- (1) Temperature during testing shall be within a scope of -5°C - 40°C . However, when the temperature is less than 5°C , the test may be avoided upon declaration of the vehicle manufacturer, etc.
- (2) Average wind speed during testing shall be 5m/s or less.
- (3) Visibility during testing shall be 1km or more.
- (4) Illumination during testing shall be 1lx or less without lighting of the test track turned on.

4.5 Illumination Conditions

All the light shall be turned off for nighttime test without surround light. And for the nighttime test with surrounding light, the illumination shall meet the following conditions when lights are turned on. Further, the illumination shall be the horizontal and vertical illumination as measured at a height of 1.0m from the test track surface. (Diagram 4)

- (1) For the point at which the Standard Track and the Standard Crossing Line intersect, the illumination shall be within $15 \pm 2\text{lx}$.
- (2) On the Standard Crossing Line, in a section that is 6m on the CPF start side from the point where the Standard Track and the Standard Crossing Line intersect and 1m on the opposite side,

the illumination shall be within a scope from 10lx to 25lx.

- (3) On the Standard Track, in a section that is 80m on the side where the test vehicle approaches from the point where the Standard Track and the Standard Crossing Line intersect and 40m on the opposite side, the illumination shall be within a scope from 5lx to 50lx.

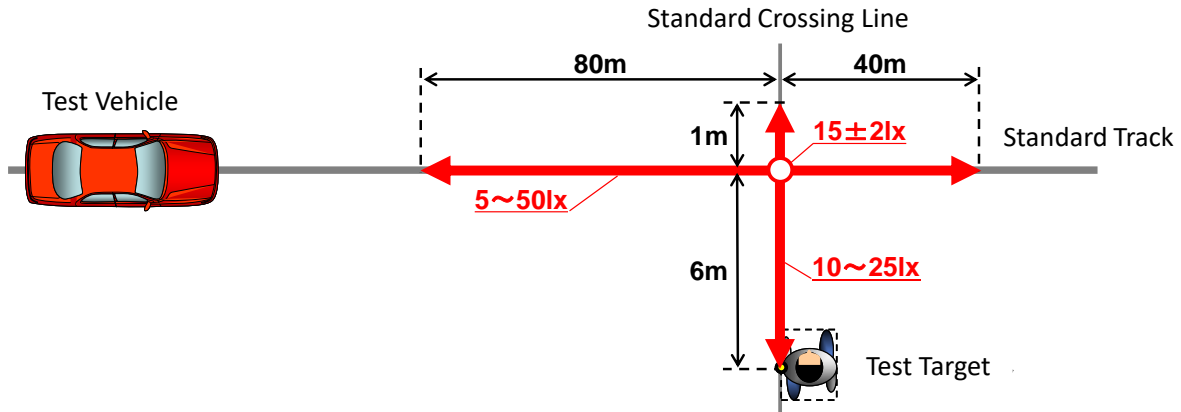


Diagram 4: Illumination Conditions as of Testing

4.6 Measurement Items

The items of measurement during the test shall be as described below and the sampling frequency shall be 100Hz or more. Further, for the yaw rate and the longitudinal acceleration, the high-frequency component shall be eliminated at cutoff frequency of 10Hz.

- (1) AEBS Activation time
- (2) FCWS Activation time
- (3) Collision time
- (4) Test vehicle and Test Target positions
- (5) Test vehicle and Test Target speeds
- (6) Test vehicle yaw rate
- (7) Test vehicle longitudinal acceleration
- (8) Test vehicle steering wheel velocity
- (9) Brake Pedal Stroke
- (10) Accelerator Stroke
- (11) Brake Temperature before Braking

4.7 Measurement equipment

The measuring equipment listed below that is used for testing shall be capable of smoothly performing handling of data of the measurement items prescribed in Item 4.6. In addition, before conducting the test, the test vehicle position shall be verified and for the other measurement equipment, accuracy shall be checked based on the results of calibration by the measurement equipment manufacturer, etc.

- (1) Test vehicle position measurement device: Accuracy of test vehicle position for each test shall be within $\pm 0.03\text{m}$.
- (2) Test vehicle speed measurement device: Accuracy of test vehicle speed for each test shall be

within $\pm 0.1\text{km/h}$.

- (3) Yaw rate measurement device: Accuracy of yaw rate for each test shall be within $\pm 0.1^\circ/\text{s}$.
- (4) Longitudinal acceleration measurement device: Accuracy of longitudinal acceleration for each test shall be within $\pm 0.1\text{m/s}^2$.
- (5) Steering wheel velocity measurement device: Accuracy of steering wheel velocity for each test shall be within $\pm 1^\circ/\text{s}$.
- (6) Brake pedal stroke measurement device: Accuracy of brake pedal stroke for each test shall be within $\pm 1\text{mm}$.
- (7) Accelerator stroke measurement device: Accuracy of accelerator stroke for each test shall be within $\pm 1\%$.
- (8) Brake Temperature Check Unit: Accuracy of temperature of each test shall be within $\pm 3\%$.
- (9) Test Target position measurement device: Accuracy of Test Target position of each test shall be within $\pm 0.03\text{m}$.
- (10) Test Target speed measurement device: Accuracy of Test Target speed of each test shall be within $\pm 0.01\text{km/h}$.

5. Test Procedure

5.1 Brake Conditioning

To condition the brake discs, drums and linings of the test vehicle (excluding those on which brake conditioning has been performed for other tests), the process of accelerating to 64km/h , braking to result in deceleration of 3.7m/s^2 and vehicle stop shall be repeated 200 times. The interval between the initial and second braking shall be either the time required to reduce the brake temperature to 110°C - 132°C or the distance of 1.6km , whichever occurs earlier. After every stop, the vehicle shall be accelerated to 64km/h and keep that speed until the next braking. (Brake Conditioning is equivalent to that provided in FMVSS105 S7.4.1.1.)

Further, upon request of the vehicle manufacturer, etc, it is allowed to run up to 100km in ordinary road, etc for the initialization of sensor units. As long as the conditions required for initialization are met, the initialization work may be performed in conjunction with the above conditioning run.

5.2 Re-brake conditioning

In the case of the first braking system test for the test car (generic term of the test carrying out brake conditioning of item 5.1), before starting the test, repeat the process of Item 5.1 at least 35 times in principle for re-conditioning. Further, when the period from the conditioning run of 5.1 to the test exceeded two weeks, the process may be repeated up to 50 times depending on the condition of the brake system in the test vehicle.

In the case of second or more braking system test (same when it takes multiple days in the same test), 35times if one week or more has passed since the previous test data, and 50 times at most if two weeks or more have passed, it is possible to carry out re-brake conditioning.

If re-brake conditioning test is not carried out on the day of test, warm up run should be carried

out until the brake temperature exceed 100 degrees by the procedure of the item 5.1

6. Test procedure

6.1 Standard Evaluation Test

- (1) Test scenario: For each of the AEBS Test and the FCWS Test, two types shall be performed: CPF and CPFO, for both with streetlight and without streetlight tests. (See Diagram 5 (a) and (b).) The initial Lateral Position of the Test Target shall be 6.0m and an acceleration section of 1.0m may be set. Further, in the CPFO test scenario, the distance (m) between the rear edge of the screening vehicle and the Standard Crossing Line shall be a value obtained by table 1.

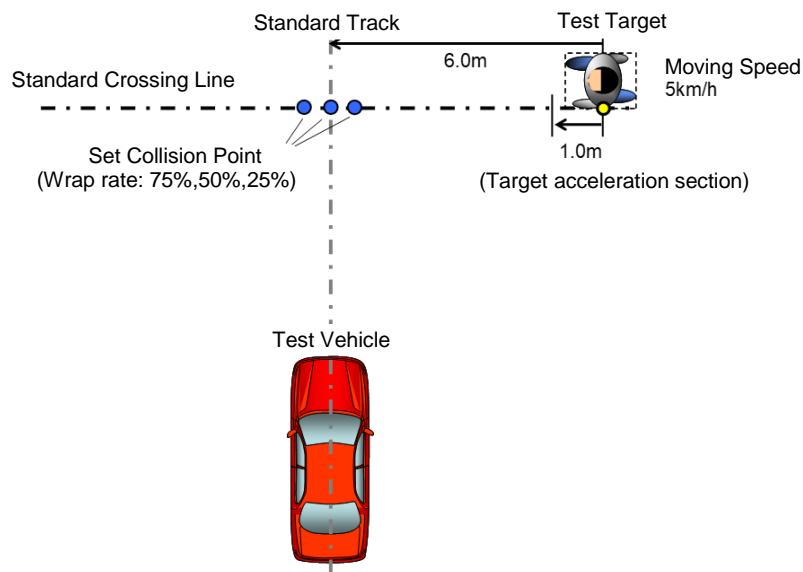


Diagram 5 (a): CPF

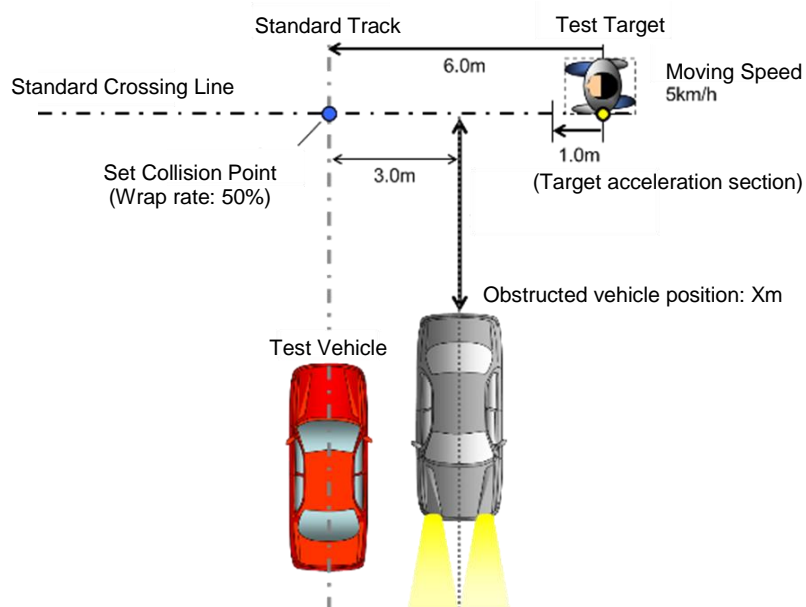


Diagram 5 (b): CPFO

Table 1: Obstructed vehicle position in CPFO: Xm

Test Vehicle Speed (km/h)	Test with surrounding light (Test Vehicle Speed (m/s) x 1.06m)	Test without surrounding light (m)
30	8.83	
35	10.31	
40	11.78	
45	13.25	19.08
50	14.72	21.68
55	16.19	24.27
60	17.67	

- (2) Test Vehicle Speed: The test speed of the test vehicle shall be in a scope described in Table 2 (a)(b), and the test will be performed by starting at the lowest speed and increasing in increments of 5km/h or 10km/h. Further, the starting vehicle speed may be raised upon declaration of the vehicle manufacturer, etc. Likewise, the ending vehicle speed may be lowered upon declaration of the vehicle manufacturer, etc. However, in either case, for the speeds not tested, results shall be handled in the same way as no activation of systems.

Table 2(a): Test Speed for test with surrounding light

	AEBS Test	FCWS Test
CPF Scenario	30-60km/h	30-60km/h
CPFO Scenario	30-60km/h	30-60km/h

Table 2(b): Test Speed for test without surrounding light

	AEBS Test	FCWS Test
CPF Scenario	30-60km/h	30-60km/h
CPFO Scenario	40-50km/h	40-50km/h

- (3) Transmission: For the test vehicles with automatic transmission, select D. For vehicles with manual transmission, select the highest gear where the RPM will be at least 1500 at the test speed and do not throw out a clutch during testing.
- (4) Headlamp: During testing, low-beam headlamps of the test vehicle and the screening vehicle

are turned on. If the test car is equipped with a high-performance headlight device in the no surrounding light test, perform the test with the function set to auto position.

(5) Test Measurement Sections: Measurement shall be commenced when the test vehicle approaches the Test Target and TTC reaching 4.0 sec. Measurement shall be ended when reaching any of the following conditions:

- ① When the test vehicle is stopped;
- ② When the rear edge of the target interference area exceeds the side edge of the approximate bumper line; or
- ③ When the test vehicle collides with the test target.

(6) Successful Completion of Test: During the period from the start of measurement until the Initial Speed is obtained, when the prescribed measurement items deviate from the permissible error shown in Table 3 and when the test video of Section 6.4 is not acquired (except when the driving status of the test car, the operating status of the test target and the collision / avoidance status can be confirmed by the in-vehicle video or the outside video), the attempted test shall be deemed invalid (foul) and shall not be counted in the number of tests. In addition, the measured value etc. shall round off the value less than the unit in each item. (Same below in this test method) And if there is an abnormality in the operating condition of the test target, the recorded test image is analyzed, and if there is an abnormality in the swing width of the head or leg, it is regarded as a foul and shall not be counted in the number of tests. In this case, the evaluation criteria shown in Appendix D may be used for the judgement.

Table 3: Test Condition Permissible Error

Test Condition	Permissible Range
Test Vehicle Speed	Test Speed ± 0.5 km/h
Test Target Speed	Set speed ± 0.2 km/h (excluding Target Acceleration Section)
Test Vehicle Lateral Position	Standard Track ± 0.05 m
Expected Collision Point	Set Collision Point $\pm 5\%$ (At measurement start only)
Yaw Rate	$\pm 1.0^\circ/\text{s}$
Steering Wheel Velocity	$\pm 15.0^\circ/\text{s}$
Brake Temperature Before Braking	65-100°C

(7) Number of Tests: The tests shall be performed 3 times for each test vehicle speed. However, if a collision is avoided or the same rate of velocity reduction is achieved twice in a row, the third test may be omitted.

(8) Test Implementation Procedures: The order of testing for the CPFO test scenario and CPF test

scenario is decided by the declaration of the car manufacturer etc. The interval of raising the test speed shall be 5km/h; however, when avoiding collisions more than 2 times out of 3 tests, the test speed may be raised by 10km/h (the 5km/h increment to be passed). When collisions are avoided also under a condition of an increase to 10km/h, collisions are deemed to be avoided for the 5km/h increment that is passed. However, when collisions could not be avoided 2 times or more out of 3 tests, the test speed shall be lowered by 5km/h and the test for the 5km/h increment that is passed must also be performed.

Subsequently, take the same procedures to conduct tests up to the highest speed condition or the one declared by the vehicle manufacturer, etc. However, the scenario will be ended when the Collision Speed in the tests of the same speed conditions becomes 40km/h or more for 2 times.

The order in which the test scenarios are conducted shall be the order reported by the automobile manufacturer, etc., and the next test scenario shall not be started until the current test scenario is completed.

- (9) Accelerator Operation during the AEBS Test: In the measurement section, the Accelerator Stroke shall be held constant so as not to cause any impact on the activation of AEBS. Further, for those test vehicles on which the accelerator is controlled when AEBS is activated, upon consultation with the vehicle manufacturer, etc, the Accelerator Stroke during AEBS activation may be adjusted.
- (10) Accelerator/Brake Operation during the FCWS Test: The accelerator of the test vehicle shall be released 1.0 second after the FCWS Activation Point. The brake pedal shall be pressed down 1.2 seconds after the FCWS Activation Point, in such a manner that it takes 0.2 seconds to reach the point where deceleration under non-threat situation of $4.0 (+0.25)\text{m/s}^2$ is generated (however, maximum is 400mm/s), and prescribed pedal force shall be maintained. For these brake operation setup values (the Brake Pedal Stroke, application rate and pedal force), the values declared by the vehicle manufacturer, etc shall be used. When the vehicle manufacturer, etc submits no setup values or when the deceleration under non-threat situation exceeds the permissible range ($4.00\text{-}4.25\text{m/s}^2$), the setup shall be performed by NASVA in accordance with the steps described in Annex E.

Further, to perform these tests for precision, it is desirable to equip the test vehicle with such operation input equipment as an automatic driving device.

- (11) When it is obvious that the same results as the AEBS Test will be obtained in the FCWS Test, regardless of with or without the FCWS function, the results of the AEBS test may be taken as those of such test. Likewise, when the time from the FCWS activation to collision is 1.2 sec. or less, the result of the AEBS Test shall be that of such test.

6.2 Partial Evaluation Test

- (1) Test scenario: Upon completion of the Standard Evaluation Test, for the AEBS Test and the FCWS Test, the Partial Evaluation Tests shall be implemented in accordance with the following setup conditions. Further, for the Test (iii), the Test Target acceleration section in Diagram 5 (a)

shall be changed to 1.5m.

① CPF: Set Collision Point 25%, Test Target speed 5km/h

② CPF: Set Collision Point 75%, Test Target speed 5km/h

③ CPF: Set Collision Point 50%, Test Target speed 8km/h

(2) Test Speed: Based on the result of the Standard Evaluation Test, it shall be Representative Speed (see definition in section 3. (27)) of the applicable test.

(3) Test Implementation Procedures: The tests shall be conducted in an order of (i) through (iii). Further, when collision is avoided at the representative vehicle speed condition of the CPF in the Standard Evaluation Test, Test (ii) may be passed on by deeming collision is avoided in the same way.

(4) Other procedures: Provisions of sections 6.1 (3) through (7) and sections 6.1 (9) through (11) shall be applied mutatis mutandis.

6.3 Measurement Data and Recording

(1) Confirmation of Completion of Testing: For each test, confirm whether the test conditions meet the permissible error of Table 3.

(2) Collision Avoided or Not: For each test, confirm whether collisions were avoided, and record collisions or not and the measurement data for the next and subsequent items into Attached Table 2.

(3) Initial Speed: Record in 0.1 km/h increments.

(4) Velocity Reduction Amount: Record in 0.1 km/h increments.

(5) Velocity Reduction Rate: Find and record the velocity reduction rate to two decimal places, rounding off to the third decimal place.

6.4 Recording Video Picture of Testing

(1) Image of inside vehicle: Pictures of the front of the test vehicle, near driver's seat and FCWS activation status shall be recorded by video cameras installed in the test vehicle interior. (Shooting may be ended due to difficulties in taking pictures inside the vehicle upon consultation with the vehicle manufacturer, etc.)

(2) Image of outside vehicle: A video camera installed at the side of the test track and in front of the test track at the point where a collision between the test vehicle and the test target is expected to occur will record the driving conditions of the test vehicle and the operation and collision/avoidance conditions of the test target.

7. Sorting Out of Test Results

Record test results, etc. in Attached Table 2.

The Velocity Reduction Rate of each test speed shall be the median of 3 effective test results. However, the Velocity Reduction Rate of the condition when collisions are avoided shall be 1.00.

Further, when testing is ended after conducting 2 tests pursuant to the exceptional clauses of sections 6.1 (7) and (8), 6.1 (7) shall be the Velocity Reduction Rate obtained and section 6.1 (8) shall be the lower value of the test results.

Annex A: Test Target Specification

For the Test Target, those having specifications equivalent to those of the Euro-NCAP (Test Protocol - AEB VRU systems Version1.0.1 July 2015 ANNEX A EPT SPECIFICATIONS) shall be used.

Attached Diagram A shows external appearance of the Test Targets (movable type/fixed type), and the drive unit and the platform to move the Test Target. In addition, measurement specifications of the adult and child dummies are shown in Attached Diagram A.

The Test Target shall be designed to have characteristics that are similar to those of human pedestrians in terms of being detected by such sensors as laser radars, millimeter-wave radars and cameras. Also, the platform shall be designed to be very thin at 2.5cm so as not to cause any impact on pedestrian detection by various sensors.



(a) Adult Movable Dummy



(b) Test Target Drive Unit

Attached Diagram A: External Appearance of Test Target

Attached Table A: Test Target Specifications

(a) Movable Dummy Specifications

Item		Dimension	
Walking posture height		1,800±20	[mm]
Shoulder center (diagram ○) height		1430	[mm]
Horizontal distance between shoulder center and platform center (diagram △)		-40	[mm]
Distance between right heel and left toe (max value during walking)		550±50	[mm]
Distance between elbows		500±20	[mm]
Torso thickness		235±20	[mm]
Forward tilt angle		85±2	[deg]
Strut angle (toward vehicle traveling direction)		5±2	[deg]
Upper arm angles	Right	60±2	[deg]
	Left	110±2	[deg]
Weight		MAX 4	[kg]



Annex B: Specifications of Screening Vehicle Used for Testing

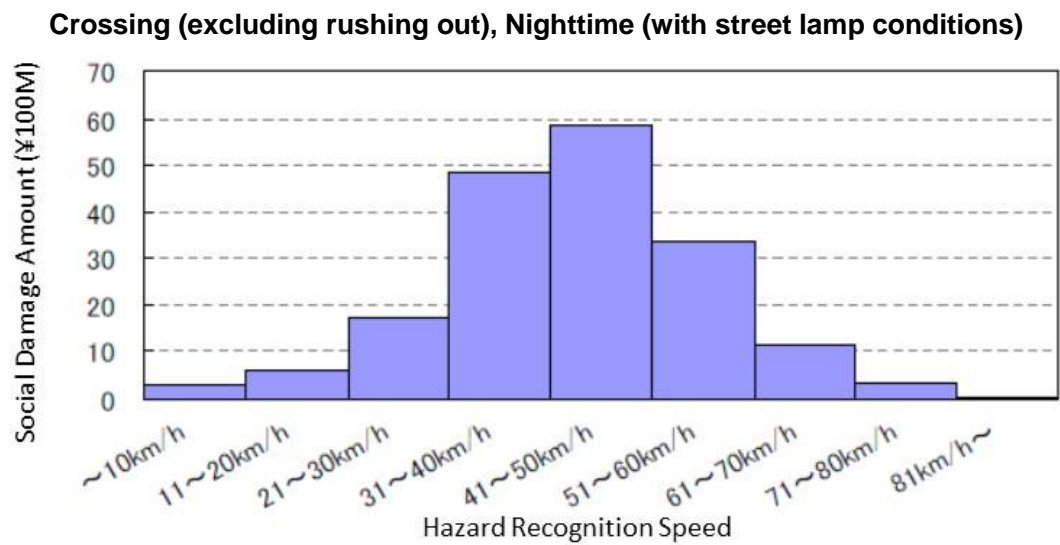
For the screening vehicles used for the CPFO scenario, a commercially available vehicle (a minivan type of a kei vehicle) meeting the specifications of Attached Table B shall be used.

Attached Table B: Specifications of Screening Vehicles for CPFO Scenario

Length	3,375±25 [mm]
Width	1,475±25 [mm]
Height	1,800±200 [mm]
Body color	White

Annex C: Amount of Social Damage Used for Selection of Representative Vehicle Speed (Night)

For the selection of the representative vehicle speed for the Partial Evaluation Test, statistics data on accidents, based on which the social damage amounts by hazard recognition speed in Attached Diagram C were calculated, shall be used. When the representative vehicle speed candidates are listed in the order of larger social damage in accordance with the test vehicle speed conditions in increments of 5km, it shall be 45km/h, 50km/h, 40km/h, 35km/h, 55km/h, 60km/h and 30km/h, from which the representative vehicle speed shall be set pursuant to the definition of the main rule.



Attached Diagram C: Social Damage Amount of Accidents by Hazard Recognition Speed (Nighttime)

Annex D: Criteria for Judging Movement Status of Test Target

D.1 Judgment by Behavior of Target Head and Leg

D.1.1 Measurement Item

On the Standard Crossing Line, measure the “speed of the Target head” between a point 3m short of the Standard Track to reaching 2m short of the Standard Track, and the “right leg position” and the “left leg position” at 2m short of the Standard Track. The image of the measurement shall be recorded at a sampling rate of 60FPS and have a resolution of 200 pixel/m.

D.1.2 Criteria for Judging Valid Test

Measurement items of D1.1 shall be within the permissible scope show in Attached Table D.

Attached Table D: Permissible Error for Target Head and Leg Behavior

(a) Walking speed: 5km/h

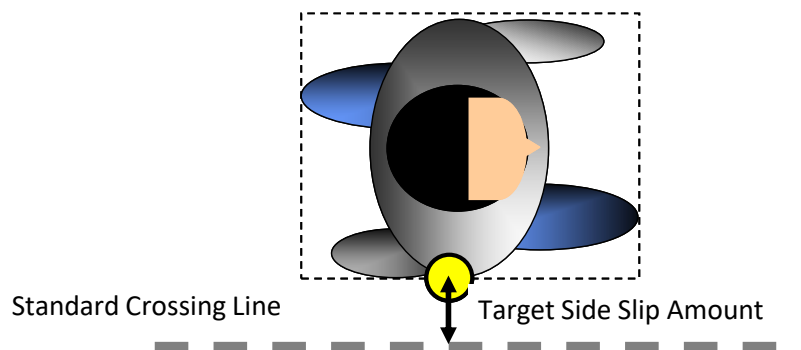
Measurement Point	2m short
Head Speed [km/h]	5.0 ± 1.0
Right Leg Position [m]	-1.77 ± 0.10
Left Leg Position [m]	-2.38 ± 0.10

(b) Walking speed: 8km/h

Measurement Point	2m short
Head Speed [km/h]	8.0 ± 1.0
Right Leg Position [m]	-1.74 ± 0.10
Left Leg Position [m]	-2.38 ± 0.10

D.2 Judgment by Target Moving Path

In the same measurement section as D.1.1, the “target side slip amount (distance from the Standard Crossing Line)” shown in Attached Diagram D shall be within a scope of $\pm 0.1\text{m}$. However, when it is difficult to directly measure such index, it may be estimated using the distance between two points at which relative positional relationship is equivalent.



Attached Diagram D: Definition Target Side Slip Amount

Annex E: Brake Operation Setup Procedure for FCWS Test

E.1 Definition

- (1) T_{BRAKE} : When the brake pedal stroke exceeded 5mm
- (2) $T_{2\text{m/s}^2}$: When the filtered deceleration data exceeded 2m/s^2 for the first time
- (3) $T_{6\text{m/s}^2}$: When the filtered deceleration data exceeded 6m/s^2 for the first time

E.2 Measurement Procedure

Apply the measurement procedure and filtering described in Chapter 3.

E.3 Test Procedure for Brake Input Characteristics

E.3.1 Test Preparation

Perform the warm-up operation of brakes and tires described in main rule Section 4.2 first before conducting the FCWS Test. The brake input characteristics shall be set immediately before the above.

E.3.2 Brake Input Characteristics Setup:

- (1) Accelerate the test vehicle to be 85km/h or more. For the test vehicles with automatic transmission, select D. For the vehicles with manual transmission, select the highest gear where the RPM will be at least 1500 at the test speed.
- (2) Release the accelerator and when the speed becomes slower than $80 (\pm 1) \text{ km/h}$, start applying brakes at the pedal application rate $20 (\pm 5) \text{ mm/s}$ until deceleration becomes 7m/s^2 . For manual transmission, throw out a clutch at the earliest timing possible before RPM will be 1500rpm or less. When the deceleration becomes 7m/s^2 , end the run and measure the Brake Pedal Stroke and pedal force in operation.
- (3) Perform the above run 3 times in a row. The interval between tests shall be 90 seconds or more but 10 minutes or less, and when 10 minutes is passed, perform the warm-up operation again before resuming the run.
- (4) Based on the deceleration data from the Brake Pedal Stroke between $T_{2\text{m/s}^2}$ and $T_{6\text{m/s}^2}$, apply quadratic curve approximation using least square, and calculate the Brake Pedal Stroke corresponding to deceleration 4m/s^2 (which shall be "D4" in unit of m). For the pedal force as well, use the same method to obtain the pedal force value corresponding to deceleration 4m/s^2 (which shall be "F4" in unit of N).

E.3.3 Brake Pedal Force Setup Procedure and Repeating Procedure

- (1) Run the test vehicle constantly at $80 (+1) \text{ km/h}$. The test vehicle gear position shall be the same as E.3.2.
- (2) By manual trigger, not in response to FCWS, apply brakes in accordance with the steps described in E.4. Based on the measured deceleration data, obtain average deceleration of the sections from $T_{\text{BRAKE}}+1 \text{ sec}$ to $T_{\text{BRAKE}}+3 \text{ sec}$. If the average deceleration deviates from $4 (+0.25) \text{ m/s}^2$, use the correction formula below to correct the F4 value.

$$F4_{\text{new}} = F4_{\text{original}} * (4 / \text{average deceleration})$$

$$(\text{e.g., when average deceleration is } 5\text{m/s}^2, F4_{\text{new}} = F4_{\text{original}} * 4 / 5)$$

Use the corrected F4 and repeat brake operations of E.4 so that the average deceleration will be within a scope of 4 (+0.25) m/s².

E.4 Brake Operation Procedure during FCWS Test

- (1) Detect the activation of FCWS, time of which shall be T_{FCW} .
- (2) Release the accelerator at $T_{\text{FCW}}+1$ sec.
- (3) Brake pedal stroke control shall start at $T_{\text{FCW}}+1.2$ sec, and the application rate shall be either $D4 \times 5$ mm/s or 400mm/s, whichever is smaller. (In other words, it shall be the speed at which the stroke reaches D4 in 200ms, and the upper limit value shall be 400mm/s.)
- (4) Monitor the pedal force values processed by second-order filtering with a cutoff frequency 20Hz or by moving average at 50ms, and upon reaching either of the following, switch to the pedal force control with target value of F4. The time of the switch shall be recorded as T_{switch} .
 - a. When the stroke D4 defined in E.3 is exceeded for the first time.
 - b. When the pedal force value F4 defined in E.3 is exceeded for the first time.

Further, when it is shifted to pedal force control before reaching enough pedal stroke after performing filtering, etc, upon consultation with the vehicle manufacturer, etc, T_{switch} timing may be adjusted. (For example, take a measure for not switching to pedal force control until reaching certain pedal stroke.)
- (5) At T_{switch} onward, control the brake pedal in such a way that the pedal force will be $F4 \pm 25\%$.
Stable pedal force control should be realized within 200ms from T_{switch} ; however, even when the pedal force value exceeds $F4 \pm 25\%$ due to intervention by AEBS, it shall be acceptable when duration is 200ms or less.
- (6) It is desirable that the pedal force average value will be in the range of $F4 \pm 10\text{N}$ from $T_{\text{FCW}} + 1.4$ sec to the end of the test.

Attached Table 1: Autonomous Emergency Brake System [for Pedestrian at night] Performance Test Conditions and Test Vehicle Specification

[To be filled in by the Vehicle Manufacturer, etc]

1. Test Vehicle Specification

(1) Model/Type (Model Name): _____ / _____ (_____)

(2) Sensor System: _____

(3) Installed Tire

	Front	Rear
Size		
Brand/Type		
Air Pressure (kPa)		

2. Declarations, etc by Vehicle Manufacturer, etc

(1) AEBS Test Start Speed With surrounding light CPF: _____ km/h CPFO: _____ km/h

Without surrounding light CPF: _____ km/h CPFO: _____ km/h

(2) AEBS Test End Speed With surrounding light CPF: _____ km/h CPFO: _____ km/h

Without surrounding light CPF: _____ km/h CPFO: _____ km/h

(3) FCWS Function Available or Not: Available / Not Available

(4) FCWS Test Start Speed With surrounding light CPF: _____ km/h CPFO: _____ km/h

Without surrounding light CPF: _____ km/h CPFO: _____ km/h

(5) FCWS Test End Speed With surrounding light CPF: _____ km/h CPFO: _____ km/h

Without surrounding light CPF: _____ km/h CPFO: _____ km/h

(6) FCWS Function Specification: "Auditory and visual information" and "auditory and haptic information"

Frequency of auditory information: _____ Hz • _____ Hz

Attach a document stating the location of the provision of such information (speaker location, display location, etc.).

(7) FCWS Test Brake Operation Setup Values

Brake Pedal Stroke: _____ mm Application Rate: _____ mm/s Pedal Force: _____ N

(8) Activation Start Timing Manual Setup: Yes (_____) / No

(9) High-performance headlight device Available or Not: Available / Not Available

(10) Limit on number of AEBS activations: Yes (up to _____ times per run) / No

(11) Approximate Bumper Line Setup Values [mm]:

Vehicle overall width: _____

A = (_____ , _____)

B = (_____ , _____)

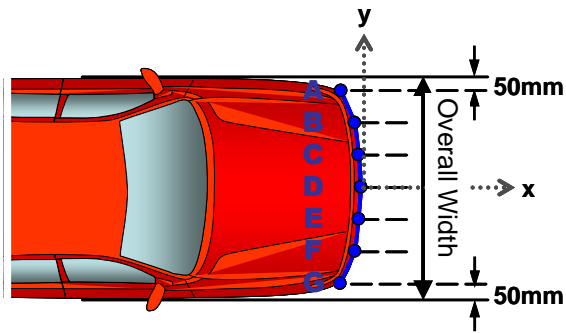
C = (_____ , _____)

D = (_____ 0 , _____ 0)

E = (_____ , _____)

F = (_____ , _____)

G = (_____ , _____)



(12) Protection System: Document describing how to deactivate the Passenger Protection System and the Pedestrian Protection System, or document describing brief overview of the modification for deactivation.

(13) Prior data submission: Yes (Attached Table 3 or equivalent) / No

(14) Order of test scenarios: ① ②

(15) Notes

3. Functions, Cautions, etc of Systems to Support Users

Documents shall be attached relating to the subjects and conditions of activation under the environment determined by the vehicle manufacturer, etc and the idea of functions of the system.

Attached Table 2: Autonomous Emergency Brake System [for Pedestrian at night] Performance Test Result

[To be filled in by Testing Institute]

Test date (YYYY/MM/DD):_____ Place:_____

1. Test Vehicle Specification

(1) Model/Type (Model Name):_____ / _____ (_____)

(2) Frame number:_____

(3) Sensor system:_____

(4) Installed Tire

	Front	Rear
Size		
Brand/Type		
Air Pressure (kPa)		

(5) Test Vehicle Load Distribution

		Left Wheel	Right Wheel	Subtotal	Grand Total	Front-rear Distribution
Load Distribution at Vehicle Delivery (daN)	Front Axle					%
	Rear Axle					%
Load Distribution at Testing (daN)	Front Axle					%
	Rear Axle					%

(Note) Indicate as 1daN = 1kgf

2. Test Conditions Setup, etc

(1) AEBS Test Start Speed Test with surrounding light CPF:_____ km/h CPFO:_____ km/h

Test without surrounding light CPF:_____ km/h CPFO:_____ km/h

(2) AEBS Test End Speed Test with surrounding light CPF:_____ km/h CPFO:_____ km/h

Test without surrounding light CPF:_____ km/h CPFO:_____ km/h

(3) FCWS Test Available or Not: Available / Not Available

(4) FCWS Test Start Speed Test with surrounding light CPF:_____ km/h CPFO:_____ km/h

Test without surrounding light CPF:_____ km/h CPFO:_____ km/h

(5) FCWS Test End Speed Test with surrounding light CPF:_____ km/h CPFO:_____ km/h

Test without surrounding light CPF:_____ km/h CPFO:_____ km/h

(6) FCWS Function Specification: "Auditory and visual information" and "auditory and haptic"

information"

(7) FCWS Test Brake Operation Setup Values Test implemented or not: Yes/No

Brake Pedal Stroke: _____ mm Application Rate: _____ mm/s Pedal Force: _____ N

(8) Activation Start Timing Manual Setup: Yes (_____) / No

(9) Approximate Bumper Line Setup Values [mm]:

Vehicle overall width: _____

A = (_____ , _____)

B = (_____ , _____)

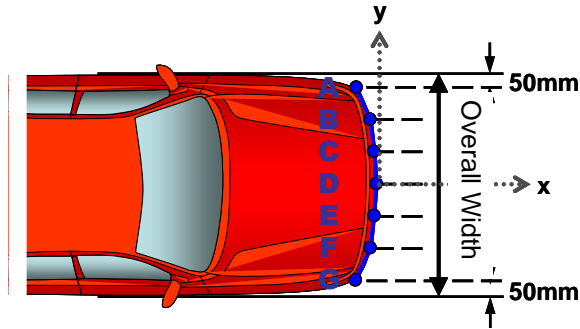
C = (_____ , _____)

D = (0 , 0)

E = (_____ , _____)

F = (_____ , _____)

G = (_____ , _____)



(10) Partial Evaluation Test Representative Speed: Test with surrounding light CPF: _____ km/h

Test without surrounding light CPF: _____ km/h

(11) Headlights during test without surrounding light:

Lo-beam headlight ▪ High-performance headlights (auto)

3. Environmental Condition

Day 1 Test date (YYYY/MM/DD): _____ Place: _____

Start Time: _____ Weather: _____ Temp.: _____ Wind Speed: _____

End Time: _____ Weather: _____ Temp.: _____ Wind Speed: _____

Remarks: _____

Day 2 Test date (YYYY/MM/DD): _____ Place: _____

Start Time: _____ Weather: _____ Temp.: _____ Wind Speed: _____

End Time: _____ Weather: _____ Temp.: _____ Wind Speed: _____

Remarks: _____

Day 3 Test date (YYYY/MM/DD): _____ Place: _____

Start Time: _____ Weather: _____ Temp.: _____ Wind Speed: _____

End Time: _____ Weather: _____ Temp.: _____ Wind Speed: _____

Remarks: _____

4. Test Result

(1) Standard Evaluation Test: AEBS test for CPF (with surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
30km/h	1st						
	2nd						
	3rd						
35km/h	1st						
	2nd						
	3rd						
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						
55km/h	1st						
	2nd						
	3rd						
60km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation, —: Not implemented

(2) Standard Evaluation Test: FCWS test for CPF (with surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
30km/h	1st						
	2nd						
	3rd						
35km/h	1st						
	2nd						
	3rd						
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						
55km/h	1st						
	2nd						
	3rd						
60km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(3) Standard Evaluation Test: AEBS test for CPFO (with surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
30km/h	1st						
	2nd						
	3rd						
35km/h	1st						
	2nd						
	3rd						
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						
55km/h	1st						
	2nd						
	3rd						
60km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(4) Standard Evaluation Test: FCWS test for CPFO (with surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
30km/h	1st						
	2nd						
	3rd						
35km/h	1st						
	2nd						
	3rd						
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						
55km/h	1st						
	2nd						
	3rd						
60km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(5) Partial Evaluation Test: AEBS test for CPF (with surrounding light)

Wrap rate: 25%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Wrap rate: 75%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Pedestrian speed: 8km/h

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation, —: Not implemented

(6) Partial Evaluation Test: FCWS test for CPF (with surrounding light)

Wrap rate: 25%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Wrap rate: 75%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Pedestrian speed: 8km/h

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation, —: Not implemented

(7) Standard Evaluation Test: AEBS test for CPF (without surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
30km/h	1st						
	2nd						
	3rd						
35km/h	1st						
	2nd						
	3rd						
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						
55km/h	1st						
	2nd						
	3rd						
60km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(8) Standard Evaluation Test: FCWS test for CPF (without surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
30km/h	1st						
	2nd						
	3rd						
35km/h	1st						
	2nd						
	3rd						
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						
55km/h	1st						
	2nd						
	3rd						
60km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(9) Standard Evaluation Test: AEBS test for CPFO (without surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(10) Standard Evaluation Test: FCWS test for CPFO (without surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(11) Partial Evaluation Test: AEBS test for CPF (without surrounding light)

Wrap rate: 25%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Wrap rate: 75%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Pedestrian speed: 8km/h

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(12) Partial Evaluation Test: FCWS test for CPF (without surrounding light)

Wrap rate: 25%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Wrap rate: 75%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Pedestrian speed: 8km/h

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

Attached Table 3: Test Results of the Collision Damage Mitigation Braking Control System [for Pedestrian at night] Performance Test Result

[For advance data as stipulated in the detailed regulations of the New Car, etc.Assessment Information Provision Project]

***Only the results of tests conducted on the same type of vehicle as the assessment test vehicle (with optional equipment similar to that of the test vehicle) using the test methods specified by NASVA may be submitted.**

Test date (YYYY/MM/DD):_____ Place:_____

1. Test Vehicle Specification

(1) Model/Type (Model Name):_____ / _____ (_____)

(2) Frame number:_____

(3) Sensor system:_____

(4) Installed Tire

	Front	Rear
Size		
Brand/Type		
Air Pressure (kPa)		

(5) Test Vehicle Load Distribution

		Left Wheel	Right Wheel	Subtotal	Grand Total	Front-rear Distribution
Load Distribution at Vehicle Delivery (daN)	Front Axle					%
	Rear Axle					%
Load Distribution at Testing (daN)	Front Axle					%
	Rear Axle					%

(Note) Indicate as 1daN = 1kgf

2. Setting of Conditions for Testing, etc.

(1) AEBS Test Start Speed with surrounding light CPF:_____ km/h CPFO:_____ km/h
 without surrounding light CPF:_____ km/h CPFO:_____ km/h
 (2) AEBS Test End Speed with surrounding light CPF:_____ km/h CPFO:_____ km/h
 without surrounding light CPF:_____ km/h CPFO:_____ km/h

(3) FCWS Test Available or Not: Available / Not Available

(4) FCWS Test Start Speed with surrounding light CPF: _____ km/h CPFO: _____ km/h
 without surrounding light CPF: _____ km/h CPFO: _____ km/h

(5) FCWS Test End Speed with surrounding light CPF: _____ km/h CPFO: _____ km/h
 without surrounding light CPF: _____ km/h CPFO: _____ km/h

(6) FCWS Function Specification: "Auditory and visual information" and "auditory and haptic information"

(7) FCWS Test Brake Operation Setup Values Test implemented or not: Yes/No

Brake Pedal Stroke: _____ mm Application Rate: _____ mm/s Pedal Force: _____ N

(8) Activation Start Timing Manual Setup: Yes (_____) / No

(9) Approximate Bumper Line Setup Values [mm]:

Vehicle overall width: _____

A = (_____ , _____)

B = (_____ , _____)

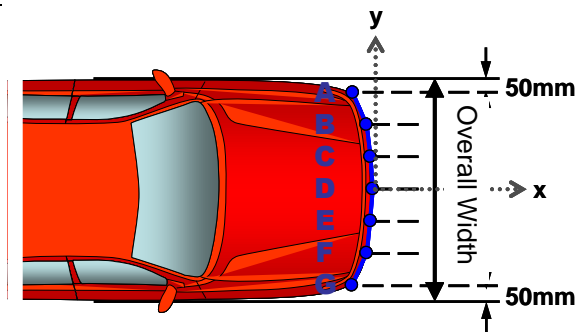
C = (_____ , _____)

D = (0 , 0)

E = (_____ , _____)

F = (_____ , _____)

G = (_____ , _____)



(10) Partial Evaluation Test Representative Speed: with surrounding light CPF: _____ km/h
 with surrounding light CPF: _____ km/h

(11) Headlights during test without surrounding light:

Lo-beam headlight • High-performance headlights (auto)

3. Environmental Condition

Day 1 Test date (YYYY/MM/DD):_____ Place:_____

Start Time:_____	Weather:_____	Temp.:_____	Wind Speed:_____
End Time: _____	Weather:_____	Temp.:_____	Wind Speed:_____

Remarks:_____

Day 2 Test date (YYYY/MM/DD):_____ Place:_____

Start Time:_____	Weather:_____	Temp.:_____	Wind Speed:_____
End Time: _____	Weather:_____	Temp.:_____	Wind Speed:_____

Remarks:_____

Day 3 Test date (YYYY/MM/DD):_____ Place:_____

Start Time:_____	Weather:_____	Temp.:_____	Wind Speed:_____
End Time: _____	Weather:_____	Temp.:_____	Wind Speed:_____

Remarks:_____

4. Test Result

(1) Standard Evaluation Test: AEBS test for CPF (with surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
30km/h	1st						
	2nd						
	3rd						
35km/h	1st						
	2nd						
	3rd						
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						
55km/h	1st						
	2nd						
	3rd						
60km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation, —: Not implemented

(2) Standard Evaluation Test: FCWS test for CPF (with surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
30km/h	1st						
	2nd						
	3rd						
35km/h	1st						
	2nd						
	3rd						
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						
55km/h	1st						
	2nd						
	3rd						
60km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(3) Standard Evaluation Test: AEBS test for CPFO (with surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
30km/h	1st						
	2nd						
	3rd						
35km/h	1st						
	2nd						
	3rd						
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						
55km/h	1st						
	2nd						
	3rd						
60km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(4) Standard Evaluation Test: FCWS test for CPFO (with surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
30km/h	1st						
	2nd						
	3rd						
35km/h	1st						
	2nd						
	3rd						
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						
55km/h	1st						
	2nd						
	3rd						
60km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(5) Partial Evaluation Test: AEBS test for CPF (with surrounding light)

Wrap rate: 25%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Wrap rate: 75%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Pedestrian speed: 8km/h

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(6) Partial Evaluation Test: FCWS test for CPF (with surrounding light)

Wrap rate: 25%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Wrap rate: 75%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Pedestrian speed: 8km/h

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(7) Standard Evaluation Test: AEBS test for CPF (without surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
30km/h	1st						
	2nd						
	3rd						
35km/h	1st						
	2nd						
	3rd						
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						
55km/h	1st						
	2nd						
	3rd						
60km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(8) Standard Evaluation Test: FCWS test for CPF (without surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
30km/h	1st						
	2nd						
	3rd						
35km/h	1st						
	2nd						
	3rd						
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						
55km/h	1st						
	2nd						
	3rd						
60km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(9) Standard Evaluation Test: AEBS test for CPFO (without surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(10) Standard Evaluation Test: FCWS test for CPFO (without surrounding light)

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
40km/h	1st						
	2nd						
	3rd						
45km/h	1st						
	2nd						
	3rd						
50km/h	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(11) Partial Evaluation Test: AEBS test for CPF (without surrounding light)

Wrap rate: 25%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Wrap rate: 75%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Pedestrian speed: 8km/h

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented

(12) Partial Evaluation Test: FCWS test for CPF (without surrounding light)

Wrap rate: 25%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Wrap rate: 75%

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

Pedestrian speed: 8km/h

			(a)	(b)	(c)=(a)-(b)	(d)=(c)/(a)	
Velocity Conditions	Number of Tests	Avoided or Not (*)	Initial Speed	Speed at Collision	Velocity Reduction Amount	Velocity Reduction Rate	Velocity Reduction Rate Median
	1st						
	2nd						
	3rd						

(*) ○: Collision avoided, P: Passed (deemed avoided), △: Speed reduced, x: No activation , —: Not implemented