

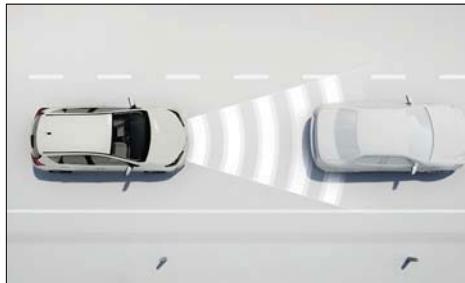
# LEXUS SAFETY SYSTEM+

A COMPREHENSIVE SUITE  
OF ADVANCED TECHNOLOGIES  
2022 MODELS

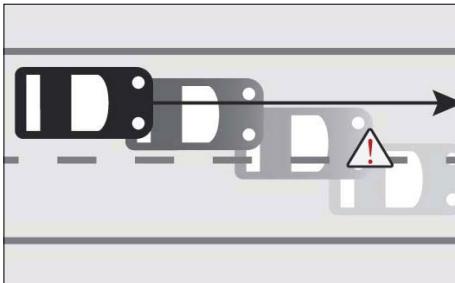
**Collision protection includes collision prevention.** Collisions that result in injury may be caused by the delay in a driver's recognition of the situation and his or her ability to react accordingly. According to NHTSA<sup>1</sup>, there were almost 6.3 million reported crashes in 2015 – many of which were avoidable.

Lexus Safety System+<sup>2</sup> is designed to help protect drivers, passengers, people in other vehicles on the road and pedestrians from harm. This system is composed of advanced active safety packages anchored by automated pre-collision warning<sup>3</sup> and braking. Lexus Safety System+ represents the latest milestone in our long history of creating advancements and innovations in safety that have helped prevent or mitigate crashes and protect people.

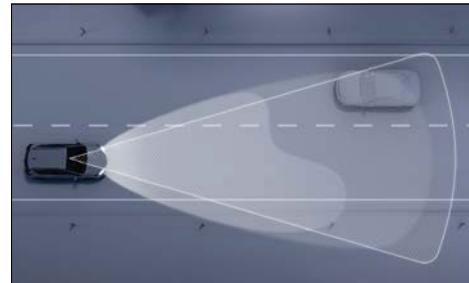
## LEXUS SAFETY SYSTEM+ ADDRESSES THREE OF THE MOST COMMON ACCIDENT TYPES



FRONTAL COLLISIONS



UNINTENDED LANE DEPARTURES



NIGHTTIME ACCIDENTS

Lexus Safety System+ is designed to support driver awareness, decision-making and vehicle operation over a wide range of speeds under certain conditions. Packaged together in an integrated system, Lexus Safety System+ features help address three key areas of accident protection: **preventing or mitigating frontal collisions<sup>3</sup>**, **keeping drivers within their lane<sup>4</sup>** and **enhancing road safety during nighttime driving<sup>5</sup>**. Always drive safely, obey traffic speed limits and laws and focus on the road while driving.

Lexus Safety System+ is comprised of four systems (with some variations shown as well):

1. Pre-Collision System<sup>3</sup> with Pedestrian Detection<sup>6</sup> | Left Turn Intersection Support<sup>7</sup>
2. Lane Departure Alert<sup>4</sup>
3. Intelligent High Beams<sup>5</sup>
4. Dynamic Radar Cruise Control<sup>9</sup>

Lexus Safety System+ 2.0 and 2.5 include two additional features:

5. Road Sign Assist<sup>14†</sup>
6. Lane Tracing Assist<sup>15†</sup>

Lexus Safety System+ 3.0 enhancements include:

7. Curve Speed Management added to Dynamic Radar Cruise Control
8. Additional Intersection Support

## AVAILABILITY BY MODEL

22 MODEL YEAR	LSS+	LSS+ 2.0	LSS+ 2.5	LSS+ 3.0
UX		✓		
NX				✓
RX/RXL		✓		
GX	✓			
LX			✓	
ES			✓	
IS			✓	
LS			✓	
LC	✓			
RC	✓			
RC F	✓			

## FEATURES BY PACKAGE

22 MODEL YEAR	LSS+	LSS+ 2.0	LSS+ 2.5	LSS+ 3.0
Pre-Collision with Pedestrian Detection	✓	✓	✓	✓
Low-light Pedestrian & Daytime Bicyclist Detection		✓	✓	✓
Left Turn Vehicle Intersection Support			✓	✓
Right/Left Turn Oncoming Pedestrian Detection/Braking				✓
Front to Front Oncoming Car Detection				✓
Lane Departure Alert*	✓	✓	✓	✓
Intelligent High Beams	✓	✓	✓	✓
Dynamic Radar Cruise Control**	✓	✓	✓	✓
Enhanced All-Speed Dynamic Radar Cruise Control			✓	✓
With Curve Speed Management				✓
Lane Tracing Assist		✓	✓	✓
Enhanced Lane Tracing Assist			✓	✓
Road Sign Assist		✓	✓	✓

\* Certain models also include Steering Assist and Lane Keep Assist.

\*\* High-speed or All-speed depending on model.

# 1. PRE-COLLISION SYSTEM with PEDESTRIAN DETECTION

Standard:

**IS | ES | LS | NX | RX | GX | LX | RC & RC F | LC | UX**

With enhanced radar and camera capabilities, this system<sup>3</sup> can help detect the vehicle ahead, a preceding bicyclist in daytime, and a preceding pedestrian in daytime and low-light conditions. Should it detect a potential frontal collision, it can help provide steering assistance and can help automatically brake the vehicle to a stop. As there is a limit to the degree of recognition accuracy and control performance that this system can provide, do not overly rely on this system. This system will not prevent collisions or lessen collision damage or injury in every situation. Do not use Pre-Collision System with Pedestrian Detection<sup>6</sup> instead of normal braking operations under any circumstances. Do not attempt to test the operation of the pre-collision system yourself, as the system may not operate or engage, possibly leading to an accident. In some situations, such as when driving in inclement weather (heavy rain, fog, snow, sandstorm, etc.) or while driving on a curve and for a few seconds after driving on a curve, a preceding vehicle/pedestrian may not be detected by the radar and camera sensors, preventing the system from operating properly.



## VEHICLE DETECTION

Pre-Collision System with Pedestrian Detection uses an in-vehicle camera and front-grille-mounted millimeter-wave radar to help detect the vehicle in front of your vehicle.

- When the Pre-Collision System with Pedestrian Detection determines that the possibility of a frontal collision with that vehicle is high, it prompts the driver to take evasive action and brake, by using an audible and visual alert.
- If the driver notices the hazard and brakes, the system may provide additional braking force using Brake Assist<sup>10</sup>. This system may apply greater braking force in relation to how strongly the brake pedal is depressed.
- If the driver does not brake in a set time and the system determines that the possibility of a frontal collision with another vehicle is extremely high, the system may automatically apply the brakes, reducing speed in order to help the driver reduce the impact and – in certain cases – avoid the collision.
  - Pre-Collision System may operate automated braking for potential collisions with a vehicle at certain vehicle speeds.**
  - May reduce vehicle speed by up to 25 MPH for potential collisions with a vehicle<sup>11</sup>.**
  - For Lexus Safety System+ 2.5 and 3.0: With enhanced radar and camera capabilities, this system now features left turn intersection support for pedestrians and vehicles.**

## PEDESTRIAN DETECTION

In certain conditions, Pre-Collision System with Pedestrian Detection may also help to detect a preceding pedestrian.

- The in-vehicle camera of Pre-Collision System with Pedestrian Detection may detect a potential pedestrian based on size, profile and motion of the detected pedestrian. However, a pedestrian may not be detected depending on the conditions, including the surrounding brightness and the motion, posture, size and angle of the potential detected pedestrian, preventing the system from operating. Refer to the *Owner's Manual* for additional information.
- Under certain conditions, if Pre-Collision System with Pedestrian Detection determines that the possibility of a frontal collision with a pedestrian is high, it prompts the driver to take evasive action and brake, by using an audible and visual alert, followed by Brake Assist.
  - These alerts operate when the vehicle speed is between approximately 7 to 50 MPH.**
- If the driver does not brake in a set time and the system determines that the risk of collision with a pedestrian is extremely high, the system may automatically apply the brakes, reducing speed in order to help the driver reduce the impact and – in certain cases – avoid the collision.
  - Pre-Collision System with Pedestrian Detection may operate automated braking for potential collisions with a pedestrian at certain speeds<sup>12</sup>.**
  - Pre-Collision System with Pedestrian Detection may reduce vehicle speed by up to 19 MPH for potential collisions with a pedestrian<sup>12</sup>.**
  - For Lexus Safety System+ 2.0, 2.5 and 3.0, the pre-collision system includes low-light pedestrian detection and daytime bicyclist detection.**

If the vehicle is stopped by the operation of the pre-collision brake function, the operation of the pre-collision brake hold will be canceled (brake will be released) after the vehicle has been stopped for approximately two seconds, to allow the vehicle to move if necessary. The driver of the vehicle must then determine whether brake or gas pedal application, or neither, is appropriate for the conditions.

Pre-Collision System with Pedestrian Detection automatic system cancellation may occur if there is a failure with Pre-Collision System with Pedestrian Detection, at which time the warning light turns ON or flashes and a warning message is displayed. The pre-collision braking function may not operate if certain operations are performed by the driver. If the accelerator pedal is being depressed strongly or the steering wheel is being turned, the system may determine that the driver is taking evasive action and possibly prevent the pre-collision braking function from operating. In some situations, while the pre-collision braking function is operating, operation of the function may be canceled if the accelerator pedal is depressed strongly or the steering wheel is turned and the system determines that the driver is taking evasive action.

The following setting(s) can be adjusted (varies by vehicle). Adjustments affect both vehicle and pedestrian detection together; they cannot be adjusted independently:

- Pre-Collision System with Pedestrian Detection alert timing (alert timing only; brake operation remains the same): Far – Mid (default) - Near.
- Pre-Collision System with Pedestrian Detection: turn function ON or OFF. If Pre-Collision System with Pedestrian Detection is turned off by the driver, Pre-Collision System with Pedestrian Detection will default back to ON with the Mid alert timing each time the ignition (IGN) is cycled.

Refer to a Lexus *Owner's Manual* for additional information on Pre-Collision System with Pedestrian Detection operation, limitations and precautions.

## 2a. LANE DEPARTURE ALERT

Standard:

**GX**

Lane Departure Alert<sup>4</sup> uses an in-vehicle camera designed to detect visible white and yellow lane markers in front of the vehicle and the vehicle's position on the road. If the system determines that the vehicle is starting to unintentionally deviate from its lane, the system alerts the driver with an audible and visual alert. When the alerts occur, the driver must check the surrounding road situation and carefully operate the steering wheel to move the vehicle back to the center part of their lane.

As there is a limit to the degree of recognition accuracy and control performance that this system can provide, do not overly rely on this system. This system will not alert the driver of or help prevent unintentional lane departures in every situation. Do not use Lane Departure Alert instead of normal steering operations under any circumstances. In some situations, such as when driving in inclement weather such as heavy rain, fog, snow or a sandstorm or while driving on a curve and for a few seconds after driving on a curve, visible lane markers may not be detected by the camera sensor, preventing the system from operating or engaging properly.



- **Lane Departure Alert is designed to function at speeds of approximately 32 MPH or higher on relatively straight roadways.**

• The vehicle's multi-information display indicates the system's operating status (may vary by vehicle):

- The inside of the displayed lines will be empty if the system is not able to detect the lane markings or if the system operation is temporarily disabled on one or both sides.
- The inside of the lines will be filled in (usually white) if the system is able to detect the lane markings.
- The inside of the lines will flash on the affected side (usually orange) when Lane Departure Alert is operating – this is the visual alert.

The following setting can be adjusted (varies by vehicle):

- Lane Departure Alert audible and visual alert: turn function ON or OFF and adjust alert sensitivity.

**NOTE:** Operation of the Lane Departure Alert system continues in the same condition regardless of ignition cycle until changed by the driver or system is reset.

Refer to a Lexus Owner's Manual for additional information on Lane Departure Alert operation, limitations and precautions.

## 2b. LANE DEPARTURE ALERT with STEERING ASSIST

Standard:

**NX | RX | IS | ES | RC | RC F | LS | LX | UX**

This system<sup>7</sup> utilizes a camera to monitor visible lane markings. If an inadvertent lane departure is detected at speeds above 32 mph, the system is designed to warn you so that you can steer back into the lane, and can even take slight corrective measures to help keep you within your visibly marked lane. Lane Tracing Assist requires the driver's hands to remain on the steering wheel. Lexus Safety System+ 2.5 offers improved stability.



In addition to the alert function of Lane Departure Alert, certain vehicles with electronic power steering (EPS) will feature a Steering Assist function. When equipped and enabled, if the system determines that the vehicle is on a path to unintentionally depart from its lane, the system may provide small corrective steering inputs to the steering wheel for a short period of time to help the driver keep the vehicle in its lane.

As there is a limit to the degree of recognition accuracy and control performance that this system can provide, do not overly rely on this system. This system will not alert the driver of or help prevent unintentional lane departures in every situation. Do not use Lane Departure Alert with Steering Assist instead of normal steering operations under any circumstances. In some situations, such as when driving in inclement weather such as heavy rain, fog, snow or a sandstorm, or while driving on a curve and for a few seconds after driving on a curve, visible lane markers may not be detected by the camera sensor, preventing the system from operating or engaging properly.

- Lane Departure Alert with Steering Assist is designed to function at speeds of approximately 32 MPH or higher on relatively straight roadways**
- The vehicle's multi-information display indicates the system's operating status (may vary by vehicle):
  - The inside of the displayed lines will be empty if the system is not able to detect the lane markings or if the system operation is temporarily disabled on one or both sides.
  - The inside of the lines will be filled in (usually white) if the system is able to detect the lane markings.
  - The inside of the lines will flash on the affected side (usually orange) when Lane Departure Alert with Steering Assist is operating – this is the visual alert.
  - Outside of the filled-in lines will flash on the affected side (usually green) if Steering Assist function is operating.

The following settings can be adjusted (varies by vehicle):

- Lane Departure Alert with Steering Assist audible and visual alert: turn function ON or OFF and adjust alert sensitivity.
- Steering Assist function: turn the Steering Assist function ON or OFF and adjust sensitivity.

**NOTE:** Operation of the Lane Departure Alert with Steering Assist system continues in the same condition regardless of ignition cycle until changed by the driver or system is reset.

Refer to a Lexus Owner's Manual for additional information on Lane Departure Alert with Steering Assist operation, limitations and precautions.

## 2c. LANE DEPARTURE ALERT with STEERING ASSIST and LANE KEEP ASSIST

Standard:

**LC**

This system is only a driver assist function and will deactivate when the driver is not holding the steering wheel and steering.

- The system assists the driver with some of the steering operations necessary for staying in the current visibly marked lane **while the Dynamic Radar Cruise Control\* is on**.
- Using the DISP switch on the steering wheel, the Lane Center Assist for the Lane Keep Assist<sup>8</sup> can be activated or deactivated on the customization display of the Multi Information Display.

\* When Dynamic Radar Cruise Control is not in operation, the Lane Keep Assist function does not operate either.



## 3. INTELLIGENT HIGH BEAMS

Standard:

**IS | ES | LS | UX | NX | RX | GX | LX | RC & RC F | LC**

To help provide greater visibility for you as well as other drivers, Intelligent High Beams<sup>5</sup> offer added illumination to help keep you focused on the road. When the road ahead is clear, the system defaults to high-beam mode, then temporarily switches to low beams when it detects the headlamps or taillamps of vehicles ahead.

The Intelligent High Beams safety system is designed to help drivers see more of what's ahead at nighttime without dazzling other drivers. By using high beams more frequently, the system may allow earlier detection of a preceding pedestrian and obstacles.

As there is a limit to the degree of recognition accuracy and control performance that this system can provide, do not overly rely on this system. This system will not cycle headlights between low and high beams in every situation. In some situations, such as when driving in inclement weather such as heavy rain, fog, snow or a sandstorm, or while driving on a curve and for a few seconds after driving on a curve, forward lights may not be detected by the camera sensor, preventing the system from operating or engaging properly.

- Intelligent High Beams are designed to function at speeds of approximately 25 MPH or higher.**  
**Minimum speed may vary by vehicle.**

The following setting(s) can be adjusted:

- Intelligent High Beams: turn function ON or OFF.



Refer to a Lexus Owner's Manual for additional information on Intelligent High Beams operation, limitations and precautions.

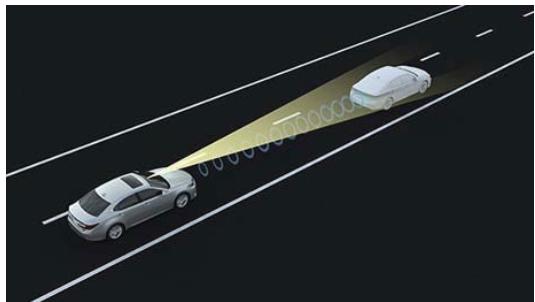
## 4a. HIGH-SPEED DYNAMIC RADAR CRUISE CONTROL

Standard:

**RC F | GX**

On highways or expressways, Dynamic Radar Cruise Control<sup>9</sup> functions similar to conventional "constant speed" cruise control in that it helps vehicles travel at a consistent speed set by the driver, but this system adds a vehicle-to-vehicle distance control mode, which assists the driver by adjusting vehicle speed (within a set range) to help maintain a pre-set distance to a preceding vehicle when the preceding vehicle is traveling at a lower speed.

Once a vehicle speed is set by the driver, Dynamic Radar Cruise Control uses a grille-mounted millimeter-wave radar and an in-vehicle camera to detect a preceding vehicle and help determine its distance. If the vehicle ahead is detected traveling at a speed slower than your set speed or within your distance range setting, the system is designed to automatically decelerate your vehicle without having to cancel the cruise control. When a greater reduction in vehicle speed is necessary, the system may apply the brakes and operate your vehicle brake lights. The system will then respond to changes in the speed of the vehicle ahead in order to help maintain the vehicle-to-vehicle distance set by the driver. When there is no longer a preceding vehicle driving slower than your vehicle's set speed, the system accelerates until the set speed is reached and returns to constant speed cruising.



As there is a limit to the degree of recognition accuracy and distance/deceleration control performance that this system can provide, do not overly rely on this system. This system will not operate in every situation. In some situations, such as when driving in inclement weather such as heavy rain, fog, snow or a sandstorm, or while driving on a curve and for a few seconds after driving on a curve, a preceding vehicle may not be detected by the camera/radar sensors, preventing the system from operating or engaging properly.

- **Dynamic Radar Cruise Control is designed to function at speeds of approximately 25 to 110 MPH. However, vehicle speed must be above approximately 28 MPH to initiate Dynamic Radar Cruise Control, as that is the lowest set speed.**

The following setting(s) can be adjusted:

- Vehicle-to-vehicle distance settings, or distance between your vehicle and the preceding vehicle: Long (default) - Medium - Short.

Refer to a Lexus Owner's Manual for additional information on Dynamic Radar Cruise Control operation, limitations and precautions.

## 4b. ALL-SPEED DYNAMIC RADAR CRUISE CONTROL

Standard:

**LS | ES | IS | RC | LC | UX | NX | RX | LX**

This system<sup>9</sup> helps you maintain a preset speed and following distance from the vehicle ahead. Whether at highway speeds or in stop-and-go traffic, the system is designed to detect if you get closer than the preset distance and can automatically slow your vehicle—even to a complete stop. Select vehicles may also feature All-Speed Dynamic Radar Cruise Control, which is designed to also cover speeds below 25 MPH. All-Speed Dynamic Radar Cruise Control is designed to function at approximately 0 to 110 MPH. All-Speed Dynamic Radar Cruise Control may enable low-speed following, speed matching, stopping and acceleration/deceleration relative to a preceding vehicle.

- An all-speed following function has been added to the DRCC system.
- Using equipment such as millimeter-wave radar and a camera sensor, the system can recognize the vehicle traveling ahead and then mirror the speed of the preceding vehicle until it stops while maintaining a set distance between vehicles.
- Since the vehicle may stop while maintaining an appropriate distance to the vehicle ahead, the system may help reduce driver burden when driving in congested highway traffic.
- When there is no vehicle traveling ahead, the vehicle travels at a constant speed in accordance with the speed setting.
- By implementing following control at all vehicle speeds, the system may help alleviate driving fatigue and supports efforts to maintain a set distance between vehicles.
- For Lexus Safety System+ 2.5 and 3.0, this system now helps detect an upcoming curve and may lower your speed accordingly.

Refer to a Lexus Owner's Manual for additional information on Dynamic Radar Cruise Control operation, limitations and precautions.

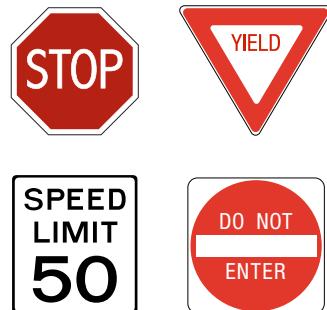
## 5. ROAD SIGN ASSIST

Standard:

**LS | ES | UX | RX | NX | LX | IS**

This system<sup>14</sup> uses a built-in camera to help provide road sign information in the instrument panel. In addition to displaying speed limit information, the system can alert you of certain detected signs you otherwise might have missed. Road Sign Assist is designed to **read certain traffic signs and display them on the vehicle's Multi Information Display (MID) center, or Head-Up Display (HUD), if available**. Road Sign Assist also aides the driver in the event a sign is overlooked or missed. While a speed limit sign is displayed, the system notifies the driver if the vehicle exceeds the displayed speed limit plus a specified threshold value. The driver is notified by displaying an orange border of the sign in the MID. The system can read Speed Limit, Stop, Yield and Do Not Enter signs. When Do Not Enter signs are detected, the driver is notified by flashing the sign in the multi-information display. The settings can be customized so that a buzzer sounds when the notification is displayed.

Refer to a Lexus Owner's Manual for additional information on Road Sign Assist operation, limitations and precautions.



## 6. LANE TRACING ASSIST

Standard:

**LS | ES | UX | RX | NX | LX | IS**

When All-Speed Dynamic Radar CruiseControl<sup>9</sup> is enabled, this hands-on system<sup>15</sup> monitors visible lane markings and can now recognize vehicles ahead. To help the driver keep their vehicle centered in the lane, it can provide steering assistance. Designed for added convenience and to help reduce driver strain, the system can even be used in traffic and on highways with gradual curves.

This system utilizes a camera to monitor visible lane markings. If an inadvertent lane departure is detected at speeds above 32 mph, the system is designed to warn you so that you can steer back into the lane, and can even take slight corrective measures to help keep you within your visibly marked lane. Lane Tracing Assist requires the driver's hands to remain on the steering wheel. Lexus Safety System+ 2.5 offers improved stability.

Refer to a Lexus Owner's Manual for additional information on Lane Tracing Assist operation, limitations and precautions.

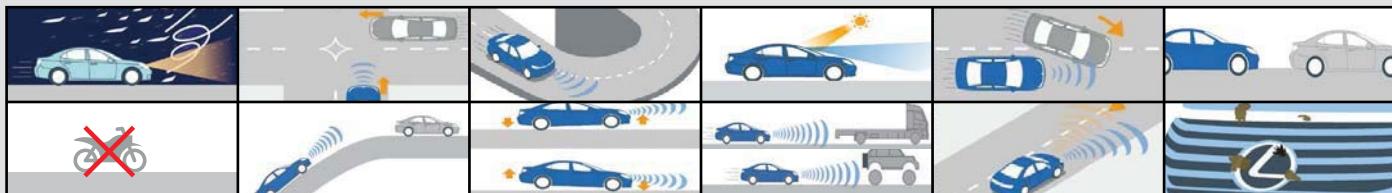


## PRECAUTIONS: PRE-COLLISION SYSTEM WITH PEDESTRIAN DETECTION

Pre-Collision System<sup>3</sup> with Pedestrian Detection<sup>6</sup> is premised on safe driving by the driver. It is not a system that will avoid collisions under all conditions. Do not depend on the system or use it in place of emergency brake operation.

Pre-Collision System with Pedestrian Detection operation is dependent on the front-grille-mounted millimeter-wave radar and in-vehicle camera's ability to detect and see clearly a preceding vehicle or pedestrian on relatively straight roadways, as well as the visibility/detectability of the preceding vehicle/pedestrian itself. Pre-Collision System with Pedestrian Detection may not operate if it cannot recognize a visible preceding vehicle or pedestrian. Pre-Collision System with Pedestrian Detection is not designed to detect animals. Situations such as a fogged, dirty, broken or tinted windshield or ice, rain, snow or sticker-covered windshield blocking the camera or laser may affect Pre-Collision System with Pedestrian Detection operation. Intense light from the front or inclement weather obstructing camera visibility or laser detection, or sharp curves in the road, may affect Pre-Collision System with Pedestrian Detection operation. Also, changes to the vehicle's height or angle from load, suspension or tire modifications or chains may affect Pre-Collision System with Pedestrian Detection operation. Furthermore, if a preceding vehicle cannot be correctly recognized, there are cases where unneeded driver alerts/automatic braking may occur, so the driver needs to pay continuous attention to the surrounding conditions, the direction of travel and vehicle's location on the road. Ultimately, the driver is responsible for brake input, vehicle speed, distance to a preceding vehicle and operation at all times.

### VEHICLE DETECTION MAY NOT OPERATE IN THE FOLLOWING CONDITIONS:



1. When visibility to the front is poor due to bad weather (rain, snow, fog, dust raised by wind, sandstorm, blizzard, etc.)
2. When there is a sudden appearance in the forward direction of the vehicle
3. When driving around locations with sharp curves or undulations or for a period of time after turning due to camera recognition
4. When there is intense light from the front such as strong sunlight or high beams of a vehicle going the opposite direction
5. When a preceding vehicle cuts in front of you suddenly, abruptly steers, accelerates or decelerates, or is offset compared to your vehicle
6. When very close to the vehicle in front (distance of approximately 6.5 feet or less) or coming close to a preceding vehicle after making a lane change
7. Motorcycle or bicycle may not be detected
8. When driving on an up or down slope and not able to recognize a preceding vehicle
9. When vehicle angle or stance changes dramatically due to load, changes to suspension, tire pressure, etc.
10. If the rear-most surface of the preceding vehicle is small, low or irregularly high
11. When the camera or laser faces the wrong direction due to damage or misalignment
12. When something is on the sensor such as bugs, dirt, ice, etc.

### In the following types of environment, the system may not be able to recognize vehicles in front and may not operate:

- If the vehicle in front does not have its taillights on at night or in a tunnel
- If camera recognition conditions are poor shortly after starting the vehicle or when the camera is hot, such as when parked in the sun
- Low light (dusk, dawn, etc.); when driving without headlights at night or in a tunnel

### The system does not operate when the following operations are performed:

- While VSC<sup>13</sup> is activated
- While the accelerator is pressed
- While the brake is pressed
- While backing up
- While driving at very high speeds

### PRE-COLLISION SYSTEM WITH PEDESTRIAN DETECTION MAY OPERATE IN THE FOLLOWING CONDITIONS, EVEN IF A COLLISION IS NOT LIKELY:

1. When there is an obstacle or parked car at the point of entering a curve, in a curve or at an intersection
2. When passing through a narrow steel bridge or through a low ceiling area like a tunnel or parking structure
3. When there is a metal object or protrusion on the road surface or items dropped onto the road
4. When passing an opposing vehicle when turning right or left or passing an opposing vehicle around a curve
5. When driving on an uneven road or in weeds
6. When suddenly getting close to another vehicle that is driving ahead
7. Upon seeing a raised intersection, sign or advertisement board/vinyl in front of the vehicle
8. While driving up or down a slope, where metal such as a steel plate (manhole cover) is in front of the vehicle
9. Reacting to Electronic Toll Collection (ETC) bar when passing through an ETC gantry
10. When sensor direction is offset due to a strong impact near the sensor
11. When passing under a bridge or narrow tunnel
12. When turning around a curve where there is a pedestrian to the front of your vehicle (on a sidewalk)
13. While passing near a pedestrian or through a group of pedestrians
14. If a pedestrian suddenly crosses in front of your vehicle, or suddenly stops while crossing
15. When passing a leading vehicle or when a leading vehicle turns to the left or right
16. When passing through parked cars or driving between vehicles
17. When driving on a narrow road with roadside guardrails, telephone poles, trees, etc.

### THE FOLLOWING TYPES OF PEDESTRIANS MAY NOT BE DETECTED OR PRE-COLLISION SYSTEM WITH PEDESTRIAN DETECTION MAY NOT OPERATE:

1. Pedestrians that suddenly appear from behind or alongside a vehicle
2. Pedestrians close to abrupt changes in lighting such as at tunnel exits
3. Pedestrians wearing white that reflects sunlight

**This section is abbreviated and does not include all precautions or limitations.**

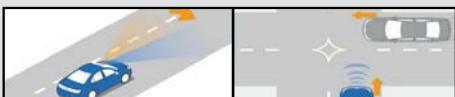
Refer to a Lexus Owner's Manual for a more comprehensive description of system operation, precautions and limitations.

4. Pedestrians walking in a group
5. Pedestrians staying close to or walking alongside a wall, fence, guardrail, vehicle or other obstacle
6. Pedestrians with brightness similar to scenery and that blend into the background
7. Pedestrians walking at high speed of approximately 5 MPH or higher
8. Pedestrians that abruptly change walking speed
9. Pedestrians colliding with the edge of the vehicle
10. Pedestrians walking on top of metal on the road surface
11. Pedestrians that are 3 feet or shorter or 6.5 feet or taller
12. Pedestrians whose silhouette is hidden by a raincoat, coat, long skirt, etc.
13. Pedestrians where a part of their body is hidden by any object
14. Pedestrians holding, shoulder or carrying a large package or using an umbrella
15. Pedestrians leaning forward, crouching, lying down or standing still upright
16. Pedestrians pushing a stroller, wheelbarrow, bicycle, etc.

## PRECAUTIONS: LANE DEPARTURE ALERT

Lane Departure Alert<sup>4</sup> operation is dependent on the in-vehicle camera's ability to see clearly and detect visible lane markers on relatively straight roadways, as well as the visibility of the lane markers themselves. Lane Departure Alert does not operate if it cannot recognize visible lane markers. Situations such as a fogged, dirty, broken or tinted windshield or ice, rain, snow or sticker-covered windshield blocking the camera may affect Lane Departure Alert operation. Also, changes to the vehicle's height or angle from suspension or tire modifications or chains may affect Lane Departure Alert operation. Furthermore, if lane markers cannot be correctly recognized, there are cases where unneeded driver alerts may occur, so the driver needs to pay continuous attention to the surrounding conditions, the direction of travel and vehicle's location on the road. Ultimately, the driver is responsible for steering input and vehicle operation at all times.

### SYSTEM MAY NOT OPERATE AS DESIGNED UNDER THE FOLLOWING CONDITIONS:



1. Bad weather conditions such as rain, fog, snow, dust storm, etc., blocking camera visibility or lane marker visibility
2. When driving around locations with sharp curves or undulations or for a period of time after turning due to camera recognition

Other:

- If there is construction on the side of the road that may be mistaken as a white line (such as a guardrail, curb, reflection pole, etc.)
- When driving at a branching or merging road location
- When pulling a trailer due to angle changes from load

### SYSTEM OPERATION MAY BE REDUCED UNDER THE FOLLOWING CONDITIONS:



1. If the camera faces the wrong direction due to damage or misalignment

Other:

- If lane markers have been rubbed off, removed or can't be seen due to dirt, rain, snow cover or fog
- Road surface is bright (strong light reflection), light (concrete), wet (rainy weather, after rainfall, puddles, etc.)

### SYSTEM MAY STOP TEMPORARILY UNDER THE FOLLOWING CONDITION:



1. When amount of light changes dramatically (tunnel exit/entrance)
2. If the vehicle moves up and down (uneven/bumpy road) or when driving on slippery roads, where camera angle changes relative to the lane markers
3. When the camera is bathed in strong light (headlights from opposing vehicle, sunlight, reflection from surrounding vehicles)

### THE SYSTEM WILL NOT OPERATE IN THE FOLLOWING CONDITIONS:



1. If driving on an unpaved road
2. When driving too close to a preceding vehicle, blocking the camera from seeing the lane markers

Other:

- If the windshield is fogged up

**This section is abbreviated and does not include all precautions or limitations.**

Refer to a Lexus Owner's Manual for a more comprehensive description of system operation, precautions and limitations.

## PRECAUTIONS: INTELLIGENT HIGH BEAMS

Intelligent High Beams<sup>5</sup> operation is dependent on the in-vehicle camera's ability to see clearly and detect preceding headlights or taillights, as well as the visibility of the preceding headlights or taillights themselves. Situations such as a fogged, dirty, broken or tinted windshield or ice, rain, snow or sticker-covered windshield blocking the camera may affect Intelligent High Beams operation. It is the driver's responsibility to pay attention to his or her surroundings and directly confirm safety of surroundings by turning high beams ON and OFF manually as needed.

### IN THE FOLLOWING CONDITIONS, THE SYSTEM MAY NOT BE ABLE TO ACCURATELY DETECT SURROUNDING VEHICLES AND LIGHT:



1. Bad weather conditions such as rain, fog, snow or a dust storm
2. A road with frequent curves or when there is a sharp curve
3. When driving on a road that is uneven (rough roads such as stone paving, gravel road, unpaved road, etc.)
4. If a vehicle in front is driving without lights or using irregular lights, odd color lights or where the light axis is offset
5. When road conditions go up and down frequently

Other:

- When the windshield reflects something on the dashboard
- When there is light similar to headlights or taillights in the vicinity
- If there is a vehicle in front with very dirty headlights or taillights
- When surroundings become light and dark frequently
- When there is an object in front that strongly reflects light (mirror, sign, etc.)
- When the vehicle is inclined front to back or side to side while driving (load, tire pressure, changes to suspension, when being towed)
- When there is a problem with the vehicle or if modified

## PRECAUTIONS: DYNAMIC RADAR CRUISE CONTROL

Dynamic Radar Cruise Control<sup>9</sup> is a system primarily for driving on expressways and highways. With regard to traffic conditions on general roads, there are cases where it will not operate appropriately and could lead to an accident. In these situations, do not use Dynamic Radar Cruise Control. Dynamic Radar Cruise Control operation is dependent on the millimeter-wave radar's ability to detect a preceding vehicle, as well as the detectability of the preceding vehicle itself. While driving, the driver will need to continually pay attention to distance between vehicles with the leading vehicle and surroundings, and decelerate and accelerate themselves to ensure distance between their vehicle and preceding or following vehicles is safe. Situations such as a broken, dirty, ice, rain, snow, film or sticker-covered front Lexus emblem blocking the radar, all may affect Dynamic Radar Cruise Control operation.

### IN THE FOLLOWING CONDITIONS, DYNAMIC RADAR CRUISE CONTROL MAY LEAD TO AN UNEXPECTED ACCIDENT, SO DO NOT USE THE SYSTEM:



1. Bad weather conditions, such as rain, fog, snow or a dust storm
  - When the system judges weather to be bad, there are cases where it automatically turns OFF
2. Raindrops, snow, ice, road debris or film/metal coatings on the millimeter-wave radar sensor (badge or cover)
  - If the system detects filth, it may automatically turn OFF

Other:

- Roads with a lot of traffic or around a sharp curve
- Slippery road surfaces, such as icy or snowy roads
- Steep inclines
- Traffic conditions leading to frequent acceleration and deceleration
- When leaving lane while on an expressway, etc.
- When vehicle is being towed

### IN THE FOLLOWING CONDITIONS, THE SYSTEM IS NOT ABLE TO ACCURATELY DETECT LEADING VEHICLES AND MAY NOT BE ABLE TO MAINTAIN APPROPRIATE DISTANCE BETWEEN VEHICLES:



1. When the leading vehicle is pulling an empty trailer, etc., making rear surface area very small (including motorcycles)
2. When vehicle angle or stance changes dramatically due to load, changes to suspension, tire pressure, etc.

**This section is abbreviated and does not include all precautions or limitations.**

Refer to a Lexus Owner's Manual for a more comprehensive description of system operation, precautions and limitations.

**IN THE FOLLOWING CONDITIONS, DETECTION OF THE LEADING VEHICLE MAY BE DELAYED OR MAY NOT BE POSSIBLE:**

- When a leading vehicle cuts in front of your vehicle at a close distance
- Motorcycle driving at the edge of the lane

**IN THE FOLLOWING CONDITIONS, THE SYSTEM MAY INADVERTENTLY OPERATE OR MAY NOT BE ABLE TO DETECT THE LEADING VEHICLE:**



1. In a curve or when the lane width is narrow; if a vehicle from another lane is recognized as that of your lane
2. When the leading vehicle is driving at the edge of the lane and is not in the detection area

Other:

- When the leading vehicle leaves the sensor detection area, such as at a curve
- When the leading vehicle leaves the sensor detection area due to steering input

**THE SYSTEM WILL NOT OPERATE IN THE FOLLOWING CONDITION:**

- If the opposing object is a stopped vehicle or a leading vehicle with a speed dramatically slow compared to your own vehicle

## PRECAUTIONS: ROAD SIGN ASSIST

Road Sign Assist<sup>14</sup> operation is dependent on the in-vehicle camera's ability to see clearly and detect select preceding road signs, as well as the visibility of the select preceding road signs themselves. Situations such as a fogged, dirty, broken or tinted windshield or rain, snow, ice or sticker-covered windshield blocking the camera may affect Road Sign Assist operation. Drivers are responsible for paying attention to their surroundings and directly confirming the accuracy of posted road signs.

**IN THE FOLLOWING SITUATIONS, THE SYSTEM MAY NOT ACTIVATE OR MAY SHOW AN INCORRECT DISPLAY:**

1. When the camera and radar are misaligned
2. When mud, snow, ice or sticker covers the windshield or windshield area is dirty or fogged over
3. When driving around bright lights or strong reflections from signs, road surfaces or other vehicles, or oncoming headlights
4. When the sign is small or low contrast, especially if the sign is electronic or illuminated with non-uniform ambient light
5. When there is not enough time to recognize the sign due to high-speed driving
6. When the sign is located in a ramp way or just after a turn/junction, too far offset or too low, or posted beyond the intersection/corner
7. When an unknown sign has a shape or design that is very similar to a known sign
8. If there is a specific time associated with the displayed speed, such as school zones
9. When vehicle angle/stance is changed, for example if the vehicle is lifted or lowered, is towing, or is loaded down with weight
10. When driving in heavy rain, sticking snow, heavy fog or the splash from a preceding vehicle
11. When the sign is covered with dirt or a sticker, or is faded, rotated or bent
12. When all or part of the sign is hidden by objects like vehicles, leaves, trees, poles, etc.
13. When visibility is poor or there are drastic changes in brightness
14. When a traffic sign sticker is placed on the back of a truck or vehicle
15. When traveling between countries with different units or driving lanes
16. When there is a problem with the vehicle or if it is modified

**This section is abbreviated and does not include all precautions or limitations.**

Refer to a Lexus Owner's Manual for a more comprehensive description of system operation, precautions and limitations.

## PRECAUTIONS: LANE TRACING ASSIST

Lane Tracing Assist<sup>15</sup> is a system that operates only when All-Speed Dynamic Radar Cruise Control<sup>19</sup> and Lane Departure Alert<sup>4</sup> are activated. The Lane Tracing Assist system is designed for driving on expressways and highways. Lane Tracing Assist is not designed for, and should not be used in traffic conditions that are encountered when driving on roads other than expressways and highways. Attentive and responsible driving is necessary even when Lane Tracing Assist is active, otherwise an accident may occur. Lane Tracing Assist operation is dependent on the vehicle's millimeter-wave radar's ability to detect a preceding vehicle as well as the in-vehicle camera's ability to see clearly and detect visible lane markers on relatively straight roadways, as well as the visibility of the lane markers themselves. Lane Tracing Assist does not operate if it cannot recognize visible marked lanes or a preceding vehicle. While driving, drivers need to continually pay attention to the distance between vehicles and surroundings, and decelerate or accelerate to ensure a safe distance between their vehicle and preceding/following vehicles. Situations such as a fogged, dirty, broken or tinted windshield or rain, snow, ice or sticker-covered windshield or anything blocking the Lexus emblem radar sensor and/or the in-vehicle camera may affect Lane Tracing Assist operation. Also, changes to the vehicle's height or angle due to suspension or tire modifications/chains may affect Lane Tracing Assist operation. Furthermore, if lane markers cannot be correctly recognized, there are cases where unneeded driver alerts may occur, so drivers need to pay continuous attention to the surrounding conditions, the direction of travel, and the vehicle's location on the road. Ultimately, drivers are responsible for steering input and vehicle operation at all times.

### IN THE FOLLOWING CONDITIONS, LANE TRACING ASSIST MAY NOT OPERATE AS DESIGNED:

1. When vehicle angle/stance is changed, for example if the vehicle is lifted or lowered, is towing, or is loaded down with weight
2. When driving in inclement weather such as rain, fog, snow, dust storm, etc. blocking camera visibility or lane marker visibility
3. If a vehicle in another lane is interpreted as being in your lane when driving in a curved or narrow lane
4. When the camera and radar are misaligned
5. When amount of light changes dramatically, such as at a tunnel exit/entrance
6. When the preceding vehicle leaves the sensor detection area due to steering input
7. When driving on roads with a lot of traffic, curved or narrow roads, steep/short inclines or downhill slopes
8. When driving on slippery road surfaces, such as on ice or snow
9. When approaching objects on the roadside that may be misunderstood as a white line, such as a guardrail, curb, reflection pole, etc.
10. When driving at a branching or merging road location
11. When the preceding vehicle has high ground clearance
12. When the preceding vehicle is a motorcycle
13. When a preceding vehicle cuts in front of your vehicle at a close distance
14. When the leading vehicle has a very small rear surface area, such as a vehicle pulling an empty trailer
15. When driving around locations with sharp curves or undulations or for a period of time after turning due to camera recognition
16. When the preceding vehicle is driving at the edge of the lane and is not in the detection area
17. When leaving a lane while on an expressway, when exiting from a freeway, or when entering or merging onto a freeway
18. When the camera is bathed in strong light (headlights from oncoming vehicle, sunlight, reflection from surrounding vehicles)
19. When there are raindrops, snow, ice, road debris or film/metal coatings on the millimeter-wave radar sensor or front glass
20. When the road surface is bright (strong light reflection), light (concrete), wet (rainy weather, after rainfall, puddles, etc.)
21. When there are traffic conditions leading to frequent acceleration and deceleration
22. If the vehicle moves up and down (uneven/bumpy road) or when driving on slippery roads where camera angle changes relative to the lane markers
23. When there is a problem with the vehicle or if it is modified
24. When the warning tone sounds frequently
25. When the vehicle speed returns to the set speed after accelerating
26. When driving on roads that have overhanging/covering structures, such as a tunnel or bridge

### LANE TRACING ASSIST WILL NOT OPERATE UNDER THE FOLLOWING CONDITIONS:

1. If driving on an unpaved road
2. If the windshield is fogged up
3. When the camera and radar are misaligned
4. When driving too close to a preceding vehicle, blocking the camera from seeing the lane markers
5. If the preceding object is a stopped vehicle or a preceding vehicle with a speed dramatically slower than your own vehicle
6. When vehicle angle/stance is changed, for example if the vehicle is lifted or lowered, is towing, or is loaded down with weight

This section is abbreviated and does not include all precautions or limitations.

Refer to a Lexus Owner's Manual for a more comprehensive description of system operation, precautions and limitations.

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**1.** United States Department of Transportation, National Highway Traffic Safety Administration (NHTSA). (2016). *TRAFFIC SAFETY FACTS 2015*.

**2.** Drivers should always be responsible for their own safe driving. Please always pay attention to your surroundings and drive safely. Depending on the conditions of roads, vehicles, and weather, etc., the system(s) may not work as intended. See *Owner's Manual* for details. **3.** The Lexus Safety System+ Pre-Collision System is designed to help avoid collisions or reduce the crash speed and damage in certain frontal collisions only. It is not a substitute for safe and attentive driving. System effectiveness is dependent on road, weather and vehicle conditions. See *Owner's Manual* for additional limitations and details. **4.** Lane Departure Alert is designed to read lane markers under certain conditions, and provide visual and audible alerts when lane departure is detected. It is not a collision avoidance system or a substitute for safe and attentive driving. Effectiveness is dependent on road, weather and vehicle conditions. See *Owner's Manual* for additional limitations and details. **5.** Intelligent High Beams operate at speeds above 25 mph. Factors such as a dirty windshield, weather, lighting and terrain limit effectiveness requiring driver to manually operate the high beams. See *Owner's Manual* for additional limitations and details. **6.** The Pre-Collision System (PCS) with Pedestrian Detection (PD) is designed to determine if impact is imminent and help reduce impact speed and damage in certain frontal collisions involving a vehicle, or a pedestrian. PCS w/PD is not a substitute for safe and attentive driving. System effectiveness depends on many factors, such as speed, size and position of pedestrian and weather, light and road conditions. See *Owner's Manual* for additional limitations and details. **7.** Lane Departure Alert with Steering Assist is designed to read lane markers under certain conditions. It provides a visual and audible alert and slight steering force when lane departure is detected. It is not a collision-avoidance system or a substitute for safe and attentive driving. Effectiveness is dependent on road, weather and vehicle conditions. See *Owner's Manual* for additional limitations and details. **8.** Lane Keep Assist is designed to read lane markers under certain conditions. It provides a visual and audible alert and slight steering force when lane departure is detected. It is not a collision-avoidance system or a substitute for safe and attentive driving. Effectiveness is dependent on road, weather and traffic conditions. See *Owner's Manual* for additional limitations and details. **9.** Dynamic Radar Cruise Control is designed to assist the driver and is not a substitute for safe and attentive driving practices. System effectiveness is dependent on road, weather and traffic conditions. See *Owner's Manual* for additional limitations and details. **10.** Brake Assist is designed to help the driver take full advantage of the benefits of ABS. It is not a substitute for safe driving practices. Braking effectiveness also depends on proper vehicle maintenance, tire and road conditions. See *Owner's Manual* for additional limitations and details. **11.** Results achieved during testing using a vehicle traveling at 25 mph and a stationary vehicle. System operation depends on driving environment (including road and weather) and vehicle circumstances. **12.** Results achieved during testing using a vehicle traveling at 19 mph and a stationary vehicle/pedestrian; system operation depends on driving environment (including road and weather) and vehicle circumstances. **13.** Vehicle Stability Control is an electronic system designed to help the driver maintain vehicle control under adverse conditions. It is not a substitute for safe and attentive driving practices. Factors including speed, road conditions, weather and driver steering input can all affect whether VSC will be effective in preventing a loss of control. See *Owner's Manual* for additional limitations and details. **14.** Do not rely exclusively on Road Sign Assist (RSA). RSA is a driver support system that utilizes the vehicle's forward facing camera and navigation system (when data is available) to recognize certain road signs and provide information to the driver via the multi-information display and/or Head-Up display. Effectiveness is dependent on road, weather, vehicle and sign conditions. Use common sense when using RSA and do not drive distracted. See *Owner's Manual* for additional limitations and details. **15.** Lane Tracing Assist (LTA) is designed to read visible lane markers and detect other vehicles under certain conditions when DRCC is engaged. When potential lane departure is detected, LTA provides a visual warning and either an audible alert or vibration in the steering wheel and can apply a slight steering force. It is not a collision-avoidance system or a substitute for safe and attentive driving. Effectiveness is dependent on many factors including road, weather and vehicle conditions. See *Owner's Manual* for additional limitations and details.