TSS PRECAUTIONS

This document covers a wide range of TSS features spanning a number of years. Functionality has changed over those years, and the functionality of your vehicle might not exactly match what is described in this document. Please consult your *Owner's Manual* for information specific to your vehicle.TSS[1] is designed to support driver awareness, decision making and vehicle operation. However, it is not intended to be overly relied upon, and it does not replace safe driving. Drivers are responsible for their own safety, and must always obey traffic speed limits and laws and focus on the road while driving.

PRE-COLLISION SYSTEM (PCS)[2]

Applicability:

Toyota Safety Sense™ C (TSS-C)
Toyota Safety Sense™ 2.5 (TSS 2.5)
Toyota Safety Sense™ P (TSS-P)
Toyota Safety Sense™ 2.5+ (TSS 2.5+)
Toyota Safety Sense™ 2.0 (TSS 2.0)
Toyota Safety Sense™ 3.0 (TSS 3.0)

PCS 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. PCS operation is dependent on the front millimeter-wave radar (all except TSS-C) or windshield-mounted laser system (TSS-C) and forward-facing camera's ability to detect and see clearly a preceding vehicle or pedestrian[3] (pedestrian detection is available on model year 2019 and later TSS-C vehicles) on relatively straight roadways, as well as the visibility/detectability of the preceding vehicle/pedestrian itself. PCS may not operate if it does not recognize a preceding vehicle or pedestrian. PCS is not designed to detect animals, road cones or pylons, road debris, or other objects. Situations such as a fogged, dirty, broken or tinted windshield or rain, snow, ice or sticker-covered forward-facing camera, millimeter-wave radar, or laser may affect PCS operation. Intense light from the front or inclement weather obstructing camera, radar or laser detection, or sharp curves in the road, may affect PCS operation. Also, changes to the vehicle's height or angle from load or towing over the specified limit, suspension or tire modifications/chains or lift kits may affect PCS operation. Furthermore, if a preceding vehicle is not correctly recognized, unneeded driver alerts or automatic braking 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 their own safe driving, steering, braking, the vehicle speed and operation, and distance to a preceding vehicle at all times. (NOTE: Vehicles equipped with TSS 2.0, 2.5, 2.5+, and 3.0 may also detect a bicyclist, in addition to a vehicle or a pedestrian. TSS 3.0 may also detect motorcycles or guardrails in certain conditions and laterally approaching vehicles. Bicyclist and motorcycles are only detectable when they are being ridden.)

PCS may not recognize a vehicle, pedestrian[3], or other detectable object in the following conditions and environments:

When vehicle angle/stance is changed, for example if the vehicle is towing or is loaded down with weight over the specified limit, or is lifted or lowered*	When a vehicle or a pedestrian approaches your vehicle head-on or nearly head-on
If the vehicle is modified with non-genuine parts or if the vehicle cannot be driven in a stable manner, such as when the vehicle has been in an accident or is malfunctioning	When approaching the side or front of a vehicle
When visibility to the front is poor due to inclement weather (rain, snow, fog, dust raised by wind, sandstorm, blizzard, etc.)	When the overall width of the preceding vehicle is narrow (such as an Ultra Lightweight Vehicle or motorcycles)
When a pedestrian, vehicle, or other detectable object suddenly appears in front of the vehicle	If a preceding vehicle has a small rear end, such as an unloaded truck, or is carrying a load which protrudes past its rear bumper
When driving on an up or down slope	If a vehicle ahead is irregularly shaped, such as a tractor or side car
When very close to a preceding vehicle with a similar speed (approximately 6.5 feet or less) or coming close to a preceding vehicle after changing lanes	If the sun or other light is shining directly on a detectable object ahead
Motorcycles may not be detected (except TSS 3.0)	Bicyclist may not be detected (TSS-C and TSS-P only)

* This does not apply to Toyota Genuine parts or accessories designed and manufactured specifically for TSS functional compliance.

PCS may not recognize a vehicle, pedestrian[3], or other detectable object in the following conditions and environments (cont.):

When a detectable object blends in with the surrounding area, such as when it is dim (at dawn or dusk) or dark (at night or in a tunnel)	While making a left/right turn and for a few seconds after making a left/right turn
If the vehicle in front does not have its taillights on or the view of the taillights is obscured by a bike rack or other object	When driving through steam or smoke, or in inclement weather such as heavy rain, fog, snow or a sandstorm
When the taillights of the vehicle ahead are obscured by a bike rack or other objects	When driving in low light (dusk, dawn, etc.) or when driving without headlights at night or in a tunnel
When a preceding vehicle cuts in front of you suddenly, abruptly steers, accelerates or decelerates, or is offset compared to your vehicle	If the wheels are misaligned
When the headlights are not illuminated while driving in the dark, such as at night or when in a tunnel	If the front of the vehicle is raised or lowered, has high ground clearance, or has a low rear end, such as a low bed trailer
When a headlight is malfunctioning, misaligned, or a lens is dirty and illumination is weak	When a very bright light, such as the sun or the headlights of oncoming traffic, shines directly into the camera sensor
If the rear-most surface of the preceding vehicle is small, low or irregularly high	After the hybrid system has started and the vehicle has not been driven for a certain amount of time
If the camera and/or radar (all except TSS-C) or laser (TSS-C) is misaligned or being blocked (by a wiper blade, etc.)	When a detectable object ahead is not directly in front of your vehicle (TSS 2.5, TSS 2.5+ and TSS 3.0: objects that are not directly in front may be detected in certain circumstances)
When something is on the sensor such as bugs, dirt, ice, a sticker, etc.	When the vehicle is hit by water, snow, dust, etc. from a vehicle ahead
When the sensors detect something that is not a preceding vehicle, pedestrian, or detectable object	While driving on a hill or curve, and for a few seconds after driving on a curve
If camera recognition conditions are poor shortly after starting the vehicle or when the camera is hot, such as when parked in the sun	If your vehicle is skidding, wobbling, or being driven at extremely high speeds
If a detectable object cuts in front of your vehicle or emerges from beside a vehicle	When a pedestrian abruptly changes walking speed, is walking fast or is running out from behind a vehicle or a large object
If a detectable object ahead makes an abrupt maneuver (such as sudden swerving, acceleration or deceleration)	When a pedestrian or bicyclist is on top of metal on the road surface
When multiple detectable objects are close together or overlapping, such as when pedestrians are walking in a group	When a pedestrian or riding height of a bicyclist is 3 feet or shorter or 6.5 feet or taller
When a detectable object is near a wall	When a pedestrian or bicyclist has a part of the body hidden by any object
When pedestrians are walking in a group or are close together	When a pedestrian or bicyclist leans forward, crouches, squats, or lies down, or a bicyclist is bending forward excessively
When a pedestrian or bicyclist is staying close to or walking alongside a wall, fence, guardrail, vehicle or other obstacle	When a pedestrian or bicyclist wears oversized clothing (a rain coat, long skirt, etc.), obscuring the pedestrian's silhouette
When the color or brightness of a detectable object causes it to blend in with its surroundings	When a pedestrian or bicyclist carries large baggage, holds an umbrella, etc., hiding part of the body
If a pedestrian or bicyclist is moving fast	If a bicyclist is riding a child-sized bicycle, is carrying a large load, if it is being ridden by more than one person, or is riding a uniquely shaped bicycle (bicycle with a child seat, tandem bicycle, etc.)
When a pedestrian or bicyclist suddenly appears from behind or alongside a vehicle	When a pedestrian pushes a stroller, wheelchair, wheelbarrow or other vehicle
When a detectable object is close to abrupt changes in lighting, such as at tunnel exits	When a bright light, such as the sun, is reflecting off of a detectable object, or the detectable object is white and looks extremely bright

This section is abbreviated and does not include all precautions and limitations. TSS-C and TSS-P do not detect bicyclists. Refer to a Toyota *Owner's Manual* for a more comprehensive description of PCS operation, precautions and limitations.

PCS may operate in the following conditions, even if a collision is not likely:

When vehicle angle/stance is changed, for example if the vehicle is towing or is loaded down with weight over the specified limit, or is lifted or lowered*	When changing lanes while overtaking a detectable object
When there is an obstacle, vehicle, pedestrian, object, or parked car at the point of entering a curve, in a curve or at an intersection	When rapidly closing on a preceding vehicle, or overtaking a preceding vehicle that is changing lanes
When the camera and/or radar (all except TSS-C) or laser (TSS-C) are misaligned	When driving on a narrow road with roadside guardrails, telephone poles, trees, etc.
When there is a metal object (manhole cover, steel plate, etc.), steps, dip, or a protrusion on the road surface or roadside	When a detectable object approaches very close to the vehicle
When passing an oncoming vehicle when turning right or left or passing an oncoming vehicle around a curve	When passing under an object (billboard, etc.) at the top of an uphill road
When driving on an uneven road, or when driving through weeds, steam or smoke	When driving through or under an object that may contact the vehicle, such as thick grass, tree branches, or a banner
When suddenly getting close to another vehicle that is driving ahead	When the vehicle is hit by water, snow, dust, etc. from a detectable object ahead
Upon detecting a raised intersection, sign or advertisement board in front of the vehicle	When using an automatic car wash
While driving up or down a slope, where metal such as a steel plate (manhole cover) is in front of the vehicle	When there are patterns or paint on the road or a wall that may be mistaken for a detectable object
When rapidly closing on an electric toll gate barrier, parking area barrier, or other barrier that opens and closes	When driving near a TV tower, broadcasting station, electric power plant, or other location where strong radio waves or electrical noise may be present
When passing a vehicle or pedestrian, or vehicle in an oncoming lane that is stopped to make a right/left turn	When driving near an object that reflects radio waves, such as a large truck or guardrail
When driving on a narrow path surrounded by a structure, such as in a tunnel or on an iron bridge, or through a place with a low structure above the road (low ceiling, traffic sign, etc.)	If the vehicle is modified with non-genuine parts or if the vehicle cannot be driven in a stable manner, such as when the vehicle has been in an accident or is malfunctioning
When turning around a curve where there is a pedestrian to the front of your vehicle on a sidewalk	While passing near a pedestrian or through a group of pedestrians
If a pedestrian suddenly crosses in front of your vehicle, or suddenly stops while crossing	When passing a preceding vehicle or a leading vehicle turning to the left or right
When passing through parked cars or driving between vehicles	When driving on a road where relative location to a detectable object ahead in an adjacent lane may change, such as on a winding road
If the front of the vehicle is raised or lowered, such as when the road surface is uneven or undulating	When approaching an object on the roadside, such as guardrails, utility poles, trees, or walls

* This does not apply to Toyota Genuine parts or accessories designed and manufactured specifically for TSS functional compliance.

In the following situations, PCS may not operate properly and should be disabled:

When vehicle angle/stance is changed, for example if the vehicle is towing or is loaded down with weight over the specified limit, or is lifted or lowered*	When transporting the vehicle via truck, boat, train or similar means of transportation
When the vehicle is towing another vehicle or is being towed	When the vehicle is driven in a sporty manner or off-road
When inspecting the vehicle using a drum tester such as a chassis dynamometer or speedometer tester, or when using an on-vehicle wheel balancer	When a compact spare tire or an emergency tire puncture repair kit is used, tire chains are installed, or the tires are the incorrect size, not properly inflated or very worn
When the vehicle is raised on a lift with the engine running and the tires are allowed to rotate freely	When temporarily attaching accessories (such as snow removing equipment) that obstruct the front sensor to the vehicle

* This does not apply to Toyota Genuine parts or accessories designed and manufactured specifically for TSS functional compliance.

In the following situations, PCS may not operate properly and should be disabled (cont.):

After a strong impact has been applied to the front bumper or front grille, due to an accident or other reasons	If the vehicle cannot be driven in a stable manner, such as when the vehicle has been in an accident or is malfunctioning
When the tires are very worn or not properly inflated	When snow chains, a compact spare tire, or tires of a size other than specified are installed

PCS will not operate when the following operations are performed:

While VSC[4] is active or the accelerator or brake is pressed	While driving at very high speeds or backing up
If the shift lever is in Reverse	If VSC[4] is disabled, only the pre-collision warning function will be operational
If a battery terminal has been disconnected and reconnected and then the vehicle has not been driven for a certain amount of time	When the L4 operation indicator lights up, only the collision warning is enabled (only 4WD vehicles with L4 mode)

This section is abbreviated and does not include all precautions or limitations. Refer to a Toyota *Owner's Manual* for a more comprehensive description of PCS operation, precautions and limitations.

EMERGENCY STEERING ASSIST

Applicability:
Toyota Safety Sense™ 2.5 (TSS 2.5) **Toyota Safety Sense™ 2.5+ (TSS 2.5+)** **Toyota Safety Sense™ 3.0 (TSS 3.0)**

If the system determines that the possibility of a collision with a pedestrian or other detectable object is high and that there is sufficient space for the vehicle to be steered into within its lane, and the driver has begun evasive maneuver or steering, emergency steering assist will assist the steering movements to help enhance the vehicle stability and for lane departure prevention. Emergency steering assist operation will be canceled when the system determines that lane departure prevention function has been completed. (NOTE: Vehicles equipped with TSS 3.0 that also have available front corner radar will have a version of Emergency Steering Assist with Active Support that may initiate a steering action.)

In the following situations, emergency steering assist may not operate, or operation may be canceled:

If the accelerator pedal is depressed strongly	If the steering wheel is turned heavily, held in place, or turned in the opposite direction of the system operation
If the brake pedal is depressed	If the turn signal lever is operated

DYNAMIC RADAR CRUISE CONTROL (DRCC)[5]

Applicability:
Toyota Safety Sense™ P (TSS-P)
Toyota Safety Sense™ 2.5+ (TSS 2.5+)
Toyota Safety Sense™ 2.0 (TSS 2.0)
Toyota Safety Sense™ 3.0 (TSS 3.0)
Toyota Safety Sense™ 2.5 (TSS 2.5)

DRCC is a system designed for driving on expressways and highways. DRCC 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 DRCC is active, otherwise an accident may occur. DRCC operation is dependent on the millimeter-wave radar and forward-facing camera's ability to detect a preceding vehicle, as well as the detectability of the preceding vehicle itself. While driving, drivers will need to continually pay attention to the distance between vehicles, respect the leading vehicle and surroundings, and decelerate or accelerate to ensure distance between their vehicle and the preceding or following vehicles is safe. Situations such as a dirt, rain, snow, film, ice or sticker-covered/broken front Toyota emblem blocking the radar or camera all may affect DRCC operation.

(This section also applies to Full-Speed Range DRCC available on certain vehicles equipped with DRCC.)

In the following conditions, DRCC may lead to an unexpected accident, so do not use the system:

- When vehicle angle/stance is changed, for example if the vehicle is towing or is loaded down with weight over the specified limit, or is lifted or lowered*
- If the vehicle is modified with non-genuine parts or if the vehicle cannot be driven in a stable manner, such as when the vehicle has been in an accident or is malfunctioning
- When driving in inclement weather such as rain, fog, snow or a dust storm
- When raindrops, snow, ice, road debris, or film/metal coatings are present on the millimeter-wave radar sensor or front glass
- When driving on roads with a lot of traffic or around a sharp curve
- When driving in traffic conditions leading to frequent acceleration and deceleration
- When driving on slippery road surfaces, such as on ice or snow
- When leaving your lane while on an expressway, etc.
- When driving on steep/short inclines and downhill slopes
- When exiting from, or when entering or merging onto a freeway
- When the warning tone sounds frequently
- When the camera and/or radar are misaligned
- When driving on roads where there are pedestrians, cyclists, etc.

* This does not apply to Toyota Genuine parts or accessories designed and manufactured specifically for TSS functional compliance.

In the following conditions, DRCC may not be able to maintain appropriate distance between vehicles:

- When vehicle angle/stance is changed, for example if the vehicle is towing or is loaded down with weight over the specified limit, or is lifted or lowered*
- If the vehicle is modified with non-genuine parts or if the vehicle cannot be driven in a stable manner, such as when the vehicle has been in an accident or is malfunctioning
- When the preceding vehicle has an extremely high ground clearance
- When the vehicle speed returns to the set speed after accelerating
- When driving on curved or narrow roads
- When the camera and/or radar are misaligned
- When driving on roads that have overhanging/covering structures, such as a tunnel or bridge
- When the preceding vehicle is pulling an empty trailer, etc., making rear surface area very small (including motorcycles)
- When driving in inclement weather such as rain, fog, snow or a dust storm

* This does not apply to Toyota Genuine parts or accessories designed and manufactured specifically for TSS functional compliance.

In the following conditions, DRCC detection of the preceding vehicle may be delayed or may not be feasible:

- When a preceding vehicle cuts in front of your vehicle at a close distance
- If the vehicle is modified with non-genuine parts or if the vehicle cannot be driven in a stable manner, such as when the vehicle has been in an accident or is malfunctioning
- When the camera and/or radar are misaligned
- When the preceding vehicle is a motorcycle
- When driving in inclement weather such as rain, fog, snow or a dust storm
- If the preceding object is a stopped vehicle or a preceding vehicle with a speed dramatically slower than your own vehicle

In the following conditions, DRCC may inadvertently operate or may not be able to detect the preceding vehicle:

- When vehicle angle/stance is changed, for example if the vehicle is towing or is loaded down with weight over the specified limit, or is lifted or lowered*
- When the preceding vehicle leaves the sensor detection area, such as at a curve or due to steering input
- When the preceding vehicle is driving at the edge of the lane and is not in the detection area
- When the camera and/or radar are misaligned
- If the vehicle is modified with non-genuine parts or if the vehicle cannot be driven in a stable manner, such as when the vehicle has been in an accident or is malfunctioning
- If a vehicle in another lane is interpreted as being in your lane when driving in a curved or narrow lane
- When driving in inclement weather such as rain, fog, snow or a dust storm

* This does not apply to Toyota Genuine parts or accessories designed and manufactured specifically for TSS functional compliance.

In the following situations, the curve speed reduction function may not operate properly (TSS 2.5+ and TSS 3.0 only):

- When the vehicle is being driven around a curve on an incline/decline
- When the accelerator pedal is being depressed
- When the vehicle speed is excessively high when entering a curve
- When the vehicle is being driven around a gentle curve or an extremely short curve
- When the course of the vehicle differs from the shape of the curve
- When the steering wheel is suddenly operated

This section is abbreviated and does not include all precautions or limitations. Refer to a Toyota *Owner's Manual* for a more comprehensive description of DRCC operation, precautions and limitations.

LANE DEPARTURE ALERT (LDA)[6]

Applicability:
Toyota Safety Sense™ C (TSS-C)
Toyota Safety Sense™ 2.5+ (TSS 2.5+)
Toyota Safety Sense™ P (TSS-P)
Toyota Safety Sense™ 3.0 (TSS 3.0)
Toyota Safety Sense™ 2.0 (TSS 2.0)

LDA operation is dependent on the forward-facing camera's ability to see clearly and detect lanes of the roadway on relatively straight roadways, as well as the visibility of the lane markers themselves. LDA does not operate if it cannot recognize visible lanes of the roadway. Situations such as a fogged, dirty, broken, or tinted windshield or rain, snow, ice or sticker- covered windshield blocking the camera may affect LDA operation. Also, changes to the vehicle's height or angle from hauling heavy loads, towing over the specified limit, suspension lowering/lifting, or tire modifications/chains may affect LDA operation. Furthermore, if lanes of the roadway 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 drivers are responsible for steering input and vehicle operation at all times. (Note: Vehicles equipped with systems other than TSS-C and TSS-P may also detect curbs and road edges, in addition to lanes of the roadway. Vehicles equipped with systems other than TSS-C and certain TSS-P vehicles include a Steering Assist feature. TSS 3.0 may also detect certain roadside objects, such as guardrails.)

LDA may not operate as designed under the following conditions:

- When vehicle angle/stance is changed, for example if the vehicle is towing or is loaded down with weight over the specified limit, or is lifted or lowered*
- If the vehicle is modified or if the vehicle cannot be driven in a stable manner, such as when the vehicle has been in an accident or is malfunctioning
- When driving in inclement weather such as rain, fog, snow, dust storm, etc. blocking camera visibility or lane visibility
- When the camera and/or radar are misaligned
- When approaching objects on the roadside that may be misunderstood as a white line, such as a guardrail, curb, reflection, pole, etc. (TSS 3.0 may also detect certain roadside objects, such as guardrails.)
- When driving at a branching or merging road location
- When driving around locations with sharp curves or undulations or for a period of time after turning due to camera recognition

* This does not apply to Toyota Genuine parts or accessories designed and manufactured specifically for TSS functional compliance.

LDA operation may be reduced under the following conditions:

- When the camera is misaligned.
- When approaching objects on the roadside that may be misunderstood as a white line, such as a guardrail (except TSS 3.0), reflection pole, etc.
- If there is not a clearly marked lane or clearly defined road edge (Road Edge Detection not available on TSS-C or TSS-P)
- If the road surface is bright (strong light reflection), light (concrete), wet (rainy weather, after rainfall, puddles, etc.)
- If the vehicle is modified with non-genuine parts or if the vehicle cannot be driven in a stable manner, such as when the vehicle has been in an accident or is malfunctioning

LDA may stop temporarily under the following conditions:

- When amount of light changes dramatically, such as at a tunnel exit/entrance
- 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
- When the camera is bathed in strong light (headlights from oncoming vehicle, sunlight, reflection from surrounding vehicles)
- If the vehicle is modified with non-genuine parts or if the vehicle cannot be driven in a stable manner, such as when the vehicle has been in an accident or is malfunctioning

LDA will not operate under the following conditions:

- If driving on an unpaved road
- When driving too close to a preceding vehicle, blocking the camera from seeing the lane markers
- If the windshield is fogged up

This section is abbreviated and does not include all precautions or limitations. Refer to a Toyota *Owner's Manual* for a more comprehensive description of LDA operation, precautions and limitations.

AUTOMATIC HIGH BEAMS (AHB)[7]

Applicability:
Toyota Safety Sense™ C (TSS-C)
Toyota Safety Sense™ 2.5 (TSS 2.5)
Toyota Safety Sense™ P (TSS-P)
Toyota Safety Sense™ 2.5+ (TSS 2.5+)
Toyota Safety Sense™ 2.0 (TSS 2.0)
Toyota Safety Sense™ 3.0 (TSS 3.0)

AHB operation is dependent on the forward-facing 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 rain, snow, ice or sticker- covered windshield blocking the camera may affect AHB operation. Drivers are responsible for paying attention to their surroundings and directly confirming the safety of their 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:

- When driving in inclement weather such as rain, fog, snow or a dust storm
- When driving on a road that is uneven (rough roads such as stone paving, gravel road, unpaved road, etc.)
- When road conditions go up and down frequently
- When there is light similar to headlights or taillights in the vicinity
- When surroundings become light and dark frequently
- When the vehicle is inclined front-to-back or side-to-side while driving (for example, uneven load or tire pressure, changes to suspension, when being towed)
- When driving on a road with frequent curves or when there is a sharp curve
- If a vehicle in front is driving without lights, irregular lights, odd colored lights or where the light axis is offset
- When the windshield reflects something on the dashboard
- If there is a vehicle in front with very dirty headlights or taillights
- When there is an object in front that strongly reflects light (mirror, sign, etc.)
- If the vehicle is modified with non-genuine parts or if the vehicle cannot be driven in a stable manner, such as when the vehicle has been in an accident or is malfunctioning

This section is abbreviated and does not include all precautions or limitations. Refer to a Toyota *Owner's Manual* for a more comprehensive description of AHB operation, precautions and limitations.

ROAD SIGN ASSIST (RSA)[8]

Applicability:
Toyota Safety Sense™ 2.0 (TSS 2.0) **Toyota Safety Sense™ 2.5 (TSS 2.5)** **Toyota Safety Sense™ 2.5+ (TSS 2.5+)**
Toyota Safety Sense™ 3.0 (TSS 3.0)

RSA operation is dependent on the forward-facing 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 RSA 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:

When vehicle angle/stance is changed, for example if the vehicle is towing or is loaded down with weight over the specified limit, or is lifted or lowered*	When mud, snow, ice or sticker covers the windshield or windshield area is dirty or fogged over
When driving around bright lights or strong reflections from signs, road surfaces or other vehicles, or oncoming headlights	When the sign is small or low contrast, especially if the sign is electronic or illuminated with non-uniform ambient light
When the camera is misaligned	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
When an unknown sign has a shape or design that is very similar to a known sign	If there is a specific time associated with the displayed speed, such as school zones
If the vehicle is modified with non-genuine parts or if the vehicle cannot be driven in a stable manner, such as when the vehicle has been in an accident or is malfunctioning	When visibility is poor or there are drastic changes in brightness
When driving in heavy rain, sticking snow, heavy fog or the splash from a preceding vehicle	When a traffic sign sticker is placed on the back of a truck or vehicle
When the sign is covered with dirt or a sticker, or is faded, rotated or bent	When traveling between countries with different units or driving lanes
When all or part of the sign is hidden by objects like vehicles, leaves, trees, poles, etc.	When there is not enough time to recognize the sign due to high-speed driving

* This does not apply to Toyota Genuine parts or accessories designed and manufactured specifically for TSS functional compliance.

This section is abbreviated and does not include all precautions or limitations. Refer to a Toyota *Owner's Manual* for a more comprehensive description of RSA operation, precautions and limitations.

LANE TRACING ASSIST (LTA)[9]

Applicability:
Toyota Safety Sense™ 2.0 (TSS 2.0) **Toyota Safety Sense™ 2.5 (TSS 2.5)** **Toyota Safety Sense™ 2.5+ (TSS 2.5+)**
Toyota Safety Sense™ 3.0 (TSS 3.0)

LTA is a system that operates only when DRCC and LDA are activated. The LTA system is designed for driving on expressways and highways. LTA 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 LTA is active, otherwise an accident may occur. LTA operation is dependent on the vehicle's millimeter-wave radar's ability to detect a preceding vehicle as well as the forward-facing camera's ability to see clearly and detect visible lanes of the roadway on relatively straight roadways, as well as the visibility of the lane markers themselves and other lane-defining objects. LTA does not operate if it cannot recognize visible lanes of the roadway 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 Toyota emblem radar sensor and/or the forward-facing camera may affect LTA operation. Also, changes to the vehicle's height or angle due to suspension or tire modifications/chains may affect LTA operation. Furthermore, if the system cannot correctly recognize the lanes of the road, 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. Certain vehicles equipped with TSS 3.0 will also have an Emergency Drive Stop System (EDSS).[10]

In the following conditions, LTA may not operate as designed:

- When vehicle angle/stance is changed, for example if the vehicle is towing or is loaded down with weight over the specified limit, or is lifted or lowered*
- When driving in inclement weather such as rain, fog, snow, dust storm, etc. blocking camera visibility or lane marker visibility
- If a vehicle in another lane is interpreted as being in your lane when driving in a curved or narrow lane
- When the camera and/or radar are misaligned
- When amount of light changes dramatically, such as at a tunnel exit/entrance
- When the preceding vehicle leaves the sensor detection area due to steering input
- When driving on roads with a lot of traffic, curved or narrow roads, steep/short inclines or downhill slopes
- When leaving a lane while on an expressway, when exiting from a freeway, or when entering or merging onto a freeway
- When approaching objects on the roadside that may be misunderstood as a white line, such as a guardrail, curb, reflection pole, etc (TSS 3.0 may also detect certain roadside objects, such as guardrails)
- When the vehicle speed returns to the set speed after accelerating
- When the preceding vehicle has high ground clearance
- When the preceding vehicle is a motorcycle
- When a preceding vehicle cuts in front of your vehicle at a close distance
- If the vehicle is modified with non-genuine parts or if the vehicle cannot be driven in a stable manner, such as when the vehicle has been in an accident or is malfunctioning
- When driving around locations with sharp curves or undulations or for a period of time after turning due to camera recognition
- When the preceding vehicle is driving at the edge of the lane and is not in the detection area
- When driving on slippery road surfaces, such as on ice or snow
- When the camera is bathed in strong light (headlights from oncoming vehicle, sunlight, reflection from surrounding vehicles)
- When there are raindrops, snow, ice, road debris, or film/metal coatings on the millimeter-wave radar sensor or front glass
- When the road surface is bright (strong light reflection), light (concrete), wet (rainy weather, after rainfall, puddles, etc.)
- When there are traffic conditions leading to frequent acceleration and deceleration
- 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
- When the leading vehicle has a very small rear surface area, such as a vehicle pulling an empty trailer
- When the warning tone sounds frequently
- When driving at a branching or merging road location
- When driving on roads that have overhanging/covering structures, such as a tunnel or bridge

* This does not apply to Toyota Genuine parts or accessories designed and manufactured specifically for TSS functional compliance.

LTA will not operate under the following conditions:

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

* This does not apply to Toyota Genuine parts or accessories designed and manufactured specifically for TSS functional compliance.

This section is abbreviated and does not include all precautions or limitations. Refer to a Toyota *Owner's Manual* for a more comprehensive description of LTA operation, precautions and limitations.

PROACTIVE DRIVING ASSIST (PDA)[11]

Applicability:
Toyota Safety Sense™ 3.0 (TSS 3.0)

PDA is designed to provide some assistance for regular braking and steering operations and to help control distance from detectable objects when DRCC is not engaged. PDA is designed to detect preceding vehicles, pedestrians, bicyclists, and the lines of the road. PDA is not intended to support emergency driving conditions and is not a substitute for attentive driving. The separate features of this system have different operating conditions, but all require PCS to be turned on. PDA operation will be canceled if the driver applies the brakes or accelerator, or turns the steering wheel with a certain amount of force. PDA uses the same system sensors as PCS, and many of the system limitations for PCS also apply to PDA. PDA is only available on TSS 3.0 vehicles and may also require a software update.

In the following situations, PDA may not operate properly:

- When the camera and/or radar are misaligned, modified, or obstructed
- Situations in which the lane may not be detected, or when the lanes are excessively wide or narrow
- When a detectable object is approaching your vehicle, is wandering, or stops immediately before entering the path of your vehicle
- When a detectable object cuts in front of or emerges from beside a vehicle
- When changing lanes while overtaking a detectable object
- When passing a detectable object that is changing lanes or turning left/right
- When certain objects (guardrails, power poles, trees, walls, fences, poles, traffic cones, mailboxes, etc.) are in the surrounding area
- When driving on snowy, icy, or rutted roads
- When approaching a vehicle ahead which is perpendicular or at an angle to the vehicle or is facing the vehicle

This section is abbreviated and does not include all precautions or limitations. Refer to a Toyota *Owner's Manual* for a more comprehensive description of PDA operation, precautions and limitations.

DISCLOSURES

1. Toyota Safety Sense effectiveness is dependent on many factors including road, weather and vehicle conditions. Drivers are responsible for their own safe driving. Always pay attention to your surroundings and drive safely. See *Owner's Manual* for additional limitations and details. **2.** 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, a pedestrian, a bicyclist (TSS 2.0, 2.5, 2.5+, and 3.0), or a motorcyclist (TSS 3.0.) 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 or bicyclist and weather, light and road conditions. See *Owner's Manual* for additional limitations and details. **3.** The Pedestrian Detection System, part of the Advanced Pre-Collision System, is designed to detect a pedestrian ahead of the vehicle, determine if impact is imminent and help reduce impact speed. It is not a collision avoidance system and 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. **4.** 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. **5.** Dynamic Radar Cruise Control (DRCC) is designed to assist the driver and is not a substitute for safe and attentive driving practices. System effectiveness is dependent on many factors including road, weather and traffic conditions. See *Owner's Manual* for additional limitations and details. **6.** Lane Departure Alert is designed to read visible 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 many factors, including road, weather and vehicle conditions. See *Owner's Manual* for additional limitations and details. **7.** Automatic High Beams operate at speeds above 25 mph. Factors such as a dirty windshield, weather, lighting and terrain limit effectiveness requiring the driver to manually operate the high beams. See *Owner's Manual* for additional limitations and details. **8.** 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. **9.** The Lane Tracing Assist (LTA) lane centering function is designed to read visible lane markers and detect other vehicles under certain conditions. It is only operational when DRCC is engaged. Not available on vehicles with manual transmissions. See *Owner's Manual* for additional limitations and details. **10.** Emergency Driving Stop System will not detect all emergency situations and only operates when Dynamic Radar Cruise Control and Lane Tracing Assist are active. See *Owner's Manual* for additional limitations. **11.** Proactive Driving Assist (PDA) is designed to detect certain objects or curves in the road and provide gentle braking and/or steering support. PDA is not a substitute for safe and attentive driving. System effectiveness depends on many factors, such as speed, size and position of detected objects and weather, light and road conditions. See *Owner's Manual* for additional limitations and details.

Published 10.26.22