

# THE FUTURE OF SAFETY IS HERE

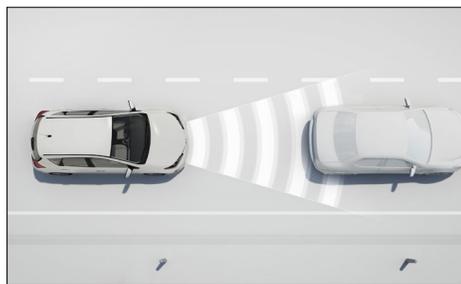
TOYOTA'S ADVANCED ACTIVE SAFETY PACKAGES: TSS-C AND TSS-P



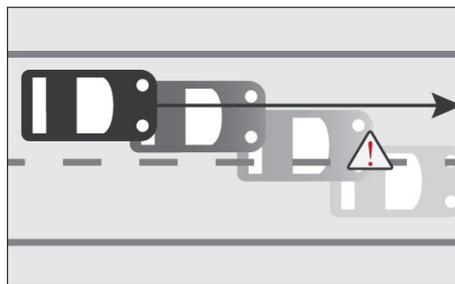
**Crash protection starts with crash prevention.** Collisions that result in injury may be caused by the delay in a driver's recognition of the situation and their ability to react accordingly. According to NHTSA<sup>1</sup>, there were almost 5.7 million reported crashes in 2014—many of which were avoidable.

Toyota Safety Sense™ (TSS)<sup>2</sup> is designed to help protect drivers, passengers, people in other vehicles on the road and pedestrians (TSS-P<sup>2</sup> and AHB<sup>7</sup>) from harm. TSS<sup>2</sup> is comprised of advanced active safety packages anchored by automated pre-collision warning<sup>3</sup> and braking. TSS<sup>2</sup> represents the latest milestone in our long history of creating advancements and innovations in safety that have helped prevent crashes and protect people.

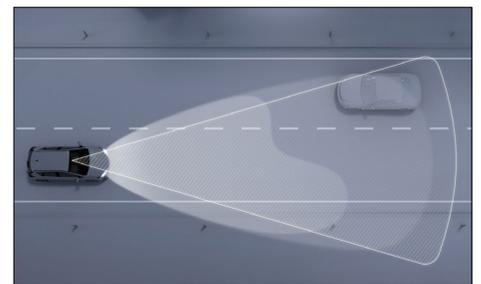
## TSS ADDRESSES THE THREE MOST COMMON ACCIDENT TYPES



Frontal Collisions



Unintended Lane Departures



Nighttime Accidents

TSS<sup>2</sup> 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, TSS<sup>2</sup> features help address three key areas of accident protection: preventing or mitigating **frontal collisions**<sup>3</sup>, keeping drivers **within their lane**<sup>6</sup>, and enhancing road safety during **nighttime driving**<sup>7</sup>. Always drive safely, obey traffic speed limits and laws and focus on the road while driving.

TSS<sup>2</sup> will be offered on certain vehicles in the form of two packages:

- **Toyota Safety Sense™ C<sup>2</sup> [TSS-C]** for compact vehicles
- **Toyota Safety Sense™ P<sup>2</sup> [TSS-P]** for mid-sized and large vehicles

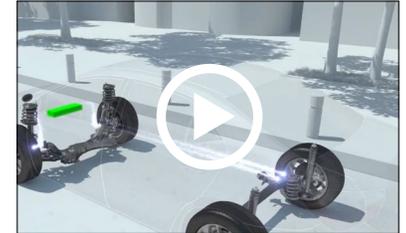
## TSS-C



Toyota Safety Sense™ C<sup>2</sup> features three proprietary active safety technologies: Pre-Collision System<sup>3</sup>, Lane Departure Alert<sup>6</sup>, Automatic High Beams<sup>7</sup>. TSS-C<sup>2</sup> combines an in-vehicle camera and laser for outstanding performance and reliability. The package is designed to alert the driver to and/or help mitigate or prevent collisions in a range of vehicle speeds.

### PRE-COLLISION SYSTEM (PCS) – VEHICLE DETECTION

With Toyota Safety Sense™ C<sup>2</sup>, PCS<sup>3</sup> uses an **in-vehicle camera and laser** to help detect the vehicle in front of your vehicle. 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 PCS<sup>3</sup> instead of normal braking operations under any circumstances. Do not attempt to test the operation of the pre-collision system<sup>3</sup> 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 may not be detected by the laser and camera sensors, preventing the system from operating properly.



### VEHICLE DETECTION

- When the Pre-Collision System<sup>3</sup> 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 audio and visual alert
  - These alerts operate when the vehicle speed is between approximately 7 to 85 miles-per-hour (MPH) for potential collisions with a vehicle** (*Alerts are designed to function prior to auto brake function at speeds between approximately 10 to 85 MPH. Alert and brake functions may occur simultaneously for PCS operational speeds below 10 MPH.*)
- If the driver notices the hazard and brakes, the system may provide additional braking force using Brake Assist<sup>4</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
  - The PCS<sup>3</sup> included with the TSS-C<sup>2</sup> package may operate auto braking feature at speeds between approximately 7 to 50 MPH<sup>5</sup> for potential collisions with a vehicle**
  - May reduce vehicle speed by up to 19 MPH for potential collisions with a vehicle<sup>5</sup>**
- 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

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 PCS system may not work if there is a failure with the system (at which time the warning light turns ON or flashes and a warning message is displayed).

The following setting(s) can be adjusted (Varies by vehicle and type of TSS):

- PCS Alert Timing (Alert timing only, brake operation remains the same): Far – Mid (default) - Near
- Pre-Collision System: Turn function ON or OFF. If PCS<sup>2</sup> is turned off by the driver, PCS<sup>2</sup> will default back to ON with the Mid alert timing each time the ignition is cycled

Refer to a Toyota Owner's Manual for additional information on PCS<sup>2</sup> operation, setting adjustments, limitations and precautions.

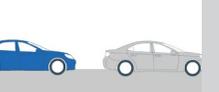
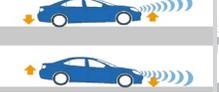
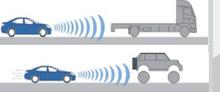
**PRECAUTIONS**

**TSS-C: PRE-COLLISION SYSTEM (PCS)**

PCS<sup>2</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.

**REMINDER: TSS-C PCS<sup>2</sup> is not designed to detect pedestrians.** TSS-C PCS<sup>2</sup> operation is dependent on the in-vehicle laser and camera's ability to detect and see clearly a preceding vehicle on relatively straight roadways, as well as the visibility/detectability of the preceding vehicle itself. PCS<sup>2</sup> may not operate if it cannot recognize a visible preceding vehicle. PCS<sup>2</sup> 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 PCS<sup>2</sup> operation. Intense light from the front or inclement weather obstructing camera visibility or laser detection, or sharp curves in the road, may affect PCS<sup>2</sup> operation. Also, changes to the vehicle's height or angle from load, suspension or tire modifications/chains may affect PCS<sup>2</sup> 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 and vehicle speed/distance to a preceding vehicle/operation at all times.

**TSS-C PCS<sup>2</sup> may not operate in the following conditions:**

					
When visibility to the front is poor due to bad weather (rain, snow, fog, dust raised by wind, sandstorm, blizzard, etc.)	When there is a sudden appearance in the forward direction of the vehicle	When driving around locations with sharp curves or undulations or for a period of time after turning due to camera recognition	When there is intense light from the front such as strong sunlight or high beams of a vehicle going the opposite direction	When a preceding vehicle cuts in front of you suddenly, abruptly steers, accelerates or decelerates, or is offset compared to your vehicle	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
					
Motorcycle or bicycle may not be detected	When driving on an up or down slope and not able to recognize a preceding vehicle	When vehicle angle/stance is changing dramatically	If the rear-most surface of the preceding vehicle is small, low or irregularly high	When the camera or laser faces the wrong direction due to damage or misalignment	When the sensors detect something that is not a preceding vehicle

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

1. If the vehicle in front does not have its tail lights on at night or in a tunnel
2. If camera recognition conditions are poor shortly after starting the vehicle or when the camera is hot, such as when parked in the sun
3. 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:**

1. While VSC<sup>12</sup> is activated
2. While the accelerator is pressed
3. While the brake is pressed
4. While backing up
5. While driving at very high speeds

**TSS-C PCS<sup>3</sup> 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, advertisement board 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 passing a leading vehicle or a leading vehicle turning to the left or right
13. When passing through parked cars or driving between vehicles
14. When driving on a narrow road with roadside guard rails, telephone poles, trees, etc.

**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<sup>2</sup> operation, precautions and limitations.

## LANE DEPARTURE ALERT (LDA)

LDA<sup>6</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 audio 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 LDA 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.



- **LDA<sup>6</sup> 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 and type of TSS):
  - 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 LDA<sup>6</sup> is operating. This is the Visual Alert

The following setting(s) can be adjusted (Varies by vehicle and type of TSS):

- LDA Audio and Visual Alert: Turn function ON or OFF & Adjust Alert Sensitivity

NOTE: Operation of the LDA<sup>6</sup> system and setting adjustments continues in the same condition regardless of ignition cycle until changed by the driver or system is reset

Refer to a Toyota Owner's Manual for additional information on LDA<sup>6</sup> operation, setting adjustments, limitations and precautions.

## PRECAUTIONS

### TSS-C: LANE DEPARTURE ALERT (LDA)

LDA<sup>6</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. LDA<sup>6</sup> 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 LDA<sup>6</sup> operation. Also, changes to the vehicles height or angle from suspension or tire modifications / chains may affect LDA<sup>6</sup> 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:



Bad weather conditions such as rain, fog, snow, dust storm, etc. blocking camera visibility or lane marker visibility



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 misunderstood as a white line (such as a guard rail, curb, reflection pole, etc.)
- When driving at a branching or merging road location
- When pulling a trailer due to angle changes from load

#### The system will not operate in 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

Other:

- If the windshield is fogged up

#### System operation may be reduced under the following conditions:



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



- 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 conditions:



When amount of light changes dramatically (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 opposing vehicle, sunlight, reflection from surrounding vehicles)

**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<sup>6</sup> operation, precautions and limitations.

## AUTOMATIC HIGH BEAMS (AHB)

AHB<sup>7</sup> is a safety system designed to help drivers see more of what's ahead at nighttime without dazzling other drivers. When enabled, Automatic High Beams<sup>7</sup> uses an in-vehicle camera to help detect the headlights of oncoming vehicles and tail lights of preceding vehicles, then automatically switches between high and low beams as appropriate to provide the most light possible and enhance forward visibility. By using high beams more frequently, the system may allow earlier detection of pedestrians 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 beam 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.

- **AHB<sup>7</sup> is designed to function at speeds of approximately 25 MPH or higher. Minimum speed may vary by vehicle.**

The following setting(s) can be adjusted:

- AHB: Turn function ON or OFF

Refer to a Toyota Owner's Manual for additional information on AHB<sup>7</sup> operation, setting adjustments, limitations and precautions.

### PRECAUTIONS

#### TSS-C/TSS-P: AUTOMATIC HIGH BEAMS (AHB)

*AHB<sup>7</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 AHB<sup>7</sup> operation. It is the driver's responsibility to pay attention to their 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:**



Bad weather conditions such as rain, fog, snow or a dust storm



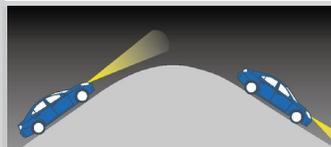
A road with frequent curves or when there is a sharp curve



When driving on a road that is uneven (rough roads such as stone paving, gravel road, unpaved road, etc.)



If a vehicle in front is driving without lights, irregular lights, odd color lights or where the light axis is offset



When road conditions go up and down frequently

Other:

- When the windshield reflects something on the dashboard
- When there is light similar to head lights or tail lights in the vicinity
- If there is a vehicle in front with very dirty head lights or tail lights
- 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

**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<sup>7</sup> operation, precautions and limitations.

## TSS-P



Toyota Safety Sense™ P<sup>2</sup> combines an in-vehicle camera and front-grill mounted millimeter-wave radar for enhanced performance and more functionality. In addition to the three active safety technologies featured in the TSS-C<sup>2</sup> package, TSS-P<sup>2</sup> enhances the Pre-Collision System<sup>3</sup> by adding a Pedestrian Detection function<sup>9</sup>, enhances LDA by adding a Steering Assist function<sup>8</sup> on certain models, and adds Dynamic Radar Cruise Control<sup>10</sup>.

## PRE-COLLISION SYSTEM WITH PEDESTRIAN DETECTION FUNCTION (PCS W/PD) – VEHICLE AND PEDESTRIAN DETECTION

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 PCS<sup>3</sup> instead of normal braking operations under any circumstances. Do not attempt to test the operation of the pre-collision system<sup>3</sup> 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

With Toyota Safety Sense™ P<sup>2</sup>, PCS<sup>3</sup> uses an **in-vehicle camera and front-grill mounted millimeter-wave radar** to help detect the vehicle in front of your vehicle.

- When the PCS<sup>3</sup> 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 audio and visual alert
  - **These alerts operate when the vehicle speed is between approximately 7 to 110 MPH for potential collisions with a vehicle**
- If the driver notices the hazard and brakes, the system may provide additional braking force using Brake Assist<sup>4</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
  - **The PCS<sup>3</sup> included with the TSS-P<sup>2</sup> package may operate automated braking for potential collisions with a vehicle when vehicle speeds are between approximately 7 to 110 MPH<sup>11</sup>**
  - **May reduce vehicle speed by up to 25 MPH for potential collisions with a vehicle<sup>11</sup>**

### PEDESTRIAN DETECTION

In certain conditions, the PCS<sup>3</sup> system included with the TSS-P<sup>2</sup> package may also help to detect pedestrians<sup>9</sup>.

- The in-vehicle camera of PCS<sup>3</sup> detects a potential pedestrian based on size, profile, and motion of the detected pedestrian<sup>9</sup>. 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)
- If PCS<sup>3</sup> determines that the possibility of a frontal collision with a pedestrian is high under certain conditions, it prompts the driver to take evasive action and brake, by using an audio and visual alert, followed by brake assist<sup>4</sup>
  - **These alerts operate when the vehicle's 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
  - **The PCS<sup>3</sup> included with the TSS-P<sup>2</sup> package may operate automated brake for potential collisions with a pedestrian<sup>5</sup> when vehicle speeds are between approximately 7 to 50 MPH**
  - **May reduce vehicle speed by up to 19 MPH for potential collisions with a pedestrian<sup>5</sup>**

Applicable to TSS-P<sup>1</sup> PCS<sup>2</sup> Vehicle and Pedestrian Detection<sup>9</sup>: 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.

Applicable to TSS-P<sup>1</sup> PCS<sup>2</sup> Vehicle and Pedestrian Detection<sup>9</sup>: PCS<sup>3</sup> automatic system cancellation may occur if there is a failure with the PCS system, 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 and type of TSS<sup>2</sup>). Adjustments made affect vehicle and pedestrian detection together, they cannot be independently adjusted:

- Pre-Collision System: Turn function ON or OFF
- PCS Alert Timing (Alert timing only, brake operation remains the same): Far – Mid (default) - Near. If PCS<sup>3</sup> is turned off by the driver, PCS<sup>3</sup> will default back to ON with the Mid alert timing each time the IGN is cycled

Refer to a Toyota Owner's Manual for additional information on PCS<sup>3</sup> operation, setting adjustments, limitations and precautions.

**PRECAUTIONS**

**TSS-P: PRE-COLLISION SYSTEM WITH PEDESTRIAN DETECTION FUNCTION (PCS W/PD)**

PCS<sup>3</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.

TSS-P PCS<sup>3</sup> 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. PCS may not operate if it cannot recognize a visible preceding vehicle or pedestrian. PCS 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 PCS<sup>2</sup> operation. Intense light from the front or inclement weather obstructing camera visibility or laser detection, or sharp curves in the road, may affect PCS<sup>2</sup> operation. Also, changes to the vehicle's height or angle from load, suspension or tire modifications/chains may affect PCS 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 and vehicle speed/distance to a preceding vehicle/operation at all times.

**TSS-P PCS Vehicle Detection may not operate in the following conditions:**

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

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

1. If the vehicle in front does not have its tail lights on at night or in a tunnel
2. If camera recognition conditions are poor shortly after starting the vehicle or when the camera is hot, such as when parked in the sun
3. 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:**

1. While VSC<sup>12</sup> is activated
2. While the accelerator is pressed
3. While the brake is pressed
4. While backing up
5. While driving at very high speeds

**TSS-P PCS<sup>3</sup> 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, 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 a leading vehicle turning to the left or right
16. When passing through parked cars or driving between vehicles
17. When driving on a narrow road with roadside guard rails, telephone poles, trees, etc.

(CONTINUED)

**PRECAUTIONS**

**(CONTINUED) TSS-P: PRE-COLLISION SYSTEM WITH PEDESTRIAN DETECTION FUNCTION (PCS W/PD)**

**In regards to TSS-P PCS<sup>3</sup> Pedestrian Detection<sup>9</sup>, the following types of pedestrians may not be detected or the PCS<sup>3</sup> 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
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. Persons 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 rain coat, coat, long skirt, etc.
13. Pedestrians where a part of their body is hidden by any object
14. Pedestrians holding, shouldering 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.

**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<sup>3</sup> operation, precautions and limitations.

**LANE DEPARTURE ALERT WITH STEERING ASSIST FUNCTION (LDA w/SA)  
(ELECTRONIC POWER STEERING (EPS) EQUIPPED MODELS)**

The alert function of LDA<sup>8</sup> in TSS-P<sup>2</sup> operates the same as TSS-C<sup>2</sup> vehicles. LDA<sup>8</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 audio 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.



In addition to the alert function of LDA, TSS-P<sup>2</sup> equipped vehicles with EPS will feature a Steering Assist function<sup>8</sup>. 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 LDA 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.

- **LDA<sup>8</sup> 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 and type of TSS):
  - 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 LDA<sup>8</sup> is operating. This is the Visual Alert
  - Outside of the filled in lines will flash on the affected side (usually green) if Steering Assist<sup>8</sup> function is operating

The following setting(s) can be adjusted (Varies by vehicle and type of TSS<sup>2</sup>):

- LDA Audio and Visual Alert: Turn function ON or OFF & Adjust Alert Sensitivity
- Steering Assist function: Turn the Steering Assist function ON or OFF & Adjust Sensitivity
- Vehicle Sway Warning: Turn function ON or OFF & Adjust Alert Sensitivity

NOTE: Operation of the LDA<sup>8</sup> system and setting adjustments continues in the same condition regardless of ignition cycle until changed by the driver or system is reset

Refer to a Toyota Owner's Manual for additional information on LDA<sup>8</sup> operation, setting adjustments, limitations and precautions.

**PRECAUTIONS**

**TSS-P: LANE DEPARTURE ALERT WITH STEERING ASSIST FUNCTION (LDA w/SA)**

LDA<sup>6</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. LDA<sup>6</sup> 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 LDA<sup>6</sup> operation. Also, changes to the vehicle's height or angle from suspension or tire modifications / chains may affect LDA<sup>6</sup> 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:**



Bad weather conditions such as rain, fog, snow, dust storm, etc. blocking camera visibility or lane marker visibility



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 misunderstood as a white line (such as a guard rail, curb, reflection pole, etc.)
- When driving at a branching or merging road location
- When pulling a trailer due to angle changes from load

**The system will not operate in 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

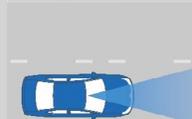
Other:

- If the windshield is fogged up

**System operation may be reduced under the following conditions:**



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



- 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 conditions:**



When amount of light changes dramatically (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 opposing vehicle, sunlight, reflection from surrounding vehicles)

**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<sup>6</sup> operation, precautions and limitations.

**DYNAMIC RADAR CRUISE CONTROL (DRCC)**

On highways or expressways, Dynamic Radar Cruise Control<sup>10</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<sup>10</sup> uses a front-grill 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.



- **DRCC<sup>10</sup> is designed to function at speeds of approximately 25 to 110 MPH. However, vehicle speed must be above approximately 28 MPH to initiate DRCC<sup>10</sup> as that is the lowest set speed.**
- Starting with certain 2016 Prius Liftback models (and 2017 Prius Liftback and Prius Prime), select Toyota vehicles may also feature the new **Full-Speed Range DRCC<sup>10</sup>, which is designed to also cover speeds below 25 MPH. Full-Speed Range DRCC<sup>10</sup> is designed to function at approximately 0 to 110 MPH.** Full-Speed Range DRCC<sup>10</sup> may enable low speed following, speed matching, stopping, and acceleration/deceleration to a preceding vehicle

The following setting(s) can be adjusted:

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

Refer to a Toyota Owner's Manual for additional information on DRCC<sup>10</sup> operation, setting adjustments, limitations and precautions.

**PRECAUTIONS**

**TSS-P: DYNAMIC RADAR CRUISE CONTROL (DRCC)**

*DRCC<sup>10</sup> is a system primarily for driving on expressways and highways. With regards 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 DRCC. DRCC<sup>10</sup> 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 Toyota Emblem blocking the radar all may affect DRCC<sup>10</sup> operation.*

**In the following conditions, DRCC<sup>10</sup> may lead to an unexpected accident, so do not use the system:**

	Bad weather conditions, such as rain, fog, snow or a dust storm <i>When the system judges weather to be bad, there are cases where it automatically turns OFF</i>
	Raindrops, snow, ice, road debris, or film/metal coatings on the millimeter wave radar sensor (badge or cover) <i>If the system detects filth, it may automatically turn OFF</i>
Other:	
<ul style="list-style-type: none"> <li>• Roads with a lot of traffic or around a sharp curve</li> <li>• Slippery road surfaces, such as icy roads or snowy roads</li> <li>• Steep inclines</li> <li>• Traffic conditions leading to frequent acceleration and deceleration</li> <li>• When leaving lane while on an expressway, etc.</li> <li>• When vehicle is being towed</li> </ul>	

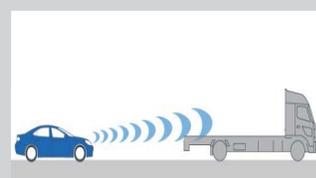
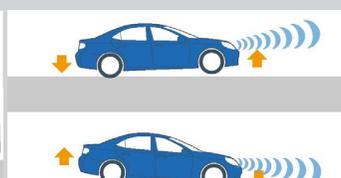
**In the following conditions, detection of the leading vehicle may be delayed or may not be feasible:**

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

**The system will not operate in the following conditions:**

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

**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:**

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

**In the following conditions the system may inadvertently operate or may not be able to detect the leading vehicle:**

	In a curve or when the lane width is narrow, if a vehicle from another lane is recognized as that of your lane
	When the leading vehicle is driving at the edge of the lane and is not in the detection area
Other:	
<ul style="list-style-type: none"> <li>• When the leading vehicle leaves the sensor detection area, such as at a curve</li> <li>• When the leading vehicle leaves the sensor detection area due to steering input</li> </ul>	

**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<sup>10</sup> operation, precautions and limitations.

**ADDITIONAL RESOURCES FOR CUSTOMERS**

For more information, please check out the following:

- ▶ [Toyota.com TSS Page](#)
- ▶ [Toyota Safety Sense™ Videos: YouTube](#)
- ▶ [Standard Automated Braking by 2017](#)
- ▶ [2013 Traffic Safety Facts](#)
- ▶ [DRCC Article](#)

1. United States Department of Transportation, National Highway Traffic Safety Administration (NHTSA). (2014). *TRAFFIC SAFETY FACTS 2013*. 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 TSS Pre-Collision System is designed to help avoid or reduce the crash speed and damage in certain frontal collisions only. It is not a substitute for safe and attentive driving. System effectiveness depends on many factors, such as speed, driver input and road conditions. See Owner's Manual for details. 4. 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 brake-system maintenance, as well as tire and road conditions. See Owner's Manual for details. 5. 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. 6. 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 depends on many factors. See Owner's Manual for details. 7. Automatic high beams operate at speeds above 25 mph. Factors such as dirty windshield, weather, lighting & terrain limit effectiveness requiring driver to manually operate the high beams. See Owner's Manual for details. 8. 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 depends on many factors. See Owner's Manual for details. 9. The Pedestrian Detection 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 substitute for safe and attentive driving. System effectiveness depends on many factors, such as speed, size and position of pedestrians, driver input and weather, light and road conditions. See Owner's Manual for details. 10. Dynamic Radar Cruise Control is designed to assist the driver and is not a substitute for safe and attentive driving practices. System effectiveness depends on many factors, such as weather, traffic and road conditions. See your Owner's Manual for 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. 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 driving practices. Factors including speed, road conditions and driver steering input can all affect whether VSC will be effective in preventing a loss of control. See Owner's Manual for details.

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