

NEXT-GENERATION SAFETY

TSS 2.0: TOYOTA'S NEWEST ADVANCED ACTIVE SAFETY PACKAGE

Toyota
Safety
Sense

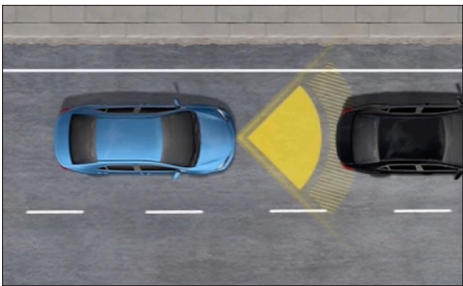
2.0



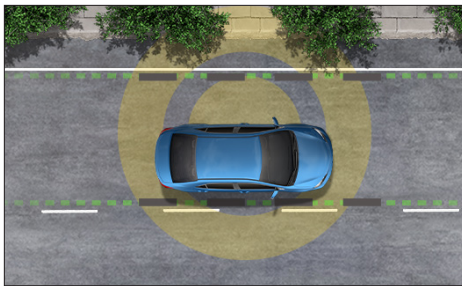
Crash protection starts with crash prevention. Collisions that result in injury may be caused by the delay in a driver's recognition of the situation and their ability to react accordingly. According to NHTSA, there were over 7.2 million reported crashes in 2016 – many of which were avoidable.

Toyota Safety Sense™ 2.0 (TSS 2.0)¹ is designed to help protect drivers, passengers, people in other vehicles on the road, pedestrians and cyclists from harm. This latest generation of Toyota Safety Sense™ represents Toyota's next milestone in a long history of creating advancements and innovations in safety that help prevent crashes and protect people.

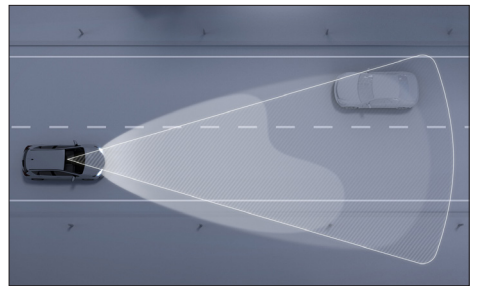
TSS ADDRESSES THE THREE MOST COMMON ACCIDENT TYPES



Frontal Collisions



Unintended Lane Departures



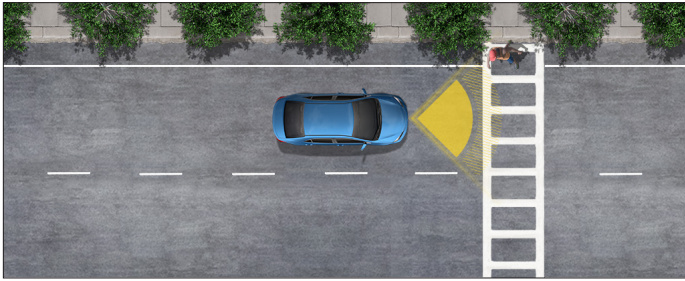
Nighttime Accidents

Under certain conditions, TSS¹ is designed to support driver awareness, decision making and vehicle operation over a wide range of speeds. Packaged together in an integrated system, TSS features help address three key areas of accident protection: preventing or mitigating **frontal collisions**², keeping drivers **within their lane**³, and enhancing road safety during **nighttime driving**⁴. However, drivers are responsible for their own safety, and must always drive safely, obey traffic speed limits and laws and focus on the road while driving.

TSS 2.0 builds on the previous TSS-C and TSS-P suites and consists of six active safety and driver assistance systems:

- **Pre-Collision System (PCS)**²
with Daytime/Low-Light Vehicle and Pedestrian Detection, plus Daytime Bicycle Detection
- **Full-Speed Range Dynamic Radar Cruise Control (DRCC)**⁵
or
Dynamic Radar Cruise Control (DRCC)⁵
- **Lane Departure Alert (LDA)**³
with Steering Assist and Road Edge Detection
- **Automatic High Beams (AHB)**⁴
- **Road Sign Assist (RSA)**⁶
- **Lane Tracing Assist (LTA)**⁷

PRE-COLLISION SYSTEM (PCS)



PCS² uses an integrated forward-facing camera and grille-mounted radar system designed to help mitigate or avoid a frontal collision*. TSS 2.0¹ enhances this system with the addition of low-light detection for pedestrians, plus daytime detection of bicycles.

Vehicle Detection

When PCS² determines that the possibility of a frontal collision with another vehicle is high, it prompts the driver to take evasive action and brake by using an **audio and visual alert**. If the driver notices the hazard and brakes, PCS may use Brake Assist⁸ to provide **additional braking force**.

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 to help mitigate the impact or avoid the collision entirely if possible.

Pedestrian and Bicycle Detection

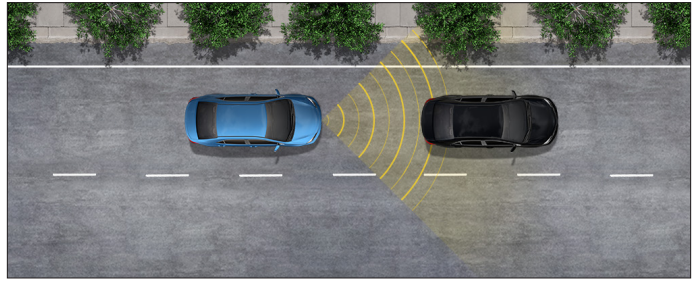
Under certain conditions, if the Pre-Collision System determines that the possibility of a frontal collision with a pedestrian or bicycle is high⁹, it prompts the driver to take evasive action and brake by using an **audio and visual alert**. If the driver notices the hazard and brakes, the system may use Brake Assist⁸ to provide **additional braking force**.

If the driver does not brake in a set time and the system determines that the risk of collision with a pedestrian or bicycle is extremely high, the system may **automatically apply the brakes**, reducing speed to help mitigate the impact or avoid the collision entirely if possible.

For TSS 2.0¹, PCS is designed to detect **bicycles in daytime situations**, as well as designed to **detect vehicles and pedestrians in both daytime and low-light situations**.

| | Operation Speed Range (Alert) | Operation Speed Range (Automatic Braking) | Potential Speed Reduction (Automatic Braking) |
|-----------------------------|-------------------------------|---|---|
| Vehicle Detection | 7-110 mph | 7-110 mph | 32 mph ¹⁰ |
| Pedestrian Detection | 7-50 mph | 7-50 mph | 25 mph ¹¹ |
| Bicycle Detection | 7-50 mph | 7-50 mph | 25 mph ¹¹ |

DYNAMIC RADAR CRUISE CONTROL (DRCC)



DRCC⁵ is a high-tech cruise control system that uses a front grille-mounted radar and a forward-facing camera to detect vehicles in front of you and automatically adjust the vehicle's speed to help maintain a pre-set distance behind a vehicle ahead.

Intended for highways, and similar to "constant speed" cruise control, DRCC⁵ lets drivers maintain a set speed without constant throttle input from the driver. DRCC goes a step further, however, by including a vehicle-to-vehicle distance control system, which adjusts the vehicle speed to help maintain a pre-set distance from vehicles ahead.

This means that if the vehicle ahead is detected traveling at a slower speed than your pre-set speed, DRCC will **automatically slow the vehicle** to maintain a pre-set following distance without deactivating cruise control. If DRCC determines the vehicle needs to slow down even more, an **audio and visual alert** occurs and **brakes may be applied**. When there's no longer a preceding vehicle driving slower than your set speed, DRCC will **accelerate back to your set speed**.

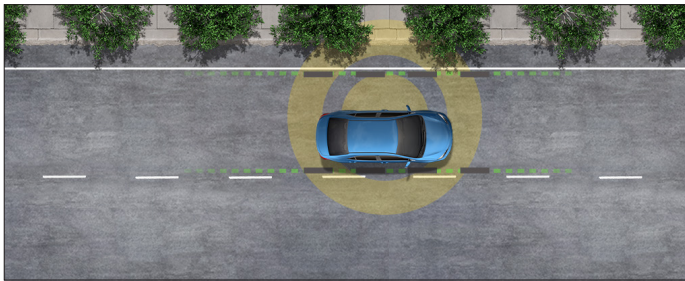
Most TSS 2.0 models will feature **Full-Speed Range Dynamic Radar Cruise Control⁵**, which is designed to allow low-speed following, speed matching, stopping, and acceleration/deceleration to a preceding vehicle.

Manual transmission models receive DRCC instead of Full-Speed Range DRCC.

| | Minimum Initialization Speed | Operation Speed Range |
|------------------------------|------------------------------|-----------------------|
| Full-Speed Range DRCC | 19 mph | 0-110 mph |
| DRCC | 19 mph | 15-110 mph |

* To ensure proper system function, Toyota does not recommend vehicle ride height modification which may adversely affect the operation of the Pre-Collision System (PCS) and Automatic Emergency Braking (AEB), Dynamic Radar Cruise Control (DRCC), Lane Departure Alert (LDA), Lane Tracing Assist (LTA), Road Sign Assist (RSA) and Automatic High Beams (AHB) systems.

LANE DEPARTURE ALERT (LDA)



LDA³ is designed to use the vehicle's forward-facing camera to detect lane departure when traveling on **relatively straight roads with clear lane markings, road edges or curbs**. The system's current operating status is indicated through colored lane marking illustrations on the vehicle's Multi-Information Display (MID). If LDA determines that the vehicle is starting to unintentionally deviate from its visibly marked lane, the system alerts the driver with an **audio and visual alert**. When this alert occurs, drivers must carefully check the surrounding road before safely directing the vehicle back to the center of the lane.

Steering Assist

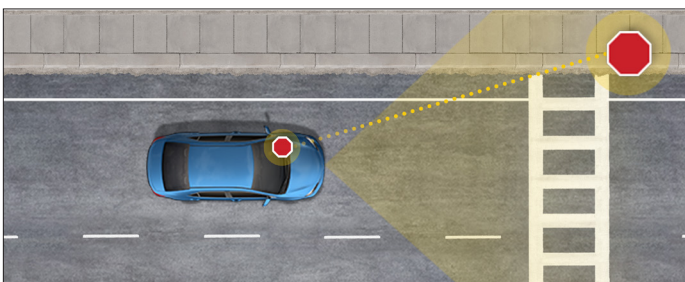
In addition to the alert function, TSS 2.0¹ vehicles equipped with Electronic Power Steering (EPS) also include Steering Assist¹². When this functionality is enabled and LDA senses that the vehicle is unintentionally drifting from its lane, the system may **automatically make small corrective steering inputs** to help the driver keep the vehicle in its lane.

Road Edge Detection

For TSS 2.0¹, LDA³ has been updated with Road Edge Detection, which may be capable of **sensing the boundary between the road surface and the side of the road**.

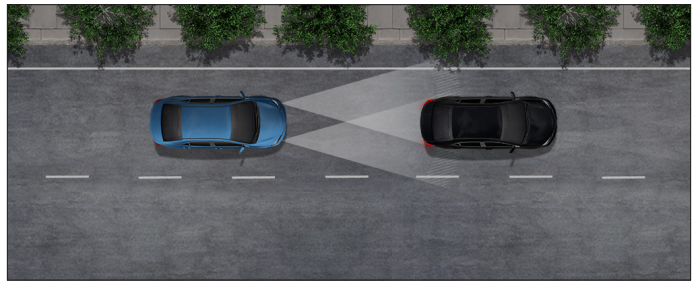
| | Minimum Operation Speed |
|----------------------------|-------------------------|
| Lane Departure Alert (LDA) | 32 mph |

ROAD SIGN ASSIST (RSA)



RSA⁶ is designed to **read certain traffic signs and display them on the vehicle's Multi-Information Display (MID)**. This allows the driver better awareness of posted road signs. The system can read Speed Limit, Stop, Yield, and Do Not Enter signs. RSA also aides the driver in the event a sign is overlooked or missed.

AUTOMATIC HIGH BEAMS (AHB)

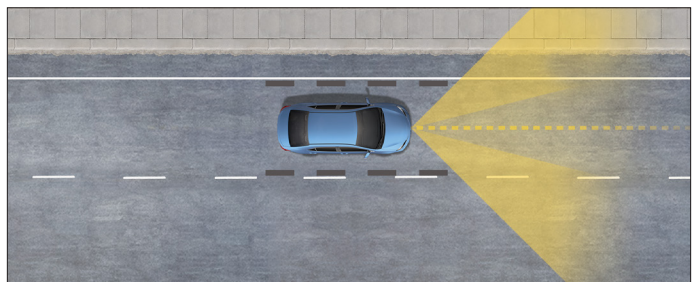


AHB⁴ is a safety system designed to help the driver see more clearly at night – while reducing glare for other drivers. By using high beams more frequently, the system may allow earlier detection of pedestrians and obstacles.

When activated, AHB⁴ is designed to rely on an in-vehicle camera to help detect the headlights of oncoming vehicles and taillights of preceding vehicles, then **automatically toggle between high and low beams**.

| | Minimum Operation Speed |
|----------------------------|-------------------------|
| Automatic High Beams (AHB) | 25 mph ¹³ |

LANE TRACING ASSIST (LTA)



LTA⁷ is designed to work with Dynamic Radar Cruise Control⁵ to keep the vehicle centered in its visibly marked lane and preemptively avoid unintended lane departures.

LTA⁷ uses a forward-facing camera to monitor lane markings – as well as the path of the vehicle ahead, if needed – and is designed to **automatically make constant steering inputs** to help keep the vehicle centered in its lane. LTA does require the driver's hands to remain on the steering wheel. Some models equipped with TSS 2.0¹ will not have the LTA feature. Check your Owner's Manual for more details.

ADDITIONAL RESOURCES

Refer to Toyota.com/Safety-Sense, the [TSS Precautions companion document](#) or a [Toyota Owner's Manual](#) for additional information on TSS operation, setting adjustments, limitations and precautions.



DISCLOSURES

1. Drivers are responsible for their own safe driving. Always pay attention to your surroundings and drive safely. System effectiveness is dependent on many factors including road, weather and vehicle conditions. See Owner's Manual for additional limitations and details. **2.** 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 is dependent on many factors including road, weather and vehicle conditions. See Owner's Manual for additional limitations and details. **3.** 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. **4.** 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. **5.** Dynamic Radar Cruise Control is designed to assist the driver and is not a substitute for safe and attentive driving practices. System effectiveness is dependent on many factors including road, weather and traffic conditions. See Owner's Manual for additional limitations and details. **6.** 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. **7.** Lane Tracing (Trace) Assist (LTA) is designed to read visible lane markers and detect other vehicles under certain conditions. When potential lane departure is detected, LTA provides a visual warning and either an audible alert or vibration in the steering wheel and can apply a slight steering force. It is not a collision-avoidance system or a substitute for safe and attentive driving. Effectiveness is dependent on many factors including road, weather and vehicle conditions. See Owner's Manual for additional limitations and details. **8.** Brake Assist (BA) is designed to help the driver take full advantage of the benefits of ABS. It is not a substitute for safe driving practices. Braking effectiveness also depends on proper vehicle maintenance, tire and road conditions. See Owner's Manual for additional limitations and details. **9.** The Pedestrian Detection System, part of the Advanced Pre-Collision System, is designed to detect a pedestrian or bicyclist 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 or bicyclist and weather, light and road conditions. See Owner's Manual for additional limitations and details. **10.** Results achieved during testing using a vehicle traveling at 32 mph and a stationary vehicle/pedestrian; system operation depends on driving environment (including road and weather) and vehicle circumstances. **11.** 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. **12.** Lane Departure Alert with Steering Assist is designed to read visible lane markers under certain conditions. It provides a visual and audible alert and slight steering force when lane departure is detected. It is not a collision-avoidance system or a substitute for safe and attentive driving. Effectiveness is dependent on many factors including road, weather and vehicle conditions. See Owner's Manual for additional limitations and details. **13.** Automatic high beams system operates at speeds above 25 mph. Situations such as a dirty windshield, variable weather, lighting conditions and hilly terrain will limit effectiveness, requiring the driver to manually turn off. See Owner's Manual for details.