

# **With The All-New 2018 LS, Lexus Reimagines Its Global Flagship Sedan**

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## 2018 Lexus 500 Product Information

### 2018 Lexus 500h Product Information

It is entirely possible that no single automobile has, upon its introduction, upended a deeply established category as decisively as the first Lexus LS did when it launched the luxury brand 28 years ago. The original luxury disruptor, the Lexus LS has for nearly three decades set benchmarks for powertrain smoothness, ride quietness, craftsmanship, attention to detail, documented dependability and long-term quality.

The Lexus brand supported that groundbreaking vehicle by setting and maintaining new standards for customer experience and satisfaction. Now, Lexus is repeating history with the introduction of the all-new, fifth-generation LS flagship sedan for 2018. Inside and out, the new LS reflects a strong, uniquely Japanese identity and approach to luxury and offers innovative technology with a human touch. Yet the all-new LS was designed to be the brand's latest global citizen, available in over 90 countries.

“Not only will the LS symbolize the Lexus brand, it will become the definitive new-generation luxury car embodying Japanese tradition and culture,” said LS Chief Engineer Toshio Asahi. “As such, this global pinnacle must go far beyond what the world expects from a luxury car.”

### **Longer, Lower, Wider – and More Exciting**

Longer and lower than the model it replaces, the all-new LS debuts a strikingly sleek and bold design with a coupe-like silhouette punctuated by the unique Lexus design language. A new driver-centric performance feel stems from building the LS on the company's all-new global architecture for luxury vehicles (GA-L). This premium rear-wheel drive platform, an offers a more dynamic driving experience while further elevating renowned Lexus comfort.

The original Lexus LS won acclaim by anticipating what luxury customers would want, rather than by simply amplifying what established luxury automobile brands offered at the time. In that spirit, the 2018 LS sedan's spacious cabin, unique appointments, and visionary technology will once again surprise customers by resetting expectations for a global flagship sedan.

“We set previously unheard of targets and resolutely pushed ahead towards these ambitious goals,” said LS Chief Engineer Asahi. “The customers who are going to want to own a Lexus flagship are already surrounded by luxury on a daily basis — people who have a sharp eye for authenticity to begin with. We wouldn't turn their heads with a conventional premium product.”

### **A Flagship Reborn**

The original LS launched the Lexus brand and the all-new 2018 LS advances the brand's more dynamic direction. Each generation of LS sedan leading up to the all-new 2018 iteration has elevated the state of luxury, craftsmanship, performance and safety in its own way. To create the 2018 LS, Lexus took the approach of starting from new, reimagining what a flagship sedan should be, as if launching the brand once again. The goal was not to just improve on what Lexus had done, but to exceed expectations of global luxury customers.

A common thread through all LS models remains: *Omotenashi*, the concept of Japanese hospitality. Applied to a luxury automobile, it means adopting a human-focused approach to the vehicle: taking care of the driver and passengers, anticipating their needs, attending to their comfort and helping to protect them from hazards.

### **Crafting a Unique Identity**

“The LS is the flagship of the Lexus brand,” said Chief Designer Koichi Suga. “More than any other model, it embodies the history and image of Lexus and serves as a symbol for everything the brand stands for.”

Lexus designers took full advantage of the new platform, with its lower profile and length on par with that of a prestige long-wheelbase sedan, to give the new LS a stretched, ground-hugging appearance. Compared to the outgoing LS, the new model is about 0.6 inches lower, while the hood and trunk are approximately 1.2 inches and 1.6 inches lower, respectively.

Following the “Yet” philosophy that has been passed on since the first-generation LS, Lexus created a design offering the room and comfort of a prestige “three-box” sedan, yet with the more striking coupe-like silhouette that holds stronger appeal for many of today’s luxury customers. The new LS is also the first Lexus sedan with a six-window profile, which enables excellent outward visibility. A first for a Lexus sedan, the flush-surface windows smoothly integrate with the side pillar.

The unique rendition of the spindle grille mesh, with a texture that seemingly changes in changing light, is the result of both intense CAD development and hand-adjusting thousands of individual surfaces. Flanking the unique grille, the narrow slit-like 3-projector lamp merges with an L-shaped LED lamp that wraps broadly around to the side to give the front of the LS a resolute gaze.

The coupe-like silhouette is not due solely to the fastback roof style. Maximizing the GA-L platform’s low form, the pillars of the cabin taper from the central position of the occupants. Together with the contrast between the pulled-in doors and the front and rear fenders that flare away from the central position of the occupants, this creates a dynamic form.

A front to the rear shoulder line gives the vehicle’s basic posture a low stance with a horizontal axis and a bold appearance. Additionally, the axes of the dramatically flared front and rear fenders are slanted forwards, creating a dynamic impression that evokes driving performance. An outer slide-type moonroof preserves headroom with the lower roofline.

The 2018 LS debuts two new 19-inch wheel designs and three 20-inch wheel designs, two of which are also new. The 20-inch premium wheels employ a brilliant appearance created using an electroplating technique known as sputtering. All but one (F SPORT) of the new wheel designs feature a hollow rim structure that helps reduce resonant sounds generated by the tires.

## **Vehicle Dynamics**

More than ever before, luxury sedan drivers demand greater handling agility and performance feel, but without sacrificing comfort. It’s one of the most difficult balances to achieve in a vehicle, yet the new Lexus GA–L platform easily meets this challenge.

The GA-L platform is the stiffest in Lexus history, setting the stage for enhanced handling, ride smoothness and cabin quietness. The 123-inch wheelbase is 1.3-inch longer than the outgoing LS long-wheelbase model. The new wide and low LS design optimizes the center of gravity and weight distribution.

Helping to provide the uncanny ride and handling balance in the new LS is the latest generation of a chassis control technology: Vehicle Dynamics Integrated Management (VDIM), which was first introduced in 2005. This system implements cooperative control of all available vehicle subsystems— ABS, Traction Control (TRAC/TRC), Vehicle Stability Control (VSC) and Electric Power Steering (EPS), Variable Gear Ratio Steering (VGRS) and Dynamic Rear Steering (DRS)—to control basic longitudinal, lateral and vertical motion as well as yaw, roll and pitch.

The all-new GA-L vehicle architecture that underpins the LS is the result of a completely new approach to engineering, materials and loads of the vehicle structure. Rather than starting from existing vehicle platform and then figuring out how to modify it to fit the LS’ shape and strengthen it to support contemporary chassis dynamics, Lexus engineers literally started with a clean sheet of paper – a blank CAD screen– in designing the

new structure.

Examples of this can be easily seen underhood, where new cast-aluminum suspension towers that support the upper spring seats and suspension mounts are visible above each front wheel. Since aluminum and steel can't be welded together with conventional techniques, the joint attaching the aluminum tower casting to the steel body structure is made with self-piercing rivets and high-strength adhesive bonding; similar processes are used to secure the aluminum rear suspension towers to the body structure behind the back seats. Compared to structures with similar capabilities in steel, this technology is 42 percent lighter at the front; in the rear the aluminum structure has 1.5 times the rigidity of steel with 50 percent less weight.

In creating the new LS, engineers used lightweight materials including ultra-high tensile hot stamped steel and other steel alloys in critical areas with tensile strengths from 590 up to 1180 MPa and aluminum. The 2018 LS has a high tensile steel mass composition of nearly 30 percent, which is more than double what was present in the previous-generation LS (14.1 percent).

A combination of special body adhesive and the use of Laser Screw Welding, a proprietary laser welding process proven on other recent Lexus models, increases panel joint rigidity and gives the LS a feeling of exceptional strength and solidity.

Critical to its driving performance, the new platform lowers the vehicle's center of gravity by placing most of its mass, including the engine and the occupants in positions more centralized and lower in the chassis. Special braces in the engine compartment, stiff aluminum front and rear suspension towers, and other features help bolster the strength of key chassis structures.

LS models have long set benchmarks for suspension compliance, yet even here Lexus saw opportunity for further gains. For example, the all-new multilink front suspension employs double ball joints on the upper and lower control arms to help allow for control of the smallest movements from the driver inputs and road conditions. This unique dual-ball joint arrangement optimizes suspension geometry to increase wheel control and yield more precise steering response with better initial effort. To reduce unsprung weight and aid agility and comfort, aluminum is used extensively in the suspension.

Like the previous LS, the all-new model offers an available air suspension system that further refines the already sublime ride quality. A new, more advanced version of Adaptive Variable Suspension (AVS) continually adjusts damping control in response to driving operations and road surface conditions. "Continually" is the key word, because Lexus increased the damping-force switching levels from the previous model's nine to 650 in the 2018 LS. The result is faster, more seamless and refined operation.

The new AVS system effectively provides both shock isolation and a flat ride even on road surfaces with large undulations as well as small, rough areas. The result is enhanced steering response and stability along with greater ride comfort. As a real-world example, when driving an AVS-equipped 2018 LS in an urban setting over a rough surface, the system can increase ride comfort without increasing damping force too much. Yet, when the steering wheel is turned, damping force increases to suppress unwanted weight transfer and preserve flat cornering.

### **LS Performance and Smoothness Redefined: Twin-Turbo V6 and 10-Speed Transmission**

For high power, scintillating performance and excellent fuel efficiency, Lexus designed an all-new 60-degree 3.5-liter V6 engine specifically for the new LS. This engine has an undersquare design for improved thermal efficiency coupled with twin turbochargers, and has benefitted from the company's F1 technology. This new LS engine is indicative of the more dynamic approach being taken by Lexus, offering V8-level power in a more compact package with efficiency and refinement.

The new LS engine offers the output one would expect in a flagship sedan: 416 horsepower and 442 lb-ft of torque, significant gains over the outgoing LS model's naturally aspirated 4.6-liter V8 (386 hp and 367 lb-ft). The engine's long stroke, optimized 0.86 bore-to-stroke ratio, increased valve angle, straight intake ports and laser-clad intake valve seats developed using performance simulations based on F1 technology combine to yield world top-level high-speed combustion technology and thermal efficiency.

The twin turbochargers were designed and produced in-house to control tolerances and quality. They achieve top-level mechanical efficiency by improving exhaust energy recovery using a curved turbine blade shape and increased blade length, along with die-cast compressor housings and improved surface precision. Electric wastegates provide ultra-precise turbo boost control for seamless, lag-free power buildup. The intercoolers are cooled by engine coolant for higher performance and efficiency.

A special version of Lexus' D-4S gasoline direct injection plus port injection system was developed to improve injection control linked to turbocharger operation. Called D-4ST, this system controls new six hole direct injectors and the port fuel injectors to take advantage of the turbochargers and the high tumble ratio of the engine.

Twin water-to-air intercoolers reduce the temperature of air pressurized by turbocharging. The intercoolers are mounted on top of the engine, each in a direct path between its turbocharger and intake throttle to reduce volume and lag in the intake tract.

Remarkable powertrain smoothness, a Lexus hallmark, begins deep inside the cylinder block, where a ladder frame support for the crankshaft main bearings adds rigidity for low vibration. Redesigned engine mounts, the electric wastegates and numerous other features also contribute to the engine's ultra-smooth demeanor.

In RWD form, the new LS 500 sees a 0-60 time of 4.6 seconds. Perhaps more critical to driving enjoyment, though, is how Lexus tuned the engine and transmission to deliver instant acceleration and a constant buildup of torque toward the engine's redline. The driver can tailor powertrain response and feel by choosing from Normal, Sport S or Sport S+ modes. Just enough of the exhaust note can be heard to enhance the car's dynamic nature.

The first-ever 10-speed automatic transmission for a premium passenger car, having debuted in the Lexus LC 500, is now also used in the new LS 500 gas models. It is a torque converter automatic, yet with shift times that rival those of dual-clutch transmissions. The wide bandwidth afforded by 10 closely spaced ratios is ideal for all driving situations. Using aluminum for the clutch drum, clutch hub and planetary carrier reduce rotating mass; coupled with shortened internal oil passages and smaller, faster shift solenoids results in quicker shifts. These improvements, plus a resin plastic transmission oil pan, yield a 10-speed transmission weighing the same as the previous 8-speed gearbox.

The LS features steering wheel shifter paddles. However, even drivers who might enjoy controlling gearshifts manually will be duly impressed by the automatic mode's advanced electronic control system. The artificial intelligence transmission logic (AI-Shift Control) anticipates the driver's input by monitoring acceleration, braking and lateral-g forces to execute perfectly timed, ultra-quick shifts.

For starting acceleration, the close ratios of the low gears and the short shift times enable a rhythmical and exhilarating acceleration feel. The high torque of the twin-turbo engine matches ideally with the higher gear ratios for effortless, serene highway cruising, yet very quick downshifts yield direct acceleration with no lag in G response. To provide a direct feel, while also supporting fuel efficiency, torque converter lock-up activates in all ranges except when starting off.

The available AWD system features a Torsen<sup>®</sup> limited-slip center differential to further enhance grip, traction and cornering stability. The torque distribution can vary from 31 percent front / 69 percent rear on dry roads to as much as 48 percent front / 52 percent rear on slick surfaces.

## **The New LS Hybrid**

The 2018 LS Hybrid takes an entirely different approach than the previous LS Hybrid model. The new Multi Stage Hybrid System, which debuted in the LC 500h Coupe, combines a naturally aspirated Atkinson-cycle 3.5-liter V6 gasoline engine with two electric motor/generators and uses a compact, lightweight lithium-ion battery. D-4S direct fuel injection and lightweight valvetrain components allow a 6,600-rpm redline, with Dual Variable Valve Timing with Intelligence (Dual VVT-i) ensuring ample torque across the engine speed range. Combined system output of the internal combustion engine with the electric traction system is 354 hp, enabling the LS 500h to accelerate from 0-60 mph in 5.1 seconds (RWD).

The new system is based on the electronically controlled planetary continuously variable transmission of Lexus Hybrid Synergy Drive coupled to an all-new four-speed automatic gear set at the output stage. The two systems work together to expand the overall range of gearing and increase operation of the V6 engine across a wider speed range than previous hybrids.

In M mode, the two gearsets are controlled together to provide the effect of 10 ratios, giving the LS 500h a highly engaging driving feel and allowing the driver to shift through the ratios with paddle shifters.

And with a 22.2-gallon fuel tank and 25/33/28 (city/highway/combined) manufacturer-estimated fuel economy, the LS 500h RWD has a range of over 600 miles, depending on driving conditions and habits.

## **Progressive Comfort with Traditional Inspiration**

Creating a new standard of flagship luxury is not simply a matter of adding more features and technology. Inspired by the *omotenashi* principle, Lexus sought to instill the new LS cabin with luxury that welcomes and envelops passengers while treating the driver like a partner.

“I hope that when you open the door you’ll experience an immediate, intuitive sense that you’re looking at an interior that is unlike any luxury car before,” said Chief Designer Suga.

New seating designs include available 28-way power adjustable front seats. Combining electric motors with a new pneumatic control system allows fine adjustment of the entire seat with minimal weight and bulk. In the rear seats, two dedicated heaters—located in the shoulder and lower back areas of the seat—warm these specific areas without warming a person’s entire body.

The organically shaped dash design clusters information displays at a uniform height to support the “seat-in-control” layout that emphasizes the driver’s ability to operate all systems without changing body posture.

## **Cabin Couture**

The 2018 LS 500 offers a choice of nine interior color schemes, plus two for the F SPORT (Black and Circuit Red). In addition, nine choices in interior trim are available, including the exclusive Naguri-style aluminum for the F SPORT.

Nearly all elements are upholstery-wrapped, and a high level of craftsmanship has been applied even to the finer details, resulting in an elegant finish with a sense of depth. For example, the higher-grade seats feature quilting, and the perforation pattern on the F SPORT front seats has the same L-shaped mesh pattern as the car’s front grille.

Inspired by Shimamoku wood patterns, the new forms that combine the artistic combination of natural woodwork and application of Japan’s sophisticated sliced wood and laser-cutting manufacturing technologies are used for the new LS. New patterns, including Art Wood Organic, Art Wood Herringbone and Laser Special Matte feature bolder contrasts between light and dark, giving the wood a more vibrant appearance.

Art Wood Organic was inspired by a “blazing fire”, and took over a year to create. By layering the wood and applying a natural gloss coating to enhance the vibrancy of the grain, the resulting pattern gives the impression of a flickering flame.

Art Wood Herringbone features wood mosaic craftsmanship similar to that used for decorating musical instruments. Natural wood pieces are individually handcrafted by a Takumi craftsman to create a delicate, Lexus-original mosaic, with an L-motif pattern subtly blended into the herringbone design.

To create the Laser Cut Special wood trim, a cutting and forming technology is utilized to expose beautiful metal lines beneath the natural wood veneer that can be seen and felt.

### **The Intersection of Tradition and Technology**

A new approach to creating trim elements again turned to Japanese culture, combining traditional Japanese aesthetics with advanced manufacturing techniques. This is reflected in signature touches, such as beautiful interior ambient lighting inspired by Japanese Andon lanterns and armrests that appear to float next to the door panel.

On Executive models, Kiriko Glass ornamentation and available hand-folded pleats on the door trim perfectly illustrate the brand’s “Innovative elegance through Japanese craftsmanship” and exemplify a true handcrafted approach.

The striking cut glass ornamentation – a world first in a production vehicle – draws inspiration from Japanese Kiriko glassware. Traditional Kiriko patterns are created using a technique that involves hand-cutting clear colors and delicate lines in a piece of glass, which are then repeatedly polished to a soft glow. For the 2018 LS, Kiriko master craftsmen worked closely with Lexus designers and engineers to duplicate the hand-carved appearance of Kiriko glass using leading-edge laser data copying and polishing technology. For those not choosing the Executive Package, the look of the Kiriko glass pattern ornamentation has been adopted for the display zone in front of the passenger seat.

The hand-pleated upholstery is produced using a process that took four years to develop—and that can be done only by human hands. A single cloth sheet is folded like origami paper, each fold carefully overlapped with the next, creating a dramatic pleated effect. The effect of the light and the three-dimensional upholstery creates an elegant space that envelops the occupants.

Integrated into the LS 500’s cabin is the next-generation Remote Touch Interface (RTI), designed to mimic smartphone operation and supporting handwritten input. In addition to its 12.3-inch wide navigation display, the LS can incorporate an optional 24-inch color heads-up display (HUD)—currently the largest in the world—that projects a variety of information onto the driver’s forward view.

### **Enveloping Rear Seat Luxury**

While making the LS even more of a driver’s car, Lexus also optimized the LS as a car to be driven in, lavishing considerable attention to the rear seat. There are options for both heating and massage in addition to the Executive Package which adds a passenger-side seat which can be reclined up to 48 degrees.

Available rear “Relaxation Seats” with a warming function use air bladders integrated into the seatback and seat cushion. These are inflated to strategically apply pressure to the occupant’s body, while also applying warmth to the shoulder and lower back areas. The occupant can select from three full-body programs (“Refresh”, “Stretch” and “Simple”) and four that target specific areas (“Upper Body”, “Lower Body”, “Shoulder”, and “Lumbar”).\*

Because the new LS is lower than previous versions, Lexus for the first time equipped the available air suspension with an access function. Activated by unlocking the car with the smart key, access mode

automatically raises the vehicle to make it easier to get in and out.

\*This description has been modified from its original form.

### **The New LS F SPORT**

Within the Lexus line, the “F” models, including GS F and RC F, are the track-tuned maximum-performance machines. The F SPORT versions, including the new LS 500 F SPORT RWD, instill a more engaging driving spirit through carefully applied chassis tuning and enhancements, while still emphasizing exceptional comfort.

Lexus took full advantage of the new GA-L platform’s inherent driving agility when developing the 2018 F SPORT package. Handling enhancements via the latest iteration of the VDIM system allows for integrated management of these chassis dynamics as a single system. Optimal control of these motions enables exceptional ride comfort, enhancing traction, safety and handling agility. VDIM is capable of aiding stability when the car is traversing split-friction surfaces, such as dry pavement with ice.

More of the GA-L platform’s intrinsic performance capability is unlocked via exclusive 20-inch alloy wheels with 245/45RF20 front and 275/40RF20 rear tires in either summer performance or all-season compounds. In addition, larger front and rear brakes — six-piston aluminum monoblock calipers on front around two-piece ventilated spiral-fin iron rotors 15.7 inches (400 mm) in diameter by 1.4 inches (36 mm) wide and four-piston calipers on 14.1 inches (359 mm) by 1.2 inches (30 mm) ventilated spiral-fin rotors in the rear, all with high-friction brake pads—serve to drive the car’s dynamic message home. The available Performance Package on gas F SPORT models adds Variable Gear Ratio Steering (VGRS) system, Active Rear Steering and Active Stabilizer. The result is a full-size premium luxury sedan that responds more like a sports coupe through curves, without sacrificing renowned Lexus ride comfort.

The 2018 LS 500 F SPORT stands out, but doesn’t shout. It essentially “turns up the volume” of the new LS design, so to speak, without distorting the fidelity. An exclusive version of the spindle grille shows even greater intricacy in the design – and the brand’s obsessive attention to details. CAD operators spent five months developing the F SPORT grille to achieve the desired texture and interaction with light. Even then, they adjusted nearly 7,000 individual surfaces to achieve the desired look and texture (compared to 5,000 for the standard model’s grille).

Special F SPORT rocker moldings along with the aforementioned 20-inch wheels accentuate the rakish LS profile. Lexus infused the F SPORT persona throughout the cabin, starting with the perforated-grill pattern on seating surfaces and Naguri aluminum trim elements. F SPORT 28-way electric/pneumatic seats with cushion length extenders brace occupants when driving through curves, ensure exceptional comfort no matter how long or brief the drive.

The driver faces a special F SPORT speedometer and tachometer in a movable meter with a meter ring that slides to display information, an iconic design adapted from the limited-production Lexus LFA supercar. Attention to detail shows in the aluminum accelerator pedal and F SPORT shift handle, and footrest. The crowning touch is an Ultrasuede headliner.

### **The Sounds of Near Silence—or Stirring Music**

Lexus tuned the LS exhaust to convey a more authoritative tone, yet also designed the cabin to ensure utterly quiet cruising. New sound suppression methods further hush the environment compared even to the super-quiet previous LS models. Active Noise Control quiets the cabin even more by detecting the sound of the engine coming into the vehicle and cancelling certain frequencies using antiphase sound from the audio speakers.

The serenity of the LS cabin provides an ideal stage for the standard premium audio system or the new audiophile-worthy available 3D surround Mark Levinson QLI Reference Surround Sound System. Employing



Quantum Logic Immersion technology (QLI), Clari-Fi music restoration technology and 23 speakers in 16 locations throughout the car (including the rear ceiling), and a 16-channel Mark Levinson Reference Amplifier producing the equivalent of 2400 watts with 0.05 percent Total Harmonic Distortion (THD) it offers an audio experience unparalleled in any Lexus.

### Advanced Safety Features and Driver Support

Lexus safety features are developed based on the Integrated Safety Management Concept to make each driver better. The concept focuses on analyzing and optimizing safety technologies for four main causes of traffic fatalities: accidents related to pedestrians, vehicle departures from roads, intersections, and rear-end collisions.

“The LS is designed to be the top runner in advanced safety technologies,” said Lexus LS Chief Engineer Asahi. The all-new Lexus LS provides world-class safety technology through the combination of two advanced Lexus safety systems, Lexus Safety System+ and Lexus Safety System+ A (Advanced) Package, which are ultimately aimed at reducing traffic fatalities.

Lexus Safety System+ comes standard on the LS. Lexus Safety System+ A offers additional equipment and is available as an option. Both systems, in addition to other technologies, support more secure driving in a broad range of situations, providing the driver with information ranging from support status notifications to information on vehicle behavior during safety feature operation via the multi-information display and, when equipped, the large color heads-up display (HUD).

		Advanced Package	LSS+
Pre-Collision System (PCS)	Pedestrian Alert	✓	-
	Active Steering Assist	✓	-
	Front PCS w/Pedestrian Detection	✓	✓
	Front Lateral Side PCS	✓	-
Lexus CoDrive	Dynamic Radar Cruise Control (DRCC)	✓	✓
	Lane Trace Assist (LTA)	✓	-
Front Cross-Traffic Alert (FCTA)		✓	-
Road Sign Assist (RSA)		✓	-
Intelligent High Beam		✓	✓
Lane-Keep Assist (LKA)		Incl. w/LTA	✓
Lane Departure Alert (LDA)		Incl. w/LTA	✓

### Pre-Collision System (PCS)

On cars equipped with Lexus Safety System+ A, PCS detects a pedestrian and vehicles ahead using millimeter-wave radar and a stereo camera, supporting collision prevention and damage mitigation with an alert, pre-collision brake assist and pre-collision braking. The PCS can detect a pedestrian and has improved deceleration performance during automatic braking. For example, it can decelerate the vehicle by about 32 mph, thus improving its collision-prevention performance.

Pedestrian Alert is a technology that specifies the direction of the presence of a pedestrian, and Active Steering Assist can automatically control steering and braking in certain situations. With Pedestrian Alert, if there is the possibility of a collision with a pedestrian ahead, the direction of the pedestrian’s presence is shown in an animation via the LS’s large color HUD. Active Steering Assist is designed to determine when there is a high possibility of collision with a pedestrian in the lane of travel or with some continuous structures, such as a guardrail. If the system also determines that a collision is imminent and cannot be avoided through brake control

alone, but might be avoided with steering control, the system assists in collision mitigation or avoidance reduction through limited automatic steering control in addition to activating an alert and applying the brakes.

### Lexus CoDrive

In the Lexus Safety System+ A package, All-Speed Dynamic Radar Cruise Control is combined with Lane Trace Assist (LTA) to provide steering support on a highway or motor-vehicle-only roadway under what is called Lexus CoDrive. These systems function together as a “co-driver” by effectively assisting the driver on dynamic roads or in traffic, coordinating with the LS’s large color HUD and multi-information display.

### All-Speed Dynamic Radar Cruise Control

This system offers better basic recognition performance with wide-angle detection using newly developed millimeter-wave radar and a camera with a wider forward recognition range. All-Speed Dynamic Radar Cruise Control also allows for smoother acceleration at startup and while driving for a more comfortable ride, and smooth deceleration in the case of a rapid decrease speed when following another vehicle.

### Lane Trace Assist (LTA)

LTA can assist the driver by “tracing” the path of the vehicle ahead in instances where lane lines might not be recognized, or in low-speed rush-hour driving when there is little distance to the preceding vehicle. The system can also assist on more dynamic roads; if the speed at which an LTA-equipped vehicle entering a curve is deemed to be too fast, the driver will be alerted by way of the LS’s HUD and multi-information display, and the vehicle may also be automatically slowed down.

### Front Cross Traffic Alert (FCTA)

To help prevent collisions at intersections, FCTA is meant to detect forward cross-traffic vehicles. When approaching an intersection at low speed, the radar sensors on the front side of the vehicle can detect approaching vehicles to the left and right of the vehicle’s front end (up to a distance of 164 feet). In this case, the HUD is used to inform the driver if a vehicle is detected. If the vehicle proceeds regardless of the presence of an approaching vehicle in cross traffic, warnings are also issued by a buzzer and the LS’s multi-information display.

### Road Sign Assist (RSA)

RSA acquires specific road sign information—including stop, speed limit, no entry and yield signs—using a camera and navigation maps and then displays such using the LS’s HUD and multi-information display.

### Intelligent High-beam with Adaptive Front Lighting (AFS)

To help provide added visibility, intelligent high-beam headlamps offer added illumination when the road ahead is clear and temporarily switch to low-beam when they sense another vehicle ahead. The Adaptive Front Lighting system automatically swivels the vehicle’s headlamps into approaching curves or corners according to vehicle speed and steering input, helping enhance the driver’s nighttime visibility.

### Lane Departure Alert (LDA) with Steering Assist

LDA helps to prevent lane departures. In addition to detecting road lane lines, under certain circumstances it is now also capable of detecting the boundaries between asphalt and such elements as grass, dirt and curbs through advances in recognition capability. Thus, it can also alert the driver when the vehicle might depart from its lane and provides assistance by operating the steering wheel to help keep the vehicle in its lane.

## **Other active safety technologies**

### Parking Support Brake

With the aim of reducing damage from accidents when parking, low-speed braking support systems have been integrated into a single package. Added to the already available Intelligent Clearance Sonar (ICS) and Rear Cross Traffic with Auto Brake (RCTAB), Parking Support Brake (PKSB) is designed to detect moving or standing pedestrians using a rear camera, and in the case of a possible collision, minimize damage by using alerts

and brake control.

### Panoramic View Monitor

Side clearance view and cornering view functions have been added to the Panoramic View Monitor, which supports periphery safety checks. Side clearance view produces an image on the LS's 12.3-inch display monitor of the area in front of the car as if it were seen from an elevated point at the rear of the car, allowing the driver to more intuitively confirm the space on the sides of the vehicle when slowly passing another vehicle on a narrow road (approximately 7 mph) or when moving toward the shoulder of the road to allow passage. When side clearance view is in operation, cornering view automatically produces an image of the vehicle as viewed from the rear at an angle in line with driving operation during cornering.

### Lexus Enform Keeps You Connected

The 2018 Lexus LS Lexus now offers seven available Enform services for enhanced convenience:

- Complimentary now for the first ten years, Lexus Enform Safety Connect includes an Emergency Assistance Button (SOS), Roadside Assistance, Automatic Collision Notification, and Stolen Vehicle Notification. The Lexus Enform response center operates 24/7/365.
- The complimentary Lexus Enform App Suite 2.0 app offer access to favorite mobile applications through the vehicle's center console display, including NPR One, Pandora®, iHeartRadio, Slacker and Yelp.

Lexus Enform Destination Assist (complimentary for one year) acts as an in-car personal concierge, providing directions and destinations delivered by a live agent.

- Lexus Enform Wi-Fi allows up to five devices to be connected via the vehicle's 4G LTE service powered by Verizon, and a 4 GB complimentary trial is offered.
- With Lexus Enform Remote (one-year trial subscription included), the customer can remotely view and control certain aspects of the vehicle using a mobile app for iOS and Android devices. Once registered, the app can operate remote door lock/unlock; remote stop/start for the engine and climate control; vehicle finder, guest driver monitor, and more.

Lexus Enform Service Connect (complimentary 10-year subscription now included), enables the LS to send alerts for specific factory recommended maintenance, simultaneously alerting a preferred Lexus retailer.

- New Dynamic Navigation offers three enhanced features: greater accuracy through continuous cloud-based updates with Dynamic Map; alternative routes based on conditions ahead via Dynamic Route and Dynamic Points of Interest (POI), which automatically sorts POI results based on relevance; and, search the cloud using conversational speech for addresses or POIs via Dynamic Voice Recognition system.