

2013 Consumer Electronics Show - Toyota Motor Corp. and Lexus Advance Active Safety Research Vehicle

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Autonomous Technology Press Conference

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Good morning everyone and Happy New Year.

I'm really excited to be a part of this year's Consumer Electronics Show. I can't wait to take a look around and see all the new technologies that are coming to the market.

But I'm glad my kids aren't here. My wife and I would never hear the end of all the new devices they've absolutely got to have.

Before we get started today... I'd like to introduce a couple of people you might want to talk to later...

First, our Toyota Division Senior Vice President Bob Carter and also, our resident expert on advanced technology Jim Pisz.

Gentlemen... thank you for joining us today.

Now, two years ago our Toyota Division was awarded "Best in Show" honors when it unveiled its ENTUNE integrated audio and communications system.

Today marks the first time Lexus has come to CES and there is a good reason for us to be here.

In 2011, more than 32,000 lives were lost on U.S. highways. Car crashes were again the No. 1 cause of death among U.S. teens. And, one-in-six highway deaths were attributed to distracted driving.

The message after today's press conference will be clear. Lexus and Toyota Motor Corporation will lead the industry into a new era of automated integrated active-safety technologies.

Simply put...our goal is to eliminate future traffic fatalities and injuries.

To that end...three events in the last few months are significant. And, we'll discuss all three today.

First, in October we launched the all-new 2013 Lexus LS featuring the world's most advanced active-safety pre-crash system.

Then in November, we opened our nine-acre Intelligent Transportation System proving grounds, to accelerate the development of vehicle-to-vehicle and vehicle-to-roadside infrastructure communications.

Finally, today, we lift the veil on our advanced active safety research vehicle, offering a peek inside our automated safety vehicle research.

Every year our industry continues to introduce new technologies that further reduce traffic casualties. Technology is important, but technology alone is not the answer.

We see traffic safety as a holistic blend of people, vehicles and the driving environment as individual parts of an integrated whole.

In fact, our safety strategy has five critical components. They include;

- the initial time the driver and car begin their journey from a parked position
- to the active safety systems designed to avoid a crash
- to pre-crash features aimed at preparing for a collision
- to passive safety technologies to help survive a crash
- to rescue and response systems after a crash has occurred

We call it, our “Integrated Safety Management Concept.”

A key component of this approach focuses on high-level driver-assist technologies that may at some point in the future evolve into a fully autonomous car.

It’s probably fair to say that for most people the term autonomous is synonymous with driverless.

At Lexus, that's only part of the story.

Instead, we believe that in our pursuit of developing more advanced automated technologies the driver must be fully engaged in the operation of the vehicle at all times.

Our vision is not necessarily a car that drives itself but rather a car equipped with an intelligent, always-attentive co-pilot whose skills contribute to safer driving.

When you think about it, electronic stability control is an early example of features that are now government mandated.

The key point is that automated technologies make driving easier and simpler, enhance the driver’s perception of his environment, his decision-making process and his overall safety skills.

We believe a more skillful driver...is a safer driver. And that this reliable, added-edge of safety can make the driver more confident... and the driving process more enjoyable.

Safety....confidence...and driving enjoyment.

At Lexus, for our customers, a “layered” introduction of automated technologies is a key component of our “Integrated Safety Management Concept.”

Our layered efforts with automated technology actually started a decade ago, when we first introduced our pre-collision system. Since then... its capabilities have drastically improved.

The new 2013 Lexus LS with the world's most advanced pre-collision system uses a combination of millimeter-wave radar, a stereo camera and near infra-red projectors.

Our system is designed to assist the driver in avoiding or mitigating collisions with vehicles and pedestrians under a wide range of speeds ... day or night.

Based on the position speed and trajectory of an object if the system anticipates a collision you'll hear a warning sound and a 'BRAKE' alert will be illuminated on the instrument panel. At the same time, several integrated systems automatically activate to increase steering quickness, suspension control and brake effectiveness.

The shocks are stiffened to help control 'nose dive' and increase steering responsiveness and the automatic seat belt pre-tensioners activate. Our system even applies the brakes automatically to reduce impact speed.

The 2013 Lexus LS is graphic evidence of how automated technologies have advanced in the last decade.

So what paths must be explored in the future?

We believe there are two that seem most compelling. A few months ago, TMC began full-scale operations at its ITS proving ground at the Higashi-Fuji Technical Center in Japan. The facility which simulates an urban environment has a communications system that links road-to-vehicle, vehicle-to-vehicle, pedestrian-to-vehicle, traffic signals and control device and entire course monitoring.

The research conducted at our proving grounds will help prevent accidents involving pedestrians and other vehicles, improve poor visibility at intersections and much more...

Through it all, Toyota Motor Corporation is dedicated to collaborating with government regulators, and cooperating with ITS governing boards to help advance future mobility.

Now, whereas ITS is focused on integrating the car with the driving environment, our advanced safety research vehicle is aimed at enhancing the car and the driver's ability to perceive process and respond with the aid of on-board automated technologies.

We believe our approach is unique, in that it involves two parallel programs half a world apart exploring different technologies to achieve one common goal.

Now, one of these active safety research programs is based in Japan...the other in Ann Arbor, Michigan at the Toyota Research Institute, North America, known as TRINA.

The TRINA program is aimed purely at research.

The Japan engineering group adds the element of exploring future product development for market integration.

Now, this LS Hybrid is just one example of areas we are exploring at TRINA.

It's fitted with:

- advanced GPS;
- forward and side-facing radars and hi-def color cameras;
- 360-degree laser tracking;
- gyroscope and accelerometer...among “other” sensor components.

Our goal is a system that constantly perceives, processes and responds to its surroundings, that scans the movement of objects around it, identifies a green light from a red light, and measures the trajectory, roll, pitch and yaw of the vehicle as it steers, accelerates and brakes along the most efficient route to its programmed destination.

An array of equipment processes data formulates decisions and enacts by-wire responses.

As you can imagine, we can't discuss specific performance parameters and we can't speculate today on how or when such a car might be available in the marketplace.

Our guess is not in the immediate future. And that's how it should be.

At the moment, this is a pure research project with a strong statement of the shape of things to come.

Sensor...and by-wire technologies have opened the door for machines to recognize and respond to the environment around them beyond the capabilities of humans.

However, sensing and understanding what is around you are vastly different.

So, we must combine the judgment of humans with the precision of machines and that takes time.

Right now, machines can handle single tasks like parking following traffic and staying within a lane.

But, we need to introduce a layered approach that will broaden capabilities.

Step-by-step, we will build trust with society and government so that vehicles will be allowed to perform more automated tasks. These capabilities must be integrated with consistency and reliability before vehicles are trusted to drive alone.

The real value of this project is that it reinforces our focus on what a few years ago seemed an impossible dream, the elimination of traffic fatalities and injuries, which is the ultimate goal of a society that values mobility.

Thank you for joining us this morning.

Bob Carter, Jim Pisz, the advanced technology communications group and I will be available to discuss our presentation today.

Thank you again for coming.

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