

Volvo & Child Passenger Safety

April 23, 2009

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Volvo and Child Passenger Safety

CT DOT CPS conference

April 23, 2009

- Company Heritage
- Volvo & Safety
- Holistic Approach & Safety Systems
- City Safety
 - Information
 - Key Points
- City Safety “Hands On” Demonstration Outside



Our heritage...

“Cars are driven by people.
The guiding principle behind
everything we make at Volvo,
therefore, is – and must
remain – safety”

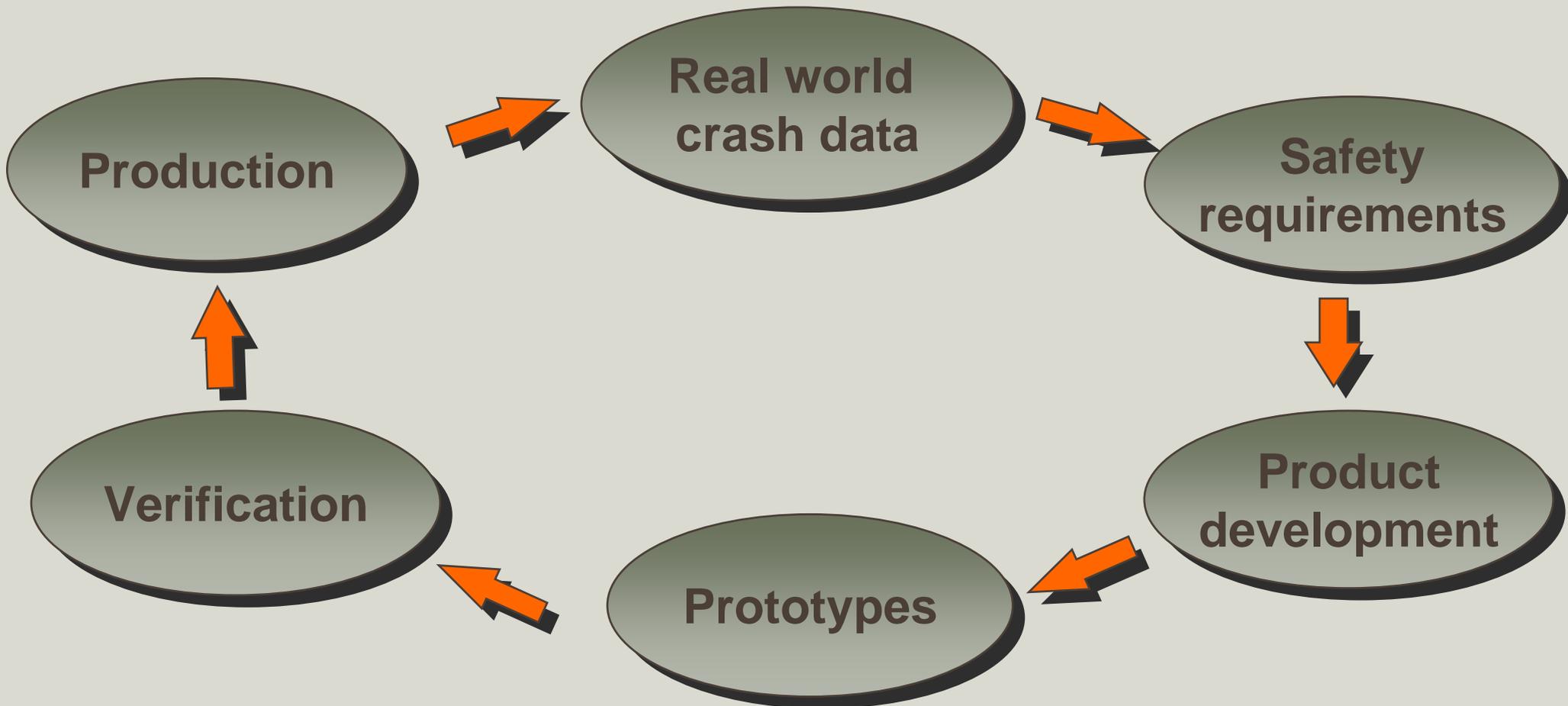
*Assar Gabrielsson & Gustaf Larson,
the founders of Volvo*



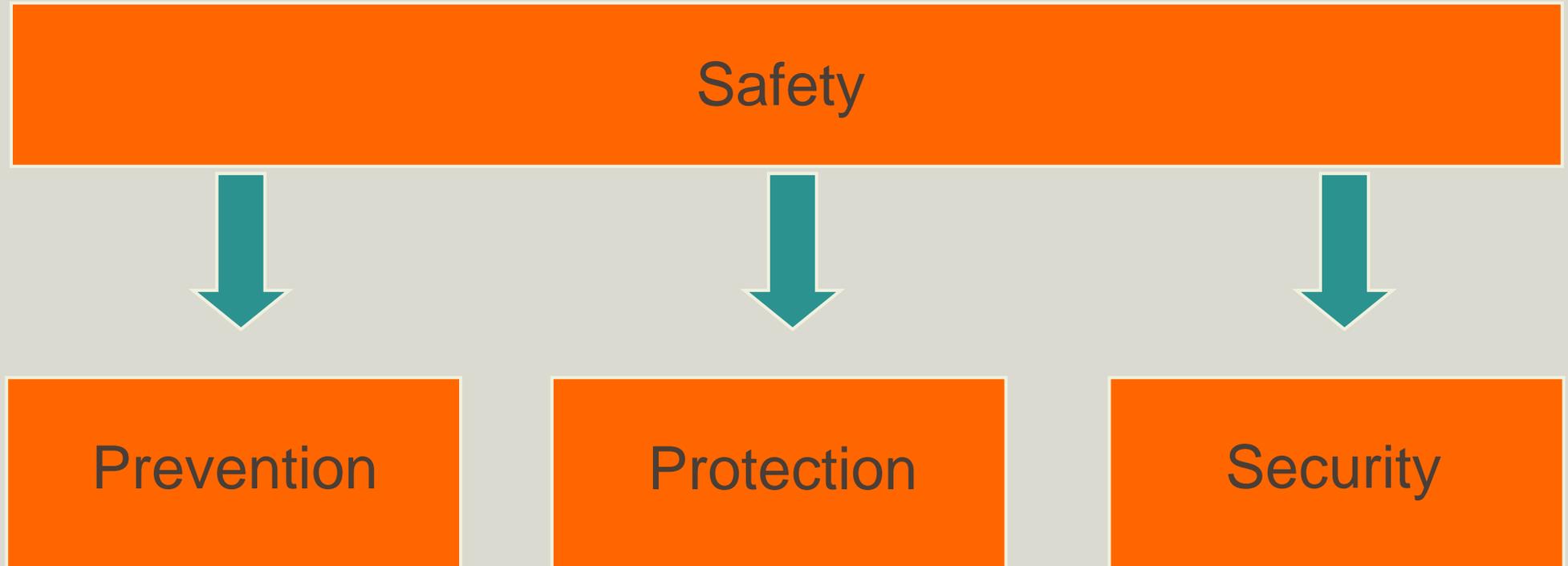
Volvo Traffic Accident Research



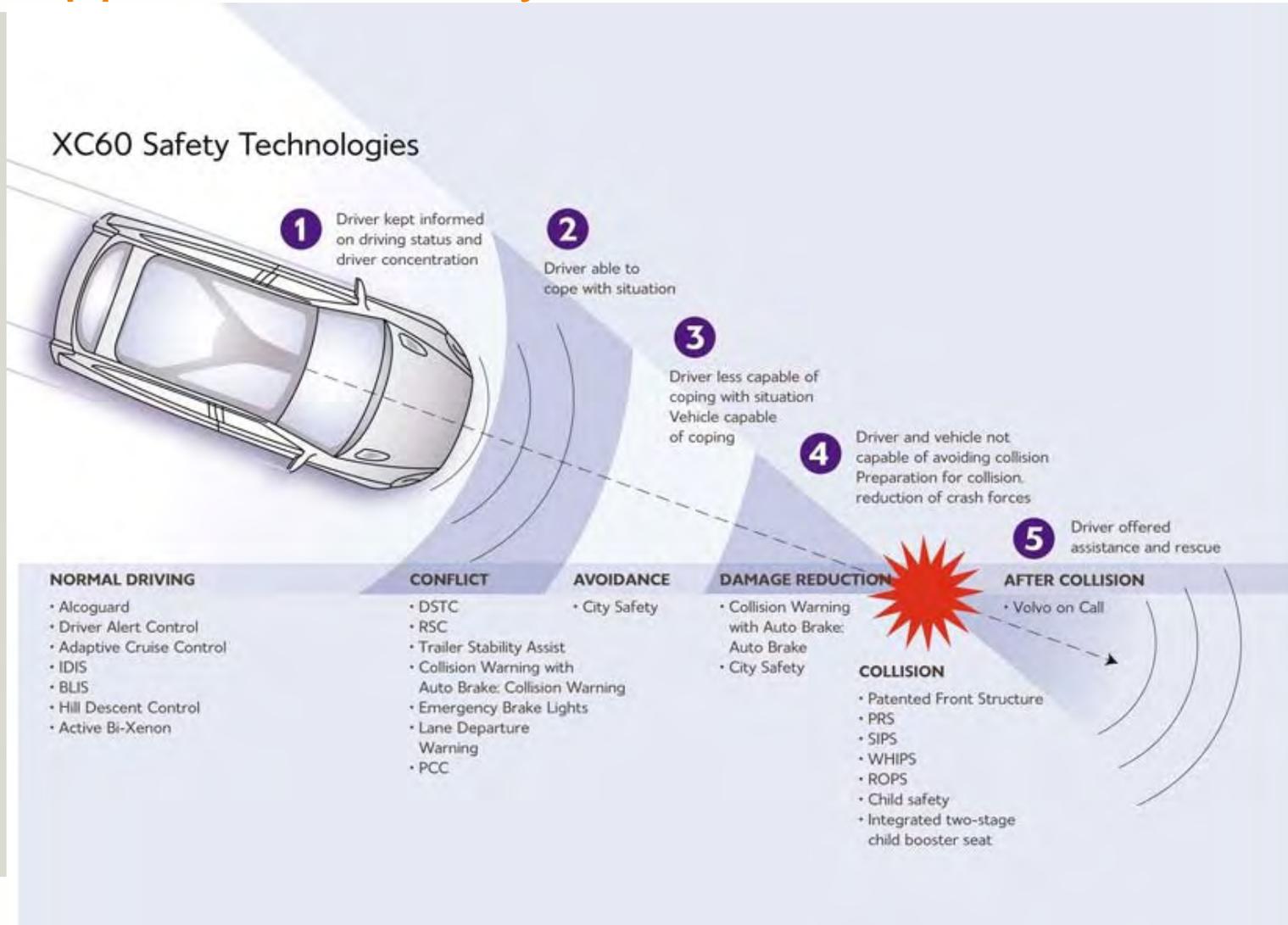
Knowledge saves lives



Safety Strategy



Holistic approach to safety



Holistic approach example

Normal (Non-conflict)

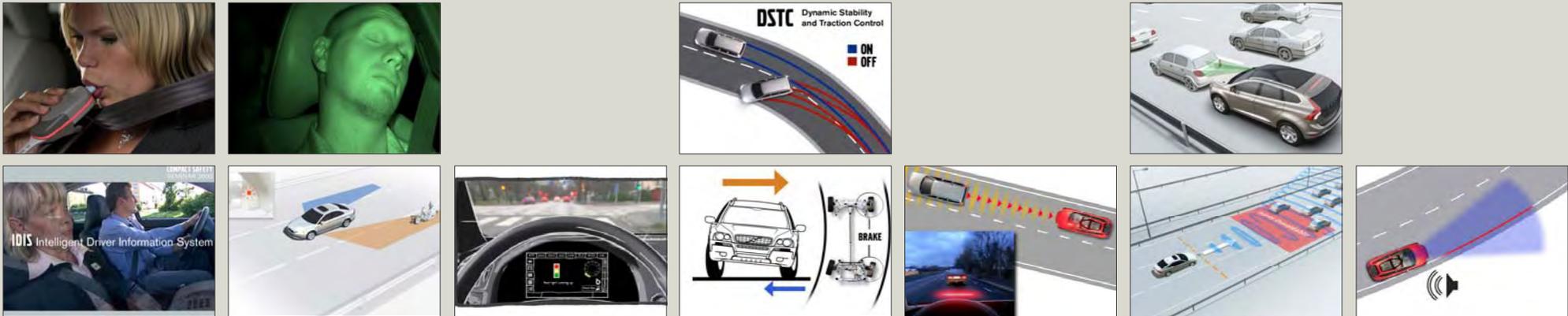
Alcoguard
Driver Alert Control
ACC/Distance Alert
LDW
IDIS
BLIS
 Volvo CoDriver

Conflict

DSTC
RSC
Collision Warning

Avoidance/Mitigation

City Safety
Mitigation/Auto Brake
 ELA



Time →



Child Safety.....A rich and...

In the 1960's Swedish professor and Medical Doctor Bertil Aldman pioneered the rearward-facing child seat, an inspiration from the seats in the Gemini mission astronauts.

In 1964 Volvo presented the first child safety seat



...long history in child safety...

In 1978, Volvo was the first auto manufacturer in the world to introduce its own child safety booster cushion, where older children could use the safety belt without disadvantages.

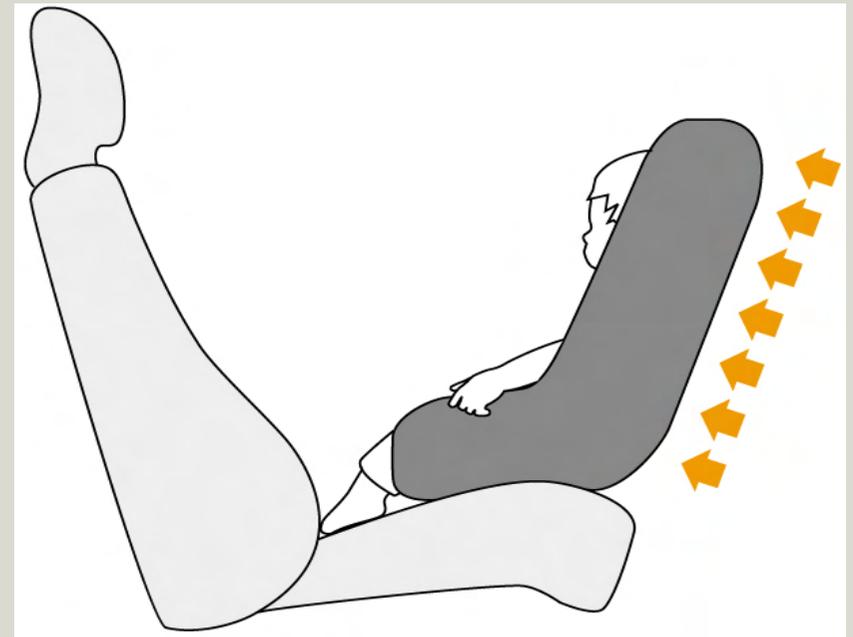
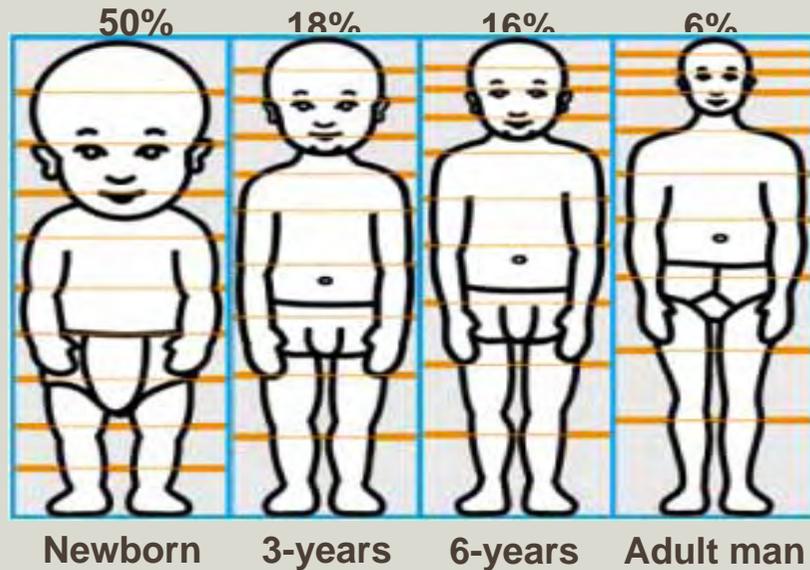


In 1990 Volvo introduced, also as a world first, the integrated booster cushion.

Volvo Child Safety Strategy:

Extensive research has been performed by Volvo

In the event of a frontal collision (most common & most severe) the force must be distributed over the entire body of the child due to the size of head and fragility of the neck



Children should travel facing rearward as long as possible (0 - 4 years)

Volvo Child Safety Strategy:

- In an ordinary seat, the lap belt will be positioned over the soft tissue of the abdomen.
- In the event of a frontal collision this belt geometry can lead to serious injuries in the abdominal area.
- In a booster seat, the child will be lifted up so that the lap belt can be positioned properly over the pelvis.



WRONG



CORRECT

Children 4-10 years old should sit on a booster seat

Accessory Booster seat & Backrest

- Crash tested and approved to ESE R44-03 and FMVSS 213
- Belt positioning seats
- U.S. Weight Range: 33-80 lbs
- CA Weight Range: 40-80 lbs
- An IIHS Best Bet
- Available through Volvo Retailers



Volvo Child Safety Products

Integrated booster seats

- Available on the S40, V50, V70, XC60, XC70, & XC90
- Belt positioning seat covers
 - U.S. Weight Range: 33-80 lbs
 - CA Weight Range: 40-80 lbs



Volvo European Child Safety Products



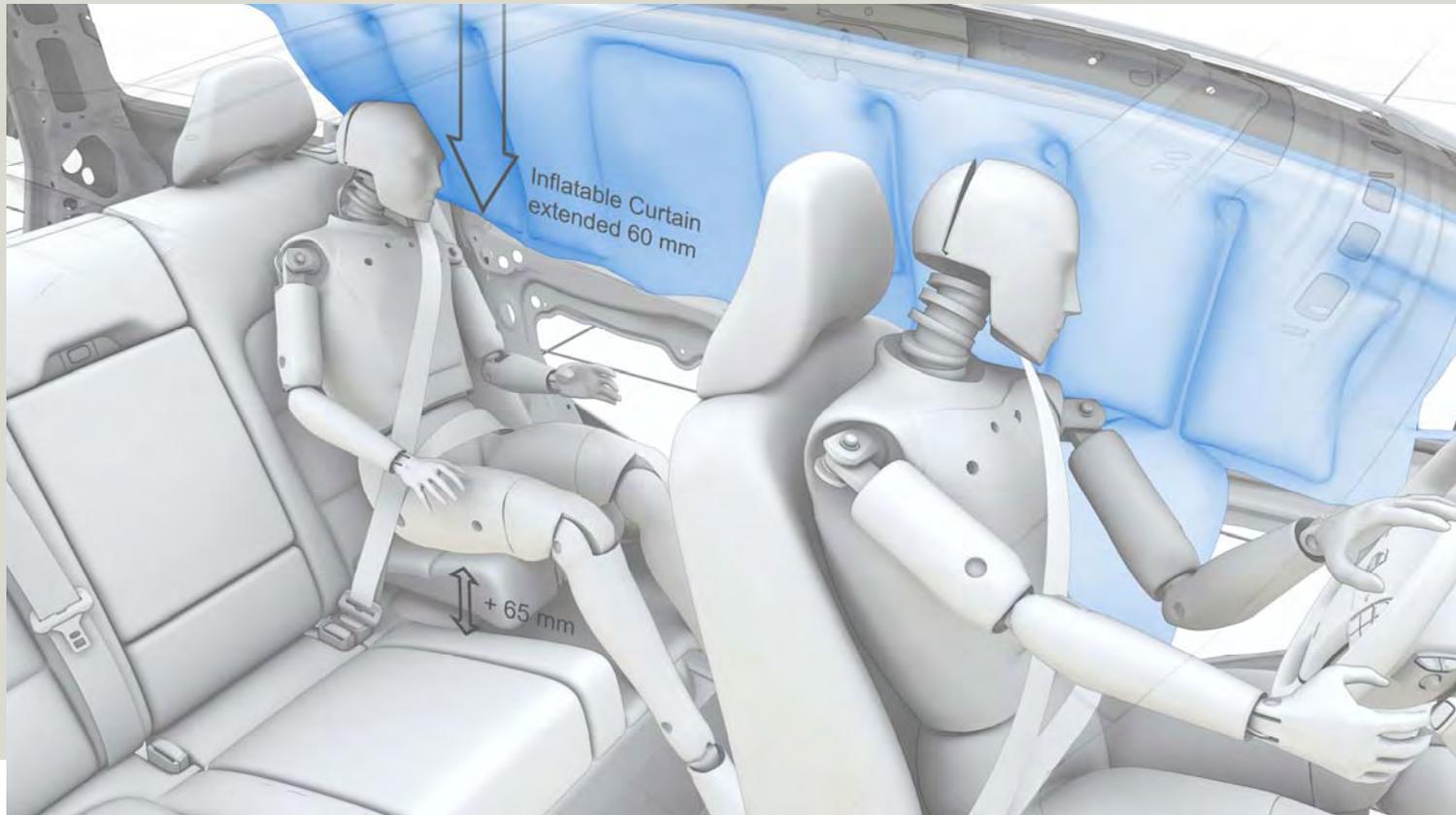
Volvo World's First Dual Stage Integrated Booster

- Standard on the 2009MY V70 and available on the 2009MY XC70
- Allows proper belt placement on the pelvis and across chest
- The lower setting is intended for children measuring 45-55 in (115-140 cm), while the upper setting is for children measuring 37-47 in (95-120 cm).



Volvo World's First Dual Stage Integrated Booster

The inflatable curtains have been extended by 2.4 in (60 mm), and in combination with the strong body side structure this provides children of different sizes with effective protection in a side impact.



First line of defense

Seatbelts - 50th Anniversary

- Pioneered the 3 point seat belt in 1958.
- Standard pyrotechnic belts in all outboard seating positions
- All seating positions equipped with:
 - Automatic Locking Retractors for child seats
 - and Emergency Locking Retractors
- 3 point seatbelts in the rear positions (1972)
- Standard three point seatbelt in the rear center seat from 1998 to present



Volvo & Child Safety: Features

Anti-Pinch reversible windows

- Window reverses itself upon contact
- Standard on all vehicles

Child Locks

- Lock does not allow unintentional opening of doors
- Both Mechanical & Electrical
- Available on all vehicles

Child Window Locks

- Disables the window switch for the second row occupants
- Available on all vehicles

Isofix (LATCH)

- Isofix standard on every model since 2001 (excluding the C70)

MY2010 Rear Seatbelt Reminders



Volvo & Child Safety: Retailer training

- Program developed for retailers
- Three courses:
 - Child Passenger Safety: Practices and Devices
 - Information to share with customers
 - Child Passenger Safety at the Volvo Retailer
 - To promote a child passenger safety education and inspection event at the retailer for the retailer managers
 - Child Passenger Safety Seats & their installation
 - A series of video demonstrations of the different types of child passenger safety seats
- Training courses available online for all Volvo retailers



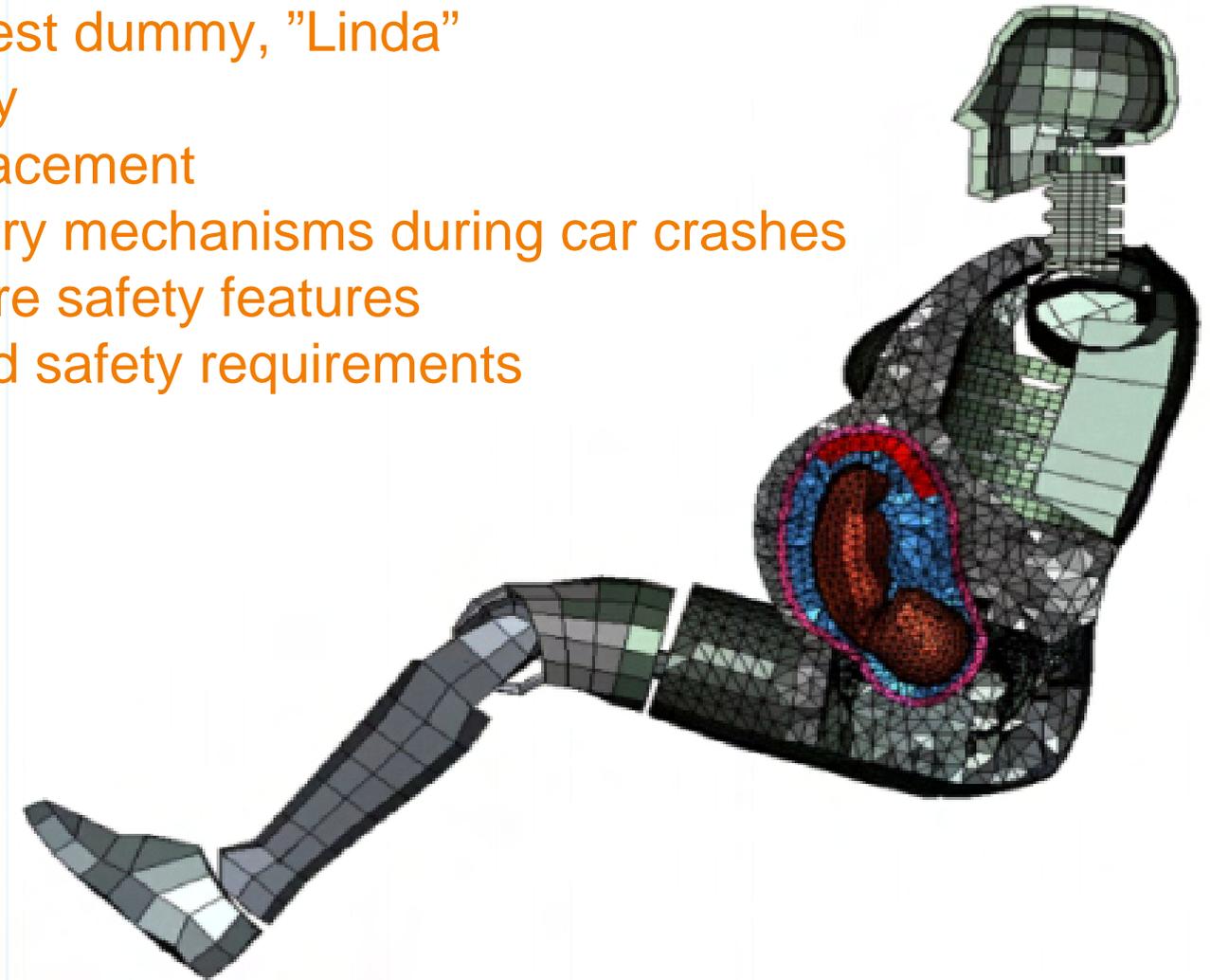
Volvo & Child Safety: Manual

- Available to everyone
- Manual containing Volvo child safety philosophy and recommendations



Volvo Child Safety Future.....Meet Linda

- Virtual pregnant crash test dummy, "Linda"
- Intended uses of dummy
 - Test correct belt placement
 - Investigation of injury mechanisms during car crashes
 - Design tool for future safety features
 - Future standardized safety requirements



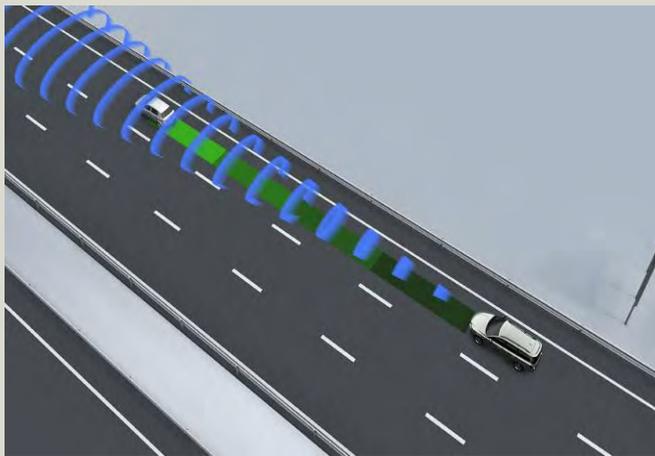
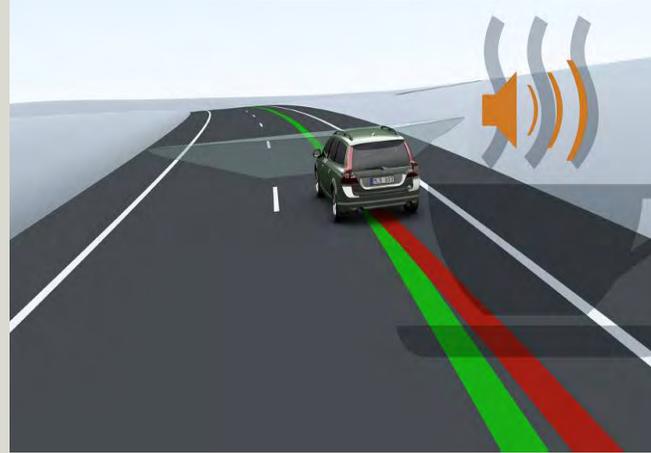
...our tomorrow

Vision 2020

Our vision is that by 2020
no one will be killed or injured in a Volvo



Introduction to Active Safety Systems



Blind Spot Information System (BLIS)

- Camera-based monitoring system.
- “Watches” the area alongside and to the offset rear of the car.
- The system alerts the driver both to cars approaching from behind and cars that have recently been overtaken.
- Available on all Volvo models.



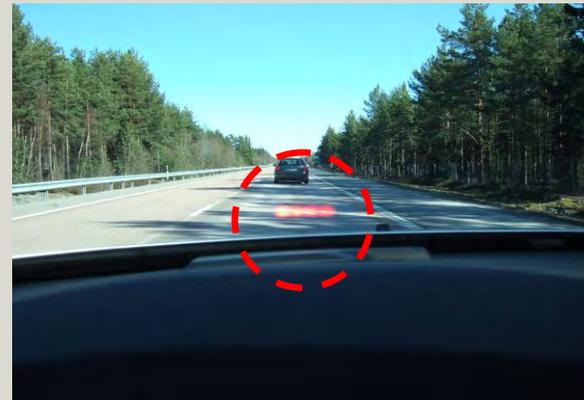
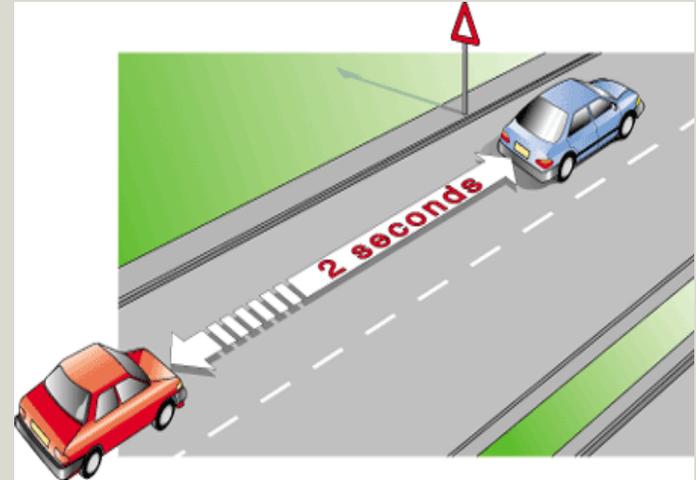
Distance Alert (DA)

Why?

- 30% of all accidents are rear end collisions.
- Distance Alert (DA) helps keeping proper distance.
- Easier to keep local regulations compared to other methods (i.e. counting road markers).

How?

- Distance selected by driver
- When the distance is too short, the middle segment of the Head-Up Display is lit.
- DA is active above 20 mph and ACC is not active.
- DA uses the radar sensor.



Adaptive Cruise Control (ACC)

Why?

- Helps the driver to keep distance, which enhances safety.
- ACC contributes to relaxed driving.

How?

- The system automatically adapts the speed to keep the distance.
- ACC is active between 20 and 125 mph.
- ACC uses the radar sensor.



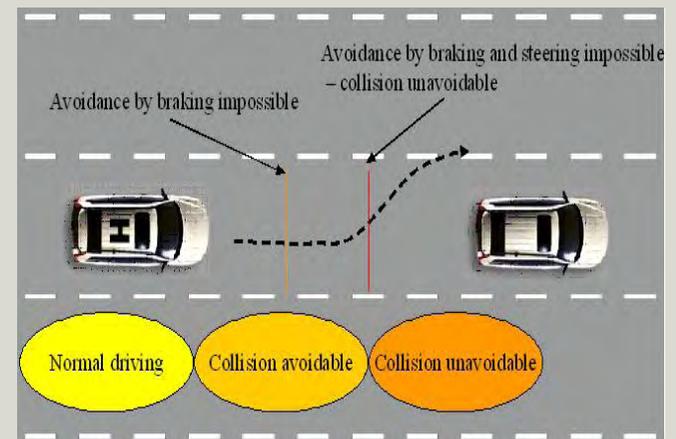
Collision Warning with Auto Brake (CWAB)

Why?

- About 30% of all accidents are rear-end collisions.
- In 50% of these accidents, the driver does not brake at all.
- 50% of the rear-end collisions occur towards stationary vehicles.

How?

- An intuitive audible and visual warning by flashing the Head Up Display.
- Prepares the brake system by pre-charging it.
- When a collision is unavoidable, Auto Brake will brake autonomously (50% brake force).
- CWAB uses the radar and a camera to monitor the area in front of the car.



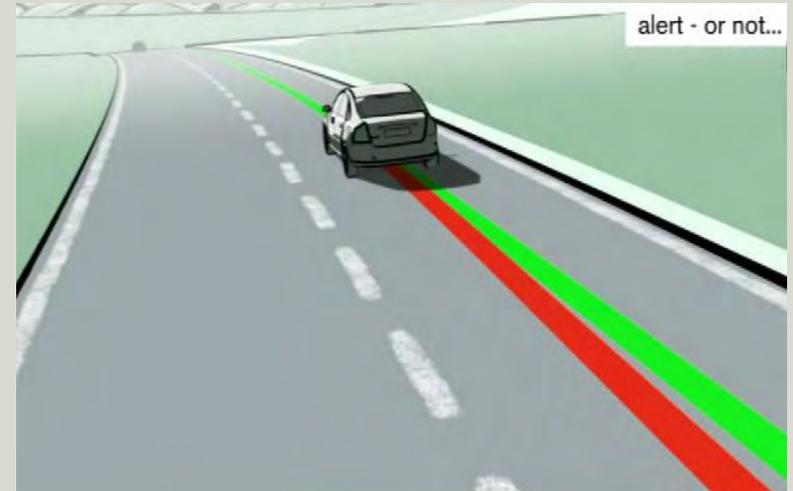
Driver Alert Control (DAC)

Why?

- About 20 % of the fatal highway accidents are caused by driver fatigue.
- >100,000 accidents are caused by driver fatigue in the US every year, in which 1,500 people are killed and another 71,000 are injured.

How?

- Analyses the driving behaviour.
- Driver alerted via an audible signal
“Time for a break” is shown.
- Information displayed in the trip computer.
- Activation speed is 40 mph.
- Camera mounted on the inside of the windscreen.



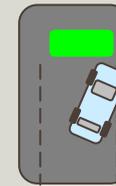
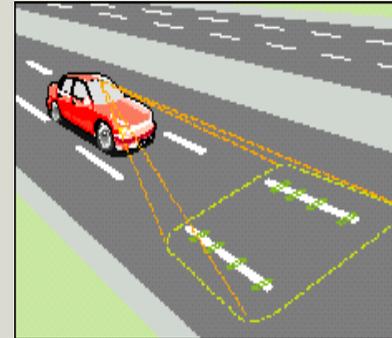
Lane Departure Warning (LDW)

Why?

- About 33% of all accidents involve an initial road departure.
- Of these, 75% occur on roads with speed limits of 45 mph and above. Many of these accidents are connected to serious personal injuries.

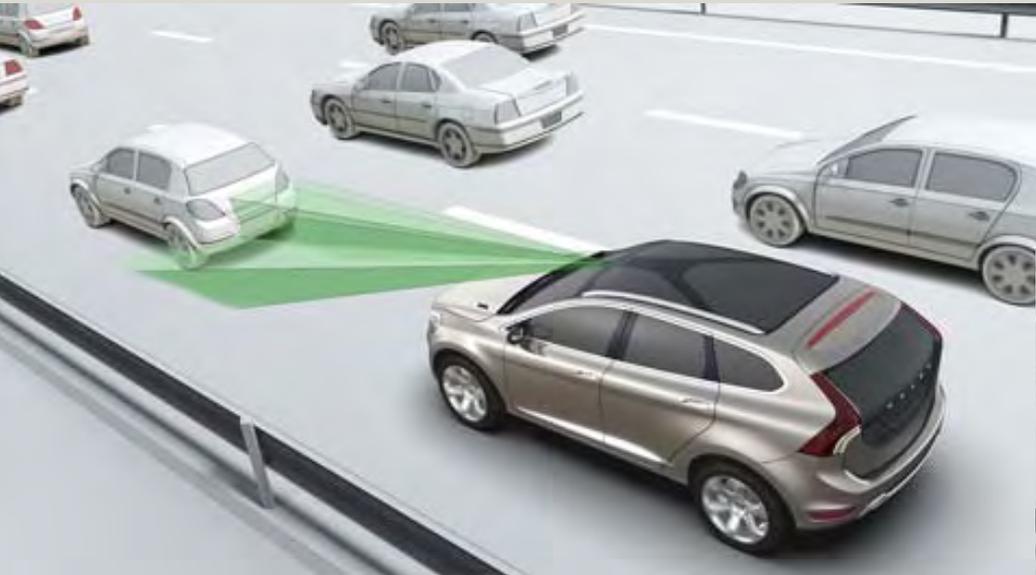
How?

- Warns the driver when the vehicle crosses a lane marker while the turn indicator is not used.
- Activation speed is 40 mph.
- Information displayed in the trip computer.
- On/off via a button located in the center stack.
- Camera mounted on the inside of the windshield.



City Safety: The Future of Safety

- More than 75% of all accidents are in speeds below 18 MPH (30 km/h) (estimate from NASS)



City Safety – Autonomous braking in low speed

- In low speed following, and parking lot situations many collisions occur as a result of distraction
- City safety is a technology to address these collisions and help in reducing injuries and damage in low speed rear impacts <18mph (30 km/h)
 - Collision Avoidance to 9 mph (15 km/h)
 - Collision Mitigation: 9 to 18 mph (30 km/h)
- Benefit
 - Further improved Safety – Partner protection
 - Whiplash
 - Pedestrian
 - Reduced cost of ownership – repair/insurance costs



City Safety – Functionality

- Active in vehicle speeds below 30 km/h (18 mph)
- Active for stationary and moving vehicles, but not on coming traffic
- Over-ride when the driver is considered alert through steering or throttle input. The driver is always in control

There are two scenarios when automatic braking is initiated...



THE VEHICLE AHEAD STOPS



THE VEHICLE AHEAD REMAINS IN MOTION

...and two different speed intervals:

City Safety – Sensor System

- LIDAR (Laser radar) for distance

- Digital Camera for detection
- Max object detection range approx 30 feet (10 meters) from bumper



Film: City Safety-The Future of Safety



The Next Generation of Preventive Safety

Volvo is introducing a Pedestrian Detection system

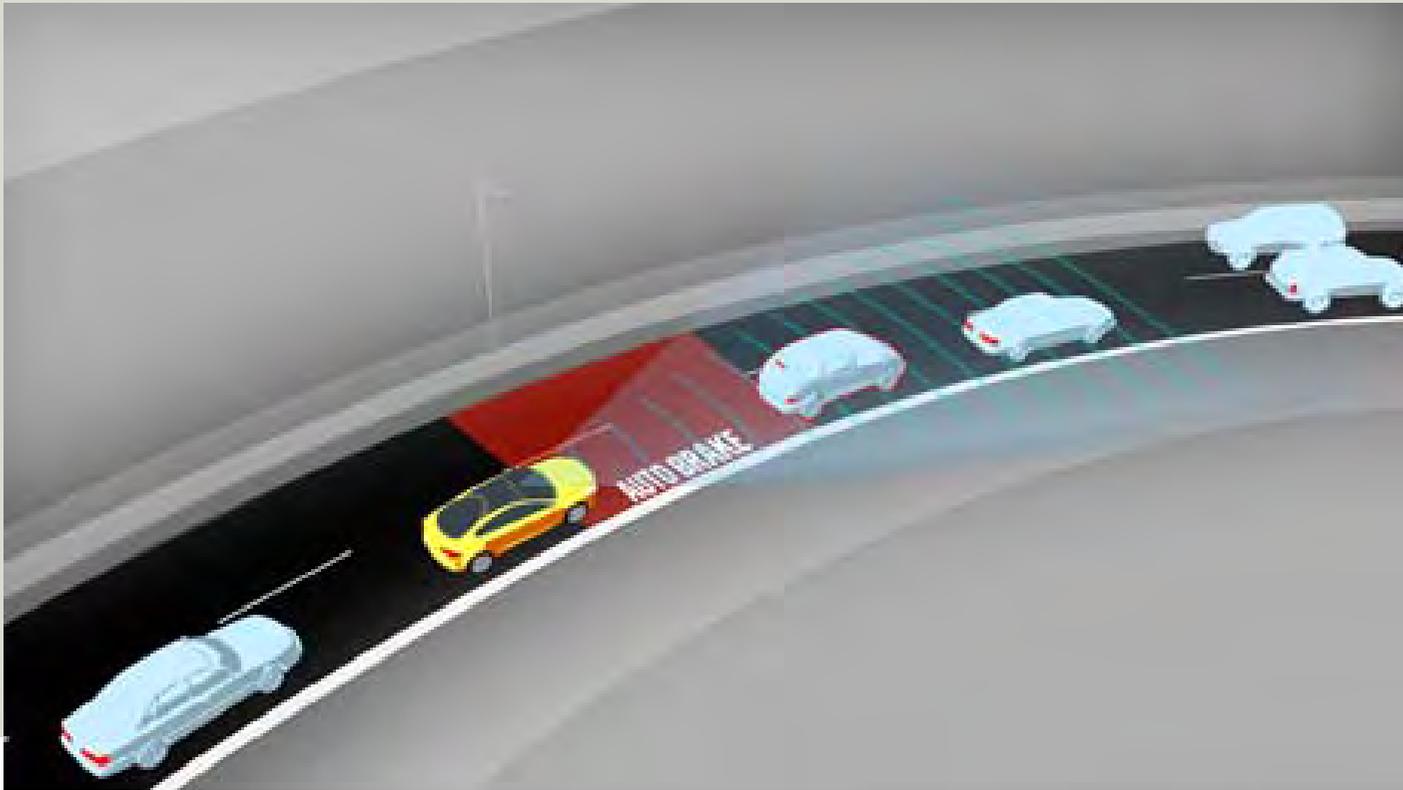
- The system reacts when a pedestrian walks out in front of a car – and will activate the car's full braking power if the driver does not respond to the danger.
- System avoids collisions up to 20 kph (10 mph) and reduces impact forces by as much as 75% if driven faster



The Next Generation of Preventive Safety

Volvo is introducing Collision Warning with Full Auto Brake

- Applies 100% brake force (vs current 50%) with new technology
- Updated Adaptive Cruise Control allows braking to a complete stop



The new Volvo XC60...

Body Structure & Steel Material

Alcoguard

City Safety

2-stage booster cushion with load limiter

IDIS

ROPS

Pre-prepared restraints

Emergency brake lights

Extended IC

Collision Warning with Auto brake

BLIS

Driver Alert Control

Distance Alert

Active Bi-Xenon

WHIPS



Side airbags

Compatibility beam

Trailer Stability Assist

SIPS

Advanced brakes:

DSTC

Lane Departure Warning

Roll Stability Control

HBA, OHB, RAB, FBS, PPB



"Cars are driven by people..."



Volvo & Child Passenger Safety



Thank You!

Please visit us at:

www.volvocars.com/us

