Briefing on IIHS and HLDI
Columbus, OH • April 9, 2014
Mr. Kim Hazelbaker – Sr. V.P.
The Insurance Institute for Highway Safety, founded in 1959, is an independent, nonprofit, scientific, and educational organization dedicated to reducing the losses — deaths, injuries, and property damage — from crashes on the nation's highways.

The Highway Loss Data Institute, founded in 1972, shares and supports this mission through scientific studies of insurance data representing the human and economic losses resulting from the ownership and operation of different types of vehicles and by publishing insurance loss results by vehicle make and model.

Both organizations are wholly supported by auto insurers.
Where are we?
Location of IIHS/HLDI and Vehicle Research Center

North America
Washington, DC
Virginia
Charlottesville
Arlington
Member groups

- Acceptance Insurance
- ACE Private Risk Services
- Affirmative Insurance
- Agency Insurance Company of Maryland
- Alfa Alliance Insurance Corporation
- Alfa Insurance
- Allstate Insurance Group
- American Family Mutual Insurance
- American National Property and Casualty Company
- Ameriprise Auto & Home
- Amica Mutual Insurance Company
- ARI Insurance Companies
- Auto Club Enterprises
- Auto Club Group
- Auto-Owners Insurance
- Aviva Insurance
- Bankers Insurance Group
- Bituminous Insurance Companies
- California Casualty Group
- California State Auto Group
- Capital Insurance Group
- Chubb & Son
- Colorado Farm Bureau Mutual Insurance Company
- Commonwealth Mutual Insurance Company of America
- Concord Group Insurance Companies
- COUNTRY Financial
- CSE Insurance Group
- Dallas National Insurance Company
- Direct General Corporation
- Driver’s Insurance Group
- Erie Insurance Group
- Esurance
- Farm Bureau Financial Services
- Farm Bureau Insurance of Michigan
- Farm Bureau Mutual Insurance Company of Idaho
- Farmers Insurance Group of Companies
- Farmers Mutual Hail Insurance Company of Iowa
- Farmers Mutual of Nebraska
- Fireman’s Fund Insurance Company
- Florida Farm Bureau Insurance Companies
- Frankenmuth Insurance
- Gainsco Insurance
- GEICO Group
- Georgia Farm Bureau Mutual Insurance Company
- Goodville Mutual Casualty Company
- Grange Insurance
- Hallmark Insurance Company
- Hanover Insurance Group
- The Hartford
- Haulers Insurance Company, Inc.
- Horace Mann Insurance Companies
- ICW Group
- Imperial Fire & Casualty Insurance Company
- Indiana Farmers Mutual Insurance Company
- Infinity Property & Casualty
- Kemper Preferred
- Kentucky Farm Bureau Insurance
- Liberty Mutual Insurance Company
- Louisiana Farm Bureau Mutual Insurance Company
- Maryland Automobile Insurance Fund
- Mercury Insurance Group
- MetLife Auto & Home
- Michigan Millers Mutual Insurance Company
- MiddleOak
- Mississippi Farm Bureau Casualty Insurance Company
- MMG Insurance
- Mutual of Enumclaw Insurance Company
- Nationwide
- New Jersey Manufacturers Insurance Group
- Nodak Mutual Insurance Company
- Norfolk & Dedham Group
- North Carolina Farm Bureau Mutual Insurance Company
- Northern Neck Insurance Company
- Ohio Mutual Insurance Group
- Old American County Mutual Fire Insurance
- Old American Indemnity Company
- Oregon Mutual Insurance
- Pekin Insurance
- PEMCO Insurance
- Plymouth Rock Assurance
- Progressive Corporation
- QBE
- The Responsive Auto Insurance Company
- Rockingham Group
- Safe Auto Insurance
- Safeco Insurance
- Samsung Fire & Marine Insurance Company
- SECUra Insurance
- Sentry Insurance
- Shelter Insurance
- Sompo Japan Insurance Company of America
- South Carolina Farm Bureau Mutual Insurance Company
- Southern Farm Bureau Casualty Insurance Company
- State Auto Insurance Companies
- State Farm
- Tennessee Farmers Mutual Insurance Company
- Texas Farm Bureau Insurance Companies
- Tower Group Companies
- The Travelers Companies
- United Educators
- USAA
- Utica National Insurance Group
- Virginia Farm Bureau Mutual Insurance
- West Bend Mutual Insurance Company
- Western National
- Westfield Insurance
- Young America Insurance Company
- Zurich North America
The Big Picture

Fatalities: 33,561
Registered vehicles: 253,639,386
Total crashes: 5,615,000
Property damage only crashes: 3,950,000
Injury crashes: 1,634,000
Motor vehicle crash deaths and deaths per billion vehicle miles traveled

1950-2012

- Deaths per billion vehicle miles traveled
- Motor vehicle deaths

- 11.3 per billion
- 33,561
Crash Testing 101
IIHS frontal offset test
Frontal crash tests:
1997 Pontiac Trans Sport
2005 Chevrolet Uplander
IIHS crashworthiness tests

- Front moderate overlap, beginning 1995
- Side impact, beginning 2003
- Rear crash (whiplash mitigation), beginning 2004
- Roof strength, beginning 2009
Crash protection ratings by model year

Improvements: Beginning in 1995
Small overlap frontal - 2012
Definition of small overlap
Majority of loading outside longitudinal structures

frame rail largely undamaged
Overhead video small overlap test
Minimal airbag protection – Lincoln MKZ
Stable airbag interaction – Infiniti G25
# Small overlap frontal ratings

<table>
<thead>
<tr>
<th>Make</th>
<th>Overall</th>
<th>Structure</th>
<th>Restraints &amp; Kinematics</th>
<th>Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acura TL</td>
<td>G</td>
<td>A</td>
<td>G</td>
<td>G G G G</td>
</tr>
<tr>
<td>Volvo S60</td>
<td>G</td>
<td>G</td>
<td>A</td>
<td>G G G G</td>
</tr>
<tr>
<td>Infiniti G</td>
<td>A</td>
<td>M</td>
<td>G</td>
<td>G G G G</td>
</tr>
<tr>
<td>Acura TSX</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>G G G P</td>
</tr>
<tr>
<td>BMW 3 series</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>G G G P</td>
</tr>
<tr>
<td>Lincoln MKZ</td>
<td>M</td>
<td>P</td>
<td>M</td>
<td>G G A G</td>
</tr>
<tr>
<td>Volkswagen CC</td>
<td>M</td>
<td>M</td>
<td>P</td>
<td>G G A G</td>
</tr>
<tr>
<td>Mercedes C class</td>
<td>P</td>
<td>P</td>
<td>M</td>
<td>G G G P</td>
</tr>
<tr>
<td>Lexus IS 250/350</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>G G G P</td>
</tr>
<tr>
<td>Audi A4</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>G G P G</td>
</tr>
<tr>
<td>Lexus ES 350</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>G G M P</td>
</tr>
</tbody>
</table>

**Legend:**
- good **G**
- acceptable **A**
- marginal **M**
- poor **P**
Television coverage:
New small overlap crash test
Small overlap advertisements
SWEDEN 1
GERMANY 0

The 2012 Volvo S60- the highest rated vehicle in the Insurance Institute for Highway Safety’s new small overlap frontal crash test. The German guys? Well, let’s just say that they didn’t even come close.

5 YEAR WARRANTY + 5 YEAR SCHEDULED MAINTENANCE
5 YEAR WEAR & TEAR + 5 YEAR ROADSIDE ASSISTANCE
TOP SAFETY PICK
Requirements for *TOP SAFETY PICK* awards

- G rating in moderate overlap front test
- G rating in side test
- G rating in roof strength test
- G rating in head restraint test
- G or A rating in small overlap front test

meets *TOP SAFETY PICK* criteria,
plus earns basic, advanced or superior rating for front crash prevention
2014 TOP SAFETY PICK winners
February 2014

Minicars
- Chevrolet Spark

Small cars
- Dodge Dart
- Ford Focus
- Honda Civic 2-door
- Hyundai Elantra
- Scion tC
- Subaru Impreza
- Subaru XV Crosstrek

Midsize moderately priced cars
- Chrysler 200
- Dodge Avenger
- Kia Optima
- Nissan Altima
- Toyota Camry
- Volkswagen Passat

Midsize luxury/near luxury cars
- Acura TL

Small SUVs
- Mitsubishi Outlander Sport

Midsize luxury SUVs
- Volvo XC90
2014 *TOP SAFETY PICK*+ winners
February 2014

**Small cars**
- Honda Civic 4-door
- Mazda 3
- Toyota Prius

**Midsize moderately priced cars**
- Ford Fusion
- Honda Accord 2-door
- Honda Accord 4-door
- Mazda 6
- Subaru Legacy
- Subaru Outback

**Midsize luxury/near luxury cars**
- Infiniti Q50
- Lincoln MKZ
- Volvo S60

**Large luxury cars**
- Acura RLX
- Volvo S80

**Small SUVs**
- Mazda CX-5
- Mitsubishi Outlander
- Subaru Forester

**Midsize SUVs**
- Toyota Highlander

**Midsize luxury SUVs**
- Acura MDX
- Mercedes M class
- Volvo XC60

**Minivans**
- Honda Odyssey
Volkswagen

TOP SAFETY PICK

advertisements
50th Anniversary
40 mph frontal offset crash test
1959 Chevrolet Bel Air and 2009 Chevrolet Malibu
1959 Chevrolet Bel Air and 2009 Chevrolet Malibu
Highway Loss Data Institute
HLDI data providers have 80+% share of PPA

- 21st Century Insurance
- Alfa Alliance Insurance Corporation
- Allstate Insurance Group
- American Family Mutual Insurance
- American National Family of Companies
- Amica Mutual Insurance Company
- Auto Club Group
- Automobile Insurers Bureau of Massachusetts
- Chubb & Son
- COUNTRY Financial
- CSAA Insurance Group
- Erie Insurance Group
- Esurance
- Farm Bureau Financial Services
- Farmers Insurance Group of Companies
- Florida Farm Bureau Insurance Companies
- Foremost
- GEICO Corporation
- The Hartford
- Kemper Preferred
- Kentucky Farm Bureau Insurance
- Liberty Mutual Insurance Company
- MetLife Auto and Home
- National General
- Nationwide
- New Jersey Manufacturers Insurance Group
- PEMCO Insurance
- Plymouth Rock Assurance
- Progressive Corporation
- Rockingham Group
- Safeco Insurance Companies
- SECURA Insurance
- Sentry Insurance
- State Farm Insurance Companies
- Tennessee Farmers Mutual Insurance Company
- The Travelers Companies
- USAA
Other data suppliers

CARFAX

Mitchell

AudaExplore

CCC Information Services Inc.
## Size of HLDI passenger vehicle database

Number of unique VINs in files, January 2014

<table>
<thead>
<tr>
<th>model year</th>
<th>number of vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>16,151,798</td>
</tr>
<tr>
<td>2005</td>
<td>15,901,024</td>
</tr>
<tr>
<td>2006</td>
<td>14,941,999</td>
</tr>
<tr>
<td>2007</td>
<td>14,646,871</td>
</tr>
<tr>
<td>2008</td>
<td>12,911,270</td>
</tr>
<tr>
<td>2009</td>
<td>8,424,884</td>
</tr>
<tr>
<td>2010</td>
<td>9,640,023</td>
</tr>
<tr>
<td>2011</td>
<td>10,010,995</td>
</tr>
<tr>
<td>2012</td>
<td>10,534,771</td>
</tr>
<tr>
<td>2013</td>
<td>9,820,897</td>
</tr>
<tr>
<td>2004-2013</td>
<td>122,984,532</td>
</tr>
</tbody>
</table>
Size of HLDI motorcycle database
Number of unique VINs in files, January 2014

<table>
<thead>
<tr>
<th>model year</th>
<th>VIN count</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>495,226</td>
</tr>
<tr>
<td>2005</td>
<td>620,601</td>
</tr>
<tr>
<td>2006</td>
<td>695,426</td>
</tr>
<tr>
<td>2007</td>
<td>715,512</td>
</tr>
<tr>
<td>2008</td>
<td>559,947</td>
</tr>
<tr>
<td>2009</td>
<td>440,087</td>
</tr>
<tr>
<td>2010</td>
<td>182,088</td>
</tr>
<tr>
<td>2011</td>
<td>207,920</td>
</tr>
<tr>
<td>2012</td>
<td>257,722</td>
</tr>
<tr>
<td>2013</td>
<td>182,536</td>
</tr>
<tr>
<td>total</td>
<td>4,357,065</td>
</tr>
</tbody>
</table>
Coverages reported to HLDI

Private Passenger Auto

- Collision
- Comprehensive
- Personal injury protection
- Medical payments
- Physical damage liability
- Bodily injury liability
Crash avoidance systems
Wave of new technologies
Radar, LIDAR, ultrasonic, infrared, cameras, GPS
Mercedes advertisement
Electronic Stability Control:
The first crash avoidance success
What is Electronic Stability Control (ESC)?

ESC is an extension of ABS, which has speed sensors and independent braking for each wheel. Additional sensors monitor how well a vehicle is responding to a driver’s input.
Effects on crash risk

Percent change in crash rates for vehicles with standard ESC vs. optional or no ESC, updated May 2010
Relative overall collision losses
Before and after standard ESC, April 2006

- Luxury cars
  - Before
  - After

- Sports cars
  - Before
  - After

- SUVs
  - Before
  - After
Volvo City Safety
PDL claim frequencies for 2010-12 Volvo XC60 with City Safety vs. other 2009-12 midsize luxury SUVs

Calendar years 2009-12
Volvo XC60 City Safety  updated results

<table>
<thead>
<tr>
<th>vs. other midsize luxury SUVs</th>
<th>claim frequency</th>
<th>claim severity</th>
<th>overall losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>property damage liability</td>
<td>-16.0%</td>
<td>-14.6%</td>
<td>-13.1%</td>
</tr>
<tr>
<td>bodily injury</td>
<td>-37.6%</td>
<td>-33.3%</td>
<td>-28.7%</td>
</tr>
<tr>
<td>collision</td>
<td>-21.1%</td>
<td>-20.2%</td>
<td>-19.3%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>vs. other Volvos</th>
<th>claim frequency</th>
<th>claim severity</th>
<th>overall losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>property damage liability</td>
<td>-8.3%</td>
<td>-5.2%</td>
<td>-1.9%</td>
</tr>
<tr>
<td>bodily injury</td>
<td>-41.5%</td>
<td>-33.7%</td>
<td>-25.0%</td>
</tr>
<tr>
<td>collision</td>
<td>-13.3%</td>
<td>-11.4%</td>
<td>-9.3%</td>
</tr>
</tbody>
</table>
PDL claim frequencies for 2011-12 Volvo S60 with City Safety vs. other 2011-12 4-door midsize luxury cars

Calendar years 2011-12
# Volvo S60 City Safety

## vs. other midsize 4-door luxury cars

<table>
<thead>
<tr>
<th></th>
<th>claim frequency</th>
<th>claim severity</th>
<th>overall losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>property damage liability</td>
<td>-19.5%  -16.3%  -12.9%</td>
<td>$257  $373  $486</td>
<td>-$8  -$4  $0</td>
</tr>
<tr>
<td>bodily injury</td>
<td>-30.4%  -18.2%  -3.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>collision</td>
<td>-10.7%  -8.7%  -6.6%</td>
<td>-$802  -$668  -$537</td>
<td>-$92  -$79  -$66</td>
</tr>
</tbody>
</table>

## vs. other Volvos

<table>
<thead>
<tr>
<th></th>
<th>claim frequency</th>
<th>claim severity</th>
<th>overall losses</th>
</tr>
</thead>
<tbody>
<tr>
<td>property damage liability</td>
<td>-18.1%  -10.7%  -2.6%</td>
<td>$416  $649  $863</td>
<td>-$1  $7  $13</td>
</tr>
<tr>
<td>bodily injury</td>
<td>-49.9%  -28.3%  2.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>collision</td>
<td>7.6%  13.5%  19.7%</td>
<td>$96  $360  $608</td>
<td>$37  $58  $78</td>
</tr>
</tbody>
</table>
PDL claim frequencies by severity range

Volvo S60 vs. all other 4-door midsize luxury cars

- low <$1,500
- mid $1,500-$6,999
- high $7,000+

Volvo S60 vs. all other 4-door midsize luxury cars
Point of impact distribution for PDL damage estimates

Volvo XC60 and other midsize luxury SUVs

Volvo XC60

5.7% 8.0% 4.6%
3.9% 2.2% 2.2%
8.4% 46.2% 5.4%

other midsize luxury SUVs

5.4% 7.3% 4.5%
3.4% 2.1% 1.9%
8.0% 48.2% 5.3%
## Collision Avoidance Technology

<table>
<thead>
<tr>
<th>Make</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acura</td>
<td>Adaptive headlights, Collision mitigation braking system (Forward collision warning with auto brake and Adaptive cruise control) (Blind spot warning)</td>
</tr>
<tr>
<td>Buick</td>
<td>Lane departure warning, Rear park assist</td>
</tr>
<tr>
<td>Infiniti</td>
<td>Adaptive headlights, Adaptive cruise control, Adaptive cruise control with full stop, Around view monitor, Brake assist, Lane departure warning, Lane departure prevention, Rear camera (Advance brake assist, Low speed follow, Forward collision warning with auto brake)</td>
</tr>
<tr>
<td>Mazda</td>
<td>Adaptive headlights, Blind spot warning, Rear camera</td>
</tr>
<tr>
<td>Mercedes Benz</td>
<td>Adaptive headlights, Adaptive head beam assist, Attention assist, Active blind spot assist, Blind spot warning, Distronic, DistronicPlus PreSafe brake, Lane departure warning, Night view assist, Night view assist with pedestrian protection, ParkTronic, Rear camera (Distronic Plus, Lane departure prevention, Park assist, Park guidance)</td>
</tr>
<tr>
<td>Volvo</td>
<td>Adaptive headlights, Blind spot warning, Park assist, Rear Camera (Adaptive cruise control, lane departure warning, Forward collision warning with auto brake)</td>
</tr>
</tbody>
</table>
Forward collision warning
## Collision losses for forward collision warning

With feature vs. without

<table>
<thead>
<tr>
<th></th>
<th>claim frequency</th>
<th>claim severity</th>
<th>overall losses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mercedes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with adaptive cruise control</td>
<td>-6.1%</td>
<td>0.0%</td>
<td>$24</td>
</tr>
<tr>
<td></td>
<td>-3.1%</td>
<td>$813</td>
<td>$45</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$1,049</td>
<td>$67</td>
</tr>
<tr>
<td><strong>Volvo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with adaptive cruise control</td>
<td>-16.5%</td>
<td>4.5%</td>
<td>-$36</td>
</tr>
<tr>
<td></td>
<td>-6.6%</td>
<td>$445</td>
<td>$9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$1,093</td>
<td>$62</td>
</tr>
</tbody>
</table>
## Property damage liability losses for forward collision warning

### With feature vs. without

<table>
<thead>
<tr>
<th></th>
<th>Claim frequency</th>
<th>Claim severity</th>
<th>Overall losses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mercedes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with adaptive cruise control</td>
<td>-12.0%</td>
<td>-1.9%</td>
<td>-10%</td>
</tr>
<tr>
<td></td>
<td>-7.1%</td>
<td>$58</td>
<td>$25</td>
</tr>
<tr>
<td></td>
<td>-$100</td>
<td>$225</td>
<td>-$4</td>
</tr>
<tr>
<td></td>
<td>-$2</td>
<td>$225</td>
<td>$2</td>
</tr>
<tr>
<td><strong>Volvo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with adaptive cruise control</td>
<td>-21.9%</td>
<td>10.6%</td>
<td>-18%</td>
</tr>
<tr>
<td></td>
<td>-7.1%</td>
<td>$266</td>
<td>$821</td>
</tr>
<tr>
<td></td>
<td>-$201</td>
<td>$821</td>
<td>$27</td>
</tr>
<tr>
<td></td>
<td>-$18</td>
<td>$27</td>
<td>$27</td>
</tr>
</tbody>
</table>
Forward collision warning with auto brake
Collision losses for forward collision warning with auto brake

With feature vs. without

<table>
<thead>
<tr>
<th></th>
<th>claim frequency</th>
<th>claim severity</th>
<th>overall losses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acura</strong>&lt;br&gt;with adaptive cruise control</td>
<td>-11.2%  -3.1%  5.7%</td>
<td>-$452  $31  $567</td>
<td>-$52  -$9  $41</td>
</tr>
<tr>
<td><strong>Mercedes</strong>&lt;br&gt;with adaptive cruise control</td>
<td>-12.8%  -7.1%  -1.0%</td>
<td>-$258  $145  $578</td>
<td>-$54  -$18  $20</td>
</tr>
<tr>
<td><strong>Volvo</strong>&lt;br&gt;with lane departure warning &amp; driver alert</td>
<td>-13.8%  -2.9%  9.3%</td>
<td>-$700  -$179  $417</td>
<td>-$62  -$19  $32</td>
</tr>
</tbody>
</table>
## Property damage liability losses for forward collision warning with auto brake

**With feature vs. without**

<table>
<thead>
<tr>
<th></th>
<th>claim frequency</th>
<th>claim severity</th>
<th>overall losses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acura</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with adaptive cruise control</td>
<td>-25.9%</td>
<td>-14.2%</td>
<td>-0.6%</td>
</tr>
<tr>
<td><strong>Mercedes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with adaptive cruise control</td>
<td>-23.3%</td>
<td>-14.3%</td>
<td>-4.2%</td>
</tr>
<tr>
<td><strong>Volvo</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with lane departure warning &amp; driver alert</td>
<td>-25.1%</td>
<td>-10.0%</td>
<td>8.2%</td>
</tr>
</tbody>
</table>
Adaptive headlights
## Collision losses for adaptive headlights

**With feature vs. without**

<table>
<thead>
<tr>
<th></th>
<th>claim frequency</th>
<th>claim severity</th>
<th>overall losses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acura</td>
<td>-11.9%</td>
<td>-2.0%</td>
<td>-40</td>
</tr>
<tr>
<td></td>
<td>9.0%</td>
<td>$12</td>
<td>$466</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$556</td>
<td>$38</td>
</tr>
<tr>
<td>Mazda</td>
<td>-12.0%</td>
<td>-6.4%</td>
<td>-33</td>
</tr>
<tr>
<td></td>
<td>-0.6%</td>
<td>$126</td>
<td>$132</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$403</td>
<td>$9</td>
</tr>
<tr>
<td></td>
<td>$132</td>
<td>$126</td>
<td>$403</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$403</td>
<td>$9</td>
</tr>
<tr>
<td></td>
<td>$132</td>
<td>$126</td>
<td>$403</td>
</tr>
<tr>
<td>Volvo</td>
<td>-1.9%</td>
<td>-0.1%</td>
<td>$42</td>
</tr>
<tr>
<td></td>
<td>1.8%</td>
<td>$758</td>
<td>$628</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$891</td>
<td>$54</td>
</tr>
<tr>
<td></td>
<td>$628</td>
<td>$758</td>
<td>$891</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$891</td>
<td>$54</td>
</tr>
<tr>
<td></td>
<td>$628</td>
<td>$758</td>
<td>$891</td>
</tr>
<tr>
<td>Volvo</td>
<td>-4.2%</td>
<td>-0.7%</td>
<td>$8</td>
</tr>
<tr>
<td></td>
<td>2.9%</td>
<td>$149</td>
<td>$28</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$333</td>
<td>$8</td>
</tr>
<tr>
<td></td>
<td>$28</td>
<td>$149</td>
<td>$333</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$333</td>
<td>$8</td>
</tr>
<tr>
<td></td>
<td>$28</td>
<td>$149</td>
<td>$333</td>
</tr>
</tbody>
</table>
## Property damage liability losses for adaptive headlights

### With feature vs. without

<table>
<thead>
<tr>
<th></th>
<th>claim frequency</th>
<th>claim severity</th>
<th>overall losses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acura</strong></td>
<td>-20.3% -6.3% 10.3%</td>
<td>-$418 -$9 $473</td>
<td>-$20 -$5 $14</td>
</tr>
<tr>
<td><strong>Mazda</strong></td>
<td>-18.3% -10.1% -1.2%</td>
<td>-$574 -$381 -$170</td>
<td>-$33 -$23 -$12</td>
</tr>
<tr>
<td><strong>Mercedes</strong></td>
<td>-12.7% -10.0% -7.2%</td>
<td>$21 $112 $207</td>
<td>-$8 -$5 -$2</td>
</tr>
<tr>
<td><strong>Volvo</strong></td>
<td>-13.4% -9.0% -4.4%</td>
<td>-$152 -$29 $101</td>
<td>-$14 -$9 -$3</td>
</tr>
</tbody>
</table>
Lane departure warning
Collision losses for lane departure warning
With feature vs. without

<table>
<thead>
<tr>
<th></th>
<th>claim frequency</th>
<th>claim severity</th>
<th>overall losses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Buick</strong></td>
<td>-1.1% 4.2% 9.7%</td>
<td>-$212 -$34</td>
<td>$154 -$10 $6</td>
</tr>
<tr>
<td>with side view assist</td>
<td></td>
<td></td>
<td>$24</td>
</tr>
<tr>
<td><strong>Mercedes</strong></td>
<td>-8.5% 5.6% 22.0%</td>
<td>$3 $1,010</td>
<td>$2,199 $1 $99</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$222</td>
</tr>
<tr>
<td><strong>Volvo</strong></td>
<td>-13.8% -2.9% 9.3%</td>
<td>-$700 -$179</td>
<td>$417 -$62 -$19</td>
</tr>
<tr>
<td>with forward collision with auto brake &amp; driver alert</td>
<td></td>
<td></td>
<td>$32</td>
</tr>
</tbody>
</table>
## Property damage liability losses for lane departure warning

**With feature vs. without**

<table>
<thead>
<tr>
<th></th>
<th>claim frequency</th>
<th>claim severity</th>
<th>overall losses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Buick</strong></td>
<td>-1.3% 7.2% 16.4%</td>
<td>-$138 $46 $247</td>
<td>-$2 $6 $15</td>
</tr>
<tr>
<td>with side view assist</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Mercedes</strong></td>
<td>-14.6% 10.9% 43.9%</td>
<td>-$548 $150 $1,057</td>
<td>-$16 $13 $55</td>
</tr>
<tr>
<td><strong>Volvo</strong></td>
<td>-25.1% -10.0% 8.2%</td>
<td>-$501 -$83 $415</td>
<td>-$29 -$11 $11</td>
</tr>
<tr>
<td>with forward collision with auto brake &amp; driver alert</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Availability of features for automobiles
New vehicle series with electronic stability control

By model year

<table>
<thead>
<tr>
<th>Year</th>
<th>Standard</th>
<th>Optional</th>
<th>Not Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Registered vehicles with electronic stability control

By calendar year

<table>
<thead>
<tr>
<th>Year</th>
<th>Standard</th>
<th>Optional</th>
<th>Not Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2005</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Registered vehicles with electronic stability control, actual and predicted

By calendar year
New vehicle series with forward collision warning

By model year

- 2000: 100% standard
- 2002: 100% standard
- 2004: 100% standard
- 2006: 100% standard
- 2008: 100% standard
- 2010: 100% standard
- 2012: 100% standard

Legend:
- Green: standard
- Yellow: optional
- Red: not available
Registered vehicles with forward collision warning

By calendar year

- 2000
- 2002
- 2004
- 2006
- 2008
- 2010
- 2012

Legend:
- standard
- optional
- not available
Registered vehicles with forward collision warning, actual and predicted

By calendar year

![Graph showing the percentage of registered vehicles with forward collision warning over time. The graph compares actual data with predicted data and includes a previous prediction line. The x-axis represents calendar years from 2000 to 2050, while the y-axis shows the percentage ranging from 0% to 100%. The graph uses different lines to represent actual, predicted, and previous predicted data.]
New vehicle series with rear camera

By model year
Registered vehicles with rear camera
By calendar year

![Bar chart showing the percentage of registered vehicles with rear camera availability by year, with standard, optional, and not available categories.]
Registered vehicles with rear camera, actual and predicted

By calendar year
New vehicle series with adaptive headlights

By model year

- Standard
- Optional
- Not available

Registered vehicles with adaptive headlights

By calendar year

<table>
<thead>
<tr>
<th>Year</th>
<th>standard</th>
<th>optional</th>
<th>not available</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Registered vehicles with adaptive headlights, actual and predicted

By calendar year

- **Actual**
- **Predicted**
Calendar year features reach 95% of registered vehicle fleet with and without mandate.
First public release of IIHS crash avoidance ratings

September 27, 2013
vehicle to pedestrian

vehicle to stationary vehicle

vehicle to moving vehicle
Autobrake performance tests

25 km/h

Subaru Outback with EyeSight

Mercedes-Benz E350 with Distronic Plus
Testing benefits of autobrake

25 mph

12 mph
36 midsize sedans and SUVs rated Not Available

- Acura RDX
- Acura TL
- Acura TSX sedan
- Acura TSX wagon
- Audi A3
- BMW X5
- Buick Verano
- Chrysler 200
- Dodge Avenger
- Dodge Journey
- Honda Pilot
- Hyundai Santa Fe
- Hyundai Sonata
- Jeep Wrangler
- Kia Optima
- Kia Sorento
- Mazda CX-9
- Nissan Altima
- Nissan Maxima
- Nissan Murano
- Nissan Pathfinder
- Nissan Xterra
- Subaru Tribeca
- Suzuki Kizashi
- Toyota 4Runner
- Toyota Camry
- Toyota FJ Cruiser
- Toyota Highlander
- Toyota Prius v
- Toyota Venza
- Volkswagen CC
- Volkswagen Jetta sedan
- Volkswagen Jetta Sportwagen
- Volkswagen Passat
- Volvo C30
- Volvo XC90
25 midsize 2013-14 models rated Basic

- Acura ZDX
- BMW 3 series
- BMW X3
- Chevrolet Equinox
- Chevrolet Malibu
- Dodge Durango (2014)
- Ford Edge
- Ford Explorer
- Ford Flex
- Ford Fusion
- GMC Terrain
- Honda Accord
- Honda Crosstour
- Infiniti Q50 (2014)
- Infiniti QX50 (2014)
- Infiniti QX60 (2014)
- Infiniti QX70 (2014)
- Jeep Cherokee (2014)
- Lexus IS (2014)
- Lexus RX (2014)
- Lincoln MKT
- Lincoln MKX
- Lincoln MKZ
- Mercedes-Benz GLK
- Mercedes-Benz M-Class
6 midsize 2013-14 models rated Advanced

- Jeep Grand Cherokee (2014)
- Lexus ES
- Mazda 6 (2014)
- Acura MDX (2014)
- Audi A4
- Audi Q5
7 midsize 2013-14 models rated Superior

Cadillac ATS
Cadillac SRX
Mercedes-Benz C-Class
Volvo S60
Volvo XC60

Subaru Legacy
Subaru Outback
761 broadcasts attracted 60 million viewers
Park assist
1954
California
Source of insurance loss statistics on most car, SUV, pickup, and motorcycle models on the road