HLDI
Highway Loss Data Institute

Bulletin | Vol. 32, No. 8 : April 2015

Subaru collision avoidance features: an update

This report updates a prior analysis of two Subaru collision avoidance features: EyeSight and a rear-vision camera. The EyeSight system uses dual front facing cameras to provide several collision avoidance functions. These functions include: forward collision warning with autonomous braking, adaptive cruise control with complete stop, lane departure warning, and lead vehicle start alert. There is about 40 percent more collision exposure in this study than in the prior one. Although all estimates in this study are within the confidence bounds of the prior study, the point estimates of some of the effects have shifted.

The pattern of frequency reductions, in particular the reductions for property damage liability in conjunction with a much larger reduction for bodily injury liability, is consistent with expectations for vehicles fitted with forward collision systems. Forward collision systems are designed to prevent or mitigate front-to-rear crashes, which typically result in property damage liability claims and bodily injury liability claims if an injury in the struck vehicle occurs. In initial reports, although consistent with expectations, the estimated benefits for these two coverages differed from other systems HLDI had studied. In the current analyses, the property damage liability benefit increased by nearly 5 percentage points from the prior report while the updated bodily injury liability benefit for EyeSight dropped nearly 6 percentage points. These results are comparable to other similar systems.

The updated results for the rear-vision camera are within the bounds indicated in the prior study. The updated rear-vision camera results show reductions in property damage liability, collision, and bodily injury liability claim frequencies; the result for property damage liability is statistically significant.

Change in claim frequencies by collision avoidance feature, initial vs. updated results

	EyeSight		Rear-vision camera	
Vehicle damage coverage types	Initial results	Updated results	Initial results	Updated results
Collision	3.5%	0.5%	-2.5%	-1.2%
Property damage liability	**-10.6%**	**-15.1%**	**-6.4%**	**-7.0%**
Injury coverage types	Initial results	Updated results	Initial results	Updated results
Bodily injury liability	**-40.3%**	**-34.7%**	4.1%	-1.6%
Medical payment	20.5%	22.4%	9.3%	4.8%
Personal injury protection	-10.1%	-2.9%	-2.0%	1.4%

Introduction

This Highway Loss Data Institute (HLDI) bulletin provides an updated look at the effects of two available Subaru collision avoidance systems on insurance losses. An earlier HLDI report found encouraging results (HLDI, 2014). The prior HLDI results indicate these systems are having some benefit. This HLDI bulletin updates the prior analysis with more exposure. The increase in collision exposure was 37.1 percent. The two features included in this analysis are as follows:

EyeSight uses a dual-camera system located behind the windshield to assess the risk of a collision with leading traffic. EyeSight's functionality includes the following four features:

Forward collision warning with autonomous braking uses the cameras to assess the risk of a rear-end collision with an obstacle in front, and warns the driver with an audible alert. If the driver does not take evasive action, the brakes are automatically applied to reduce impact damage or, if possible, prevent the collision. EyeSight is capable of avoiding a collision with a speed difference to the obstacle in front as high as 30 mph. However, not every situation under these conditions will result in full collision avoidance. Some of the EyeSight functionality may be turned off by the driver and can be activated/deactivated via the instrument cluster controls, but will reactivate at the next ignition cycle.

Adaptive cruise control with complete stop is a system that uses the dual cameras to monitor traffic ahead and maintain the driver's selected following distance. As traffic conditions dictate, the system employs braking force to maintain the set following distance. Adaptive cruise control is available at speeds up to 90 mph and can bring the car to a stop in traffic. Forward collision warning remains active even when adaptive cruise control is turned off.

Lane departure warning utilizes the dual cameras to identify traffic lane markings. Audio and visual warnings will indicate if the vehicle path deviates from the lane and the turn signal is not on. The system is functional at speeds at or above 32 mph (50 km/h). The system may be deactivated by the driver, but will reactivate at the next ignition cycle.

Lead vehicle start alert notifies the driver by means of an audible tone and the lead vehicle indicator on the multi-information display when the driver's vehicle remains stopped after the vehicle in front has started to move forward. When the EyeSight-equipped vehicle has stopped within 32 feet of a stationary vehicle and both remain stopped for several seconds, this system will alert the driver of the EyeSight vehicle if his/her car remains stationary after the lead vehicle has moved 10 feet.

Rear-vision camera is an optical parking aid that uses a rear-facing camera mounted at the rear of the vehicle to show the area behind the vehicle on a central display screen. The image includes static distance/guidance lines to aid the driver in parking maneuvers. The display is activated when the reverse gear is engaged.

Vehicles

EyeSight and the rear-vision camera are offered as optional equipment on various Subaru models. The presence or absence of these features is discernible from the information encoded in the vehicle identification numbers (VINs). EyeSight and rear-vision camera are offered as optional equipment on several 2013 and 2014 Subaru vehicles. Subaru vehicles without these features served as the control vehicles in this analysis. Table 1 lists the total exposure, measured in insured vehicle years, and the exposure of each feature as a percentage of total exposure.

Table 1: Feature exposure by vehicle series

Make	Series	Model year range	Rear-vision camera	EyeSight	Total exposure
Subaru	Forester 4dr 4WD	2014	82%	7%	129,117
Subaru	Legacy 4dr 4WD	2013-14	22%	7%	76,402
Subaru	Outback station wagon 4WD	2013-14	58%	9%	235,219

Insurance Data

Automobile insurance covers damages to vehicles and property, as well as injuries to people involved in crashes. Different insurance coverages pay for vehicle damage versus injuries, and different coverages may apply depending on who is at fault. The current study is based on property damage liability, collision, bodily injury liability, personal injury protection, and medical payment coverages. Exposure is measured in insured vehicle years. An insured vehicle year is equivalent to one vehicle insured for 1 year, two vehicles for 6 months, etc.

Because different crash avoidance features may affect different types of insurance coverage, it is important to understand how coverages vary among the states and how this affects inclusion in the analyses. Collision coverage insures against vehicle damage to an at-fault driver's vehicle sustained in a crash with an object or other vehicle; this coverage is common to all 50 states. Property damage liability (PDL) coverage insures against vehicle damage that at-fault drivers cause to other people's vehicle and property in crashes; this coverage exists in all states except Michigan, where vehicle damage is covered on a no-fault basis (each insured vehicle pays for its own damage in a crash, regardless of who is at fault).

Coverage of injuries is more complex. Bodily injury (BI) liability coverage insures against medical, hospital, and other expenses for injuries that at-fault drivers inflict on occupants of other vehicles or others on the road. Although motorists in most states may have BI coverage, this information is analyzed only in states where the at-fault driver has first obligation to pay for injuries (33 states with traditional tort insurance systems). Medical payment (MedPay) coverage, also sold in the 33 states with traditional tort insurance systems, covers injuries to insured drivers and the passengers in their vehicles, but not injuries to people in other vehicles involved in the crash. Seventeen other states employ no-fault injury systems (personal injury protection coverage, or PIP) that pay up to a specified amount for injuries to occupants of involved-insured vehicles, regardless of who is at fault in a collision. The District of Columbia has a hybrid insurance system for injuries and is excluded from the injury analysis.

Statistical methods

Regression analysis was used to quantify the effect of vehicle features while controlling for other covariates. The covariates included calendar year, model year, garaging state, vehicle density (number of registered vehicles per square mile), rated driver age group, rated driver gender, rated driver marital status, deductible range (collision coverage only), and risk. For each safety feature studied, a variable was included.

Claim frequency was modeled using a Poisson distribution, whereas claim severity (average loss payment per claim) was modeled using a Gamma distribution. Both models used a logarithmic link function. Estimates for overall losses were derived from the claim frequency and claim severity models. Estimates for frequency, severity, and overall losses are presented for collision and property damage liability. For PIP, BI, and MedPay, three frequency estimates are presented. The first frequency is the frequency for all claims, including those that already have been paid and those for which money has been set aside for possible payment in the future, known as claims with reserves. The other two frequencies include only paid claims separated into low and high severity ranges. Note that the percentage of all injury claims that were paid by the date of analysis varies by coverage: 73.5 percent for PIP, 52.7 percent for BI, and 62.0 percent for MedPay. The low severity range was <$1,000 for PIP and MedPay, <$5,000 for BI; high severity covered all loss payments greater than that.

A separate regression was performed for each insurance loss measure for a total of 15 regressions (5 coverages x 3 loss measures each). For space reasons, only the estimates for the individual crash avoidance features are shown on the following pages. To illustrate the analyses, however, Appendix A contains full model results for collision claim frequencies. To further simplify the presentation here, the exponent of the parameter estimate was calculated, 1 was subtracted, and the resultant multiplied by 100. The resulting number corresponds to the effect of the feature on that loss measure. For example, the estimate of the effect of EyeSight on collision claim frequency was 0.0052; thus, vehicles with the feature had 0.5 percent more collision claims than without EyeSight ((exp(0.0052)-1)*100=0.5).

Results

Results for Subaru's EyeSight system are summarized in Table 2. The lower and upper bounds represent the 95 percent confidence limits for the estimates. For vehicle damage losses, claim frequency is down for property damage liability and up slightly for collision coverage. The decrease in property damage liability claim frequency is significant (bold and shaded grey in the table).

For injury losses, overall claim frequency (both paid and reserved) is lower for both BI and PIP, but not for MedPay, and only the bodily injury liability benefit is statistically significant. Among low-severity paid claims, only BI shows reductions. Among high severity claims, BI and PIP show reductions, and the decrease for BI and the increase for MedPay are statistically significant.

Table 2: Change in insurance losses for EyeSight

Vehicle damage coverage type	Lower bound	FREQUENCY	Upper bound	Lower bound	SEVERITY	Upper bound	Lower bound	OVERALL LOSSES	Upper bound
Collision	-4.1%	0.5%	5.4%	-$198	$4	$216	-$15	$1	$19
Property damage liability	-21.5%	**-15.1%**	-8.2%	-$155	$46	$262	-$16	**-$10**	-$3

Injury coverage type	Lower bound	FREQUENCY	Upper bound	Lower bound	LOW SEVERITY FREQUENCY	Upper bound	Lower bound	HIGH SEVERITY FREQUENCY	Upper bound
Bodily injury liability	-52.0%	**-34.7%**	-11.2%	-67.0%	-42.5%	0.1%	-90.7%	**-74.5%**	-30.0%
Medical payment	-0.1%	22.4%	49.9%	-35.0%	8.7%	81.8%	1.5%	**35.5%**	80.7%
Personal injury protection	-19.4%	-2.9%	16.9%	-13.3%	26.6%	84.9%	-35.4%	-15.5%	10.5%

Results for Subaru's rear-vision camera are summarized in Table 3. Again, the lower and upper bounds represent the 95 percent confidence limits for the estimates. For vehicle damage losses, claim frequencies are down but only the property damage liability reduction is significant. Claim severities are up, resulting in minimal change in overall losses.

Under injury coverages, claim frequency is lower for BI, but not for PIP or MedPay, and none of the differences is statistically significant. Among paid claims, claim frequency is up for nearly all injury coverage types.

Table 3: Change in insurance losses for rear-vision camera

Vehicle damage coverage type	Lower bound	FREQUENCY	Upper bound	Lower bound	SEVERITY	Upper bound	Lower bound	OVERALL LOSSES	Upper bound
Collision	-3.9%	-1.2%	1.7%	-$35	$88	$215	-$7	$3	$13
Property damage liability	-10.9%	**-7.0%**	-2.9%	-$84	$28	$144	-$9	**-$5**	$0

Injury coverage type	Lower bound	FREQUENCY	Upper bound	Lower bound	LOW SEVERITY FREQUENCY	Upper bound	Lower bound	HIGH SEVERITY FREQUENCY	Upper bound
Bodily injury liability	-15.8%	-1.6%	15.1%	-21.3%	3.1%	35.0%	-25.2%	7.1%	53.1%
Medical payment	-8.5%	4.8%	20.1%	-12.4%	23.3%	73.6%	-12.3%	7.4%	31.6%
Personal injury protection	-9.2%	1.4%	13.2%	-25.2%	-4.9%	20.9%	-12.5%	1.8%	18.4%

Discussion

The loss results for the systems included in this study have changed slightly since they were first studied in December 2014. While just a few months have passed, the exposure available for analysis had increased by nearly 40 percent. The increase in exposure has resulted from both the sale of additional vehicles and the additional time insured for the vehicles included in the previous study. All of the claim frequency estimates from this analysis are within the confidence bounds of the estimates in the previous study.

Table 4 shows the differences in the claim frequency estimates between the initial results published in December 2014 and the updated results included in this report. EyeSight is showing an increased benefit for property damage liability and the collision disbenefit measured in the first study (3.5 percent) is now almost gone (0.5 percent). The previous injury benefits under BI and PIP are now smaller than previously estimated. Rear camera continues to reduce property damage liability claims and indicates some collision and bodily injury liability benefits. More data is needed to be confident in the bodily injury liability results.

Table 4: Change in claim frequencies by collision avoidance feature, initial vs. updated results

	EyeSight		Rear-vision camera	
Vehicle damage coverage types	Initial results	Updated results	Initial results	Updated results
Collision	3.5%	0.5%	-2.5%	-1.2%
Property damage liability	**-10.6%**	**-15.1%**	**-6.4%**	**-7.0%**
Injury coverage types	**Initial results**	**Updated results**	**Initial results**	**Updated results**
Bodily injury liability	**-40.3%**	**-34.7%**	4.1%	-1.6%
Medical payment	20.5%	22.4%	9.3%	4.8%
Personal injury protection	-10.1%	-2.9%	-2.0%	1.4%

Front crash prevention systems are designed to prevent front-to-rear crashes, which are the type of crashes that result in PDL and BI claims, and the Subaru EyeSight system continues to be associated with reductions for these two coverage types. In fact, the estimated reductions for the EyeSight system for PDL and BI continue to be among the highest estimated by HLDI thus far. The EyeSight system however continues to be associated with increases in both collision and Med Pay claim frequencies. All other front crash prevention systems evaluated by HLDI were associated with reductions in collision frequency, although those estimates were small and generally not statistically significant. Previously, collision claim frequency for EyeSight was associated with a 3.5 percent increase and now is down to a less than 1 percent disbenefit. Additionally, most other front crash prevention systems evaluated by HLDI were associated with reductions in MedPay claim frequencies. Figures 1 and 2 summarize the frequency effects under five coverage types for the eight front crash prevention systems. The reductions in collision claim frequencies for other manufacturers are smaller than PDL reductions and, given that collision claims often include single-vehicle crashes, the larger reduction in PDL frequencies is expected. The reason that EyeSight is associated with a slight increase in collision claim frequency and a larger increase in MedPay claim frequency is unknown. It should be noted that the results for manufacturers other than Subaru and Honda are from reports published between 2012 and 2013, while these Subaru results are from current insurance loss data.

Figure 1: Changes in physical damage claim frequency for front crash prevention systems

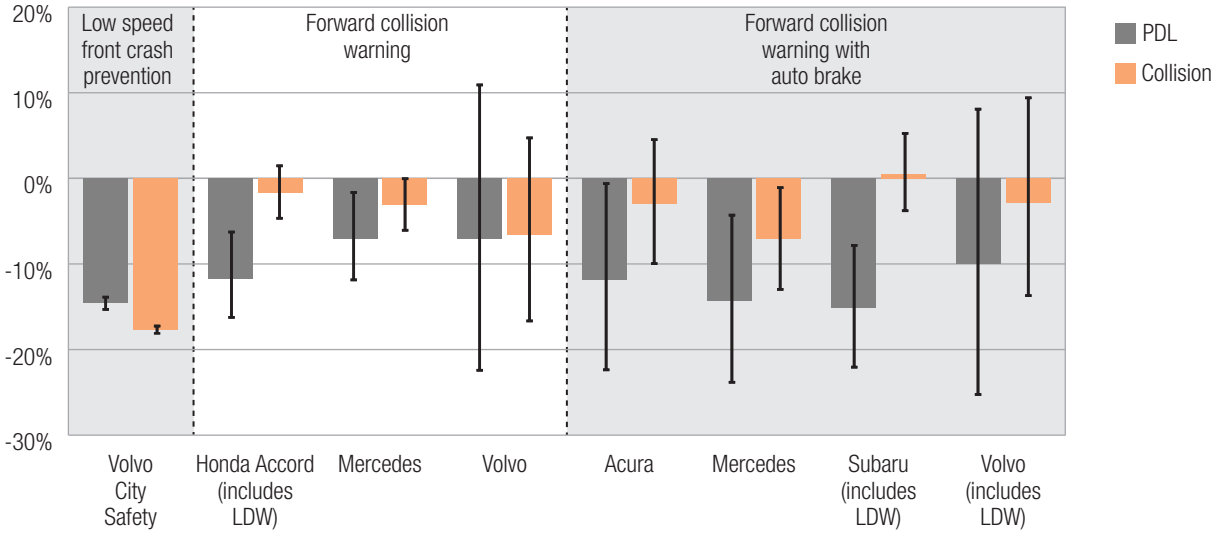
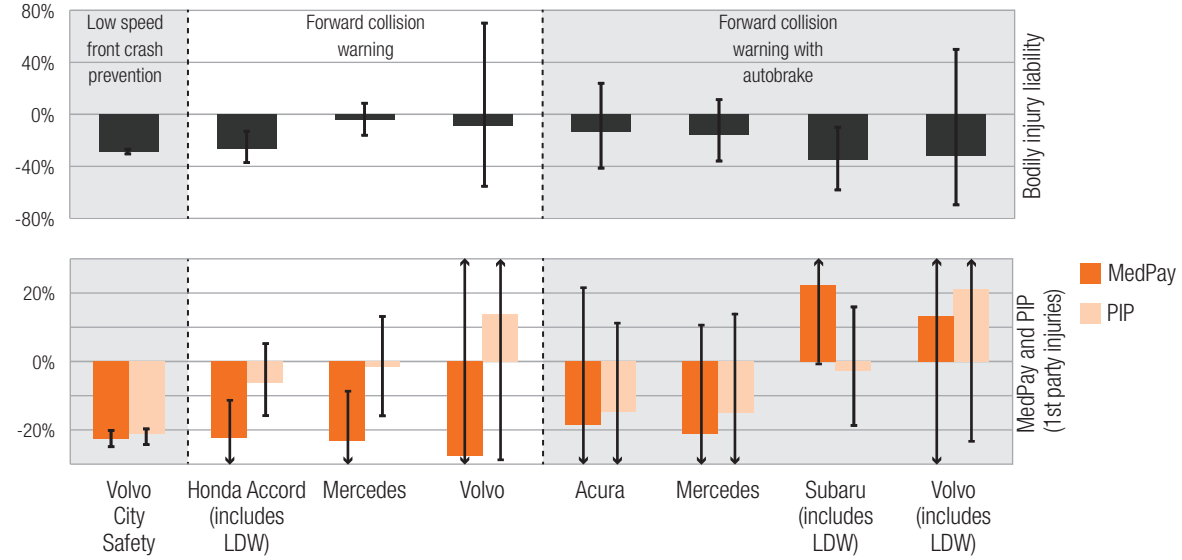


Figure 2: Changes in injury claim frequency for front crash prevention systems



In addition to EyeSight, HLDI has evaluated one lane departure warning (LDW) system as a standalone system, one LDW system paired with a blind spot system (BLIS), and two LDW systems paired with front crash prevention systems. **Figures 3 and 4** summarize the claim frequency effects under five coverage types for the five LDW systems. Both the standalone LDW system and the LDW system paired with BLIS were associated with increases in claim frequencies for all coverages except BI. However, in the two assessments of LDW paired with front crash prevention, the systems were associated with reductions in claim frequency for many of the coverages. The results for EyeSight further add to the uncertainty of the effect of LDW systems on insurance losses.

Figure 3: Changes in LDW physical damage claim frequency

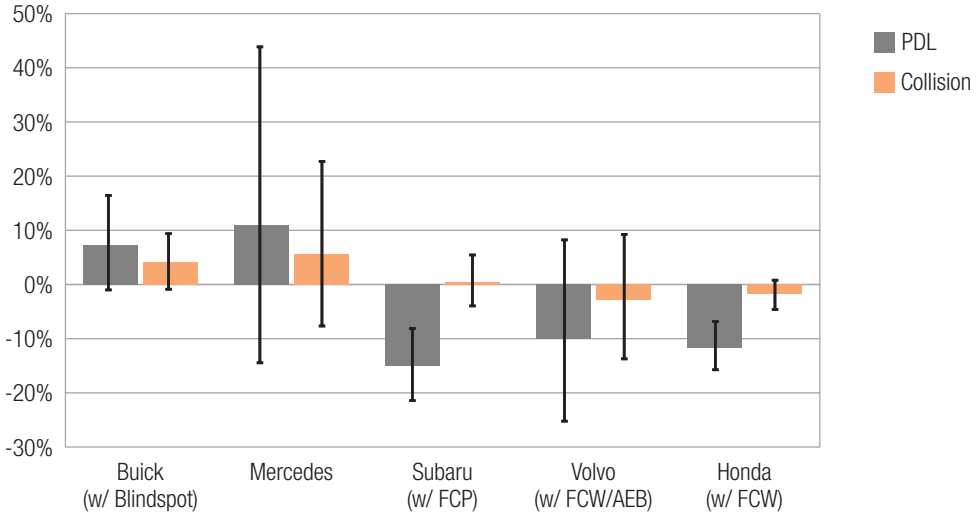
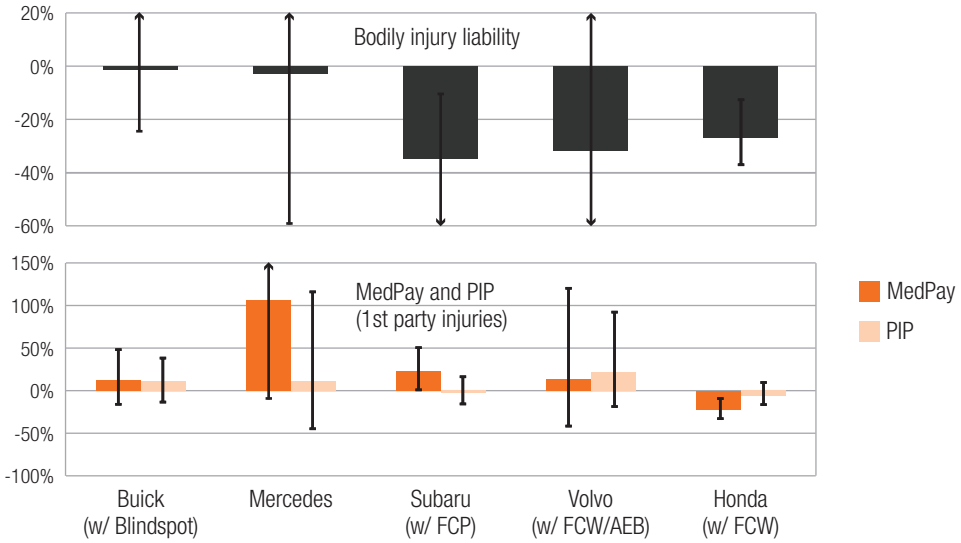


Figure 4: Changes in LDW injury claim frequency



A rear-vision camera would be expected to reduce impacts with other vehicles, objects, and some nonoccupants when operating the vehicle in reverse. This would be expected to yield reductions in collision and PDL losses and, perhaps, in BI losses. Both collision and PDL claims decreased as in the previous study, with the PDL result continuing to be significant. The current results now show small but not significant increases in claim frequency for both MedPay and PIP. The previous reduction in PIP claims is no longer found. Rear/parking collision avoidance systems were evaluated for other manufactures — Buick, Mercedes-Benz, and Mazda — and results varied by automaker as shown in **Figures 5 and 6**. The Subaru rear camera appears to be associated with reduced physical damage claims, but its effect on injury coverage losses is uncertain.

Figure 5: Changes in physical damage claim frequency for rear parking systems

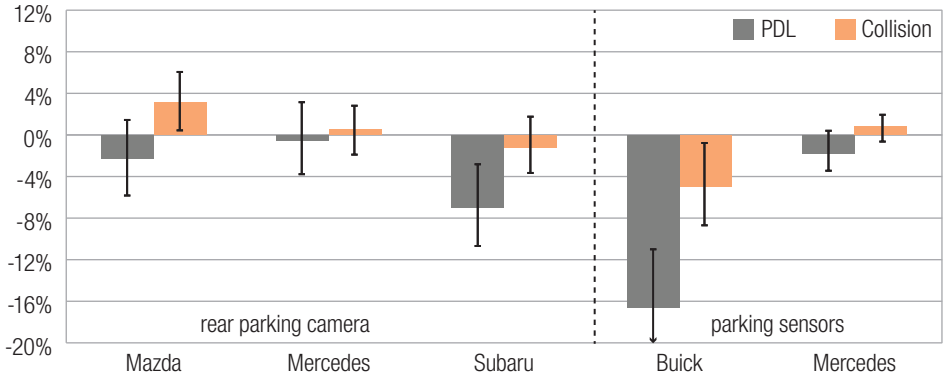
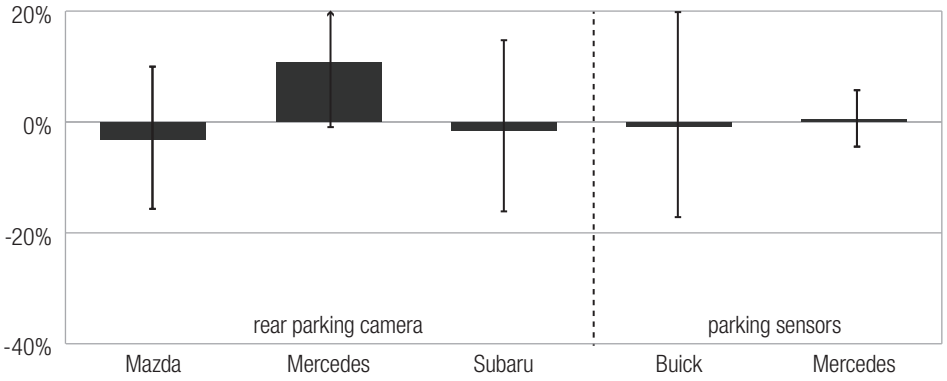


Figure 6: Changes in bodily injury liability claim frequency for rear parking systems



Limitations

There are limitations to the data used in this analysis. At the time of a crash, the status of a feature is not known. The features in this study can be deactivated by the driver, and there is no way to know how many of the drivers in these vehicles turned off a system prior to the crash. However, surveys conducted by the Insurance Institute for Highway Safety indicate that large majorities of drivers with these types of systems leave them on. If a significant number of drivers do turn these features off, any reported reductions may actually be underestimates of the true effectiveness of these systems.

Additionally, the data supplied to HLDI does not include detailed crash information. The specific crash types addressed by the different technologies cannot be isolated in these analyses. For example, it is not known how many of the crashes in the rear camera analysis involved backing-up, which is the only maneuver during which the camera is active. All collisions, regardless of the ability of a feature to mitigate or prevent the crash, are included in the analysis.

All of these features are optional and associated with increased costs. The type of person who selects these options may be different from the person who declines. While the analysis controls for several driver characteristics, there may be other uncontrolled attributes associated with people who select these features.

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Appendix A

Appendix A: Illustrative regression results — collision frequency									
Parameter		Degrees of freedom	Estimate	Effect	Standard error	Wald 95% confidence limits		Chi-square	P-value
Intercept		1	-9.0595		0.0816	-9.2194	-8.8996	12328.80	<0.0001
Calendar year	2012	1	-0.1414	-13.2%	0.0420	-0.2237	-0.0590	11.32	0.0008
	2013	1	-0.0226	-2.2%	0.0140	-0.0500	0.0049	2.59	0.1075
	2014	0	0	0	0	0	0		
Vehicle model year and series	2014 Forester	1	0.0025	0.3%	0.0199	-0.0365	0.0415	0.02	0.8994
	2013 Legacy	1	0.2198	24.6%	0.0236	0.1736	0.2661	86.92	<0.0001
	2014 Legacy	1	0.1713	18.7%	0.0314	0.1098	0.2328	29.81	<0.0001
	2013 Outback	1	0.0363	3.7%	0.0193	-0.0015	0.0742	3.54	0.0601
	2014 Outback	0	0	0	0	0	0		
Rated driver age group	14–24	1	0.2484	28.2%	0.0347	0.1804	0.3163	51.32	<0.0001
	25–29	1	0.1345	14.4%	0.0293	0.0772	0.1919	21.14	<0.0001
	30–39	1	0.0681	7.0%	0.0222	0.0246	0.1117	9.39	0.0022
	50–59	1	-0.0829	-8.0%	0.0218	-0.1256	-0.0402	14.47	0.0001
	60–64	1	-0.0332	-3.3%	0.0251	-0.0824	0.0159	1.75	0.1855
	65–69	1	0.0308	3.1%	0.0260	-0.0201	0.0817	1.40	0.2361
	70+	1	0.1397	15.0%	0.0244	0.0919	0.1875	32.79	<0.0001
	Unknown	1	0.0085	0.9%	0.0312	-0.0526	0.0696	0.07	0.7851
	40–49	0	0	0	0	0	0		
Rated driver gender	Male	1	-0.0531	-5.2%	0.0148	-0.0822	-0.0240	12.80	0.0003
	Unknown	1	-0.1979	-18.0%	0.0456	-0.2873	-0.1086	18.87	<0.0001
	Female	0	0	0	0	0	0		
Rated driver marital status	Single	1	0.1310	14.0%	0.0168	0.0980	0.1640	60.70	<0.0001
	Unknown	1	0.1630	17.7%	0.0451	0.0746	0.2515	13.05	0.0003
	Married	0	0	0.0%	0	0	0		
Risk	Nonstandard	1	0.1614	17.5%	0.0336	0.0955	0.2273	23.05	<0.0001
	Standard	0	0	0	0	0	0		
State	Alabama	1	-0.0293	-2.9%	0.1244	-0.2732	0.2146	0.06	0.8138
	Arizona	1	0.0115	1.2%	0.0929	-0.1706	0.1936	0.02	0.9017
	Arkansas	1	0.0240	2.4%	0.1252	-0.2213	0.2693	0.04	0.8481
	California	1	0.1777	19.4%	0.0774	0.0260	0.3295	5.27	0.0217
	Colorado	1	0.0040	0.4%	0.0787	-0.1503	0.1582	0.00	0.9597
	Connecticut	1	-0.1094	-10.4%	0.0827	-0.2714	0.0526	1.75	0.1858
	Delaware	1	-0.0643	-6.2%	0.1204	-0.3003	0.1717	0.29	0.5934
	District of Columbia	1	0.2939	34.2%	0.1422	0.0151	0.5727	4.27	0.0388
	Florida	1	-0.1884	-17.2%	0.0854	-0.3558	-0.0209	4.86	0.0274
	Georgia	1	-0.1845	-16.8%	0.0959	-0.3725	0.0035	3.70	0.0544
	Hawaii	1	-0.0638	-6.2%	0.1768	-0.4104	0.2828	0.13	0.7182
	Idaho	1	-0.1766	-16.2%	0.1012	-0.3749	0.0217	3.05	0.0808
	Illinois	1	-0.0596	-5.8%	0.0821	-0.2206	0.1013	0.53	0.4677
	Indiana	1	-0.1384	-12.9%	0.0954	-0.3254	0.0486	2.10	0.1469
	Iowa	1	-0.3677	-30.8%	0.1156	-0.5942	-0.1412	10.12	0.0015
	Kansas	1	-0.3424	-29.0%	0.1225	-0.5824	-0.1024	7.82	0.0052

Appendix A: Illustrative regression results — collision frequency									
Parameter		Degrees of freedom	Estimate	Effect	Standard error	Wald 95% confidence limits		Chi-square	P-value
	Kentucky	1	-0.3859	-32.0%	0.1222	-0.6255	-0.1463	9.97	0.0016
	Louisiana	1	0.0670	6.9%	0.1298	-0.1875	0.3214	0.27	0.6059
	Maine	1	0.0649	6.7%	0.0958	-0.1227	0.2526	0.46	0.4977
	Maryland	1	-0.1852	-16.9%	0.0847	-0.3513	-0.0191	4.78	0.0288
	Massachusetts	1	-0.1384	-12.9%	0.0887	-0.3122	0.0353	2.44	0.1185
	Michigan	1	0.2859	33.1%	0.0868	0.1159	0.4560	10.86	0.0010
	Minnesota	1	-0.0314	-3.1%	0.0839	-0.1959	0.1331	0.14	0.7084
	Mississippi	1	0.0554	5.7%	0.1918	-0.3205	0.4314	0.08	0.7726
	Missouri	1	-0.1436	-13.4%	0.0978	-0.3353	0.0481	2.15	0.1422
	Montana	1	0.0637	6.6%	0.1016	-0.1355	0.2629	0.39	0.5309
	Nebraska	1	-0.2381	-21.2%	0.1094	-0.4525	-0.0237	4.74	0.0295
	Nevada	1	-0.0194	-1.9%	0.0999	-0.2153	0.1764	0.04	0.8457
	New Hampshire	1	-0.0884	-8.5%	0.0933	-0.2713	0.0945	0.90	0.3434
	New Jersey	1	-0.0320	-3.1%	0.0811	-0.1909	0.1268	0.16	0.6928
	New Mexico	1	-0.0501	-4.9%	0.1057	-0.2572	0.1569	0.23	0.6351
	New York	1	-0.0050	-0.5%	0.0776	-0.1571	0.1471	0.00	0.9488
	North Carolina	1	-0.3110	-26.7%	0.0882	-0.4838	-0.1382	12.44	0.0004
	North Dakota	1	0.0499	5.1%	0.1290	-0.2031	0.3028	0.15	0.6992
	Ohio	1	-0.2415	-21.5%	0.0830	-0.4042	-0.0787	8.46	0.0036
	Oklahoma	1	-0.0326	-3.2%	0.1127	-0.2535	0.1883	0.08	0.7726
	Oregon	1	-0.1238	-11.6%	0.0830	-0.2864	0.0389	2.22	0.1358
	Pennsylvania	1	-0.0271	-2.7%	0.0776	-0.1793	0.1251	0.12	0.7270
	Rhode Island	1	0.0613	6.3%	0.1149	-0.1640	0.2865	0.28	0.5940
	South Carolina	1	-0.3011	-26.0%	0.1126	-0.5219	-0.0804	7.15	0.0075
	South Dakota	1	-0.0673	-6.5%	0.1374	-0.3366	0.2021	0.24	0.6246
	Tennessee	1	-0.0856	-8.2%	0.0964	-0.2745	0.1034	0.79	0.3747
	Texas	1	-0.0717	-6.9%	0.0825	-0.2334	0.0901	0.75	0.3851
	Utah	1	-0.1970	-17.9%	0.0920	-0.3773	-0.0167	4.59	0.0322
	Vermont	1	0.0549	5.6%	0.0994	-0.1400	0.2497	0.30	0.5810
	Virginia	1	-0.0886	-8.5%	0.0820	-0.2493	0.0722	1.17	0.2801
	Washington	1	-0.1126	-10.6%	0.0790	-0.2675	0.0423	2.03	0.1541
	West Virginia	1	-0.1098	-10.4%	0.0929	-0.2919	0.0724	1.39	0.2376
	Wisconsin	1	-0.0853	-8.2%	0.0854	-0.2527	0.0821	1.00	0.3180
	Wyoming	1	0.0164	1.7%	0.1228	-0.2243	0.2572	0.02	0.8935
	Alaska	0	0	0	0	0	0		
Deductible range	0–250	1	0.6557	92.6%	0.0240	0.6088	0.7027	749.41	<0.0001
	251–500	1	0.4193	52.1%	0.0215	0.3771	0.4615	378.87	<0.0001
	1,001+	1	-0.4636	-37.1%	0.1401	-0.7382	-0.1890	10.95	0.0009
	501–1,000	0	0	0	0	0	0		
Registered vehicle density	0–99	1	-0.2348	-20.9%	0.0196	-0.2731	-0.1964	144.09	<0.0001
	100–499	1	-0.1372	-12.8%	0.0151	-0.1668	-0.1075	82.27	<0.0001
	500+	0	0	0	0	0	0		
Rear camera		1	-0.0117	-1.2%	0.0145	-0.0400	0.0167	0.65	0.4200
EyeSight		1	0.0052	0.5%	0.0241	-0.0419	0.0524	0.05	0.8280

Highway Loss Data Institute

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