



2013–15 Honda Accord collision avoidance features

This is the fourth look at the collision avoidance features on the Honda Accord. The Honda Accord is a popular passenger car and is one of the best-selling vehicles in America. Interestingly, Honda has equipped most of the Accords with a camera-based front crash prevention system, while one Honda Accord trim is equipped with a radar-based one.

This Highway Loss Data Institute (HLDI) report updates three prior analyses of Honda Accord collision avoidance features with the addition of the 2015 model year. Forward Collision Warning (FCW) paired with Lane Departure Warning (LDW) is on most Honda Accord trims, as well as the Crosstour, and uses a single camera mounted behind the windshield for sensing. The Honda Accord four-door Touring trim is studied for only the second time in this bulletin and is equipped with FCW, LDW, and Adaptive Cruise Control (ACC). This system utilizes a radar unit mounted in the front grille, similar to most other forward collision warning systems studied by HLDI. Despite similar FCW function, these systems are evaluated separately. LaneWatch, a passenger-side blind spot information system, utilizes a camera mounted on the passenger side mirror and is equipped on some of the studied vehicles.

With the addition of time and the 2015 model year, there is almost 75 percent more exposure in this study as in the prior one. All of the estimates in this study are within the confidence bounds of the prior study. The updated results for the FCW/LDW system continue to be associated with reductions in claim frequency for all five coverage types examined. The property damage liability (PDL) claim frequency benefits for the radar-based system are slightly larger than those for the camera system, but the confidence bounds overlap. Alternative analysis for the camera-based system using data from 2012 model year vehicles to control for differences in trim levels yields similar results. This is an indication that the benefits for the camera-based system can be attributed to the feature and not variability associated with the trim level.

The camera-based system is associated with a decline in collision claim severity, while the radar based Touring system is associated with a significant increase. This is consistent with previous HLDI findings, and the increased claim severity is likely associated with the replacement cost of the radar units in crashes not avoided.

The updated claim frequency loss results for LaneWatch continue to be equivocal. Simple comparisons of trim lines with and without LaneWatch were consistent with expectations. Incursion into an occupied adjacent lane would be expected to result in a two-vehicle crash that would lead to a PDL claim against the encroaching driver. The estimated reductions in PDL claims are much larger than the reductions estimated for collision claims. This is consistent with the fact that the reductions in collision claims from such crashes would be diluted by the many single-vehicle crashes that result in collision claims and are unaffected by the LaneWatch system. However, alternative analysis using data from 2012 model year vehicles to control for differences in trim levels indicates an increase in claim frequency under three coverage types for the system. Thus, the observed benefits may not be attributable to the LaneWatch system.

Change in claim frequencies by collision avoidance feature, results summary

Vehicle damage coverage type	Forward Collision Warning & Lane Departure Warning				Forward Collision Warning, Lane Departure Warning & Adaptive Cruise Control	
	April 2014	September 2014	April 2015	Current	April 2015	Current
Collision	-3.8%	-3.6%	-1.7%	-2.3%	2.0%	4.4%
Property damage liability	-14.0%	-9.9%	-11.7%	-10.1%	-15.8%	-13.2%
Injury coverage type	April 2014	September 2014	April 2014	Current	April 2015	Current
Bodily injury liability	-39.5%	-29.2%	-26.8%	-24.2%	-39.4%	-12.5%
Medical payment	-27.3%	-29.7%	-22.3%	-21.7%	-25.7%	-26.7%
Personal injury protection	-10.7%	-16.8%	-6.3%	-6.4%	10.4%	5.6%

Introduction

This Highway Loss Data Institute (HLDI) bulletin provides an updated look at the effects of available Honda Accord collision avoidance systems on insurance losses. Earlier HLDI studies found encouraging results (HLDI, 2014a, 2014b, 2015). Prior HLDI results indicate these systems are having some benefit. This HLDI bulletin updates prior analyses with more exposure and adds the 2015 Honda Accord model year vehicles. The features included in this analysis are as follows:

Forward Collision Warning (FCW) uses a camera system located behind the windshield to assess the risk of a collision with leading traffic. The warning system has three driver-selectable range settings. When a potential crash is detected, lights flash in the heads-up display, the FCW indicator blinks, and there is continuous beeping. The system is active only at speeds more than 10 mph and can be deactivated by the driver. At each ignition cycle, the system defaults to the previous on/off setting. Vehicles with FCW also have Lane Departure Warning.

Lane Departure Warning (LDW) utilizes the same camera as forward collision warning to also identify traffic lane markings. Audio and visual warnings will indicate if the vehicle path deviates from the intended lane. The system is functional at speeds between 40 and 90 mph but does not warn if the turn signal is on or the movement is determined to be sufficiently sudden as to be evasive. The system can be deactivated by the driver. At each ignition cycle, the system defaults to the previous on/off setting.

Adaptive Cruise Control (ACC) uses radar sensors mounted in the front bumper 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 active at speeds more than 10 mph. Forward Collision Warning remains active even when adaptive cruise control is turned off.

LaneWatch is Honda's term for a passenger-side-only blind spot monitor. A camera mounted behind the external passenger side rearview mirror monitors the passenger side of the vehicle and displays an 80-degree field of view on the console-mounted information screen when the turn signal indicator is activated. Reference lines are also provided to indicate proximity. Both the turn signal indicator and reference lines are driver-controllable settings and can be deactivated. An upcoming navigation system maneuver can also be given priority over the LaneWatch display. LaneWatch can be deactivated by the driver. At each ignition cycle, it will default to the previous on/off setting.

All of the vehicles in this study were equipped with rear cameras. As there are no vehicles without this feature, their effectiveness cannot be evaluated in this analysis. The vehicles in this analysis may also have been equipped with optional rear parking sensors. This feature was not controlled for in the analysis, as the availability of rear parking sensors on a vehicle was not discernible from the vehicle identification number (VIN).

► Method

Vehicles

Several trim levels are offered on the vehicles included in this study. Trim levels are bundles of vehicle options such as interior materials, engines, and comfort, convenience, and safety features. For example, the Honda Accord EX-L V6 is equipped with a 6-cylinder motor, leather seats, and several collision avoidance technologies. The less expensive LX is equipped with cloth seats, a 4-cylinder motor, and no collision avoidance technologies. For the Honda vehicles included in this study, the trim levels can be determined in the first 10 positions of the VIN. The collision avoidance features in this study are either standard or not available at the trim level. Consequently, by knowing the trim level, the presence of the collision avoidance features is known. LaneWatch and the combination of FCW and LDW are offered as standard equipment on several 2013–15 Honda Accord models (trims). LaneWatch and the combination of FCW, LDW, and ACC are offered on the Touring trim of the four-door Honda Accord. Honda Accord vehicles without these features served as the control vehicles in the analysis. **Table 1** lists total exposure, measured in insured vehicle years, and the exposure of each feature as a percentage of total exposure. Also included in **Table 1** is the exposure from the three prior HLDI reports.

Table 1: Feature exposure by vehicle series

Make	Series	Model year range	Forward Collision Warning (includes Lane Departure Warning)	Forward Collision Warning (includes Lane Departure Warning and Adaptive Cruise Control)	LaneWatch	Total exposure	April 2015 report exposure	September 2014 report exposure	April 2014 report exposure
Honda	Accord 2dr	2013–15	67%	–	67%	95,725	56,381	29,915	15,183
Honda	Accord 4dr	2013–15	37%	–	47%	985,148	569,785	283,665	157,309
Honda	Accord 4dr Touring	2013–15	–	100%	100%	20,007	11,662	–	–
Honda	Accord Crosstour 4dr	2013–15	70%	–	78%	18,692	10,767	5,750	2,408
Honda	Accord Crosstour 4dr 4WD	2013–15	100%	–	100%	15,301	8,671	4,474	1,968

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 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 can be 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 each vehicle feature 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 for the Honda Accord that were paid by the date of analysis varies by coverage: 72.7 percent for PIP, 58.2 percent for BI, and 58.9 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 Honda Accord 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 Forward Collision Warning (including Lane Departure Warning) on collision claim frequency was -0.0228; thus, vehicles with the feature had 2.3 percent fewer collision claims than without FCW/LDW ($(\exp(-0.0228)-1)*100=-2.3$).

► Results

Results for Honda Accord's Forward Collision Warning System including Lane Departure Warning are summarized in **Table 2**. The lower and upper bounds represent the 95 percent confidence limits for the estimates. For vehicle damage losses, the frequency and severity of claims as well as overall losses are down. Half of the reductions are significant (indicated in bold in the table).

For the injury-related coverage types, bodily injury liability and medical payment claim frequencies for paid and unpaid claims show significant reductions. Among paid claims, claim frequency shows a benefit with many being significant.

Table 2: Change in insurance losses for Accords with camera-based Forward Collision Warning and Lane Departure Warning

Vehicle damage coverage type	Lower bound	FREQUENCY	Upper bound	Lower bound	SEVERITY	Upper bound	Lower bound	OVERALL LOSSES	Upper bound
Collision	-4.6%	-2.3%	0.1%	-\$198	-\$80	\$43	-\$28	-\$15	-\$2
Property damage liability	-13.6%	-10.1%	-6.4%	-\$194	-\$77	\$45	-\$18	-\$13	-\$8
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	-32.6%	-24.2%	-14.7%	-43.5%	-30.5%	-14.5%	-43.6%	-29.5%	-11.9%
Medical payment	-29.5%	-21.7%	-13.2%	-50.4%	-34.3%	-13.0%	-30.8%	-19.1%	-5.4%
Personal injury protection	-13.7%	-6.4%	1.6%	-20.5%	-3.6%	16.8%	-15.4%	-5.5%	5.6%

Results for Honda Accord's LaneWatch system are summarized in **Table 3**. Again, the lower and upper bounds represent the 95 percent confidence limits for the estimates. Reductions in claim frequency are estimated for both first- and third-party vehicle damage coverages. Both collision and property damage liability claim frequency reductions are statistically significant. Losses per insured vehicle year (overall losses) declined significantly under both property damage liability and collision coverage.

Under injury coverages, the frequency of claims is lower for all three coverages. The reductions under bodily injury liability and personal injury protection are statistically significant. Among paid claims, there is a significant reduction in high severity MedPay and PIP claims, yet no clear pattern emerges.

Table 3: Change in insurance losses for LaneWatch in Accords with camera-based Forward Collision Warning

Vehicle damage coverage type	Lower bound	FREQUENCY	Upper bound	Lower bound	SEVERITY	Upper bound	Lower bound	OVERALL LOSSES	Upper bound
Collision	-7.3%	-5.1%	-2.9%	-\$255	-\$140	-\$23	-\$44	-\$31	-\$18
Property damage liability	-12.8%	-9.5%	-6.0%	-\$136	-\$22	\$96	-\$16	-\$11	-\$6

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	-20.8%	-11.4%	-1.2%	-21.0%	-4.2%	16.1%	-28.4%	-11.9%	8.3%
Medical payment	-14.6%	-5.8%	4.0%	-5.1%	24.1%	62.2%	-29.9%	-18.7%	-5.7%
Personal injury protection	-20.6%	-14.2%	-7.2%	-19.7%	-3.5%	15.9%	-25.1%	-16.8%	-7.6%

Table 4 shows the differences in the claim frequency estimates between the results published in April 2014, September 2014, and April 2015 and the updated results included in this report. The updated results for the combined FCW/LDW system continue to show frequency benefits for all coverage types. The PDL claim frequency reduction remains significant, although the size of the effect is between the two prior estimates. All three injury coverages continue to show reductions in claim frequency. The effect consistently dropped for bodily injury liability across the four studies. The benefits of LaneWatch under collision has increased over the four reports and is statistically significant. The frequency reduction under property damage liability is significant and similar to the prior estimate. The frequency reductions under the injury-related coverages are all larger than those of the prior report, with the estimates for bodily injury liability and personal injury protection being statistically significant.

Table 4: Change in claim frequencies by collision avoidance feature, earlier vs. updated results in Accords with camera-based Forward Collision Warning

Vehicle damage coverage type	Forward Collision Warning & Lane Departure Warning				LaneWatch			
	April 2014	September 2014	April 2015	Current	April 2014	September 2014	April 2015	Current
Collision	-3.8%	-3.6%	-1.7%	-2.3%	-2.5%	-2.6%	-5.0%	-5.1%
Property damage liability	-14.0%	-9.9%	-11.7%	-10.1%	-7.8%	-12.5%	-8.8%	-9.5%

Injury coverage type	Forward Collision Warning & Lane Departure Warning				LaneWatch			
	April 2014	September 2014	April 2015	Current	April 2014	September 2014	April 2015	Current
Bodily injury liability	-39.5%	-29.2%	-26.8%	-24.2%	7.9%	-5.2%	-6.0%	-11.4%
Medical payment	-27.3%	-29.7%	-22.3%	-21.7%	-11.1%	-8.6%	-3.5%	-5.8%
Personal injury protection	-10.7%	-16.8%	-6.3%	-6.4%	-15.8%	-13.1%	-12.7%	-14.2%

Honda Accord Touring:

Results for Honda Accord Touring's Forward Collision Warning System including Lane Departure Warning and Adaptive Cruise Control are summarized in **Table 5**. The lower and upper bounds represent the 95 percent confidence limits for the estimates. For property damage liability, claim frequency (statistically significant) and overall losses are down. Under collision coverage, the Touring trim showed an increase in claim frequency, claim severity, and overall losses, with severity and overall losses being significant.

For the injury-related coverage types, bodily injury liability and medical payment claim frequencies for paid and unpaid claims show reductions. Among paid claims, claim frequency also shows a benefit under bodily injury liability and medical payment coverages.

Table 5: Change in insurance losses for Forward Collision Warning, Lane Departure Warning and Adaptive Cruise Control

Vehicle damage coverage type	Lower bound	FREQUENCY	Upper bound	Lower bound	SEVERITY	Upper bound	Lower bound	OVERALL LOSSES	Upper bound
Collision	-1.1%	4.4%	10.1%	\$71	\$355	\$657	\$15	\$49	\$85
Property damage liability	-21.0%	-13.2%	-4.5%	-\$193	\$95	\$412	-\$23	-\$11	\$2
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	-32.8%	-12.5%	14.0%	-42.8%	-9.8%	42.2%	-51.0%	-18.0%	37.0%
Medical payment	-42.4%	-26.7%	-6.8%	-74.3%	-46.5%	11.7%	-45.9%	-22.8%	10.2%
Personal injury protection	-12.9%	5.6%	28.0%	-42.1%	-5.2%	55.4%	-23.0%	0.3%	30.7%

Results for Honda Accord Touring's LaneWatch system are summarized in **Table 6**. Again, the lower and upper bounds represent the 95 percent confidence limits for the estimates. Reductions in claim frequency are estimated for both first- and third-party vehicle damage coverages. Collision and property damage liability claim frequency reductions are statistically significant. Losses per insured vehicle year (overall losses) declined significantly under these two coverage types.

Under injury coverages, the frequency of claims is lower for all three coverages. The reductions under bodily injury liability and personal injury protection are statistically significant. Among paid claims, larger reductions are seen for higher severity claims.

Table 6: Change in insurance losses for Honda Accord Touring LaneWatch

Vehicle damage coverage type	Lower bound	FREQUENCY	Upper bound	Lower bound	SEVERITY	Upper bound	Lower bound	OVERALL LOSSES	Upper bound
Collision	-7.1%	-4.9%	-2.6%	-\$251	-\$137	-\$20	-\$43	-\$30	-\$17
Property damage liability	-12.7%	-9.3%	-5.8%	-\$123	-\$7	\$113	-\$15	-\$10	-\$5
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	-20.8%	-11.6%	-1.3%	-20.5%	-3.6%	17.0%	-29.1%	-12.8%	7.4%
Medical payment	-15.0%	-6.1%	3.7%	-5.5%	23.7%	62.1%	-30.4%	-19.2%	-6.2%
Personal injury protection	-21.5%	-15.1%	-8.2%	-21.2%	-5.2%	14.4%	-26.1%	-17.9%	-8.8%

Table 7 shows the differences in the claim frequency estimates between the initial Touring trim results published in April 2015, and the updated results included in this report. The updated results for the combined FCW/LDW/ACC system continue to show frequency benefits for most coverage types. The PDL claim frequency reduction remains significant, although the size of the effect is smaller than the prior estimate. Bodily injury liability and medical payment continue to show reductions in claim frequency, but the significance has changed. The bodily injury liability effect dropped over 25 percentage points and is no longer significant, while the medical payment benefit remained similar but is now significant. The original estimated 39.4 percent BI reduction was the highest among FCW systems and higher than the reductions for systems with autonomous braking. The current estimate is now more in line with BI estimates for other FCW systems. While the reduction from 39.4 to 12.5 percent is large, the confidence bounds for the two estimates overlap. The benefits of LaneWatch continue across all coverage types, with nearly all reductions being significant. The frequency reductions under collision and property damage liability are significant and similar to the prior estimate. The frequency reductions under the injury-related coverages are all larger than those of the prior report, with the estimates for bodily injury liability and personal injury protection being statistically significant.

Vehicle damage coverage types	Collision Mitigation Warning, Lane Departure Warning & Adaptive Cruise		LaneWatch	
	April 2015 report	Current report	April 2015 report	Current report
Collision	2.0%	4.4%	-4.8%	-4.9%
Property damage liability	-15.8%	-13.2%	-8.8%	-9.3%
Injury coverage types	April 2015 report	Current report	April 2015 report	Current report
Bodily injury liability	-39.4%	-12.5%	-6.6%	-11.6%
Medical payment	-25.7%	-26.7%	-3.4%	-6.1%
Personal injury protection	10.4%	5.6%	-13.4%	-15.1%

Comparison results:

Table 8 shows the differences in the claim frequency estimates for the Honda Accord/Crosstour and Honda Accord Touring. The results for the FCW/LDW (ACC on Touring) system show minimal, if any, benefit under collision coverage across the vehicle series. However, under property damage liability, claim frequency is reduced significantly. Under injury coverages, reductions are seen across all vehicle series and coverages, with the exception of personal injury protection claim frequency for the Honda Accord Touring. Several of the reductions are significant.

Table 8 also shows the differences in the claim frequency estimates for LaneWatch for the Honda Accord/Crosstour and Honda Accord Touring. The estimated reductions in claim frequency for both of these vehicles are nearly identical across all coverage types. This may in part be due to the control populations being identical. Significant reductions are seen for both vehicles under collision, property damage liability, bodily injury liability, and personal injury protection coverages

Vehicle damage coverage types	Collision Mitigation Warning, Lane Departure Warning & Adaptive Cruise		LaneWatch	
	Honda Accord/Crosstour	Honda Accord Touring	Honda Accord/Crosstour	Honda Accord Touring
Collision	-2.3%	4.4%	-5.1%	-4.9%
Property damage liability	-10.1%	-13.2%	-9.5%	-9.3%
Injury coverage types	April 2015 report	Current report	April 2015 report	Current report
Bodily injury liability	-24.2%	-12.5%	-11.4%	-11.6%
Medical payment	-21.7%	-26.7%	-5.8%	-6.1%
Personal injury protection	-6.4%	5.6%	-14.2%	-15.1%

► Discussion

The loss results for the collision avoidance systems included in this study continue to be favorable and fall within the bounds of the prior studies. However, some of the point estimates have changed. While less than a year has passed from the April 2015 study, the exposure available for analysis has nearly doubled for the Honda Accord and Crosstour. The increase in exposure has resulted from the addition of the 2015 model year and the additional time insured for the vehicles included in the previous study. The results for the combined FCW/LDW system are in-line with prior findings for comparable systems. The frequency benefits are fairly similar but slightly larger than the prior bulletin. The frequency estimates for LaneWatch continue to indicate reductions, and with the exception of medical payment, the reductions are statistically significant.

Forward collision warning systems are designed to prevent or mitigate front-to-rear crashes, which typically result in PDL and BI claims if injury in the struck vehicle occurs. The updated FCW/LDW system continues to be associated with reductions in claim frequency for all five coverage types examined. The Honda Accord Touring trim with the radar based FCW/LDW/ACC system has much less exposure, but the magnitude of the property damage liability benefit is similar to the camera-based FCW/LDW system. The PDL claim frequency benefit for the radar-based system is slightly larger than for the camera system, but the confidence bounds overlap. The camera-based system resulted in a decline in collision claim severity, while the radar-based Touring system resulted in a significant increase. This is in line with previous HLDI findings, and the increased claim severity is likely associated with the replacement cost of the radar units in crashes not avoided.

The analysis of Honda's LaneWatch, a passenger side blind spot detection system, showed a reduction in claims, with significant effects for collision, PDL, bodily injury liability, and PIP. This is the first report where the reduction in bodily injury liability claim frequency is significant. Effects of LaneWatch are patterned as expected. Incursion into an occupied adjacent lane would be expected to result in a two-vehicle crash that would lead to a property damage liability claim against the encroaching driver. The PDL estimates for the Accord/Crosstour and Accord Touring are nearly identical and statistically significant, and the estimated reduction in property damage liability claims is much larger than the reduction estimated for collision claims. This is consistent with the fact that the reductions in collision claims from such crashes would be diluted by the many single-vehicle crashes that result in collision claims and are unaffected by the LaneWatch system.

As previously mentioned, the collision avoidance systems are tied to the vehicle trim levels. In order to be confident that the measured differences were attributable to the collision avoidance features and not the trim levels, a supplemental analysis was conducted including loss data for model year 2012 Honda Accord vehicles. While the Honda Accord was redesigned in 2013, the trim levels in 2012–15 were comparable. The inclusion of loss data for the 2012 model year, in which no crash avoidance features were present, allowed the supplemental analysis to include the vehicle trim level in addition to the control variables used in the primary analysis. Thus, the supplemental analysis assumes that loss differences attributable to the different trim levels were the same in both model years. The summary results of the supplemental analysis are included in **Appendix B**, and the full regression analysis results for collision claim frequencies are shown in **Appendix C**. The supplemental results for the combination FCW/LDW system is consistent with the supplemental analysis from the prior bulletins. Due to the similarity of the two analyses for FCW/LDW and uncertainty about the applicability of 2012 model trim level differences to the redesigned 2013–15 models, the analysis presented in the results section of this bulletin is expected to be the better predictor of the effects on losses of that system. However, the supplemental estimates for the LaneWatch system are showing increased claim frequencies. While the results in the main portion of this bulletin show lower losses for LaneWatch vehicles, the alternative analyses suggest that the positive results may not be due to LaneWatch but to other, uncontrolled factors that affect losses for different trim levels. Similar analysis could not be conducted for the Touring trim as the 2013 model year (included in this analysis) was the first year that trim was available.

► 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. Information on point of impact and the vehicle's transmission status is not available. The technologies in this report target certain crash types. For example, LaneWatch is designed to prevent sideswipe-type collisions. All collisions, regardless of the ability of a feature to mitigate or prevent the crash, are included in the analysis.

References

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Highway Loss Data Institute. 2014b. Honda Accord collision avoidance features: an update. *Loss Bulletin* Vol. 31, No. 16. Arlington, VA.

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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	-8.6275		0.2469	-9.1115	-8.1435	1220.67	<0.0001
Calendar year	2012	1	-0.5095	-39.9%	0.0481	-0.6037	-0.4153	112.42	<0.0001
	2013	1	-0.0088	-0.9%	0.0104	-0.0291	0.0116	0.71	0.4000
	2014	1	0.0269	2.7%	0.0076	0.0119	0.0418	12.41	0.0004
	2015	0	0	0	0	0	0		
Vehicle model year and series	2013 Accord 2dr	1	-0.0361	-3.5%	0.1332	-0.2973	0.2250	0.07	0.7864
	2014 Accord 2dr	1	0.0094	0.9%	0.1342	-0.2535	0.2723	0.00	0.9442
	2015 Accord 2dr	1	-0.0175	-1.7%	0.1404	-0.2926	0.2577	0.02	0.9011
	2013 Accord 4dr	1	-0.1546	-14.3%	0.1328	-0.4148	0.1056	1.36	0.2443
	2014 Accord 4dr	1	-0.1328	-12.4%	0.1328	-0.3931	0.1274	1.00	0.3170
	2015 Accord 4dr	1	-0.1619	-14.9%	0.1333	-0.4232	0.0994	1.48	0.2245
	2013 Accord Crosstour 4dr 2WD	1	-0.1686	-15.5%	0.1361	-0.4354	0.0983	1.53	0.2157
	2014 Accord Crosstour 4dr 2WD	1	-0.0965	-9.2%	0.1462	-0.3830	0.1900	0.44	0.5092
	2015 Accord Crosstour 4dr 2WD	1	-0.2297	-20.5%	0.2063	-0.6341	0.1748	1.24	0.2657
	2013 Accord Crosstour 4dr 4WD	1	-0.1168	-11.0%	0.1370	-0.3853	0.1517	0.73	0.3939
	2014 Accord Crosstour 4dr 4WD	1	-0.1045	-9.9%	0.1450	-0.3886	0.1797	0.52	0.4711
	2015 Accord Crosstour 4dr 4WD	0	0	0	0	0	0		

Appendix A: Illustrative regression results — collision frequency

Parameter	Degrees of freedom	Estimate	Effect	Standard error	Wald 95% confidence limits		Chi-square	P-value	
Rated driver age group	14–24	1	0.2923	34.0%	0.0150	0.2629	0.3217	378.80	<0.0001
	25–29	1	0.1787	19.6%	0.0134	0.1525	0.2049	179.04	<0.0001
	30–39	1	0.0538	5.5%	0.0114	0.0315	0.0760	22.44	<0.0001
	50–59	1	-0.0600	-5.8%	0.0116	-0.0828	-0.0372	26.56	<0.0001
	60–64	1	-0.0877	-8.4%	0.0151	-0.1172	-0.0582	33.90	<0.0001
	65–69	1	-0.0209	-2.1%	0.0154	-0.0510	0.0093	1.84	0.1746
	70+	1	0.0972	10.2%	0.0130	0.0716	0.1227	55.53	<0.0001
	Unknown	1	0.0007	0.1%	0.0182	-0.0349	0.0364	0.00	0.9678
	40–49	0	0	0	0	0	0		
Rated driver gender	Male	1	-0.0567	-5.5%	0.0077	-0.0717	-0.0417	54.75	<0.0001
	Unknown	1	-0.2119	-19.1%	0.0302	-0.2712	-0.1527	49.22	<0.0001
	Female	0	0	0	0	0	0		
Rated driver marital status	Single	1	0.1911	21.1%	0.0084	0.1745	0.2076	514.29	<0.0001
	Unknown	1	0.2378	26.8%	0.0302	0.1786	0.2970	62.04	<0.0001
	Married	0	0	0	0	0	0		
Risk	Nonstandard	1	0.2611	29.8%	0.0145	0.2327	0.2896	324.25	<0.0001
	Standard	0	0	0	0	0	0		
State	Alabama	1	-0.0309	-3.0%	0.2108	-0.4441	0.3822	0.02	0.8833
	Arizona	1	0.0517	5.3%	0.2102	-0.3603	0.4637	0.06	0.8058
	Arkansas	1	-0.0002	0.0%	0.2143	-0.4203	0.4199	0.00	0.9992
	California	1	0.3322	39.4%	0.2088	-0.0770	0.7414	2.53	0.1116
	Colorado	1	0.0936	9.8%	0.2116	-0.3211	0.5083	0.20	0.6583
	Connecticut	1	0.0213	2.2%	0.2107	-0.3916	0.4343	0.01	0.9194
	Delaware	1	0.0270	2.7%	0.2154	-0.3951	0.4492	0.02	0.9001
	District of Columbia	1	0.4898	63.2%	0.2181	0.0622	0.9173	5.04	0.0248
	Florida	1	-0.1687	-15.5%	0.2091	-0.5784	0.2411	0.65	0.4198
	Georgia	1	-0.0491	-4.8%	0.2095	-0.4598	0.3616	0.05	0.8148
	Hawaii	1	0.1947	21.5%	0.2152	-0.2272	0.6165	0.82	0.3657
	Idaho	1	-0.1423	-13.3%	0.2259	-0.5850	0.3003	0.40	0.5286
	Illinois	1	-0.0026	-0.3%	0.2095	-0.4131	0.4080	0.00	0.9902
	Indiana	1	-0.1214	-11.4%	0.2112	-0.5353	0.2925	0.33	0.5653
	Iowa	1	-0.0646	-6.3%	0.2166	-0.4891	0.3599	0.09	0.7656
	Kansas	1	-0.0069	-0.7%	0.2140	-0.4264	0.4126	0.00	0.9744
	Kentucky	1	-0.1900	-17.3%	0.2132	-0.6077	0.2278	0.79	0.3728
	Louisiana	1	0.2488	28.2%	0.2098	-0.1624	0.6599	1.41	0.2357
	Maine	1	-0.0777	-7.5%	0.2274	-0.5233	0.3679	0.12	0.7325
	Maryland	1	0.1524	16.5%	0.2094	-0.2580	0.5628	0.53	0.4668
	Massachusetts	1	0.1644	17.9%	0.2104	-0.2479	0.5767	0.61	0.4344
	Michigan	1	0.3685	44.6%	0.2109	-0.0448	0.7818	3.05	0.0805
	Minnesota	1	-0.0695	-6.7%	0.2116	-0.4842	0.3453	0.11	0.7427
	Mississippi	1	0.1196	12.7%	0.2121	-0.2962	0.5354	0.32	0.5729
	Missouri	1	-0.1301	-12.2%	0.2116	-0.5448	0.2846	0.38	0.5386
	Montana	1	-0.2483	-22.0%	0.2460	-0.7304	0.2338	1.02	0.3127

Appendix A: Illustrative regression results — collision frequency

Parameter	Degrees of freedom	Estimate	Effect	Standard error	Wald 95% confidence limits		Chi-square	P-value
Nebraska	1	-0.1527	-14.2%	0.2191	-0.5822	0.2768	0.49	0.4859
Nevada	1	0.0176	1.8%	0.2130	-0.3999	0.4351	0.01	0.9342
New Hampshire	1	0.2418	27.4%	0.2136	-0.1769	0.6605	1.28	0.2578
New Jersey	1	0.0327	3.3%	0.2091	-0.3771	0.4426	0.02	0.8757
New Mexico	1	0.0265	2.7%	0.2162	-0.3973	0.4502	0.01	0.9026
New York	1	0.3229	38.1%	0.2089	-0.0865	0.7323	2.39	0.1222
North Carolina	1	-0.2700	-23.7%	0.2097	-0.6809	0.1409	1.66	0.1978
North Dakota	1	0.1987	22.0%	0.2308	-0.2536	0.6510	0.74	0.3892
Ohio	1	-0.1516	-14.1%	0.2095	-0.5622	0.2590	0.52	0.4693
Oklahoma	1	-0.0321	-3.2%	0.2124	-0.4484	0.3842	0.02	0.8800
Oregon	1	0.0282	2.9%	0.2124	-0.3882	0.4445	0.02	0.8945
Pennsylvania	1	0.1789	19.6%	0.2092	-0.2312	0.5890	0.73	0.3925
Rhode Island	1	0.2318	26.1%	0.2135	-0.1867	0.6503	1.18	0.2777
South Carolina	1	-0.1377	-12.9%	0.2105	-0.5502	0.2749	0.43	0.5131
South Dakota	1	-0.0488	-4.8%	0.2373	-0.5139	0.4163	0.04	0.8371
Tennessee	1	-0.1013	-9.6%	0.2104	-0.5138	0.3111	0.23	0.6301
Texas	1	0.0121	1.2%	0.2090	-0.3975	0.4217	0.00	0.9540
Utah	1	-0.0964	-9.2%	0.2152	-0.5182	0.3254	0.20	0.6543
Vermont	1	0.0525	5.4%	0.2297	-0.3977	0.5027	0.05	0.8192
Virginia	1	0.0724	7.5%	0.2094	-0.3379	0.4827	0.12	0.7294
Washington	1	0.0270	2.7%	0.2105	-0.3856	0.4397	0.02	0.8979
West Virginia	1	-0.2047	-18.5%	0.2205	-0.6369	0.2275	0.86	0.3533
Wisconsin	1	-0.0261	-2.6%	0.2116	-0.4409	0.3887	0.02	0.9018
Wyoming	1	-0.0309	-3.0%	0.2618	-0.5440	0.4823	0.01	0.9061
Alaska	0	0	0	0	0	0		
Deductible range								
0–250	1	0.4880	62.9%	0.0120	0.4645	0.5115	1657.24	<0.0001
1,001+	1	-0.4155	-34.0%	0.0717	-0.5561	-0.2750	33.59	<0.0001
251–500	1	0.2851	33.0%	0.0103	0.2649	0.3053	764.94	<0.0001
501–1,000	0	0	0	0	0	0		
Registered vehicle density								
0–99	1	-0.2658	-23.3%	0.0131	-0.2916	-0.2401	410.26	<0.0001
100–499	1	-0.1777	-16.3%	0.0085	-0.1944	-0.1611	438.99	<0.0001
500+	0	0	0	0	0	0		
Forward collision warning & lane departure warning	1	-0.0228	-2.3%	0.0123	-0.0469	0.0013	3.42	0.0642
LaneWatch	1	-0.0525	-5.1%	0.0118	-0.0757	-0.0293	19.69	<0.0001

► **Appendix B: Analysis results included model years 2012–15, accounting for vehicle series and model level loss differences**

Change in insurance losses for Forward Collision Warning and Lane Departure Warning									
Vehicle damage coverage type	Lower bound	FREQUENCY	Upper bound	Lower bound	SEVERITY	Upper bound	Lower bound	OVERALL LOSSES	Upper bound
Collision	-8.3%	-4.8%	-1.0%	-\$106	\$80	\$273	-\$29	-\$10	\$10
Property damage liability	-14.8%	-9.6%	-4.1%	-\$166	\$5	\$187	-\$18	-\$10	-\$2

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	-28.7%	-15.6%	-0.1%	-40.8%	-20.6%	6.5%	-42.5%	-21.7%	6.6%
Medical payment	-25.4%	-12.6%	2.5%	-46.4%	-17.5%	27.2%	-29.5%	-11.0%	12.3%
Personal injury protection	-11.9%	-0.4%	12.6%	-23.5%	1.7%	35.4%	-11.2%	4.6%	23.2%

Change in insurance losses for LaneWatch									
Vehicle damage coverage type	Lower bound	FREQUENCY	Upper bound	Lower bound	SEVERITY	Upper bound	Lower bound	OVERALL LOSSES	Upper bound
Collision	-2.5%	1.1%	4.9%	-\$332	-\$164	\$11	-\$28	-\$10	\$9
Property damage liability	0.4%	6.2%	12.3%	-\$268	-\$111	\$54	-\$6	\$2	\$12

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	-14.8%	-0.3%	16.8%	-20.3%	4.9%	38.0%	-24.4%	0.9%	34.6%
Medical payment	-9.8%	4.8%	21.8%	-17.1%	24.7%	87.6%	-21.7%	-2.4%	21.6%
Personal injury protection	-14.4%	-3.8%	8.0%	-22.7%	1.3%	32.7%	-20.0%	-6.7%	8.9%

► **Appendix C**

Illustrative regression results for secondary analysis — collision frequency									
Parameter		Degrees of freedom	Estimate	Effect	Standard error	Wald 95% confidence limits		Chi-square	P-value
Intercept		1	-8.6052		0.1482	-8.8957	-8.3147	3370.67	<0.0001
Calendar year	2011	1	-0.3345	-28.4%	0.0426	-0.4180	-0.2510	61.62	<0.0001
	2012	1	-0.0499	-4.9%	0.0107	-0.0710	-0.0289	21.64	<0.0001
	2013	1	0.0002	0.0%	0.0076	-0.0146	0.0150	0.00	0.9774
	2014	1	0.0241	2.4%	0.0064	0.0117	0.0366	14.44	0.0001
	2015	0	0	0	0	0	0		
Model year	2012	1	-0.0866	-8.3%	0.0151	-0.1161	-0.0570	33.01	<0.0001
	2013	1	-0.0027	-0.3%	0.0143	-0.0307	0.0253	0.04	0.8481
	2014	1	0.0297	3.0%	0.0145	0.0014	0.0581	4.22	0.0400
	2015	0	0	0	0	0	0		
Vehicle series and trim	Accord 2dr EX	1	0.0949	10.0%	0.0269	0.0422	0.1477	12.45	0.0004
	Accord 2dr EX-L	1	0.0958	10.1%	0.0225	0.0517	0.1400	18.10	<0.0001
	Accord 2dr EX-L V6	1	0.0793	8.3%	0.0219	0.0364	0.1222	13.11	0.0003
	Accord 2dr LX-S	1	0.1483	16.0%	0.0234	0.1024	0.1941	40.17	<0.0001

Illustrative regression results for secondary analysis — collision frequency

Parameter	Degrees of freedom	Estimate	Effect	Standard error	Wald 95% confidence limits		Chi-square	P-value
Accord 4dr EX	1	-0.0819	-7.9%	0.0223	-0.1256	-0.0381	13.45	0.0002
Accord 4dr EX-L	1	-0.0536	-5.2%	0.0187	-0.0902	-0.0171	8.26	0.0040
Accord 4dr EX-L V6	1	-0.0810	-7.8%	0.0191	-0.1184	-0.0435	17.96	<0.0001
Accord 4dr LX	1	-0.0146	-1.4%	0.0185	-0.0510	0.0217	0.62	0.4297
Accord 4dr Sport	1	-0.0258	-2.5%	0.0188	-0.0626	0.0110	1.89	0.1695
Accord Crosstour 4dr 2WD EX	1	-0.0546	-5.3%	0.0340	-0.1212	0.0121	2.57	0.1089
Accord Crosstour 4dr 2WD EX-L	1	0.0057	0.6%	0.0332	-0.0593	0.0707	0.03	0.8631
Accord Crosstour 4dr 2WD EX-L V6	1	0.0056	0.6%	0.0320	-0.0571	0.0683	0.03	0.8612
Accord Crosstour 4dr 4WD EX-L V6	0	0	0	0	0	0		
Rated driver age group								
14-24	1	0.2766	31.9%	0.0158	0.2456	0.3076	306.06	<0.0001
25-29	1	0.1667	18.1%	0.0148	0.1376	0.1958	126.09	<0.0001
30-39	1	0.0387	3.9%	0.0138	0.0117	0.0657	7.91	0.0049
40-49	1	-0.0191	-1.9%	0.0138	-0.0463	0.0080	1.91	0.1666
50-59	1	-0.0620	-6.0%	0.0138	-0.0891	-0.0350	20.18	<0.0001
60-64	1	-0.1110	-10.5%	0.0156	-0.1417	-0.0804	50.37	<0.0001
65-69	1	-0.0445	-4.4%	0.0159	-0.0758	-0.0133	7.79	0.0052
70+	1	0.0688	7.1%	0.0147	0.0400	0.0975	22.01	<0.0001
Unknown	0	0	0	0	0	0		
Rated driver gender								
Male	1	-0.0498	-4.9%	0.0059	-0.0613	-0.0383	72.13	<0.0001
Unknown	1	-0.2253	-20.2%	0.0206	-0.2657	-0.1849	119.31	<0.0001
Female	0	0	0	0	0	0		
Rated driver marital status								
Single	1	0.1882	20.7%	0.0064	0.1756	0.2008	854.72	<0.0001
Unknown	1	0.2498	28.4%	0.0206	0.2095	0.2902	147.26	<0.0001
Married	0	0	0	0	0	0		
Risk								
Nonstandard	1	0.2342	26.4%	0.0101	0.2144	0.2539	538.64	<0.0001
Standard	0	0	0	0	0	0		
State								
Alabama	1	-0.1562	-14.5%	0.1477	-0.4457	0.1333	1.12	0.2903
Arizona	1	-0.0789	-7.6%	0.1473	-0.3676	0.2099	0.29	0.5924
Arkansas	1	-0.0485	-4.7%	0.1503	-0.3430	0.2461	0.10	0.7470
California	1	0.1999	22.1%	0.1461	-0.0865	0.4862	1.87	0.1713
Colorado	1	-0.0286	-2.8%	0.1484	-0.3194	0.2623	0.04	0.8474
Connecticut	1	-0.0792	-7.6%	0.1475	-0.3683	0.2099	0.29	0.5912
Delaware	1	-0.0385	-3.8%	0.1512	-0.3348	0.2578	0.06	0.7989
District of Columbia	1	0.4014	49.4%	0.1535	0.1006	0.7022	6.84	0.0089
Florida	1	-0.2841	-24.7%	0.1463	-0.5709	0.0026	3.77	0.0521
Georgia	1	-0.1856	-16.9%	0.1467	-0.4732	0.1019	1.60	0.2057
Hawaii	1	0.1033	10.9%	0.1522	-0.1949	0.4015	0.46	0.4973
Idaho	1	-0.2728	-23.9%	0.1615	-0.5893	0.0438	2.85	0.0913
Illinois	1	-0.1157	-10.9%	0.1466	-0.4031	0.1717	0.62	0.4299
Indiana	1	-0.2088	-18.8%	0.1479	-0.4987	0.0811	1.99	0.1581
Iowa	1	-0.1758	-16.1%	0.1525	-0.4747	0.1231	1.33	0.2489
Kansas	1	-0.1971	-17.9%	0.1509	-0.4929	0.0987	1.71	0.1915
Kentucky	1	-0.2872	-25.0%	0.1494	-0.5800	0.0056	3.70	0.0546

Illustrative regression results for secondary analysis — collision frequency

Parameter	Degrees of freedom	Estimate	Effect	Standard error	Wald 95% confidence limits		Chi-square	P-value	
Louisiana	1	0.0981	10.3%	0.1470	-0.1900	0.3862	0.45	0.5047	
Maine	1	-0.1286	-12.1%	0.1603	-0.4427	0.1855	0.64	0.4223	
Maryland	1	0.0455	4.7%	0.1466	-0.2419	0.3328	0.10	0.7565	
Massachusetts	1	0.0113	1.1%	0.1472	-0.2773	0.2999	0.01	0.9386	
Michigan	1	0.2460	27.9%	0.1477	-0.0435	0.5355	2.77	0.0958	
Minnesota	1	-0.2183	-19.6%	0.1484	-0.5091	0.0725	2.16	0.1412	
Mississippi	1	-0.0345	-3.4%	0.1489	-0.3264	0.2575	0.05	0.8170	
Missouri	1	-0.2625	-23.1%	0.1483	-0.5532	0.0283	3.13	0.0768	
Montana	1	-0.1343	-12.6%	0.1693	-0.4662	0.1976	0.63	0.4277	
Nebraska	1	-0.2826	-24.6%	0.1544	-0.5852	0.0200	3.35	0.0672	
Nevada	1	-0.0839	-8.0%	0.1497	-0.3773	0.2095	0.31	0.5751	
New Hampshire	1	0.1372	14.7%	0.1497	-0.1562	0.4307	0.84	0.3593	
New Jersey	1	-0.0881	-8.4%	0.1463	-0.3749	0.1987	0.36	0.5470	
New Mexico	1	-0.1001	-9.5%	0.1528	-0.3995	0.1993	0.43	0.5124	
New York	1	0.1590	17.2%	0.1462	-0.1275	0.4454	1.18	0.2768	
North Carolina	1	-0.3694	-30.9%	0.1468	-0.6571	-0.0817	6.33	0.0118	
North Dakota	1	-0.0133	-1.3%	0.1663	-0.3392	0.3126	0.01	0.9361	
Ohio	1	-0.2827	-24.6%	0.1466	-0.5701	0.0047	3.72	0.0539	
Oklahoma	1	-0.1786	-16.4%	0.1492	-0.4710	0.1138	1.43	0.2313	
Oregon	1	-0.1095	-10.4%	0.1494	-0.4022	0.1833	0.54	0.4636	
Pennsylvania	1	0.0549	5.6%	0.1464	-0.2320	0.3419	0.14	0.7075	
Rhode Island	1	0.1032	10.9%	0.1498	-0.1904	0.3969	0.47	0.4909	
South Carolina	1	-0.2830	-24.6%	0.1475	-0.5722	0.0061	3.68	0.0550	
South Dakota	1	-0.1783	-16.3%	0.1687	-0.5091	0.1524	1.12	0.2907	
Tennessee	1	-0.2123	-19.1%	0.1474	-0.5012	0.0765	2.08	0.1496	
Texas	1	-0.1158	-10.9%	0.1462	-0.4024	0.1709	0.63	0.4286	
Utah	1	-0.2350	-20.9%	0.1517	-0.5323	0.0623	2.40	0.1213	
Vermont	1	-0.1078	-10.2%	0.1639	-0.4291	0.2135	0.43	0.5109	
Virginia	1	-0.0806	-7.7%	0.1466	-0.3679	0.2067	0.30	0.5824	
Washington	1	-0.1282	-12.0%	0.1477	-0.4177	0.1613	0.75	0.3853	
West Virginia	1	-0.2524	-22.3%	0.1550	-0.5562	0.0514	2.65	0.1035	
Wisconsin	1	-0.1760	-16.1%	0.1484	-0.4668	0.1149	1.41	0.2357	
Wyoming	1	-0.0986	-9.4%	0.1861	-0.4634	0.2663	0.28	0.5964	
Alaska	0	0	0	0	0	0			
Deductible range	0–250	1	0.4789	61.4%	0.0091	0.4611	0.4967	2784.48	<0.0001
	1,001+	1	-0.4838	-38.4%	0.0583	-0.5980	-0.3696	68.94	<0.0001
	251–500	1	0.2623	30.0%	0.0078	0.2470	0.2775	1131.12	<0.0001
	501–1,000	0	0	0	0	0	0		
Registered vehicle density	0–99	1	-0.2653	-23.3%	0.0101	-0.2852	-0.2454	685.02	<0.0001
	100–499	1	-0.1803	-16.5%	0.0065	-0.1930	-0.1676	773.16	<0.0001
	500+	0	0	0	0	0	0		
Forward Collision Warning & Lane Departure Warning	1	-0.0487	-4.8%	0.0195	-0.0869	-0.0106	6.26	0.0123	
LaneWatch	1	0.0111	1.1%	0.0186	-0.0254	0.0475	0.36	0.5511	



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