HLDI
Highway Loss Data Institute

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Audi's Traffic Jam Assist

Summary

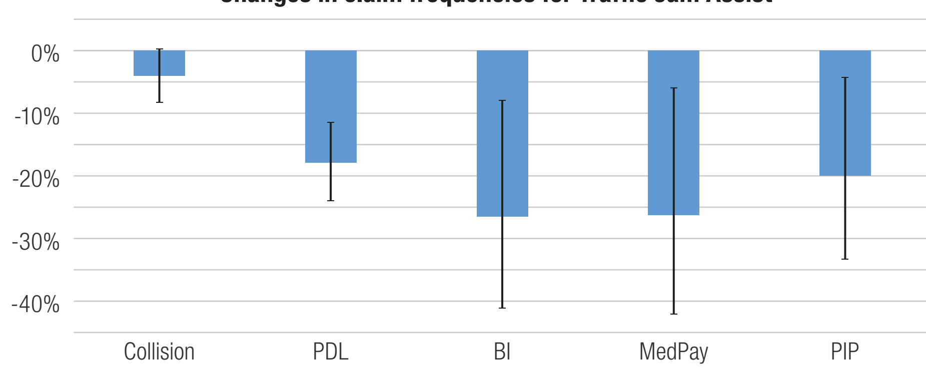
This is the second Highway Loss Data Institute (HLDI) study examining the changes in insurance losses associated with Audi's Traffic Jam Assist on the 2017 Q7 and A4. The current bulletin updates the prior study (HLDI, 2020a) by adding 60 percent more vehicle exposure.

When Audi's Traffic Jam Assist detects a traffic scenario at a speed below 40 mph, it can control the vehicle's speed (using the adaptive cruise control system) and provide steering input. Traffic Jam Assist meets the SAE International's definition of Level 2 driving automation (2018).

Claim frequency results are shown in the following figure and are consistent with the prior results. Note that the presence of high beam assist, adaptive cruise control, and active lane assist was linked with Traffic Jam Assist, and therefore the changes in insurance losses associated with these individual systems could not be isolated. Results in this report reflect the changes in insurance losses for all these systems combined but for simplicity will be referred to as Traffic Jam Assist.

Audi's Traffic Jam Assist (including the related systems) was associated with claim frequency reductions under all coverages, and the current reductions are within the confidence bounds of the prior report. Collision claim frequency was 4 percent lower with the feature, and property damage liability (PDL) claim frequency was 18 percent lower. Injury coverages also showed large claim frequency reductions of 27 percent for bodily injury (BI) liability, 26 percent for medical payment (MedPay), and 20 percent for personal injury protection (PIP). All results were statistically significant, except for collision. By contrast, only the PDL and MedPay benefits in the prior report were significant.

Changes in claim frequencies for Traffic Jam Assist



In addition, Traffic Jam Assist is associated with significant reductions to PDL claim severity and overall losses. Although collision claim severity increased for Traffic Jam Assist, this was offset by the frequency benefits; consequently, overall losses were down for collision claims.

Introduction

HLDI research has shown that many advanced driver assistance systems (ADAS) are associated with significant reductions in claim frequencies (HLDI, 2020b). Evaluations of these systems continue to be important as these technologies are evolving and may serve as a precursor of fully autonomous vehicles.

As technology has advanced, the level of automation has also increased. Vehicles capable of supporting the driver in maintaining speed, accelerating, braking, and steering under certain conditions have been available to consumers for several years now.

One such system is Audi's Traffic Jam Assist. When Audi's Traffic Jam Assist detects a traffic scenario at a speed below 40 mph, it can control the vehicle's speed (using the adaptive cruise control system) and provide steering input. The system uses radar sensors and a video camera to orient itself by the lane markings and other vehicles on the road. It helps the driver guide the vehicle through gentle steering interventions and follows the preceding convoy of vehicles within the system limits. When Traffic Jam Assist reaches its system limits — as when traffic eases up or a narrow curve lies ahead — the driver must fully take over the driving task without the assistance of Traffic Jam Assist. The system provides assistance by warning the driver in several stages. As a final measure, the system automatically brings the vehicle to a safe stop.

Traffic Jam Assist meets the SAE International's definition of Level 2 driving automation (2018). This study adds to the growing body of knowledge of the real-world effects of Level 2 driving automation by examining insurance losses for Audi's Traffic Jam Assist on the 2017 Q7 and A4.

Method

Vehicles

Although some features are available as standard equipment for certain model years and trim levels, other features are offered as optional equipment. The presence or absence of these optional features is not discernible from the information encoded in the Vehicle Identification Numbers (VINs). Rather, this must be determined from build information maintained by the manufacturer. Audi supplied HLDI with VIN-level information on the presence or absence of collision avoidance technologies based on a list of 2010–17 model year Audi VINs from HLDI's database. This information was used in prior studies (HLDI, 2018; 2020a) to evaluate insurance losses associated with Audi's advanced driver assistance systems and Audi's Traffic Jam Assist.

This study is based on the 2017 Q7 and A4. Both vehicles came with standard front crash prevention systems and optional Traffic Jam Assist, which includes adaptive cruise control, high beam assist and active lane assist. Although other systems such as blind spot monitoring, parking sensors, surround view cameras, etc., were available, they are not studied in this report. In order to isolate changes in insurance losses associated with Traffic Jam Assist (along with adaptive cruise control, high beam assist, and active lane assist), only vehicles also equipped with the same set of other features were included.

Table 1 provides a summary of the collision exposure (insured vehicle years) for the 2017 Q7 and A4 with and without Traffic Jam Assist.

Table 1: 2017 Audi A4 and Q7 collision exposure

Vehicle series	Collision exposure	Exposure with Traffic Jam Assist
A4 2WD	540	63%
A4 4WD	11,832	73%
A4 Allroad SW	2,212	78%
Q7	139,153	49%

Insurance data

Automobile insurance covers damages to vehicles and property in crashes, as well as injuries to people involved in the 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 one year, two vehicles for six 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 another 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 vehicles 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, or PIP, coverage) 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 Traffic Jam Assist while controlling for several covariates. The covariates included calendar year, garaging state, vehicle series, 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. A binary variable was included to indicate the presence of Traffic Jam Assist.

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 PDL. 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: 72 percent for PIP, 73 percent for BI, and 59 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.

For space reasons, only the estimates for Traffic Jam Assist are shown on the following pages. To illustrate the analyses, however, the **Appendix** 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 change in collision claim frequency associated with Traffic Jam Assist was −0.0408; thus, vehicles with the feature had 4.0 percent fewer collision claims than those without Traffic Jam Assist $((\exp(-0.0408)-1) \times 100 = -4.0)$.

Results

Table 2 summarizes the results for Audi's Traffic Jam Assist. For vehicle damage losses, collision claim frequency was down 4 percent, and PDL claim frequency was down 18 percent. The PDL estimate was statistically significant. Collision claim severity was up 3 percent but not statistically significant. PDL severity was down a significant 8 percent. This resulted in a reduction of 1 percent to collision overall losses and a statistically significant reduction of 25 percent to PDL overall losses.

For injury losses, the overall frequency of claims (paid plus reserve) decreased for BI, MedPay, and PIP coverages by 27, 26, and 20 percent, respectively. All of the injury results were significant.

Table 2: Change in insurance losses for Traffic Jam Assist

Vehicle damage coverage type	Lower bound	FREQUENCY	Upper bound	Lower bound	SEVERITY	Upper bound	Lower bound	OVERALL LOSSES	Upper bound
Collision	-8.0%	-4.0%	0.2%	-2.2%	2.8%	8.0%	-7.6%	-1.4%	5.3%
Property damage liability	-23.9%	**-17.9%**	-11.4%	-15.0%	**-8.4%**	-1.3%	-32.4%	**-24.8%**	-16.4%

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	-41.4%	**-26.5%**	-7.7%	-58.4%	-35.3%	0.6%	-51.2%	**-30.3%**	-0.4%
Medical payment	-42.3%	**-26.3%**	-6.0%	-42.6%	17.7%	141.4%	-52.8%	**-32.2%**	-2.7%
Personal injury protection	-33.1%	**-20.0%**	-4.3%	-60.0%	-34.1%	8.8%	-35.8%	-18.6%	3.1%

Figure 1 shows the physical damage claim frequency results for Traffic Jam Assist from **Table 2** as well as separate results for the 2017 A4 and Q7. Traffic Jam Assist was associated with reductions in frequency on the Q7 but increases on the A4. Traffic Jam Assist was associated with 5 percent and 20 percent reductions to collision and PDL claim frequency, respectively, on the Q7. Both results were statistically significant. In contrast, on the A4, Traffic Jam Assist was associated with a 5 percent collision frequency increase and an 18 percent PDL frequency increase. However, data were extremely limited for the A4, so results are not significant with wide confidence bounds.

Figure 1: Change in collision and PDL claim frequency for Traffic Jam Assist

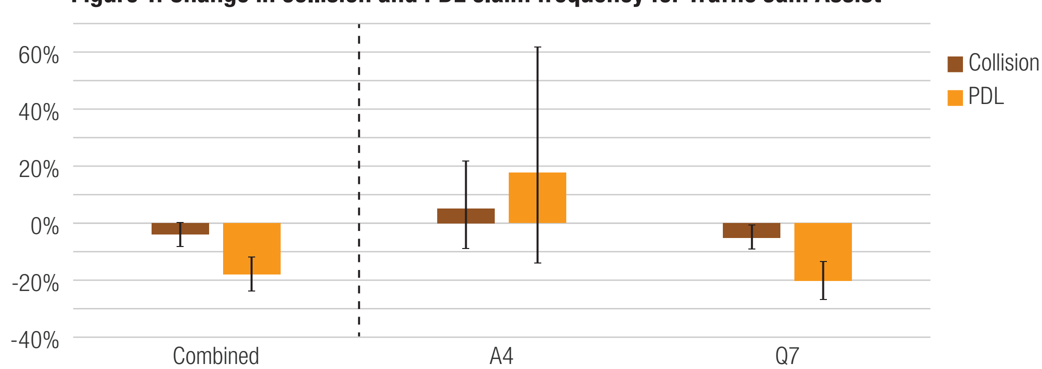
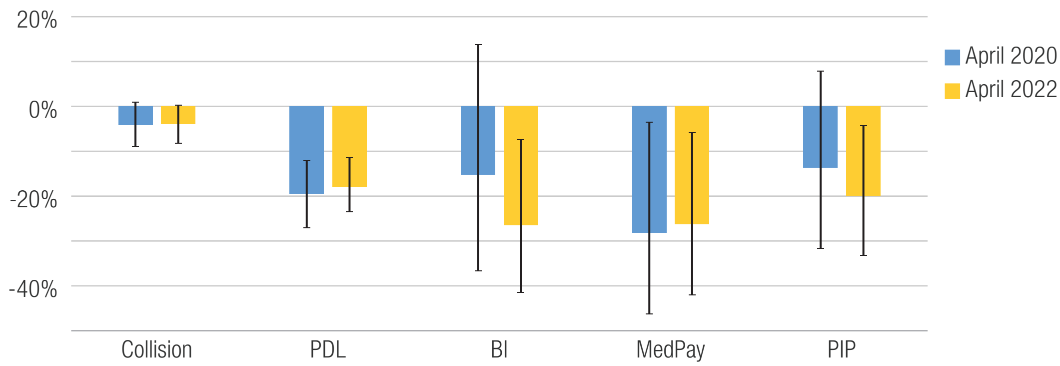


Figure 2 shows the variations in claim frequency estimates between the initial results published in April 2020 (HLDI, 2020a) and the updated results included in this report. The updated estimates all followed the same pattern as the previous ones. All the updated effectiveness estimates were statistically significant, except for collision claim frequency. The collision and PDL results have stabilized, with minimal changes. The magnitude of the BI benefit has increased slightly and is now more in line with expectations. Changes in MedPay and PIP remained consistent with previous findings, but with smaller confidence bounds.

Figure 2: Changes in claim frequency for Traffic Jam Assist, initial versus updated results



Discussion

This is the second study examining changes in insurance losses associated with Audi's Traffic Jam Assist system on the 2017 Q7 and A4. Traffic Jam Assist was associated with claim frequency reductions across all coverages. While some reduction in frequencies may have been expected, the magnitude of the reduction was surprising given that the comparison vehicles were also equipped with the same suite of other ADAS features. The reduction in PDL claim frequency of 18 percent exceeds the reduction provided by most front automatic emergency braking systems. Given these large reductions in insurance losses for a system that is linked with other related systems and only operational at speeds of 40 mph or below, it is unclear how much of the benefit is derived from the system alone or is attributable to a nonvehicle-related factor that HLDI's data cannot account for.

Research on the real-world effects of Level 2 driving automation has thus far been limited and inconclusive. An evaluation of Nissan's ProPilot Assist (HLDI, 2021a) found reductions in claim frequency, but most of the reductions were not statistically significant. Meanwhile, BMW's Driver Assistance Plus package, a combination of several systems capable of Level 2 automation, was associated with some of the largest frequency reductions seen thus far for an advanced driver assistance package (HLDI, 2021b). However, results were comparable to those of the similar Driver Assistance package, which includes adaptive cruise control but not lane centering. This suggests the frequency reductions may be attributable to factors other than the increased automation, i.e., from lane centering.

Audi's Traffic Jam Assist was associated with a decrease in collision claim frequency but an increase in severity. Although a higher cost for repairing or replacing the damaged systems could be a reason for the increased claim severity, a shift in the distribution of claim costs could be another possible reason. **Figure 3** shows the collision claim frequency by severity range for Traffic Jam Assist. Collision claim frequency was reduced by 8 percent for low-severity claims, 2 percent for mid-severity claims, and 5 percent for high-severity claims. Consequently, some of the increase in collision claim severity is likely attributable to a greater reduction in lower severity claims, resulting in the claim severity distribution shifting towards a higher mean.

Figure 4 shows that Audi's Traffic Jam Assist was also associated with reductions to PDL claim frequencies across all severity ranges. Unlike the collision results, the largest reduction for PDL was seen in high-severity claims (32 percent), followed by the claim frequency reductions of 16 percent for low-severity claims and 15 percent for mid-severity claims. Changes in all three severity ranges were statistically significant. As a result, Traffic Jam Assist was associated with a significant 8 percent decrease in PDL claim severity. However, it is unclear why the patterns of collision and PDL claim frequency by severity range varied, and it should be noted that the amount of data by severity range was limited.

Figure 3: Changes in collision claim frequency by severity range for Traffic Jam Assist

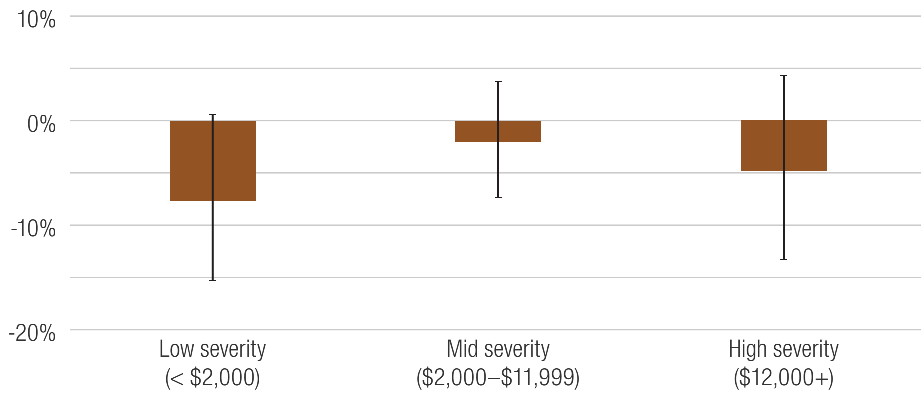
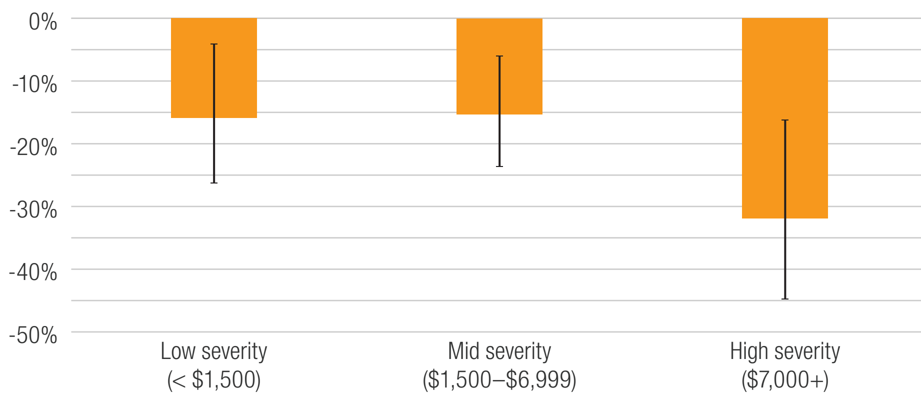


Figure 4: Changes in PDL claim frequency by severity range for Traffic Jam Assist



Results for Traffic Jam Assist varied between the Q7 and A4. It is unclear whether those differences are a result of randomness in the limited data available, differences in the vehicle types, or other unknown factors. Further research is needed to better understand the mechanism by which Traffic Jam Assist is reducing claim frequencies.

Limitations

ADAS and driving automation technology can only affect insurance losses if the technology is used by drivers. Many ADAS systems, like forward collision warning and automatic emergency braking, are enabled at ignition or are left on by drivers (Reagan et al., 2018). In contrast, driving automation technologies like Traffic Jam Assist need to be activated each time they are used, and drivers mostly use Level 1 and Level 2 driving automation technology on limited-access freeways and highways (Reagan et al., 2019). Traffic Jam Assist can only be used in a relatively narrow set of conditions. It is unknown how much of typical driving is done under conditions that would allow the use of Traffic Jam Assist. Hence, driving automation technology like the system examined in this study may only act on a limited population of crashes. This suggests that the actual effect of Traffic Jam Assist on insurance losses may be much greater than the effect observed in this study.

Additionally, the data supplied to HLDI do 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, the backup camera is designed to prevent collisions when a vehicle is backing up. All collisions, regardless of the ability of a feature to mitigate or prevent the crash, are included in the analysis.

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

References

Highway Loss Data Institute. (2018). Audi collision avoidance features: 2010–17 model years. *Loss Bulletin*, *35*(44).

Highway Loss Data Institute. (2020a). Audi's Traffic Jam Assist. *Loss Bulletin*, *37*(6).

Highway Loss Data Institute. (2020b). Compendium of HLDI collision avoidance research. *Loss Bulletin*, *37*(12).

Highway Loss Data Institute. (2021a). Advanced Driver Assistance Systems on the 2017–19 Nissan Rogue. *Loss Bulletin*, *38*(1).

Highway Loss Data Institute. (2021b). 2013–17 BMW collision avoidance features — a 2021 update. *Loss Bulletin*, *38*(26).

Reagan, I.J., Hu, W., Cicchino, J.B., Seppelt, B., Fridman, L., & Glazer, M. (2019). Measuring adult drivers' use of Level 1 and 2 driving automation by roadway functional class. *Proceedings of the Human Factors and Ergonomics Society 2019 Annual Meeting, 63*(1), 2093–2097.

Reagan, I.J., Cicchino, J.B., Kerfoot, L.B., & Weast, R.A. (2018). Crash avoidance and driver assistance technologies — Are they used? *Transportation Research Part F*, 52, 176–190.

SAE International. (2018). *Taxonomy and definitions for terms related to driving automation systems for on-road motor vehicles* (SAE J3016_201806).

Appendix

Appendix: Illustrative regression results — collision frequency

Parameter		Degrees of freedom	Estimate	Effect	Standard error	Wald 95% confidence limits		Chi-square	P-value
Intercept		1	-9.0084		0.0498	-9.1061	-8.9107	32674.03	<0.0001
Calendar year	2016	1	0.3865	47.2%	0.0528	0.2829	0.4902	53.46	<0.0001
	2017	1	0.4700	60.0%	0.0361	0.3992	0.5408	169.12	<0.0001
	2018	1	0.3841	46.8%	0.0357	0.3141	0.4541	115.70	<0.0001
	2019	1	0.3409	40.6%	0.0362	0.2698	0.4121	88.25	<0.0001
	2021	1	0.1673	18.2%	0.0384	0.0920	0.2426	18.97	<0.0001
	2020	0	0	0	0	0	0		
Vehicle series	A4 2WD	1	0.1444	15.5%	0.1655	-0.1799	0.4687	0.76	0.3829
	A4 ALLROAD QUAT SW 4WD	1	-0.0126	-1.3%	0.0901	-0.1892	0.1640	0.02	0.8885
	A4 QUATTRO 4D 4WD	1	0.1213	12.9%	0.0382	0.0463	0.1964	10.05	0.0015
	Q7 4D 4WD	0	0	0	0	0	0		
Rated driver age group	14–24	1	-0.1224	-11.5%	0.0647	-0.2493	0.0044	3.58	0.0585
	25–29	1	0.1893	20.8%	0.0650	0.0617	0.3168	8.46	0.0036
	30–39	1	0.0363	3.7%	0.0306	-0.0238	0.0964	1.40	0.2366

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Parameter		Degrees of freedom	Estimate	Effect	Standard error	Wald 95% confidence limits		Chi-square	P-value
	50–59	1	-0.1335	-12.5%	0.0326	-0.1975	-0.0695	16.74	<0.0001
	60–64	1	-0.0670	-6.5%	0.0477	-0.1606	0.0264	1.98	0.1597
	65–69	1	-0.0039	-0.4%	0.0519	-0.1058	0.0979	0.01	0.9389
	70+	1	-0.0301	-3.0%	0.0476	-0.1234	0.0632	0.40	0.5273
	Unknown	1	-0.1479	-13.7%	0.0783	-0.3015	0.0056	3.56	0.0590
	40–49	0	0	0	0	0	0		
Rated driver gender	Male	1	-0.0521	-5.1%	0.0225	-0.0964	-0.0078	5.33	0.0210
	Unknown	1	0.0404	4.1%	0.0942	-0.1442	0.2251	0.18	0.6677
	Female	0	0	0	0	0	0		
Rated driver marital status	Single	1	0.1892	20.8%	0.0302	0.1299	0.2486	39.11	<0.0001
	Unknown	1	-0.0855	-8.2%	0.0731	-0.2290	0.0578	1.37	0.2424
	Married	0	0	0	0	0	0		
Risk	Nonstandard	1	0.2464	27.9%	0.0640	0.1208	0.3719	14.80	0.0001
	Standard	0	0	0	0	0	0		
State	Alabama	1	0.0142	1.4%	0.1279	-0.2364	0.2649	0.01	0.9110
	Alaska	1	0.3048	35.6%	0.3559	-0.3928	1.0025	0.73	0.3918
	Arizona	1	0.0095	1.0%	0.0999	-0.1863	0.2053	0.01	0.9241
	Arkansas	1	0.1715	18.7%	0.1901	-0.2011	0.5441	0.81	0.3670
	California	1	0.2439	27.6%	0.0434	0.1587	0.3291	31.49	<0.0001
	Colorado	1	0.2801	32.3%	0.0716	0.1396	0.4206	15.28	<0.0001
	Connecticut	1	0.1181	12.5%	0.0876	-0.0535	0.2899	1.82	0.1774
	Delaware	1	0.1641	17.8%	0.1802	-0.1892	0.5174	0.83	0.3627
	Dist of Columbia	1	0.2698	31.0%	0.1833	-0.0894	0.6290	2.17	0.1411
	Florida	1	-0.1269	-11.9%	0.0540	-0.2329	-0.0210	5.52	0.0188
	Georgia	1	-0.0612	-5.9%	0.0689	-0.1964	0.0738	0.79	0.3742
	Hawaii	1	0.3473	41.5%	0.2163	-0.0766	0.7713	2.58	0.1084
	Idaho	1	0.0655	6.8%	0.2171	-0.3600	0.4911	0.09	0.7627
	Illinois	1	0.1485	16.0%	0.0584	0.0338	0.2631	6.45	0.0111
	Indiana	1	0.0053	0.5%	0.1232	-0.2362	0.2470	0.00	0.9652
	Iowa	1	-0.1886	-17.2%	0.1834	-0.5482	0.1709	1.06	0.3037
	Kansas	1	-0.2775	-24.2%	0.1751	-0.6208	0.0657	2.51	0.1131
	Kentucky	1	-0.1484	-13.8%	0.1681	-0.4780	0.1811	0.78	0.3774
	Louisiana	1	0.2521	28.7%	0.0935	0.0688	0.4353	7.27	0.0070
	Maine	1	-0.1578	-14.6%	0.3359	-0.8161	0.5005	0.22	0.6385
	Maryland	1	0.2082	23.1%	0.0709	0.0692	0.3472	8.63	0.0033
	Massachusetts	1	0.5388	71.4%	0.0727	0.3962	0.6814	54.85	<0.0001
	Michigan	1	0.3696	44.7%	0.0993	0.1749	0.5643	13.84	0.0002
	Minnesota	1	-0.0038	-0.4%	0.1001	-0.2000	0.1923	0.00	0.9693
	Mississippi	1	-0.0064	-0.6%	0.2041	-0.4066	0.3937	0.00	0.9748
	Missouri	1	0.2058	22.9%	0.1084	-0.0067	0.4184	3.60	0.0577
	Montana	1	-0.0219	-2.2%	0.2955	-0.6012	0.5573	0.01	0.9408
	Nebraska	1	-0.1298	-12.2%	0.2161	-0.5535	0.2938	0.36	0.5480
	Nevada	1	0.1337	14.3%	0.1104	-0.0827	0.3502	1.47	0.2259
	New Hampshire	1	-0.1200	-11.3%	0.1870	-0.4867	0.2466	0.41	0.5211

Appendix: Illustrative regression results — collision frequency									
Parameter		Degrees of freedom	Estimate	Effect	Standard error	Wald 95% confidence limits		Chi-square	P-value
	New Jersey	1	0.0336	3.4%	0.0605	-0.0851	0.1523	0.31	0.5791
	New Mexico	1	-0.0298	-2.9%	0.2087	-0.4389	0.3793	0.02	0.8864
	New York	1	0.1632	17.7%	0.0524	0.0603	0.2661	9.67	0.0019
	North Carolina	1	-0.0342	-3.4%	0.0747	-0.1808	0.1122	0.21	0.6464
	North Dakota	1	-0.2545	-22.5%	0.4124	-1.0629	0.5537	0.38	0.5370
	Ohio	1	0.0287	2.9%	0.0881	-0.1441	0.2015	0.11	0.7446
	Oklahoma	1	0.0997	10.5%	0.1216	-0.1387	0.3381	0.67	0.4124
	Oregon	1	0.0217	2.2%	0.1066	-0.1871	0.2307	0.04	0.8382
	Pennsylvania	1	0.1685	18.4%	0.0638	0.0434	0.2937	6.97	0.0083
	Rhode Island	1	0.3964	48.6%	0.1831	0.0374	0.7553	4.69	0.0304
	South Carolina	1	0.0074	0.7%	0.1053	-0.1989	0.2139	0.01	0.9435
	South Dakota	1	0.2946	34.3%	0.3377	-0.3674	0.9566	0.76	0.3831
	Tennessee	1	-0.0648	-6.3%	0.0984	-0.2578	0.1281	0.43	0.5101
	Utah	1	-0.0331	-3.3%	0.1351	-0.2979	0.2317	0.06	0.8065
	Vermont	1	0.3476	41.6%	0.2402	-0.1232	0.8184	2.09	0.1479
	Virginia	1	0.0488	5.0%	0.0667	-0.0821	0.1797	0.53	0.4650
	Washington	1	0.0439	4.5%	0.0732	-0.0996	0.1875	0.36	0.5489
	West Virginia	1	0.1875	20.6%	0.2803	-0.3619	0.7370	0.45	0.5036
	Wisconsin	1	0.0163	1.6%	0.1171	-0.2133	0.2460	0.02	0.8891
	Wyoming	1	0.6249	86.8%	0.3384	-0.0384	1.2882	3.41	0.0648
	Texas	0	0	0	0	0	0		
Deductible range	0–250	1	0.0255	2.6%	0.0330	-0.0392	0.0903	0.60	0.4395
	501–1000	1	-0.1962	-17.8%	0.0249	-0.2452	-0.1472	61.67	<0.0001
	1001+	1	-0.5781	-43.9%	0.0881	-0.7509	-0.4053	43.02	<0.0001
	251–500	0	0	0	0	0	0		
Registered vehicle density	0–99	1	-0.1289	-12.1%	0.0494	-0.2259	-0.0319	6.78	0.0092
	100–499	1	-0.0688	-6.6%	0.0284	-0.1246	-0.0131	5.86	0.0155
	500+	0	0		0	0	0		
Traffic Jam Assist		1	-0.0408	-4.0%	0.0216	-0.0832	0.0015	3.56	0.0592

HLDI
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The Highway Loss Data Institute is a nonprofit public service organization that gathers, processes, and publishes insurance data on the human and economic losses associated with owning and operating motor vehicles. DW202204 DH Run 1174