

Insurance Report



Whole vehicle theft losses

2016–18 Passenger Cars, Pickups, SUVs, and Vans

WT-18 May 2019



Highlights

The 2016–18 model year passenger vehicles combined had a whole vehicle theft claim frequency of 0.27 claims per 1,000 insured vehicle years and an average loss payment per whole vehicle theft (claim severity) of \$30,164, resulting in an average loss payment per insured vehicle year (overall loss) of \$8.

Whole vehicle theft overall losses were highest for very large luxury cars (\$46 per insured vehicle year). Large two-door cars, a category consisting of variants of the Dodge Challenger, had the second-highest overall losses (\$33). Mini sports cars had the lowest overall losses (\$2).

Whole vehicle theft claim frequencies were highest for large two-door cars (0.98 claims per 1,000 insured vehicle years) and lowest for mini sports cars (0.08 claims). Very large luxury cars had the second-highest whole vehicle theft claim frequencies (0.52 claims).

Whole vehicle theft claim severities were highest for very large luxury cars (\$89,362 per claim) and lowest for mini four-door cars (\$13,325).

The Dodge Charger HEMI, a large four-door car, had the highest relative whole vehicle theft claim frequency at more than 5 times the all-passenger-vehicle average. The BMW 3 series four-door, a midsize luxury car, had the lowest relative whole vehicle theft claim frequency, equal to just 4.

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► Introduction

Theft claims under comprehensive coverage in the Highway Loss Data Institute (HLDI) database can result from three different types of thefts: theft of contents from a vehicle, theft of vehicle parts, and theft of the entire vehicle. Most companies do not supply data to HLDI about the type of theft. Using the methodology defined in the **Appendix**, vehicle age and price were used to classify total theft losses.

The purpose of the current analysis is to quantify the extent to which whole vehicle theft varies by vehicle size/class and make/series. This report is an update of previous HLDI reports and presents whole vehicle theft losses under comprehensive coverage for passenger vehicles produced during model years 2016–18. Vehicles in this report were up to 4 years old during the period studied.

Results for all 2016–18 vehicles are included in the overall totals and in the separate totals for class and size subgroups in the principal table (**Table 4**). A detailed description of these class and size subgroups appears in the HLDI *Technical Appendix* (2010). Reporting requirements were 20,000 insured vehicle years of exposure or 100 claims. A total of 319 passenger car, pickup, SUV, and van series met this reporting criterion.

Results in this report were standardized to control for the effect of demographic and geographic variables, to accurately assess the contribution of the vehicle to insurance losses. Losses were standardized by calendar year, model year, garaging state, number of registered vehicles per square mile (vehicle density), driver age, gender, marital status, deductible, and risk. Standardization was accomplished using a two-step process. First, regression models were constructed to produce estimates for each variable for claim frequency, claim severity, and overall losses. Then, the estimates were reweighted so that every vehicle has the same exposure distribution across all of the variables in the model.

This standardization procedure was first described in HLDI special report A-77, *Make and Series Results and Modeling* (2008). Further modifications were described in special report A-82, *Collision Losses After All-Variable Standardization* (2009). For details about this procedure, see *HLDI Loss Data Computation Methods* (2018).

Van sizing and classification change

HLDI is using a new size and classification scheme for vans. The HLDI vehicle class name of *cargo/passenger van* was changed to *van*, and cargo variants of vans or minivans are now classed with their noncargo variants. For more information, see *HLDI Van Sizing and Classification Change* (2017).

► Whole vehicle theft losses by vehicle type

Table 1 lists whole vehicle theft losses for 2016–18 passenger vehicles by vehicle type after all-variable standardization. The 2016–18 model year passenger vehicles combined had a whole vehicle theft claim frequency of 0.27 claims per 1,000 insured vehicle years and an average loss payment per whole vehicle theft (claim severity) of \$30,164, resulting in an average loss payment per insured vehicle year (overall loss) of \$8. Pickups had the highest whole vehicle theft claim frequency (0.38), claim severity (\$41,056), and overall losses (\$16).

Table 1: Whole vehicle theft losses for 2016–18 model years by vehicle type after all-variable standardization

Vehicle type	Claim frequency	Claim severity	Overall loss
Passenger cars	0.29	\$24,226	\$7
Pickups	0.38	\$41,056	\$16
SUVs	0.21	\$32,346	\$7
All passenger vehicles*	0.27	\$30,164	\$8

*All-passenger-vehicle total includes 23,122 years of exposure and five claims from vans.

► **Whole vehicle theft losses by class and size**

Figures 1–3 show relative whole vehicle theft claim frequencies, claim severities, and overall losses by vehicle class and size for 2016–18 models. In each figure, the value 100 represents the average result for all passenger vehicles.

Relative claim frequencies ranged from 30 for mini sports cars to 366 for large two-door cars, a category consisting of variants of the Dodge Challenger. Very large luxury cars had the second-highest relative whole vehicle theft claim frequency (193) (Figure 1). Relative claim severities ranged from 44 for four-door minicars to 296 for very large luxury cars (Figure 2). Relative overall losses ranged from 26 for mini sports cars to 572 for very large luxury cars (Figure 3). Two-door microcars, small sports cars, small luxury cars, and large vans did not have enough exposure to produce credible results.

Figure 1: Relative whole vehicle theft claim frequencies by class and size, 2016–18 model years

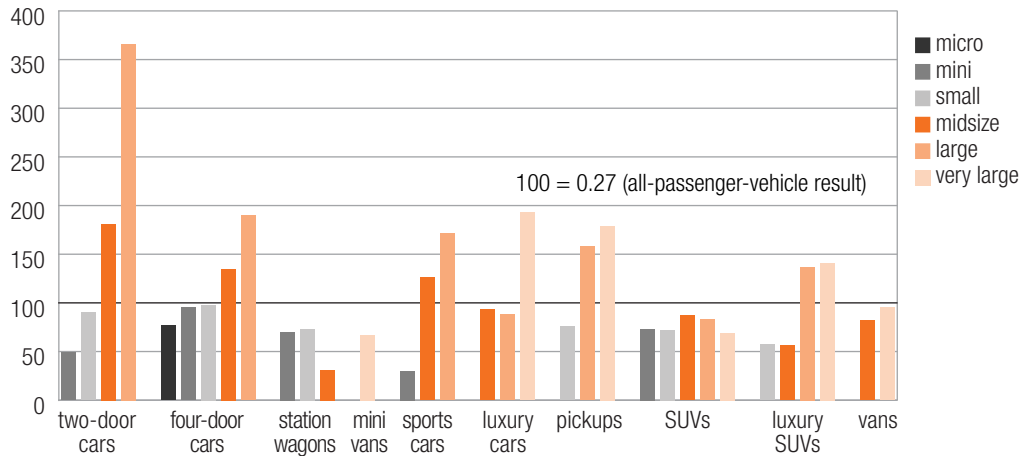


Figure 2: Relative whole vehicle theft claim severities by class and size, 2016–18 model years

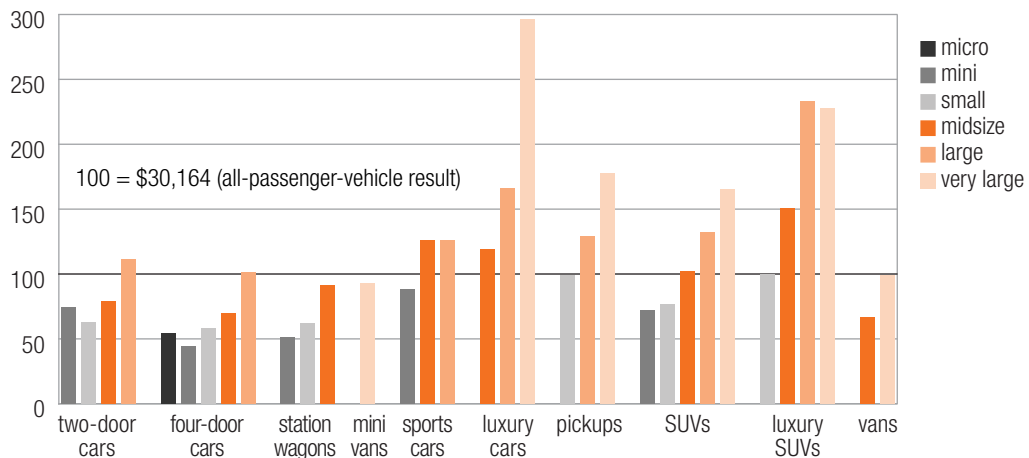
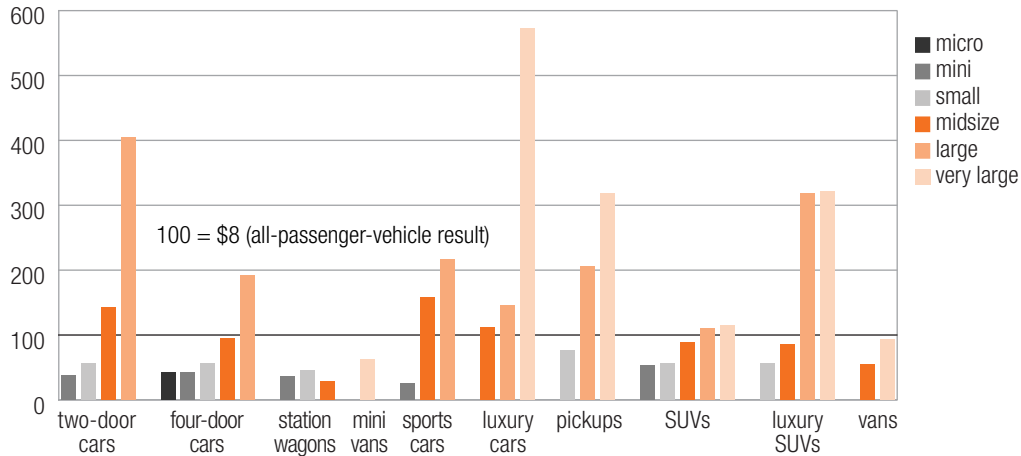


Figure 3: Relative whole vehicle theft overall losses by class and size, 2016–18 model years



► **Best and worst whole vehicle theft losses**

Table 2 lists the 20 vehicle series with the highest (worst) relative claim frequencies for whole vehicle theft. The Dodge Charger HEMI had the worst result (544). All the vehicle series with the worst theft claim frequencies had overall losses that were more than twice the all-passenger-vehicle average.

Table 2: Highest whole vehicle theft claim frequencies, 2016–18 model years

Make	Series	Model years	Exposure (insured vehicle years)	Claims	Relative claim frequency	Relative claim severity	Relative overall losses
Dodge	Charger HEMI	16–18	74,467	108	544	115	627
Dodge	Challenger SRT Hellcat	16–18	20,647	29	529	190	1,002
Infiniti	Q50 4dr	16–18	50,923	71	525	113	594
Infiniti	QX80 4dr	16–18	22,380	25	422	179	757
GMC	Sierra 1500 crew cab	16–18	56,626	59	393	135	531
Dodge	Challenger	16–18	168,373	161	358	96	342
Nissan	Maxima	16–18	256,941	241	351	92	323
Chevrolet	Silverado 1500 crew cab	16–18	182,637	156	320	121	388
Chrysler	300 4WD	16–18	44,825	35	293	94	276
Mercedes-Benz	S class 4dr LWB 4WD	16–18	20,578	16	291	295	859
Dodge	Charger 4WD	16–18	32,744	24	274	87	240
Dodge	Durango 4dr 4WD	16–18	114,046	83	271	122	331
Land Rover	Range Rover 4dr 4WD	16–18	45,369	33	271	305	825
Chevrolet	Silverado 1500 crew cab 4WD	16–18	469,847	338	269	146	392
Dodge	Charger	16–18	95,638	68	266	77	205
Nissan	Titan crew cab short bed	17–18	20,014	13	250	116	291
Chevrolet	Silverado 1500	16–18	22,367	15	248	94	233
GMC	Sierra 1500 crew cab 4WD	16–18	244,371	157	241	158	382
Audi	A7 4dr 4WD	16–18	25,370	16	239	191	456
Infiniti	QX80 4dr 4WD	16–18	27,852	18	236	210	497

Table 3 lists the 20 vehicle series with the lowest (best) relative claim frequencies for whole vehicle theft. The BMW 3 series four-door, a midsize luxury car, headed the list with a relative claim frequency equal to just 4. All vehicles with the best results had whole vehicle theft claim frequencies that were less than one-third of the all-passenger-vehicle average. All of the best vehicles had whole vehicle theft overall losses that were less than half of the all-passenger-vehicle average.

Table 3: Lowest whole vehicle theft claim frequencies, 2016–18 model years

Make	Series	Model years	Exposure (insured vehicle years)	Claims	Relative claim frequency	Relative severity	Relative overall losses
BMW	3 series 4dr	16–18	104,901	1	4	106	5
Tesla	Model S 4dr electric 4WD	16–18	63,875	2	11	246	26
Tesla	Model X 4dr electric 4WD	16–18	54,003	2	12	270	31
Chevrolet	Equinox 4dr 4WD	18	84,215	3	15	84	13
Buick	Encore 4dr 4WD	16–18	81,292	3	15	81	12
Subaru	Legacy 4WD with EyeSight	16–18	121,979	6	17	80	14
GMC	Acadia 4dr	17–18	79,985	4	19	111	21
Subaru	Forester 4dr 4WD with EyeSight	16–18	275,420	15	20	100	20
GMC	Acadia 4dr 4WD	17–18	81,386	4	20	139	28
Volkswagen	New Beetle	16–18	36,469	2	21	63	13
BMW	3 series 4dr 4WD	16–18	88,303	5	21	117	25
Subaru	Outback 4WD with EyeSight	16–18	536,429	31	22	97	21
BMW	X5 4dr	16–18	35,648	2	22	165	37
Subaru	Crosstrek 4WD	18	48,615	3	25	83	21
Chevrolet	Traverse 4dr	18	39,704	3	26	114	29
Subaru	Crosstrek 4WD with EyeSight	18	46,282	3	26	83	22
Lexus	RX 450h hybrid 4dr 4WD	16–18	29,661	2	28	160	45
Honda	Odyssey	18	86,010	6	28	134	37
Mazda	MX-5 Miata convertible	16–18	50,360	4	30	88	26
Cadillac	XT5 4dr	17–18	90,952	7	30	128	38

► Vehicle series whole vehicle theft losses

Detailed whole vehicle theft results for all 2016–18 passenger vehicles with at least 20,000 insured vehicle years of exposure or 100 paid whole vehicle theft claims are listed in **Table 4**. The values reported are total exposure (insured vehicle years), number of claims, and relative results for three loss categories: claim frequency, claim severity, and overall losses. The value 100 corresponds to the average result for all passenger vehicles in each loss category. Individual series are listed in ascending order of relative overall losses within each size and class group.

The total exposure accumulated for the three model years was more than 23 million insured vehicle years for passenger cars and more than 31 million insured vehicle years for pickups, SUVs, and vans. Whole vehicle theft claims numbered more than 6,700 for passenger cars and more than 7,600 for pickups, SUVs, and vans.

Table 4: Whole vehicle theft losses by series, 2016–18 model years

Make	Series	Model years	Exposure (insured vehicle years)	Claims	Relative claim frequency	Relative claim severity	Relative overall losses
All passenger vehicles		16–18	54,047,620	14,448	100=0.27	100=\$30,164	100=\$8
All passenger cars		16–18	23,022,284	6,759	110	80	88
MICRO CARS							
4-door		16–18	22,594	5	77	54	42
Mitsubishi	Mirage	17–18	22,594	5	77	54	42
MINI CARS							
2-door		16–18	70,623	9	49	74	37
Mini	Cooper	16–18	40,244	4	37	86	32
4-door		16–18	397,349	101	95	44	42
Chevrolet	Spark	16–18	85,678	12	53	39	21
Mini	Cooper	16–18	36,870	3	34	79	27
Ford		16–18	79,447	15	70	45	32
Mitsubishi	Mirage G4	17–18	22,133	7	122	42	51
Station wagons		16–18	302,586	57	70	51	36
Ford	Fiesta	16–18	59,257	11	70	43	30
Honda	Fit	16–18	205,794	37	67	55	37
Sports		16–18	50,360	4	30	88	26
Mazda	MX-5 Miata convertible	16–18	50,360	4	30	88	26
SMALL CARS							
2-door		16–18	300,446	72	90	63	57
Volkswagen	New Beetle	16–18	36,469	2	21	63	13
Volkswagen	New Beetle convertible	16–18	23,202	2	38	70	26
Honda	Civic	16–18	88,034	19	79	67	53
Scion/Toyota	FR-S/86 series	16–18	27,927	7	92	73	67
4-door		16–18	6,621,719	1,741	98	58	57
Volkswagen	Golf	16–18	50,735	4	30	68	20
Chevrolet	Cruze	16–18	370,209	46	47	56	26
Scion/Toyota	iA/Yaris iA series	16–18	113,540	17	55	48	26
Chevrolet	Sonic	16–18	73,815	14	72	48	34
Volkswagen	GTI	16–18	95,981	12	46	83	38
Mazda	3 hatchback	16–18	121,370	20	61	64	40
Hyundai	Elantra	17–18	464,652	111	89	55	49
Mazda	3	16–18	209,555	48	85	60	51

Table 4: Whole vehicle theft losses by series, 2016–18 model years

Make	Series	Model years	Exposure (insured vehicle years)	Claims	Relative claim frequency	Relative claim severity	Relative overall losses
Chevrolet	Cruze hatchback	17–18	45,582	11	89	59	52
Kia	Forte	16–18	310,073	93	112	51	57
Toyota	Prius hybrid	16–18	250,379	51	76	75	57
Ford	Focus	16–18	245,409	73	111	52	57
Toyota	Corolla	16–18	1,154,446	330	107	55	59
Subaru	WRX 4WD	16–18	164,164	26	59	103	61
Subaru	Impreza 4WD	17–18	29,128	7	90	68	62
Toyota	Prius c hybrid	16–18	39,472	12	118	57	67
Nissan	Versa	16–18	189,527	86	171	41	70
Honda	Civic	16–18	1,061,137	315	111	65	73
Volkswagen	Golf R 4WD	16–18	21,347	3	59	124	73
Nissan	Sentra	16–18	442,498	179	152	51	78
Honda	Civic hatchback	17–18	120,281	35	110	74	82
Toyota	Prius Prime plug-in hybrid	17–18	36,080	9	98	89	87
Acura	ILX	16–18	90,367	28	115	78	90
Station wagons		16–18	1,546,395	301	73	62	45
Chevrolet	Sonic	16–18	30,737	3	35	53	19
Subaru	Crosstrek 4WD	18	48,615	3	25	83	21
Subaru	Crosstrek 4WD with EyeSight	18	46,282	3	26	83	22
Nissan	Versa Note	16–18	60,382	9	59	43	25
Scion/Toyota	iM/Corolla iM series	16–18	74,445	10	50	52	26
Subaru	Impreza 4WD	17–18	56,137	6	43	68	29
Ford	C-Max hybrid	16–18	23,272	3	53	60	32
Volkswagen	Golf	16–18	31,494	4	51	63	32
Subaru	Impreza 4WD with EyeSight	17–18	31,737	3	38	86	32
Volkswagen	Golf Alltrack 4WD	17–18	29,767	4	44	79	35
Ford	Focus	16–18	164,354	31	71	62	44
Kia	Soul	16–18	442,275	126	106	52	55
Kia	Forte	16–18	36,677	10	105	52	55
MIDSIZE CARS							
2-door		16–18	74,842	36	181	79	142
4-door		16–18	7,094,783	2,559	135	70	95
Subaru	Legacy 4WD with EyeSight	16–18	121,979	6	17	80	14
Ford	Fusion hybrid	16–18	64,061	6	32	71	23
Mazda	6	16–18	235,791	37	58	66	38
Subaru	Legacy 4WD	16–18	121,685	19	60	66	40
Volkswagen	Jetta	16–18	433,561	82	71	58	41
Hyundai	Sonata hybrid	16–18	43,453	7	58	74	43
Ford	Fusion plug-in hybrid	16–18	45,789	6	52	101	53
Volkswagen	Passat	16–18	214,227	53	92	66	60
Chevrolet	Malibu	16–18	466,626	119	95	67	63
Hyundai	Sonata	16–18	483,854	138	106	62	66
Ford	Fusion 4WD	16–18	73,766	17	88	81	71
Ford	Fusion	16–18	672,224	203	113	64	72

Table 4: Whole vehicle theft losses by series, 2016–18 model years

Make	Series	Model years	Exposure (insured vehicle years)	Claims	Relative claim frequency	Relative claim severity	Relative overall losses
Toyota	Camry	18	199,323	61	114	84	96
Kia	Optima	16–18	301,545	124	154	63	98
Nissan	Altima	16–18	632,682	300	178	63	112
Honda	Accord	18	125,122	58	175	87	151
Nissan	Maxima	16–18	256,941	241	351	92	323
Station wagons		16–18	788,567	66	31	91	28
Subaru	Outback 4WD with EyeSight	16–18	536,429	31	22	97	21
Subaru	Outback 4WD	16–18	252,138	34	51	84	43
Sports		16–18	481,700	162	126	126	158
Ford	Mustang convertible	16–18	34,920	8	88	95	84
Ford	Mustang 2dr	16–18	145,765	45	116	74	87
Chevrolet	Corvette 2dr	16–18	54,063	12	86	169	146
Ford	Mustang GT 2dr	16–18	116,717	56	180	107	192
Nissan	370Z 2dr	16–18	20,593	13	229	105	241
Chevrolet	Corvette Z06 2dr	16–18	27,669	10	138	274	377
Luxury		16–18	1,700,994	424	93	119	111
BMW	3 series 4dr	16–18	104,901	1	4	106	5
BMW	3 series 4dr 4WD	16–18	88,303	5	21	117	25
Cadillac	ATS 4dr 4WD	16–18	20,715	2	37	108	40
Audi	A3 4dr 4WD	16–18	47,361	6	45	92	42
Cadillac	ATS 4dr	16–18	30,959	4	48	89	43
BMW	4 series 4dr	16–18	34,195	3	33	131	44
Audi	A4 4dr 4WD	17–18	68,105	7	38	129	49
Audi	A4 4dr	17–18	25,415	4	59	106	63
Lexus	ES 300h hybrid 4dr	16–18	27,493	4	53	120	63
Lincoln	MKZ hybrid 4dr	16–18	27,808	5	64	101	65
Mercedes-Benz	C class 4dr	16–18	109,524	18	62	119	74
Lexus	IS 300 4dr 4WD	16–18	38,132	7	69	113	78
Lexus	ES 350 4dr	16–18	199,316	34	64	124	79
Lincoln	MKZ 4dr	16–18	51,129	11	80	103	82
BMW	4 series 4dr 4WD	16–18	23,539	4	57	144	82
Audi	A3 4dr	16–18	37,363	10	100	84	84
Mercedes-Benz	CLA class 4dr 4WD	16–18	27,681	5	69	122	85
Mercedes-Benz	CLA class 4dr	16–18	46,785	12	97	99	96
Acura	TLX 4dr	16–18	105,848	31	110	94	104
Mercedes-Benz	C class 4dr 4WD	16–18	109,355	33	113	119	134
Lincoln	MKZ 4dr 4WD	16–18	38,505	13	129	113	145
Infiniti	Q50 4dr 4WD	16–18	50,803	18	132	116	153
Infiniti	Q50 4dr	16–18	50,923	71	525	113	594
LARGE CARS							
2-door		16–18	203,274	199	366	111	404
Dodge	Challenger	16–18	168,373	161	358	96	342
Dodge	Challenger SRT Hellcat	16–18	20,647	29	529	190	1,002

Table 4: Whole vehicle theft losses by series, 2016–18 model years

Make	Series	Model years	Exposure (insured vehicle years)	Claims	Relative claim frequency	Relative claim severity	Relative overall losses
4-door		16–18	841,872	427	190	101	192
Toyota	Avalon hybrid	16–18	22,071	4	72	99	72
Buick	LaCrosse	17–18	27,513	6	85	90	76
Chevrolet	Impala	16–18	164,573	51	117	77	90
Toyota	Avalon	16–18	108,342	28	98	93	92
Ford	Taurus	16–18	42,697	14	121	77	93
Chrysler	300	16–18	68,535	24	129	88	113
Dodge	Charger	16–18	95,638	68	266	77	205
Dodge	Charger 4WD	16–18	32,744	24	274	87	240
Chrysler	300 4WD	16–18	44,825	35	293	94	276
Dodge	Charger HEMI	16–18	74,467	108	544	115	627
Sports		16–18	204,597	94	171	126	216
Chevrolet	Camaro convertible	16–18	24,350	7	107	106	114
Chevrolet	Camaro 2dr	16–18	158,542	73	172	102	176
Luxury		16–18	677,742	159	88	166	145
Tesla	Model S 4dr electric 4WD	16–18	63,875	2	11	246	26
Mercedes-Benz	E class 4dr	17–18	43,798	5	46	175	81
Genesis	G80 4dr 2WD/4WD	17–18	29,575	4	54	159	86
Audi	A6 4dr 4WD	16–18	75,138	14	69	148	102
Cadillac	CTS 4dr	16–18	20,252	6	102	116	119
Mercedes-Benz	E class 4dr 4WD	17–18	40,111	8	70	168	119
Audi	A7 4dr 4WD	16–18	25,370	16	239	191	456
VERY LARGE CARS							
Minivans		16–18	1,491,495	266	67	93	62
Chrysler	Pacifica	17–18	219,184	21	35	106	37
Honda	Odyssey	18	86,010	6	28	134	37
Kia	Sedona	16–18	119,394	26	82	84	69
Dodge	Grand Caravan	16–18	220,779	58	99	71	70
Toyota	Sienna 4WD	16–18	69,088	12	64	125	80
Toyota	Sienna	16–18	246,226	60	91	101	93
Luxury		16–18	150,347	78	193	296	572
Cadillac	XTS 4dr	16–18	34,720	5	53	113	60
Mercedes-Benz	S class 4dr LWB	16–18	20,175	12	219	299	655
Mercedes-Benz	S class 4dr LWB 4WD	16–18	20,578	16	291	295	859
All pickups, SUVs, and vans		16–18	31,025,342	7,689	93	117	109
PICKUPS							
All pickups		16–18	7,012,925	2,695	144	136	196
All small pickups		16–18	1,537,848	314	76	99	76
2-door plus		16–18	250,480	57	84	80	67
Toyota	Tacoma xtra cab 4WD	16–18	81,669	8	35	102	35
Chevrolet	Colorado ext cab 4WD	16–18	31,892	3	39	99	38
Chevrolet	Colorado ext cab	16–18	39,580	10	96	73	70
Toyota	Tacoma xtra cab	16–18	47,395	15	118	81	96
Nissan	Frontier ext. cab	16–18	36,206	15	157	66	104

Table 4: Whole vehicle theft losses by series, 2016–18 model years

Make	Series	Model years	Exposure (insured vehicle years)	Claims	Relative claim frequency	Relative claim severity	Relative overall losses
4-door		16–18	1,287,368	257	75	104	78
Chevrolet	Colorado crew cab 4WD	16–18	188,687	17	33	117	39
Chevrolet	Colorado crew cab	16–18	107,731	13	44	90	39
GMC	Canyon crew cab	16–18	43,442	6	48	90	43
GMC	Canyon crew cab 4WD	16–18	68,385	8	45	113	51
Honda	Ridgeline crew cab 4WD	17–18	71,184	7	39	133	52
Toyota	Tacoma double cab 4WD	16–18	336,584	67	75	118	88
Toyota	Tacoma double cab	16–18	186,658	45	90	99	89
Nissan	Frontier crew cab SWB	16–18	84,342	28	126	78	98
Toyota	Tacoma double cab LWB 4WD	16–18	75,698	21	104	119	124
Nissan	Frontier crew cab SWB 4WD	16–18	77,690	34	162	88	142
All large pickups		16–18	4,291,759	1,816	158	129	205
2-door		16–18	124,832	66	199	92	183
Ford	F-150	16–18	33,547	9	101	83	84
Ram	1500 SWB	16–18	21,466	13	229	89	204
Chevrolet	Silverado 1500	16–18	22,367	15	248	94	233
2-door plus		16–18	221,919	53	89	108	95
Ford	F-150 SuperCab 4WD	16–18	157,961	33	79	113	89
Ford	F-150 SuperCab	16–18	63,958	19	113	98	111
4-door		16–18	3,945,008	1,697	161	132	212
Chevrolet	Silverado 1500 ext. cab 4WD	16–18	334,939	49	54	117	64
GMC	Sierra 1500 ext. cab 4WD	16–18	77,178	12	58	115	67
Ram	1500 crew cab LWB 4WD	16–18	59,366	14	89	117	104
Toyota	Tundra double cab 4WD	16–18	97,469	24	93	123	114
Ram	1500 ext. cab 4WD	16–18	158,647	50	117	99	115
Ram	1500 crew cab SWB 4WD	16–18	468,595	134	107	118	126
Toyota	Tundra double cab	16–18	46,505	16	128	104	134
Toyota	Tundra CrewMax	16–18	68,213	23	125	120	151
Ram	1500 ext. cab	16–18	74,388	36	182	88	160
Nissan	Titan crew cab short bed 4WD	17–18	29,158	10	130	133	173
Toyota	Tundra CrewMax 4WD	16–18	226,685	75	124	143	178
Ford	F-150 SuperCrew 4WD	16–18	805,234	260	121	149	180
Ford	F-150 SuperCrew	16–18	240,100	104	162	113	184
Chevrolet	Silverado 1500 ext. cab	16–18	73,414	43	217	99	215
Ram	1500 crew cab SWB	16–18	141,759	88	231	103	238
Nissan	Titan XD crew cab 4WD	16–18	33,961	18	193	143	275
Nissan	Titan crew cab short bed	17–18	20,014	13	250	116	291
GMC	Sierra 1500 crew cab 4WD	16–18	244,371	157	241	158	382
Chevrolet	Silverado 1500 crew cab	16–18	182,637	156	320	121	388
Chevrolet	Silverado 1500 crew cab 4WD	16–18	469,847	338	269	146	392
GMC	Sierra 1500 crew cab	16–18	56,626	59	393	135	531
All very large pickups		16–18	1,183,319	565	179	178	318
2-door		16–18	11,739	11	—	—	—
2-door plus		16–18	49,550	14	103	130	134
Chevrolet	Silverado 2500 ext. cab 4WD	16–18	29,429	5	61	111	67

Table 4: Whole vehicle theft losses by series, 2016–18 model years

Make	Series	Model years	Exposure (insured vehicle years)	Claims	Relative claim frequency	Relative claim severity	Relative overall losses
4-door		16–18	1,122,029	540	180	180	325
Chevrolet	Silverado 3500 crew cab 4WD	16–18	47,775	10	79	172	136
Chevrolet	Silverado 2500 crew cab 4WD	16–18	163,617	35	80	178	141
GMC	Sierra 2500 crew cab 4WD	16–18	96,666	19	75	192	144
GMC	Sierra 3500 crew cab 4WD	16–18	28,172	8	100	200	200
Ram	2500 crew cab LWB 4WD	16–18	31,719	13	151	143	216
Ram	2500 crew cab SWB 4WD	16–18	205,240	80	147	152	223
Ram	3500 crew cab LWB 4WD	16–18	64,132	30	172	156	268
Ram	2500 mega cab 4WD	16–18	36,212	16	162	190	307
Ford	F-350 SuperCrew 4WD	17–18	65,658	36	203	224	453
Ford	F-250 SuperCrew 4WD	17–18	132,699	81	230	212	486
SUVs							
All SUVs		16–18	23,912,482	4,967	78	107	83
Mini SUVs		16–18	552,293	107	73	72	53
Kia	Niro hybrid 4dr	17–18	41,038	4	36	71	26
Honda	HR-V 4dr	16–18	183,287	32	65	67	44
Mazda	CX-3 4dr 4WD	16–18	33,621	6	66	69	46
Honda	HR-V 4dr 4WD	16–18	248,532	57	86	75	65
Small SUVs		16–18	9,155,664	1,773	72	77	56
Chevrolet	Equinox 4dr 4WD	18	84,215	3	15	84	13
Subaru	Forester 4dr 4WD with EyeSight	16–18	275,420	15	20	100	20
Chevrolet	Trax 4dr	16–18	158,880	15	36	60	22
Fiat	500X 4dr	16–18	29,566	3	38	58	22
Chevrolet	Trax 4dr 4WD	16–18	112,125	11	35	67	24
Chevrolet	Equinox 4dr	18	127,908	11	34	84	28
GMC	Terrain 4dr	18	27,090	3	37	95	35
Ford	Escape 4dr 4WD	16–18	506,555	59	43	83	36
Mazda	CX-5 4dr	16–18	227,462	32	52	73	38
Toyota	RAV4 hybrid 4dr 4WD	16–18	164,316	18	40	99	40
Jeep	Renegade 4dr 4WD	16–18	207,466	33	59	67	40
Nissan	Rogue Sport 4dr	17–18	30,623	5	56	72	40
Mazda	CX-5 4dr 4WD	16–18	352,740	48	51	79	40
Subaru	Forester 4dr 4WD	16–18	524,432	72	51	79	41
Nissan	Rogue Sport 4dr 4WD	17–18	36,088	5	57	77	44
Kia	Sportage 4dr 4WD	17–18	99,084	17	65	76	49
Jeep	Renegade 4dr	16–18	90,258	19	80	65	52
Honda	CR-V 4dr 4WD	17–18	364,335	54	55	96	53
Ford	Escape 4dr	16–18	635,712	131	77	71	54
Nissan	Rogue 4dr 4WD	16–18	624,321	126	75	75	56
Jeep	Compass 4dr	17–18	26,032	6	82	71	58
Kia	Sportage 4dr	17–18	95,346	20	80	73	58
Hyundai	Tucson 4dr	16–18	222,231	52	88	68	59
Jeep	Compass 4dr 4WD	17–18	88,985	17	71	84	60
Toyota	C-HR 4dr	18	43,098	10	86	74	64

Table 4: Whole vehicle theft losses by series, 2016–18 model years

Make	Series	Model years	Exposure (insured vehicle years)	Claims	Relative claim frequency	Relative claim severity	Relative overall losses
Nissan	Rogue 4dr	16–18	453,455	112	93	70	64
Fiat	500X 4dr 4WD	16–18	22,822	6	99	66	65
Mitsubishi	Outlander 4dr	16–18	59,709	16	102	64	65
Toyota	RAV4 4dr	16–18	491,670	109	83	80	66
Hyundai	Tucson 4dr 4WD	16–18	191,591	44	87	79	68
Toyota	RAV4 4dr 4WD	16–18	651,025	160	92	84	77
Mitsubishi	Outlander Sport 4dr	16–18	45,536	16	131	61	80
Jeep	Wrangler 2dr SWB 4WD	16–18	133,775	29	80	106	85
Honda	CR-V 4dr	17–18	191,285	52	101	89	90
Mitsubishi	Outlander Sport 4dr 4WD	16–18	39,442	15	141	65	91
Mitsubishi	Outlander 4dr 4WD	16–18	55,778	25	165	73	121
Midsize SUVs		16–18	8,056,444	1,874	87	102	89
GMC	Acadia 4dr	17–18	79,985	4	19	111	21
GMC	Acadia 4dr 4WD	17–18	81,386	4	20	139	28
Chevrolet	Traverse 4dr	18	39,704	3	26	114	29
Ford	Flex 4dr	16–18	28,721	3	35	92	32
Hyundai	Santa Fe Sport 4dr	16–18	205,540	27	48	80	39
Dodge	Journey 4dr 4WD	16–18	69,410	11	61	76	46
Volkswagen	Tiguan 4dr 4WD	18	27,916	4	49	96	47
Hyundai	Santa Fe Sport 4dr 4WD	16–18	158,816	26	62	78	48
Hyundai	Santa Fe 4dr	16–18	63,495	9	52	94	49
Ford	Edge 4dr	16–18	119,527	22	68	93	64
Jeep	Cherokee 4dr 4WD	16–18	458,310	103	84	81	68
Hyundai	Santa Fe 4dr 4WD	16–18	62,796	12	69	102	70
Volkswagen	Tiguan 4dr	18	23,931	5	84	85	71
Ford	Edge 4dr 4WD	16–18	209,282	39	70	103	72
Nissan	Murano 4dr 4WD	16–18	119,484	23	72	101	73
Honda	Pilot 4dr	16–18	197,764	36	68	112	76
Toyota	Highlander 4dr 4WD	16–18	453,564	77	63	121	77
Mazda	CX-9 4dr	16–18	22,412	4	73	105	77
Toyota	4Runner 4dr	16–18	102,453	18	67	117	78
Nissan	Pathfinder 4dr 4WD	16–18	118,079	27	84	96	81
Toyota	Highlander 4dr	16–18	239,750	48	75	110	82
Honda	Pilot 4dr 4WD	16–18	435,939	80	69	120	83
Kia	Sorento 4dr 4WD	16–18	256,319	63	92	91	84
Jeep	Cherokee 4dr	16–18	237,168	83	131	67	88
Kia	Sorento 4dr	16–18	335,945	103	115	81	92
Volkswagen	Atlas 4dr 4WD	18	29,184	6	74	130	96
Nissan	Pathfinder 4dr	16–18	95,382	28	110	87	96
Toyota	4Runner 4dr 4WD	16–18	366,263	75	76	129	98
Jeep	Grand Cherokee 4dr	16–18	112,211	30	101	102	102
Nissan	Murano 4dr	16–18	101,945	31	115	91	105
Jeep	Wrangler 4dr 4WD (NEW)	18	44,483	9	73	148	108
Mazda	CX-9 4dr 4WD	16–18	44,377	12	101	125	126

Table 4: Whole vehicle theft losses by series, 2016–18 model years

Make	Series	Model years	Exposure (insured vehicle years)	Claims	Relative claim frequency	Relative claim severity	Relative overall losses
Jeep	Grand Cherokee 4dr 4WD	16–18	480,413	142	110	114	126
Ford	Explorer 4dr	16–18	319,061	114	134	105	140
Toyota	Highlander hybrid 4dr 4WD	16–18	36,243	10	102	138	141
Jeep	Wrangler 4dr 4WD	16–18	567,295	168	111	128	142
Dodge	Journey 4dr	16–18	214,662	129	225	66	148
Ford	Explorer 4dr 4WD	16–18	544,811	186	128	121	154
Large SUVs		16–18	1,364,875	304	83	132	110
GMC	Yukon 4dr 4WD	16–18	95,999	13	50	181	91
Chevrolet	Tahoe 4dr 4WD	16–18	153,551	29	71	158	113
Dodge	Durango 4dr	16–18	57,540	16	107	106	113
Nissan	Armada 4dr 4WD	17–18	22,567	5	85	154	131
Nissan	Armada 4dr	17–18	24,088	6	95	166	158
GMC	Yukon 4dr	16–18	60,373	17	105	166	175
Chevrolet	Tahoe 4dr	16–18	130,590	43	123	150	185
Dodge	Durango 4dr 4WD	16–18	114,046	83	271	122	331
Very large SUVs		16–18	302,032	56	69	165	115
GMC	Yukon XL 1500 4dr 4WD	16–18	73,130	6	31	187	57
Chevrolet	Suburban 1500 4dr 4WD	16–18	98,617	11	41	167	69
GMC	Yukon XL 1500 4dr	16–18	31,146	9	113	179	202
Chevrolet	Suburban 1500 4dr	16–18	54,144	21	146	160	232
LUXURY SUVs							
Small luxury SUVs		16–18	670,444	103	57	100	57
Buick	Encore 4dr 4WD	16–18	81,292	3	15	81	12
Buick	Encore 4dr	16–18	187,864	23	47	69	32
BMW	X1 4dr 4WD	16–18	86,834	10	43	115	49
Mercedes-Benz	GLA class 4dr 4WD	16–18	43,130	6	48	110	53
Lincoln	MKC 4dr 4WD	16–18	49,301	7	50	109	54
Lincoln	MKC 4dr	16–18	47,562	8	64	99	64
Mercedes-Benz	GLA class 4dr	16–18	34,572	7	80	106	84
Audi	Q3 4dr	16–18	20,757	5	95	103	97
Audi	Q3 4dr 4WD	16–18	59,220	14	89	112	99
Land Rover	Range Rover Evoque 4dr 4WD	16–18	38,332	11	107	129	139
Midsize luxury SUVs		16–18	3,002,378	452	56	151	85
Buick	Envision 4dr 4WD	16–18	41,174	3	31	116	36
BMW	X5 4dr	16–18	35,648	2	22	165	37
Cadillac	XT5 4dr	17–18	90,952	7	30	128	38
Lincoln	MKX 4dr	16–18	54,177	5	32	124	39
Lexus	RX 450h hybrid 4dr 4WD	16–18	29,661	2	28	160	45
Lexus	RX 350 4dr	16–18	143,023	12	32	143	46
Acura	RDX 4dr 4WD	16–18	163,942	20	45	111	50
Volvo	XC90 4dr 4WD	16–18	122,229	11	33	161	53
Acura	RDX 4dr	16–18	96,281	13	51	106	55
Mercedes-Benz	GLC class 4dr	16–18	71,911	8	42	129	55
Audi	Q5 4dr 4WD	18	53,253	6	40	156	63

Table 4: Whole vehicle theft losses by series, 2016–18 model years

Make	Series	Model years	Exposure (insured vehicle years)	Claims	Relative claim frequency	Relative claim severity	Relative overall losses
Mercedes-Benz	GLC class 4dr 4WD	16–18	84,395	9	39	168	66
Land Rover	Discovery Sport 4dr 4WD	16–18	52,721	7	51	131	67
Lexus	RX 350 4dr 4WD	16–18	206,927	23	42	169	70
Acura	MDX 4dr	16–18	76,119	12	60	134	81
Acura	MDX 4dr 4WD	16–18	230,113	36	59	140	82
Mercedes-Benz	GLE class 4dr	16–18	66,213	10	55	155	86
BMW	X4 4dr 4WD	16–18	25,176	4	62	159	98
BMW	X5 4dr 4WD	16–18	133,625	21	59	171	101
Infiniti	QX60 4dr 4WD	16–18	70,370	14	77	136	105
Porsche	Macan 4dr 4WD	16–18	83,827	10	44	246	109
Lincoln	MKX 4dr 4WD	16–18	62,399	15	88	129	114
Mercedes-Benz	GLE class 4dr 4WD	16–18	113,603	23	75	182	136
BMW	X6 4dr 4WD	16–18	21,360	6	107	198	212
Infiniti	QX60 4dr	16–18	45,862	23	188	124	232
Jaguar	F-Pace 4dr 4WD	17–18	42,157	19	169	180	305
Mercedes-Benz	GLE class coupe 4dr 4WD	16–18	26,737	13	176	241	425
Large luxury SUVs		16–18	746,200	273	137	233	318
Tesla	Model X 4dr electric 4WD	16–18	54,003	2	12	270	31
Porsche	Cayenne 4dr 4WD	16–18	60,097	10	62	231	142
Audi	Q7 4dr 4WD	17–18	105,308	21	73	195	143
Lexus	GX 460 4dr 4WD	16–18	105,165	30	107	165	177
Mercedes-Benz	GLS class 4dr 4WD	17–18	54,413	15	106	245	258
Cadillac	Escalade 4dr 4WD	16–18	54,363	17	114	240	275
Land Rover	Range Rover Sport 4dr 4WD	16–18	80,589	44	203	237	480
Infiniti	QX80 4dr 4WD	16–18	27,852	18	236	210	497
Cadillac	Escalade 4dr	16–18	22,794	14	227	225	510
Infiniti	QX80 4dr	16–18	22,380	25	422	179	757
Land Rover	Range Rover 4dr 4WD	16–18	45,369	33	271	305	825
Very large luxury SUVs		16–18	62,153	23	141	228	321
Cadillac	Escalade ESV 4dr 4WD	16–18	34,947	11	116	256	297
All vans		16–18	99,936	28	104	93	97
VANS							
Midsize vans		16–18	23,122	5	82	67	55
Large vans		16–18	5,577	5	—	—	—
Very large vans		16–18	71,236	18	95	99	93
Ford	T-250 Transit cargo	16–18	22,595	2	33	96	32

► Appendix — methodology

Theft claims under comprehensive coverage pay for financial losses associated with any of the three types of theft claims: theft of contents from a vehicle, theft of vehicle parts, and theft of the entire vehicle. Presumably, the cost of a claim for theft of vehicle content and/or personal valuables in a vehicle should be less than the value of the vehicle, while the theft of an entire vehicle should result in a claim that is near the residual value of the vehicle. Therefore, any theft claim that is near the residual value of the vehicle is likely to be a whole vehicle theft.

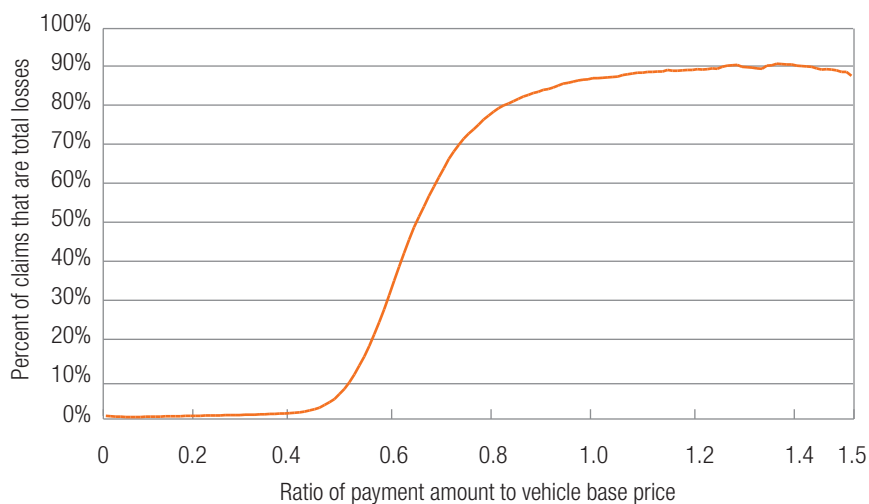
Under collision coverage, a vehicle is declared a total loss when crash damage is so severe that the cost to repair the vehicle is higher than the vehicle's residual value. Insurers then take possession of the damaged vehicle and pay the insured the residual value of the vehicle. Data on collision total loss claims are provided to HLDI. Under comprehensive coverage, when an insured vehicle is stolen, insurers pay the insured the residual value of the vehicle.

Therefore, it can be assumed that total loss payments under collision coverage are approximately equal to payments for whole vehicle theft under comprehensive coverage.

Collision claims data and information on vehicle base price were used to calculate thresholds that approximate vehicle residual values at the calendar year, model year, and make and series level. Those thresholds were then used as a whole vehicle theft threshold. If the payment associated with a theft claim was greater than the threshold value, then it was designated a whole vehicle theft.

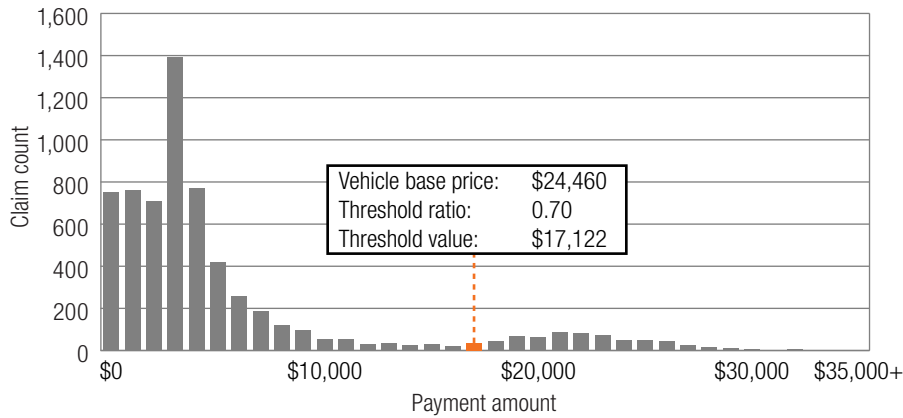
Information on all collision claims for 2016–18 model year vehicles during calendar years 2015–18 was obtained, and each claim was categorized as a total loss or not a total loss. Information on vehicle base price for each vehicle and a ratio of collision payment to vehicle base price was calculated. The relationship between the payment ratio and the likelihood that a claim resulted in a total loss was studied by comparing the percentage of total losses across different values of the payment ratio. For example, among claims with the payment ratio ranging from 0.25 to 0.28, only about 1 percent resulted in a total loss; whereas, among claims with a payment ratio ranging from 0.62 to 0.63, as much as 50 percent resulted in a total loss. The payment ratio of 0.70 was selected as a preliminary threshold amount. At this ratio, two thirds of collision claims with this payment ratio resulted in a total loss. This ratio was selected based on the shape of the distribution curve to balance the proportions of false negatives and false positives. This curve is illustrated in **Appendix Figure 1**.

Appendix Figure 1: Collision total loss likelihood relative to claim payments and vehicle base price

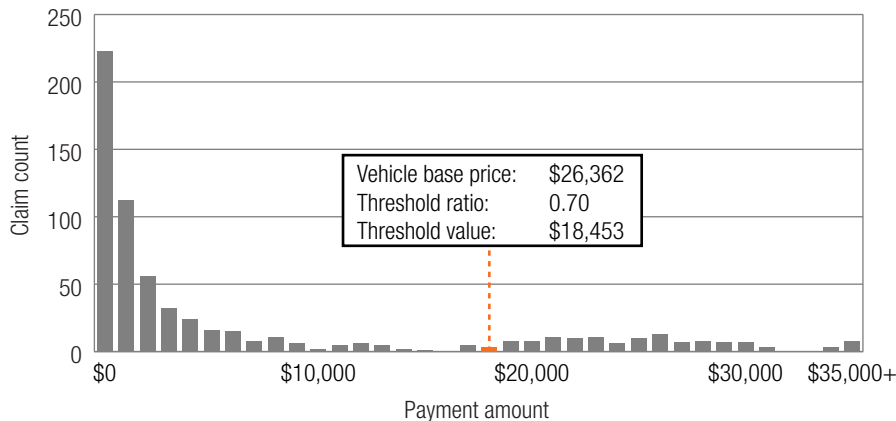


To further verify the validity of this threshold for theft claims, individual claim sizes for three popular vehicles were examined: Honda Accord, Honda CR-V, and Subaru Forester. In general, claim size distributions are different for collision and theft claims. A crash can result in damage for any dollar value between a few hundred dollars and the full price of the vehicle. For theft, a loss is likely to be minor (when some parts are stolen) or major (when the whole vehicle is stolen) and less likely to be in between. When the theft claim size distributions for those three vehicles were examined and base prices were taken into account, the threshold value of 0.70 fit into that “in between” range. The theft claim size distributions for these three vehicles are illustrated in **Appendix Figures 2–4**.

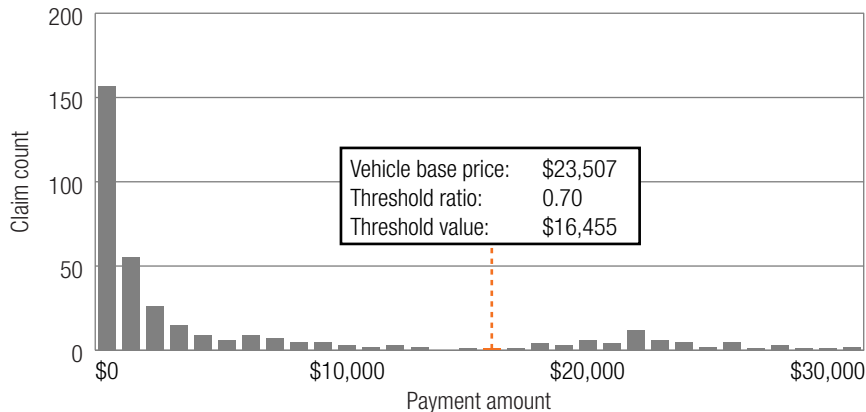
Appendix Figure 2: Honda Accord theft claim size distribution



Appendix Figure 3: Honda CR-V 4WD theft claim size distribution



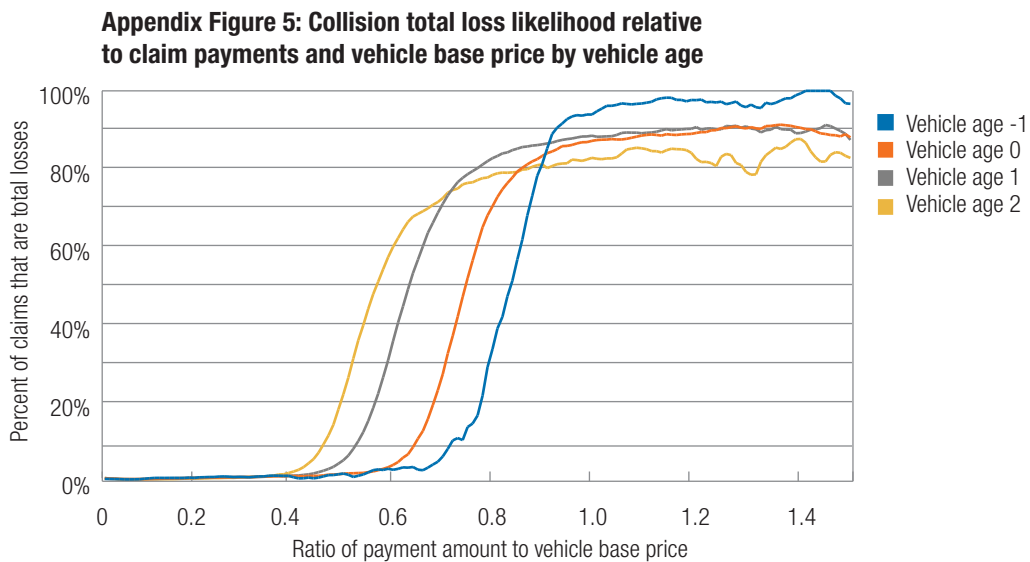
Appendix Figure 4: Subaru Forester 4WD theft claim size distribution



Vehicles depreciate significantly as they age. Consequently, individual thresholds were calculated for each of the possible vehicle ages in the analysis. The ages ranged from -1 to 2. A negative vehicle age occurs when the model year is greater than the calendar year. Vehicles from a model year can and often are sold in the calendar year preceding the model year. These thresholds were selected because two thirds of collision claims associated with the thresholds resulted in a total loss.

Vehicle age	Threshold
-1	0.85
0	0.77
1	0.66
2	0.60

Appendix Figure 5 illustrates the collision total loss likelihood relative to claim payment amounts and vehicle base price by vehicle age. As the vehicle age increases, the total loss threshold decreases.



After these age-level values were selected, theft claims were evaluated to determine if they were likely to be whole vehicle theft claims. For each claim, the payment amount was divided by the vehicle base price. If the resulting ratio was greater than the threshold value appropriate for the age of the vehicle, then the claim was considered a whole vehicle theft. All claims considered to be whole vehicle theft were combined with exposure data and run through HLDI’s all-variable standardization procedure. The end result was that claim frequencies decreased and claim severities increased for the vehicles with the highest theft losses. For example, the 2018 Toyota Camry has an overall theft claim frequency of 2.8, compared with a whole vehicle theft claim frequency of 0.3. Claim severity for this vehicle increased from \$7,350 for any type of theft to \$25,465 for whole vehicle theft.

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