

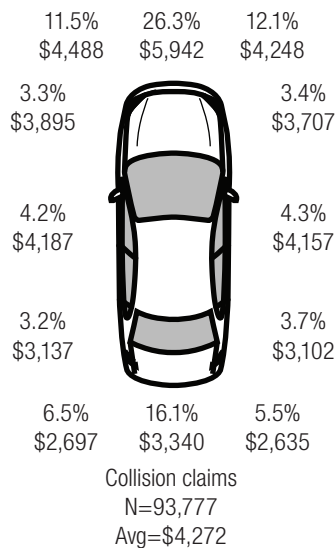


Point of impact and claim size distribution for collision claims by rated driver age

► Summary

Prior HLDI studies have examined collision claim size distributions and how collision claims vary by point of impact (HLDI, 2007). This analysis looks at how collision claim size distributions and losses by point of impact vary by rated driver age group. The purpose of this descriptive analysis is to provide context for future work that will examine how results for collision avoidance systems vary by rated driver age. Results indicate that frontal crashes represent a higher percentage of claims for young drivers than other age groups. By contrast, senior drivers have a higher percentage of rear crashes (primarily rear corners) than other age groups. At every impact point, claim severities for teens are higher than for other age groups, while severities for seniors are lowest for all impact points. Claim size distributions also exhibited differences by age group. Consistent with their low severities by point of impact, seniors had more claims below \$2,000 than the other age groups. Conversely, young drivers had more claims at or above \$10,000 than other age groups.

Percent distribution of collision claims and average damage amount by point of impact



► Introduction

Prior HLDI studies of collision avoidance technologies have controlled for rated driver demographics including age, however HLDI has not conducted a study designed to evaluate whether system benefits vary by driver age. The purpose of this descriptive analysis is to provide context for future work that will examine how results for collision avoidance systems vary by rated driver age.

► Methods

Insurance data

Automobile insurance covers damage 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 collision coverage. Collision coverage insures against physical damage sustained in crashes to insured people's own vehicles.

Previous HLDI studies have shown that certain crash avoidance technologies can cut collision losses. To control for the effect of crash avoidance technologies, vehicles included in this study were limited to 24 series of 2013 midsize four-door or two-door cars for which none of the following forward collision technologies were available: forward collision warning, forward collision warning with auto braking, and front parking sensor. For each series, rear parking camera and sensors were only optional or not available. The list of these vehicles can be found in the [Appendix](#).

Points of impact are provided to HLDI by AudaExplore, CCC Information Services, Inc., and Mitchell. These companies provide automated vehicle repair estimate software used by a large number of auto repair shops and automobile insurers. In addition to the type of claim (PDL, collision, or comprehensive), the estimation data include primary and secondary points of impact for damaged vehicles. Only primary points of impact were used in the present study due to the low number of claims with secondary points of impact. Rollover, undercarriage damage, and obvious totals were not included in this study.

Analysis method

Points of impact on the vehicle were classified into 12 locations corresponding with clock positions where 12 o'clock is frontal. The proportions of impacts by clock point collision claims were examined and compared among three rated driver age groups, youthful (14–24), prime (25–65), and senior (66+). Analyses were based on 93,777 collision claims.

► Results

Figure 1 shows the percent distribution of claims and average damage amounts by point of impact for collision coverage. The highest percentage of claims occurred for front center impacts. Front center claims made up 26 percent of collision claims. Average damage amounts were also the highest for front center claims (\$5,942). For each of the four center clock points — 12 o'clock, 3 o'clock, 9 o'clock, and 6 o'clock — the percentage of claims and the average damage amounts were higher than for the two clock points next to it from both sides.

Figure 1: Percent distribution of collision claims and average damage amount by point of impact

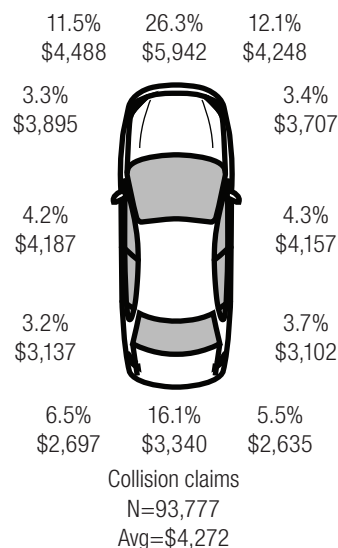


Figure 2 summarizes the data from **Figure 1** into four impact points: front, right, left, and rear. Frontal impacts made up half of the claims, followed by rear claims, 28 percent. The proportion of right claims, 11.4 percent, was slightly higher than that of left claims, 10.7 percent.

Figure 2: Collision claim distribution by point of impact

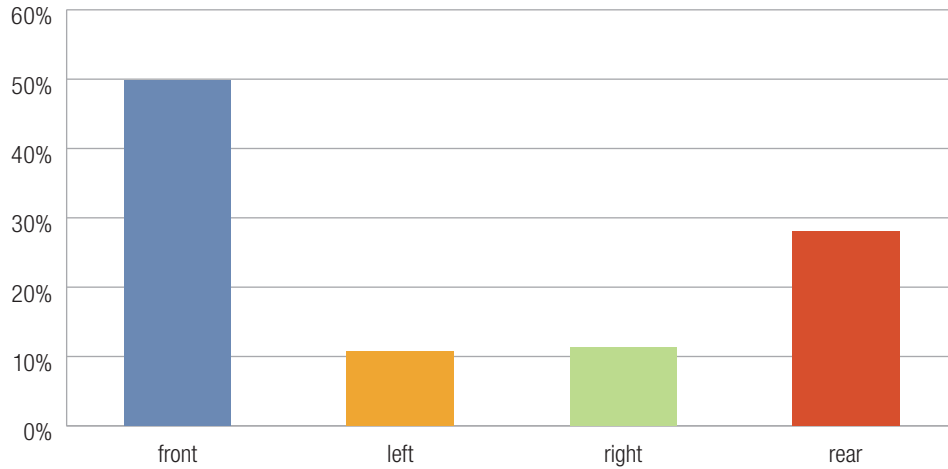


Figure 3 examines claim severity of four impact points. Average severity of frontal claims was the highest, \$5,197, followed by that of left claims (\$3,781) and that of right claims (\$3,682). Rear claims had the lowest average claim severity, \$3,053.

Figure 3: Collision claim severity by point of impact

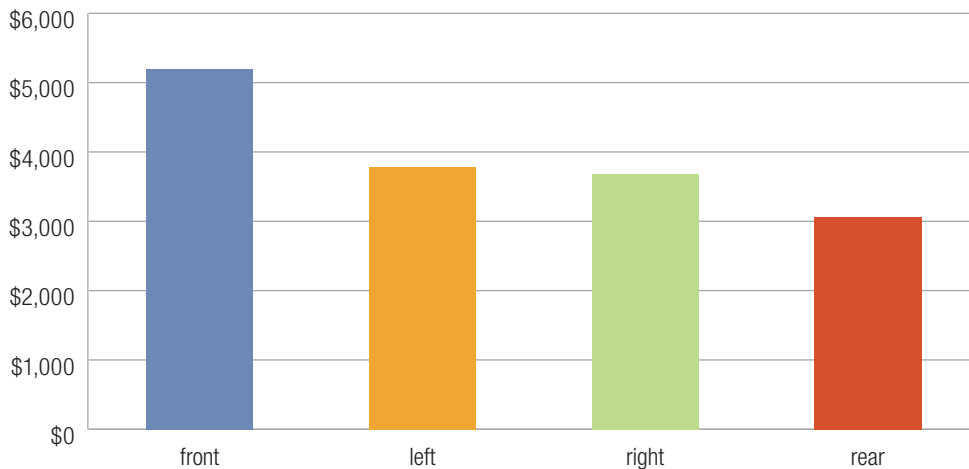


Figure 4 shows the percent distribution of collision claims and average damage amounts by point of impact for three age groups: youthful, prime, and senior. For each group, front center impacts had the highest percentage, ranging from 22.6 percent for seniors to 30.3 percent for youthful drivers. Front center impacts also had the highest average claim severity within each age group, ranging from \$5,250 for seniors to \$6,623 for youthful drivers. Among all age groups, youthful drivers had the highest front center impact percentage and the lowest rear center percentage.

Figure 4: Percent distribution of collision claims and average damage amounts by point of impact and driver age group

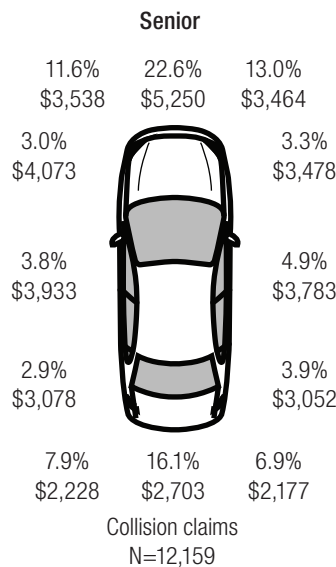
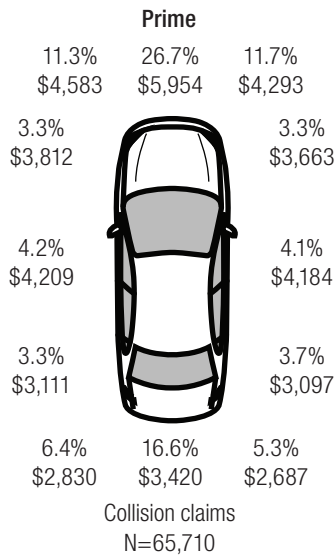
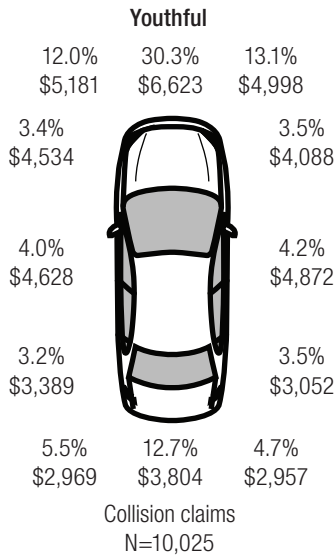


Figure 5 summarizes the data from **Figure 4** into four impact points: front, right, left, and rear. Front impacts made up the highest percentage for each age group. The front impact percentage was 55 percent for youthful drivers, 50 percent for prime age drivers, and 47 percent for seniors, exhibiting a decreasing trend with driver age. The rear impact percentage showed the opposite trend, increasing with age from 23 percent for youthful drivers to 28 percent for prime age drivers and 31 percent for seniors. Logistic regressions were completed to compare the proportion of front and rear claims among the three age groups. The percentage of front claims for each of the age groups was significantly different ($P < 0.0001$) from the others. This was also true for rear claims.

Figure 5: Collision claim distribution by point of impact and driver age group

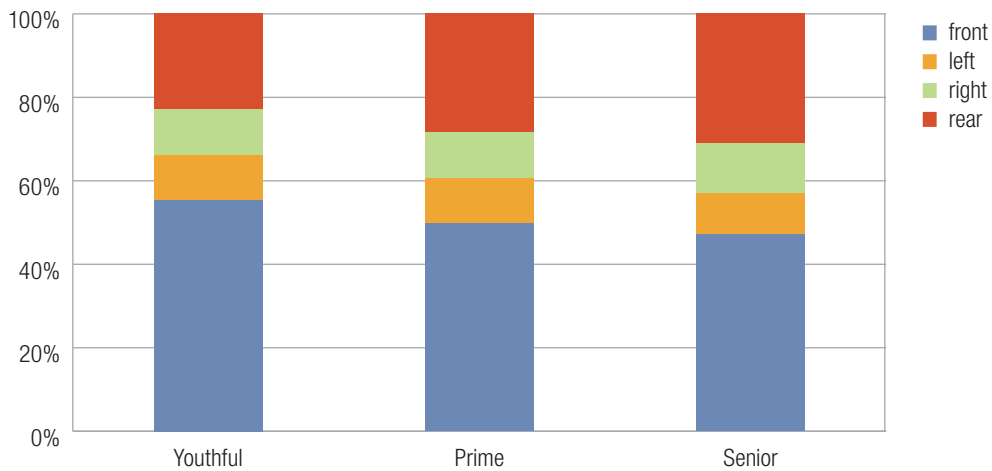


Figure 6 quantifies claim severity by point of impact for the three age groups. Frontal claims were the most costly to repair regardless of driver age, followed by left side claims, and rear claims were the least costly to repair. For each impact point, the youthful group had the highest average claim severity while the senior group had the lowest.

Figure 6: Collision claim severity by point of impact and driver age group

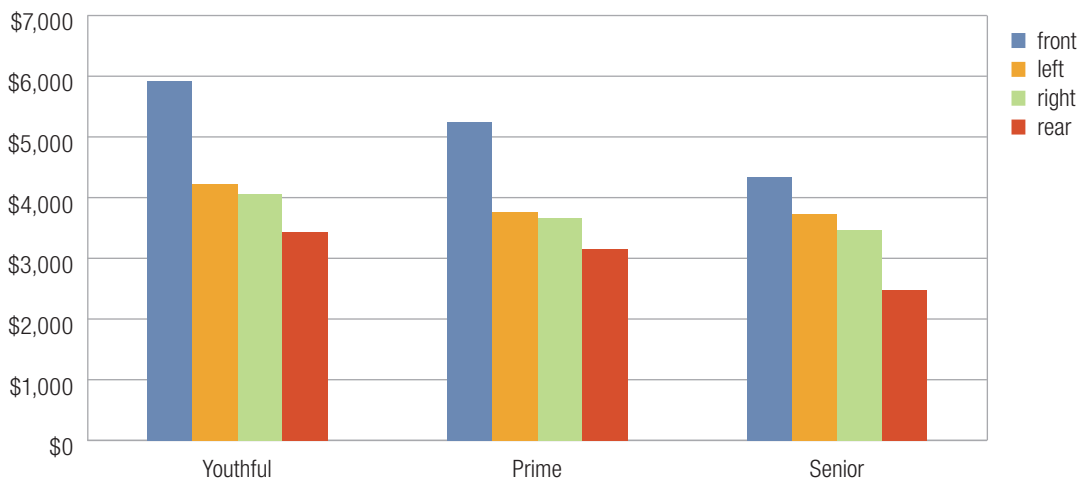


Figure 7 shows collision claim distribution by claim size for the three driver age groups. The percentage of claims with a damage amount less than \$3,000 accounted for 50 percent of youthful claims, 58 percent of prime age claims, and 67 percent of senior claims. In comparison, the percentage of claims with a damage amount of at least \$10,000 accounted for 14 percent of youthful claims, 11 percent of prime age claims, and 8 percent of senior claims. For the two lowest ranges, the percentage of claims for the senior group in that range was much higher than that for the youthful group. This trend reversed when the claim size range increased to \$3,000–\$3,999.

Figure 7: Collision claim distribution by claim size and driver age group

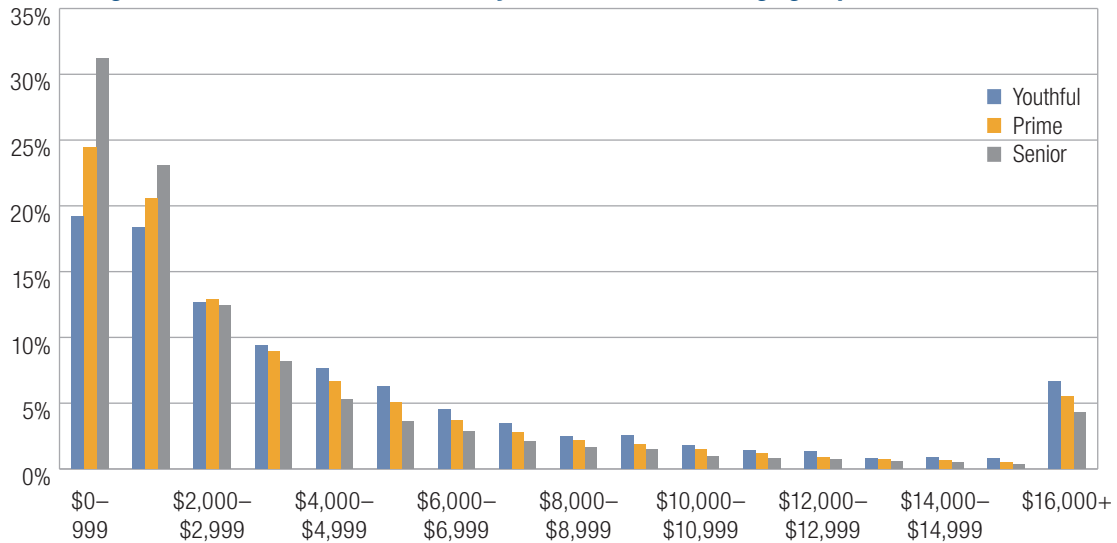
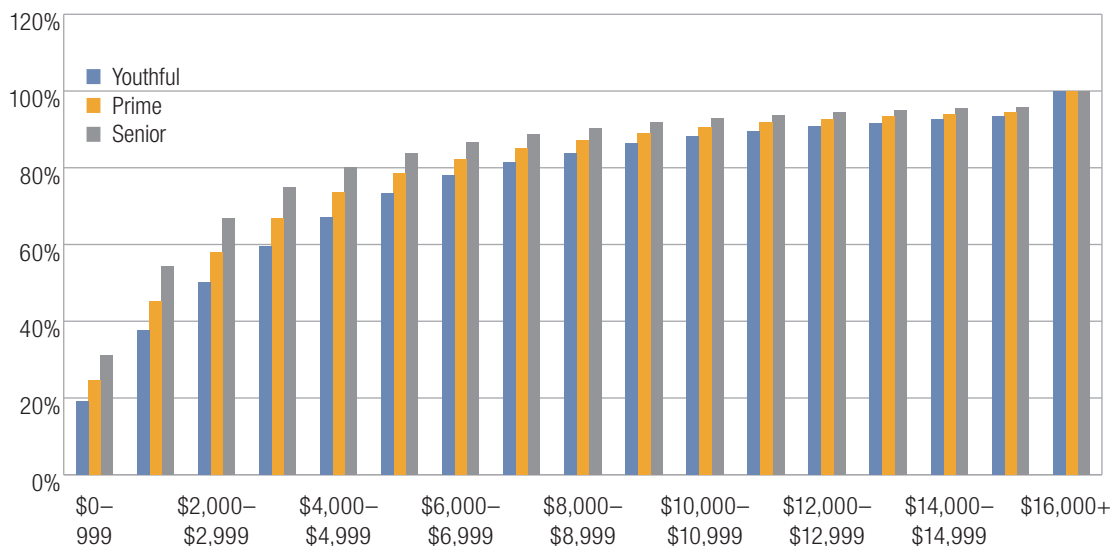


Figure 8 provides the cumulative effect of claim size distribution by driver age group from **Figure 7**. The gap of accumulated percentage between the senior group and the youthful group peaked at the \$1,000–\$1,999 range, with a difference of 17 percent.

Figure 8: Accumulated collision claim distribution by claim size and driver age group



► Discussion

Young drivers have much higher collision claim frequencies than any other group of drivers. This bulletin sought to examine how the distribution of collision claims varied by point of impact and driver age. The largest percentage of claims for all drivers was to the front center of their vehicles, but youthful drivers (ages 14–24) were the most likely to be involved in this type of damaging crash. Older drivers (ages 66 and older), on the other hand, were the most likely of the three age groups to have a rear strike collision claim. It appears that, in comparison with the other age groups, young drivers more frequently strike vehicles or property in front of them while older drivers frequently have rear damage from backup crashes. In general, collision claim severities for senior drivers tend to be less costly than for other drivers. More than half of senior collision claims cost less than \$2,000. In comparison, less than 40 percent of youthful collision claims fall into this category. The results of this analysis may indicate that certain vehicle features such as collision avoidance technologies can be targeted at certain age groups. Older drivers, for example, may benefit more from backup cameras, while younger drivers may benefit greatly from front crash prevention systems.

References

Highway Loss Data Institute. 2007. Point of impact distribution. *Loss Bulletin* Vol. 24, No. 3. Arlington, VA.

► **Appendix**

Appendix: Study vehicles and their crash avoidance features					
Series	Forward Collision Warning	Forward Collision Warning with Auto Braking	Parking Sensor - Front	Parking Sensor - Rear	Parking Camera - Rear
2013 Acura TSX 4dr	Not available	Not available	Not available	Optional	Optional
2013 Chrysler 200 4dr	Not available	Not available	Not available	Not available	Not available
2013 Dodge Avenger 4dr 2WD	Not available	Not available	Not available	Not available	Not available
2013 Hyundai Sonata 4dr	Not available	Not available	Not available	Not available	Optional
2013 Hyundai Sonata hybrid 4dr	Not available	Not available	Not available	Not available	Optional
2013 Kia Optima 4dr	Not available	Not available	Not available	Not available	Optional
2013 Kia Optima hybrid 4dr	Not available	Not available	Not available	Not available	Optional
2013 Mazda 6 4dr 2WD	Not available	Not available	Not available	Not available	Optional
2013 Nissan 810/Maxima 4dr	Not available	Not available	Not available	Not available	Optional
2013 Nissan Altima 4dr	Not available	Not available	Not available	Not available	Optional
2013 Subaru Legacy 4dr 4WD	Not available	Not available	Not available	Not available	Optional
2013 Suzuki Kizashi 4dr 2WD	Not available	Not available	Not available	Not available	Optional
2013 Suzuki Kizashi 4dr 4WD	Not available	Not available	Not available	Optional	Optional
2013 Toyota Camry 4dr 2WD	Not available	Not available	Not available	Not available	Optional
2013 Toyota Camry hybrid 4dr	Not available	Not available	Not available	Not available	Optional
2013 Volkswagen CC 4dr 2WD	Not available	Not available	Not available	Not available	Optional
2013 Volkswagen Jetta hybrid 4dr	Not available	Not available	Not available	Not available	Optional
2013 Volkswagen New Jetta 4dr	Not available	Not available	Not available	Not available	Optional
2013 Volkswagen Passat 4dr 2WD	Not available	Not available	Not available	Not available	Optional
2013 Chrysler 200 convertible	Not available	Not available	Not available	Not available	Not available
2013 Hyundai Genesis 2dr	Not available	Not available	Not available	Optional	Optional
2013 Nissan Altima 2dr	Not available	Not available	Not available	Not available	Optional
2013 Volkswagen EOS convertible	Not available	Not available	Optional	Optional	Optional
2013 Volvo C30 2dr	Not available	Not available	Not available	Not available	Not available

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