CONSUMER SAFETY INFORMATION PROGRAMS AT IIHS

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ABSTRACT

Since 1969, when the Insurance Institute for Highway Safety (IIHS) began publishing results of low-speed crash tests to highlight differences in vehicle bumpers, it has been a significant source of information about how the safety of different vehicle designs varies. Currently, IIHS maintains crashworthiness ratings covering five crash modes along with ratings of front crash prevention (FCP) systems and children's booster seats, as well as annual updates of insurance loss reports from its affiliate, the Highway Loss Data Institute (HLDI).

This report describes the experience with IIHS's latest consumer information efforts and identifies the next areas of consumer information to come online. It presents information about the number of vehicle models and booster seats evaluated; their ratings assigned as well as media, consumer, and manufacturer response; and small overlap crashworthiness and FCP ratings. Research underpinning future rating programs addressing Lower Anchors and Tethers for Children (LATCH) and advanced head lighting systems also is summarized.

Since launching its booster seat ratings, IIHS has evaluated 200 designs for their ability to adjust rear seat belt fit to booster-age children across a wide variety of rear seat belt configurations. The number of models rated Best Bet, indicating they will provide good belt fit in common passenger vehicles, has increased from a low of 10 in 2008 to 69 in 2014. Media coverage of these annual ratings announcements is estimated to average an audience of 88 million people in the United States. IIHS internet pages with booster ratings are among the most viewed, with an average of 102,800 page views monthly.

IIHS began rating vehicle front crashworthiness on the basis of a 64 km/h small overlap crash against a rigid barrier in 2012. Of the 118 currently rated 2015 models, 49 are good, 25 acceptable, 23 marginal, and 21 poor. Several models have been tested in two design iterations with improved performance in the second test, indicating automakers are able to design vehicles to better protect occupants in similar crashes. It is estimated that the media coverage across all small overlap ratings announcements has achieved 1.1 billion views. Surveys of automobile dealers indicate that good ratings in this test have led to increased sales, at least in the short term.

IIHS ratings of vehicle FCP systems include both warning and autobraking functions. The proportion of new models available with FCP of any kind has increased from 30 to 60 percent. The combined media coverage of three announcements featuring FCP ratings were viewed 212 million times. While not as strong as for crash test ratings, there was indication that these announcements positively affected sales of vehicles with these systems.

Large audiences for IIHS consumer information programs have prompted manufacturers of rated products to make changes in ways indicated by IIHS tests. Based on this experience with current programs, there is good reason to believe that IIHS ratings of LATCH and advanced head lighting systems can also improve vehicle safety.

INTRODUCTION

The Insurance Institute for Highway Safety (IIHS) was founded in 1959 as a nonprofit research and communications organization. Its mission is to conduct and publish research that will lead to the reduction of deaths, injuries, and property damage associated with crashes on roads in the United States of America. One of the ways in which IIHS uses its research to motivate improvements in vehicle designs has been through consumer information programs that

highlight differences in safety among different vehicles. The most recognizable form of such programs are crashworthiness ratings based on crash tests, the first of which were published by the New Car Assessment Program of the U.S. Department of Transportation [1]. However, such consumer information can take other forms such as the publication of insurance losses by make and model, which have been produced by IIHS affiliate the Highway Loss Data Institute (HLDI) since 1973 [2]. More recently, IIHS has applied the consumer information model to motivate improvements to child restraint systems and commercial truck underride guards.

IIHS's first foray into providing information about crash differences among contemporary vehicle models was bumper tests in 1969, which ultimately led to regulatory bumper performance requirements. In 1972, HLDI was formed to examine highway safety issues through analysis of insurance loss data provided by a subset of IIHS sponsors. The compilation of data from the largest insurers in the United States allows HLDI analyses to ascertain the model-specific contribution to losses under different types of insurance coverage. HLDI has published annual comparisons of losses by make and model since 1973. While not fully explaining the differences in insurance costs paid by different insurance customers, these analyses partly explain the differences an individual will pay depending on the model insured. Results are published on a scale that relates the insurance experience of a specific model to the average for all contemporary passenger vehicles. This type of information was considered so important to consumers that the Motor Vehicle Information and Cost Savings Act of 1972 required the U.S. Department of Transportation to devise a means of distributing it wherever new vehicles were sold [3]. From 1993 until 2013, when the availability of information via the internet obviated the need for auto dealers to keep printed brochures on hand, HLDI's data have helped the National Highway Traffic Safety Administration fulfill this requirement [4].

Since 1995, IIHS has created a rigorous program of crash test ratings that have led to measureable improvements in the crash protection offered by modern vehicles. Its first crash rating program involved front crashes at 64 km/h with a 40 percent overlap against a deformable barrier. Test results are graded on a scale of good, acceptable, marginal, and poor to reflect the relative protection for occupants exposed to similar crashes. The ratings are based not only on measurements made by sensors in the test dummy but also on analysis of the dummy's observable motion and measurements of safety cage deformation. Figure 1 illustrates the increasing availability of good-rated vehicles across model years, and these improvements have been associated with a lower risk of death in front crashes [5].

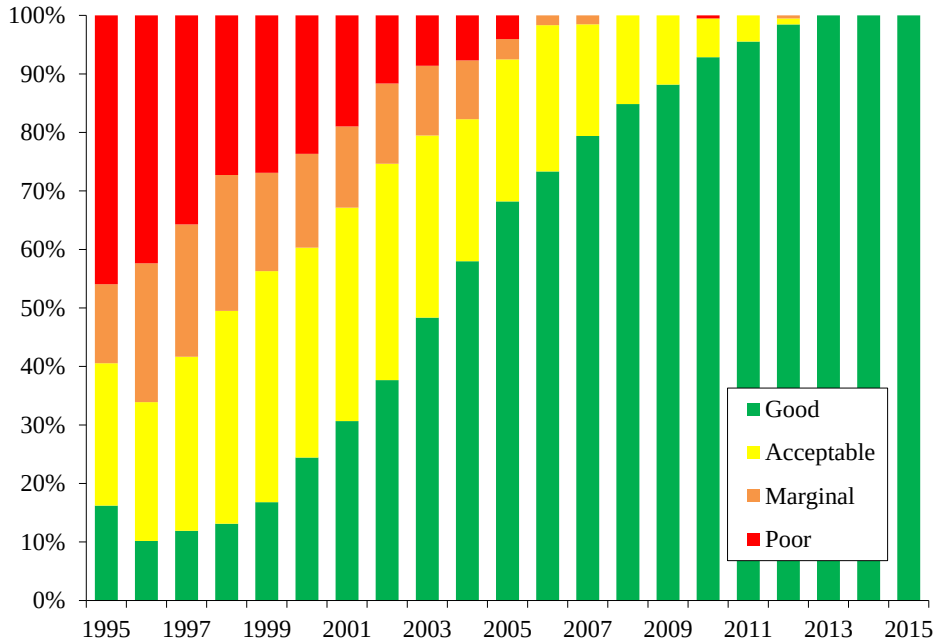

Figure 1. IIHS moderate front overlap crash test ratings by model year.

The IIHS crashworthiness program currently consists of five tests, all using the poor-to-good scale of ratings: two front (moderate and small overlap impacts at 64 km/h), a side impact at 50 km/h, a quasi-static test of roof strength, and a simulated rear crash used to evaluate the ability of vehicle seats and head restraints to mitigate neck injury. Like IIHS's original front crash test, the side and rear crashworthiness evaluations have resulted in measurable changes in the likelihood that vehicle occupants will be injured or killed in crashes represented by the corresponding evaluation [6][7]. The roof strength test was initiated based on research establishing the protective effect of strong roofs in rollover crashes [8][9]. All of these programs have led to meaningful improvements in the safety of the U.S. passenger vehicle fleet.

IIHS *Top Safety Pick* awards were launched in 2005 to recognize those 2006 model year designs that offered the highest levels of crash protection, as indicated in IIHS tests. In addition to rewarding automakers whose products offer the highest level of safety, the rewards also generate a single list of recommendations to consumers. The annual announcement of these ratings is widely covered by the U.S. news media. Table 1 shows the number of times an IIHS-produced video was broadcast for each of the *Top Safety Pick* announcements since 2006, along with the estimated size of the audience that saw those broadcasts. Also, automakers increasingly use *Top Safety Pick* claims in their advertising, as Table 2 attests. Public attention to this award amplifies the incentive for automakers to improve the safety of their products.

Table 1.
Number of television broadcasts and estimated audience for IIHS *Top Safety Pick* announcements.

Award year	Number of broadcasts	Estimated audience (millions)
2006	1,123	95.0
2007	1,365	102.3
2008	1,051	100.0
2009	1,880	115.1
2010	2,580	149.4
2011	2,052	114.2
2012	637	41.3
2013	1,262	155.5
2014	856	74.8
2015	1,083	76.7

Table 2.
Number of requests to approve *Top Safety Pick* advertising claims.

Award year	Advertising approval requests
2006	218
2007	288
2008	361
2009	328
2010	341
2011	646
2012	635
2013	573
2014	614

The criteria for earning *Top Safety Pick* was made more stringent twice between its introduction and 2012. The *Top Safety Pick+* was introduced in 2014 as a type of "soft landing" for the introduction of new front crashworthiness requirements. Designs that met the previous year's criteria kept their *Top Safety Pick* accolades, but an acceptable or good rating in the new test was required to earn the new award. Table 3 shows the criteria for *Top Safety Pick* and *Top Safety Pick+* awards during their history. For the foreseeable future, *Top Safety Pick+* will continue to be the way to identify IIHS's latest safety recommendations.

Ratings of small overlap front crashworthiness and front crash prevention systems are the latest additions to IIHS consumer information programs encompassed by *Top Safety Pick.* Also, IIHS has rated belt-positioning booster seats for children since 2009 and has published a one-time comparison of commercial truck underride guards. Evaluations for vehicle LATCH (Lower Anchors and Tethers for Children) and advanced headlights are also being developed. The remainder of this paper describes these programs and the safety improvements they have compelled or intend to once launched.

Table 3.
IIHS *Top Safety Pick* criteria, 2006-15.

Award year	Moderate overlap front crash	Side impact	Rear crash	Electronic stability control	Roof strength	Small overlap front crash	Front crash prevention
2006	Good	Good	Good or acceptable				
2007	Good	Good	Good	Available			
2008	Good	Good	Good	Available			
2009	Good	Good	Good	Available			
2010	Good	Good	Good	Available	Good		
2011	Good	Good	Good	Available	Good		
2012	Good	Good	Good	*	Good		
2013	Good	Good	Good		Good	Acceptable	
TSP+	Good	Good	Good		Good	Good	
2014	Good	Good	Good		Good	Good or acceptable	
TSP+	Good	Good	Good		Good	Good or acceptable	Basic or better
2015	Good	Good	Good		Good	Good or acceptable	
TSP+	Good	Good	Good		Good	Good or acceptable	Advanced or better

TSP+ = Top Safety Pick+
*Electronic stability control became required by regulation beginning September 1, 2011

LATEST CONSUMER INFORMATION PROGRAMS

Booster Seat Belt Fit Ratings

Booster seats are intended to improve the fit of vehicle seat belts for children who have outgrown child restraint systems with internal harnesses and that are anchored to the vehicle with the seat belts or dedicated attachments. The simplest boosters are cushions that raise the child above the vehicle seating surface such that the lap belt crosses the bony pelvis and the shoulder belt does not interfere with the neck or face. This improves the comfort for young vehicle occupants and, more important, helps the seat belts restrain them more effectively in a crash. Children riding in boosters are much less likely to be injured in a crash than children secured by vehicle seat belts alone [10].

Due to the variation in rear seating areas of modern vehicles and the variety of booster seat configurations, some combinations do not result in good belt fit for some children. This complication leads to a high rate of booster misuse in the field [11]. To address this problem, IIHS researchers worked with the University of Michigan Transportation Research Institute (UMTRI) to develop a method for evaluating which booster seat designs provide the best belt fit across a range of vehicles [12]. The evaluation uses a 6-year-old Hybrid III dummy to represent the relevant child population. The dummy is seated on each booster, which is installed on a test fixture representing a rear seat with variable seat belt anchor positions. Both lap and shoulder belt positions on the dummy are recorded for four seat belt anchor configurations representing the variation in the modern vehicle fleet. Boosters that provide ideal fit — lap belt lying flat on the thighs and close to the hip with the shoulder belt crossing the middle of the sternum — in all four configurations are rated Best Bet, reflecting the notion that the design provides sufficient control of the belt routing that it would be expected to provide correct fit for all booster-age children in almost any vehicle. Boosters rated Good Bet also would be expected to provide no more than slight deviations from ideal fit in almost any vehicle. The Check Fit rating means that acceptable fit is possible for some, but not all, seat belt anchor configurations. Consumers are advised to check whether such boosters provide good belt routing for their children in the vehicles in which the boosters will be used. Seats rated Not Recommended fail to provide acceptable belt fit in any of the four tested belt anchor configurations.

The booster seat belt fit evaluations were first published in 2008 and have been repeated every year since. Among the 41 booster designs evaluated in the first year, 10 were rated Best Bet, 5 were Good Bet, and 13 were Not

Recommended. The rest were rated Check Fit. The availability of Best Bet boosters has increased in every update of the IIHS ratings, indicating that child restraint manufacturers are taking the rating guidance into account when developing new products. Figure 2 compares the current distribution of seat ratings with those from 2008. These improvements also have led to customer satisfaction for those boosters earning Best Bet ratings, as this email correspondence from Michael Noah, president of Harmony Juvenile Group, attests:

> I'm happy to report that over the past year many customers with some of our Best Bet boosters experienced only good outcomes from some pretty severe crashes. It is nice to know that the combination of technology in the seat design along with the good work that you do — truly leads to the outcomes we are all working towards.

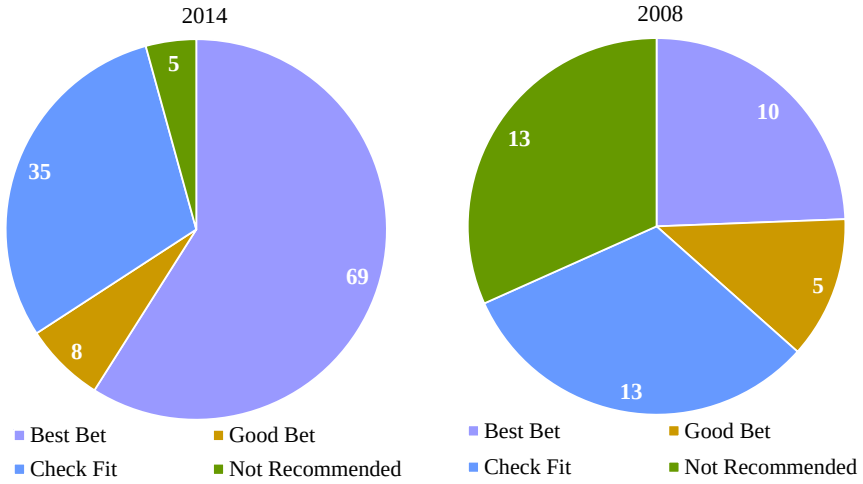

Figure 2. IIHS Booster seat ratings published in 2014 compared with those published in 2008.

The public is very much interested in information about child safety. The booster ratings pages of the IIHS internet website are among the most frequently visited, receiving an average of 102,800 page views monthly. Likewise, the television audiences for announcements of new booster ratings are regularly large. Table 4 shows the number of television broadcasts and estimated audience for each update of IIHS booster ratings.

Table 4.
Number of television broadcasts and estimated audience for IIHS booster seat ratings announcements.

Award year	Number of broadcasts	Estimated audience (millions)
2008	1,384	87.1
2009	3,669	182.9
2010	2,575	153.3
2011	739	44.5
2012	864	42.6
2013	1,452	53.7
2014	1,299	53

Truck Underride Guards

During the past 5 years, the number of passenger vehicle occupants killed each year in crashes with large trucks has averaged more the 2,400 in the United States. According to a 1997 study, about half of these deaths involve the passenger vehicle underriding some portion of the truck [13]. Approximately one-fifth of the underride deaths occur in crashes to the rear of the truck, despite requirements that many heavy trucks be equipped with underride prevention guards.

Research by IIHS identified the nature of underride guard failures, and testing showed there was a range of effectiveness among designs meeting U.S. regulatory requirements [14]. Specifically, two of the three tested guards prevented underride of a midsize car in full-overlap crash tests at 56 km/h, and only one prevented underride when overlap with the guard was reduced to 50 percent [15]. This research received moderate amount of media attention and was featured in 1,296 broadcasts with a total estimated audience of 64 million viewers.

Follow-up testing during 2012-13 involving truck trailers from the eight largest manufacturers in the U.S. market already showed improvements for the guards that performed least well in earlier testing [16]. All eight guards prevented underride in the full-overlap test, all but one prevented underride in the 50 percent overlap condition, and only one prevented underride when the overlap was reduced to 30 percent. This test program also received media attention and was featured in 811 broadcasts with a total estimated audience of 37 million viewers. This attention has resulted in six of the seven trailer manufacturers whose guards could not prevent underride in all three test conditions to report they are developing more effective guards. In 2014, one company, Vanguard, whose guard failed to prevent underride in the 50 percent overlap condition in both rounds of tests, tested an improved design at IIHS that successfully prevented underride in this condition. These observations suggest that comparative safety evaluations can be an effective means of stimulating improvements in the commercial fleets as it has for private passenger vehicles.

Small Overlap Front Crashworthiness Ratings

By the 2008 model year, 85 percent of passenger vehicles rated by IIHS earned good ratings in the moderate overlap front crash test and the remainder were rated acceptable, indicating the evaluation was no longer providing significant discriminating information to consumers nor spurring further improvements in front crashworthiness design. So IIHS researchers examined crashes of good-rated vehicles to ascertain whether further improvements in front crashworthiness were possible. This research focused on crashes resulting in serious injury or fatality and found that many had damage patterns indicating overlaps smaller than the 40 percent overlap of the crash tests [17]. In such crashes, the energy absorbing structures in the crush zones often were minimally damaged while the safety cages were severely collapsed. Crash testing showed that some vehicles provided better protection with less collapse of the safety cage than others in the same small overlap test configuration. This led to the development of IIHS's newest crash test evaluation, which involves crashing a vehicle at 64 km/h with 25 percent of its width overlapping a rigid barrier with a rounded edge (Figure 3).

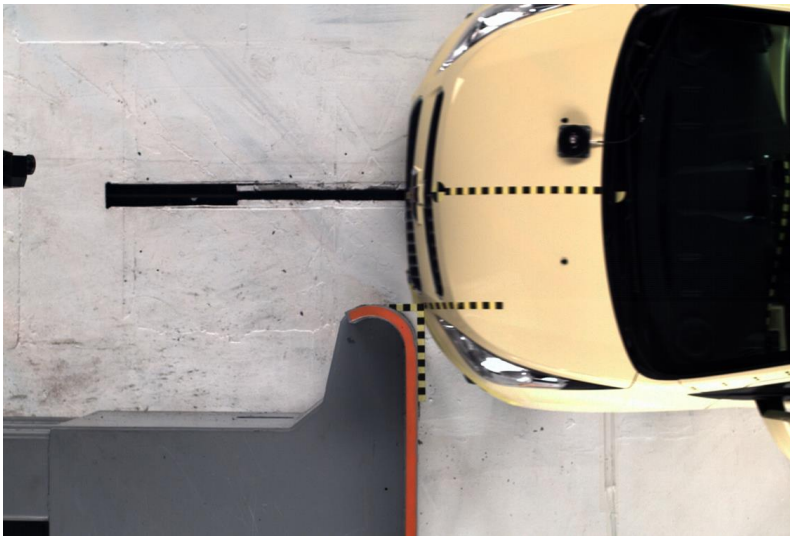

Figure 3. Small overlap crash test configuration (overhead view at t = 0).

Small overlap front crash test ratings of new vehicles were first published in August 2012. Eleven midsize luxury cars were tested, with two rated good, one acceptable, four marginal, and four poor. Since that time, 133 model designs have been evaluated in this test. Figure 4 shows an example the survival space difference for a vehicle rated good compared with one rated poor. In addition to structural differences, these tests also show differences in the ability of restraint systems to prevent impacts between the driver dummy's head and instrument panel (Figure 5). Figure 6 shows ratings in the small overlap front test by vehicle type for the 2015 model year. Eight models have been tested both before and after modifications or redesigns intended to improve front crashworthiness. All eight modifications/redesigns showed increased survival space compared with their predecessors, and six of the eight had improved overall ratings [18]. It is too early to know the extent to which such changes are affecting real crash outcomes.

These new crash test ratings received considerable news media and public attention (Table 5). In addition to traditional television news, IIHS's YouTube channel also attracted large numbers of viewers. Table 6 shows the number of views for the YouTube videos associated with each of the public releases of small overlap crash test ratings. The combined number of views for all small overlap crash test videos, including individual crash tests, exceeded 37 million as of mid-December 2014.

Figure 4. Comparison of survival space in Mazda CX-9 (poor) and Chevrolet Equinox (good) following a 64 km/h 25 percent overlap crash against a rigid barrier.

Figure 5. Comparison of driver dummy motion during a 64 km/h 25 percent overlap crash against a rigid barrier.

All of this attention to the new crash test ratings has also elevated consumer interest in vehicles earning good ratings, at least in the short term. Surveys of vehicle dealerships indicated that announcements of crash test ratings increased consumer interest in and sales of good-rated models in the week following ratings announcements compared with the week before [19]. Thus, it seems worth automakers' efforts to design their products to earn good crash test ratings.

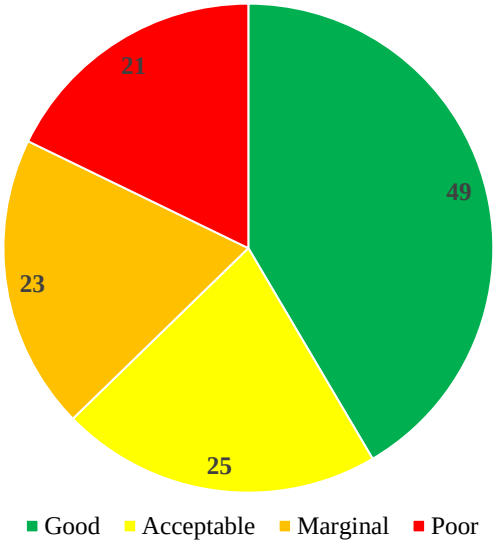

Figure 6. Small overlap front crash test ratings for 2015 model year vehicles.

Table 5.
Number of television broadcasts and estimated audience for IIHS front small overlap crash test ratings announcements.

Date	Vehicle group	Number of broadcasts	Estimated audience (millions)
November 20, 2014	Minivans	1,905	129.2
July 30, 2014	Small cars 2	3,245	165.5
April 8, 2014	Midsize SUVs	2,441	146.2
January 22, 2014	Minicars	2,048	121.9
August 8, 2013	Small cars 1	1,129	110
May 16, 2013	Small SUVs	790	63.4
December 20, 2012	Midsize non-luxury cars	1,262	155.5
August 14, 2012	Midsize luxury cars	2,751	212.3

Table 6.
Number of views for IIHS small overlap crash test ratings news videos on YouTube, as of January 23, 2015.

Date	Vehicle group	Number of YouTube views
November 20, 2014	Minivans	209,845
July 30, 2014	Small cars 2	174,944
April 8, 2014	Midsize SUVs	229,127
January 22, 2014	Minicars	426,338
August 8, 2013	Small cars 1	179,066
May 16, 2013	Small SUVs	235,290
December 20, 2012	Midsize non-luxury cars	951,370
August 14, 2012	Midsize luxury cars	816,218

Front Crash Prevention Systems Ratings

HLDI published a series of analyses using insurance data that evaluated the benefit of new crash avoidance technologies [20][21][22]. These analyses showed that all of the systems intended to help drivers avoid being in front-to-rear collisions were preventing some crashes reported to insurers. Vehicles with forward collision warning (FCW) from three automakers had 7-10 percent fewer liability claims for damage done to other vehicles and 4-7 percent fewer collision claims for own damage compared with the same year/make/models without FCW. The frequency of injury claims also was reduced. The results for automatic braking systems were even better. Volvo vehicles with City Safety (a standard feature) have 15 percent fewer liability claims and 18 percent fewer collision claims than their market competitors without automatic braking systems, and injury claims are reduced by more than 25 percent. Similarly, optional automatic braking systems from four different automakers also reduce liability claims compared with their counterparts without it. There is an indication that own damage and injury claims also are reduced with these systems, but the confidence intervals for the estimated reductions are large.

Based on these crash and injury reductions and consistency across different automakers' implementations of FCP systems, IIHS began rating them in 2013. The ratings — basic, advanced, and superior — are intended to reflect the level of benefit consumers could expect from systems with different characteristics. The basic level is intended to identify models available with FCW, although it is possible to earn the basic rating with automatic braking that produces small speed reductions in one of two simulated front-to-rear crashes. The FCW performance requirements are the same as those that the National Highway Traffic Safety Administration uses to identify FCW in its New Car Assessment Program. The advanced rating is intended to represent models with the availability of automatic braking systems similar to Volvo's City Safety or the optional systems studied by HLDI. Typically this requires collision prevention or near prevention through automatic braking in one of two simulated front-to-rear collisions at 20 and 40 km/h. However, it is possible to earn the advanced rating with moderate speed reductions in both tests. Models that combine FCW with automatic braking earn more points toward their ratings than those with automatic braking alone. The superior rating is intended to identify models with more capable automatic braking and requires that both simulated collisions be avoided or nearly so through the automatic application of brakes. Figure 7 shows that the availability of these systems at every rating level has increased in the 2015 model year compared with 2013.

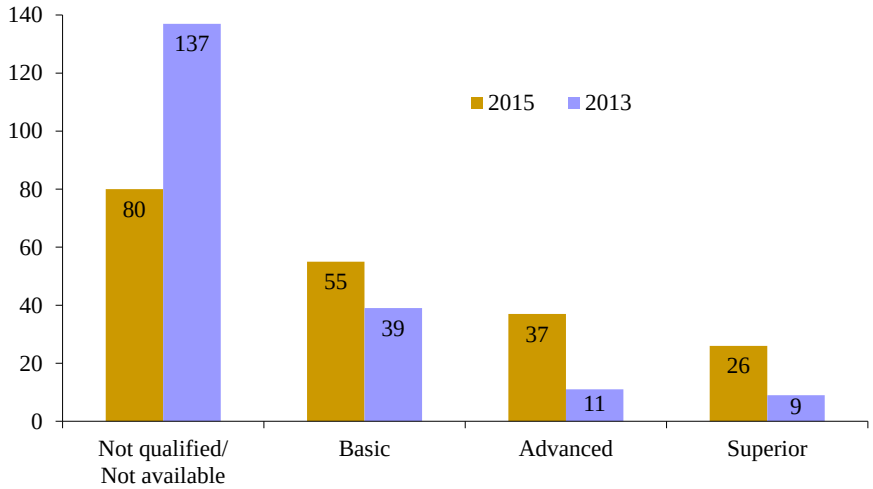

Figure 7. Comparison of the availability of FCP systems with different IIHS ratings, 2015 vs. 2013 model year

IIHS FCP ratings were first published in September 2013, and an update was published in May 2014. Both received a moderate amount of news and public attention, with estimated audiences of 58 and 79 million, respectively, in addition to being highlighted in *Top Safety Pick* announcements since 2013. Consumer response, as measured by reported level of interest and sales at automobile dealerships, was muted in comparison with what was observed for

crashworthiness ratings [19]. Nevertheless, compared with dealerships whose marquis brands did not offer FCP technology on any product, those that were mentioned in the FCP ratings announcements had better new vehicle sales experience.

FUTURE CONSUMER INFORMATION PROGRAMS

Vehicle LATCH Evaluations

All passenger vehicles sold in the United States have been required to be equipped with Lower Anchors and Tethers for Children (LATCH) since September 1, 2002 [23]. The purpose of LATCH, which is similar to ISOFIX, is to facilitate the proper installation of child restraint systems (CRS) and to provide top tether anchors for CRS installed with vehicle seat belts. Since its earliest implementation, however, many LATCH systems have failed to achieve this basic function, and observations of child restraint installations indicate that only slightly more than half of CRS in vehicles equipped with LATCH were installed using it [24][25]. Use of the top tether on forward-facing CRS is similarly low [26][27].

The Society of Automotive Engineers (SAE) Child Restraint Systems Subcommittee and ISO TC22/SC12/WG1/TF2 have drafted procedures and tools for assessing LATCH usability and the compatibility between vehicles and child restraints when using LATCH [28][29]. IIHS researchers working with UMTRI have established that the measures recommended by SAE and ISO do predict correct use of LATCH to install CRS [30][31][32][33]. Clear space around the anchor measured as an angle in a vertical plane, a low force to attach a simulated CRS LATCH connector, and a shallow depth of the anchor within the seat bight all were associated with higher rates of correct CRS installation using LATCH. This research will be the basis of a LATCH evaluation that IIHS intends to begin publishing in 2015. The evaluation will emphasize the ease-of-use characteristics in seating positions that are required by regulation to be equipped with LATCH and offer additional credit toward the highest rating for additional seating positions also equipped with easy-to-use LATCH.

In January 2015, NHTSA published a notice of proposed rulemaking that announced its intention to require easier-to-use LATCH [34]. The proposed requirements are consistent with IIHS and UMTRI's research, so the new LATCH evaluation will serve as a guide to parents purchasing new vehicles until all passenger vehicles are required to be equipped with better LATCH.

Advanced Head-lighting Evaluations

HLDI's studies of optional crash avoidance systems also found a significant benefit of adaptive headlights that was consistent across four automakers' implementations [20]. The frequency of property damage liability claims was reduced by 5-10 percent and collision claims were reduced by 1-6 percent for vehicles equipped with headlights that point in the direction the car is being steered, compared with their counterparts with traditional fixed-aim headlights. Large reductions of injury claim frequencies were also associated with steerable headlight systems.

The demonstrated benefits of these new headlight systems has inspired IIHS researchers to begin developing an evaluation of headlight systems to promote, through consumer recommendations, those that provide a better view of the road ahead. The main focus of this effort is identifying systems that enhance forward view on curved roads because this is the situation in which the steerable headlights studied by HLDI offer the greatest benefit over fixed-aim systems [35].

Ideally, the evaluation will not specify the technology by which enhanced lighting is achieved, so work has concentrated on making measurements of illumination as the tested vehicles are driven toward sensors placed on the test track (Figure 8). Curved paths are deemed necessary to assess how well each system illuminates curved roads. The curve radii will be based on locations of nighttime fatal crashes. Likely, tests will also include measurements

from straight approaches to the sensors because more injurious and fatal crashes at night occur on straight roads than on curves (Figure 9). Furthermore, initial measurements indicate a large range in straight-line distance that different headlight systems illuminate the road (Figure 10). The initial evaluations of new car headlight systems are expected to be published in 2015 with possible integration into the *Top Safety Pick* program in 2017.

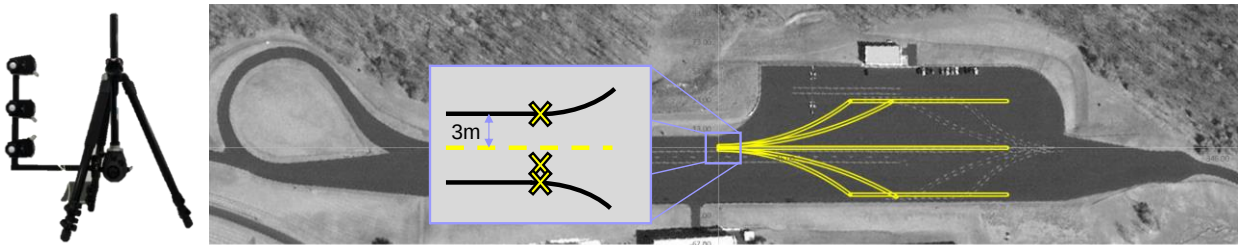

Figure 8. Conceptual set-up for IIHS headlight evaluations.

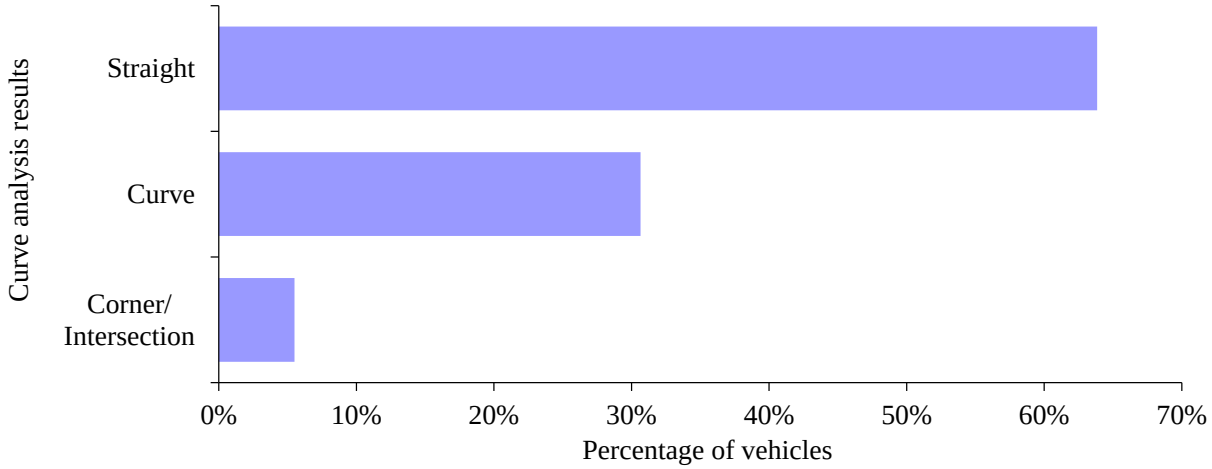

Figure 9. Distribution of road types for nighttime fatal crashes based on 2012 Fatal Analysis Reporting System.

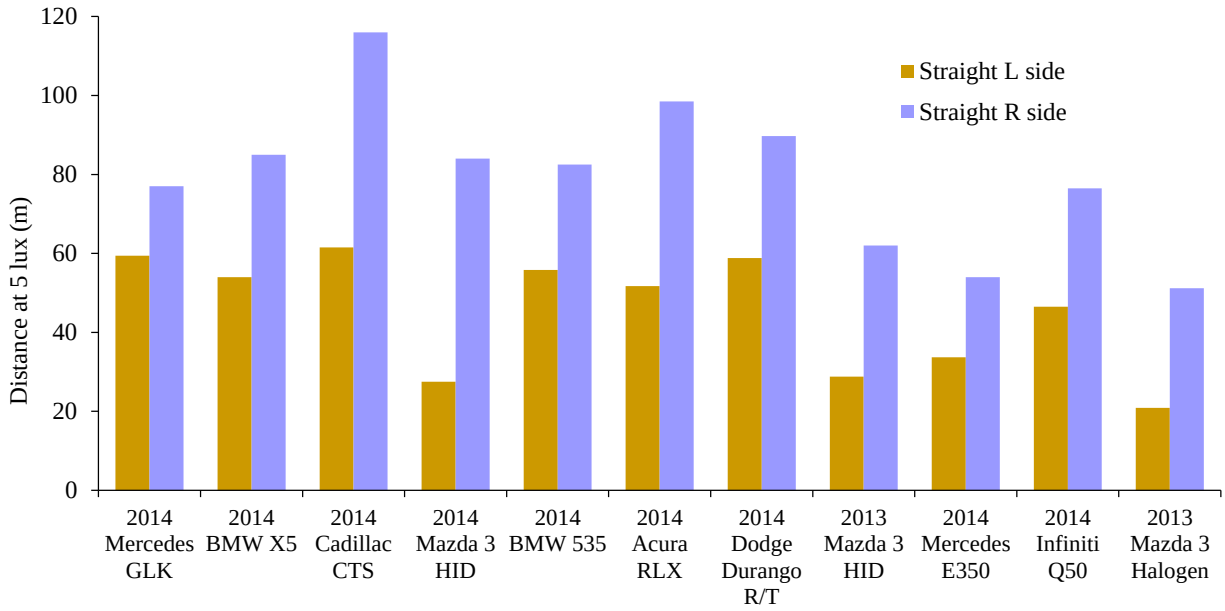

Figure 10. Maximum straight-line distance for 5 lux illumination at 25 cm above road level by year/make/model.

CONCLUSIONS

IIHS and HLDI have a long history of publishing comparisons of the crash safety of different vehicles. In some cases, this effort has led to legislative requirements for the distribution of information or regulatory requirements for the design of vehicles. More recently, large audiences for IIHS consumer information programs have prompted manufacturers of rated products to make changes in ways indicated by IIHS tests, and models achieving better ratings have been rewarded by increased sales. IIHS experience with truck underride guard testing also suggests that the consumer information model can promote improved safety in the commercial vehicle fleet. Based on its experience with current programs, there is good reason to believe that IIHS ratings of LATCH and advanced head lighting systems can also improve vehicle safety.

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