

**Survey of Vehicle Owners
Regarding Bumper Protection**

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ABSTRACT

Seven hundred owners of 1995-97 model year vehicles registered in Michigan and Texas were surveyed about their awareness of bumper performance data, how these data might affect future purchase decisions, and their opinions about current federal bumper regulations. A majority of respondents (61 percent) were aware of the availability of bumper performance data, and most who were aware said they had seen or heard this information on television (58 percent), followed by magazines (30 percent) and newspapers (27 percent). When purchasing their current vehicles, 17 percent considered bumper strength. When shopping for their next vehicles, most respondents said they would probably (37 percent) or definitely (20 percent) purchase vehicles with better bumpers over those with poorer bumpers. Seventy-seven percent of respondents expressed support for returning the bumper standard to 5 mph from the current 2.5 mph standard. When asked if the bumper standard should apply to vehicle types other than cars, 88 percent said it should. Overall, little difference was noted among respondents who recently had been in collisions with minor front or rear damage compared with those who had not.

INTRODUCTION

The basic purpose of vehicle bumpers is to prevent damage in low-speed impacts. Bumpers that fail to provide this protection result in higher insurance costs and deductibles paid by consumers, as well as the inconvenience of having the vehicle in the shop to have the damage repaired. Minimum levels of bumper performance are specified in Federal Motor Vehicle Safety Standard 215. This standard, however, does not apply to multipurpose passenger vehicles such as minivans, utility vehicles, pickup trucks, or full-size (large) vans. In 1982, the bumper standard was relaxed from 5 mph front and rear barrier tests with only minor cosmetic damage to 2.5 mph tests with unlimited damage to bumpers and their attachment hardware.

The Insurance Institute for Highway Safety (IIHS) conducts bumper tests of new model vehicles at 5 mph and has found the costs to repair damage from these impacts vary widely among vehicles. For example, recent Institute tests of a group of 1997 model year luxury cars found the costs to repair damage ranged from \$0 to almost \$750 for the front-into-barrier test, \$0 to more than \$1,000 for the rear-into-barrier test, and about \$300 to more than \$3,000 for the rear-into-pole test (IIHS, 1997). When seven 1998 model year small utility vehicles were tested, damage costs ranged from \$0 to about \$900 for the front-into-barrier test, \$0 to more than \$2,500 for the rear-into-barrier test, and from about \$1,000 to nearly \$3,000 for the rear-into-pole test (IIHS, 1998).

A national survey of car owners conducted for the Institute in 1982 found the majority (66 percent) of respondents indicated a preference for a 5 mph or higher bumper performance standard (Opinion Research Corporation, 1982). Surveys of vehicle owners conducted in 1990 and 1993 by the Insurance Research Council (1990, 1993) also found the majority of respondents said they thought the bumper standard should either return to 5 mph or be set at an even higher speed.

This study extends the work of earlier surveys by seeking information on consumers' awareness of vehicle bumper performance differences in low-speed crash tests and the availability of these test results. The study also investigates how knowledge of comparative information on bumper performance of competing vehicles might affect future vehicle purchase decisions. Also of interest was whether people who had been in collisions in the past year or so in which their vehicles sustained front or rear damage hold different opinions regarding bumper strength than those who had not had this experience recently. Respondents who were in collisions with front or rear damage were asked their opinions about the process and cost of getting the damage repaired. All respondents were asked if they had considered bumper strength and safety information when purchasing the vehicles they currently drove, and how well they thought their vehicle bumpers would perform in a low-speed crash test. The survey also included questions about the federal bumper regulation to determine if consumers support reinstating the 5 mph standard and expanding it to apply to minivans, utility vehicles, and pickups.

This work was supported by the Insurance Institute for Highway Safety.

METHOD

Telephone interviews were conducted from June 25 to July 9, 1998 with drivers of vehicles registered in Michigan and Texas. Respondents were those who said they were age 18 or older, male or female head of household, and owned or leased a 1995, 1996, or 1997 model year vehicle. A total of 700 interviews were completed in two quota groups. One group consisted of 400 respondents who said they either had not been in collisions with their vehicles in the past year or so or had been in collisions in which their vehicles did not sustain front or rear damage. The second group consisted of 300 respondents who said their vehicles had been in collisions in the past year or so in which their vehicles sustained front or rear damage that cost \$2,000 or less to repair.

Responses were gathered from two different listed sample frames among residents of Michigan and Texas. The first sample frame consisted of a random selection of 4,800 people known to own or lease (owners) 1995-97 model year vehicles. Because low-speed collisions are more likely to occur in congested urban traffic, only the owners of vehicles registered in Michigan and Texas counties classified as metropolitan statistical areas, as defined by the Office of Management and Budget (1993), were included in the sample frames to improve the incidence of locating respondents who qualified for the collision-damage quota group. To further narrow the search for people with recent experience in getting repaired relatively minor front or rear vehicle damage, a second sample frame was developed from a list compiled by the Highway Loss Data Institute of vehicle identification numbers of 1995-97 model year vehicles, registered in the same counties as the first sample frame, for which collision damage claims of \$1,500 or less had been filed with their insurance companies in calendar year 1997. Assuming a \$500 collision deductible — the most common amount for newer vehicles — a claim of \$1,500 would represent damage of \$2,000. Because the list did not have information on the deductible amount or damage location, respondents were questioned to determine if their vehicles sustained front or rear damage and if the repair amount was \$2,000 or less. A sample of 7,225 telephone numbers was selected randomly from this list.

Respondents from both sample frames were screened for qualification in either quota group, based on their answers to a series of questions regarding collision experience and vehicle damage. Owners of vehicles that had been damaged, but not to the front or rear, were included in the noncollision group because the bumper would not have been contacted in the collision. In order to compare responses of people who had been in low-speed frontal or rear-end collisions with those who had not, respondents who said their vehicles had sustained more than \$2,000 in front or rear damage were not included in the survey because it would be difficult to determine impact severity in these crashes. Survey results have a margin of error of ± 3.7 percentage points at a 95 percent confidence level.

RESULTS

Respondents' ages, genders, and education levels are listed in Table 1. Nearly half (49 percent) of all respondents were ages 35-54. The collision-damage group contained a higher percentage of respondents ages 18-34 than the noncollision/no damage group (24 percent compared with 17 percent), and the noncollision/no damage group had a higher percentage of 55-64 year-olds (16 percent compared with 9 percent). There were no other statistically significant age differences observed between the two groups, nor were any significant differences noted in gender or education (differences between these two groups in their responses to other questions are noted where they exist).

Table 1
Respondent Age, Gender, and Education (Percent)

	Total (N=700)	Collision- Damage (N=300)	Noncollision/ No damage (N=400)
Age			
18-34	20	24 ^a	17 ^a
35-54	49	51	48
55-64	13	9 ^a	16 ^a
≥65	17	14	19
Don't know/refused	2	2	1
Gender			
Male	42	39	45
Female	58	61	55
Education			
Less than high school	3	2	3
High school graduate	19	19	20
Technical/vocational	3	3	3
Some college	25	24	25
College graduate	30	30	30
Postgraduate	20	21	19
Don't know/refused	--	1	--

^a Collision-damage group significantly different from noncollision/no damage group ($p < 0.05$)

Awareness of bumper test information: Sixty-one percent of respondents said they were aware of the availability of information on the ability of bumpers to prevent damage in low-speed collisions. Respondents in the collision-damage group were significantly less likely than those in the noncollision/no damage group to say they were aware that bumper performance information was available to consumers (56 percent versus 65 percent).

Respondents who said they were aware that bumper performance information was available to consumers were asked where they had seen or heard about it (Table 2). The most frequent response was television (58 percent), followed by magazines (30 percent), newspapers (27 percent) and Consumer Reports (15 percent). When asked to identify from a list which entities they thought conducted bumper tests, 62 percent said tests were conducted by a consumer group, 57 percent mentioned auto

manufacturers, 44 percent said an insurance group, and 40 percent mentioned the government. One hundred thirty respondents said they recalled the name of one or more organizations that conducted bumper tests. Consumer Reports was the most frequently named organization (48 percent), followed by General Motors (10 percent), Ford (8 percent), and car companies in general (8 percent). Six respondents (5 percent) named the Insurance Institute for Highway Safety.

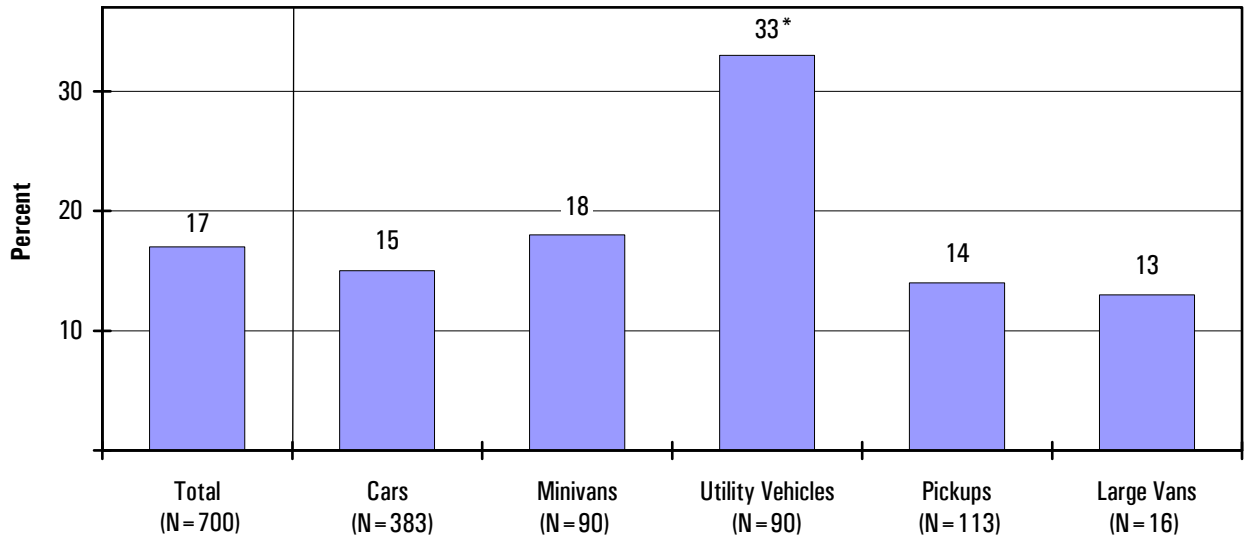
Table 2
Where Respondents Saw or Heard Information Regarding
Bumper Performance in Low-Speed Crash Tests (N=428)

	Percent	Number
Television	58	248
Magazines	30	129
Newspaper	27	117
Consumer Reports	15	66
Internet	8	36
Word of mouth	8	34
Other	7	32
Dealership	6	27
Radio	4	18
Insurance Company	3	12
Work in auto industry	2	8
Don't know/refused	2	10

Purchase decisions: Respondents were asked if they had considered bumper strength when they purchased the vehicles they currently owned; 17 percent said they had (Figure 1). Thirty-three percent of utility vehicle owners said they had considered bumper strength; this was significantly more than owners of cars (15 percent), minivans (18 percent), or pickups (14 percent). When asked if they had used crash test or other published safety ratings when choosing the vehicles they currently owned, 32 percent of all respondents said they had. Minivan owners (50 percent) were significantly more likely to say they used such ratings than owners of cars (30 percent) or pickups (21 percent), and utility vehicle owners (39 percent) were more likely than pickup owners to say they used ratings (Figure 2).

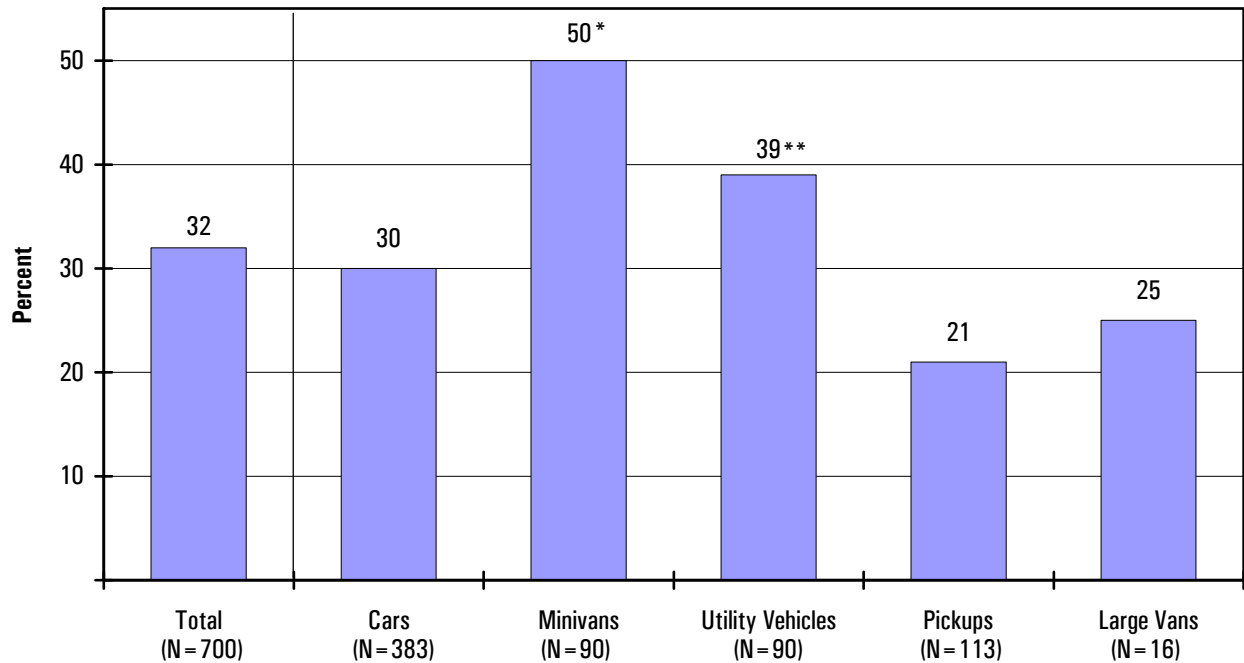
When asked to consider their next new vehicle purchases, respondents were given four choices to describe their reaction to information that one of their selections had much poorer bumpers than another. Fifty-seven percent of respondents said they probably (37 percent) or definitely (20 percent) would purchase vehicles with better bumpers over those with poorer bumpers (Table 3). About one-fifth (21 percent) of respondents said they might still purchase vehicles with poorer bumpers if they liked them a lot, and another 19 percent said their purchase decisions would not be affected. Differences were noted among male and female responses and owners of different vehicle types. Females indicated a greater preference than males for buying vehicles with stronger bumpers, and males were more likely than females to select responses that indicated a lesser interest in bumper performance. Utility vehicle and

Figure 1
Percent Who Considered Bumper Strength When Purchasing Current Vehicles



*Significantly different from car, minivan, and pickup owners ($p < 0.05$)

Figure 2
Percent Who Considered Crash Test/Safety Ratings in Current Vehicle Purchases



*Significantly different from car and pickup owners ($p < 0.05$)

**Significantly different from pickup owners ($p < 0.05$)

Table 3
In Next Vehicle Purchase, if One Vehicle You Were Considering Had Much Poorer Bumpers Than Other Vehicles You Were Thinking of Buying, Would You... (Percent)

	Total (N=700)	Male (N=295)	Female (N=405)	Car (N=383)	Minivan (N=90)	Utility Vehicle (N=90)	Pickup (N=113)	Large Van (N=16)
Definitely buy one with better bumpers	20	16 ^a	23 ^a	17 ^b	28 ^b	28 ^b	19	19
Probably purchase one with better bumpers	37	30 ^a	41 ^a	40 ^c	36	34	26 ^c	44
Might still purchase vehicle with poor bumpers if you liked it a lot	21	26 ^a	17 ^a	21	16 ^d	22	27 ^d	13
Purchase decision would not be affected by this information	19	25 ^a	14 ^a	18 ^e	18	14 ^e	27 ^e	19
Other	1	1	2	2	1	1	1	6
Don't know/refused	2	2	2	3	2	--	1	--

^a Males significantly different from females ($p < 0.05$)

^b Minivan and utility vehicle owners significantly different from car owners ($p < 0.05$)

^c Car owners significantly different from pickup owners ($p < 0.05$)

^d Pickup owners significantly different from minivan owners ($p < 0.05$)

^e Pickup owners significantly different from car and utility vehicle owners ($p < 0.05$)

minivan owners were significantly more likely than car owners to say they definitely would choose vehicles with better bumpers, and pickup owners were significantly more likely than car and utility vehicle owners to say their purchase decisions would not be affected by bumper information.

Respondents were asked how much more they would be willing to pay for vehicles if the bumpers could withstand with no damage a 5 mph impact, given choices ranging from less than \$50 to \$200 or more (Table 4). Twenty-five percent said they would be willing to pay \$200 or more, 18 percent said \$150-200, 16 percent said \$100-150, 12 percent said \$50-100, and 21 percent said less than \$50. Utility vehicle owners (38 percent) were significantly more likely than owners of cars (23 percent) or pickups (20 percent) to say they would be willing to pay \$200 or more for bumpers that protect in collisions of up

Table 4
How Much More Would You be Willing to Pay for 5 mph Bumpers? (Percent)

	Total (N=700)	Male (N=295)	Female (N=405)	Car (N=383)	Minivan (N=90)	Utility Vehicle (N=90)	Pickup (N=113)	Large Van (N=16)
<\$50	21	25 ^a	18 ^a	20	17	19	26	25
\$50-100	12	13	11	13	10	7	15	25
\$100-150	16	18	15	16	23	14	14	6
\$150-200	18	16	20	19	16	18	20	6
≥\$200	25	21 ^a	28 ^a	23 ^b	24	38 ^b	20 ^b	25
Don't know/refused	8	7	9	9	10	4	4	13

^a Males significantly different from females ($p < 0.05$)

^b Utility vehicle owners significantly different from car and pickup owners ($p < 0.05$)

to 5 mph. Respondents in the highest income group (annual household income of \$75,000 or more) were significantly more likely than those in the lowest income group (annual household income of less than \$30,000) to say they would be willing to pay \$150-200 (23 percent compared with 11 percent).

Perceptions of bumper performance: Respondents were asked if they thought their vehicles' bumper performance would be poor, fair, good, or excellent in a low-speed crash test (Table 5). Overall, 56 percent of respondents said they thought the ability of their vehicle bumpers to prevent damage would be good (39 percent) or excellent (17 percent), and 39 percent said fair (31 percent) or poor (8 percent). Twelve percent of respondents in the collision-damage group said they thought their vehicles' bumper performance would be poor compared with 5 percent in the noncollision/no damage group, and this difference was statistically significant. Respondents who owned vehicles other than cars (i.e., minivans, utility vehicles, pickups, and large vans) were significantly more likely than car owners to give their vehicle bumpers an excellent rating (22 percent versus 12 percent), and car owners were significantly more likely than other vehicle owners to say their vehicle bumpers were fair (35 percent versus 26 percent).

Table 5
How Well Do You Think the Bumpers on Your Vehicle
Would Perform in a Low-Speed Crash Test? (Percent)

	Total (N=700)	Collision- Damage (N=300)	Noncollision/ No damage (N=400)	Car Owners (N=383)	Other Vehicle Owners (N=317)
Excellent	17	15	18	12 ^b	22 ^b
Good	39	37	41	38	40
Fair	31	34	29	35 ^b	26 ^b
Poor	8	12 ^a	5 ^a	8	9
Don't know/refused	5	2 ^a	8 ^a	7	4

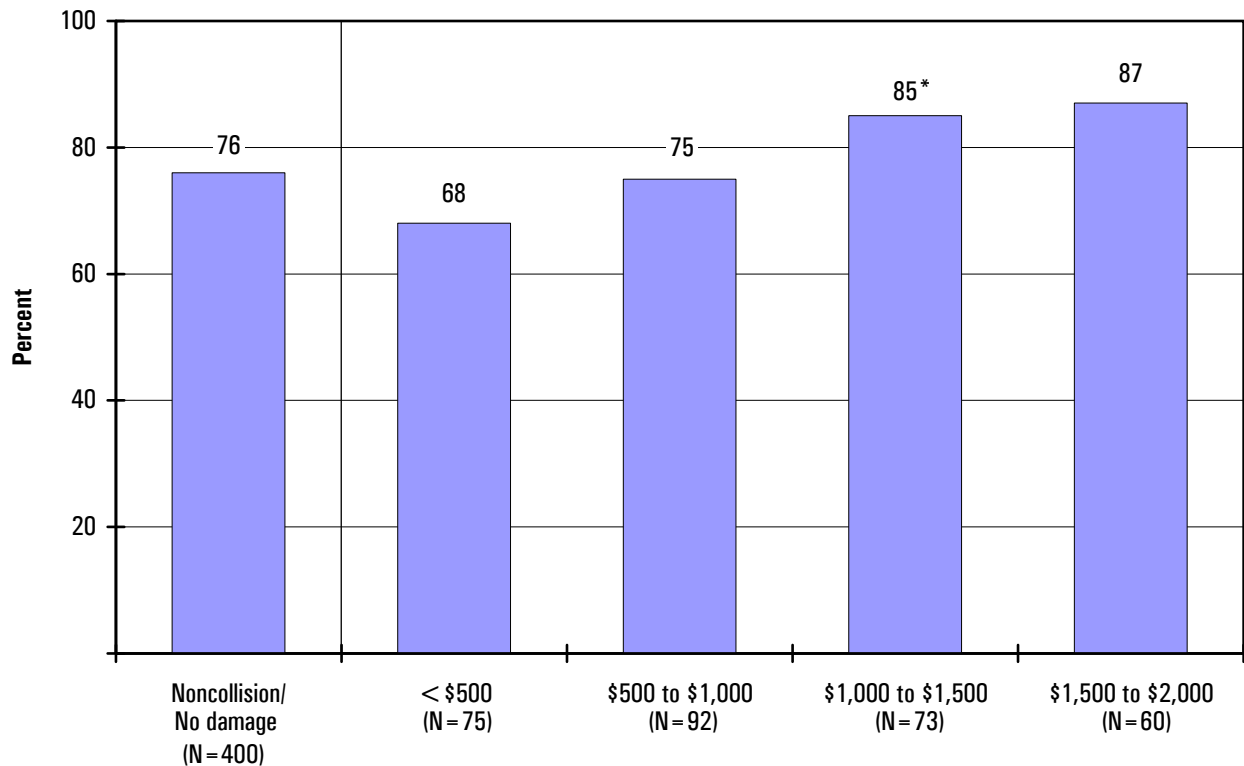
^a Collision-damage group significantly different from noncollision/no damage group ($p < 0.05$)

^b Car owners significantly different from other vehicles owners ($p < 0.05$)

Federal bumper standard: Respondents were told that the federal bumper standard had been lowered to 2.5 mph in 1983 and asked if they thought it should be returned to 5 mph. Overall, 77 percent of respondents said they thought the government should require car bumpers to withstand a 5 mph impact with no damage. Compared with those who said they were aware of the availability of bumper performance information, people who said they were not aware were more likely to say the government should return the standard to 5 mph (81 percent versus 73 percent). Those who were aware of bumper performance information were more likely than those who were not to say the standard did not need to be raised (18 percent versus 12 percent). Figure 3 shows the percentages of respondents who said the bumper standard should be raised as a function of the dollar amounts of damage their vehicles had sustained in frontal or rear-end collisions. There was a clear relationship between damage cost and support for a stronger bumper standard, with respondents who experienced higher repair costs

significantly more likely to express support for a 5 mph standard. Eighty-five percent of respondents who said they had been in collisions with \$1,000-1,500 in damage and 87 percent with \$1,500-2,000 in damage favored raising the bumper standard, compared with 68 percent with less than \$500 in damage.

Figure 3
Percent Who Said Bumper Standard Should Return to 5 mph by Damage Cost



*Significantly different from damage cost less than \$500 ($p < 0.05$)

Respondents were told that the current requirement for bumpers to withstand a 2.5 mph impact with no damage applies only to cars and not to other types of passenger vehicles. When asked if they thought the bumper standard for cars should be rewritten to apply to minivans, sport utility vehicles, vans, and light trucks, 88 percent of respondents said it should. There were no significant differences in positive responses among owners of different vehicle types; however, pickup owners (11 percent) and car owners (9 percent) were more likely than minivan owners (2 percent) to say the standard should not be changed.

Minor collision damage repairs: Respondents in the collision-damage group were asked a series of questions about their experiences having their vehicles' damages repaired (Table 6). Of the 300 respondents who said they had been in collisions in which their vehicles sustained front or rear damage of \$2,000 or less, 37 percent said the repair cost was higher than they thought it would be. Twenty-six percent said they or other household members had to take time off from work to get their vehicles repaired. The amount of time respondents said their vehicles were in the shop for damage repair

was 1-2 days for 29 percent of respondents, 3-4 days for 28 percent, and 5 or more days for 39 percent. Overall, 48 percent of respondents who had their vehicles' front or rear damage repaired said the process of getting the repairs done was very (21 percent) or somewhat (26 percent) inconvenient, and 52 percent said it was a little inconvenient (26 percent) or not much of a problem (26 percent).

Table 6
Damage Repair Experience of Respondents
in Collision-Damage Group (N=300)

	Percent	Number
Repair cost higher than expected	37	110
Took time off work	26	79
Number of days vehicle in shop		
1-2 days	29	87
3-4 days	28	85
≥5 days	39	116
Don't know/refused	4	12
Thought getting the vehicle repaired was:		
Very inconvenient	21	64
Somewhat inconvenient	26	79
A little inconvenient	26	78
Not much of a problem	26	78
Don't know/refused	--	1

DISCUSSION

Results of this survey indicated that although people want bumpers that are protective in low-speed collisions, they have not put much effort into comparing vehicle bumper performance differences when making their purchase decisions. A majority of respondents in this survey said they support strengthening the current bumper standard and having it apply to all types of passenger vehicles. When making their most recent vehicle purchase decisions, few considered the ability of bumpers to prevent damage in low-speed collisions, but many said they would for their next purchases. For the most part, little difference was noted among respondents who said they had been in collisions with front or rear damage in the past year or so compared with those who had not.

Seventy-seven percent of respondents expressed support for reinstating the 5 mph bumper standard; this is consistent with earlier surveys that indicated the majority of the public supported stronger bumper standards. The present survey also indicated support for applying the bumper standard to all types of passenger vehicles, and this support was consistent across owners of all vehicles types.

Respondents who had been in collisions with front or rear damage were more likely than others to say they thought their vehicle bumpers would perform poorly in a low-speed crash test. Among respondents whose vehicles had front or rear collision damage repaired, 74 percent said the process of getting repairs made was a little, somewhat, or very inconvenient. Sixty-seven percent said their vehicles

were in the shop for more than two days. Perhaps reflecting disappointment in their vehicles' bumper performance, respondents whose vehicles had front or rear damage with higher repair costs were more likely than those with less expensive damage to support a stronger bumper standard.

Although the majority of respondents appeared to be aware of the availability of bumper performance information, they did not seem to be actively seeking it out; rather they were aware through media sources such as television, magazines, and newspapers. Only one-sixth of respondents said they had considered the ability of bumpers to prevent damage in low-speed collisions when making the purchase decisions for the vehicles they currently drove. However, more than half said that for their next vehicle purchases, they would definitely or probably buy vehicles with better bumpers over those with much poorer bumpers. A survey of new car buyers found similar results regarding vehicle safety (Ferguson and Williams, 1996). Many respondents indicated this was a very important factor in their purchase decisions; however, few actively sought crash test results, and many said they would use safety data if it were more readily available to them.

Greater availability of bumper performance data would help consumers realize the wide range of repair costs for similar vehicles in low-speed collisions. Many factors influence vehicle purchase decisions (Ferguson and Williams, 1996; Ferguson, 1992; Insurance Research Council, 1990), and consumers must make tradeoffs among these factors when selecting vehicles to buy. The interest in a stronger bumper standard expressed by respondents in this survey indicated consumers would like a standard that requires bumpers of all vehicles to prevent damage in low-speed collisions, which would give them one less factor to consider when making vehicle purchase decisions.

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