POTENTIAL DAMAGES IN HEAVY TRUCK CRASHES

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Summary

Currently, large trucks carrying property in interstate commerce are required to carry at least $750,000 in liability insurance, per crash. This minimum requirement was set more than 30 years ago and has never been increased. This report assesses the adequacy of this minimum amount by examining the costs and damages associated with serious truck crashes. It finds the minimum is an order of magnitude too low.

In 2012 dollars, the estimated upper decile/quartile range for liability awards in large truck crashes involving death or catastrophic injury is $9-10 million. The U.S. Department of Transportation uses a $9.1 million value per life saved in decision-making about truck safety. Moreover, multiple people sometimes are injured or killed in a single fatal large truck crash. Thus a policy limit per crash of at least $10 million seems appropriate. This value should be indexed for inflation and productivity growth in the same manner that DoT indexes its regulatory analysis value. DoT's official value exceeds the most probable mean compensation, which is between $3.5 million and $6 million per casualty. Conversely, this limit will be well below awards for gross negligence in some states. Those mega-awards have risen steadily in heavy truck liability cases, with a $40.8 million award in 2011.

These estimates build on a range of evidence.

- A forensic economist typically would value productivity losses and medical costs for a crash fatality at $1.2-$6.0 million depending on victim age and state liability regime. In Federal courts and state courts that allow recovery for lost quality of life in death cases, compensation quite possibly lies in the $5.0-$9.0 million range. Some heavy truck crashes involve multiple fatalities.
- In 2004-2010, US jury verdicts in wrongful death cases averaged $3.6 million. Mega-awards skewed this distribution. The 75th percentile verdict was $3.0 million.
- The 75th percentile award for brain injury when a business was liable is $3.1 million.
- Plaintiff life care plans for traumatic brain and spinal cord injuries that require attendant care can run from $6.0 to $9.0 million or more. This number covers only costs of care. It excludes lost productivity and quality of life.
- Mean cost per catastrophic crash injury (MAIS severity 4-5) including medical care, lost productivity, and lost quality of life is $2.7-$4.0 million, with some injuries costing much more.
- The mean and 90th percentile among 119 unsealed million-dollar verdicts & settlements for truck crashes since 2007 are $4.3 and $9.1 million.
- Most large US passenger air lines carry insurance liability limits of $3 to $10 million per casualty,
- Jury verdicts for non-fatal injury are free of some artificial constraints that legislatures impose on wrongful death awards. They suggest a value of $3.7 to $6.1 million per casualty.
- On February 28, 2013, the U.S. Department of Transportation adopted a $9.1 million value per life saved for regulatory analysis use with sensitivity analysis at

$5.2 and $12.9 million (Trottenberg and Rivkin 2013). These values will be indexed for inflation and further increased with productivity growth.

Introduction

Large trucks hauling property in interstate commerce are only required to carry liability insurance in the amount of $750,000 "per occurrence," regardless of the number of persons killed or injured in a crash. The Motor Carrier Act of 1980 authorized the Secretary of Transportation to set the proper amount to compensate victims and enhance motor carrier safety. The Secretary set the $750,000 minimum requirement, and in the intervening 30 years has never increased the amount even though the costs of damages associated with large truck crashes have increased dramatically over that time period.

Failure to update the minimum financial responsibility limit threatens highway safety and transfers the costs of operations on the low end of the trucking industry to truck crash victims and to American taxpayers. When a trucking company lacks sufficient liability insurance coverage or assets to pay for damages it causes, truck crash victims who are not compensated for their damages essentially subsidize the operation of the industry, as those costs are not absorbed by the industry itself. To the extent these victims became destitute and reliant on public funding such as Medicare, Medicaid or welfare programs, taxpayers also subsidize trucking operations.

Inadequate insurance minimums skew competition within the industry. Larger companies that actually have assets to protect do not insure at the minimum limits; they have an incentive to protect themselves with greater insurance because they know that $750,000 does not come close to covering the damage an 80,000 pound rig can cause. Smaller companies that have fewer assets and "nothing to lose" purchase the minimum amount of coverage knowing they will simply have to go out of business for a while if they have a bad crash. Accordingly, safer, more successful companies with substantial assets may have insurance "towers" of tens of millions of dollars, while their smaller competitors purchase only the minimum amount required and rely on bankruptcy and corporate laws to protect operators from paying for damages they cause. The result is that the costs, per truck, at the lower end of the industry are reduced (because these costs are not being fully paid by the industry participants), which tends to drive competition, and therefore safety, to the lowest common denominator.

This report assesses how frequently crash liability is likely to exceed the $750,000 per occurrence minimum amount limit. It examines both fatal and serious injury crashes.

Much evidence is available to inform the choice of a policy limit per crash. It includes:

1. Computed estimates of work-related losses compensable in tort litigation.

2. Average amount and distribution of recent US Federal and state jury verdicts and settlements for wrongful death and serious injury.

3. Distribution of crash injury costs.

4. Typical liability limits per casualty in US commercial airline insurance.

5. Value per life used in US Department of Transportation regulatory analyses.

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Productivity Loss per Fatality

Fatality Analysis and Reporting System (FARS) data indicate that 3,757 people died in large truck crashes in 2011 including 3,122 who were not occupants in the trucks. Compensable losses for fatalities found to be the fault of large truck owners ought to be covered by the insurance policies those owners carry. Indeed, large truck crashes sometimes involve multiple fatalities and/or injuries, which might argue for a higher "per occurrence" policy limit.

Table 1 shows how average compensable fatality economic losses vary by decedent gender and age. It shows two sets of estimated present values of future earnings and household production for someone of average earning capacity. The table presents a range for calculation of purely economic losses associated with a fatality depending on the requirements of a particular state's laws. One set applies a 3% discount rate, with a counterbalancing 1% productivity growth rate for wage work but no productivity growth for household work. On the low end, in 2012 dollars, potentially compensable "economic" losses per crash fatality average $1,271,272 including $11,916 in medical costs and $1,259,357 in lost productivity (wages, fringe benefits, and household work). The second set uses as an example the provisions of Pennsylvania law, which requires courts to assume that inflation totally offsets discounting but does not preclude assuming productivity growth. It uses the 1.5% productivity growth rate that some plaintiff economists have applied in the state. These assumptions yield awards as high as $6.26 million for infant boys of average earnings and life expectancy. In both sets of estimates, the average for someone with a college education would be substantially higher. Awards also would be substantially higher in states that permit recovery for lost quality of life and/or for non-economic losses.

Verdicts and Settlements

Thompson Reuters (2012) captured most personal injury jury verdicts in 2004-2010. Across all plaintiff jury verdicts it captured for personal injury and death, the average liability award was $791,756 with a range from $1 to $326 million. Fourteen percent of awards exceeded $750,000, including 2% below $1 million, 6% from $1 to $2.49 million, 3% from $2.5 to $4.99 million, and 3% above that.

The mean wrongful death award during that time period was $3.6 million, with a median of $1.2 million. One fourth of death awards exceeded $3 million. Serious truck crashes tend to involve greater injuries and damages. Truck crashes accounted for 22% of vehicular liability death claims for adult males and 20% for adult females.

Vehicular negligence (essentially motor vehicle crashes) accounted for 65% of the plaintiff verdicts entered into the database between 2004 and 2010. Among these awards, one fourth of awards for brain injury exceeded $1,430,548. Furthermore, almost half of all brain injury awards exceeded $1 million.

The median award for business negligence claims against transportation industries was higher than for other industries, $573,526. Among all business award claims, the median death award was $1.16 million with 25% of awards above $3.5 million. For brain injuries, the median was $577,000 with the 75th percentile starting at $3,108,000. For leg

injuries, the median was $374,000, with 25% above $1,452,635. Over all plaintiff verdicts, 25% exceeded $736,875.

Table 1: Average Lifetime Productivity (Wage, Fringe Benefit, and Household Production) Loss by Discount Rate, Productivity Growth Rate, Gender, and Age Group

Age Group	0% Discount Rate, 1.5% Productivity Growth Rate		3% Discount Rate, 1.0% Productivity Growth Rate	
	Male	Female	Male	Female
LT 1	$6,261,601	$4,347,522	$1,366,073	$1,039,901
1-4	6,109,344	4,264,243	1,451,630	1,108,250
5-9	5,761,862	4,067,508	1,591,232	1,221,032
10-14	5,390,295	3,851,879	1,753,407	1,350,412
15-19	5,042,341	3,636,122	1,926,649	1,479,828
20-24	4,677,833	3,381,240	2,067,232	1,567,697
25-29	4,229,297	3,038,003	2,104,797	1,554,675
30-34	3,699,245	2,638,556	2,029,412	1,458,384
35-39	3,124,974	2,231,629	1,861,916	1,319,239
40-44	2,546,419	1,840,718	1,630,629	1,157,311
45-49	1,999,852	1,476,576	1,367,577	982,611
50-54	1,498,277	1,142,291	1,086,310	798,980
55-59	1,046,789	840,245	795,176	610,329
60-64	664,663	588,455	518,425	437,625
65-69	410,148	414,439	325,571	316,143
70-74	265,798	296,405	217,846	233,894
75-79	169,030	210,507	142,823	172,261
80-84	107,958	148,502	93,998	125,909
85 & over	59,160	87,702	53,389	78,216

Note: Estimates produced using the age-earnings model used in making benefits estimates for NHTSA regulatory analyses.

Because of the difference in mass between large trucks and passenger vehicles, trucks can cause more injuries and greater damages in a single crash. Truck crashes accounted for more than 7% of all awards for spinal nerve injuries with disc damage; 25% of these awards exceeded $622,500 per person injured. From year to year, larger awards ranged from $5.0-$8.4 million. Among cases involving paralysis, 86% of awards were at least $1 million. More million-dollar-plus verdicts in 2009-10 were for spinal nerve or disc injuries than for brain injuries.

We obtained a list of truck crash resolutions from Thompson Reuters of 454 jury verdicts and settlements of $1 million and over that were undated or from 1990 onwards. These results are offered as examples only as the listing is an incomplete convenience sample. Because we are interested in damage levels, we used award amounts prior to judicial reductions for comparative negligence or due to arbitrary state damage caps. Verdicts comprised 52% of cases reported to Thompson Reuters. Because courts often publish verdicts and verdicts are not usually sealed, this percentage is higher than the likely percentage of verdicts among all litigation closed with compensation during this

time period. Large settlements are especially likely to be sealed so this listing is likely to underestimate the value of truck crash claims. As Table 2 shows, possibly as a result, verdicts tended to be somewhat larger than reported settlements.

Table 2. Large Truck Crash Jury Verdicts and Settlements of $1 Million and Over Reported to Thompson-Reuters, United States, 1990-2012 and Undated

	All	Verdicts	Settlements
Cases	454	234	220
Mean Amount	$3,973,623	$4,774,396	$3,085,955
Maximum	$40,800,000	$30,000,000	$40,800,000
Quartile 1	$1,301,900	$1,300,000	$1,250,000
Median	$2,272,500	$2,645,043	$2,000,000
Quartile 3	$4,978,897	$7,000,000	$3,590,000
Decile 9	$8,997,000	$11,340,180	$5,785,495

Table 3 breaks the verdicts and settlements down by time period. Looking at the case counts, it is clear that reporting was even less complete prior to 2000 and that reporting from 2009 forward also was incomplete at the time of this data extract. For example, 17 cases were reported in 2009 versus an average of 29 per year in 2001-2008. Settlements in particular appeared to be underreported, comprising only 31% of cases reported for 2009-2012. In general – and probably due to inflation, compensation per million dollar verdict rose steadily from 2001-2002 to 2009-2012. That is true of compensation mean, maximum, by quartile, and at the 90th percentile. (Relatively small case counts probably account for the occasional aberration.)

Since 2009, compensation of $1 million or more in trucking crashes has averaged $4.45 million per crash. The data are right-skewed with the mean well above the median. More than a quarter of these crashes involved more than $5 million in compensation. Since 2005, 10% have involved compensation exceeding $9 million. Some large payouts were for crashes with multiple people injured or killed.

As the distributional information in Table 3 illustrates, compensation averages mask great variability. Compensation ranges widely within and especially between jurisdictions even for similar cases (Bovbjerg, Sloan, and Blumstein 1989). In some states, wrongful death awards of $5 to $15 million are common.

Table 3. Large Truck Crash Jury Verdicts and Settlements of $1 Million and Over Reported to Thompson Reuters by Time Period, United States, 1990-2012

Time Period	1990-2000	2001-2002	2003-2004	2005-2006	2007-2008	Since 2009
Cases	138	33	55	75	70	49
% Settlements	43%	58%	49%	49%	56%	31%
Mean Amount	$3,915,436	$3,202,420	$3,943,963	$3,930,829	$4,192,077	$4,458,173
Maximum	$30,000,000	$11,230,000	$15,500,000	$17,500,000	$20,793,297	$40,800,000
Quartile 1	$1,275,234	$1,250,000	$1,100,519	$1,234,282	$1,500,000	$1,270,508
Median	$2,000,000	$1,931,976	$2,187,885	$2,143,135	$2,500,000	$2,500,000
Quartile 3	$4,821,200	$4,751,495	$5,543,943	$4,420,879	$5,100,000	$5,140,053
Decile 9	$9,073,578	$6,884,780	$8,488,150	$9,210,989	$10,171,777	$8,051,787

These data require three reminders. First, the lag from incident to trial verdict averages four years (Thompson Reuters 2012). Second, the lag from verdict to capture in Thompson Reuters' data base often is 2-3 years. Third, cases with the clearest liability often settle. Many settlements, especially large ones, are sealed and therefore never make it into the database.

Insights from Crash Cost Studies

NHTSA crash cost data by severity, body part, and fracture involvement (Blincoe et al. 2002) confirm that costs for severe injury vary widely. For example, in 2012 dollars, medical cost for a single nonfatal injury that posed a critical threat to life (Abbreviated Injury Scale severity 5) averaged $308,124. Within that category, medical costs for abdominal injuries averaged $161,528 while those for a complete spinal cord severance averaged $974,741. Even these more finely grained means conceal long tails. They also include patients who are scraping by on inadequate care for lack of funds. Indeed, in litigation, life care plans for quadriplegics with full severance or brain injuries involving long-term loss of consciousness or requiring supervised care commonly are in the $6-9 million range or higher. Even when awards are in this range, recovery as a practical matter, is limited by the limits of available insurance coverage. Insurance pays out to the policy limit and the at-fault driver may or may not turn over his/her assets and declare bankruptcy. When compensation is exhausted, the injured person must rely on the public safety net. If the injured cannot return to work, private health insurance is more likely to recover its past payouts from compensation received than to cover long-term medical needs.

As Table 4 shows, including the value of lost quality of life, even people with relatively common AIS-3 crash injuries incur costs exceeding the current truck liability limits for a crash. With multiple people sometimes injured in a single crash, these data suggest a liability limit of at least $5 million per heavy truck crash.

Table 4. Average medical, productivity, and quality of life costs per crash-injured person in 2012 dollars and 2000 injury incidence, by maximum AIS-severity (MAIS) of the person's injuries

	Cases	Medical	Productivity	Quality of Life	Total
MAIS 1	3,599,995	$34,508	$16,965	$136,042	$187,515
MAIS 2	366,987	$78,839	$49,886	$165,021	$293,746
MAIS 3	117,694	$242,902	$71,744	$542,757	$857,403
MAIS 4	36,264	$511,795	$371,835	$1,798,598	$2,682,228
MAIS 5	9,463	$90,753	$430,427	$3,468,420	$3,989,600

Source: Inflated from Blincoe et al. (2002).

Insured Liability Levels for Commercial Airlines

Commercial air crashes are akin to large truck crashes since both involve federally regulated commercial transport. While an individual airline crash may cause a larger number of fatalities and injuries than a truck crash, the amount of coverage available "per person" killed or injured probably should be similar. Thus insurance coverage levels of these carriers seems relevant. Large US airlines are heavily insured.

On September 11, 2001, for example, both American and United Airlines carried policies covering a maximum of $1.5 billion in liability coverage per crash, with a $500 million deductible. Within these limits, in 2000, a further limit per wrongful death typically lay in the $3 to $10 million range (Bannister, undated). The availability of $3 to $10 million per person killed or injured underscores the insufficiency of the current trucking minimum limits which applies to the entire "occurrence" rather than the "per person."

The Value of Life Implicit in Court Compensation for Nonfatal Injury

Because court compensation for fatalities is artificially constrained, the best insight into the value juries place on casualties comes from awards for nonfatal injury. This method adds the tangible work losses to the dollar value juries place on a lifetime of intangibles. The values come from jury verdicts for non-economic damages--damages other than medical costs and productivity losses. Cohen (1988), Viscusi (1988), and Rodgers (1993) establish the theoretical framework for estimating non-economic damages from jury verdicts. The basic concept is that the amount of compensatory damages awarded by a jury minus the actual out-of-pocket losses associated with the injury approximates a survivor's pain and suffering. Lopez, Dexter, and Reinert (1995), Cohen (1988), Miller, Cohen, and Rossman (1993), Miller, Cohen, and Wiersema (1996), Bovbjerg, Sloan, and Blumstein (1989), Rodgers (1993), Lawrence et al. (2000), Miller, Brigham et al. (1993), and Smith (2000) use regressions on jury verdicts to value pain and suffering for serious birth defects, assault, rape, medical malpractice, consumer product injury, burns, and injuries caused by drinking drivers.

Cohen and Miller (2001) and Smith (2000) use data on the average quality-adjusted life years (QALYs) lost to different injuries to analyze the value of a lifetime of intangibles that juries use in their awards. The QALY estimates have around a 0.6 correlation with pain and suffering awarded. Adding average productivity lost per fatality to the value of a lifetime of QALYs, these studies compute the value of life juries use to determine non-economic damages. In 2012 dollars, that value ranges from $3.15 million for consumer product injury to $3.7 million for injuries in impaired driving crashes to $4.7 million for assaults.

Notably, juries do not view death as the worst of fates. Awards are most likely to exceed $1,000,000 for paralyzing injury, with brain damage and wrongful death virtually tied for second place (Thomas et al. 2000). Awards to survivors of serious casualty often rival or exceed death awards.

Value of Fatal Risk Reduction

A different dollar-based framework looks at the willingness to pay of a family for the health and safety of a member. This willingness to pay approach is used in benefit-cost analysis more than in the courtroom. It originated with Dreze (1962) and Schelling (1968). Jones-Lee (1982, 1989) and Arthur (1981) provide the theoretical framework.

The willingness-to-pay approach derives a value of risk reduction from studies of what people actually pay for small changes in their chance of being killed or injured or their direct survey responses about what they are willing to pay. Economists call such values willingness to pay estimates. The value of fatal risk reduction, aggregated over many people, yields the value of a statistical life. For example, if each of 10,000 people

spent $300 for a 1 in 10,000 risk reduction, together they would spend $3 million in the expectation of saving one life. That value has two components: (1) the value of the productivity foregone and (2) the value of the pain, suffering, grief, lost companionship, and lost quality of life (Arthur 1981).

Willingness to pay estimates incorporate non-economic damages plus lost productivity. They underpin most US regulatory analyses of life-safety decisions. Consequently, the Office of Management and Budget has looked thoughtfully at the range for the value of statistical life. Rather than prescribe a value, they allow agencies to choose one but require sensitivity analysis. On February 28, 2013, the U.S. Department of Transportation adopted a $9.1 million value per life saved for regulatory analysis use with sensitivity analysis at $5.2 and $12.9 million (Trottenberg and Rivkin 2013). These values will be indexed for inflation and further increase with productivity growth.

Conclusion and Recommendations

This paper presented a range of evidence about the family losses associated with a casualty. Table 5 summarizes the range of the estimates. As it shows, the most probable mean compensation is between $2 million and $6 million per casualty. A single death or catastrophic injury, however, can cost as much as $9 million or more – and the U.S. Department of Transportation has embraced a value in that range. Moreover, multiple people sometimes are injured or killed in a single fatal large truck crash. Thus a policy limit per crash of at least $10 million dollars seems appropriate. This value should be indexed for inflation and productivity growth in the same manner that DoT indexes its regulatory analysis value. It will not cover the largest liability awards. In one 2011 verdict, for example, compensation for a large truck crash exceeded $40 million.

Table 5: Summary of the Evidence

EVIDENCE	VALUE RANGE
Compensable value per wrongful death of a 20-29 year old male	$2.1 - $4.5 million
Mean jury verdict in wrongful death, 2004-2010	$3.5 million
75th percentile award for brain injury when a business was liable	$3.1 million
Life care plan for TBI/SCI requiring attendant care	$6.0 - 9.0 million
Mean & 90th percentile among million-dollar verdicts & settlements for truck crashes since 2007	$4.3 - $9.1 million
Mean cost per crash injury, MAIS severity 4-5	$2.7 - $4.0 million
Commercial aviation crashes, insurance policy limits	$3.0 - $10.0 million
Value of life implied by jury verdicts for non-fatal injury	$3.7 - $6.1 million
Value of statistical life in U.S. DoT safety regulatory analyses	$5.2 - $12.9 million

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