

Costs of Crashes to Government, United States, 2008

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ABSTRACT – We estimated how much the Federal government and state/local government pay for different kinds of crashes in the United States. Government costs include reductions in an array of public services (emergency, incident management, vocational rehabilitation, coroner court processing of liability litigation), medical payments, social safety net assistance to the injured and their families, and taxes foregone because victims miss work. Government also pays when its employees crash while working and covers fringe benefits for crash-involved employees and their benefit-eligible dependents in non-work hours. We estimated government shares of crash costs by component. We applied those estimates to existing US Department of Transportation estimates of crash costs to society and employers. Government pays an estimated \$35 billion annually because of crashes, an estimated 12.6% of the economic cost of crashes (Federal 7.1%, State/local 5.5%). Government bears a higher percentage of the monetary costs of injury crashes than fatal crashes or crashes involving property damage only. Government is increasingly recovering the medical cost of crashes from auto insurers. Nevertheless, medical costs and income and sales tax losses account for 75% of government's crash costs. For State/local government to break even on a 100%-State funded investment in road safety, the intervention would need to have an unrealistically high benefit-cost ratio of 34. Government invests in medical treatment of illness to save lives and improve quality of life. Curing a child's leukemia, for example, is not less costly than leaving that leukemia untreated. Safety should not be held to a different standard.

INTRODUCTION

Costs of crashes to society and employers in the United States have been analyzed carefully and periodically updated (e.g., Zaloshnja, Miller, Romano, et al., 2004, Zaloshnja and Miller, 2006, Zaloshnja, Miller, Council, et al., 2006, Zaloshnja and Miller, 2009). Miller et al. (Miller, 1989, Miller, Viner, Rossman, et al., 1991) and Blincoc (1996) more fully investigated who pays the crash costs. Although government's share of costs periodically is reported (Blincoc, Seay, Zaloshnja, et al., 2002; Zaloshnja and Miller, 2009), the underlying percentage of different costs borne by government has not been recalculated in many years. Moreover, the existing government cost estimates do not account for costs government incurs as an employer responsible for the fringe benefit expenses of its employees.

With most States currently wrestling budget crises, policymakers and safety advocates increasingly are asking whether safety programs can be part of the solution. The hope, as yet untested, is that crash prevention will return savings to State government

that exceed State government's costs. Evaluating this possibility requires sound estimates of the savings.

The aims of this paper are (1) to estimate how much the Federal government and State/local government pay for different kinds of crashes and (2) to consider whether return on investment is an appropriate government crash safety investment objective

METHODS

Crash costs paid in full or in part by government in the United States include:

Public services – fire and emergency medical services (EMS) at the crash scene, incident management services, police services, coroner or medical examiner services for fatalities, vocational rehabilitation and social services to the injured and their families.

Medical care – emergency department, hospital, physician's office, rehabilitation, mental health, nursing home, and pharmaceutical services for injury victims. Government shares in these costs through Medicare, Medicaid, and other public medical insurance programs, as well as limited direct service delivery (e.g., medical care at community health centers and Veteran's Administration hospitals).

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Foregone taxes – income and sales taxes not paid because the injured have less income and the dead are lost to the workforce.

Social safety net expenses – social services and public assistance payments including Social Security Disability Income, welfare (Temporary Assistance to Needy Families), food stamps, housing assistance, low income home energy assistance, and other programs that assist people when injury leaves them permanently disabled or indigent.

Adjudication and sanctioning – costs of processing crash-related citations, plus costs of incarceration and lesser sanctions, and costs of license point tracking and license suspension. Unfortunately, nationally representative data were not available on these costs or the portion of them paid by offenders.

Fringe benefits for government employees and their benefit-eligible dependents – sick leave, private health, disability, and life insurance payments, and for employees injured on the job, Workers' Compensation insurance payments.

Administrative costs when government employees are injured or killed – co-worker distraction, hiring and training temporary or permanent replacement workers or paying co-workers overtime to fill in, loss of unique skills, processing personnel changes, processing sick leave and workers' compensation claims.

Incident investigation and liability expenses – costs incurred when government employees are involved in crashes while working include investigation and record-keeping on crashes, for-cause drug and alcohol testing, and disciplinary action. If the government employee is at fault (i.e., causes the crash), the government also is liable for the losses of anyone who was injured or whose property was damaged in the crash.

Court costs – court costs associated with liability lawsuits against government and its employees.

Property damage – including damage to roadside furniture and government vehicles.

Offsetting these costs, when people die prematurely due to crash injuries, government saves on Medicare, Social Security, and sometimes Medicaid and public assistance payments that the deceased would have received after retirement. We were unable to model those offsetting savings, in part because deceased workers also would have continued to pay into these systems, thus partially funding their benefits.

Cost Estimation

We started from existing US Department of Transportation (DOT) unit crash costs and costs of crashes to employers (Blincoe, Seay, Zaloshnja, et al., 2002; Zaloshnja, Miller, Romano, et al., 2004, Zaloshnja and Miller, 2006, 2009), inflated to 2009 dollars. We applied the unit costs to 2005-2008 national incidence data weighted in the same way as the prior studies. We tabulated estimates by crash nature and police-reported severity, broken down by detailed cost category. We then applied the payer matrix to estimate government costs.

This section describes new estimates we made for some portions of the costs that are largely borne by State government and our estimates of the government share of other costs.

Public Services

Public services costs are paid almost entirely by State and local government. Using the data underlying the crash cost estimates (Miller, Viner, Rossman, et al., 1991), we separated out EMS, police, fire, vocational rehabilitation, and court costs.

The States of Missouri and Washington provided average incident management costs. In 2009 dollars, the estimated mean cost per crash attendance was \$82 for 315 crashes in Missouri and \$125 for 3,880 crashes in Washington (assuming the response rate to serious injury (A) crashes was 60% of the response rate to fatal (K) crashes). We adopted Washington State's estimate because the data were much more complete than the Missouri data. Using data on the percentage of crashes attended, we broke the estimate down by police-reported crash severity.

To break the costs of incident management (and roadway furniture damage) down into cost per person involved in a crash by injury severity, we followed the method used by Miller, Viner, Rossman et al. (1991). We first cross-tabulated the number of people in a crash by the Abbreviated Injury Scale (AIS) severity of their maximum injury (MAIS) and by the maximum MAIS of anyone in the crash (AAIS). Second, we used that cross-tabulation to iteratively estimate costs by MAIS. Specifically, we first divided the cost for a property damage only (PDO) crash by the uninjured people involved in a PDO crash to get a cost per uninjured person. Next, we used that cost per uninjured person to compute the cost of an AAIS 1 crash net of the costs associated with uninjured people. Dividing by the number of MAIS1 injury victims in a crash then yields the cost per MAIS 1 victim. This process was repeated

sequentially to compute costs for all MAIS levels. We also counted the number of vehicles per crash by AAIS.

We estimated the coroner costs from Hickman, Hughes, Strom et al. (2007). This survey-based document provides the costs and workload of all US medical examiner and coroner offices except in Louisiana. We calculated the cost per accepted fatal case under the assumption that 5% of the office budget is used to determine which cases to accept, keep records about those determinations, and handle public relations and education requests unrelated to specific deaths. We also assumed that all crash fatalities are accepted for investigation.

Medical Care

Using the million-record 2007 Health Care Cost and Utilization Project (HCUP) Nationwide Inpatient Sample, we estimated that 15.8% of hospital costs for motor vehicle crashes were paid by Medicaid and 7.3% were paid by Medicare (Table 1). Because frequency data are not available, that estimate excludes costs incurred when the wage losses and medical bills resulting from serious injury cause someone to become an indigent or disabled Medicaid recipient, with Medicaid paying all their medical bills, not just their injury bill.

Table 1. Primary payer for medical costs of hospital-admitted road crash injuries, United States, 2007

Payer	Ages 0-18	Ages 19-64	Ages >= 65	All Ages
Medicare	0.4%	2.3%	40.5%	7.3%
Medicaid	30.6%	12.1%	2.2%	15.8%
Private	59.4%	44.4%	50.0%	56.1%
Self	4.3%	10.5%	2.8%	10.9%
Charity	0.3%	1.2%	0.0%	1.2%
Other	4.5%	7.7%	4.4%	8.5%
Unknown	0.5%	0.2%	0.2%	0.3%

Source: Health Care Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS). HCUP-NIS charge data were converted to costs using cost-to-charge ratios supplied by HCUP.

Private includes auto insurance, private health insurance, HMO/managed care, and Worker’s Compensation; NIS does not differentiate these sources

Self pay and charity care ultimately may shift to Medicare or Medicaid

Other includes VA, CHAMPUS, state and local health care programs

On average, 43% of Medicaid costs (6.8% of total medical costs) are paid by State government (Scott,

2005). The Federal government pays the remaining 57% of Medicaid costs and all Medicare costs.

Foregone Taxes

The decrease in State tax revenues was estimated from the wage loss component of national crash costs. State tax loss represents the income and sales taxes that will not be paid to State government due to income loss. The 5.27% tax rate used is the population-weighted national average across States.

To estimate that percentage, we summed individual tax revenue by State from the 2008 Annual Survey of State Government Finances. It is the sum of individual income, general sales, and selective sales tax revenue. The US Statistical Abstract 2010 (Bureau of Labor Statistics, 2010) provided population and per capita income by State in 2008, which we used to compute total income. Dividing individual tax revenue by total income yielded the average percentage of income paid as State taxes.

The average Federal income tax rate across all households was 9.3% in 2007 (Congressional Budget Office, 2011).

Social Safety Net

We used survey-based estimates from Miller and Luchter (1988) that safety net expenditures were 0.0165 of wage loss including fringe benefits. The Federal government bore an estimated 60.6% of this expense and States paid the rest.

Costs Incurred by Government as an Employer

We estimated the proportion of all occupational road crash deaths that kill government employees and assumed that percentage also applied to non-fatal occupational crashes. The U.S. Bureau of Labor Statistics’ (BLS’) 2008 Census of Fatal Occupational Injuries (CFOI) shows that State government employees accounted for 58 of the 1,193 occupational motor vehicle fatalities on public roads (3.8%) and Federal employees accounted for 35 (2.0%). (Local government employees accounted for another 102 or 8.5%. Of 1804 motor vehicle fatalities on and off public roads, the percentages were 3.2%, 1.9%, and 7.8%).

Taylor, Zaloshnja, and Miller (2010) gives NHTSA’s latest estimates of the employer costs of crashes. The costs are based on the methods in Zaloshnja and Miller (2006). Table 2 shows selected employer costs and the share of total crash costs they constitute. Except for wage and medical care costs, the employer

shares of costs were multiplied times the government shares of employee fatalities to estimate government costs of employee crashes while at work.

Table 2. Occupational (on the clock) crash costs, total crash costs, and the percentage occupational for selected crash cost categories (in billions of 2008 dollars)

	Employer Cost	Total Cost	% Employer
Wages	7.63*	81.78	9.33%
Medical Care	11.86*	50.82	23.34%
Injury Liability	13.37	164.24	8.14%
Legal	1.08	14.8	7.30%
Insurance Administration	2.21	17.58	12.57%
Investigation & Disruption	5.62	5.62	100%
Property Damage	6.12	82.23	7.44%

Source: Computed from estimates in Taylor, Zaloshnja and Miller (2010) and Zaloshnja and Miller (2009), with estimates from the latter source inflated to 2008 dollars. Employee wages and medical care exclude employer costs due to non-work crashes.

*Includes wage losses due to injuries in non-work hours.

Government covers the medical and wage loss costs of crashes in work and non-work hours. We assumed government workers and their dependents had average crash risks. That means the fringe benefit costs would be proportional to employment

The percentage of employees working for State government, 3.7%, was computed by dividing State government employment for October 2009 of 5,182,000 (Bureau of Labor Statistics, 2010) by total employment in 2009 including self-employed and agricultural workers of 140,602,470 (Bureau of the Census, 2010, Table DP3). The 3.7% estimate is the State share of wage and medical care costs in Table 2. (For example, employers pay 9.33% (0.0933) of the wage losses resulting from non-work crashes. Thus, State government's share is 0.37% of wage losses (3.7% * 0.0933).) The Federal share, computed similarly, is 1.8%.

We assumed government employees and their benefit-eligible dependents other than working spouses with other insurance will be covered by government-funded health insurance.

To compute dependent care coverage, we used demographic data from Bureau of the Census (2010, Tables S1101 and S2302). We multiplied the number of family households with at least one person

working in 2009 (75,530,746 * 0.863 = 55,811,477) times 2.23, which is the average number of household members in a family household other than the household head, then subtracted the number of second earners in employed family households (40,711,072). These computations suggested that 104,647,093 dependents who are not employed live in homes with an employed person, or 0.744 dependents per employee (104,647,093/140,602,470). This is a lower bound on dependents per benefit-eligible employee.¹ Furthermore, of the 307,006,556 U.S. residents in 2009, an estimated 79.88% of people are workers or their dependents ((307,006,556 - 140,602,470 employed people - 104,647,093 dependents)/ 307,006,556). That means 5.14% of crash victims (3.7% * (1 employee + 0.744 dependents) * 79.88%) will have their crash medical costs covered by State health insurance. Similarly, Federal health insurance will cover 2.5%.

In total, State governments pay an estimated 11.9% of the total medical costs of crashes (5.1% for employee and dependent coverage + 6.8% through Medicaid). The Federal share is 19.4% (including 3.1% for employee and dependent coverage, 9.0% for Medicare costs, and 7.3% for Medicaid costs).

Property Damage

Above we computed the property damage costs that government pays when its vehicles are involved in crashes. State and local government also absorb most of the costs of damage to signs, lampposts, guardrails, and other roadside furniture.

Estimated costs of roadside furniture damage by crash severity came from 1,462 crashes in 2008 tracked by the Missouri Claims Recovery Department. The data also indicated the portion of costs not recovered from at-fault drivers and their insurers.

RESULTS

Government pays an estimated \$35 billion annually because of crashes (not tabulated). Of that bill, \$15 billion falls on State and local government. The Federal government picks up the rest. Government pays an estimated 12.6% of the monetary cost of

¹ If we instead assumed that working partners of State employees were covered by State employee health insurance, the estimate would rise to 1.455 ((104,647,093+40,711,072)/(140,602,470-40,711,072)), but we surely would double-count, most obviously in homes where both earners worked for State government.

police-reported crashes (Federal 7.1%, state/local 5.5%) and 6.7% of the comprehensive costs including the value of lost quality of life (Federal 3.8%, state/local 2.9%). Government bears a higher percentage of the monetary costs of injury crashes than fatal crashes or crashes involving property damage only.

Government is increasingly recovering the medical cost of crashes from auto insurers. Nevertheless, medical costs and income and sales tax losses account for 75% of government's crash costs.

Table 3 shows detailed State government cost estimates per crash-involved person by police-reported KABCO injury severity. The largest government expenses are for medical costs and tax losses. The largest Federal government costs (Table 4) also are in these categories.

Table 3. State government costs per crash-involved person by police-reported severity (in 2009 dollars)

State	O	C	B	A	K
PUBLIC SVCS	67	237	344	765	5,065
EMS	20	55	80	188	859
Fire	7	17	32	100	534
Police	17	62	72	87	243
Incident Management	2	2	5	17	112
Roadside Furniture	13	19	20	21	31
Voc Rehab	2	20	34	99	-
Coroner	-	-	-	-	1,635
Court	6	62	101	253	1,651
MEDICAL	39	760	1,440	4,862	4,244
Medicaid	23	445	843	2,846	2,484
Employee Medical	16	315	597	2,016	1,760
EMPLOYER	15	149	236	740	8,284
Employee Wage Loss	1	23	39	146	2,700
Employer Admin Cost	4	37	47	97	527
Insur Admin	1	12	21	67	301
Legal	3	58	104	376	4,236
At-Fault Liability	-	4	9	34	474
Property Damage	6	15	16	20	46
TAX LOSS	11	291	497	1,867	34,601
SAFETY NET	2	43	74	276	5,121
TOTAL STATE	134	1,480	2,591	8,510	57,315
% of Monetary Cost	3.4%	6.2%	6.7%	6.8%	4.4%
% of Comprehensive Cost	3.0%	3.6%	3.7%	3.7%	1.4%

O = property damage only, C = possible injury, B = evident injury, A = serious injury, K = killed

Predictability, government costs rise with injury severity. State and local government pay \$72,700 per fatality and the Federal government pays \$103,000.

Table 4. Federal government costs per crash-involved person by police-reported injury severity (in 2009 dollars)

Federal	O	C	B	A	K
MEDICAL	65	1,258	2,384	8,048	7,023
Medicare/Medicaid	55	1,068	2,024	6,831	5,961
Employee Medical	10	190	360	1,217	1,062
EMPLOYER	8	90	141	447	4,995
Employee Wage Loss	-	14	23	88	1,625
Employer Admin Cost	2	22	28	59	318
Insur Admin	1	7	12	40	182
Legal	2	35	63	227	2,556
At-Fault Liability	-	3	5	21	286
Property Damage	3	9	10	12	28
TAX LOSS	19	514	876	3,295	61,061
SAFETY NET	2	66	113	425	7,879
TOTAL FEDERAL	94	1,928	3,514	12,215	80,958
% of Monetary Cost	2.4%	8.1%	9.0%	9.7%	6.2%
% of Comprehensive Cost	2.1%	4.7%	5.0%	5.3%	1.9%

Table 5 shows the unit costs to State and Federal government per crash-involved person by MAIS severity. This table omits fatalities (MAIS 6) because their unit costs appear in the K column of Tables 3-4.

By crash severity, Table 6 (appended) shows State government costs per crash-involved person for occupants by restraint use, motorcyclists, non-occupants, people in impaired driving crashes, and people in teen driver crashes. This table uses more collapsed categories than Tables 3-5. Table 6 also shows multipliers that can be used to estimate Federal costs from the State costs.

DISCUSSION

The tables provide unit costs by crash type and police-reported crash severity. Multiplying the unit costs times crash counts for a State will yield estimated State government spending associated with the crashes. Before multiplying, we recommend adjusting the costs to State-specific prices, tax rates, and Federal Medicaid participation rates. The appropriate multipliers are available from the lead

Table 5. State and Federal government costs per crash-involved person by MAIS and cost category (in 2009 dollars)

MAIS	0	1	2	3	4	5
STATE						
PUBLIC						
SVCS	50	241	814	1,462	3,843	4,233
EMS	17	50	184	380	982	1,003
Fire	7	9	93	224	629	641
Police	12	78	97	107	116	124
Incident Management	2	1	1	77	74	74
Roadside Furniture	12	22	22	22	22	22
Voc Rehab	0	17	104	226	369	718
Coroner	0	0	0	0	0	0
Court	0	64	313	426	1,651	1,651
MEDICAL	0	553	3,565	8,196	24,811	55,370
Medicaid	0	324	2,087	4,797	14,522	32,409
Employee Med	0	229	1,478	3,399	10,289	22,961
EMPLOYER	8	77	636	1,545	2,724	9,204
Employee Wages	0	8	121	312	483	2,304
Employer Admin	2	15	118	258	285	496
At-fault Liab	1	6	60	147	257	550
Legal	0	30	293	729	1,506	5,401
Insur Admin	0	1	26	69	149	411
Property Damage	5	17	18	30	44	42
TAX LOSS	0	107	1,549	4,002	6,189	29,524
SAFETY NET	0	16	229	592	916	4,370
TOT STATE	58	994	6,793	15,797	38,483	102,701
% of Monetary	2.6%	4.4%	3.9%	3.7%	4.4%	3.4%
% of Comp	2.6%	3.4%	2.3%	2.8%	2.9%	2.2%
FEDERAL						
MEDICAL	0	915	5,900	13,564	41,064	91,640
Medicare/Medicaid	0	777	5,008	11,513	34,855	77,784
Employee Medical	0	138	892	2,051	6,209	13,856
EMPLOYER	4	46	383	933	1,644	5,551
Employee Wages	0	5	73	188	291	1,387
Employer Admin	1	9	71	156	172	299
At-fault Liab	0	4	36	89	155	332
Legal	0	18	177	440	909	3,259
Insur Admin	0	0	15	42	90	248
Property Damage	3	10	11	18	27	26
TAX LOSS	0	188	2,734	7,062	10,921	52,101
SAFETY NET	0	24	353	911	1,409	6,723
TOT FED	4	1,173	9,370	22,470	55,038	156,015
% of Monetary	0.2%	5.2%	5.4%	5.2%	6.3%	5.2%
% of Comp	0.2%	4.0%	3.2%	4.0%	4.2%	3.4%

author upon request. State-specific costs by police-reported severity, crash geometry, and speed limit will appear in the final report on National Cooperative Highway Research Project 20-24 (068).

Although our estimates obviously are U.S.-specific, our methods and conceptual framework are broadly applicable. They are especially relevant for countries like Australia, Canada, and the United Kingdom where costs are split between tiered levels of government.

Comparison with Prior Estimates

Our estimates of government costs exceed estimates built from payer distributions in the late 1980s and early 1990s. We estimate the State burden is 5.5% of economic costs in 2009, almost double the 2.9% estimate for 1994 (Blincoe, 1996), the 2.7% estimate for 2000 (Blincoe, Seay, Zaloshnja, et al., 2002), and the 2.1% estimate for 1984-86 (Miller, Viner, Rossman, et al., 1991). Federal costs have risen much less, from 6.3% in 1984-86 and 1990 to 6.4% in 2000 to 7.1% in 2009.

The growth in estimated government payments is an artifact, not a trend. It largely results from our inclusion of government costs incurred as an employer and of State sales tax revenue impacts. Prior estimates included neither of those cost elements. Federal costs rose only modestly in aggregate because our inclusion of employer costs was offset by a fall in the average income tax rate from 11% in 1982 to 9.3% in 2007.

Nevertheless, government's share of some costs has shifted. The most accurate payer data are for inpatient care. Medicare and Medicaid covered 15.8% of these costs in 2007 compared to 13.7% in 1992. Despite a large growth in the elderly population, Medicare costs were essentially stable, 7.3% in 2007 and 7.5% in 1992. That stability probably resulted from growing Medicare cost recovery from auto insurers. In 2007, among people over age 65, Medicare paid for 40.5% of crash injury hospitalizations and 89.5% of other injury hospitalizations.

Return on State Government Investment

Our analysis suggests that State/local governments rarely will save money by implementing highway safety infrastructure programs. The benefit-cost ratio needed for a State to break even is an unrealistically high 34:1 (1.0/2.9% State/local). The ratio required will be lower if the program can be targeted to Medicaid recipients, meaning government garners virtually all of the medical care savings.

A lower benefit-cost ratio is required when government does not pay some of the program costs. Benefit-cost estimates for laws that interfere with personal freedom fall into this category. Miller, Finkelstein, Zaloshnja et al. (2005), for example, uses intervention costs that incorporate the discomfort and inconvenience costs of new users of safety belts and motorcycle helmets. Its intervention costs for graduated licensing includes the attendant mobility loss. Its costs for the 21-minimum drinking age, zero tolerance for drivers under 21, and a 0.08 maximum driver blood alcohol level account for the forced reduction in either previously legal drinking or in mobility. These laws would have much higher benefit-cost ratios if costs were estimated from a governmental perspective. Such estimates are badly needed.

The job of the State is to protect and enhance the welfare of its citizens. Government invests in medical treatment of illness to save lives and improve quality of life. Curing a child's leukemia, for example, is not less costly than leaving that leukemia untreated.

Like medical care, preventive health and safety efforts are designed to save lives and increase quality of life. So it is unclear why safety is held to a different standard. Crash prevention saves life years and quality of life at a small cost to government compared to most medical treatment. It should not be held to a higher standard. The savings to citizens and employers count.

Limitations

Because almost all States use the KABCO system in their crash reports, we largely reported our estimates in that system. The system, however, does not code victim severity either consistently or reproducibly (see Zaloshnja, Miller, Council, et al., 2006, for details). Notably, police often code injury severity without physically examining the victim and victims sometimes have been transported from the scene before the officer who later codes severity arrives.

The crash costs underlying our estimates convert future expenses to present value at the 4% discount rate that the Federal Highway Administration (1994) requires States to use in resource allocation. The public health community prefers a 3% rate (Gold, Siegel, Russell, et al., 1996).

The cost estimates for police and fire services are quite old. While they are only 1% of the government costs for a fatality, they are 20% of the costs for a crash involving property damage only. Thus newer estimates would be desirable. The estimated

administrative costs that employers incur because of crashes are largely built on assumption rather than fact. Recent overseas studies might support an upgrading of these estimates in the future. The social safety net expenditures also are quite old. Unfortunately, it would be virtually impossible to update them without a large sample survey. Finally, we were unable to estimate the reduction in government costs associated with crash-related deaths. That means we overestimate the costs of crashes to the Federal government and to a much lesser extent, to State government.

Our analysis shares many strengths and weaknesses with the underlying societal crash cost estimates. Its limitations largely also apply to the crash costs that State governments and the Federal government use in allocating resources and analyzing regulations. They are limitations of the nation's official crash costs, not just of our analysis. Moreover, the percentage of costs borne by government would be less sensitive to cost updating than the actual costs; the updated police, fire, and employer administrative costs would appear in both the numerator and denominator.

CONCLUSION

Government provides a range of services in response to road crashes. It bears part of the medical care and wage loss bill for its citizens. In addition, as a major employer, government pays the bill when employees crash while working. It also pays the fringe benefit costs of crashes off the job by employees and benefit-eligible dependents.

Our study shows that government, and especially State government, pays only a small part of the road crash bill. Furthermore, public medical insurance has become increasingly good at recovering crash costs from auto insurers. Therefore, State-funded road safety measures cannot ease a budget crisis. State governments rarely will save much money by passing road safety laws. Nevertheless, crashes cost State and local governments \$15 billion annually. Prevention will reduce that bill while saving lives and reducing injuries.

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APPENDIX

Table 6. Costs of crashes to a State and multiplier to estimate Federal costs from State costs, by crash type and police-reported crash severity (in 2009 dollars)

		Public Services	Medical	Employer	Tax Loss	Safety Net	Total
Federal/State Multiplier		0	1.655	0.611	1.766	1.549	
Motorcyclist	O	52	7	10	2	0	71
Motorcyclist	C	355	1,041	236	528	78	2,238
Motorcyclist	B	435	1,676	298	640	95	3,144
Motorcyclist	A	1,004	6,873	1,062	2,731	404	12,074
Motorcyclist	K	5,065	4,244	8,284	34,601	5,121	57,315
Unbelted Occupant	O	64	34	12	10	2	122
Unbelted Occupant	C	267	1,028	198	421	62	1,976
Unbelted Occupant	B	462	2,807	368	780	115	4,532
Unbelted Occupant	A	1,006	7,485	1,066	2,737	405	12,699
Unbelted Occupant	K	5,065	4,244	8,284	34,601	5,121	57,315
Belted Occupant	O	61	32	12	10	1	116
Belted Occupant	C	230	611	115	210	31	1,197
Belted Occupant	B	334	1,157	201	413	61	2,166
Belted Occupant	A	711	4,561	657	1,598	237	7,764
Belted Occupant	K	5,065	4,244	8,284	34,601	5,121	57,315
Non-Occupant	O	56	31	12	8	1	108
Non-Occupant	C	248	876	170	341	51	1,686
Non-Occupant	B	415	1,780	292	645	96	3,228
Non-Occupant	A	977	6,698	988	2,549	377	11,589
Non-Occupant	K	5,065	4,244	8,284	34,601	5,121	57,315
In Impaired Driving Crash	O	69	43	15	12	2	141
In Impaired Driving Crash	C	232	709	138	263	39	1,381
In Impaired Driving Crash	B	306	1,266	199	406	60	2,237
In Impaired Driving Crash	A	586	3,301	515	1,260	186	5,848
In Impaired Driving Crash	K	5,065	4,244	8,284	34,601	5,121	57,315
In Teen Driver Crash	O	63	58	15	18	3	157
In Teen Driver Crash	C	278	911	196	412	61	1,858
In Teen Driver Crash	B	412	1,742	296	652	96	3,198
In Teen Driver Crash	A	1,041	8,248	1,179	2,998	444	13,910
In Teen Driver Crash	K	5,065	4,244	8,284	34,601	5,121	57,315