A Higher Road for a Better Tomorrow

MIDWEST ECONOMIC POLICY INSTITUTE


# The $5 Billion Cost of Construction Fatalities in the United States:

## *A 50 State Comparison*

**May 8, 2017**

# Executive Summary

This Midwest Economic Policy Institute (MEPI) Policy Brief estimates the economic burden of occupational fatalities in the United States from 2011 through 2015. The national report finds stark differences in construction labor markets in states across the nation.

**Construction workers tend to be more productive and better compensated in states with higher unionization and stronger prevailing wage laws.**

- Hawaii, Illinois, Minnesota, and New York are all in the top 10 states for high construction unionization, high productivity per worker, and high compensation. All four states have workers who produce over $86 in "value added" economic output per hour worked.
- The construction workforces in Oklahoma and South Carolina are consistently in the bottom 10 for unionization, productivity, and pay. These two states have considerably low unionization rates (under 6 percent) and hourly wages plus benefits (under $26 per hour).

**Across the country, a total of 4,339 construction workers lost their lives at work from 2011 through 2015.**

- An average of 867.8 construction workers suffered a workplace fatality per year; this means that an average of 16 construction workers die on-the-job every week across the nation.
- Of the 50 states, the fatality rate was lowest in New Hampshire, where there were 0.72 deaths per 10,000 workers in construction occupations. The fatality rate was highest in North Dakota, where there were 4.21 deaths per 10,000 workers in construction occupations. The national average fatality rate is 1.68 on-the job fatalities per 10,000 construction workers.
- Comparing on-the-job fatalities to total labor hours worked, Alaska, New Hampshire, and Maryland have the three safest construction labor markets out of the 50 states. North Dakota, New Mexico, and West Virginia had the most frequent on-the-job fatalities.
- On-the-job fatalities are 13.8 percent to 26.0 percent higher in states that do not have effective prevailing wage laws.

**There are high economic costs to on-the-job construction fatalities in all 50 states.**

- Adjusted to today's dollars, the average cost of one fatal occupational injury is $5.3 million across all private industry occupations.
- Nationally, the 867.8 average annual construction worker fatalities cost $4.6 billion per year.
- Construction-related deaths cost the United States nearly $5 billion in lost production, lost family income, pain and suffering costs, and reduced quality of life every year.

**States try to combat construction fatalities by implementing "high road" solutions that ultimately make the construction industry safer.**

- States with the most construction worksites inspected tend to be the states with the lowest workplace fatality rates among construction workers.
- States with strong or average prevailing wage laws generally have lower fatality rates among construction workers. Maintaining or reintroducing state prevailing wage laws could reduce construction injury and fatality rates at no additional cost to the taxpayer.
- Local responsible bidder ordinances ensure that taxpayer dollars go to the lowest responsible bidder who pays a middle-class wage, abides by local quality standards, and has

a proven track record of safety and investment in worker training; thus, responsible bidder ordinances can help to lower the economic costs associated with construction fatalities.

- Economic research finds that trades unions increase apprenticeship training and raise construction worker productivity, skill, and workplace safety.

While construction remains one of the most dangerous occupations in the country, steps can be taken to reduce the costs of construction-related fatalities. A "high road" approach to construction improves worker training, boosts worker productivity, and minimizes injury risks at minimal costs to taxpayers that are offset by these benefits. The nearly $5 billion in lost economic activity due to on-the-job construction fatalities could be reduced if states enact legislation that creates a "high road" construction industry in their area.

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# About the Author

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# Introduction

The Occupational Safety & Health Administration classifies construction as a high-hazard industry comprising a wide range of activities involving building, alteration, and repair. While the rate of construction-related injuries and illnesses has been on the decline in recent decades, roughly half of all workers in construction occupations are still exposed to hazardous tools and machinery on a weekly basis. Federal law guarantees that all workers, including construction workers, have the right to a safe workplace. Accordingly, construction employers are required to take steps to reduce the risk of on-the-job injuries, illnesses, and deaths.

Many different issues lead to fatal and nonfatal injuries in the construction industry. The Occupational Safety & Health Administration notes that the leading causes of worker deaths on construction sites were falls (39.9 percent), electrocutions (8.2 percent), workers being struck by an object (8.1 percent), and "caught-in/between" hazards such as cave-ins during excavations (4.3 percent). These causes have been called construction's "Fatal Four" because they are responsible for more than half of all construction worker deaths (OSHA, 2017). Unfortunately, oversight agencies have been unable to reduce the frequency of such injuries in large part due to a lack of sufficient resources (Wrightson, 2012).

The consequences of these construction-related injuries and fatalities have significant negative impacts on state economies. When workers miss work due to injury or illness, their employers lose productivity, the worker loses wage income, and local businesses lose consumer spending. Taxpayers may also foot the bill for added workers' compensation and public insurance costs. In addition, workplace deaths devastate families and result in pain and suffering costs. Ultimately, occupational injuries and fatalities in construction can cost states hundreds of millions of dollars in lost economic output every year.

This Midwest Economic Policy Institute (MEPI) Policy Brief highlights the economic burden of occupational fatalities in construction labor markets across the United States. The report begins with a review of a related policy paper (Wrightson, 2012) and the data utilized. Then, the construction labor markets of each state are compared and contrasted before data on construction fatalities are presented. Estimates on the economic costs of construction-related deaths are subsequently calculated. Finally, this report offers policy recommendations to guide states in addressing the needs of both the construction industry and construction workers before recapping key findings in the conclusion.

## Review and Data

This report is a replication of *The Price of Inaction: A Comprehensive Look at the Costs of Injuries and Fatalities in Maryland's Construction Industry*, applied to each state using recent data (Wrightson, 2012). This national report presents each state's distinct construction labor market frameworks with data from 2011 through 2015.

The majority of the data used in this paper draws from:

- *Costs of Occupational Injury and Illness Across States* by Dr. Waehrer, Dr. Leigh, Dr. Cassady, and Dr. Miller (Waehrer et al., 2004);
- *The Census of Fatal Occupational Injuries* by the Bureau of Labor Statistics of the U.S. Department of Labor for 2011, 2012, 2013, 2014, and 2015 (BLS, 2017a);
- The *Current Population Survey Outgoing Rotation Groups* by the U.S. Census Bureau for 2011, 2012, 2013, 2014, and 2015 (CEPR, 2016);
- The 2012 *Economic Census of Construction* by the U.S. Census Bureau (Census, 2015a);

The findings adjust Waehrer et al. (2004) evaluations on the costs of workplace fatalities in each state to current dollars using the Consumer Price Index (CPI-U). Cost estimates are then multiplied by recent data to provide estimates on the economic burden of construction-related deaths. Waehrer et al. (2004) determined total state costs by adding up direct costs, indirect costs, and quality-of-life costs.[1] The inflation adjustment from 1993 to 2017 is 1.7029. That is, $100 in 1993 had the same buying power as $170.29 today (BLS, 2017b).

[1] Direct costs include payments for hospital services, rehabilitation, burial costs, insurance administrative costs, property damage, etc. Indirect costs include productivity losses, wage losses, and administrative costs. Quality of life costs include the pain and suffering of victims and their families.

## The Construction Labor Markets of 50 States

Construction workers experience distinct labor market frameworks in the 50 states. Individual states have different laws in place that change construction industries across the nation. Figure 1 illustrates the states that have strong or average prevailing wage laws, weak prevailing wage laws, and no prevailing wage laws. The classifications of state prevailing wage laws provided by Duncan et al. (2015) and are updated to reflect recent legislative changes. A state prevailing wage law establishes minimum hourly compensation rates for workers employed on publicly-funded projects based on local market wages and conditions. The main purpose of a prevailing wage law is to protect local construction standards in the competitive public bidding process. A state's prevailing wage law may be classified as "strong," "average," or "weak" based on contract coverage thresholds, the type of work included or excluded from coverage, and the determination of wage rates– following a methodology outlined by Thieblot (1995).

*Figure 1: Prevailing Wage Laws by State, Feb. 2017*

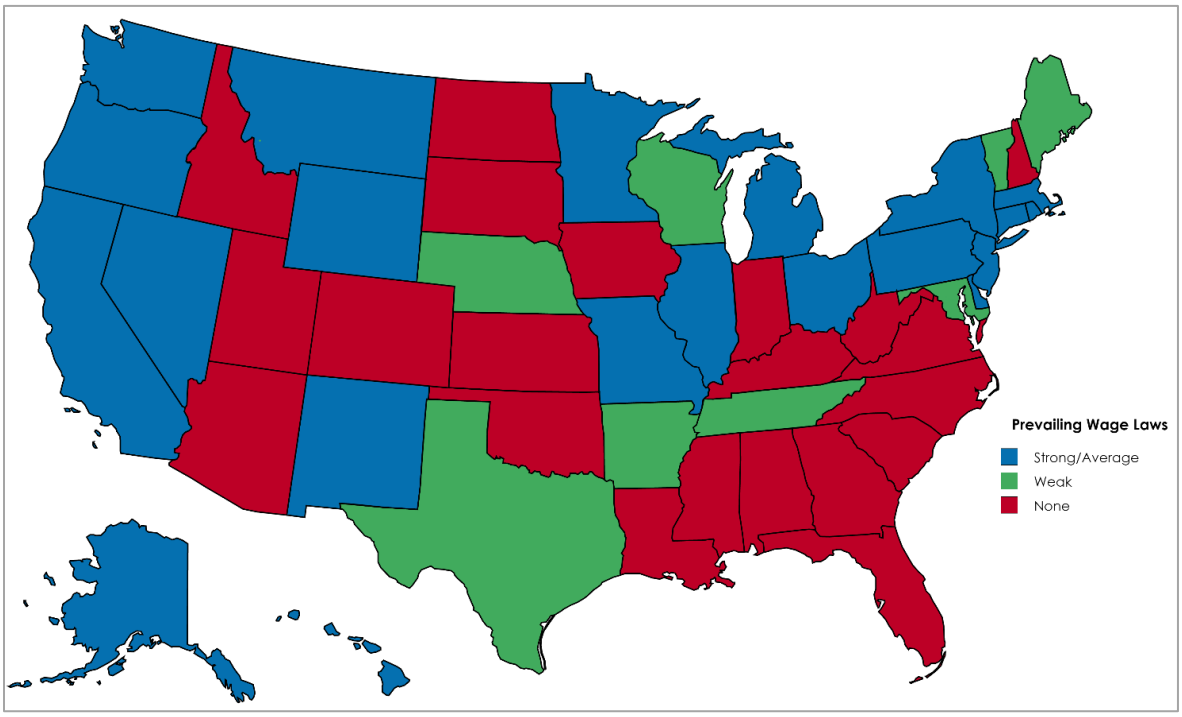


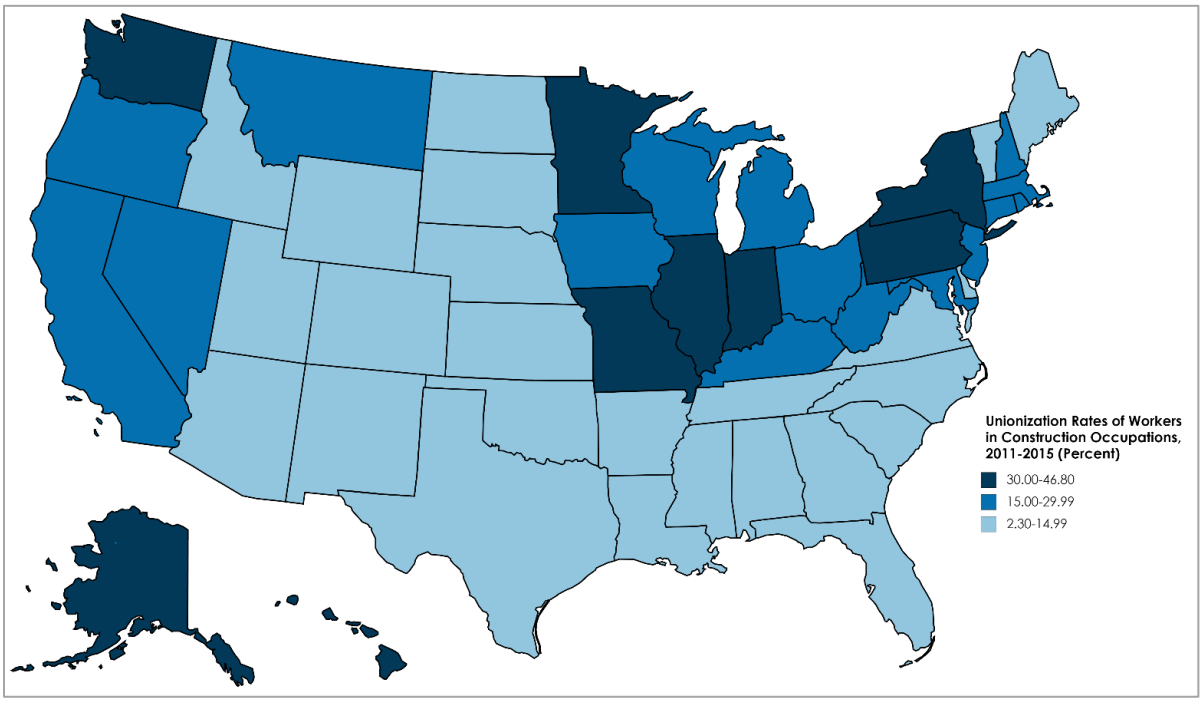

Figure 2 displays unionization rates of construction workers in each state using *Current Population Survey* data from over the 5-year period from 2011 through 2015; the survey is conducted by the U.S. Census Bureau (CEPR, 2016). States with strong or average prevailing wage laws tend to have higher construction unionization rates, while states with no or weak state prevailing wage laws tend to have lower unionization.[2] From 2011 to 2015, blue-collar construction workers in Illinois, Hawaii, and Minnesota were between 40 percent and 47 percent unionized. On the other hand, only 2 to 3 percent of construction workers in Texas, Arkansas, North Carolina, and South Carolina were members of labor organizations.

[2] Note: Indiana had an average of 35.6 percent of its construction workforce unionized from 2011 through 2015. However, Indiana repealed its Common Construction Wage in 2015. Unionization rates are expected to fall due to the repeal.

*Figure 2: Unionization Rates of Workers in Construction Occupations by State, 2011-2015*

| Highest Unionization Rates of Workers in Construction Occupations States | | |
|---|---|---|
| 1 | Illinois | 46.8% |
| 2 | Hawaii | 45.5% |
| 3 | Minnesota | 39.6% |
| 4 | Indiana | 35.6% |
| 5 | Missouri | 35.1% |
| 6 | New York | 34.6% |
| 7 | Alaska | 34.0% |
| 8 | Pennsylvania | 32.4% |
| 9 | Washington | 32.0% |
| 10 | Michigan | 29.5% |

| Lowest Unionization Rate of Workers in Construction Occupations States | | |
|---|---|---|
| 41 | Oklahoma | 5.7% |
| 42 | Louisiana | 5.6% |
| 43 | Georgia | 5.3% |
| 44 | Utah | 5.0% |
| 45 | Virginia | 4.6% |
| 46 | Florida | 3.5% |
| 47 | Texas | 2.9% |
| 48 | Arkansas | 2.3% |
| 49 | North Carolina | 2.3% |
| 50 | South Carolina | 2.3% |




Construction workers tend to be more productive and better compensated in states with higher unionization and stronger prevailing wage laws. Figures 3 and 4 utilize information from the *2012 Economic Census of Construction* conducted by the U.S. Census Bureau (Census, 2015a). Productivity is measured by "value added" per hour worked by blue-collar construction employees. "Value added" measures worker productivity over one year through business revenues minus the costs for materials, components, supplies, fuels, and subcontracted work. Hourly compensation is the annual payroll of blue-collar construction workers divided by the total number of construction worker labor hours reported in the *Economic Census of Construction*.

*Figure 3: Hourly Productivity of Workers in Construction Occupations, 2012*

| Highest Productivity Per Worker States | | |
|---|---|---|
| 1 | Hawaii | $108.05 |
| 2 | New Jersey | $107.46 |
| 3 | Rhode Island | $96.86 |
| 4 | New York | $91.38 |
| 5 | Illinois | $87.72 |
| 6 | Nevada | $87.31 |
| 7 | Minnesota | $86.14 |
| 8 | Massachusetts | $84.75 |
| 9 | Delaware | $84.58 |
| 10 | California | $84.01 |

| Lowest Productivity Per Worker States | | |
|---|---|---|
| 41 | South Carolina | $62.36 |
| 42 | South Dakota | $60.24 |
| 43 | New Mexico | $59.56 |
| 44 | Maryland | $59.01 |
| 45 | Alaska | $58.58 |
| 46 | Oklahoma | $57.00 |
| 47 | Nebraska | $56.82 |
| 48 | North Carolina | $52.66 |
| 49 | Vermont | $51.53 |
| 50 | Maine | $47.62 |

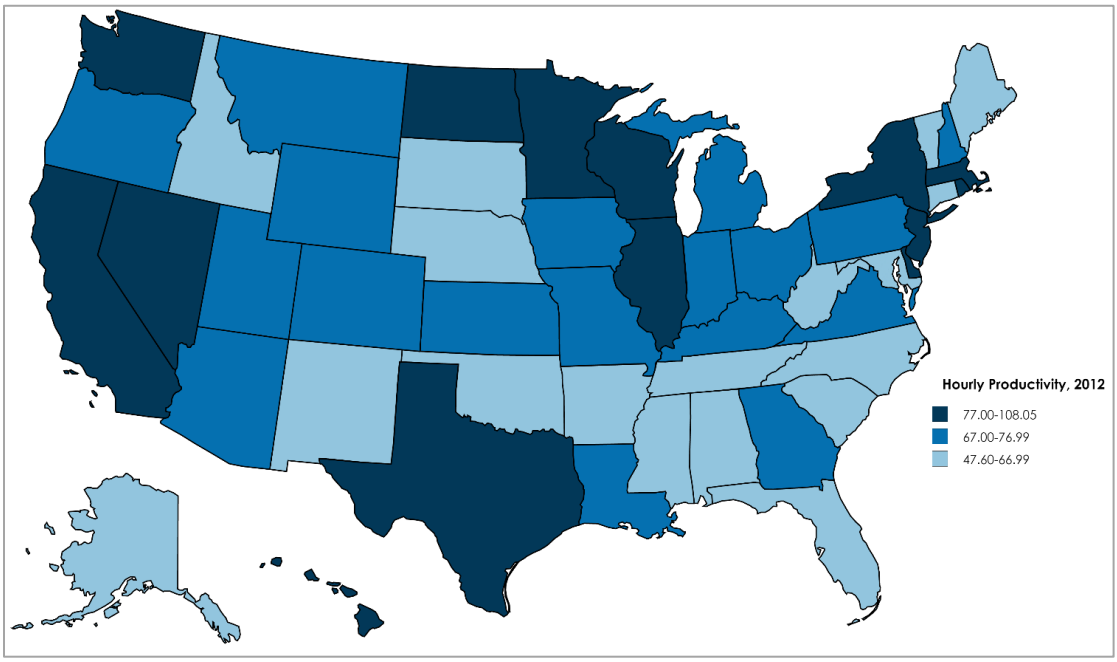
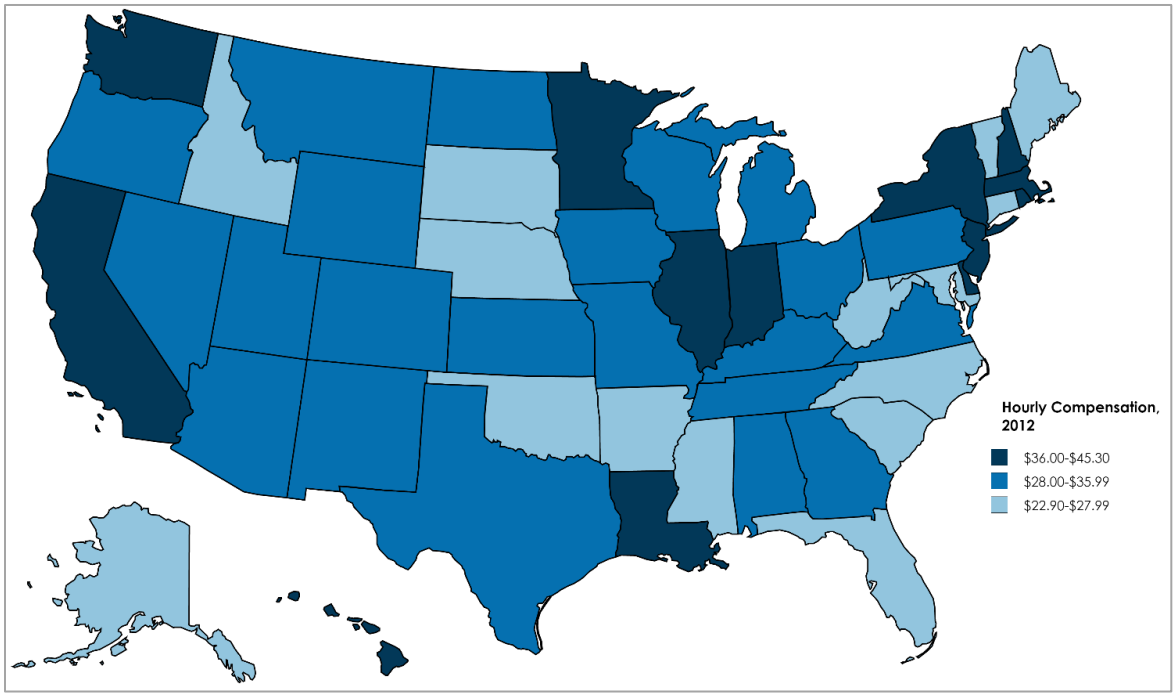



*Figure 4: Hourly Compensation of Workers in Construction Occupations, 2012*

| Highest Hourly Compensation States | | |
|---|---|---|
| 1 | Hawaii | $45.31 |
| 2 | New Jersey | $43.82 |
| 3 | New York | $41.03 |
| 4 | Illinois | $41.02 |
| 5 | Washington | $39.72 |
| 6 | Delaware | $38.70 |
| 7 | Massachusetts | $38.21 |
| 8 | Louisiana | $37.96 |
| 9 | California | $37.10 |
| 10 | Minnesota | $36.90 |

| Lowest Hourly Compensation States | | |
|---|---|---|
| 41 | Connecticut | $26.47 |
| 42 | West Virginia | $26.16 |
| 43 | South Carolina | $26.16 |
| 44 | South Dakota | $25.88 |
| 45 | Vermont | $25.75 |
| 46 | Nebraska | $25.46 |
| 47 | North Carolina | $24.70 |
| 48 | Idaho | $24.49 |
| 49 | Maine | $23.81 |
| 50 | Oklahoma | $22.93 |




Hawaii, Illinois, Minnesota, and New York are all in the top 10 states for high construction unionization, high productivity per worker, and high compensation. All four states have workers who produce over $86 in "value added" economic output per hour worked. As a reward for their high productivity, these workers earn higher wages, taking home $45.31 an hour in Hawaii, $41.03 an hour in New York, $41.02 an hour in Illinois, and $36.90 an hour in Minnesota. These four states have higher productivity per worker because their construction industries have strong prevailing wage standards of training and compensation, and skilled tradespeople who are more likely to be members of labor organizations.

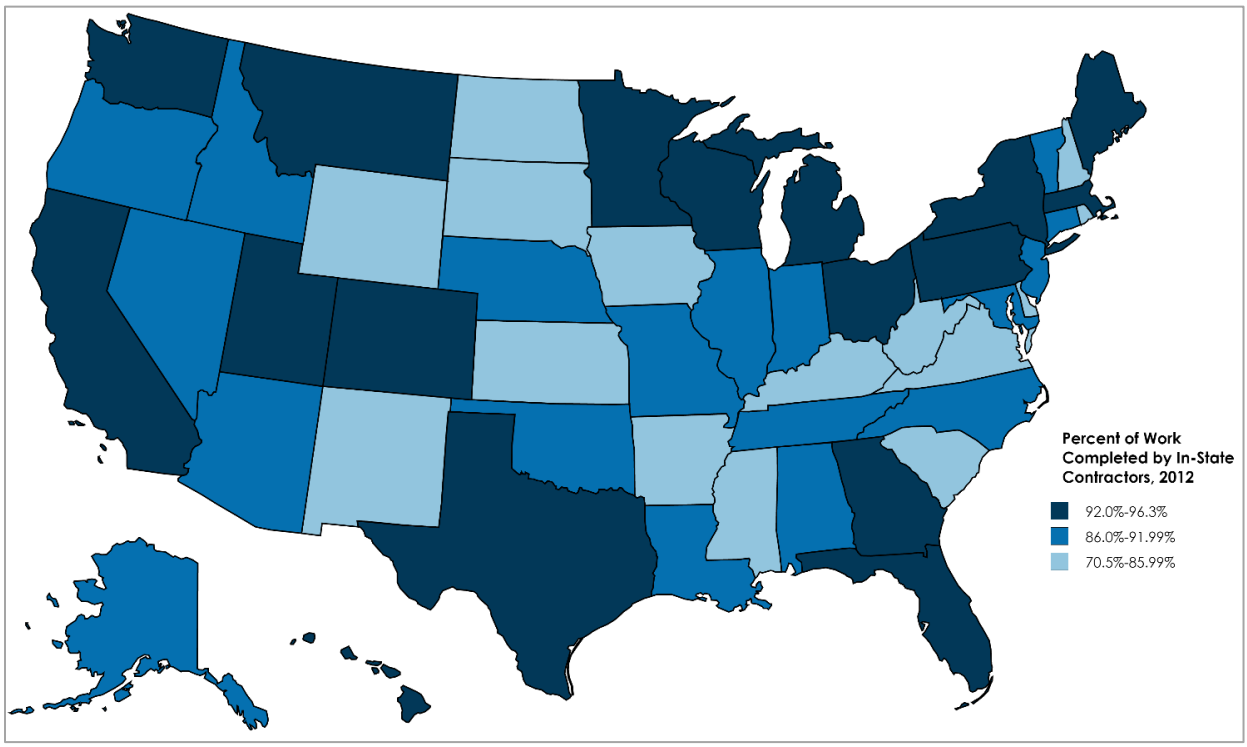
Oklahoma and South Carolina's construction workforce are consistently in the bottom 10 for unionization, productivity, and pay. South Carolina's construction workers are about 42 percent less productive than workers in Hawaii and about 32 percent less productive than workers in New York. Oklahoma's construction workers are about 47 percent less productive than workers in Hawaii and 38 percent less productive than those in New York, respectively. These two states also have considerably low unionization rates (under 6 percent) and hourly compensation (under $26 per hour).

Each construction labor market influences the share of construction value in a state that is completed by in-state contractors. Figure 5 also uses information from the *2012 Economic Census of Construction* to evaluate the percentage of construction work completed by in-state businesses. Utah, California, Wisconsin, Michigan, Florida, Minnesota, Texas, Washington, Colorado, and New York have the highest construction work completed by in-state contractors out of the 50 states. Virginia, Kentucky, New Hampshire, South Carolina, Kansas, Wyoming, Delaware, Mississippi, North Dakota, and West Virginia have the least amount of construction work completed by in-state contractors in the nation.

*Figure 5: Percent of Work Completed by In-State Contractors by State, 2012*

| Highest Percent of Work Completed by In-State Contractors States | | |
|---|---|---|
| 1 | Utah | 96.26% |
| 2 | California | 96.04% |
| 3 | Wisconsin | 95.90% |
| 4 | Michigan | 95.46% |
| 5 | Florida | 95.38% |
| 6 | Minnesota | 95.18% |
| 7 | Texas | 95.00% |
| 8 | Washington | 94.43% |
| 9 | Colorado | 94.25% |
| 10 | New York | 93.94% |

| Lowest Percent of Work Completed by In-State Contractor States | | |
|---|---|---|
| 41 | Virginia | 83.86% |
| 42 | Kentucky | 83.30% |
| 43 | New Hampshire | 82.55% |
| 44 | South Carolina | 82.41% |
| 45 | Kansas | 82.35% |
| 46 | Wyoming | 81.70% |
| 47 | Delaware | 78.96% |
| 48 | Mississippi | 78.93% |
| 49 | North Dakota | 75.73% |
| 50 | West Virginia | 70.51% |



## Construction Fatalities across the Nation from 2011 through 2015

Construction is one of the most dangerous occupations in the United States. Fatality rates provide the most accurate assessment of worker risks. Simply put, on-the-job deaths of workers cannot be concealed. On the other hand, injury rates suffer from an underreporting problem. For example, 2009 report conducted by the Government Accountability Office found that many employers did not report workplace injuries and illnesses because they did not want to increase workers' compensation costs and also feared that it would have a negative impact on their chances of winning a bid on a project. Fully 53 percent of doctors and other health practitioners said that they experienced pressure from companies to downplay injuries or illnesses. In addition, many workers also did not report on-the-job injuries out of fear that they might be disciplined or even terminated by their employers (GAO, 2009). As a result, fatality rates are more reliable than injury rates or illness rates.

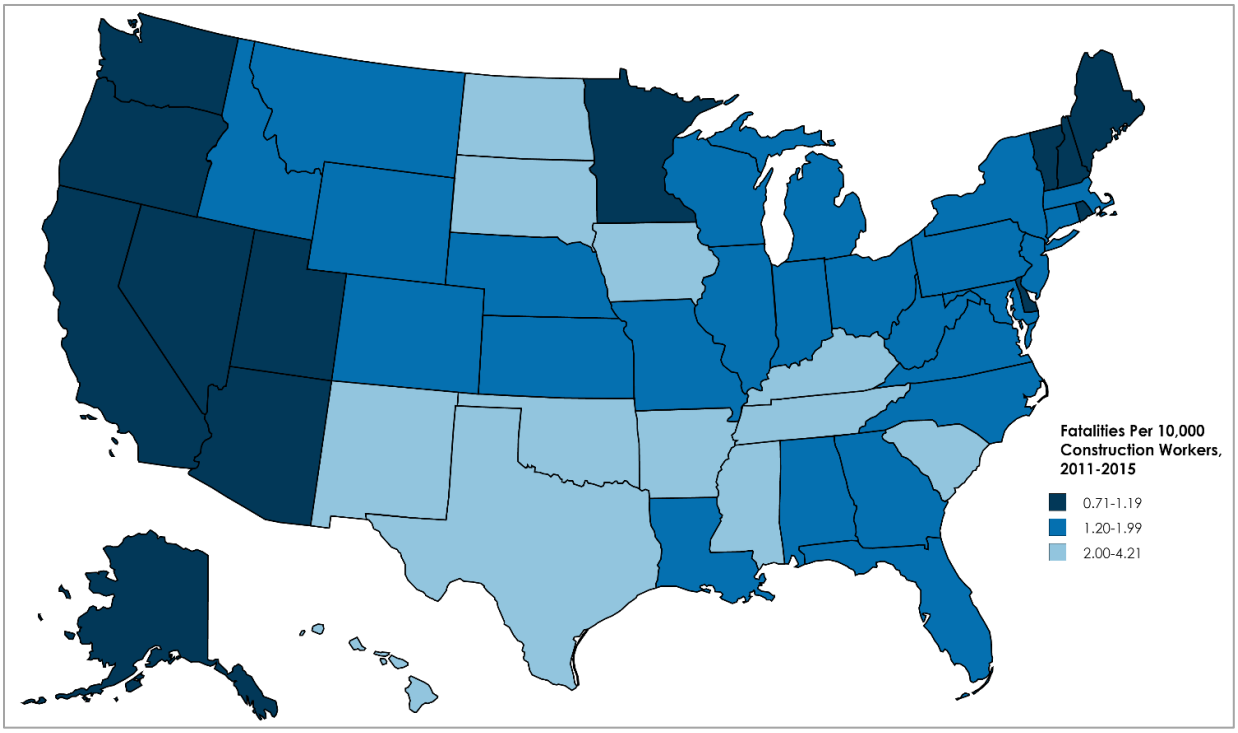
The following data provide a general overview of construction-related fatalities in the United States. Across the country, a total of 4,339 construction workers lost their lives at work from 2011 through 2015. Note that Texas, California, New York, and Pennsylvania have the largest construction markets of the 50 states, employing hundreds of thousands of blue-collar construction workers employed on average from 2011 through 2015, respectively. New Hampshire, Delaware, Rhode Island, and Vermont had the smallest construction markets, with fewer than 20,000 blue-collar construction workers employed in each state.

Figure 6 depicts construction fatalities relative to each state's construction workforce. The graph illustrates the annual number of fatalities per 10,000 construction workers. Of the fifty states, the fatality rate was lowest in New Hampshire, where there were 0.72 deaths per 10,000 workers in construction occupations. By contrast, the fatality rate was highest in North Dakota, where there were 4.21 deaths per 10,000 workers in construction occupations. Note that a primary driver of this high fatality rate was the amount of weakly-regulated fracking activity in North Dakota over this time.

*Figure 6: Fatalities Per 10,000 Construction Workers by State, 2011-2015*

| Lowest On-the-job Fatalities Per 10,000 Construction Workers States | | |
|---|---|---|
| 1 | New Hampshire | 0.716 |
| 2 | Alaska | 0.732 |
| 3 | Washington | 0.786 |
| 4 | Arizona | 0.865 |
| 5 | Delaware | 0.908 |
| 6 | Vermont | 0.989 |
| 7 | Maine | 1.060 |
| 8 | Minnesota | 1.088 |
| 9 | Oregon | 1.113 |
| 10 | Utah | 1.141 |

| Highest On-the-job Fatalities Per 10,000 Construction Workers States | | |
|---|---|---|
| 41 | Mississippi | 2.031 |
| 42 | South Dakota | 2.057 |
| 43 | Texas | 2.120 |
| 44 | Kentucky | 2.132 |
| 45 | Iowa | 2.170 |
| 46 | New Mexico | 2.316 |
| 47 | South Carolina | 2.530 |
| 48 | Arkansas | 2.570 |
| 49 | Oklahoma | 2.684 |
| 50 | North Dakota | 4.209 |




The top 10 states with the fewest on-the-job fatalities have much safer construction labor markets than the national average of 1.68 on-the-job fatalities per 10,000 construction workers. A total of 26 states have safer construction industries than the national average, while 24 have fatality rates that exceed the national average. The bottom 10 states (i.e., those with the highest fatality rates) have much higher incidences of construction-related deaths than the national average.

## Labor Hours Worked Without a Construction-Related Fatality by State

Another way to look at the frequency of work-related fatalities in construction is to evaluate deaths using work hours provided by the *2012 Economic Census of Construction*. Figure 8 considers the fact that construction workers tend to work longer hours in some states than others. For construction workers, annual labor hours may vary for a number of reasons. The winter season limits the number of hours available to work more in some states than others. Public works– which typically accounts for 20 to 30 percent of total construction (Philips, 2014)– may support more construction work in states that are in better financial positions or where the federal government has prioritized projects. In addition, contractors in states with less-skilled, less-productive workers may need to extract more hours per employee in order to get jobs done on time. In states where construction worker hourly wages are relatively lower, the blue-collar employees may also face a "labor-leisure" tradeoff, choosing to work more hours in an effort to "catch up" to the annual incomes earned by their counterparts in other states. Whatever the case, Figure 7 accounts for these differences.

By the labor hours metric, Alaska, New Hampshire, and Maryland have the three safest construction labor markets out of the 50 states in relation to on-the-job fatalities. A construction worker lost his or her life on-the-job every 34.6 million labor hours in Alaska, every 23.7 million labor hours in New Hampshire, and every 19.0 million labor hours in Maryland. Note that Figure 7 is based on the total

number of hours worked by all blue-collar construction workers. That is, Alaska went 34.6 million work hours put in by all construction employees without suffering a construction worker death. In comparison, construction worker deaths occur much more frequently in North Dakota, New Mexico, and West Virginia. The equivalent figures were on-the-job deaths every 2.3 million labor hours in North Dakota, every 4.4 million labor hours in New Mexico, and every 4.5 million labor hours in West Virginia. Alaska's construction workers go the longest without suffering a workplace fatality while North Dakota's see a worker die on-the-job the most often. Combined, an average of 867.8 construction workers suffered a workplace fatality every year in the United States. This means that an average of 16 construction workers die every week across the nation.

Fatalities are more common in states with weak or no prevailing wage laws (Figure 8). On-the-job fatalities are 13.8 percent to 26.0 percent higher in states that do not have effective prevailing wage laws. A construction worker working on a project in a state with a weak prevailing wage law or without a prevailing wage law is 26.0 percent more likely to suffer an on-the-job fatality than a comparable worker in a state with a strong or average prevailing wage law. Aggregating states weak prevailing wage laws with their more effective counterparts reveals that all states without the policy experience 13.8 percent higher fatality rates than all states with prevailing wage, regardless of strength.

Because prevailing wage laws ensure that workers are paid the local-market rate, construction workers in average or strong prevailing wage states tend to be better trained, tend to have more workplace safety rules, and are more likely to consider the construction industry as a *career* instead of a seasonal job. Ultimately, prevailing wage laws ensure that workers are paid a middle-class wage and decrease the chances of construction workers dying on-the-job.

The decline of unionization has contributed to higher construction worker fatalities. As construction unions have declined over recent years, fewer construction workers are represented by a union and fewer construction workers complete essential training and safety programs. Some states have enacted laws on the state or local level– often called "Responsible Bidder Ordinances" or "Contractor Responsibility Ordinances"– where contractors must ensure that their workers are up-to-date on safety training in order to win bids on public projects. Unfortunately, without these laws and without a union presence, inadequately trained workers in construction are often working in hazardous conditions. In New York City, for example, 29 of 31 on-the-job fatalities over the past two years have been on nonunion job sites (Pizzigati, 2017). Unionized workplaces often have better safety procedures and rules that can save the lives of construction workers.

*Figure 7: Labor Hours Without a Fatality and State Rank, 2011-2015*

| Labor Hours Until Workplace Fatality and State Rank, 2011-2015 | | | | | |
|---|---|---|---|---|---|
| State | Labor Hours Without a Fatality | Rank | State | Labor Hours Without a Fatality | Rank |
| Alabama | 9,504,831 | 25 | Montana | 7,105,417 | 38 |
| Alaska | 34,556,875 | 1 | Nebraska | 9,442,286 | 28 |
| Arizona | 18,513,333 | 5 | Nevada | 11,174,839 | 18 |
| Arkansas | 5,169,153 | 46 | New Hampshire | 23,692,857 | 2 |
| California | 13,842,736 | 11 | New Jersey | 10,443,182 | 21 |
| Colorado | 9,246,517 | 30 | New Mexico | 4,387,917 | 49 |
| Connecticut | 12,955,930 | 14 | New York | 10,250,139 | 22 |
| Delaware | 16,011,429 | 9 | North Carolina | 10,909,032 | 19 |
| Florida | 8,515,079 | 35 | North Dakota | 2,289,360 | 50 |
| Georgia | 8,261,983 | 36 | Ohio | 8,575,272 | 34 |
| Hawaii | 6,393,519 | 41 | Oklahoma | 5,746,053 | 45 |
| Idaho | 9,497,708 | 26 | Oregon | 14,777,206 | 10 |
| Illinois | 9,491,973 | 27 | Pennsylvania | 9,530,447 | 24 |
| Indiana | 10,561,543 | 20 | Rhode Island | 13,021,111 | 12 |
| Iowa | 7,362,576 | 37 | South Carolina | 6,297,778 | 42 |
| Kansas | 8,692,813 | 33 | South Dakota | 6,962,857 | 40 |
| Kentucky | 6,071,497 | 44 | Tennessee | 8,828,483 | 32 |
| Louisiana | 9,006,355 | 31 | Texas | 7,092,852 | 39 |
| Maine | 16,331,154 | 8 | Utah | 11,280,488 | 17 |
| Maryland | 19,012,778 | 3 | Vermont | 17,977,857 | 6 |
| Massachusetts | 13,003,188 | 13 | Virginia | 11,581,982 | 16 |
| Michigan | 9,606,667 | 23 | Washington | 18,979,894 | 4 |
| Minnesota | 17,473,404 | 7 | West Virginia | 4,538,085 | 48 |
| Mississippi | 6,291,900 | 43 | Wisconsin | 11,687,787 | 15 |
| Missouri | 9,329,512 | 29 | Wyoming | 4,946,290 | 47 |

*Figure 8: Fatal Injuries per 10,000 Construction Workers by Prevailing Wage Status, 2011-2015*

| State | On-the-job Fatalities Per 10,000 Construction Workers | Difference in No or Weak/No State |
|---|---|---|
| States with No Prevailing Wage Law | 1.8106 | +13.84% |
| States with Any Prevailing Wage Law | 1.5905 | |
| States with a Weak or No Prevailing Wage Law | 1.8609 | +26.02% |
| States with a Strong or Average Prevailing Wage Law | 1.4767 | |

## The Economic Costs of Construction Fatalities

The Occupational Safety and Health Act of 1970 states "that personal injuries and illnesses arising out of work situations impose a substantial burden upon, and are a hindrance to, interstate commerce in terms of lost production, wage loss, medical expenses, and disability compensation payments" (OSHA, 1970). Other businesses such as restaurants and grocery stores also lose due to the fall in worker incomes. If the project uses public funds, then injuries also cost taxpayers.

Workplace deaths result in each of these losses and more. As noted by Wrightson (2012), "[w]orkplace deaths are tragedies that devastate families and their surrounding communities." For families, on-the-job fatalities result in a loss in lifetime earnings, in pain and suffering costs, and in a reduced quality of life.

To assess the economic costs of construction-related fatalities, estimates from Waehrer et al. (2004) are utilized and adjusted to constant 2017 dollars. Adjusted to today's dollars, the average cost of fatal occupational injuries is $5.34 million nationally across all private industry occupations. At the state-level, the cost of an occupational fatality in the middle 50 percent of states (25$^{th}$ quartile to the 75$^{th}$ quartile) ranges from $5.24 million to $5.54 million per death on the job.

Figure 9 multiplies cost estimates for each state by the average number of workplace fatalities in each state (from the previous section). **Nationally, the 867.8 average annual construction worker fatalities cost $4.63 billion per year**. This means that construction-related deaths cost the United States nearly $5 billion in lost production, lost family income, pain and suffering costs, and reduced quality of life every year.

In general, the states with the highest total estimated costs are those with the largest construction workforces. The five states with the highest estimated costs per year are Texas ($595 million), California ($327 million), Florida ($268 million), New York ($235 million), and Pennsylvania ($182 million). The five states with the lowest estimated annual costs are Vermont ($7 million), New Hampshire ($8 million), Delaware ($8 million), Alaska ($9 million), and Rhode Island ($11 million).

When evaluating economic costs of construction fatalities across fatalities, perhaps the best comparisons are to neighboring states within the same region. For example, the estimated cost of construction fatalities is significantly lower in Minnesota ($51 million per year) than in North Dakota ($86 million per year) even though Minnesota averaged 116,000 construction and extraction workers for 2011 through 2015 while North Dakota averaged under 41,000. This disparity demonstrates the significant cost of high fatality rates associated with weakly-regulated fracking activity, as well as with not having a prevailing wage law.

Note that these estimates likely understate actual costs because many of the factors considered by Waehrer et al. (2004) – especially health care costs – have risen at a faster rate than overall inflation.

*Figure 9: Estimated Total Cost of Construction Fatalities and Average Fatalities by State, 2011-2015*

| Estimated Cost of Construction Fatalities and Average Fatalities by State, 2011-2015 | | | | | |
|---|---|---|---|---|---|
| State | Estimated Cost of Construction Fatalities | Average Fatalities Per Year | State | Estimated Cost of Construction Fatalities | Average Fatalities Per Year |
| Alabama | $62,356,000 | 11.8 | Nebraska | $37,104,000 | 7.0 |
| Alaska | $8,858,000 | 1.6 | Nevada | $33,216,000 | 6.2 |
| Arizona | $48,217,000 | 9.0 | New Hampshire | $7,750,000 | 1.4 |
| Arkansas | $61,799,000 | 11.8 | New Jersey | $104,137,000 | 17.6 |
| California | $327,242,000 | 59.2 | New Mexico | $64,289,000 | 12.0 |
| Colorado | $95,362,000 | 17.8 | New York | $234,880,000 | 43.2 |
| Connecticut | $47,610,000 | 8.6 | North Carolina | $136,131,000 | 24.8 |
| Delaware | $7,750,000 | 1.4 | North Dakota | $85,850,000 | 17.2 |
| Florida | $268,310,000 | 50.8 | Ohio | $157,515,000 | 29.4 |
| Georgia | $133,472,000 | 24.2 | Oklahoma | $119,427,000 | 22.8 |
| Hawaii | $29,895,000 | 5.4 | Oregon | $37,753,000 | 6.8 |
| Idaho | $25,716,000 | 4.8 | Pennsylvania | $182,357,000 | 35.8 |
| Illinois | $155,202,000 | 29.4 | Rhode Island | $11,495,000 | 1.8 |
| Indiana | $87,777,000 | 16.2 | South Carolina | $84,830,000 | 16.2 |
| Iowa | $69,131,000 | 13.2 | South Dakota | $21,996,000 | 4.2 |
| Kansas | $53,226,000 | 9.6 | Tennessee | $92,419,000 | 17.8 |
| Kentucky | $81,204,000 | 14.6 | Texas | $594,958,000 | 119.2 |
| Louisiana | $112,077,000 | 21.4 | Utah | $43,931,000 | 8.2 |
| Maine | $14,394,000 | 2.6 | Vermont | $6,812,000 | 1.4 |
| Maryland | $84,911,000 | 14.4 | Virginia | $132,489,000 | 22.2 |
| Massachusetts | $76,397,000 | 13.8 | Washington | $47,871,000 | 9.4 |
| Michigan | $115,712,000 | 21.6 | West Virginia | $50,360,000 | 9.4 |
| Minnesota | $50,716,000 | 9.4 | Wisconsin | $69,429,000 | 12.2 |
| Mississippi | $53,430,000 | 10.0 | Wyoming | $33,216,000 | 6.2 |
| Missouri | $85,629,000 | 16.4 | Other/Unclassified | $62,179,000 | 11.5 |
| Montana | $25,716,000 | 4.8 | National Average | $4,634,501,000 | 867.8 |

## How States Try to Combat the Problem

There are at least four policy approaches that states can take to ensure safe working conditions in the construction industry. First, increasing resources to conduct inspections can reduce workplace risks. However, given budget constraints and the current political climate, the allocation of additional resources to worker safety programs may not be likely. Thus, the second, third, and fourth approaches are indirect ways to address the problem without increasing state expenditures. Second, maintaining a prevailing wage laws is an effective policy that increases productivity and reduces the number of workplace disabilities, according to economic research. Third, local responsible bidder ordinances have been implemented to ensure that contractors who construct public projects meet acceptable safety standards. Finally, avoiding politically-motivated attacks on construction unions has reduced injury and fatality rates in construction for many states.

### Approach #1: Increasing Resources to Conduct OSHA Inspections

Only a small fraction of construction worksites are inspected every year. In fiscal year 2016, just over 75,000 worksites were inspected by the Occupational Safety and Health Administration (OSHA, 2017). By contrast, there are over 7.56 million total business establishments across the United States, including about 667,000 construction establishments (Census, 2015b). The most frequently cited OSHA standards violations in construction were fall protection and scaffolding requirements violations.

In a previous analysis, the Midwest Economic Policy Institute found that Midwest states with the most construction worksites inspected were also the states with the lowest workplace fatality rates among construction workers. For example, North Dakota and South Dakota had lower shares of construction worksites visited than Minnesota and Iowa but had higher on-the-job fatality rates (Manzo & Manzo, 2017). The federal government and state governments can invest more resources into OSHA to conduct more investigations in order to save lives. Increasing funding can save states millions of dollars in added productivity and in reduced medical and workers' compensation costs.

### Approach #2: Maintaining or Introducing State Prevailing Wage Laws

Prevailing wage laws increase apprenticeship training, which improves worker productivity and reduces injuries and fatalities in construction. Prevailing wage moderately increases a construction worker's earnings (Manzo et al., 2016; Kelsay, 2015; Philips, 2014). Higher wages change incentives for both potential workers and their employers. The higher income in construction occupations encourages more potential workers to seek employment in the industry, which increases the available labor supply from which employers can find the best talent. On the other side, the higher wage entices more employers to invest in worker training so that enhanced productivity per worker offsets any increase in labor cost.

The net result is that apprenticeship training is higher in states that have prevailing wage. From 1991 through 2011, an estimated 14.4 percent of the construction labor force was an apprentice in states with prevailing wage compared to just 7.7 percent in states without prevailing wage (Dickson Quesada et al., 2013). In addition, after nine states repealed their prevailing wage laws between 1979 and 1988, registered construction apprenticeship training in those states fell by roughly 40 percent (Philips et al., 1995).

Because prevailing wage increases worker training, the higher-skilled workforce is also more productive and safer. Workers are 14 to 33 percent more productive in states with prevailing wage (Philips, 2014). Moreover, construction workers in states without prevailing wage laws report 12 percent more disabilities than their counterparts in states with the policy (Philips, 2014). The increase in worker productivity combines with other effects to offset increases in labor costs. Thus, the preponderance of economic research actually finds that prevailing wage laws do not increase total construction costs (Duncan & Manzo, 2017; Duncan, 2011; Mahalia, 2008; Prus, 1999).

It is no surprise, therefore, that states with strong or average prevailing wage laws also generally have lower fatality rates among construction workers. Maintaining or reintroducing state prevailing wage laws could reduce construction injury and fatality rates at no additional cost to the taxpayer. Maintaining or strengthening the federal prevailing wage law, known as the Davis-Bacon Act, would also support apprenticeship training nationally and reduce fatality rates in construction (Duncan et al., 2017).

## Approach #3: Introducing Local Responsible Bidder Ordinances

A responsible bidder ordinance (also called a "responsible contractor policy") is a policy that sets minimal requirements for all contractors bidding on publicly-funded projects in a given political jurisdiction. Typically, these requirements include proof of participation in an apprenticeship training program, proof of certificates of insurance, evidence that a contractor has not been debarred from public contracts, and compliance with all local, state, and federal laws. A responsible bidder ordinance is a qualifications-based approach to contracting for public entities. The policies are a kind of "insurance policy" for taxpayers. The local ordinances establish clear, objective standards that contractors must meet in order to win bids and construct projects funded using taxpayer dollars.

The purpose of a responsible bidder ordinance is to ensure that local governments hire only professional, competent contractors that provide the highest-quality work to complete taxpayer-funded projects. In low-bid procurement systems, contractors are incentivized to avoid training their workers. The short-run drive to become the lowest bidder encourages construction companies to cut corners, cut training costs, and exclude health insurance contributions. When contractors repeatedly reduce training costs, apprenticeship training declines and the qualifications and productivity of the construction workforce declines over time. By requiring that all construction businesses who work on taxpayer-funded projects participate in registered apprenticeship programs and have a health insurance plan at work, responsible bidder ordinances promote a well-trained, safe, qualified, and productive construction labor force that completes jobs correctly, on time, and on budget. A responsible bidder ordinance creates a quality floor that levels the playing field for contractors and protects taxpayers from fly-by-night contractors.

The economics of local responsible bidder ordinances are similar to the economics of state prevailing wage laws. For instance, Waddoups and May (2014) evaluated 319 projects in Ohio– 63 that were covered by a responsible bidder ordinance and 256 that were not– and found that the policies had no statistically significant impact on total construction costs. Case studies from across the country have found that responsible bidder ordinances have promoted higher equality and more reliable services and reduced back-end reconstruction and litigation costs (Sonn & Gebreselassie, 2010). Finally, whereas only 60 to 70 percent of construction owners report being satisfied with their construction performance, evidence suggests that 98 percent of construction owners using a responsible contracting models report to being satisfied with project quality (Kashiwagi et al., 2005).

Local responsible bidder ordinances have particularly become a solution for jurisdictions that are unwilling or unable to implement effective state-level prevailing wage laws. By ensuring that taxpayer dollars go to the lowest responsible bidder who pays a middle-class wage, abides by local quality standards, and has a proven track record of safety and investment in worker training, responsible bidder ordinances can help to lower the economic costs associated with construction fatalities.

## Approach #4: Avoiding the Attack on Construction Unions

Economic research finds that building trade unions increase apprenticeship training and raise construction worker productivity. Joint labor-management apprenticeship programs play a significant role in the construction industry. In Wisconsin, for example, 95 percent of annual apprenticeship training spending is provided by union contractors. Only 5 percent of the annual investment in apprentice training comes from nonunion programs (Philips, 2015). Similarly, joint labor-management apprenticeship programs account for 99 percent of all privately-funded apprenticeship expenditures in Illinois (Bruno & Manzo, 2016). In both Ohio and Kentucky, 79 percent of all construction apprentices are enrolled in joint labor-management programs (Duncan & Manzo, 2017; Onsarigo et al., 2017). As union membership has dropped nationally, the number of joint labor-employer apprenticeship programs has also declined (Olinsky & Ayres Steinberg, 2013).

Due to the larger commitment to worker training, there is a strong positive relationship between unionization and productivity in the construction industry. Across the country, a 1 percentage-point increase in a state's construction unionization rate tends to boost worker productivity by $0.81 per hour per worker (Manzo, 2015). This data aligns with the finding that union productivity in the construction sector is 17 percent to 22 percent higher than nonunion output (Allen, 1984).

Many states have recently passed legislation intended to weaken labor unions. Despite the fact that "right-to-work" laws lower worker wages (Manzo & Bruno, 2017) and have no proven record of stimulating the economy (Collins, 2014), "right-to-work" laws have been passed in six states since 2012: Indiana, Kentucky, Michigan, Missouri, West Virginia, and Wisconsin. Illogically, many of the organizations across America that are warning of a skilled labor shortage are the same who are advocating "to weaken or destroy the building trades unions that actually train the greatest number of skilled 16 tradesmen" (Eisenbrey, 2014). Repealing state "right-to-work" laws would improve private construction industry unionization rates in states, which in turn could improve apprenticeship training and enhance workplace safety.

## Conclusion

This Policy Brief has estimated the economic burden of occupational injuries and fatalities in the nation from 2011 through 2015.

Construction workers tend to be more productive and better compensated in states with higher unionization and stronger prevailing wage laws. Hawaii, Illinois, Minnesota, and New York are all in the top 10 states for high construction unionization, high productivity per worker, and high compensation. All four states have workers who produce over $86 in "value added" economic output per hour worked. On the other hand, Oklahoma and South Carolina's construction workforce are consistently in the bottom 10 for unionization, productivity, and pay.

Across the country, a total of 4,339 construction workers lost their lives at work from 2011 through 2015. An average of 867.8 construction workers suffered a workplace fatality every year in the United States; this means that an average of 16 construction workers die on-the-job every week across the nation. Of the 50 states, the fatality rate was lowest in New Hampshire, where there were 0.72 deaths per 10,000 workers in construction occupations. The fatality rate was highest in North Dakota, where there were 4.21 deaths per 10,000 workers in construction occupations. The national average fatality rate is 1.68 on-the job fatalities per 10,000 construction workers.

Another way to look at the frequency of work-related fatalities in construction is to evaluate deaths using work hours by state. By annual labor hours worked in each state, Alaska, New Hampshire, and Maryland have the three safest construction labor markets out of the 50 states in relation to on-the-job fatalities. North Dakota, New Mexico, and West Virginia had the least-safe industries. On-the-job fatalities are also 13.8 percent to 26.0 percent higher in states that do not have effective prevailing wage laws.

Adjusted to today's dollars, the average cost of a fatal occupational injury is $5.3 million across all private industry occupations. Nationally, the 867.8 average annual construction worker fatalities cost $4.6 billion per year. Construction-related worker fatalities cost the United States nearly $5 billion in lost production, lost family income, pain and suffering costs, and reduced quality of life every year.

While construction remains one of the most dangerous occupations in the country, steps can be taken to reduce the costs of construction-related fatalities. A "high road" approach to construction improves worker training, boosts worker productivity, and minimizes injury risks at minimal costs to taxpayers that are offset by these benefits. Four "high road" policy solutions that states have taken to ensure safe working conditions in construction are:

1. Increasing resources to conduct OSHA inspections,
2. Maintaining or introducing prevailing wage laws,
3. Introducing local responsible bidder ordinances, and
4. Avoiding the attack on construction unions.

States across the country should enact legislation that creates a "high road" construction industry in their area.

## State Snapshots

### ALABAMA

- **$29.53** = average hourly pay
- **$66.46** = productivity per hour
- **7.2%** = construction unionization rate
- **1.55** fatalities per 10,000 construction workers
- **$62.4** million estimated total cost of fatalities

### ALASKA

- **$27.84** = average hourly pay
- **$58.58** = productivity per hour
- **34.0%** = construction unionization rate
- **0.73** fatalities per 10,000 construction workers
- **$8.9** million estimated total cost of fatalities

### ARIZONA

- **$33.37** = average hourly pay
- **$69.36** = productivity "value added" per hour
- **7.1%** = construction unionization rate
- **0.87** fatalities per 10,000 construction workers
- **$48.2** million estimated total cost of fatalities

### ARKANSAS


- **$27.32** = average hourly pay
- **$66.24** = productivity per hour
- **2.3%** = construction unionization rate
- **2.57** fatalities per 10,000 construction workers
- **$61.8** million estimated total cost of fatalities

### CALIFORNIA


- **$37.10** = average hourly pay
- **$84.01** = productivity per hour
- **21.1%** = construction unionization rate
- **1.18** fatalities per 10,000 construction workers
- **$327.2** million estimated total cost of fatalities

### COLORADO

- **$35.65** = average hourly pay
- **$73.85** = productivity per hour
- **9.8%** = construction unionization rate
- **1.56** fatalities per 10,000 construction workers
- **$95.4** million estimated total cost of fatalities

### CONNECTICUT

- **$26.47** = average hourly pay
- **$64.93** = productivity per hour
- **24.7%** = construction unionization rate
- **1.87** fatalities per 10,000 construction workers
- **$47.6** million estimated total cost of fatalities

### DELAWARE

- **$38.70** = average hourly pay
- **$84.58** = productivity per hour
- **12.0%** = construction unionization rate
- **0.91** fatalities per 10,000 construction workers
- **$7.8** million estimated total cost of fatalities

### FLORIDA

- **$26.87** = average hourly pay
- **$64.06** = productivity "value added" per hour
- **3.5%** = construction unionization rate
- **1.84** fatalities per 10,000 construction workers
- **$268.3** million estimated total cost of fatalities

### GEORGIA

- **$31.89** = average hourly pay
- **$72.53** = productivity "value added" per hour
- **5.3%** = construction unionization rate
- **1.94** fatalities per 10,000 construction workers
- **$133.5** million estimated total cost of fatalities

### HAWAII

- **$45.31** = average hourly pay
- **$108.05** = productivity "value added" per hour
- **45.5%** = construction unionization rate
- **2.03** fatalities per 10,000 construction workers
- **$29.9** million estimated total cost of fatalities

### IDAHO

- **$24.49** = average hourly pay
- **$62.91** = productivity "value added" per hour
- **7.9%** = construction unionization rate
- **1.62** fatalities per 10,000 construction workers
- **$25.7** million estimated total cost of fatalities

### ILLINOIS


- **$41.02** = average hourly pay
- **$87.72** = productivity "value added" per hour
- **46.8%** = construction unionization rate
- **1.59** fatalities per 10,000 construction workers
- **$155.2** million estimated total cost of fatalities

### INDIANA

- **$36.11** = average hourly pay
- **$75.92** = productivity "value added" per hour
- **35.6%** = construction unionization rate
- **1.46** fatalities per 10,000 construction workers
- **$87.8** million estimated total cost of fatalities

### IOWA


- **$30.24** = average hourly pay
- **$71.17** = productivity "value added" per hour
- **25.1%** = construction unionization rate
- **2.17** fatalities per 10,000 construction workers
- **$69.1** million estimated total cost of fatalities

### KANSAS


- **$32.12** = average hourly pay
- **$73.25** = productivity "value added" per hour
- **14.8%** = construction unionization rate
- **1.67** fatalities per 10,000 construction workers
- **$53.2** million estimated total cost of fatalities

### KENTUCKY

- **$30.92** = average hourly pay
- **$72.49** = productivity "value added" per hour
- **20.3%** = construction unionization rate
- **2.13** fatalities per 10,000 construction workers
- **$81.2** million estimated total cost of fatalities

### LOUISIANA

- **$37.96** = average hourly pay
- **$73.41** = productivity "value added" per hour
- **5.6%** = construction unionization rate
- **1.82** fatalities per 10,000 construction workers
- **$112.1** million estimated total cost of fatalities

### MAINE

- **$23.81** = average hourly pay
- **$47.62** = productivity "value added" per hour
- **11.1%** = construction unionization rate
- **1.06** fatalities per 10,000 construction workers
- **$14.4** million estimated total cost of fatalities

### MARYLAND

- **$27.11** = average hourly pay
- **$59.01** = productivity "value added" per hour
- **16.0%** = construction unionization rate
- **1.33** fatalities per 10,000 construction workers
- **$84.9** million estimated total cost of fatalities

### MASSACHUSETTS

- **$38.21** = average hourly pay
- **$84.75** = productivity "value added" per hour
- **22.4%** = construction unionization rate
- **1.38** fatalities per 10,000 construction workers
- **$76.4** million estimated total cost of fatalities

### MICHIGAN

- **$30.70** = average hourly pay
- **$71.36** = productivity "value added" per hour
- **29.5%** = construction unionization rate
- **1.86** fatalities per 10,000 construction workers
- **$115.7** million estimated total cost of fatalities

### MINNESOTA

- **$36.90** = average hourly pay
- **$86.14** = productivity "value added" per hour
- **39.6%** = construction unionization rate
- **1.09** fatalities per 10,000 construction workers
- **$50.7** million estimated total cost of fatalities

### MISSISSIPPI

- **$27.07** = average hourly pay
- **$62.65** = productivity "value added" per hour
- **5.9%** = construction unionization rate
- **2.03** fatalities per 10,000 construction workers
- **$53.4** million estimated total cost of fatalities

### MISSOURI

- **$34.68** = average hourly pay
- **$71.14** = productivity "value added" per hour
- **35.1%** = construction unionization rate
- **1.73** fatalities per 10,000 construction workers
- **$85.6** million estimated total cost of fatalities

### MONTANA


- **$28.44** = average hourly pay
- **$71.17** = productivity "value added" per hour
- **16.6%** = construction unionization rate
- **1.78** fatalities per 10,000 construction workers
- **$25.7** million estimated total cost of fatalities

### NEBRASKA

- **$25.46** = average hourly pay
- **$56.82** = productivity "value added" per hour
- **10.4%** = construction unionization rate
- **1.80** fatalities per 10,000 construction workers
- **$37.1** million estimated total cost of fatalities

### NEVADA

- **$35.54** = average hourly pay
- **$87.31** = productivity "value added" per hour
- **25.3%** = construction unionization rate
- **1.18** fatalities per 10,000 construction workers
- **$33.2** million estimated total cost of fatalities

### NEW HAMPSHIRE

- **$36.48** = average hourly pay
- **$72.91** = productivity "value added" per hour
- **16.2%** = construction unionization rate
- **0.71** fatalities per 10,000 construction workers
- **$7.8** million estimated total cost of fatalities

### NEW JERSEY

- **$43.82** = average hourly pay
- **$107.46** = productivity "value added" per hour
- **28.4%** = construction unionization rate
- **1.64** fatalities per 10,000 construction workers
- **$104.1** million estimated total cost of fatalities

## NEW MEXICO

- **$28.87** = average hourly pay
- **$59.56** = productivity "value added" per hour
- **7.5%** = construction unionization rate
- **2.32** fatalities per 10,000 construction workers
- **$64.3** million estimated total cost of fatalities

## NEW YORK

- **$41.03** = average hourly pay
- **$91.38** = productivity "value added" per hour
- **34.6%** = construction unionization rate
- **1.43** fatalities per 10,000 construction workers
- **$234.9** million estimated total cost of fatalities

## NORTH CAROLINA

- **$24.70** = average hourly pay
- **$52.66** = productivity "value added" per hour
- **2.3%** = construction unionization rate
- **1.84** fatalities per 10,000 construction workers
- **$136.1** million estimated total cost of fatalities

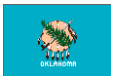
## NORTH DAKOTA

- **$31.48** = average hourly pay
- **$77.87** = productivity "value added" per hour
- **10.0%** = construction unionization rate
- **4.21** fatalities per 10,000 construction workers
- **$85.9** million estimated total cost of fatalities

## OHIO

- $34.04 = average hourly pay
- $75.74 = productivity "value added" per hour
- 28.2% = construction unionization rate
- 1.79 fatalities per 10,000 construction workers
- $157.5 million estimated total cost of fatalities

## OKLAHOMA



- $22.93 = average hourly pay
- $57.00 = productivity "value added" per hour
- 5.7% = construction unionization rate
- 2.68 fatalities per 10,000 construction workers
- $119.4 million estimated total cost of fatalities

## OREGON


- $32.80 = average hourly pay
- $68.69 = productivity "value added" per hour
- 19.7% = construction unionization rate
- 1.11 fatalities per 10,000 construction workers
- $37.8 million estimated total cost of fatalities

## PENNSYLVANIA

- $34.48 = average hourly pay
- $75.75 = productivity "value added" per hour
- 32.4% = construction unionization rate
- 1.63 fatalities per 10,000 construction workers
- $182.4 million estimated total cost of fatalities

## RHODE ISLAND

- $36.29 = average hourly pay
- $96.86 = productivity "value added" per hour
- 27.5% = construction unionization rate
- 1.19 fatalities per 10,000 construction workers
- $11.5 million estimated total cost of fatalities

## SOUTH CAROLINA

- $26.16 = average hourly pay
- $62.36 = productivity "value added" per hour
- 2.3% = construction unionization rate
- 2.53 fatalities per 10,000 construction workers
- $84.8 million estimated total cost of fatalities

### SOUTH DAKOTA

- **$25.88** = average hourly pay
- **$60.24** = productivity "value added" per hour
- **6.5%** = construction unionization rate
- **2.06** fatalities per 10,000 construction workers
- **$22.0** million estimated total cost of fatalities

### TENNESSEE

- **$28.67** = average hourly pay
- **$63.08** = productivity "value added" per hour
- **8.3%** = construction unionization rate
- **2.02** fatalities per 10,000 construction workers
- **$92.4** million estimated total cost of fatalities

### TEXAS

- **$32.92** = average hourly pay
- **$79.05** = productivity "value added" per hour
- **2.9%** = construction unionization rate
- **2.12** fatalities per 10,000 construction workers
- **$595.0** million estimated total cost of fatalities

### UTAH

- **$29.36** = average hourly pay
- **$73.11** = productivity "value added" per hour
- **5.0%** = construction unionization rate
- **1.14** fatalities per 10,000 construction workers
- **$43.9** million estimated total cost of fatalities

### VERMONT

- **$25.75** = average hourly pay
- **$51.53** = productivity "value added" per hour
- **6.6%** = construction unionization rate
- **0.99** fatalities per 10,000 construction workers
- **$6.8** million estimated total cost of fatalities

### VIRGINIA

- **$31.37** = average hourly pay
- **$73.65** = productivity "value added" per hour
- **4.6%** = construction unionization rate
- **1.44** fatalities per 10,000 construction workers
- **$132.5** million estimated total cost of fatalities

### WASHINGTON

- **$39.72** = average hourly pay
- **$83.85** = productivity "value added" per hour
- **32.0%** = construction unionization rate
- **0.79** fatalities per 10,000 construction workers
- **$47.9** million estimated total cost of fatalities

### WEST VIRGINIA

- **$26.16** = average hourly pay
- **$62.96** = productivity "value added" per hour
- **24.3%** = construction unionization rate
- **1.91** fatalities per 10,000 construction workers
- **$50.4** million estimated total cost of fatalities

### WISCONSIN


- **$35.51** = average hourly pay
- **$78.67** = productivity "value added" per hour
- **26.9%** = construction unionization rate
- **1.38** fatalities per 10,000 construction workers
- **$69.4** million estimated total cost of fatalities

### WYOMING

- **$28.61** = average hourly pay
- **$67.47** = productivity "value added" per hour
- **7.5%** = construction unionization rate
- **1.88** fatalities per 10,000 construction workers
- **$33.2** million estimated total cost of fatalities

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