

The Effects of Repealing Prevailing Wage in Wisconsin

Impacts on Ten Construction Market Outcomes

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Executive Summary

In 2017, Wisconsin lawmakers repealed the state's prevailing wage laws, which established minimum wages for skilled construction workers employed on public construction projects. Repeal of the state's prevailing wage laws has led to a host of consequences for workers and the construction industry— including lower incomes and more inequality— while failing to deliver any meaningful cost savings or increased bid competition. Prevailing wage was repealed for projects funded by local governments effective January 1, 2017 and for projects funded by the state government effective September 23, 2017.

Actual economic data reveal that:

1. Since repeal, blue-collar construction worker earnings have dropped by 6 percent, on average.
2. Repeal was associated with a 4 percent decrease in employer-provided health insurance coverage for blue-collar construction workers.
3. Since repeal, the total annual incomes of construction industry CEOs in Wisconsin have increased by an average of 54 percent, contributing to greater inequality in construction.
4. Repeal had no impact on racial diversity but resulted in less gender diversity in Wisconsin's construction workforce.
5. The number of active apprentices and the number of graduates from apprenticeship programs have grown slower in Wisconsin than in neighboring Illinois and Minnesota following repeal.
6. Total construction worker turnover increased by 8 percent in Wisconsin's heavy and highway construction sector after repeal.
7. The average number of bidders on Wisconsin Department of Transportation projects was 3.5 before repeal and 2.9 after repeal, a 16 percent decrease in bid competition.
8. There was a 60 percent increase in new Wisconsin Department of Transportation projects being awarded to out-of-state contractors following repeal.
9. Repeal had no statistical impact on the average cost per mile of resurfacing or maintaining roads in Wisconsin.
10. There has been no discernible difference in Wisconsin Department of Transportation projects coming in under budget following repeal.

These post-repeal findings corroborate the conclusions of a nonpartisan Wisconsin Legislative Fiscal Bureau report, which found that “the evidence on prevailing wage effects generally range from relatively small effects to no statistically significant effects.”

Repeal has had negative consequences for Wisconsin. Construction worker income growth has not kept pace with neighboring states, construction worker health insurance coverage has declined, and the blue-collar construction workforce has become less diverse— all of which tend to increase construction worker reliance on government assistance programs. Compared with neighboring states that had and maintained prevailing wage laws, apprenticeship training has been slower and construction worker turnover has increased in Wisconsin. Wisconsin Department of Transportation projects have had less contractor bid competition and more projects awarded to out-of-state contractors. Above all, repeal has failed to provide any cost savings on road construction projects for taxpayers. Instead, repeal has had negative effects on skilled construction workers and local contractors in Wisconsin.

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Introduction

Prevailing wage standards supported skilled construction workers employed on public works projects in Wisconsin for more than eight decades between 1931 and 2016. Prevailing wage standards are essentially minimum wages for different types of skilled construction workers on taxpayer-funded projects, requiring that construction contractors pay no less than the “prevailing” wage and benefit rates for similar work in the local area where public projects are to be completed. According to the Wisconsin Department of Transportation, prevailing wage standards were “enacted to discourage the awarding of public works contracts to low-balling employers who underbid local employers by paying workers substantially less than normally received by workers in an area” ([WisDOT, 2016](#)). Prevailing wage standards are designed to level the playing field for all construction contractors by ensuring that public expenditures reflect local market standards of compensation and craftsmanship ([WHD, 2020](#)).

Prevailing wage standards have been implemented at the federal, state, and local levels. Nationally, the Davis-Bacon Act ascertains and establishes prevailing wage standards on federally-funded construction projects. However, before passage of the federal Davis-Bacon Act, nine states had prevailing wage laws on the books. Within four years of the Davis-Bacon Act’s passage, 16 additional states added state-level prevailing wage statutes, including Wisconsin.

The State of Wisconsin had three prevailing wage laws covering public construction projects funded by state agencies, the Wisconsin Department of Transportation, and local units of government ([Sharma & Crump, 2016](#)). Wisconsin enacted the laws for state-funded projects, including for highways and bridges, in 1931 and the law for local construction projects in 1933. Prevailing wage rates were determined annually by occupation, by county, and by project type through surveys of thousands of construction companies and industry stakeholders in the state. As a result, prevailing wage rates were transparent and reflective of wages that were actually paid by contractors to workers in a local construction labor market.

Despite the academic consensus which shows that prevailing wage laws lead to enhanced productivity, higher wages for construction workers, improved safety outcomes, and more work for in-state contractors while having little to no discernible impact on total construction costs, Wisconsin lawmakers completely repealed their prevailing wage laws in 2017 ([Duncan & Ormiston, 2017](#)). The prevailing wage law for local construction projects was repealed effective January 1, 2017 and the policies covering state construction projects were repealed effective September 23, 2017 ([DWD, 2017](#)). Today, 27 states plus the District of Columbia have state prevailing wage laws— including bordering Illinois and Minnesota.

This report, conducted by researchers at the Midwest Economic Policy Institute, Illinois Economic Policy Institute, and Colorado State University-Pueblo, evaluates economic data and highway project data to assess the effects of repealing prevailing wage on ten construction market outcomes in Wisconsin: blue-collar construction worker incomes, blue-collar construction worker health insurance coverage, construction industry executive compensation, workforce diversity, apprenticeship training, worker turnover, competition in public bidding, the market share of out-of-state contractors, the cost of public construction projects, and the rate of cost overruns. A concluding section recaps key findings.

Research on the Effects of Repealing Prevailing Wage Prior to Repeal

Prior to repeal, three economic studies were published in 2015 on the effects of Wisconsin's prevailing wage laws. These reports were conducted by researchers at the University of Utah, Colorado State University-Pueblo and Smart Cities Prevail, and the Wisconsin Taxpayers Alliance. To varying degrees, all three studies provided economic forecasts on the impact of repealing the policy.

One study was published in April 2015 by Dr. Peter Philips, a Professor of Economics at the University of Utah ([Philips, 2015](#)). The report, *Wisconsin's Prevailing-Wage Law: An Economic Impact Analysis*, concluded that the policy was good for the construction industry, construction workers, and Wisconsin taxpayers. Philips found that prevailing wage standards are associated with higher construction worker incomes, better fringe benefits, greater value-added per construction worker, and more protections for local contractors against "inexperienced or unqualified bidders" from out-of-state. Notably, Philips also ascertained that joint labor-management apprenticeship programs accounted for 95 percent of all annual apprenticeship training investments in Wisconsin, contributing to higher productivity among union contractors. He found that repeal "drives down wages and also risks the loss of construction human-capital" while resulting in lower levels of worker training.

A second study by Dr. Kevin Duncan at Colorado State University-Pueblo and Alex Lantsberg at Smart Cities Prevail was released in May 2015 ([Duncan & Lantsberg, 2015](#)). The report, *How Weakening Wisconsin's Prevailing Wage Policy Would Affect Public Construction Costs and Economic Activity*, found that the policy promoted positive market outcomes for construction workers and in-state contractors. These researchers found that weakening or repealing prevailing wage in Wisconsin would result in lower earnings and benefits payments for construction workers, higher profits for contractors, more unskilled employees replacing skilled craft workers, and no cost savings for Wisconsin taxpayers—primarily because labor costs accounted for just 21 percent of total costs in highway, street, and bridge construction. They also found that "weakening Wisconsin's prevailing wage laws... would be associated with the increased use of out-of-state contractors that would reduce economic activity" as tax dollars leak out of Wisconsin's economy.

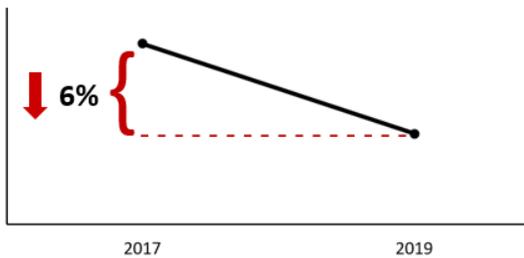
The third study was prepared in March 2015 by the Wisconsin Taxpayers Alliance for the Associated Builders and Contractors of Wisconsin ([Berry, 2015](#)). The report, *Evaluating Wisconsin's Approach to Determining Prevailing Wages: State Methodology, Regional Market Comparisons, Local Fiscal Impact*, was critical of Wisconsin's prevailing wage laws. The Wisconsin Taxpayers Alliance asserted that prevailing wage rates were 44 percent higher than "market rates," costing state and local governments between \$200 million and \$300 million per year. The report also claimed that Wisconsin's wage determination methodology inflated prevailing wages and led to less competition by small firms paying lower wages.

Finally, it is worth noting that the nonpartisan Wisconsin Legislative Fiscal Bureau published an analysis on the state's prevailing wage laws in March 2015 ([Horton, 2015](#)). The report concluded that "existing research on the impact of prevailing wage laws on construction costs is mixed and inconclusive" but that "the evidence on prevailing wage effects generally range from relatively small effects to no statistically significant effects." The report noted that the Department of Revenue (DOR), Department of Workforce Development (DWD), Department of Transportation (DOT), University of Wisconsin (UW) System, Wisconsin Technical College System (WTCS), and Department of Natural Resources (DNR) all identified little to no fiscal impact from repealing prevailing wage on government expenditures. This is because labor costs are only a small share of total construction costs and prevailing wage rates are often associated with attracting higher-skilled workers into the state's construction industry.

The Impacts of Repealing Prevailing Wage on Ten Market Outcomes

Economic data is becoming available to test claims made by policy researchers in the years leading up to repeal. Does prevailing wage promote ladders into the middle class for skilled construction workers, boost apprenticeship training, and support local contractors or does it inflate construction costs and restrict contractor competition? The impacts of repeal on these and other construction market outcomes are assessed in this section.

1. Construction Incomes



Inflation-adjusted construction worker incomes decreased by 6 percent after repeal of prevailing wage.

Previous research suggests that prevailing wage laws foster good, middle-class careers in construction. There is a significant difference in the wages paid to blue-collar construction workers in states with prevailing wage laws compared to those in states without prevailing wage (Philips, 2014; Manzo et al., 2016). Peer-reviewed analyses have found that repeal of prevailing wage laws results in a 2 percent to 4 percent decrease in blue-collar construction incomes (Fenn et al., 2018; Kessler & Katz, 2001). In nearby Indiana, where prevailing wage was repealed two years earlier in 2015, economic research has found that construction worker wages have fallen by

8 percent, relative to neighboring states that maintained prevailing wage laws (Manzo & Duncan, 2018a).

Figure 1 provides data from the *American Community Survey* conducted by the U.S. Census Bureau. Annual income data is adjusted for inflation using the Consumer Price Index (CPI-U) and contrasted with aggregate data for Illinois and Minnesota, two neighboring states with prevailing wage laws. Before repeal, the average annual income of full-time construction and extraction workers in Wisconsin was more than \$48,800 in 2015 and 2016. By contrast, in 2017 and 2018—the year during repeal and the year after repeal, respectively—the average annual income of full-time construction and extraction workers fell to about \$46,300, a drop of over \$2,500 per year (5.2 percent) after adjusting for inflation. At the same time, real incomes for full-time construction and extraction workers in Illinois and Minnesota went from around \$52,200 to about \$51,300, a decrease of about \$900 per year (1.7 percent) after adjusting for inflation. The data suggests that blue-collar construction worker incomes fell by \$1,623 per year (3.4 percent) in Wisconsin following repeal, relative to their counterparts in neighboring states with prevailing wage laws.

FIGURE 1: INFLATION-ADJUSTED CONSTRUCTION WORKER INCOME CHANGES AFTER PREVAILING WAGE REPEAL IN WISCONSIN

Full-Time Construction and Extraction Workers*	Wisconsin	Illinois and Minnesota	Difference-in-Differences
Average annual income, 2015-2016	\$48,844	\$52,244	-\$3,400
Average annual income, 2017-2018	\$46,313	\$51,336	-\$5,023
Average change in annual income	-\$2,531	-\$908	-\$1,623
Percent change in annual income	-5.18%	-1.74%	-3.44%

Source(s): Authors' analysis of the 2015-2018 *American Community Surveys* (1-Year Estimates) from the U.S. Census Bureau (Ruggles et al., 2020). *Full-time construction and extraction workers are defined as those who worked at least 48 weeks and at least 35 hours per week in the past 12 months (which is a minimum of 1,680 hours worked).

Statistical regression results on the impact of prevailing wage repeal on the average annual incomes of blue-collar construction and extraction workers are reported in Figure 2.¹ Many factors influence a worker’s annual income, including level of educational attainment, age, gender identification, racial or ethnic background, immigration status, veteran status, urban status, sector of employment, hours worked, and weeks worked per year. After accounting for these and other observable variables, full repeal of prevailing wage was associated with a 6.4 percent decrease in inflation-adjusted annual incomes for blue-collar construction workers in Wisconsin. On average, repeal lowered construction worker earnings by more than \$2,600 per year. Both effects are statistically significant.

FIGURE 2: IMPACT OF PREVAILING WAGE REPEAL ON THE REAL INCOMES OF CONSTRUCTION WORKERS

Effect on the Real Annual Incomes of Construction and Extraction Workers	Robust Difference-in-Differences Regression: Percent Change	Robust Difference-in-Differences Regression: Dollar Value Change
Impact of full repeal (2018)	-6.35%***	-\$2,649.50***
Impact of partial repeal (2017)	-3.91%	-\$875.79

Source(s): Authors’ analysis of the 2015-2018 *American Community Surveys* (1-Year Estimates) from the U.S. Census Bureau (Ruggles et al., 2020). The regressions each have 436,373 total observations that are weighted to match the actual population. For full regression results, see Table A in the “Regression Results” section of the Appendix. Three asterisks (***) indicate significance at the 99-percent confidence level. Two asterisks (**) indicate significance at the 95-percent confidence level. One asterisk (*) indicates significance at the 90-percent confidence level.

2. Health Insurance Coverage

Benefits are an important part of total compensation in the construction industry. Providing family-supporting health benefits enables contractors to attract qualified applicants and retain skilled construction workers, reducing worker turnover (Kim & Philips, 2010). Because they include fringe benefits as part of the minimum level of compensation, prevailing wage standards have been found to increase the share of construction workers with health insurance by 10 percent and boost construction worker fringe benefits packages by between 11 percent and 16 percent (Manzo et al., 2016; Fenn et al., 2018). Similarly, in neighboring Minnesota, the Minnesota Prevailing Wage Act has recently been found to expand access to private health insurance coverage among blue-collar construction workers by about 5 percent (Manzo & Duncan, 2018b).

Repeal was associated with a 4 percent decrease in construction workers with employer-provided health insurance coverage.



The data suggests that full repeal of prevailing wage decreased the share of skilled construction workers with health insurance sponsored by their employers, either voluntarily or through collective bargaining agreements (Figure 3). After accounting for other important factors, the likelihood of blue-collar construction and extraction workers in Wisconsin having employer-sponsored health insurance coverage temporarily increased by about 3.3 percentage points in 2017, a year during which prevailing wage standards applied on most state-funded construction projects but were removed on projects supported by local governments. However, these gains were reversed following full repeal. The likelihood of blue-collar construction and extraction workers in Wisconsin being covered by employer-sponsored health insurance plans was 2.8 percentage-points lower after repeal of prevailing wage than it was prior to repeal. This difference-in-differences impact, relative to their counterparts in Illinois and Minnesota, is

¹ For more on the “regression” statistical approach, see the “Report Methodology” section in the Appendix.

statistically significant at the 90-percent level of statistical confidence. The evidence suggests that full repeal reduced the total number of construction workers with employer-sponsored health insurance coverage by 3.7 percent.² With previous economic research concluding that prevailing wage standards reduce construction worker dependency on social safety net programs, the findings that repeal decreased construction worker earnings and reduced health insurance coverage also suggest that more construction workers in Wisconsin likely rely on government assistance programs such as food stamps and Medicaid post-repeal (Manzo et al., 2016).

FIGURE 3: IMPACT OF PREVAILING WAGE REPEAL ON EMPLOYER-PROVIDED HEALTH INSURANCE FOR CONSTRUCTION WORKERS

Effect on the Probability of Having Employer-Sponsored Health Insurance for Construction and Extraction Workers	Difference-in-Differences Probit Regression: Likelihood Change
Impact of full repeal (2018)	-2.76%*
Impact of partial repeal (2017)	+3.30%**
Overall chance of having employer-sponsored health coverage	74.20%***
Difference-in-difference effect of full repeal on total number of construction workers with employer-sponsored health coverage	-3.72%*

Source(s): Authors’ analysis of the 2015-2018 *American Community Surveys* (1-Year Estimates) from the U.S. Census Bureau (Ruggles et al., 2020). The regression has 460,283 total observations that are weighted to match the actual population. For full regression results, see Table A in the “Regression Results” section of the Appendix. Three asterisks (***) indicate significance at the 99-percent confidence level. Two asterisks (**) indicate significance at the 95-percent confidence level. One asterisk (*) indicates significance at the 90-percent confidence level.

3. Economic Inequality in Construction

Repeal caused a shift in income from blue-collar construction workers to construction industry CEOs.



While annual incomes and health insurance coverage have fallen for construction workers in Wisconsin relative to their peers in neighboring states, the total compensation of construction industry CEOs has risen substantially (Figure 4). After accounting for important factors such as educational attainment and type of business ownership, full repeal of prevailing wage was statistically associated with a 54.3 percent increase in inflation-adjusted total incomes for construction

industry CEOs in Wisconsin. A separate analysis suggests that the average construction industry CEO experienced an annual raise of nearly \$93,900 in the first year after full repeal of prevailing wage.

FIGURE 4: IMPACT OF PREVAILING WAGE REPEAL ON THE REAL TOTAL INCOMES OF CONSTRUCTION INDUSTRY CEOs

Effect on the Real Total Incomes of Construction Industry CEOs	Robust Difference-in-Differences Regression: Percent Change	Robust Difference-in-Differences Regression: Dollar Value Change
Impact of full repeal (2018)	+54.32%**	+\$93,869.08*
Impact of partial repeal (2017)	+6.84%	+\$39,015.07

Source(s): Authors’ analysis of the 2015-2018 *American Community Surveys* (1-Year Estimates) from the U.S. Census Bureau (Ruggles et al., 2020). The regressions each have 3,560 total observations of chief executives in the private sector that are weighted to match the actual population. For full regression results, see Table B in the “Regression Results” section of the Appendix. Three asterisks (***) indicate significance at the 99-percent confidence level. Two asterisks (**) indicate significance at the 95-percent confidence level. One asterisk (*) indicates significance at the 90-percent confidence level.

² The 2.76 percentage-point effect on the probability divided by the baseline chance of having employer-provided health coverage of 74.20 percent yields a total change of 3.72 percent.

The economic data reveal that repealing prevailing wage standards in Wisconsin caused a shift in income from blue-collar construction workers to CEOs in the construction industry (Figure 5).³ In total, all construction and extraction workers in Wisconsin experienced an estimated \$346 million decrease in wage and salary income in 2018, relative to what they would have earned had the state maintained its prevailing wage laws. By contrast, the CEOs of private construction companies saw their total incomes rise by an estimated \$111 million in 2018. The implication is that Wisconsin-based construction CEOs captured 32.1 percent of the drop in labor income and kept it for themselves, contributing to greater inequality in Wisconsin’s construction industry (Manzo & Bruno, 2014).

FIGURE 5: ESTIMATED CHANGE IN TOTAL LABOR INCOME AND TOTAL CEO PAY IN WISCONSIN FOLLOWING REPEAL

Estimated Change in Income in Wisconsin’s Construction Industry	Total 2018 Employment	Average Change (Regression Results)	Total Change (Total Employment Multiplied by Average Change)
Construction and extraction workers	130,500	-\$2,649.50	-\$345,759,750
Private construction industry CEOs	1,184	+\$93,869.08	+\$111,140,990
Shift in construction industry compensation from workers to CEOs			32.14%

Source(s): Authors’ analysis of the 2015-2018 *American Community Surveys* (1-Year Estimates) from the U.S. Census Bureau (Ruggles et al., 2020). The estimate for CEOs is statistically significant with 90 percent confidence. For more information on the average income change, see Figures 2 and 4 in the report or Tables A and B in the “Regression Results” section of the Appendix.

What happened to the other 67.9 percent of the drop in labor income? The economic forecast by Duncan and Lantsberg (2015) may provide clues. In their pre-repeal study, Duncan and Lantsberg projected that repeal of prevailing wage in Wisconsin would increase proprietor income by \$175 million. The \$111 million estimated shift in income from workers to CEOs in just the first full year following the repeal of prevailing wage standards represents 63.5 percent of the \$175 million expected by Duncan and Lantsberg. Duncan and Lantsberg also predicted that materials and fuels usage would increase— which would offset most of the drop in labor income— and that out-of-state contractors would enter the market in Wisconsin and replace local construction workers on projects funded by Wisconsin taxpayers. The increase in fuels costs is driven by the influx of nonlocal contractors, who pay more to bring both workers and materials from out-of-state, while the increase in materials costs is primarily due to the shift to less-productive workers who do not efficiently use materials (Duncan & Lantsberg, 2015).

4. Workforce Diversity

Some commentators, including in Wisconsin, have claimed that prevailing wage laws exclude people of color (Bernstein, 2018; Bott, 2017). This claim has been fiercely debated and rejected by other academic researchers (Duncan & Ormiston, 2017; Azari-Rad & Philips, 2003). Additionally, peer-reviewed economic research has found no relationship between prevailing wage laws and the racial composition of the construction workforce (Belman & Philips, 2005). There is also no evidence that repeal of prevailing wage standards has excluded people of color from participating in apprenticeship training programs the construction trades (Bilginsoy, 2003). In fact, in the nine states that repealed prevailing wage laws from 1979 to 1988, people of color accounted for 19 percent of all registered apprentices pre-repeal



Repeal decreased the number of construction workers who are women by 32 percent.

³ Construction workers account for 99.3 percent and extraction workers account for the remaining 0.7 percent of this occupational grouping in Wisconsin, according to the *American Community Survey* data.

but just 13 percent post-repeal (Philips et al., 1995). More recent research has found that prevailing wage standards boost the homeownership rate of African American construction workers by 8 percent compared with a 3 percent increase for white construction workers (Manzo et al., 2020).

FIGURE 6: RACIAL AND GENDER DIVERSITY IN THE CONSTRUCTION WORKFORCE AFTER PREVAILING WAGE REPEAL IN WISCONSIN

Racial and Gender Diversity of the Construction and Extraction Workforce	People of Color		Women	
	Wisconsin	Illinois and Minnesota	Wisconsin	Illinois and Minnesota
Share of workforce, 2015-2016	11.46%	25.40%	2.72%	2.97%
Share of workforce, 2017-2018	11.48%	27.41%	1.99%	3.52%
Percent change in diversity metrics	+0.02%	+2.01%	-0.73%	+0.55%
Difference-in-differences	-1.99%		-1.28%	

Source(s): Authors’ analysis of the 2015-2018 *American Community Surveys* (1-Year Estimates) from the U.S. Census Bureau (Ruggles et al., 2020).

In Wisconsin, 11.5 percent of blue-collar construction and extraction workers were people of color in 2015 and 2016, before repeal of prevailing wage (Figure 6). In 2017 and 2018– the year during repeal and the year after repeal– the share of the construction workforce who were people of color remained statistically unchanged at 11.5 percent. At the same time, the construction workforce became more racially diverse in Illinois and Minnesota, improving from 25.4 percent of the workforce to 27.4 percent. Similarly, the share of blue-collar construction and extraction workers who were women fell in Wisconsin from 2.7 percent down to just 2.0 percent, but increased in Illinois and Minnesota from about 3.0 percent to 3.5 percent. The data suggest that, while neighboring states that maintained their prevailing wage laws progressed in terms of racial and gender workforce diversity, Wisconsin fell behind following repeal of prevailing wage (Figure 6).

FIGURE 7: IMPACT OF PREVAILING WAGE REPEAL ON RACIAL AND GENDER DIVERSITY AMONG CONSTRUCTION WORKERS

Effect on the Probability of A Construction and Extraction Worker Being a Person of Color or Being a Woman	D-i-D Probit: Likelihood of Being a Person of Color	D-i-D Probit: Likelihood of Being a Woman
Impact of full repeal (2018)	-1.04%	-15.17%***
Impact of partial repeal (2017)	-0.02%	+0.57%
Overall chance of being a person of color or a woman	23.99%***	47.62%***
Effect of full repeal on total number of construction workers who are people of color and women	No effect	-31.85%***

Source(s): Authors’ analysis of the 2015-2018 *American Community Surveys* (1-Year Estimates) from the U.S. Census Bureau (Ruggles et al., 2020). The regressions have 460,283 total observations that are weighted to match the actual population. For full regression results, see Table C in the “Regression Results” section of the Appendix. Three asterisks (***) indicate significance at the 99-percent confidence level. Two asterisks (**) indicate significance at the 95-percent confidence level. One asterisk (*) indicates significance at the 90-percent confidence level.

After accounting for other important factors, the likelihood of any blue-collar construction and extraction worker in Wisconsin being a person of color decreased by 1.0 percent following full repeal, but the effect is not statistically significant (Figure 7). However, the likelihood of a blue-collar construction and extraction worker being a woman decreased by 15.2 percent. This result is statistically significant (Figure 7). The economic data reveal that full repeal of prevailing wage in Wisconsin had no discernible impact on

racial diversity in the construction workforce but did have a negative effect on gender diversity, reducing the total number of construction workers who are women by 31.9 percent.⁴

5. Apprenticeship Training

After repeal, the number of apprentices completing their training has grown **25 percent slower** in Wisconsin.



Construction is the most volatile major industry in Wisconsin. Between 2007 and 2011, the construction industry lost 27 percent of its total jobs compared with a 4 percent drop in employment for Wisconsin as a whole during the Great Recession. Then, between 2011 and 2019, employment in the construction industry grew by 34 percent compared with a 9 percent growth in jobs in all Wisconsin sectors (BLS, 2020a). Additionally, because construction workers frequently move from one project to another and from one contractor to another, there is less incentive for employers to invest in skills

training. Instead, contractors are incentivized to focus only on the short run since it will take multiple years to train a skilled construction worker. The result is a “market failure” in which long-term investments in worker training are not made at adequate levels. Prevailing wage laws help correct this “market failure” by reflecting local market-based standards for wages and training contributions in the communities where projects are being built, ensuring that the next generation of workers is trained and the industry can access a stable supply of skilled workers.

Economic research has shown that prevailing wage laws increase apprenticeship training in construction (Duncan & Ormiston, 2017). The number of apprentices, as a share of the overall construction workforce, is up to 8 percent higher in states with prevailing wage laws (Bilginsoy, 2003). Apprentices have also been found to complete graduation requirements at a slower rate in states without prevailing wage laws (Bilginsoy, 2003). Similarly, studies conducted after the repeal of prevailing wage laws have shown a strong correlation with a decrease in worker training (Kelsay & Manzo, 2019; Philips, 2014; Philips et al., 1995; Azari-Rad et al., 1993).

FIGURE 8: CHANGE IN ACTIVE REGISTERED APPRENTICES IN WISCONSIN AND NEIGHBORING STATES, FY2016-FY2019

Fiscal Year	Dates Covered	Wisconsin	Illinois and Minnesota
2016	10/1/2015 to 9/30/2016	10,078	25,410
2017	10/1/2016 to 9/30/2017	10,700	26,804
2018	10/1/2017 to 9/30/2018	11,124	28,698
2019	10/1/2018 to 9/30/2019	11,682	29,548
Numerical change: 2016-2019		+1,604	+4,138
Percent change: 2016-2019		+15.92%	+16.28%
Difference-in-differences		-0.37%	

Source(s): Authors’ analysis of “Data and Statistics: Registered Apprenticeship National Results” from the U.S. Department of Labor (DOLETA, 2020). The data includes both construction and non-construction occupations. In calendar year 2019, the construction trades accounted for 67.8 percent of all active apprentices in Wisconsin (DWD, 2020).

Figure 8 displays data on the number of active apprentices in registered apprenticeship programs, released by the Department of Labor Employment and Training Administration (DOLETA). Apprenticeship

⁴ The 15.17 percentage-point effect on the probability divided by the baseline chance of any given worker being a woman of 47.62 percent yields a total change of 31.85 percent.

data for Wisconsin in fiscal years 2016, 2017, 2018, and 2019 is compared with aggregated data for neighboring Illinois and Minnesota. Note that the fiscal year runs from October through September, so some of fiscal year 2017 occurred prior to repeal of prevailing wage (October, November, and December of 2016) and fiscal year 2017 primarily encompassed the repeal of prevailing wage on local projects.

Following full repeal of prevailing wages, the number of registered apprentices has grown slightly slower in Wisconsin than in neighboring Illinois and Minnesota (Figure 8). In fiscal year 2016, Wisconsin had about 10,100 active apprentices. By fiscal year 2019, two years after the policy had been repealed on both state and local projects, Wisconsin had nearly 11,700 active apprentices, a growth of 15.9 percent. By contrast, in Illinois and Minnesota, enrollment in registered apprenticeship programs increased from about 25,400 in fiscal year 2016 to more than 29,500 in fiscal year 2018, an increase in enrollment of 16.3 percent.

There are key distinctions, however, in apprenticeship completion as opposed to apprenticeship enrollment. The total number of apprentices completing their training has grown 24.8 percent slower in Wisconsin than in neighboring Illinois and Minnesota (Figure 9). In fiscal year 2016, Wisconsin’s apprenticeship programs graduated a little more than 900 apprentices. By fiscal year 2019, they graduated about 1,300 apprentices, a growth of 39.8 percent. In comparison, Illinois and Minnesota went from about 2,400 graduates to nearly 3,900 graduates, a 64.6 percent gain in the number of apprentices completing their programs. As a result, the growth in apprenticeship completers has been significantly slower in Wisconsin. While apprenticeship enrollment in Wisconsin has only slightly trailed the neighboring states that maintained their prevailing wage laws, the divergence in completion rates may indicate lower efficiency in producing certified skilled workers following prevailing wage repeal (Bilginsoy, 2003).

FIGURE 9: CHANGE IN APPRENTICESHIP COMPLETERS IN WISCONSIN AND NEIGHBORING STATES, FY2016-FY2019

Fiscal Year	Dates Covered	Wisconsin	Illinois and Minnesota
2016	10/1/2015 to 9/30/2016	949	2,356
2017	10/1/2016 to 9/30/2017	1,132	3,306
2018	10/1/2017 to 9/30/2018	1,359	3,119
2019	10/1/2018 to 9/30/2019	1,327	3,879
Numerical change: 2016-2019		+378	+1,523
Percent change: 2016-2019		+39.83%	+64.64%
Difference-in-differences		-24.81%	

Source(s): Authors’ analysis of “Data and Statistics: Registered Apprenticeship National Results” from the U.S. Department of Labor (DOLETA, 2020). The data includes both construction and non-construction occupations.

6. Worker Turnover

Quarterly Workforce Indicators (QWI) from the U.S. Census Bureau are used to investigate impacts on worker turnover in the “heavy and civil engineering construction” sector. The heavy and civil engineering construction sector primarily involves public works projects, particularly heavy and highway projects such as the construction of streets, bridges, dams, and parks. Figure 10 presents average quarterly turnover rates that have been adjusted by overall employment in each quarter to



account for the peak months of construction in the Midwest, which are the second quarter (April, May, and June) and the third quarter (July, August, and September).

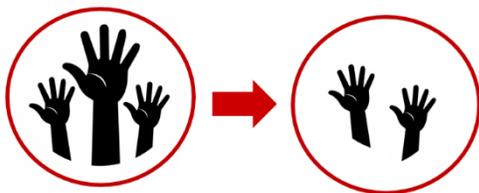
FIGURE 10: CHANGE IN HEAVY AND HIGHWAY CONSTRUCTION TURNOVER RATES IN WISCONSIN AND NEIGHBORS, 2016-2018

Average Quarterly Turnover in Heavy and Civil Engineering Construction	Wisconsin	Illinois and Minnesota	Difference-in-Differences
2016	10.14%	13.33%	-3.19%
2017	10.40%	13.34%	-2.93%
2018	10.93%	13.25%	-2.32%
Percent change: 2016-2018	+0.79%	-0.08%	+0.87%
Overall change in turnover: 2016-2018	+7.83%	-0.57%	+8.40%

Source(s): Authors’ analysis of “Quarterly Workforce Indicators” by the Center for Economic Studies at the U.S. Census Bureau (LEHD, 2020).

Figure 10 presents turnover data for heavy and highway contractors. In the year prior to repeal of prevailing wage, worker turnover in the heavy and civil engineering construction sector averaged 10.1 percent in Wisconsin and 13.3 percent in Illinois and Minnesota. In the year following repeal, however, average quarterly turnover in the sector jumped up to 10.9 percent in Wisconsin, but stayed about the same in the two neighboring states with prevailing wage laws. While Wisconsin still had lower turnover rates in the heavy and highway sector than Illinois and Minnesota, the gap has narrowed. Ultimately, the data indicates that full repeal of prevailing wage was associated with a 7.8 percent relative increase in overall worker turnover in Wisconsin’s heavy and highway construction sector.⁵ As construction incomes failed to keep pace with inflation and employer-provided health insurance coverage appears to have decreased, more workers in the heavy and highway construction sector may have exited the industry in search of other careers that offer better compensation. This increase in turnover rates imposes additional costs on contractors. The average cost of turnover is 21 percent of an employee’s salary— a finding that has been consistent over time (Boushey & Glynn, 2012).

7. Contractor Competition



Bid competition on public construction projects has decreased by 16 percent following repeal.

The next two construction market outcomes— contractor competition and out-of-state bidders— are evaluated using bid data on highway projects funded by the Wisconsin Department of Transportation (WisDOT). The data are collected and released by Bid Express, an online information service for bidding (Bid Express, 2020). The data includes 4,890 total bids on 1,515 proposed projects from January 2015 through December 2019. As a result, the information includes 33 months of data before repeal of prevailing wage on state-funded

highway projects— January 2015 through September 2017— and 27 months of data following repeal— October 2017 through December 2019.

⁵ The 0.87 percentage-point change in the difference in turnover *rate* trajectories divided by the 3.19 percent initial gap yields a total change in *overall* turnover of 8.40 percent.

Many opponents of prevailing wage laws assert that they reduce the level of bid competition, leading to higher costs on public projects. This claim is often made in the absence of empirical evidence (e.g., [Crumb, 2015](#); [Leef, 2010](#)). However, economic research on bid proposals has found no evidence that prevailing wage laws affect the number of bidders. Five peer-reviewed studies investigating a total of 2,474 bids on school, highway, and municipal projects have found that prevailing wage standards do not reduce bid competition ([Onsarigo et al., 2020](#); [Duncan & Waddoups, 2020](#); [Duncan, 2015](#); [Kim et al., 2012](#); [Bilginsoy, 1999](#)).

Actual project data reveal that the repeal of prevailing wage did not increase competition on highway projects let by the Wisconsin Department of Transportation (Figure 11). Figure 11 describes project data for the 1,515 projects awarded by WisDOT between January 2015 and December 2019. Prior to repeal of prevailing wage, a total of 832 highway projects were awarded. On these pre-repeal projects, a total of 2,897 bids were submitted by construction contractors, an average of 3.5 bids per project. After repeal of prevailing wage, 1,993 bids were submitted on 683 WisDOT projects, an average of 2.9 bids per project. The average number of contractors competing to build highway projects has thus dropped by 0.6 bids.⁶ Repeal of prevailing wage did not result in more bid competition on highway projects in Wisconsin. In fact, contractor competition decreased by 16.2 percent following repeal of prevailing wage.

FIGURE 11: OVERALL BID SUMMARY OF WISDOT HIGHWAY PROJECTS AWARDED IN WISCONSIN BETWEEN 2015 AND 2019

Bids on Wisconsin Department of Transportation Projects	Pre-Repeal (January 2015 – September 2017)	Post-Repeal (October 2017 – December 2019)
Total number of months	33	27
Public projects awarded	832	683
Total bids on awarded projects	2,897	1,993
Average number of bids per project	3.48	2.92
Change in bids per project	-0.56	
Change in overall bid competition	-16.20%	

Source(s): Authors’ analysis of Wisconsin Department of Transportation bid lettings between January 2015 and December 2019 ([Bid Express, 2020](#)).

8. Out-of-State Contractors

In general, prevailing wage laws are associated with more work for local contractors. Data from the *Economic Census of Construction* indicates that states with prevailing wage laws have 2 percent more of the total value of construction work completed by in-state contractors ([Duncan et al., 2015](#)). In neighboring Minnesota, local contractors account for 10 percent higher market share when prevailing wages are paid on public school projects— keeping tax dollars in the local economy ([Manzo & Duncan, 2018b](#)). Similarly, a case



⁶ This analysis occurred during a multi-year period of economic expansion. Wisconsin’s unemployment rate was below 5 percent during the entire period of analysis: 4.5 percent in 2015, 4.0 percent in 2016, 3.3 percent in 2017, 3.0 percent in 2018, and 3.3 percent in 2019 ([BLS, 2020b](#)). However, there was no substantial increase in the number of WisDOT projects in the post-repeal timeframe. In the 33 months prior to repeal, an average of 25.2 projects were let per month. In the 27 months after repeal, an average of 25.3 projects were let per month. Thus, there is not a noticeable change indicating more construction work for highway contractors that could explain a 16 percent drop in competition, as measured by the average number of bids per project.

study found that after Indiana weakened its prevailing wage law, public works construction employment decreased in southern Indiana but grew in northern Kentucky, indicating that repeal resulted in greater demand for out-of-state workers (Manzo, 2016).

Actual project data show that more out-of-state contractors submitted bids on Wisconsin Department of Transportation projects after repeal of prevailing wage (Figure 12). Prior to repeal, Wisconsin-based contractors submitted 2,633 bids on WisDOT projects and out-of-state companies submitted 264 bids. The out-of-state share of bids was thus 9.1 percent before repeal. After repeal, Wisconsin contractors submitted 1,728 bids and out-of-state companies submitted 265 bids. The out-of-state share of bids was 13.3 percent after repeal. Accordingly, there was a 45.9 percent increase in the total number of bids coming from out-of-state contractors on state highway projects following repeal of prevailing wage in Wisconsin.⁷

FIGURE 12: IN-STATE AND OUT-OF-STATE BIDS ON WISDOT HIGHWAY PROJECTS IN WISCONSIN BETWEEN 2015 AND 2019

Bids on WisDOT Projects by Location of Construction Contractor	Pre-Repeal (January 2015 – September 2017)	Post-Repeal (October 2017 – December 2019)
Total bids on awarded projects	2,897	1,993
Bids from Wisconsin-based contractors	2,633	1,728
Bids from out-of-state contractors	264	265
Out-of-state share of bids	9.11%	13.30%
Change in out-of-state bids		+4.18%
Total change in number of bids coming from out-of-state contractors		+45.91%

Source(s): Authors' analysis of Wisconsin Department of Transportation bid lettings between January 2015 and December 2019 (Bid Express, 2020).

FIGURE 13: IN-STATE AND OUT-OF-STATE WINS ON WISDOT HIGHWAY PROJECTS IN WISCONSIN BETWEEN 2015 AND 2019

Wins (Awards) on WisDOT Projects by Location of Construction Contractor	Pre-Repeal (January 2015 – September 2017)	Post-Repeal (October 2017 – December 2019)
Total awarded projects	826	640
Wins (awards) to Wisconsin-based contractors	752	548
Wins (awards) to out-of-state contractors	74	92
Out-of-state share of wins (awards)	8.96%	14.38%
Change in out-of-state win rate		+5.42%
Total change in number of projects awarded to out-of-state contractors		+60.46%

Source(s): Authors' analysis of Wisconsin Department of Transportation bid lettings between January 2015 and December 2019 (Bid Express, 2020).

Consequently, there was an influx in the number of projects awarded to out-of-state contractors after Wisconsin repealed prevailing wage (Figure 13). Prior to repeal, Wisconsin-based contractors won 752 WisDOT projects and out-of-state companies were awarded 74 WisDOT projects, an out-of-state win rate of 9.0 percent. Following repeal, Wisconsin-based contractors only won 548 projects while out-of-state companies were awarded 92 projects, an out-of-state win rate of 14.4 percent. After repeal, out-of-state

⁷ The 4.18 percentage-point change in the share of out-of-state bids divided by the 9.11 percent pre-repeal baseline yields a 45.91 percent relative increase in the number of out-of-state bidders.

contractors were awarded 60.5 percent more state contracts funded by Wisconsin taxpayers.⁸ This finding echoes previous research that has found a 53 percent increase in new municipal projects being awarded to out-of-state companies (Shaw, 2017).

Following repeal of prevailing wage, local contractors were primarily replaced by companies from Iowa, a neighboring state without a prevailing wage law (Figure 14). Iowa-based contractors increased their win share on Wisconsin Department of Transportation projects from 5.0 percent pre-repeal to 8.3 percent post-repeal, a gain that accounts for 61.2 percent of the drop in projects awarded to local contractors. Illinois-based contractors also saw an increase in wins on WisDOT projects, accounting for 29.4 percent of the work lost by local contractors. Companies from Michigan and Florida—two more states without prevailing wage standards—captured the rest of the work lost by in-state contractors following repeal of prevailing wage in Wisconsin.

FIGURE 14: WINS ON WISDOT HIGHWAY PROJECTS IN WISCONSIN BETWEEN 2015 AND 2019, BY STATE OF CONTRACTOR

Wins (Awards) on WisDOT Projects by State of Contractor, According to Business Addresses	Pre-Repeal		Post-Repeal		Change in Wins (Awards)	
	Wins	Share	Wins	Share	Difference	Share of Change
Wisconsin contractors	752	91.0%	548	85.6%	-5.4%	--
Iowa contractors	41	5.0%	53	8.3%	+3.3%	+61.2%
Illinois contractors	23	2.8%	28	4.4%	+1.6%	+29.4%
Minnesota contractors	5	0.6%	3	0.5%	-0.1%	-2.5%
Michigan contractors	2	0.2%	4	0.6%	+0.4%	+7.1%
Florida contractors	1	0.1%	3	0.5%	+0.3%	+6.4%
Contractors from other states*	2	0.2%	1	0.2%	-0.1%	-1.6%
Total bids on awarded projects	826	100.0%	640	100.0%	±0.0%	+100.0%

Source(s): Authors’ analysis of Wisconsin Department of Transportation bid lettings between January 2015 and December 2019 (Bid Express, 2020). *The other states with contractors submitting bids on WisDOT projects during this timeframe are Indiana, Kentucky, Maryland, Missouri, Ohio, Pennsylvania, Texas, and Washington.

9. Public Construction Costs



Repeal of prevailing wage had no statistically significant impact on road construction costs per mile.

A recent summary of the economics literature found that the vast majority of peer-reviewed studies failed to find a statistically significant link between prevailing wage laws and public construction costs (Duncan & Ormiston, 2017). There have been 18 studies on the impact of prevailing wage standards on the cost of school construction, highway maintenance, and municipal building projects that have been published in peer-reviewed academic journals since 2000. Cumulatively, these studies have analyzed more than 21,000 traditional public works

projects. In total, 15 studies (83 percent) find that prevailing wage standards have no effect on total construction costs (Figure 15). Prevailing wage laws have been found to have no impact because labor costs are a low and historically declining percentage of total costs in the construction industry and because

⁸ The 5.42 percentage-point change in the share of wins going to out-of-state bidders divided by the 8.96 percent pre-repeal baseline yields a 60.46 percent relative increase in the number of out-of-state companies being awarded projects funded by Wisconsin taxpayers.

FIGURE 15: PEER-REVIEWED RESEARCH ON THE IMPACT OF PREVAILING WAGE LAWS ON TOTAL CONSTRUCTION COSTS

Study	Authors	Year	Project Focus	Projects	Geography	Effect
1	Lameck Onsarigo; Kevin Duncan; Alan Atalah	2020	School construction	113	Ohio	No effect
2	Kevin Duncan; Jeffrey Waddoups	2020	School construction	77	Nevada	No effect
3	Kevin Duncan	2015	Highways	132	Colorado	No effect
4	Kevin Duncan	2015	Highways	91	Colorado	No effect
5	Kevin Duncan; Peter Philips; Mark Prus	2014	School construction	498	British Columbia (Canada)	No effect
6	Fadhel Kaboub; Michael Kelsay	2014	Public buildings	3,120	Midwest states*	No effect
7	Alan Atalah	2013	School construction	1,496	Ohio	No effect
8	Alan Atalah	2013	School construction	1,496	Ohio	No effect
9	Kevin Duncan; Peter Philips; Mark Prus	2012	School construction	723	British Columbia (Canada)	No effect
10	Jaewhan Kim; Chang Kuo-Liang; Peter Philips	2012	Municipal projects	141	California	No effect
11	Jeffrey Vincent; Paavo Monkkonen	2010	School construction	2,645	United States	13%
12	Kevin Duncan; Peter Philips; Mark Prus	2009	School construction	438	British Columbia (Canada)	No effect
13	Kevin Duncan; Peter Philips; Mark Prus	2006	School construction	528	British Columbia (Canada)	No effect
14	Hamid Azari-Rad; Peter Philips; Mark Prus	2003	School construction	4,653	United States	No effect
15	Hamid Azari-Rad; Peter Philips; Mark Prus	2002	School construction	4,974	United States	No effect
16	Donald Vitaliano	2002	Highways (spending)	50**	United States	8%
17	Edward Keller; William Hartman	2001	School construction	25***	Pennsylvania	2%
18	Cihan Bilginsoy; Peter Philips	2000	School construction	54	British Columbia (Canada)	No effect

*Projects were analyzed from the following 12-state region: Nebraska, South Dakota, North Dakota, Kansas, Missouri, Iowa, Minnesota, Wisconsin, Illinois, Indiana, Michigan, and Ohio.

**The 50 observations are DOT expenditures for all 50 states, and do not account for the amount of new highway construction ordered, which is an important determinant of project costs.

***The analysis did not analyze *actual* projects, but rather conducted hypothetical "wage differentials" for 25 arbitrary projects. Wage differential studies are flawed compared to regression analyses (Duncan & Ormiston, 2017).

****Three additional studies analyzing more than 1,000 affordable housing projects have estimated that prevailing wage standards are associated with a 5 percent to 16 percent increase in total costs (Littlehale, 2017; Palm & Niemeir, 2017; Dunn et al., 2005), although recent non-peer-reviewed research finds no effect (Hinkel & Belman, 2019).

Source: Individual studies listed in table.

contractors respond to higher wages by utilizing more capital equipment, hiring skilled workers in place of their less-productive counterparts, and reducing expenditures on materials and fuels (Balistreri et al., 2003; Blankenau & Cassou, 2011; Duncan & Lantsberg, 2015). Additionally, economics research has found that state prevailing wage laws foster self-sufficient construction workers who earn middle-class incomes that keep them off social safety net programs, such as food stamps, Earned Income Tax Credit (EITC) assistance, and Medicaid (Manzo et al., 2016). Consequently, repeal of prevailing wage can impose hidden costs on taxpayers with more construction workers relying on government assistance programs because they earn lower incomes.

This section utilizes project data from four Metropolitan Planning Organizations (MPOs) in Wisconsin: the Southeastern Wisconsin Regional Planning Commission (Milwaukee), the Green Bay Urbanized Area, the Fox Cities Transportation Management Area (Appleton), and the Oshkosh Urbanized Area. MPOs are regional transportation policymaking organizations in areas with populations of more than 50,000 that are comprised primarily of local elected officials (FTA, 2019). MPOs are recognized by the federal government and are required by federal law to develop Transportation Improvement Programs (TIPs) with upcoming transportation projects covering a period of at least four years (WisDOT, 2020).⁹

This report takes advantage of the fact that Wisconsin MPOs released TIP documents both before and after repeal of prevailing wage. Specifically, project data from the 2015-2018 TIPs— which were released in the fall of 2014, well before the 2017 repeal of Wisconsin’s prevailing wage law— are compared and contrasted with project data from the 2019-2022 TIPs— which were released in the fall of 2018, a year after repeal of prevailing wage on Wisconsin Department of Transportation projects. Only new projects are included in the analysis; ongoing projects are excluded to avoid any chances of overlap. For example, a project that began in 2016 would have been covered by prevailing wage standards even if 2019 was its final year of construction. Finally, this report only investigates project data from four of Wisconsin’s 14 MPOs because they met two criteria: They have publicly available TIPs for both 2015-2018 and 2019-2022 *and* they include data on the number of miles under construction in both TIPs, which allows researchers to determine the construction cost per mile.

In total, the dataset includes 72 highway preservation projects that involve either resurfacing or maintaining roads (Figure 16).¹⁰ A total of 46 of these projects were constructed before repeal and 26 were after repeal. The majority, 58 projects, were in the Milwaukee area while 14 were located in the Green Bay, Appleton, and Oshkosh areas. Most were also state projects awarded by the Wisconsin Department of Transportation (47 projects) while the rest were locally-funded by cities, townships, and counties (25 projects). Additionally, 24 projects did not receive any amount of federal support, including 11 after repeal of prevailing wage.

There has been little to no difference in construction costs per mile of highway preservation in Wisconsin since repeal of prevailing wage (Figure 16). Leading up to repeal, the average cost per mile was \$3.37 million, after adjusting for construction inflation by the National Highway Construction Cost Index (FHWA, 2020). After repeal, the average cost per mile was \$3.43 million, an *increase* of about \$52,000 per mile. This difference, however, was not statistically significant. In inflation-adjusted dollars, Milwaukee-area projects cost \$3.42 million per mile before repeal and \$3.52 million after repeal and projects outside of Milwaukee went from costing \$3.20 million to \$2.90 million, but neither change was statistically

⁹ For individual Transportation Improvement Program documents, see the “Sources.”

¹⁰ Highway resurfacing and maintenance projects are investigated because they are relatively homogenous. New construction projects, bridge projects, intersection improvements, and new bike paths (except those constructed as part of resurfacing and maintenance projects) are excluded from the analysis.

significant. Furthermore, the average cost for state projects built before repeal (\$3.06 million per mile) was not statistically different than the average cost for state projects built after repeal (\$2.77 million per mile) and the average cost for local projects built before repeal (\$3.96 million per mile) was not statistically different than the average cost for local projects built after repeal (\$4.66 million per mile). Finally, projects that did not receive any federal support— which tend to be smaller projects— actually cost *less* before repeal (\$1.18 million per mile) than after repeal (\$2.78 million per mile), but the difference is only statistically significant at the 90-percent level of statistical confidence.¹¹ No matter how the data is dissected, there is no discernible difference in total highway preservation costs per mile due to repeal of prevailing wage (Figure 16).

FIGURE 16: T-TESTS ON THE INFLATION-ADJUSTED CHANGE IN THE COST PER MILE TO PRESERVE A HIGHWAY IN WISCONSIN

T-Test Analysis	Before Repeal		After Repeal		Statistical Analysis		
	Total Projects	Cost Per Mile*	Total Projects	Cost Per Mile*	Difference	t-stat	Significant
All Projects	46	\$3,374,233 <i>(\$451,020)</i>	26	\$3,425,745 <i>(\$530,834)</i>	+\$51,512	+0.07	NO
<i>Project Location</i>							
Milwaukee Area Projects	36	\$3,423,917 <i>(\$565,280)</i>	22	\$3,520,938 <i>(\$602,266)</i>	+\$97,021	+0.11	NO
All Other Projects†	10	\$3,195,369 <i>(\$447,788)</i>	4	\$2,902,184 <i>(\$1,091,072)</i>	-\$293,185	-0.30	NO
<i>Project Owner</i>							
State Projects	30	\$3,061,782 <i>(\$609,948)</i>	17	\$2,773,835 <i>(\$593,931)</i>	-\$287,947	-0.31	NO
Local Projects	16	\$3,960,078 <i>(\$608,910)</i>	9	\$4,657,130 <i>(\$959,884)</i>	+\$697,053	+0.64	NO
<i>Federal Davis-Bacon Act</i>							
Projects with Federal Support	33	\$4,236,762 <i>(\$544,439)</i>	15	\$3,902,109 <i>(\$707,384)</i>	-\$334,653	-0.36	NO
Projects without Federal Support	13	\$1,184,735 <i>(\$368,573)</i>	11	\$2,776,158 <i>(\$797,907)</i>	+\$1,591,433	+1.91	NO

Source(s): Authors’ analysis of 2015-2018 and 2019-2022 Transportation Improvement Program (TIP) documents for three Metropolitan Planning Organizations (MPOs) in Wisconsin: the Southeastern Wisconsin Regional Planning Commission, the Fox Cities Transportation Management Area, and the Oshkosh Urbanized Area. A fourth MPO, the Green Bay Urbanized Area, had TIPs for 2015-2019 and 2019-2023 (WisDOT, 2020; SEWRPC, 2018; SEWRPC, 2014; ECWRPC, 2018a; ECWRPC, 2014a; ECWRPC, 2018b; ECWRPC, 2014b; BCPC, 2018; BCPC, 2014). *The average cost per mile is the total construction cost, adjusted by the National Highway Construction Cost Index (“NHCCI 2.0”) to the third quarter of 2019 (“2019 Q3”), divided by the total miles (FHWA, 2020). The italicized value in parenthesis is the standard error. †The projects outside of the Milwaukee area include projects in the Green Bay area, Appleton area, and Oshkosh area.

For completion, statistical regression results on the impact of prevailing wage repeal on the average cost per mile to resurface or maintain a highway in Wisconsin are reported in Figure 17.¹² Highway resurfacing projects are much costlier than highway maintenance projects: Resurfacing projects statistical cost about 137.4 percent more per mile. Federally-assisted projects also tend to be larger and more complex: projects that do not receive federal assistance are statistically associated with about 60.3 percent lower costs. This finding is consistent, however, both before and after repeal of Wisconsin’s state prevailing wage law, revealing that repeal did not make highway preservation projects without federal Davis-Bacon prevailing

¹¹ After repeal, 11 of the 26 projects (42.3 percent) did not receive any amount of federal support. These are generally smaller projects. As a result, by total construction value, 22.1 percent of the post-repeal projects did not include federal Davis-Bacon prevailing wage standards. The data, shown in Figure 16, suggests that these projects were *more* expensive following repeal.

¹² For more on the “regression” statistical approach, see the “Report Methodology” section in the Appendix.

wages any cheaper.¹³ The only other factor that meaningfully influences construction costs per mile is the location of the project, with Milwaukee County, Ozaukee County, Racine County, and Waukesha County having statistically higher costs per mile than the rest of the state. After accounting for project type, project owner, project jurisdiction, and the county of the project, repeal of prevailing wage had no statistically significant impact on highway construction costs.

These post-repeal findings corroborate both the preponderance of the academic research on prevailing wage standards, as well as the conclusions of the nonpartisan Wisconsin Legislative Fiscal Bureau. In its pre-repeal analysis, the Wisconsin Legislative Fiscal Bureau noted that “the evidence on prevailing wage effects generally range from relatively small effects to no statistically significant effects” (Horton, 2015). Indeed, actual project data reveals that repeal has not provided any cost savings on road construction projects for Wisconsin taxpayers.

FIGURE 17: IMPACT OF PREVAILING WAGE REPEAL ON THE COST PER MILE TO PRESERVE A HIGHWAY IN WISCONSIN

Effect on the Cost Per Mile to Preserve a Highway	Robust Regression: Natural Logs		
	Effect†	Error‡	Significant
Impact of full repeal	-0.110	(0.231)	NO
Federally-assisted: no federal support	-0.603**	(0.279)	YES
Interaction term: repeal x no federal support	+0.256	(0.397)	NO
Type: resurfacing	+1.374***	(0.315)	YES
Owner: state	+0.032	(0.253)	NO
MPO: Southeastern Wisconsin	-0.285	(0.473)	NO
County: Brown	+0.260	(0.497)	NO
County: Kenosha	+0.154	(0.459)	NO
County: Milwaukee	+1.217***	(0.270)	YES
County: Outagamie	+0.789	(0.494)	NO
County: Ozaukee	+0.773**	(0.300)	YES
County: Racine	+0.801***	(0.286)	YES
County: Walworth	+0.023	(0.317)	NO
County: Waukesha	+0.969***	(0.332)	YES
Constant term	+13.117***	(0.643)	YES
Total projects	72		

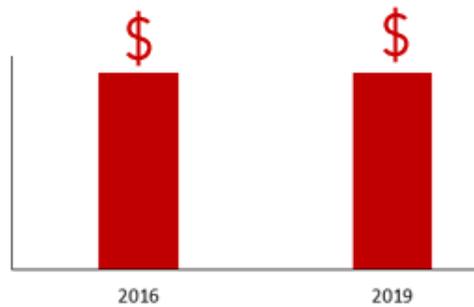
Source(s): Authors’ analysis of 2015-2018 and 2019-2022 Transportation Improvement Program (TIP) documents for three Metropolitan Planning Organizations (MPOs) in Wisconsin: the Southeastern Wisconsin Regional Planning Commission, the Fox Cities Transportation Management Area, and the Oshkosh Urbanized Area. A fourth MPO, the Green Bay Urbanized Area, had TIPs for 2015-2019 and 2019-2023 (WisDOT, 2020; SEWRPC, 2018; SEWRPC, 2014; ECWRPC, 2018a; ECWRPC, 2014a; ECWRPC, 2018b; ECWRPC, 2014b; BCPC, 2018; BCPC, 2014). The average cost per mile is the total construction cost, adjusted by the National Highway Construction Cost Index (“NHCCI 2.0”) to the third quarter of 2019 (“2019 Q3”), divided by the total miles (FHWA, 2020). Three asterisks (***) indicate significance at the 99-percent confidence level. Two asterisks (**) indicate significance at the 95-percent confidence level. One asterisk (*) indicates significance at the 90-percent confidence level. The “Natural Logs” model is a robust OLS regression on the natural logarithm of the average cost per mile, which effectively converts outputs into percent terms. Please see Appendix Table D for another “Dollar Value” model that is a robust OLS regression on the average cost per mile. †The “Effect” indicates the independent variable’s coefficient. ‡The “Error” indicates the standard error.

¹³ The “Interaction term: repeal x no federal support” is statistically insignificant, suggesting that repeal did not lower costs on highway resurfacing projects that do not receive federal funding (which do not have Davis-Bacon prevailing wage standards).

10. Cost Overruns

Project cost overruns can often be a measure of inefficiency in the construction industry. While the top priority is usually to deliver safe, high-quality infrastructure, project costs may increase due to design changes, weather conditions, safety concerns, or problems with craftsmanship. These costs are minimized by using competent, skilled construction workers on public construction projects. Recent research has found that prevailing wage laws do not alter labor or input utilization in a way that significantly affects projects. In fact, by including apprenticeship training contributions in overall labor costs, prevailing wage standards have been found to increase overall efficiency from 94.6 percent to 99.8 percent, an improvement in project efficiency that is consistent with stable total costs (Duncan et al., 2009).

Repeal of prevailing wage did not lower costs on highway construction projects in Wisconsin.



In April 2020, the Wisconsin Department of Transportation published a study called the *MAPSS Performance Improvement Report* detailing outcomes in five areas: mobility, accountability, preservation, safety, and service (WisDOT, 2020). Within that study, WisDOT reported on the final highway project cost as a percent of the original contract amount for the following fiscal years: 2015, 2016, 2017, 2018, and 2019. The state’s fiscal year runs from July through June, so fiscal year 2018– which began in July 2017– was the first year in which prevailing wage was repealed on state highway construction projects. WisDOT’s goal is to have actual project costs not exceed the original contract amount by more than 3 percent.

FIGURE 18: FINAL HIGHWAY PROJECT COST AS A PERCENT OF ORIGINAL CONTRACT AMOUNT IN WISCONSIN, FY2015-FY2019

Fiscal Year	Dates Covered	Wisconsin
2015	July 2014 to June 2015	103.8%
2016	July 2015 to June 2016	104.9%
2017	July 2016 to June 2017	102.7%
2018	July 2017 to June 2018	104.0%
2019	July 2018 to June 2019	104.1%
Pre-repeal average: FY2015-FY2017		103.8%
Post-repeal average: FY2018-FY2019		104.1%
Percentage-point difference-in-differences		+0.3%
Relative change in overall cost overruns		+7.9%

Source(s): Authors’ analysis of “Final Highway Project Cost as a Percent of the Original Contract Amount” from the Wisconsin Department of Transportation (WisDOT, 2020). The relative change in overall cost overruns is the percentage-point difference (0.3 percentage points) divided by the baseline rate of cost overruns of 3.8 percent pre-repeal, which equals 7.9 percent.

Figure 18 presents the WisDOT data. In the three years prior to repeal of prevailing wage, WisDOT projects cost an average of 103.8 percent of the original contract amount, indicating an average cost overrun rate of 3.8 percent. In the two years after repeal, the final highway project cost was 104.1 percent of the original contract amount, for an average cost overrun rate of 4.1 percent. This small difference is not statistically significant. If repeal of prevailing wage actually lowered total construction costs, one might

expect final highway project costs to be lower than the original contract amounts, but this has not occurred. Instead, the relatively consistent rate of cost overruns substantiates the previous finding that repeal of prevailing wage did not lower costs on highway construction projects in Wisconsin.

Summary of Pre-Repeal Claims and Actual Post-Repeal Data

Data has become available to begin testing claims made in the lead up to repeal of prevailing wage laws in Wisconsin. While the Wisconsin Taxpayer Alliance claimed that prevailing wage rates were 44 percent higher than “market rates” and cost state and local governments between \$200 million and \$300 million per year, both Philips and Duncan and Lantsberg predicted negative consequences for Wisconsin construction industry from repeal ([Berry, 2015](#); [Philips, 2015](#); [Duncan & Lantsberg, 2015](#)).

To date, the data suggests that the forecasts by both Philips and Duncan and Lantsberg have been borne out. On average, skilled construction workers have seen their annual incomes decrease by 6 percent— far less than the 44 percent figure by the Wisconsin Taxpayer Alliance. Inequality has also worsened in the construction industry. Furthermore, the number of graduates from Wisconsin’s apprenticeship programs has grown considerably slower than in neighboring Illinois and Minnesota, while relative construction worker turnover has increased. At the same time, there has been a 16 percent decrease in bid competition, a 60 percent rise in out-of-state contractors winning contracts on Wisconsin’s highway projects, and no statistically significant impact on total highway preservation costs per mile after adjusting for inflation. In particular, Wisconsin Department of Transportation projects without any amount of federal funding— and consequently without federal Davis-Bacon prevailing wage standards— have not gotten any cheaper following repeal of Wisconsin’s state prevailing wage law.

It is worth noting that an April 2019 opinion piece attempted to revisit predictions about prevailing wage repeal ([Mielke, 2019](#)). In that article, the author says that construction worker wages have gone up, apprenticeship enrollment has improved, and out-of-state contractors were not receiving more projects than pre-repeal. The fatal flaw in the author’s analysis was that none of the numbers were put in context. Total construction worker incomes in Wisconsin did not rise faster than inflation, according to data from the U.S. Census Bureau, and fell further in relation to neighboring states with prevailing wage laws. While apprenticeship enrollment in Wisconsin has only slightly trailed neighboring states, the total number of apprentices completing their training, has grown much slower, according to data from the U.S. Department of Labor. Finally, as this report has shown, there has been an influx of out-of-state companies— primarily from states without prevailing wage laws— both bidding on and winning contracts funded by Wisconsin taxpayers, according to data from the Wisconsin Department of Transportation. Given these issues, the author’s conclusion that “none of the predictions came true” is incorrect and at odds with actual economic data.

Conclusion

Repeal of prevailing wage has had negative consequences for Wisconsin’s construction workforce, contractors, and communities— without generating any meaningful savings for taxpayers. Skilled construction worker incomes have grown slower than neighboring states with prevailing wage laws. There is also suggestive evidence that many construction workers have lost their employer-provided health insurance coverage, which likely increased reliance on government assistance programs such as Medicaid.

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While blue-collar earnings and benefits have declined, construction industry CEOs have experienced substantial pay increases, contributing to greater inequality in Wisconsin's construction industry. Repeal has also resulted in less gender diversity in the state's construction trades, the number of apprentices graduating from programs has slowed, and construction worker turnover has worsened compared with neighboring states with prevailing wage laws.

At the same time, out-of-state contractors have flooded the market and have been awarded more projects funded by Wisconsin taxpayers while the average number of bidders has fallen, indicating a large decrease in local contractors bidding on public projects. The shift in income from workers to executives, the changing workforce dynamics, and the drop in overall bid competition have resulted in no change in public construction costs following repeal. Wisconsin Department of Transportation projects have neither experienced lower per-mile costs of preserving roads nor seen lower final costs when compared with original contract amounts. In general, the findings align with the preponderance of peer-reviewed academic studies, which conclude that prevailing wage laws have no effect on total construction costs. Ultimately, the repeal of prevailing wage has not saved taxpayers any money and, in fact, has had negative effects on construction market outcomes in Wisconsin.

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Appendix

Data Sources

This analysis utilizes data from six publicly-available sources. First, data from the *American Community Survey* (1-Year Estimates) is used to evaluate effects on four outcomes: construction worker annual incomes, construction workers with employer-provided health insurance, construction industry CEO total incomes per year, and the share of construction workers who are women and people of color. *American Community Survey* data is compiled by the U.S. Census Bureau and is made available in a public format by the Minnesota Population Center at the University of Minnesota (Ruggles et al., 2020). Because the *American Community Survey* is released on an annual basis, the analysis uses data from 2015 through 2018, with 2015 and 2016 considered the pre-repeal period, 2017 considered a partial repeal period since prevailing wage was repealed on local construction projects for the whole year but on state construction projects for three months, and 2018 considered the full repeal period. In total, the dataset includes 460,283 survey results from individuals employed in Wisconsin, Illinois, and Minnesota, including 10,352 construction and extraction workers and 3,560 chief executives in the private sector— of whom 282 were CEOs in the construction industry.

Second, state data from the U.S. Department of Labor Employment and Training Administration on apprenticeship enrollment and completers is used (DOLETA, 2020). The U.S. Department of Labor’s apprenticeship data is derived from several sources, including 25 federally-administered states, 16 federally-recognized State Apprenticeship Agencies (SAAs), and the U.S. Military Apprenticeship Program (USMAP).

Third, data from the Quarterly Workforce Indicators (QWI) is used to investigate impacts on worker turnover. The QWI dataset is compiled by the U.S. Census Bureau in the *Longitudinal Employer-Household Dynamics* survey and made available through their Local Employment Dynamics (LED) Extraction Tool (LEHD, 2020). The benefits of the QWI dataset are that it is based on actual payroll records and that industries are broken down into specific sectors. Instead of studying all blue-collar construction workers or the entire construction industry, QWI includes information on the “heavy and civil engineering construction” sector. The majority of heavy and civil engineering construction involves public works, including the construction and maintenance of highways, streets, bridges, dams, parks, and trails. Dredging, land drainage, and utility line construction are also included in heavy and civil engineering construction (Census, 2017).

Fourth, data on the number of bidders per project and out-of-state bidders are evaluated using bid data on highway projects funded by the Wisconsin Department of Transportation (WisDOT). The data are collected and released by Bid Express, an online information service for bidding (Bid Express, 2020). The data includes 4,890 total bids on 1,515 proposed projects from January 2015 through December 2019. The information includes 33 months of data before repeal of prevailing wage on state-funded highway projects and 27 months of data following repeal. Although there are 4,890 total bids, they only came from 188 construction companies, with many contractors bidding on multiple projects every year. Researchers cross-referenced company names with business addresses to determine state of origin. In total, 122 companies were based in-state while 66 firms had their primary business address out-of-state.

Fifth, data are collected and analyzed from the Transportation Improvement Programs (TIPs) of four Metropolitan Planning Organizations (MPOs) in Wisconsin: the Southeastern Wisconsin Regional Planning Commission (Milwaukee), the Green Bay Urbanized Area, the Fox Cities Transportation Management Area (Appleton), and the Oshkosh Urbanized Area (WisDOT, 2020; SEWRPC, 2018; SEWRPC, 2014; ECWRPC, 2018a; ECWRPC, 2014a; ECWRPC, 2018b; ECWRPC, 2014b; BCPC, 2018; BCPC, 2014). MPOs are regional transportation policymaking organizations in areas with populations of more than 50,000 that are comprised primarily of local elected officials (FTA, 2019). The analysis takes advantage of the fact that Wisconsin MPOs released TIP documents both before and after repeal of prevailing wage. Specifically, project data from the 2015-2018 TIPs

are compared and contrasted with project data from the 2019-2022 TIPs, except for the Green Bay Urbanized Area, which had TIPs for 2015-2019 and 2019-2023. Only new projects are included in the analysis; ongoing projects are excluded to avoid any chances of overlap. The analysis only investigates project data from four of Wisconsin's 14 MPOs because they met two criteria: They have publicly available TIPs for both 2015-2018 and 2019-2022 (or 2015-2019 and 2019-2023) *and* they include data on the number of miles under construction for at least some projects in both TIPs, which allows researchers to determine the construction cost per mile. In total, the dataset includes 72 highway preservation projects that involve either resurfacing or maintaining roads.

Finally, the analysis pulls data from Wisconsin Department of Transportation's *MAPSS Performance Improvement Report (WisDOT, 2020)*. Within that study, WisDOT reported on the final highway project cost as a percent of the original contract amount for the following fiscal years: 2015, 2016, 2017, 2018, and 2019. The state's fiscal year runs from July through June, so fiscal year 2018— which began in July 2017— was the first year in which prevailing wage was repealed on highway construction projects.

Report Methodology

This analysis uses three common statistical techniques to measure the early impacts of repeal of prevailing wages in Wisconsin. One method is called a “difference-in-differences regression” approach. This intuitive technique is utilized in both the social sciences and the medical field to isolate the impact of a change in one group (the “treatment group”) from a similar group (the “control group”). In a scientific experiment, Illinois and Minnesota would be considered the “control group” because these two Midwest states had, and continue to have, state-level prevailing wage laws. Wisconsin would be the “treatment group” as a Midwest state that experienced a change, from having prevailing wage standards to repealing them.

A “difference-in-differences regression” parses out the actual and unique impact of certain variables— such as full repeal of prevailing wage—on construction market outcomes at the individual-level. The technique describes “how much” the variable is responsible for a change, such as the annual incomes of construction and extraction workers, after accounting for all other observable factors. Because they include “interaction terms,” the analyses also take into consideration outcomes for similar workers in other industries. That is, the effect of repeal on the annual incomes of construction and extraction workers controls for income growth in other industries in Wisconsin *and* income growth for construction and extraction workers in Illinois and Minnesota. The difference-in-differences regressions are robust ordinary least squares (OLS) regressions.

Similarly, the analysis uses a “difference-in-differences probit” model. Probits are probabilistic models that help in calculating how much a variable increases a given individual's chances of achieving a certain binary outcome. For example, there are a number of factors that influence whether a blue-collar construction worker will have access to an employer-provided health insurance plan. Probits control for these variables and separate out, through average marginal effects, the impact of full repeal of prevailing wage on the likelihood of a construction and extraction worker having employer-provided health insurance. These models also account for broader state outcomes while producing results that contrast with the neighboring states that maintained prevailing wage laws.

Finally, simple “t-tests” are used to assess the relationship between prevailing wage repeal and highway construction costs. A t-test assesses whether the average after repeal is statistically different from the average before repeal. The “t-statistic” tells researchers whether the outcome has statistical significance or whether it occurred by chance. For there to be statistical significance, the t-statistic must be ± 1.96 .

Regression Results

TABLE A: DIFFERENCE-IN-DIFFERENCES – IMPACT OF PREVAILING WAGE REPEAL ON ANNUAL WAGE AND SALARY INCOME AND EMPLOYER-PROVIDED HEALTH INSURANCE COVERAGE AMONG CONSTRUCTION AND EXTRACTION WORKERS IN WISCONSIN

Difference-in-Differences Effect on Construction Incomes and Benefits	Natural Log: Income		Dollar Value: Income		Employer Health Insurance	
	Effect†	Error‡	Effect†	Error‡	Effect†	Error‡
Interaction: Full repeal x construction	-0.064**	(0.026)	-2,649.50**	(935.66)	-0.028*	(0.016)
Interaction: Partial repeal x construction	-0.039	(0.027)	-875.79	(1,030.41)	+0.033**	(0.016)
Full repeal	+0.018**	(0.008)	+30.26	(447.43)	-0.048	(0.005)
Partial repeal	+0.008	(0.008)	-375.32	(458.80)	-0.003	(0.004)
Occupation: Construction/extraction	+0.127***	(0.010)	-0746.88	(533.75)	+0.006	(0.006)
State: Wisconsin	-0.063***	(0.004)	-3,494.82***	(264.59)	+0.017***	(0.003)
Industry: Construction	+0.159***	(0.008)	+2,231.49***	(510.04)	-0.053***	(0.005)
Demographics: Age	+0.012***	(0.000)	+495.41***	(5.63)	-0.001***	(0.000)
Demographics: Foreign-born	-0.012**	(0.005)	-3,769.55***	(335.94)	-0.089***	(0.003)
Demographics: Military veteran	-0.054***	(0.007)	-4,127.47***	(453.52)	-0.050***	(0.004)
Urban status: City center	+0.078***	(0.004)	+3,786.46***	(288.58)	-0.020***	(0.003)
Urban status: Suburb	+0.096***	(0.003)	+5,880.57***	(202.76)	+0.034***	(0.002)
Gender identification: Female	-0.176***	(0.003)	-13,212.50***	(179.66)	+0.002	(0.002)
Racial or ethnic background: White	-0.005	(0.007)	-369.54	(429.13)	+0.016***	(0.004)
Racial or ethnic background: Black	-0.115***	(0.009)	-7,538.40***	(487.66)	-0.076***	(0.005)
Racial or ethnic background: Latinx	-0.088***	(0.007)	-7,393.65***	(426.32)	-0.054***	(0.004)
Education: Less than high school	-0.179***	(0.006)	+2,125.39***	(235.74)	-0.044***	(0.004)
Education: Some college, no degree	+0.115***	(0.004)	+6,081.75***	(169.88)	+0.046***	(0.002)
Education: Associate’s degree	+0.279***	(0.005)	+9,113.48***	(206.64)	+0.093***	(0.003)
Education: Bachelor’s degree	+0.533***	(0.004)	+26,615.35***	(237.99)	+0.150***	(0.002)
Education: Advanced degree	+0.780***	(0.005)	+52,341.49***	(447.54)	+0.187***	(0.003)
Sector: Self-employed	-0.237***	(0.010)	+2,408.16***	(697.27)		
Sector: Federal government	+0.158***	(0.009)	-222.76	(505.60)		
Sector: State government	-0.037***	(0.006)	-10,931.33***	(366.50)		
Sector: Local government	-0.032***	(0.005)	-10,261.75***	(253.21)		
Work: Usual hours worked per week	+0.040***	(0.000)	+1,136.36***	(9.40)	+0.004***	(0.000)
Work: 14-26 weeks worked per year	+0.907***	(0.017)	+899.31**	(452.20)	+0.022***	(0.008)
Work: 27-39 weeks worked per year	+1.413***	(0.016)	+1,562.08***	(426.72)	+0.018**	(0.007)
Work: 40-47 weeks worked per year	+1.749***	(0.015)	+4,656.63***	(441.63)	+0.047***	(0.007)
Work: 48-49 weeks worked per year	+1.921***	(0.017)	+11,821.16***	(685.72)	+0.031***	(0.008)
Work: 50-52 weeks worked per year	+2.101***	(0.014)	+15,773.21***	(372.61)	+0.127***	(0.006)
Year: 2016	+0.017***	(0.004)	+530.67**	(242.30)	+0.005**	(0.002)
Year: 2017	+0.016***	(0.004)	+747.03***	(278.17)	+0.009***	(0.003)
Year: 2018	+0.011**	(0.004)	+143.13	(271.12)	+0.015***	(0.003)
Constant term	+6.053***	(0.016)	-39,894.02***	(616.38)	+0.742***	(0.001)
Total observations	436,373		436,373		460,283	
Weighted to match population	Yes		Yes		Yes	
R ²	0.647		0.295		0.086	

Source(s): Authors’ analysis of the 2015-2018 *American Community Surveys* (1-Year Estimates) from the U.S. Census Bureau (Ruggles et al., 2020). Three asterisks (***) indicate significance at the 99-percent confidence level. Two asterisks (**) indicate significance at the 95-percent confidence level. One asterisk (*) indicates significance at the 90-percent confidence level. The first, “Natural Log: Income,” model is a difference-in-differences robust OLS regression on the natural logarithm of annual wage and salary income, which effectively converts outputs into percent terms. The second, “Dollar Value: Income,” model is a difference-in-differences robust OLS regression on the annual wage and salary income. The third, “Employer Health Insurance,” model is a difference-in-differences probit regression on the likelihood of having employer-provided health insurance coverage, with average marginal effects (*margins, dydx* in STATA). †“Effect” indicates the coefficient. ‡“Error” indicates the standard error.

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TABLE B: DIFFERENCE-IN-DIFFERENCES – IMPACT OF REPEAL ON TOTAL ANNUAL INCOME OF CONSTRUCTION INDUSTRY CEOs

Difference-in-Differences Effect on Real Total Incomes of Construction CEOs	Natural Logarithm: Total Income		Dollar Value: Total Income	
	Effect†	Error‡	Effect†	Error‡
Interaction: Full repeal x construction	+0.543**	(0.254)	+93,869.08*	(54,149.60)
Interaction: Partial repeal x construction	+0.068	(0.274)	+39,015.07	(30,522.18)
Full repeal	-0.002	(0.124)	-12,587.04	(18,492.93)
Partial repeal	+0.119	(0.109)	-3,229.54	(16,666.19)
Industry: Construction	-0.199***	(0.067)	-38,584.66***	(8,427.72)
State: Wisconsin	-0.150*	(0.081)	-9,476.56	(11,492.14)
Demographics: Age	+0.014***	(0.002)	+2,234.39***	(249.97)
Demographics: Foreign-born	+0.056	(0.065)	+9,772.28	(10,468.23)
Demographics: Military veteran	-0.151*	(0.081)	-20,480.39	(14,246.01)
Urban status: City center	+0.030	(0.060)	+7,365.12	(9,183.47)
Urban status: Suburb	+0.112***	(0.038)	+21,492.86***	(6,376.06)
Gender identification: Female	-0.313***	(0.041)	-45,874.40***	(5,850.16)
Racial or ethnic background: White	+0.179*	(0.096)	+20,542.66	(15,742.61)
Racial or ethnic background: Black	-0.195	(0.138)	-33,303.63*	(19,633.63)
Racial or ethnic background: Latinx	-0.119	(0.144)	-25,311.13	(19,994.80)
Education: Less than high school	-0.176	(0.193)	-16,896.15	(14,444.89)
Education: Some college, no degree	+0.241***	(0.080)	+38,544.68***	(10,555.11)
Education: Associate’s degree	+0.162***	(0.085)	+18,442.55*	(10,732.68)
Education: Bachelor’s degree	+0.429***	(0.068)	+64,317.56***	(9,004.57)
Education: Advanced degree	+0.595***	(0.069)	+90,022.68***	(10,029.33)
Work: Usual hours worked per week	+0.019***	(0.002)	+1,955.99***	(285.79)
Type of business: Self-employed	-0.377***	(0.045)	-33,454.70***	(6,846.04)
Year: 2016	+0.071	(0.050)	+10,332.88	(8,399.76)
Year: 2017	+0.037	(0.050)	-1,042.47	(8,759.58)
Year: 2018	+0.074	(0.053)	+9,994.54	(8,678.00)
Constant term	+9.649***	(0.196)	-96,105.33***	(25,659.08)
Total observations	3,560		3,560	
Weighted to match population	Yes		Yes	
R ²	0.221		0.141	

Source(s): Authors’ analysis of the 2015-2018 *American Community Surveys* (1-Year Estimates) from the U.S. Census Bureau (Ruggles et al., 2020). Three asterisks (***) indicate significance at the 99-percent confidence level. Two asterisks (**) indicate significance at the 95-percent confidence level. One asterisk (*) indicates significance at the 90-percent confidence level. The first, “Natural Logarithm,” model is a difference-in-differences robust OLS regression on the natural logarithm of annual total income, which effectively converts outputs into percent terms. The second, “Dollar Value,” model is a difference-in-differences robust OLS regression on the annual total income. †“Effect” indicates the coefficient. ‡“Error” indicates the standard error.

TABLE C: DIFFERENCE-IN-DIFFERENCES – IMPACT OF REPEAL ON RACIAL AND GENDER DIVERSITY IN CONSTRUCTION JOBS

Difference-in-Differences Effect on Construction Worker Diversity	Likelihood of Being a Person of Color		Likelihood of Being a Woman	
	Effect†	Error‡	Effect†	Error‡
Interaction: Full repeal x construction	-0.010	(0.022)	-0.152***	(0.037)
Interaction: Partial repeal x construction	-0.070***	(0.021)	-0.032	(0.047)
Full repeal	-0.002	(0.006)	+0.006	(0.006)
Partial repeal	+0.000	(0.006)	+0.002	(0.006)
Occupation: Construction/extraction	+0.021***	(0.006)	-0.465***	(0.011)
State: Wisconsin	-0.100***	(0.003)	+0.006*	(0.003)
Industry: Construction	-0.100***	(0.006)	-0.237***	(0.007)
Demographics: Age	-0.003***	(0.000)	-0.000**	(0.000)
Urban status: City center	+0.301***	(0.002)	-0.001	(0.003)
Urban status: Suburb	+0.096***	(0.002)	-0.005**	(0.002)
Gender identification: Female	+0.006***	(0.002)		
Racial or ethnic background: White			+0.019***	(0.004)
Racial or ethnic background: Black			+0.068***	(0.006)
Racial or ethnic background: Latinx			+0.015***	(0.005)
Education: Less than high school	+0.180***	(0.003)	-0.063***	(0.004)
Education: Some college, no degree	-0.022***	(0.002)	+0.044***	(0.003)
Education: Associate’s degree	-0.082***	(0.003)	+0.094***	(0.003)
Education: Bachelor’s degree	-0.125***	(0.003)	+0.076***	(0.003)
Education: Advanced degree	-0.090***	(0.003)	+0.094***	(0.003)
Work: Usual hours worked per week	-0.005*	(0.000)	-0.009***	(0.000)
Work: 14-26 weeks worked per year	-0.003	(0.007)	+0.012	(0.008)
Work: 27-39 weeks worked per year	+0.003	(0.006)	+0.041***	(0.007)
Work: 40-47 weeks worked per year	-0.016***	(0.006)	+0.085***	(0.007)
Work: 48-49 weeks worked per year	-0.005	(0.008)	+0.059***	(0.009)
Work: 50-52 weeks worked per year	+0.006	(0.005)	+0.057***	(0.006)
Year: 2016	+0.008***	(0.002)	-0.001	(0.003)
Year: 2017	+0.014***	(0.003)	-0.002	(0.003)
Year: 2018	+0.021***	(0.003)	-0.003	(0.003)
Constant term	+0.260***	(0.001)	+0.476***	(0.001)
Total observations	460,283		460,283	
Weighted to match population	Yes		Yes	
R ²	0.136		0.076	

Source(s): Authors’ analysis of the 2015-2018 *American Community Surveys* (1-Year Estimates) from the U.S. Census Bureau (Ruggles et al., 2020). Three asterisks (***) indicate significance at the 99-percent confidence level. Two asterisks (**) indicate significance at the 95-percent confidence level. One asterisk (*) indicates significance at the 90-percent confidence level. The first, “Likelihood of Being a Person of Color,” model is a difference-in-differences probit regression with average marginal effects. The second, “Likelihood of Being a Woman,” model is difference-in-differences probit regression with average marginal effects. Average marginal effects are ascertained by using *margins, dydx* in STATA. †“Effect” indicates the coefficient. ‡“Error” indicates the standard error.

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TABLE D: ROBUST OLS REGRESSION – IMPACT OF REPEAL ON THE COST PER MILE TO PRESERVE A HIGHWAY IN WISCONSIN

Effect on the Cost Per Mile to Preserve a Highway	Robust Regression: Dollar Value		Robust Regression: Natural Logs	
	Effect†	Error‡	Effect†	Error‡
Impact of full repeal	-\$440,858	(\$846,189)	-0.110	(0.231)
Federally-assisted: no federal support	-\$2,408,845***	(\$887,451)	-0.603**	(0.279)
Interaction term: repeal x no federal support	+\$1,080,826	(\$1,283,083)	+0.256	(0.397)
Type: resurfacing	+\$1,524,044	(\$1,054,303)	+1.374***	(0.315)
Owner: state	+\$352,310	(\$1,000,662)	+0.032	(0.253)
MPO: Southeastern Wisconsin	-\$188,886	(\$1,095,870)	-0.285	(0.473)
County: Brown	+\$614,822	(\$884,310)	+0.260	(0.497)
County: Kenosha	+\$616,697	(\$1,449,866)	+0.154	(0.459)
County: Milwaukee	+\$3,572,562***	(\$1,375,155)	+1.217***	(0.270)
County: Outagamie	+\$2,112,894*	(\$1,146,055)	+0.789	(0.494)
County: Ozaukee	+\$1,190,025	(\$1,226,461)	+0.773**	(0.300)
County: Racine	+\$1,866,023	(\$1,300,900)	+0.801***	(0.286)
County: Walworth	+\$301,994	(\$1,204,272)	+0.023	(0.317)
County: Waukesha	+\$3,183,265**	(\$1,317,364)	+0.969***	(0.332)
Constant term	+\$677,141	(\$1,848,668)	+13.117***	(0.643)
Total projects	72		72	
R ²	0.398		0.655	

Source(s): Authors’ analysis of 2015-2018 and 2019-2022 Transportation Improvement Program (TIP) documents for three Metropolitan Planning Organizations (MPOs) in Wisconsin: the Southeastern Wisconsin Regional Planning Commission, the Fox Cities Transportation Management Area, and the Oshkosh Urbanized Area. A fourth MPO, the Green Bay Urbanized Area, had TIPs for 2015-2019 and 2019-2023 ([WisDOT, 2020](#); [SEWRPC, 2018](#); [SEWRPC, 2014](#); [ECWRPC, 2018a](#); [ECWRPC, 2014a](#); [ECWRPC, 2018b](#); [ECWRPC, 2014b](#); [BCPC, 2018](#); [BCPC, 2014](#)). The average cost per mile is the total construction cost, adjusted by the National Highway Construction Cost Index (“NHCCI 2.0”) to the third quarter of 2019 (“2019 Q3”), divided by the total miles ([FHWA, 2020](#)). Three asterisks (***) indicate significance at the 99-percent confidence level. Two asterisks (**) indicate significance at the 95-percent confidence level. One asterisk (*) indicates significance at the 90-percent confidence level. The first, “Dollar Value,” model is a robust OLS regression on the average cost per mile. The second, “Natural Logs,” model is a robust OLS regression on the natural logarithm of the average cost per mile, which effectively converts outputs into percent terms. †“Effect” indicates the independent variable’s coefficient. ‡“Error” indicates the standard error.