



Wages, Productivity, and Highway Construction Costs

The National Alliance for Fair Contracting is a non-profit labor and management organization that is dedicated to the advancement of fair competitive contracting in the public sector construction industry.

**Prepared by
National Alliance For Fair Contracting
111 Massachusetts Avenue, N.W., Suite 470
Washington, D.C. 20001
Terry G. Bumpers, Director
(202) 842-2713
(202) 842-4365 FAX**

WAGES, PRODUCTIVITY, AND HIGHWAY CONSTRUCTION COSTS

INTRODUCTION

Over the years there have been various pronouncements of the cost savings that would be realized if the Davis-Bacon Act was repealed. It seems that everyone has an opinion as to the actual amount of potential savings. However, we know of no study to back-up any of the following claims:

March 7, 1993 - Senator Trent Lott (R-MS) in proposing "painless" budget cuts states that the government could save \$6.2 billion by repealing the Davis-Bacon Act.

January 18, 1993 - The Cato Institute writes that "Davis-Bacon costs the federal government billions every year."

March 22, 1993 - Senator Larry Craig (R-ID) introduces legislation calling for repeal of the Davis-Bacon Act because it would "reduce the federal deficit by \$3.29 billion in fiscal years 1994-1998."

October 29, 1994 - Federal Reserve Board Governor Lawrence Lindsey told a housing conference in Detroit that eliminating the Davis-Bacon Act would reduce a thirty-year mortgage by a full percentage point and that it amounted to an inner city tax of between 5% and 10%. When asked to see the study to back-up his claims, Mr. Lindsey produced the 1983 Congressional Budget Office (CBO) study entitled, "Modifying the Davis-Bacon Act; Implications for the Labor Market and Federal Budget" which does nothing to support his statement.

January 5, 1995 - Syndicated columnist George F. Will in the Washington Post stated, "repeal of Davis-Bacon would save the taxpayers about \$1 billion on construction costs and \$100 million in administrative costs annually. Construction companies would save \$190 million in compliance costs...."

February 8, 1995 - In prepared testimony before the House Committee on Transportation-Subcommittee on Surface Transportation, Wayne Shackelford, Commissioner of the Georgia Department of Transportation claimed that in Iowa the Davis-Bacon Act raised overall project costs between two and five percent (or \$5 - \$10 million annually).

After reviewing these cost savings estimates, which to our knowledge are not supported by any documentation, a logical person should conclude that accurate cost estimates are nowhere to be found.

Anyone in the construction industry knows that increases and decreases in wage rates are not directly correlated to total construction costs unless other factors such as productivity are taken into consideration.

The National Alliance for Fair Contracting (NAFC) commissioned an analysis of the costs to build a mile of highway, utilizing Federal Highway Administration (FHWA) data, to ascertain if a correlation exists between wages, manhours, and highway construction costs. The NAFC requested the analysis using the FHWA data because the statistics available are consistently reported by each state and cover a sustained period of time.

The data included in this study covers all fifty states over a 14-year period from 1980 - 1993 with the following volumes:

	<u>All States</u>	<u>Top 26 States</u>
Total Construction Dollars	\$87.1 billion	\$67.9 billion
Roadway Miles	98,454	68,976
Bridge Miles	2,138	1,598
Total Construction Miles	100,591	70,573
Labor Hours	1.5 billion	\$1.2 billion

The total volumes listed above are actual construction expenditures and do not include engineering costs, purchases of right-of-ways or any other cost that is not directly related to actual construction.

In order to compare apples with apples, and oranges with oranges, we compared the top construction dollar volume states which represent 78% of the total volume over the fourteen-year period, and states with an average annual volume of \$175 million and over. Even though we did not use lower dollar volumes and states with lower roadway miles in our comparisons, they are incorporated along with all other states for informational purposes.

The statistics were compiled by an independent statistical analysis firm utilizing FHWA Form PMF-C-117, and were analyzed by an economist who provided us with the comparisons and conclusions. To verify that the study's analysis, source material and conclusions are based on sound economic principles, we submitted it to Robert Gasperow of the Construction Labor Resource Council (CLRC) for review. Mr. Gasperow is a noted and respected construction industry economist who provides construction employers with various industry reports and statistics. Mr. Gasperow's opinion of this study is incorporated herein.

Mr. Gasperow stated: "The data cover 1980 through 1993 so that exceptions and atypical projects that were reported in a particular state in a particular year have little or no impact upon the findings". He further states that, "the FHWA data indicate that there is no basis for any statements which advocate lowering hourly labor costs as a means for reducing the cost of highway construction. The government figures demonstrate that states associated with higher hourly wages have lower labor hours per mile of highway and overall highway costs which are below those of lower wage states."

We submit that this study is the only one in existence which uses data compiled by a government agency that shows construction expenditures or cost savings are related to wages and productivity, and not to wages alone. Moreover, we believe it proves that simply reducing wage rates does not reduce construction costs.

WAGES, PRODUCTIVITY AND HIGHWAY CONSTRUCTION COSTS

The Findings

TOP 26 STATES IN CONSTRUCTION DOLLAR VOLUME (Tables 1 & 2)

Comparisons in this category more fairly present the overall findings in this study because they represent a grouping of states that averaged over \$100 million annually, which should eliminate any variables that might occur in lower construction dollar volume states.

These 26 states represent 78% of the total construction dollars, 70% of total construction miles and 79% of total labor hours over the 14-year period of the study. The following are the results of the comparisons for the project-per-mile averages:

	<u>Low Wage*</u>	<u>High Wage**</u>	<u>U.S. Average</u>
Average Hourly Wage	\$9.76	\$17.65	\$12.15
Man-Hours Per Mile	22,837	13,697	18,348
Labor Costs Per Mile	\$216,864	\$241,465	\$235,603
Total Costs Per Mile	\$1,141,049	\$1,017,992	\$1,136,963

As this category clearly shows the manhours to complete a mile of highway is 40% lower in the high wage states in spite of an 81% higher wage rate. Total costs per mile between the low wage states and the high wage states is 11% cheaper in high wage states when compared to an 81% wage rate differential. The high wage states averaged \$123,057 per mile savings to the taxpayers.

Some economists might take exception to making simple calculations based on averages without taking into consideration the dollar volume of work in each state as to the weight higher dollar states would have on the statistics and conclusions. For this reason we compared the same 26 dollar volume states between the annual averages and the averages weighted by total miles. The following are the results of the weighted average comparisons for project-per-mile averages:

	<u>Low Wage*</u>	<u>High Wage**</u>	<u>U.S. Average</u>
Average Hourly Wage	\$9.21	\$17.64	\$12.15
Man-Hours Per Mile	22,837	13,697	18,348
Labor Costs Per Mile	\$182,570	\$219,744	\$235,603
Total Costs Per Mile	\$986,582	\$936,639	\$1,136,963

When using the weighted average method the high-wage states built a mile of highway with 40% fewer manhours at a wage rate 92% greater than the low-wage states. In spite of the large wage rate disparity the total cost per mile of construction is still 5% lower in the high-wage states than in the low-wage states.

* Low wage states are: Texas, Georgia, Iowa, Florida, Alabama, Minnesota, Mississippi, Tennessee, North Carolina, Colorado, Virginia, Louisiana, and West Virginia

** High wage states are: Ohio, Illinois, Wisconsin, Pennsylvania, Missouri, Michigan, Washington, California, New York, Indiana, Arizona, Oregon and New Jersey

STATES WITH AVERAGE ANNUAL CONSTRUCTION OF \$175 MILLION & OVER (Tables 3 & 4)

Next, a comparison was made between eleven high-wage-rate and low-wage-rate states with over \$175 million average annual highway construction dollars spent. These eleven states represented \$41.2 billion, or 47% of all highway and bridge work in the United States over the last 14 years. The following are the results of the comparisons for project-per-mile averages:

	<u>Low Wage*</u>	<u>High Wage**</u>	<u>U.S. Average</u>
Average Hourly Wage	\$8.16	\$18.39	\$12.15
Man-Hours Per Mile	25,712	14,894	18,348
Labor Costs Per Mile	\$219,484	\$262,405	\$235,603
Total Costs Per Mile	\$1,220,700	\$1,084,337	\$1,136,963

The total cost per mile in the high-wage states was 11% lower than the low-wage states in spite of a wage rate more than double. In this comparison wage rates have little to do with total construction costs per mile or at best shows that higher wage rates reflect lower costs per mile.

Here again, the total costs per mile between low-wage states and high-wage states is of little difference when compared to the disparity in wage rate differential (81%). This category of comparisons again clearly shows that man-hours per mile are 42% less in high-wage states with an 81% higher wage rate.

More importantly, the high-wage states completed an average mile of highway in 42% fewer manhours than the low-wage states and saved the taxpayers \$136,360 per mile in construction costs.

* Low wage states are: Alabama, Florida, Georgia, Texas, and Virginia

** High wage states are: California, Illinois, Missouri, New York, Ohio and Pennsylvania

STATISTICS FOR ALL STATES (Tables 5 - 9)

Even though we did not do cost comparisons for all potential categories we have incorporated each states statistics that can be found in Tables 5 -9. It is our belief that in certain states the small dollar volume and/or the very low roadway miles (such as Hawaii, and the District of Columbia) would distort any comparisons. However, all statistics are incorporated in the study and are sorted by state and dollar volume in tables 5 - 9.

Conclusion

Simplistic views and pronouncements that proclaim lowering the hourly wage rates of construction workers will reduce construction costs and expenditures show a basic misunderstanding of the construction industry. As we have shown in this report, wage rates have a strong correlation with manhours which should prove to anyone's satisfaction that productivity is the key to calculating labor costs.

Any attempt to reduce construction expenditures by reducing wage rates will be met by with a corresponding decrease in productivity which could, in fact, produce an increase in construction costs.

**CONSTRUCTION LABOR RESEARCH COUNCIL
INDEPENDENT ANALYSIS**

CONSTRUCTION LABOR RESEARCH COUNCIL

30 M Street, N.W., Suite 900B, Washington, D.C. 20036, (202) 223-8045



February 9, 1995

Mr. Terry Bumpers
National Alliance for Fair Contracting
111 Massachusetts Avenue, N.W.
Washington, D.C. 20001

Dear Mr. Bumpers:

Construction Labor Research Council is pleased to have had the opportunity to review the material that has been prepared for the National Alliance for Fair Contracting which describes the role of labor costs in highway construction. The accompanying evaluation examines the study as to its appropriateness and the validity of its conclusions. CLRC has also added its own observations.

Attached to the evaluation is a table which contains a recalculation of the cost per mile figures in the original study. The revised figures calculate cost per mile weighted by the number of highway miles of construction in each state. This is more appropriate and consistent with the methodology used in the first study conducted by the operating engineers. As you can see, the conclusion of lower total cost per mile in higher wage states is unchanged.

The attached chart was prepared to assist in CLRC's evaluation. It demonstrates that there is no relationship between highway cost per mile and average hourly wage rates. Each point is a state's total cost and wage rate.

I would be happy to further discuss this material with you.

Sincerely,

A handwritten signature in cursive script that reads "Robert M. Gasperow".

Robert M. Gasperow
Executive Director

Enclosures
RMG:kd

Evaluation of Highway Cost Analysis
by the
Construction Labor Research Council

Construction Labor Research Council has reviewed the analysis of Federal Highway Administration (FHWA) material and labor cost data which has been prepared for the National Alliance for Fair Contracting. These data and the analysis support the Alliance's position that wage rates are but one determinant of the cost of highways. They also document that there is only minimal correlation between the hourly wage rate paid to labor and the cost of a mile of highway and, further, that the limited correlation which does exist appears to indicate that the relationship is inverse - higher hourly rates tend to equate to lower highway cost per mile.

One of the first lessons of introductory economics is to explain the inputs required to accomplish all economic objectives. These are the four factors of production - land, labor, entrepreneurial ability and capital. The desired output is the mix of these factors which results in the best utilization of these resources. To some extent the factors can be utilized in a variety of combinations to achieve the desired objective, but only one combination will minimize the cost of production.

In practice, the data support the theory when applied to the construction of a highway. For any given unit of highway, various mixes of equipment, labor, materials and management can be used to complete the project. One combination of factors will result in the lowest cost.

Looking at the amount/cost of any single factor says little about total cost. Up to a point, factors are substitutes for each other. They may be exchanged. As a gross example, earthmoving equipment is a substitute for an army of workers with picks, shovels, and buckets.

Similarly, within a factor category, there may be substitutes. Workers with varying skill levels may be utilized. There will be a higher cost per unit of time for the more highly skilled worker, but fewer labor inputs will be required of the highly skilled workers. If the gain in output per unit of time exceeds the premium paid to the more highly skilled worker, this becomes a more cost effective alternative to production.

The analysis of FHWA cost records documents the impact on highway costs of utilizing various amounts of labor inputs at varying hourly rates. It substantiates the lack of correlation between the labor inputted into a mile of highway and the total cost of the project. Utilizing higher skilled, higher hourly cost labor substantially lowers the required labor inputs, often to the extent that highway cost per mile is lower when higher hourly rates are paid to labor. There is no basis for the contention that lower labor rates result in lower highway costs. For the 26 states accounting for over three-quarters of national highway expenditures, cost per mile is \$50,000 less in higher wage states. (When using an alternate calculation method in which each state is weighted equally, the conclusion remains unchanged that higher wage states still built highways at a lower average cost per mile - almost \$25,000 less).

There are a number of factors which make the FHWA data base ideal for this type of analysis. It is a) objective, b) comprehensive and c) neutral (not designed to evaluate labor costs). The data cover 1980 through 1993 so that exceptions and atypical projects that were reported in a particular state in a particular year have little or no impact upon the findings.

Another observation from reviewing the data is the small portion of highway cost which is attributable to labor. Only 21 percent of the total expenditures recorded by the FHWA are labor costs. Efforts to reduce federal highway expenditures are, therefore, likely to be better directed toward other cost categories which account for 79 percent of highway costs.

In conclusion, the FHWA data indicate that there is no basis for any statements which advocate lowering hourly labor costs as a means for reducing the cost of highway construction. The government figures demonstrate that states associated with higher hourly wages have lower labor hours per mile of highway and overall highway costs which are below those of lower wage states.

Robert M. Gasperow
Executive Director
February, 1995

CONSTRUCTION LABOR RESEARCH COUNCIL

Highway Costs Per Mile Top 26 Dollar Value States

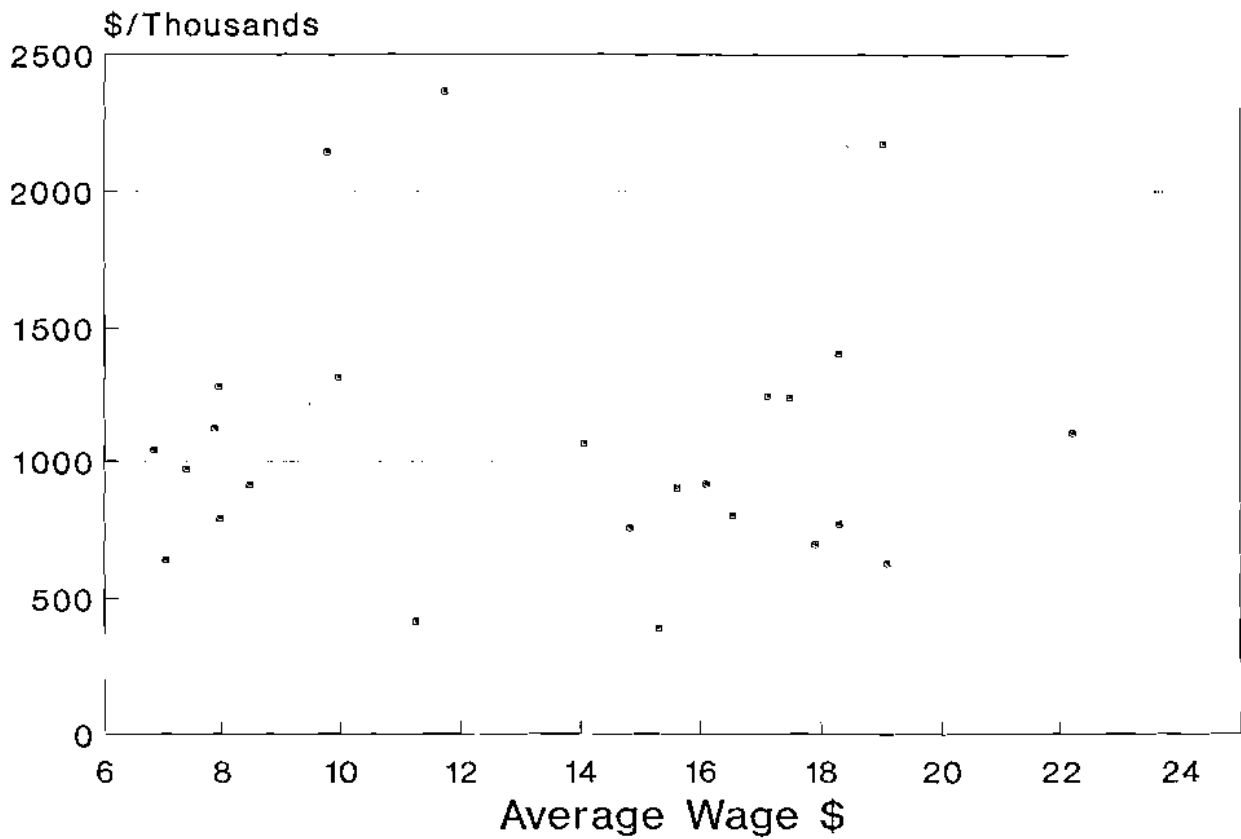
Lower Hourly Wage States

Total Cost Per Mile	\$986,582
Labor Cost Per Mile	182,570
Man-Hours Per Mile	20,389

Higher Hourly Wage States

Total Cost Per Mile	\$936,639
Labor Cost Per Mile	219,744
Man-Hours Per Mile	12,577

Highway Costs and Labor Rate



By plotting the average hourly wage for highway construction in each state against the average cost per mile of highway, it is apparent that there is no relationship between wage rates and highway cost.

Table 1**Federal Highway Administration (FHWA)
Annual Average Construction Statistics
Top 26 Dollar Value States
1980 - 1993****By Average Wage Rate**

State	Wage Rate	Total Cost Per Mile	Labor Cost Per Mile	Man Hours Per Mile
Mississippi	\$6.69	\$641,238	\$95,329	13,524
North Carolina	7.11	1,041,242	187,693	27,413
Georgia	7.36	792,559	149,224	18,726
Alabama	7.54	972,285	139,107	18,777
Tennessee	7.94	1,123,781	157,098	19,940
Florida	7.97	1,282,553	230,866	29,046
Texas	8.35	914,160	180,306	21,290
Virginia	9.61	2,141,942	397,919	40,721
Louisiana	9.84	1,317,243	241,658	24,270
Iowa	11.25	417,553	70,381	6,264
West Virginia	13.97	2,365,849	599,176	51,131
Colorado	14.48	1,066,334	215,868	15,353
Minnesota	14.78	756,899	154,603	10,430
Average	\$9.76	\$1,141,049	\$216,864	22,837
Wisconsin	15.55	394,405	78,083	5,104
Arizona	15.58	916,772	187,085	11,628
Indiana	15.70	901,438	196,404	12,594
Pennsylvania	16.38	1,239,013	300,972	17,223
Oregon	17.01	933,013	195,532	11,322
Missouri	17.16	807,021	183,754	11,116
Michigan	17.89	775,423	174,320	9,522
Illinois	18.00	1,245,858	282,810	16,530
New Jersey	18.07	2,175,605	573,429	30,152
Ohio	18.11	701,079	165,902	9,268
New York	18.29	1,407,513	357,886	22,467
Washington	19.30	631,222	159,766	8,370
California	22.40	1,105,537	283,107	12,759
Average	\$17.65	\$1,017,992	\$241,465	13,697

Table 2

Federal Highway Administration (FHWA)
Annual Average Construction Statistics
Top 26 Dollar Value States
1980 - 1993

By Average Wage Rate

State	Construction Dollars	Roadway Miles	Bridge Miles	Construction Miles	Labor Hours	Gross Earnings Dollars	Cost Per Labor Hour Dollars
Mississippi	\$104,214,382	159.925	2.596	162.521	2,197,914	15,492,852	6.69
North Carolina	136,605,543	129.199	1.996	131.195	3,596,412	24,624,313	7.11
Georgia	235,575,227	293.964	3.270	297.234	5,566,049	44,354,323	7.36
Alabama	175,379,043	175.969	4.409	180.378	3,387,023	25,091,811	7.54
Tennessee	159,584,427	139.455	2.552	142.007	2,831,677	22,309,024	7.94
Florida	298,568,951	226.856	5.937	232.793	6,761,623	53,743,931	7.97
Texas	543,368,573	583.664	10.727	594.391	12,654,732	107,171,981	8.35
Virginia	224,902,845	100.946	4.054	105.000	4,275,686	41,781,311	9.61
Louisiana	133,507,552	96.880	4.474	101.354	2,459,866	24,492,928	9.84
Iowa	108,948,848	260.163	0.759	260.922	1,634,461	18,364,010	11.25
West Virginia	151,379,021	61.911	2.074	63.985	3,271,589	38,338,304	13.97
Colorado	123,725,306	113.267	2.761	116.029	1,781,420	25,046,849	14.48
Minnesota	131,787,000	171.641	2.473	174.114	1,816,043	26,918,582	14.78
Average	\$194,426,671	193.372	3.699	197.071	4,018,038	\$35,979,248	\$9.76
Wisconsin	103,121,564	260.298	1.163	261.461	1,334,490	20,415,754	15.55
Arizona	114,338,874	123.684	1.035	124.719	1,450,225	23,332,998	15.58
Indiana	132,207,631	143.749	2.914	146.663	1,847,091	28,805,148	15.70
Pennsylvania	295,317,834	230.446	7.903	238.349	4,105,129	71,736,326	16.38
Oregon	99,555,381	105.057	1.646	106.703	1,208,087	20,863,916	17.01
Missouri	176,113,031	213.198	5.029	218.226	2,425,707	40,099,865	17.16
Michigan	168,269,513	209.285	7.718	217.003	2,066,361	37,828,102	17.89
Illinois	349,744,990	273.466	7.261	280.726	4,640,521	79,392,128	18.00
New Jersey	124,085,304	52.863	4.172	57.035	1,719,740	32,705,427	18.07
Ohio	208,766,721	291.661	6.118	297.779	2,759,917	49,402,097	18.11
New York	241,657,581	164.679	7.012	171.691	3,857,435	61,445,780	18.29
Washington	116,782,297	178.590	6.419	185.010	1,548,506	29,558,298	19.30
California	192,011,569	166.007	7.675	173.682	2,215,955	49,170,530	22.40
Average	\$178,613,253	185.614	5.082	190.69597	2,398,397	\$41,904,336	\$17.65

Table 3
Federal Highway Administration (FHWA)
Averages for States with
Average Annual Highway Construction over \$175,000,000
1980 - 1993

By Dollar Volume

State	Average Wage Rate	Total Cost Per Mile	Labor Cost Per Mile	Man Hours Per Mile
Texas	\$8.35	\$914,160	180,306	21,290
Florida	7.97	1,282,553	230,866	29,046
Georgia	7.36	792,559	149,224	18,726
Virginia	9.61	2,141,942	397,919	40,721
Alabama	7.54	972,285	139,107	18,777
Average Total	\$8.16	\$1,220,700 \$6,103,499	\$219,484 \$1,097,422	25,712 128,560
Illinois	\$18.00	\$1,245,858	\$282,810	16,530
Pennsylvania	16.38	1,239,013	300,972	17,223
New York	18.29	1,407,513	357,886	22,467
Ohio	18.11	701,079	165,902	9,268
California	22.40	1,105,537	283,107	12,759
Missouri	17.16	807,021	183,754	11,116
Average Total	\$18.39	\$1,084,337 \$6,506,021	\$262,405 \$1,574,431	14,894 89,363
National Figures				
Average	\$12.15	\$1,136,963	\$235,603	18,348
Total	\$681.19	\$57,985,108	\$12,015,774	935,737

TABLE 4

**Federal Highway Administration (FHWA)
Averages for States with
Average Annual Highway Construction over \$175,000,000
1980 - 1993**

By Dollar Volume

State	Average Construction Dollars	Roadway Miles	Bridge Miles	Average Construction Miles	Labor Hours	Gross Earnings Dollars	Cost Per Labor Hour Dollars
Texas	\$543,368,573	583.664	10.727	594.391	12,654,732	\$107,171,981	\$8.35
Florida	298,568,951	226.856	5.937	232.793	6,761,623	53,743,931	7.97
Georgia	235,575,227	293.964	3.270	297.234	5,566,049	44,354,323	7.36
Virginia	224,902,845	100.946	4.054	105.000	4,275,686	41,781,311	9.61
Alabama	175,379,043	175.969	4.409	180.578	3,387,023	25,091,811	7.54
Average Total	\$295,558,928 \$1,477,794,639	276.280 1,381.398	5.679 28.397	281.959 1,409.795	6,529,023 32,645,115	\$54,428,671 \$272,143,357	\$8.16
Illinois	\$349,744,990	273.466	7.261	280.726	4,640,521	\$79,392,128	\$18.00
Pennsylvania	295,317,834	230.446	7.903	238.349	4,105,129	71,736,326	16.38
New York	241,657,581	164.679	7.012	171.691	3,857,435	61,445,780	18.29
Ohio	208,766,721	291.661	6.118	297.779	2,759,917	49,402,097	18.11
California	192,011,569	166.007	7.675	173.682	2,215,955	49,170,530	22.40
Missouri	176,113,031	213.198	5.029	218.226	2,425,707	40,099,865	17.16
Average Total	\$243,935,288 \$1,463,611,726	223.243 1,339,457	6.833 40.997	230.076 1,380,453	3,334,111 20,004,664	\$58,541,121 \$351,246,726	\$18.39
National Figures							
Average	\$122,101,886	137.890	2.995	140.885	2,070,677	\$25,152,186	\$12.15
Total	\$6,227,196,188	7,032.394	152.745	7,185.139	105,604,536	\$1,282,761,479	\$681.19

Table 5

Federal Highway Administration (FHWA)
 Annual Average Construction Statistics
 1980-1993
 By State

State	Average Wage Rate	Average Cost Per Mile	Labor Cost Per Mile	Man Hours Per Mile
AK	\$30.81	590,496	151,752	4,888
AL	7.54	972,285	139,107	18,777
AR	7.48	926,420	147,041	20,124
AZ	15.58	916,772	187,085	11,628
CA	22.40	1,105,537	283,107	12,759
CO	14.48	1,066,334	215,868	15,353
CT	15.31	2,066,538	484,077	30,004
DC	10.82	5,477,094	1,142,849	81,272
DE	10.68	1,453,920	235,268	21,894
FL	7.97	1,282,553	230,866	29,046
GA	7.36	792,559	149,224	18,726
HI	19.02	3,592,539	828,041	47,718
IA	11.25	417,553	70,381	6,264
ID	15.47	531,494	106,839	6,156
IL	18.00	1,245,858	282,810	16,530
IN	15.70	901,438	196,404	12,594
KS	13.57	1,131,871	242,771	17,420
KY	13.67	1,522,727	316,993	26,246
LA	9.84	1,317,243	241,658	24,270
MA	17.70	2,321,025	384,457	25,868
MD	9.49	1,440,871	271,271	27,444
ME	5.85	369,975	65,246	8,846
MI	17.89	775,423	174,320	9,522
MN	14.78	756,899	154,603	10,430
MO	17.16	807,021	183,754	11,116
MS	6.69	641,238	95,329	13,524
MT	15.74	378,470	82,025	5,331
NC	7.11	1,041,242	187,693	27,413
ND	11.44	163,354	26,849	2,330
NE	9.94	498,076	85,548	8,468
NH	10.54	1,454,935	303,514	29,016
NJ	18.07	2,175,605	573,429	30,152
NM	9.70	582,122	99,380	10,305
NV	20.77	1,005,393	275,267	13,698
NY	18.29	1,407,513	357,886	22,467
OH	18.11	701,079	165,902	9,268
OK	8.28	773,085	121,686	14,477
OR	17.01	933,013	195,532	11,322
PA	16.38	1,239,013	300,972	17,223
RI	14.25	912,502	157,452	11,122
SC	6.95	725,898	122,166	17,319
SD	8.87	186,017	29,269	3,436
TN	7.94	1,123,781	157,098	19,940
TX	8.35	914,160	180,306	21,290
UT	16.95	945,800	214,566	12,814
VA	9.61	2,141,942	397,919	40,721
VT	9.31	365,470	58,528	6,096
WA	19.30	631,222	159,766	8,370
WI	15.55	394,405	78,083	5,104
WV	13.97	2,365,849	599,176	51,131
WY	12.28	501,477	104,645	8,501
Average	\$12.15	1,136,963	235,603	18,348
Total	\$681.19	57,985,108	12,015,774	935,737

Figures for ME do not include numbers from 1981, 1989, 1991, & 1992
 Figures for MD do not include numbers for 1988
 Figures for DC do not include numbers for 1980, 1982, & 1987
 Figures for ID do not include numbers for 1983
 Figures for OR do not include numbers for 1981
 Figures for MS do not include numbers for 1980

Table 6

**Federal Highway Administration (FHWA)
Annual Average Construction Statistics
1980-1993
By State**

State	Construction Dollars	Roadway Miles	Bridge Miles	Total Construction Miles	Labor Hours	Gross Earnings Dollars	Cost Per Labor Hour Dollars
AK	55,628,303	93.983	0.223	94.206	460,525	14,295,951	30.81
AL	175,379,043	175.969	4.409	180.378	3,387,023	25,091,811	7.54
AR	70,673,617	74.557	1.729	76.287	1,535,177	11,217,265	7.48
AZ	114,338,874	123.684	1.035	124.719	1,450,225	23,332,998	15.58
CA	192,011,569	166.007	7.675	173.682	2,215,955	49,170,530	22.40
CO	123,725,306	113.267	2.761	116.029	1,781,420	25,046,849	14.48
CT	75,991,779	35.500	1.273	36.773	1,103,334	17,800,705	15.31
DC	15,270,530	2.342	0.446	2.788	226,592	3,186,344	10.82
DE	30,640,211	20.513	0.562	21.074	461,389	4,958,084	10.68
FL	298,568,951	226.856	5.937	232.793	6,761,623	53,743,931	7.97
GA	235,575,227	293.964	3.270	297.234	5,566,049	44,354,323	7.36
HI	39,049,871	10.067	0.803	10.870	518,685	9,000,574	19.02
IA	108,948,848	260.163	0.759	260.922	1,634,461	18,364,010	11.25
ID	40,610,294	71.505	4.903	76.408	470,330	8,163,366	15.47
IL	349,744,990	273.466	7.261	280.726	4,640,521	79,392,128	18.00
IN	132,207,631	143.749	2.914	146.663	1,847,091	28,805,148	15.70
KS	95,735,537	80.237	4.345	84.582	1,473,398	20,533,989	13.57
KY	87,184,949	56.718	0.538	57.256	1,502,714	18,149,687	13.67
LA	133,507,552	96.880	4.474	101.354	2,459,866	24,492,928	9.84
MA	67,191,846	27.883	1.066	28.949	748,870	11,129,737	17.70
MD	44,681,412	29.207	1.804	31.010	851,046	8,412,104	9.49
ME	10,951,723	29.421	0.180	29.601	261,862	1,931,371	5.85
MI	168,269,513	209.285	7.718	217.003	2,066,361	37,828,102	17.89
MN	131,787,000	171.641	2.473	174.114	1,816,043	26,918,582	14.78
MO	176,113,031	213.196	5.029	218.226	2,425,707	40,099,865	17.16
MS	104,214,382	159.925	2.596	162.521	2,197,914	15,492,852	6.69
MT	77,931,148	205.278	0.633	205.911	1,097,779	16,889,813	15.74
NC	136,805,543	129.199	1.996	131.195	3,596,412	24,624,313	7.11
ND	49,817,054	299.335	5.628	304.963	710,535	8,188,036	11.44
NE	69,116,984	137.292	1.476	138.768	1,175,119	11,871,307	9.94
NH	29,018,368	19.408	0.537	19.945	578,716	6,053,515	10.54
NJ	124,065,304	52.863	4.172	57.035	1,719,740	32,705,427	18.07
NM	87,188,327	143.488	1.289	144.777	1,543,494	14,884,827	9.70
NV	52,820,614	51.329	1.209	52.537	719,668	14,461,770	20.77
NY	241,657,581	164.679	7.012	171.691	3,857,435	61,445,780	18.29
OH	208,766,721	291.661	6.118	297.779	2,759,917	49,402,097	18.11
OK	94,430,105	120.144	2.003	122.147	1,768,357	14,863,644	8.28
OR	99,555,381	105.057	1.646	106.703	1,208,087	20,863,916	17.01
PA	295,317,834	230.446	7.903	238.349	4,105,129	71,736,326	16.38
RI	13,699,849	14.895	0.118	15.014	166,984	2,363,901	14.25
SC	68,862,645	92.932	1.933	94.866	1,642,946	11,589,366	6.95
SD	47,314,657	252.328	2.029	254.357	873,897	7,444,760	8.87
TN	159,584,427	139.455	2.552	142.007	2,831,677	22,309,024	7.94
TX	\$543,368,573	583.664	10.727	594.391	12,654,732	\$107,171,981	\$8.35
UT	89,372,270	91.608	2.886	94.494	1,210,853	20,275,150	16.85
VA	224,902,845	100.946	4.054	105.000	4,275,686	41,781,311	9.61
VT	17,489,685	47.262	0.593	47.855	291,743	2,800,879	9.31
WA	116,782,297	178.590	6.419	185.010	1,548,506	29,558,298	19.30
WI	103,121,564	260.298	1.163	261.461	1,334,490	20,415,754	15.55
WV	151,379,021	61.911	2.074	63.985	3,271,589	38,338,304	13.97
WY	47,005,404	93.343	0.391	93.734	796,865	9,808,747	12.28
Average	\$122,101,886	137.890	2.965	140.885	2,070,677	\$25,152,186	\$12.15
Total	\$6,227,196,188	7,032.394	152.745	7,185.139	105,604,536	\$1,282,761,479	\$681.19

Figures for ME do not include numbers from 1981, 1989, 1991, & 1992

Figures for MD do not include numbers for 1988

Figures for DC do not include numbers for 1980, 1982, & 1987

Figures for ID do not include numbers for 1983

Figures for OR do not include numbers for 1981

Figures for MS do not include numbers for 1980

Table 7

**Federal Highway Administration (FHWA)
Annual Average Construction Statistics
1980-1993
By State**

State	Average Wage Rate	Average Cost Per Mile	Labor Cost Per Mile	Man Hours Per Mile
TX	8.35	914,160	180,306	21,290
IL	18.00	1,245,858	282,810	16,530
FL	7.97	1,282,553	230,866	29,046
PA	16.38	1,239,013	300,972	17,223
NY	18.29	1,407,513	357,886	22,467
GA	7.36	792,559	149,224	18,726
VA	9.61	2,141,942	397,919	40,721
OH	18.11	701,079	165,902	9,268
CA	22.40	1,105,537	283,107	12,759
MO	17.16	807,021	183,754	11,116
AL	7.54	972,285	139,107	18,777
MI	17.89	775,423	174,320	9,522
TN	7.94	1,123,781	157,098	19,940
WV	13.97	2,365,849	599,176	51,131
NC	7.11	1,041,242	187,693	27,413
LA	9.84	1,317,243	241,658	24,270
IN	15.70	901,438	196,404	12,594
MN	14.78	756,899	154,603	10,430
NJ	18.07	2,175,605	573,429	30,152
CO	14.48	1,066,334	215,868	15,353
WA	19.30	631,222	159,766	8,370
AZ	15.58	916,772	187,085	11,628
IA	11.25	417,553	70,381	6,264
MS	6.69	641,238	95,329	13,524
WI	15.55	394,405	78,083	5,104
OR	17.01	933,013	195,532	11,322
KS	13.57	1,131,871	242,771	17,420
OK	8.28	773,085	121,686	14,477
UT	16.95	945,800	214,566	12,814
NM	9.70	582,122	99,380	10,305
KY	13.67	1,522,727	316,993	26,246
MT	15.74	378,470	82,025	5,331
CT	15.31	2,066,538	484,077	30,004
AR	7.49	926,420	147,041	20,124
NE	9.94	498,076	85,548	8,468
SC	6.95	725,898	122,166	17,319
MA	17.70	2,321,025	384,457	25,868
AK	30.81	590,496	151,752	4,888
NV	20.77	1,005,393	275,267	13,898
ND	11.44	163,354	26,849	2,330
SD	8.87	186,017	29,269	3,436
WY	12.28	501,477	104,645	8,501
MD	9.49	1,440,871	271,271	27,444
ID	15.47	531,494	106,839	6,156
HI	19.02	3,592,539	828,041	47,718
DE	10.68	1,453,920	235,268	21,894
NH	10.54	1,454,935	303,514	29,016
VT	9.31	365,470	58,528	6,096
DC	10.82	5,477,094	1,142,849	81,272
ME	\$5.85	12,608,571	2,622,746	205,606
-	\$661.09	56,702,630	11,793,076	915,768
Average	12.15	387,436	79,809	16,672
Total	\$681.19	473,755	97,590	14,288

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 Figures for ME do not include numbers from 1981, 1989, 1991, & 1992

Figures for MD do not include numbers for 1988

Figures for DC do not include numbers for 1980, 1982, & 1987

Figures for ID do not include numbers for 1983

Figures for OR do not include numbers for 1981

Figures for MS do not include numbers for 1980

Table 8

**Federal Highway Administration (FHWA)
Annual Average Construction Statistics
1980-1993
By State**

State	Construction Dollars	Roadway Miles	Bridge Miles	Total Construction Miles	Labor Hours	Gross Earnings Dollars	Cost Per Labor Hour Dollars
TX	\$543,368,573	583.664	10.727	594.391	12,654,732	\$107,171,981	\$8.35
IL	349,744,990	273.466	7.261	280.726	4,640,521	79,392,128	18.00
FL	298,568,951	226.856	5.937	232.793	6,761,623	53,743,931	7.97
PA	295,317,834	230.446	7.903	238.349	4,105,129	71,736,326	16.38
NY	241,657,581	164.679	7.012	171.691	3,857,435	61,445,780	18.29
GA	235,575,227	293.964	3.270	297.234	5,566,049	44,354,323	7.36
VA	224,902,845	100.946	4.054	105.000	4,275,686	41,781,311	9.61
OH	208,766,721	291.661	6.118	297.779	2,759,917	49,402,097	18.11
CA	192,011,569	166.007	7.675	173.682	2,215,955	49,170,530	22.40
MO	176,113,031	213.198	5.029	218.226	2,425,707	40,099,865	17.16
AL	175,379,049	175.969	4.409	180.378	3,387,023	25,091,811	7.54
MI	168,269,513	209.285	7.718	217.003	2,066,361	37,828,102	17.89
TN	159,584,427	139.455	2.552	142.007	2,831,677	22,309,024	7.94
WV	151,379,021	61.911	2.074	63.985	3,271,589	38,338,304	13.97
NC	136,605,543	129.199	1.996	131.195	3,596,412	24,624,313	7.11
LA	133,507,552	96.880	4.474	101.354	2,459,866	24,492,928	9.84
IN	132,207,631	143.749	2.914	146.663	1,847,091	26,805,148	15.70
MN	131,787,000	171.641	2.473	174.114	1,816,043	26,918,582	14.78
NJ	124,085,304	52.863	4.172	57.035	1,719,740	32,705,427	18.07
CO	123,725,306	113.267	2.761	116.029	1,781,420	25,046,849	14.48
WA	116,782,297	178.590	6.419	185.010	1,548,506	29,558,298	19.30
AZ	114,338,874	123.684	1.035	124.719	1,450,225	23,332,998	15.58
IA	108,948,848	260.163	0.759	260.922	1,634,461	18,364,010	11.25
MS	104,214,382	159.925	2.596	162.521	2,197,914	15,492,852	6.66
WI	103,121,564	260.298	1.163	261.461	1,334,490	20,415,754	15.55
OR	99,555,381	105.057	1.646	106.703	1,208,087	20,863,916	17.01
KS	95,735,537	80.237	4.345	84.582	1,473,398	20,533,989	13.57
OK	94,430,105	120.144	2.003	122.147	1,768,357	14,863,644	8.28
UT	89,372,270	91.608	2.886	94.494	1,210,853	20,275,150	16.95
NM	87,188,327	148.488	1.289	149.777	1,543,494	14,884,827	9.70
KY	87,184,949	56.718	0.538	57.256	1,502,714	18,149,687	13.67
MT	77,931,148	205.278	0.633	205.911	1,097,779	16,889,813	15.74
CT	75,991,779	35.500	1.273	36.773	1,103,334	17,800,705	15.31
AR	70,673,617	74.557	1.729	76.287	1,535,177	11,217,265	7.48
NE	69,116,984	137.292	1.476	138.768	1,175,119	11,871,307	9.94
SC	68,862,645	92.932	1.933	94.866	1,642,946	11,589,366	6.95
MA	67,191,846	27.883	1.066	28.949	748,870	11,129,737	17.70
AK	55,628,303	93.983	0.223	94.206	460,525	14,295,951	30.81
NV	52,820,614	51.329	1.209	52.537	719,668	14,461,770	20.77
ND	49,817,054	299.335	5.628	304.963	710,535	8,188,036	11.44
SD	47,314,657	252.328	2.029	254.357	873,897	7,444,760	8.87
WY	47,005,404	93.343	0.391	93.734	796,865	9,806,747	12.28
MD	44,681,412	29.207	1.804	31.010	851,046	8,412,104	9.49
ID	40,610,294	71.505	4.903	76.408	470,330	8,163,366	15.47
HI	39,049,871	10.067	0.803	10.870	518,685	9,000,574	19.02
DE	30,640,211	20.513	0.562	21.074	461,389	4,958,084	10.68
NH	29,018,368	19.408	0.537	19.945	578,716	6,053,515	10.54
VT	17,489,685	47.262	0.593	47.855	291,743	2,800,879	9.31
DC	15,270,530	2.342	0.446	2.788	226,592	3,186,344	10.82
RI	13,689,849	14.895	0.118	15.014	166,984	2,363,901	14.25
ME	10,951,723	29.421	0.180	29.601	261,862	1,931,371	5.85
Average	\$122,101,886	294.797	7.466	315.154	5,254,172	\$25,152,186	\$12.15
Total	\$6,227,196,168	12,865,971	278,360	13,144,332	187,811,750	\$1,282,761,479	\$681.19

Figures for ME do not include numbers from 1981, 1989, 1991, & 1992

Figures for MD do not include numbers for 1988

Figures for DC do not include numbers for 1980, 1982, & 1987

Figures for ID do not include numbers for 1983

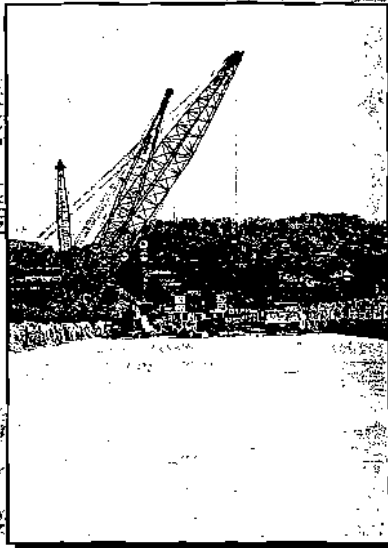
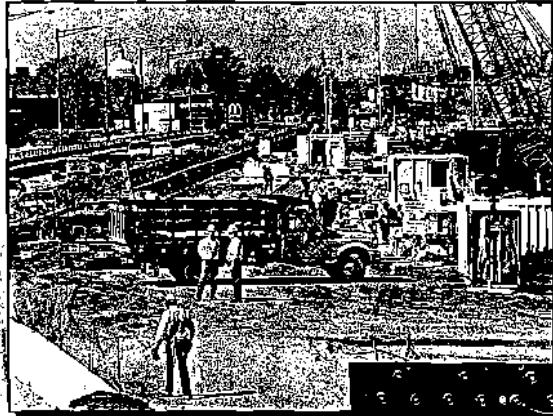
Figures for OR do not include numbers for 1981

Figures for MS do not include numbers for 1980

Table 9
Federal Highway Administration (FHWA)
Total Construction Statistics
1980 - 1993
By State

State	Total Construction Dollars	Roadway Miles	Bridge Miles	Total Construction Miles	Labor Hours	Gross Earnings Dollars	Cost Per Labor Hour Dollars
AK	778,796,247	1,315.760	3.124	1,318.884	6,447,348	200,143,314	431.35
AL	2,455,306,597	2,463.564	61.732	2,525.296	47,418,325	351,285,360	105.49
AR	989,430,634	1,043.803	24.212	1,068.015	21,492,472	157,041,704	104.75
AZ	1,600,744,234	1,731.575	14.491	1,746.066	20,303,155	326,661,971	218.06
CA	2,688,161,965	2,324.097	107.448	2,431.545	31,023,371	688,387,420	313.60
CO	1,732,154,289	1,585.741	38.660	1,624.401	24,939,881	350,656,892	202.67
CT	1,063,884,902	496.997	17.818	514.815	15,446,678	249,209,866	214.33
DC	213,787,416	32.783	6.250	39.033	3,172,292	44,608,815	151.52
DE	428,962,960	287.178	7.861	295.039	6,459,450	69,413,181	149.48
FL	4,179,965,319	3,175.980	83.118	3,259.098	94,662,727	752,415,040	111.57
GA	3,298,053,179	4,115.498	45.775	4,161.273	77,924,691	620,960,521	103.02
HI	546,698,187	140.932	11.244	152.176	7,261,584	126,008,039	266.27
IA	1,525,283,866	3,642.287	10.627	3,652.914	22,882,451	257,096,142	157.53
ID	568,544,112	1,001.064	68.646	1,069.710	6,584,621	114,287,123	216.59
IL	4,896,429,861	3,828.519	101.648	3,930.167	64,967,295	1,111,489,798	251.97
IN	1,850,906,829	2,012.487	40.795	2,053.282	25,859,271	403,272,068	219.75
KS	1,340,297,512	1,123.312	60.831	1,184.143	20,627,566	287,475,841	189.99
KY	1,220,589,290	794.047	7.534	801.581	21,037,990	254,095,622	191.36
LA	1,869,105,730	1,356.320	62.633	1,418.953	34,438,118	342,900,998	137.74
MA	940,685,850	390.364	14.925	405.289	10,484,178	155,816,321	247.79
MD	625,539,768	408.891	25.249	434.140	11,914,643	117,769,451	132.86
ME	153,324,120	411.895	2.522	414.417	3,666,073	27,039,188	81.96
MI	2,355,773,176	2,929.993	108.055	3,038.048	28,929,056	529,593,431	250.40
MN	1,845,018,001	2,402.974	34.627	2,437.601	25,424,596	376,860,145	206.86
MO	2,465,582,432	2,984.766	70.401	3,055.167	33,959,903	561,398,110	240.24
MS	1,459,001,352	2,238.945	36.343	2,275.288	30,770,789	216,899,924	93.71
MT	1,091,036,065	2,873.886	8.867	2,882.753	15,368,908	236,457,377	220.32
NC	1,912,477,599	1,808.781	27.946	1,836.727	50,349,763	344,740,384	89.58
ND	697,438,756	4,190.693	78.795	4,269.488	9,947,490	114,632,499	160.16
NE	967,637,778	1,922.089	20.663	1,942.752	16,451,665	166,198,303	139.13
NH	406,257,149	271.712	7.515	279.227	8,102,026	84,749,209	147.54
NJ	1,737,194,253	740.087	58.401	798.488	24,076,357	457,875,983	253.01
NM	1,220,636,571	2,078.834	18.041	2,096.875	21,608,914	208,387,575	135.76
NV	739,488,592	718.603	16.919	735.522	10,075,347	202,464,775	290.75
NY	3,383,206,131	2,305.507	98.169	2,403.676	54,004,084	860,240,922	255.99
OH	2,922,734,090	4,083.258	85.648	4,168.906	38,638,834	691,629,353	253.55
OK	1,322,021,466	1,682.021	28.038	1,710.059	24,757,001	208,091,016	115.93
OR	1,393,775,340	1,470.795	23.049	1,493.844	16,913,218	292,094,823	238.16
PA	4,134,449,672	3,226.242	110.647	3,336.889	57,471,809	1,004,306,560	229.38
RI	191,797,892	208.532	1.657	210.189	2,337,769	33,094,619	199.50
SC	964,077,035	1,301.053	27.064	1,328.117	23,001,246	162,251,130	97.36
SD	662,405,201	3,532.590	28.402	3,560.992	12,234,560	104,226,644	124.14
TN	2,234,181,982	1,952.363	35.730	1,988.093	39,643,483	312,326,335	111.13
TX	7,607,160,026	8,171.294	150.178	8,321.472	177,166,252	1,500,407,735	116.94
UT	1,251,211,781	1,282.506	40.408	1,322.914	16,951,937	283,852,095	237.28
VA	3,148,639,829	1,413.242	56.751	1,469.993	59,859,608	584,938,348	134.51
VT	244,855,596	661.666	8.308	669.974	4,084,399	39,212,304	130.29
WA	1,634,952,155	2,500.266	89.872	2,590.138	21,679,084	413,816,177	270.23
WI	1,443,701,899	3,644.168	16.283	3,660.451	18,682,865	285,820,552	217.68
WV	2,119,306,297	866.759	29.032	895.791	45,802,244	536,736,252	195.55
WY	658,075,651	1,306.802	5.473	1,312.275	11,156,111	137,322,453	171.97
Average	1,709,426,405	1,930.461	41.930	1,972.391	28,989,480	352,130,602	12.15
Total	87,180,746,634	98,453.521	2,138.425	100,591.946	1,478,463,498	17,958,660,706	9,536.70

Figures for ME do not include numbers from 1981, 1989, 1991, & 1992
 Figures for MD do not include numbers for 1988
 Figures for DC do not include numbers for 1980, 1982, & 1987
 Figures for ID do not include numbers for 1983
 Figures for OR do not include numbers for 1981
 Figures for MS do not include numbers for 1980



National Alliance for Fair Contracting
111 Massachusetts Avenue, N.W., Suite 470
Washington, D.C. 20001

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