

Sales of Heavy Construction Equipment as a Percentage of Construction Spending and Related Economic Impacts



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Executive Summary

In the spring of 2008, Associated Equipment Distributors (AED)¹ undertook research to determine the market impact of highway infrastructure investment on the construction equipment industry and the impact of spending on construction equipment on the overall economy. The study's key findings were as follows:

- On average, 6.4² percent of the annual budget of the highway contractors surveyed is attributable to equipment costs. Thus, we estimate that 6.4 cents of each dollar spent on highway construction is spent to buy and lease new equipment, and on major repair and maintenance outlays.
- We estimate that in 2007, \$10.2 billion³ was spent to purchase equipment for power, highways and streets, sewage and waste disposal, water supply, conservation and development projects. This estimate was arrived at by multiplying the total value of public and private non-building construction spending in 2007 – \$159.8 billion⁴ – by .064.
- Every dollar of direct spending for the purchase of heavy construction equipment generates a total of \$3.19 in economic impact – one dollar of direct spending and \$2.19 in indirect and induced economic activity from the re-spending in other sectors of the national economy of monies paid to equipment distributors.
- The total economic impact of nonbuilding construction-related equipment spending in the U.S. in 2007 was approximately \$32.5 billion.
- In 2007, the \$10.2 billion in direct spending for the purchase of heavy construction equipment generated an estimated \$9.2 billion in personal earnings (\$903,200 per \$1 million in direct equipment outlays) and supported more than 265,000 jobs (26 jobs per \$1 million in direct equipment outlays).

1. More information about AED is available at www.aednet.org.
2. Percentages have been rounded to the nearest tenth of one percent.
3. Figures in excess of \$1 billion have been rounded to the nearest \$100 million.
4. This total was developed from FMI's 2007 *U.S. Market Construction Overview*.



Research Findings

Percentage of Contractors' Operating Budgets Spent on Construction Equipment

The percentage allocation of annual spending by the highway construction companies surveyed for the purchase or leasing of heavy construction equipment ranged from a low of 1 to 1 ½ percent to a high of 11 percent.¹ The average equipment spending budget totaled 6.4 percent.

In FY 2007, Congress appropriated \$39.1 billion for highway construction projects – based on the finding that equipment spending represents, on average, 6.4 percent of contractors' operating budgets, the impact of federal highway spending on the construction equipment industry was approximately \$2.5 billion (\$39.1 billion multiplied by .064).

While we expect the impact of the highway program on equipment distributors to continue to be significant, the consensus of contractors interviewed for this study was that with rapidly rising nonequipment costs, especially the cost of oil-based products and labor, the percentage of a construction budget attributable to the purchase or leasing of heavy construction equipment will be declining in the future. In fact, several interviewees indicated that their percentage allocation was down in 2007 from previous years. Some interviewees indicated that they were keeping their equipment longer and doing more repair work and heavy maintenance to extend the life of such equipment.

1. See Appendix A.



Research Findings continued

Economic Impact of Capital Spending (Including Leasing) for Heavy Construction Equipment

Based on FMI's 2007 *U.S. Market Construction Overview*, the total value of public and private nonbuilding construction spending in 2007 was \$159.8 billion. Included in this total is construction spending for power plants, highways and streets, sewage and waste disposal, water supply, conservation and development.

With 6.4 percent of this spending outlay supporting the purchase (or leasing) of heavy construction equipment, the value of these sales totaled \$10.2 billion in 2007. The GDP multiplier for the manufacture/supply of heavy construction equipment is 3.19. That is, for every dollar in direct spending for the purchase of heavy construction equipment, a total of \$3.19 of economic impact is generated: \$1 in direct spending and \$2.19 in indirect and induced economic activity from the re-spending of the direct payment affecting all sectors of the national economy.

With the total estimated direct spending for the purchase of heavy construction equipment at \$10.2 billion, the total impact of this spending on the national economy totaled an estimated \$32.5 billion.

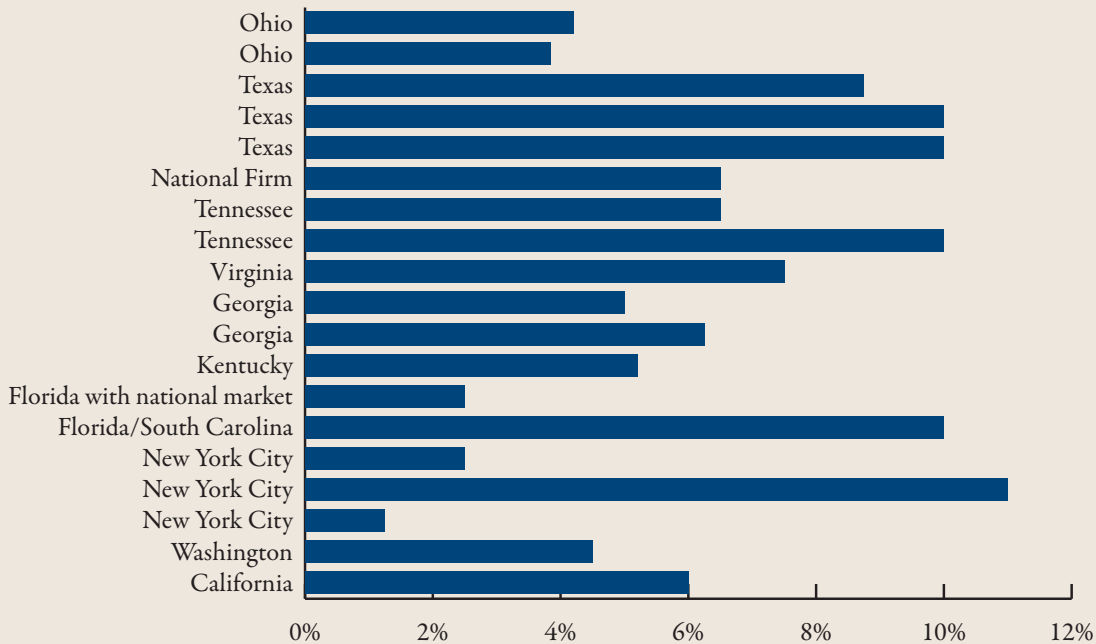
This direct spending also generates new personal earnings from the employment supported from the direct and indirect spending and re-spending of these dollars throughout the economy. In 2007, total personal earnings generated from the \$10.2 billion in direct spending for the purchase of heavy construction equipment generated a total of \$9.2 billion (\$903,200 per \$1 million in direct equipment outlays) and supported 265,200 jobs (26 jobs per \$1 million in direct equipment outlays).

Conclusions

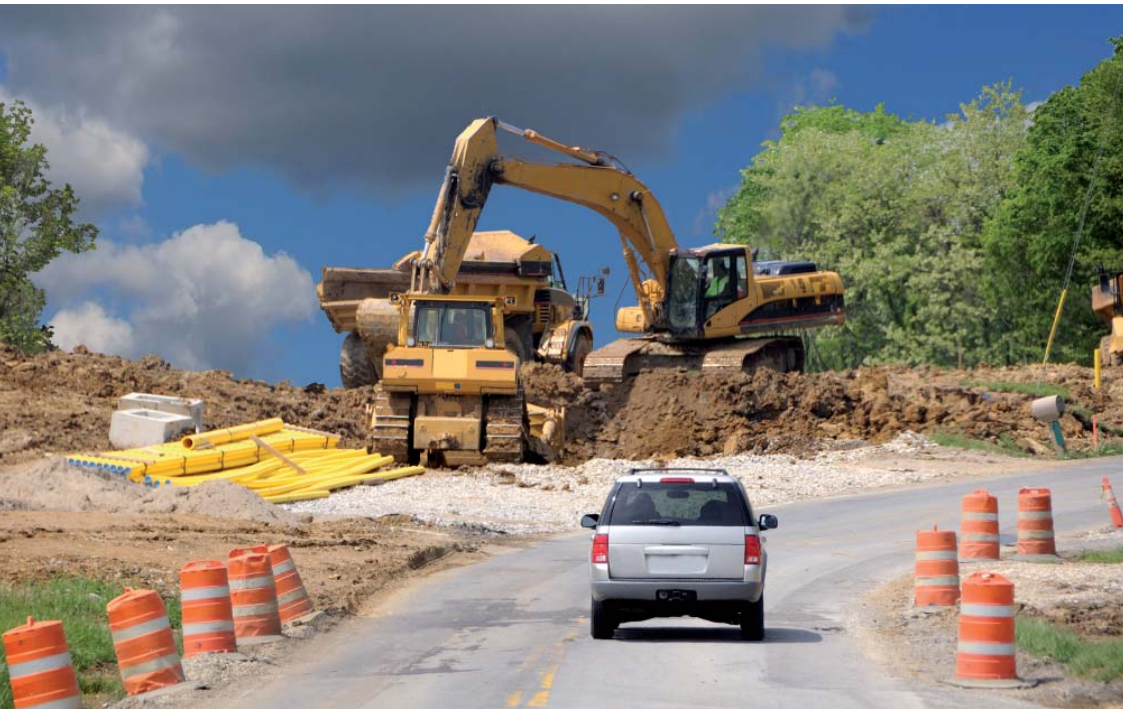
This research clarifies the important impact that infrastructure spending has on equipment distributors and, by extension, on the national economy. We believe this analysis of the flow of money from construction contractors to equipment distributors, and subsequently to their employees and related sectors of the economy, will be helpful both to lawmakers and industry leaders trying to assess the economic consequences of the various legislative proposals put forth during next year's reauthorization of the federal highway program.



Heavy Construction Equipment Purchases/Leasing as a Percent of Total Annual Operating Expenditures
Highway contractor telephone interviews conducted in April and May, 2008.



Construction Contractor Location (State) Firm Location	Percent of Total Annual Outlays
Ohio	4.2%
Ohio	3.85%
Texas	8.75%
Texas	10%
Texas	10%
National firm	5-8%
Tennessee	6-7%
Tennessee	10%
Virginia	7-8%
Georgia	5.0%
Georgia	6-6.5%
Kentucky	5.2%
Florida with national market	2-3%
Florida/South Carolina	10%
New York City	2.5%
New York City	11%
New York City	1-1.5%
Washington	4-5%
California	6%
<i>Average of all responses</i>	6.4%



Background and Research Objectives

AED is a national trade association based in Oak Brook, Illinois, that represents companies involved in the sale, rental, leasing, and servicing of construction, mining, forestry, industrial, and agricultural equipment, and related services. In early 2008, AED initiated a research study to determine:

- The impact of capital spending for highway construction and other infrastructure improvements on the demand for heavy construction equipment as reflected in the sale of new equipment and major repair and maintenance outlays for this equipment; and
- The impact of these equipment sales and maintenance outlays on the U.S. economy in 2007 (the most recent year for which construction spending data are available).
- The economic impact analysis estimated the total contribution of spending for heavy construction equipment on U.S. gross national product (GNP), the value of new personal earnings generated by this spending, and the total jobs generated throughout the U.S. economy as a result of this spending based on the direct, indirect, and induced effects for these outlays on the economy. The result of these analyses is the calculation of the percentage share of new construction outlays for highways and other infrastructure spending that supports the purchase (or substantial repair) of heavy construction equipment and an estimate of the impact of this spending on the U.S. economy.



Research Methodology

In order to achieve the first research objective – to calculate the impact of highway construction spending on the equipment industry – a survey was conducted of construction contracting companies located throughout the U.S.

This survey was not designed as a random sample but rather a purposeful sample designed to assure geographic spread as well as a range of surface transportation-related construction activity and scale of operations. The contracting companies surveyed were identified by leading AED members.

Telephone interviews were conducted during the months of April and May with the principals of 19 construction companies located in nine states with two of the construction firms having national markets and several reflecting multistate, regional markets.

The primary question asked in the survey was what percentage of the firm's 2007 total budget was allocated to the purchase or leasing of heavy construction equipment. This percentage, it was explained, should not include operating costs or general maintenance; it was to be primarily capital cost or, alternatively, leasing costs pertaining to heavy construction equipment. Clarifying discussion offered insights and explanations particular to the specific company and where this information was useful to the objective of this research key points have been included in this report.

The second objective of this research – calculating the approximate economic impact of this spending for heavy construction equipment – was achieved by applying the average percentage developed from the construction company survey to the total value of all nonbuilding construction in 2007. The total value of outlays for heavy construction equipment (purchase or leasing) was multiplied by the appropriate national Gross Domestic Product (GDP) multiplier to calculate the resultant impact on the U.S. economy. Additionally, multipliers for personal earnings and jobs were applied to the heavy equipment spending value to estimate the income and job effects of this spending as it is cycled through the economy in the form of payroll spending, business purchases, and manufacturing outlays.

About the Author



Dr. Stephen Fuller, the author of this study, holds a Ph.D. in regional planning and economic development from Cornell University and a B.A. in economics from Rutgers University. Professor Fuller joined the faculty at George Mason University (GMU) in 1994 as Professor of Public Policy and Regional Development. He served as Director of the Ph.D. Program in Public

Policy from July 1998 to June 2000 and from July 2001 to July 2002. He also serves as Director of the Center for Regional Analysis. In September 2001, the GMU Board of Visitors appointed him University Professor and in July 2002 he was named to the Dwight Schar Faculty Chair.

Prior to joining the GMU faculty, he served on the faculty at George Washington University for 25 years, including nine as Chairman of the Department of Urban Planning and Real Estate Development and one as Director of Doctoral Programs for the School of Business and Public Management.

Dr. Fuller has authored more than 500 articles, papers, and reports in the field of urban and regional economic development including monthly reports on the Washington metropolitan area and Fairfax

County economies. His research focuses on the changing structure of metropolitan area economies and measuring their current and near-term performance. In 1990, he developed a monthly series of indicators to track the current and near-term performance of the Washington area economy. He also developed leading and coincident indices for Fairfax County in 1997. These monthly reports are available on the Center for Regional Analysis Web site. His research includes studies on the impacts of federal spending, the hospitality industry, international business and the building industry on the Washington area economy.

In August 2006, Virginia Governor Tim Kaine appointed Professor Fuller to the Governor's Advisory Board of Economists. He had previously served on this Board under Governors Mark Warner, George Allen and Douglas Wilder. In 2003, he was a member of Governor Warner's Tax Reform Working Group. He also is a member of the CFO Advisory Group of the District of Columbia. Additionally, he serves on the Board of Directors of the Global Environment and Technology Foundation and Tompkins Builders Inc. He has been economic advisor to Fairfax County, Va., since 1995 and has been appointed by the Board of Supervisors to serve on the Board of Directors of the Fairfax County Convention and Visitors Authority. In 2007, he was appointed by Cardinal Bank as its Chief Economist.

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