

The Contribution of Office, Industrial and Retail Development and Construction to the U.S. Economy

2008 Edition

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Director, Center for Regional Analysis
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CONSTRUCTION



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**Prepared for and Funded by
the NAIOP Research Foundation**

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McGraw-Hill Construction**

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About NAIOP

NAIOP is the nation's leading trade association for developers, owners, investors and other professionals in industrial, office and mixed-use real estate. Founded in 1967, NAIOP comprises more than 17,500 members in 55 North American chapters and provides networking opportunities, educational programs, research on trends and innovations and strong legislative representation. For more information, visit www.naiop.org.

The NAIOP Research Foundation was established in 2000 as a 501(c)(3) organization to support the work of individuals and organizations engaged in real estate development, investment and operations. The Foundation's core purpose is to provide these individuals and organizations with the highest level of research information on how real properties, especially office, industrial and mixed-use properties, impact and benefit communities throughout North America. The initial funding for the Research Foundation was underwritten by NAIOP and its Founding Governors with an endowment fund established to fund future research. For more information, visit www.naiopr.org.

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Requests for funding should be submitted to research@naiop.org. For additional information, please contact Sheila Vertino, NAIOP Research Foundation, 2201 Cooperative Way, Herndon, VA, 20171, at (703) 904-7100, ext. 121 or vertino@naiop.org.



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About this Report

It is important to remember that the data collection measures included in this report should be regarded as guidelines rather than as absolute standards. The information readily available may differ according to the geographic area in question, and results may vary accordingly. Local and regional economic performance is a key factor. Further study and evaluation are recommended before any investment decisions are made.

This project is intended to provide information and insight to industry practitioners and does not constitute advice or recommendations. NAIOP disclaims any liability for action taken as a result of this project and its findings.

Executive Summary

The value of commercial buildings extends well beyond their initial construction value. In order to establish the full measure of this value, the pre-construction, construction and post-construction outlays associated with commercial buildings must be calculated. The direct spending for construction-related services and materials and the operations of completed buildings all generate additional jobs and payroll, which in turn are re-spent within the local and national economies, generating additional economic benefits. The total economic impact of these initial or direct construction-related outlays can be calculated by applying national and state (and local multipliers) that measure their total contribution to the economy (Gross National Product), the new personal earnings generated and the total jobs supported throughout the economy (in addition to the direct construction jobs). A complete accounting of these economic impacts encompasses the full range of pre- and post-construction activities and their direct and indirect (and induced) effects on the national economy as the direct construction-related expenditures are re-spent over and over again within the economy.

Key Terms

Gross Domestic Product (GDP) – the value of goods and services produced within the economy of the respective geographic area (nation, state).

Hard Costs – a category of construction costs that reflects the outlays for the building construction phase. Cost of labor and materials are the two primary categories. Hard costs exclude soft costs, site development and tenant improvements.

Total construction spending in the United States in 2007 totaled \$1.16 trillion, accounting directly for approximately 8.5 percent of the nation's economy—its Gross Domestic Product (GDP). Non-residential construction outlays accounted for 34.4 percent of all construction spending increasing its share for a second year since residential building spending began to decline in 2006. As a result of its increased spending, non-residential building construction spending has helped to smooth out the variability in the other categories of construction spending over the current slowing in the business cycle and should continue to do so until the residential building sector recovers.

In 2007, non-government office, industrial, warehouse and retail construction spending totaled \$89.2 billion and added 839 million square feet of building space to the existing inventory of 31.6 billion square feet existing in 2006. **The combined direct and indirect impacts of these outlays added \$283.7 billion to the national economy (GDP) in 2007 as the full impact of the direct construction spending (payroll and purchases) circulated through the economy. This construction spending supported 2.5 million jobs (full-time, year-round equivalent) across all sectors of the economy with personal earnings of \$85.5 billion.**

Hard costs accounted for 51 percent of the construction budget for the office, industrial, warehouse and retail building space in 2007, with the remaining 49 percent including soft costs, site development costs and outlays for tenant improvements. This construction-related spending totaled an estimated \$85.5 billion and contributed \$265 billion to the nation's GDP. This direct construction-related spending supported a total of 2.4 million jobs and generated \$84.7 billion in new personal earnings.

Note: This executive summary has been prepared solely to provide a general overview. It should not be relied upon for any purpose except that for which it was prepared. Please rely on the full report for detailed information about findings, definitions and discussion points.



Economic Benefits of Office, Industrial, Warehouse and Retail Construction Spending in 2007
(\$s in billions, jobs in millions)

Sources	Direct Outlays	Total Output	Personal Earnings	Jobs Supported
Construction	\$174.7	\$548.7	\$170.2	4.9
Hard Costs	89.2	283.7	85.5	2.5
Other*	85.5	265.0	84.7	2.4

*Other = Soft costs, site improvements, tenant improvements

Key Points

- Non-government office, industrial, warehouse and retail construction spending totaled \$274.7 billion, adding 839.0 million square feet of building space to the existing commercial inventory
- Combined direct and indirect impacts of construction spending added \$548.7 billion to the national economy in 2007 and supported 2.5 million full-time, year-round equivalent jobs with personal earnings of \$85.5 billion
- Operating outlays associated with the office, industrial, warehouse and retail space built in 2007 alone are estimated to total \$2.4 billion annually
- The 839.0 million square feet of new space built in 2007 provided space to house 2.0 million workers

While the construction impacts of building 851.5 million square feet of new building space represents a significant contribution to GDP and job and income growth nationwide, these new buildings continue to provide economic benefits to their host economies after their construction is complete. These economic impacts include outlays required to maintain and operate these buildings and the value of their productive output. **The operating outlays associated with the office, warehouse and retail space built in 2007 are estimated to total \$2.4 billion annually. This direct spending of building operations would add \$5.1 billion to GDP, support 56,887 new jobs and generate \$1.6 billion in new personal earnings. These operating outlays are annual and recur yearly over the life span of the building.**

Similarly, the potential productive value of these new building spaces represent a significant annual contribution to the local, state and national economies. The actual total output value of this new space is the sum of the value of the work done in these buildings. A partial measure of this total value is represented by the jobs that could be housed in this space and the earnings that these jobs may generate. **Using standard jobs-per-square foot estimates, this new space could house 2 million jobs with an annual payroll of \$86.2 billion.**

The magnitude of economic impacts associated with the building industry has been shown to be a large and a significance source of new jobs and income. Additionally, this new building space—office, industrial, warehouse and retail—provides the essential capacity required for the economy to grow each year. The 839 million square feet of new space added to the productive capacity of the national economy in 2007 provided space to house 2 million workers. These jobs, the payroll they support, the value of the work they perform and the operations of this building space are essential to the vitality of the national economy.

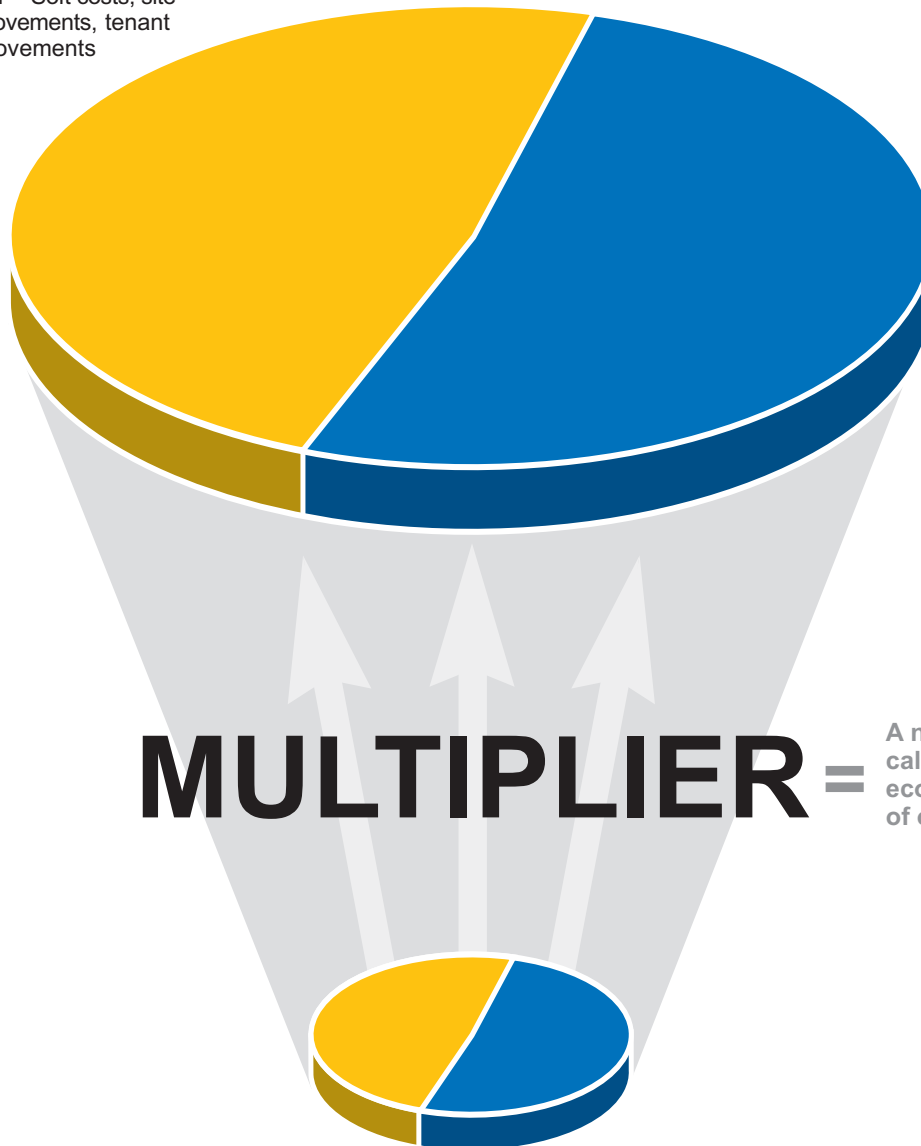
Figure 1
How Commercial Building Construction Contributes to the U.S. Economy

TOTAL IMPACT = \$548.7 billion

OTHER*
48%, \$265 billion

*Other = Soft costs, site improvements, tenant improvements

HARD COSTS
52%, \$283.7 billion



OTHER
49%, \$85.5 billion

HARD COSTS
51%, \$89.2 billion



Introduction

The value of commercial building construction is much more than the sum of pre-construction (soft costs) and construction outlays (site development, building construction and tenant improvements). Additionally, commercial buildings generate continuing post-construction value within the local and national economies as a result of the spending associated with their operations and the value of output generated by the workers and businesses they house. The full contribution of office, industrial, warehouse and retail development (construction and operations) to the nation's GDP consists of this annual direct spending and the cumulative economic benefits resulting from the re-spending of these outlays that supports jobs across all sectors of the economy and generates new personal earnings to the benefit of the local and national economy.

While the economic contributions accruing from the construction of new buildings is widely understood and valued, the pre-construction and post-construction impacts are often overlooked and undervalued. The job growth and income generated and supported by annual building operations represent a continuing flow of expenditures into the local economy that extend over the life of the structures. Additionally, these new buildings represent an expansion of the productive capacity of their host economies. The jobs and output associated with the newly built capacity contribute significant annual benefits to the local and national economies. As these post-construction benefits are cumulative, their economic impacts become increasingly significant to the economy's growth expanding and extending the initial economic benefits of the larger up-front construction outlays.

Understanding the range and magnitude of the industry's contributions to the local and national economies, and their patterns of performance over the business cycle, is important for local, state and national government officials, investors, developers and builders so that they can better manage the development process to the benefit of the economy's performance. The analyses presented in this report define the economic impacts of this industry highlighting the economic impacts flowing from office, industrial, warehouse and retail construction and operations.



Commercial Construction Counterbalances Residential

As residential building construction spending declined, spending for non-residential building construction grew. These offsetting trends have been reinforced by gains in non-building spending.

According to the U.S. Census Bureau, construction spending in the United States totaled \$1.16 trillion in 2007. This construction spending consisted of residential and non-residential buildings and non-building construction outlays. These are shown in Table 1, U.S. Total Construction Spending, 2007.

Residential construction spending declined in 2007 (and in 2006) after growing in each year since 1995. The contraction of the residential building sector in 2007 more than offset the increased spending for commercial and non-building construction resulting in a 2.3 percent decline in construction spending overall. In contrast to the contraction being experienced in the residential sector, spending for non-residential buildings increased 17.2 percent and non-building construction grew by 13 percent.

Non-residential building construction accounted for \$400.6 billion or 34.4 percent of all construction spending in 2007. In comparison, in 2005, non-residential spending (\$317.2 billion) accounted for 27.7 percent of total construction spending. This substantial shift in construction spending across major building classes illustrates the cyclical differences that characterize the different market segments in the construction industry.

Less significant shifts in construction spending are evident within non-residential building construction as presented in Table 2. Non-residential construction includes nine major building types. Among these, office, manufacturing (industrial), warehouse (flex) and retail accounted for approximately 47 percent of total new construction spending.

The patterns of total construction spending by major category over the business cycle reveal important differences. These patterns are shown in Figure 3 for the 1995-2007 period. The cyclical patterns of construction spending for residential and non-residential building and non-building (largely public) construction spending provide a sequence in which the increases and decreases in one type of construction have been compensated for by corresponding changes in the other types of construction spending so that construction outlays continue to underpin the national economy throughout the business cycle. This pattern is particularly evident since 2005. **As residential building construction spending declined, spending for non-residential building construction grew. These offsetting trends have been reinforced by gains in non-building spending. In 2007, the value of these two growing segments of the construction industry totaled \$579.78 billion, up \$45.8 billion or 8.6 percent from their value in 2006, while the value of residential construction in 2007 was down by \$20 billion or 3.2 percent from 2006.**



Table 1

U.S. Total Construction Spending, 2007
(in billions of 2007 dollars)

Type	Value	Percent Change*
Residential	\$360.7	-23.7%
Residential Improvements**	174.3	-0.3%
Nonresidential Building	400.6	17.2%
Nonbuilding***	229.2	13.0%
Totals	1,164.8	-2.3%

Sources: U.S. Department of Commerce, Census Bureau

*change in value between 2006 and 2007

**includes remodeling, renovation, and replacement work

***infrastructure such as water and sewer, highways, power, transport

Table 2

U.S. Nonresidential Construction Spending, 2007
(in billions of 2007 dollars)

Type	Value	Percent Change*
Lodging	\$30.1	66.8%
Office	65.7	20.3%
Commercial (retail)	85.7	13.5%
Health Care	45.2	14.4%
Education	98.5	14.6%
Religious	7.6	-1.2%
Public Safety	10.1	29.6%
Amusement/Recreation	20.6	12.7%
Manufacturing**	37.0	7.4%
Totals***	400.6	17.2%

Sources: U.S. Department of Commerce, Census Bureau

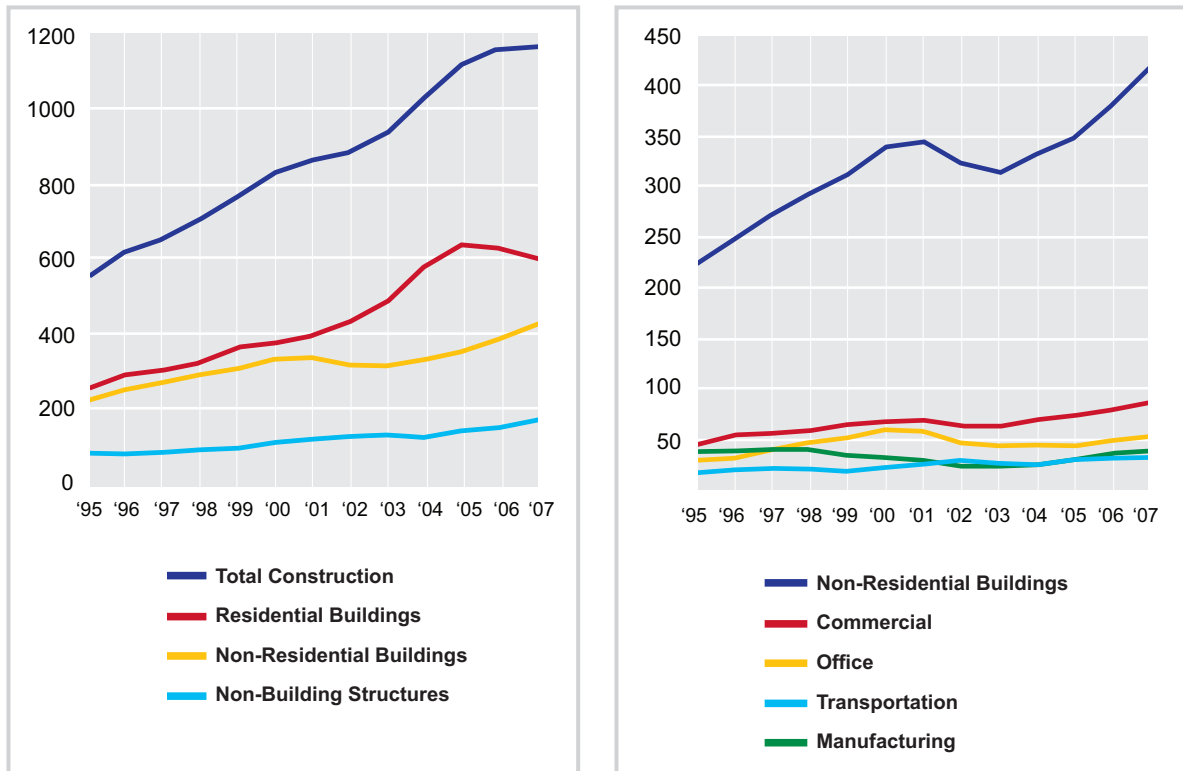
*change in value between 2006 and 2007

**includes warehouse/flex space

*** totals include some miscellaneous state and local government buildings

The 2000-2007 period illustrates these performance differences among major building categories. During the recession of 2001 and continuing into 2002, residential construction slowed and then accelerated in each of the next three years. After peaking in 2005, residential construction spending declined in 2006 by 1.4 percent and 3.2 percent in 2007. Non-residential construction outlays remained strong in 2001, even as the economy slowed, but declined in 2002 and 2003. This lag in construction outlays permitted the commercial building markets to equalize (they are demand-driven) during this period. Declining vacancy rates in 2003 and 2004 supported expanded investment in office, warehouse, retail and other non-residential building categories and total outlays increased, growing 5.4 percent in 2004, 5.7 percent in 2005, 10 percent in 2006 and 9 percent in 2007.

Figure 3
Construction Spending in the United States, 1995-2007
 (in billions of 2007 dollars)



While GDP growth slowed in 2006, and continues to be constrained in response to declining residential construction outlays, compensating increases in outlays for non-residential and non-building structures cushioned the impacts of this slowdown in 2007 and will likely help stabilize the economy's performance in 2008.

Within the non-residential construction category, office construction was the most volatile, declining in 2001, 2002 and 2003 before increasing in 2004, while commercial (retail) declined only slightly in 2002 and 2003 before resuming its upward trend in 2004 and continuing on through 2007. Construction spending for transportation (warehousing) declined only in 2003, while outlays for manufacturing (industrial) construction fell sharply in 1999 (-19%) and declined for five consecutive years losing a total of 47 percent. In 2004, construction spending for manufacturing facilities was up 10.2 percent, and in 2005 construction spending grew a strong 21.5 percent. This upward trend continued in 2006 and 2007, with gains of 16 percent and 14 percent respectively.

This pattern of offsetting construction outlays with growth in non-residential construction spending compensating for declining residential construction spending has become most evident since 2005. **While GDP growth slowed in 2006, and continues to be constrained in response to declining residential construction outlays, compensating increases in outlays for non-residential and non-building structures cushioned the impacts of this slowdown in 2007 and will likely help stabilize the economy's performance in 2008.**

...the total impact of construction spending — direct, indirect and induced — on the U.S. economy in 2007 accounted for 28.8 percent of all economic activity that year.

Economic Impacts of Construction Spending

Total direct construction spending in the United States in 2007 was \$1.16 trillion and accounted directly for 8.4 percent of the nation's GDP of \$13.8 trillion. The direct construction spending also generates new personal earnings and supports jobs across all sectors of the economy.

In 2007, the \$1.16 trillion in direct construction spending:

- supported 33.2 million jobs throughout the U.S. economy; and
- generated personal earnings totaling \$1.225 trillion.

With an output multiplier of 3.423, each dollar of this construction spending generated an additional \$2.42 of value to the economy reflecting the cumulative effects of the initial construction outlay as it was re-spent throughout the economy. Applying this multiplier to the total value of direct construction spending in 2007 increases the value of its overall contribution to GDP to \$3.97 trillion or 28.8 percent; that is, **the total impact of construction spending—direct, indirect and induced—on the U.S. economy in 2007 accounted for 28.8 percent of all economic activity that year.**

In 2007, non-government office, industrial, warehouse and retail building construction totaled 839 million gross square feet of new building space and accounted for outlays totaling \$89.2 billion (see Table 3). The economic impact of this construction activity can be calculated by applying the national construction multipliers for its contribution to GDP (3.423), personal earnings (1.0521) and employment (28.5). State multipliers for the construction industry are included in Appendix H. *It should be noted that individual state construction multipliers are smaller than the U.S. multipliers as they reflect a smaller portion of construction outlays that are retained within the respective state economy and exclude the construction-related spending flows that leak out of the state economy to other states.* The smaller states and state economies that are less well developed tend to retain smaller portions of the benefits from construction spending as these circulate through the national economy.

Table 3

Office and Industrial Construction in the United States, 2007 (square feet in millions, values in billions of 2007 dollars)

Building Type	Square Feet	Construction Value
Office	212.4	\$31.2
Industrial	78.6	16.5
Warehouse and Transportation	239.4	12.6
Retail and Entertainment	308.4	28.9
Totals	839.0	89.2

Sources: McGraw-Hill Construction Analytics; GMU Center for Regional Analysis

See Appendix D.



The \$89.2 billion in construction spending (hard costs) for office, industrial, warehouse and retail buildings in 2007 added \$194.5 billion in indirect (and induced) benefits to the national economy for a total contribution of \$283.7 billion to GDP (see Table 4). The complementary pre-construction and non-building construction outlays that are linked to these hard costs (soft costs, site development and tenant improvements) totaled \$85.5 billion or 48.9 percent of total building costs. Adding these direct outlays and their indirect and induced benefits to those generated by the outlays for hard costs increases their total contribution to the nation's GDP to \$548.7 billion in 2007.

The total direct spending of \$174.7 billion that underlies this contribution to total output also:

- supported 24.9 million jobs (full-time equivalent, year-round) during 2007;
- generated new personal earnings totaling \$170.2 billion

Table 4

Summary of Office, Industrial, Warehouse and Retail Construction and Annual Operations Impacts on the U.S. Economy, 2007
(in billions of 2007 dollars)

Sources	Direct Outlays	Total Output (1)	Personal Earnings (2)	Jobs Supported (3)
Construction	\$174.73	\$548.74	\$170.17	\$4,898,946
Soft Costs	27.91	81.77	29.45	773,234
Site Dev.*	30.03	95.52	28.79	843,961
Hard Costs	89.20	283.71	85.50	2,506,627
Tenant Imp.**	27.58	87.73	26.44	775,124
Operations	2.43	5.06	1.59	56,887

Sources: McGraw-Hill Construction Analytics; GMU Center for Regional Analysis

Notes: (1) the total value of goods and services generated directly and indirectly as a result of the initial construction outlays within the United States; (2) the additional earnings generated within the United States from direct outlays during the construction phase; (3) the additional new jobs supported nationwide by the spending and re-spending of direct outlays associated with the outlays for new construction.

*Site development includes grading, infrastructure, parking and landscaping.

**Tenant improvements exclude furniture and equipment.

See Appendices F and G.

Calculating Economic Impact

Existing National Inventory of Space (in billions of square feet)

Office	7.89
Industrial	16.47
Retail	8.03
Total	32.39

The full measure of the economic impact of office, industrial, warehouse and retail construction must include all the outlays associated with the development process—soft costs, site development costs, hard costs and costs associated with tenant improvements. In addition to the wide range of onsite construction services, these outlays also support a wide range of professional and business services, including:

- Architecture and engineering services;
- Legal services;
- Marketing and management services;
- Grading, paving and landscaping services;
- Site engineering services;
- Interior design and construction services.

This combination of outlays for pre-construction, construction and post-construction activities required to deliver buildings ready for occupancy represent this industry's total direct contribution to the national and local economies. It provides the appropriate basis for calculating the economic impacts of this spending as represented by its contribution to Gross Domestic Product (GDP), personal earnings and employment.





Calculating the Economic Impact of Soft Costs, Site Development Costs and Outlays for Tenant Improvements

To estimate these non-hard cost expenditures, NAIOP surveyed office, industrial warehouse and retail developers in April 2007. This survey duplicated a similar survey conducted in November 2006. The survey methodology and results are reported in Appendix I. The findings from these two surveys were combined for use in calculating the distribution of these complementary costs by building type relative to their respective outlays for hard costs. In total, the soft costs, site development costs and outlays for tenant improvements in 2007 totaled an estimated \$85.5 billion and accounted for 48.9 percent of the \$174.7 billion in total construction spending inclusive of hard costs.

This additional spending that is linked directly to the hard cost outlays is presented in Table 5. The variations in the distribution of these costs by building type reflect differences in building design and function.

Table 5

**Estimated Outlays by Building Category:
Soft Costs, Site Development and Tenant Improvements, 2007**
(in billions of 2007 dollars)

Sources	Soft Costs	Site Development	Tenant Improvements	Totals
Office	\$10.88	\$9.44	\$11.39	\$31.72
Industrial	4.02	5.78	4.18	13.98
Warehouse	3.29	4.11	3.23	10.63
Retail	9.72	10.71	8.78	29.21
Total	27.91	30.03	27.58	85.53

Sources: NAIOP; GMU Center for Regional Analysis

See Appendices B, C, and E.

The direct spending associated with soft costs (financing fees, insurance and taxes are not included as these have little immediate economic impact), site development costs and outlays for tenant improvements generate economic impacts beyond the initial value of these outlays. These economic impacts are calculated by applying national multipliers to determine their contributions to GDP, personal earnings and employment. Composite multipliers were developed to reflect the mix of services and activities associated with each category of outlay:

Soft Costs:

- For each \$1 of soft cost expenditure, a total contribution to GDP of \$2.93 is generated;
- For each \$1 million of soft cost outlays personal earnings increase by \$1,055,000 and 27.7 jobs are supported.

Site Development:

- For each \$1 of site development and tenant improvement spending, a total contribution to GDP of \$3.18 is generated.
- For each \$1 million of site development and tenant improvement outlays, personal earnings increase by \$958,514 and 28.1 jobs are supported.

Nationwide, the \$27.9 billion in direct soft cost outlays in 2007

- added \$81.8 billion to the nation's economy (GDP);
- generated \$29.4 billion in new personal earnings for U.S. residents; and
- supported 773,233 jobs.

Site development outlays of \$30 billion in 2007

- added \$95.5 billion to the U.S. economy (GDP);
- generated \$28.8 billion in new personal earnings for U.S. residents; and,
- supported 843,961 jobs.

Tenant improvement outlays of \$27.6 billion in 2007

- Added \$87.7 billion to the U. S. economy (GDP);
- Generated \$26.4 billion in new personal earnings for U.S. residents; and
- Supported 775,124 jobs.



These economic impacts for office, industrial, warehouse and retail construction in 2007 are shown in Table 6.

Table 6				
The Impacts of Construction Outlays for Soft Costs, Site Development And Tenant Improvements on the U.S. Economy, 2007				
(in billions of 2007 dollars)				
Sources	Direct Outlays	Total Output (1)	Personal Earnings (2)	Jobs Supported (3)
Office				
Soft Costs	10.88	31.87	11.48	301,365
Site Dev.*	9.44	30.03	9.05	265,356
Tenant Imp.**	11.39	36.24	10.92	320,175
Totals	31.72	98.14	31.45	886,896
Industrial				
Soft Costs	4.02	11.78	4.24	111,416
Site Dev.	5.78	18.37	5.54	162,295
Tenant Imp.	4.18	13.30	4.01	117,481
Totals	13.98	43.45	13.79	391,192
Warehouse				
Soft Costs	3.29	9.64	3.47	91,180
Site Dev.	4.11	13.07	3.94	115,461
Tenant Imp.	3.23	10.27	3.10	90,766
Totals	10.63	32.98	10.51	297,408
Retail				
Soft Costs	9.72	28.48	10.25	269,272
Site Dev.	10.71	34.05	10.26	300,849
Tenant Imp.	8.78	27.92	8.42	246,702
Totals	29.21	90.45	28.93	816,823
Totals				
Soft Costs	27.91	81.77	29.45	773,234
Site Dev.	30.03	95.52	28.79	843,961
Tenant Imp.	27.58	87.73	26.44	775,124
Totals	85.53	265.03	84.67	2,392,318

Sources: NAIOP; GMU Center for Regional Analysis

Notes: (1) the total value of goods and services generated directly and indirectly as a result of the initial construction outlays within the United States; (2) the additional earnings generated within the United States from direct outlays during the construction phase; (3) the additional new jobs supported nationwide by the spending and re-spending of direct outlays associated with the outlays for new construction.

*Site development includes grading, infrastructure, parking and landscaping.

**Tenant improvements exclude furniture and equipment.

See Appendices B, C and E.



Calculating the Economic Impact of Hard Costs

The U.S. Census reported that construction spending in 2007 totaled \$1.16 trillion, with non-residential building construction outlays totaling \$400.6 billion. Construction spending (hard costs only) reported by McGraw-Hill Construction Analytics for office, industrial, warehouse and retail structures totaled \$89.2 billion and represented the addition of 839 million square feet of new building space in 2007. By applying the national construction multiplier for office, industrial and commercial building construction of 3.1805, the full economic impact of this spending (contribution to GDP) can be calculated to have been \$283.7 billion (see Table 7). These direct and indirect and induced benefits supported 2.5 million jobs across all sectors of the economy and generated \$85.5 billion in new personal earnings.

Table 7

The Impacts of Direct Construction Outlays on the U.S. Economy, 2007 (in billions of 2007 dollars)

Sources	Direct Outlays	Total Output (1)	Personal Earnings (2)	Jobs Supported (3)
Office	\$31.2	\$99.3	\$29.9	877,693
Industrial	16.5	52.5	15.8	463,729
Warehouse	12.6	40.1	12.1	354,476
Retail	28.9	91.8	27.7	810,729
Totals	89.2	283.7	85.5	2,506,627

Sources: McGraw-Hill Construction Analytics; GMU Center for Regional Analysis
 Notes: (1) the total value of goods and services generated directly and indirectly as a result of the initial construction outlays within the United States; (2) the additional earnings generated within the United States from direct outlays during the construction phase; (3) the additional new jobs supported nationwide by the spending and re-spending of direct outlays associated with the outlays for new construction.

See Appendix D.

Construction Value by State

The 10 states with the largest construction values accounted for almost 55 percent of the construction outlays in the United States, while the top 20 states accounted for almost 78 percent of these outlays. The most populous states and those with the largest and fastest growing economies tend to rank highest by value of construction outlay although there are variations depending on building type. This is especially the case with industrial building outlays that was lead by South Carolina with Iowa ranking second—neither were ranked in the top 10 in 2005.



Still, several of the traditional industrial states continue to rank high for industrial construction outlays while states that have comparative transport advantages often rank higher for warehouse construction outlays than their population sizes alone would support. These states are identified and shown in rank order by value of construction in Table 6 and Figure 2. The values for all states are shown in Appendix Tables 1-7.

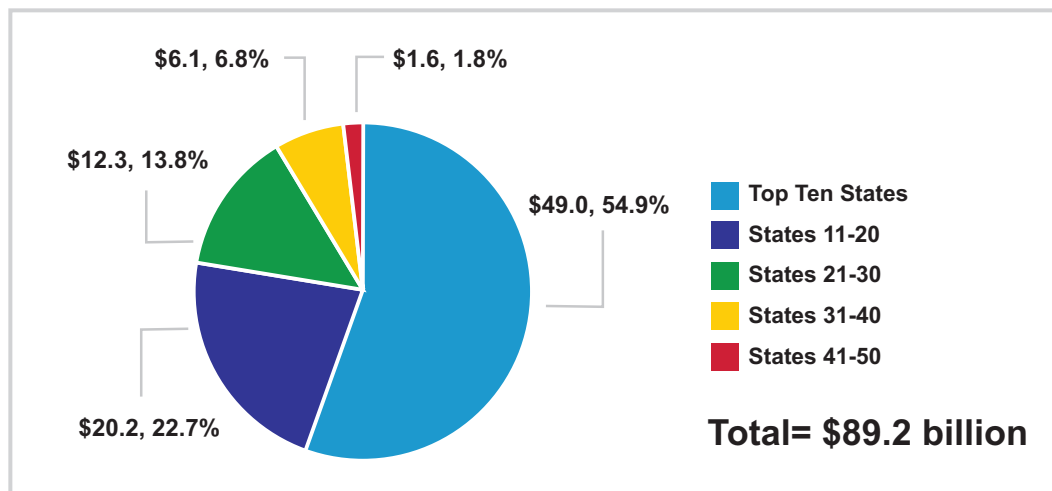
Table 8
Top 10 States by Construction Value, 2007

Ranking	Office	Industrial	Warehouse	Retail	All Categories
1	Texas	South Carolina	Texas	Florida	Texas
2	California	Iowa	Florida	California	Florida
3	Florida	Indiana	California	Texas	California
4	New York	Louisiana	Illinois	New York	New York
5	North Carolina	Georgia	Georgia	Illinois	South Carolina
6	Georgia	New York	Arizona	Georgia	Georgia
7	Illinois	Ohio	Pennsylvania	Arizona	Illinois
8	Arizona	Utah	New Jersey	Ohio	Arizona
9	Washington	Texas	Indiana	Nevada	North Carolina
10	Tennessee	Pennsylvania	Ohio	North Carolina	Indiana

Sources: McGraw-Hill Construction Analytics; GMU Center for Regional Analysis

See Appendices A and D.

Figure 2
Top 10 States by Construction Value in Four Categories, 2007
(hard costs only in billions of 2007 dollars)





Calculating the Economic Impact of Building Operations

The existing stock of built space represents a large and continuing source of economic activities that support job and income growth across the full breadth of local and state economies. While the construction outlays associated with new building in 2007 represent a significant contribution to the national economy, once the construction is complete, these benefits end. However, the outlays that support the new buildings' operations add on-going annual sources of economic benefits that accumulate over the life span of the buildings. As a result, these costs extend and magnify the economic benefits that the construction of office, industrial, warehouse and retail buildings has on their host economies.

Building operations includes outlays for regular maintenance and repair, custodial (cleaning) services, utilities and management. Management outlays represent a wide range of services including building supervision, marketing, leasing, security, building engineering services, finance and accounting. Each of these services has a multiplier effect on the economy and supports on- and off-site jobs within the local, regional and national economies and generates additional personal earnings to the benefit of local residents. These multipliers vary by type of service and state (see Appendix Tables H-3 to H-7). A sampling of national multipliers is presented in Table 9.

Table 9

Total Output, Income and Employment Multipliers for Selected Categories of Buildings Operations

Categories	Total Output (1)	Personal Earnings (2)	Employment (3)
Building Services	2.96	0.93	37.74
Management	2.97	1.08	29.69
Utilities	2.53	0.65	15.37

Sources: U.S. Department of Commerce, Bureau of Economic Analysis

Notes: (1) the total value of goods and services generated directly and indirectly as a result of the initial construction outlays within the United States; (2) the additional earnings generated within the United States from direct outlays during the construction phase; (3) the additional new jobs supported nationwide by the spending and re-spending of direct outlays associated with the outlays for new construction.

See Appendix H.



The 839 million square of new office, industrial, warehouse and retail building space built in 2007 will require \$2.4 billion in annual operating outlay to maintain and service.

Each year these new operating outlays will

- **contribute \$5.1 billion to the national economy (GDP);**
- **support 56,887 jobs; and**
- **generate total personal earnings of \$1.588 billion.**

These economic impacts are presented by building type in Table 10. The cumulative economic impact of these outlays for building operations is illustrated by adding these new operating outlays for building added to the stock in 2007 to the operating outlays associated with the total commercial building stock existing in 2006 (31.6 billion square feet would generate operating expenditures estimated to total \$73.1 billion in 2007).

Table 10
Annual Impacts of Post-Construction Outlays on the U.S. Economy, 2007
(in millions of 2007 dollars)

Sources	Direct Outlays	Total Output (1)	Personal Earnings (2)	Jobs Supported (3)
Office	\$1,435.1	\$2,980.4	\$931.7	33,303
Industrial	70.2	143.2	44.9	1,706
Warehouse	156.9	332.2	103.2	3,722
Retail	771.1	1,601.2	507.9	18,156
Totals	2,433.3	5,057.0	1,587.8	56,887

Sources: BOMA; McGraw-Hill Construction Analytics; GMU Center for Regional Analysis
Notes: (1) the total value of goods and services generated directly and indirectly as a result of building operating outlays within the United States; (2) the additional earnings generated within the United States from outlays for building operations; (3) the additional new jobs supported nationwide by the spending and re-spending of outlays associated with building operations. Operations impacts include maintenance and repair, cleaning, utilities, roads and grounds, security and administrative expenses.

See Appendix G.

These new buildings house workers and business activities that are generated by the expansion of the national economy. While the value of this added productive capacity depends on the usage of each building, one measure of the value of this work is the jobs and payroll they support. Using a standard jobs-per-square-foot estimate for each category of building, the total number of employees that could be housed within the buildings built in 2007 can be calculated. The total payroll value of

The total post-construction value of this new office, industrial, warehouse and retail space to local, state and national economies includes these buildings' daily operations and the productive capacity they add to the existing building stock.

these new workers also can be calculated by multiplying this employment estimate by the U.S. average wage earnings per worker respectively for jobs associated with each category of building.

These calculations are presented in Table 11 and show that the 839,000 square of new office, industrial, warehouse and retail building space constructed in 2007 will have the capacity to house 2 million new workers with a total estimated payroll of \$86.2 billion.

The actual value of this work and its contribution to GDP is a multiple of payroll as output value, and must generate sufficient income to cover not only the costs of payroll but also the outlays associated with business operations, payments to vendors, profit and taxes. **The total post-construction value of this new office, industrial, warehouse and retail space to local, state and national economies includes these buildings' daily operations and the productive capacity they add to the existing building stock. These contributions to the economy include jobs, income and the economic activities supported by the spending and re-spending of this new income as it circulates throughout the local and national the economies.**

Table 11

Employment and Income Impacts of the Office, Industrial, Warehouse and Retail Building Space Constructed in 2007

(square feet in millions; jobs in thousands; payroll in billions of dollars)

Building Category	Square Feet	Sq. Ft. per Job	New Jobs	Average Earnings	Total Earnings
Office	212.4	215	988.09	\$40,840	\$40.35
Industrial	78.6	900	87.39	74,660	6.52
Warehouse	239.4	900	266.03	70,735	18.82
Retail	308.4	450	685.43	29,890	20.49
Totals	839.0	414	2,026.94	42,520	86.18

Sources: GMU Center for Regional Analysis; NPA Data Services, Inc.

