



2017 EDITION

Economic Impacts of Commercial Real Estate

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

**Construction data provided by
Dodge Data & Analytics**

By

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About NAIOP

NAIOP, the Commercial Real Estate Development Association, is the leading organization for developers, owners and related professionals in office, industrial, retail and mixed-use real estate. NAIOP comprises some 18,000 members in North America. NAIOP advances responsible commercial real estate development and advocates for effective public policy. For more information, visit 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 naiop.org/research.

About Dodge Data & Analytics

Dodge Data & Analytics is the leading provider of data, analytics, news and intelligence serving the North American construction industry. The company's information enables building product manufacturers, general contractors and subcontractors, architects and engineers to size markets, prioritize prospects, target and build relationships, strengthen market positions and optimize sales strategies. The company's brands include Dodge, Dodge MarketShare™, Dodge BuildShare®, Dodge SpecShare®, Sweets, Architectural Record and Engineering News-Record. For more information, visit construction.com.

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They can be found at naiop.org/contributions2017.**

- Appendix A: Soft Costs Impacts by States
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Disclaimer

The data collection measures included in this report should be regarded as guidelines rather than as absolute standards. The data 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.

Introduction

Since 2008, NAIOP has conducted this study for purposes of estimating the annual economic contribution of commercial real estate development to the U.S. economy. The study uses key data sets from the U.S. Census Bureau and Dodge Data & Analytics (formerly McGraw-Hill Construction). (Dodge Data & Analytics, which purchased McGraw-Hill Construction in 2014, made no changes to its data or data capture methodologies.) It applies several processes and methodologies to take “snapshots” of the commercial real estate development industry from various angles and across several scales.

At the greatest scale, the study calculates the contribution of building and nonbuilding construction to the U.S. economy for the year in review. The product types included in this broad measure are residential, nonresidential and infrastructure projects in the construction pipeline, based on U.S. Census data on the value of construction put in place. Appropriate multipliers supplied by the Bureau of Economic Analysis are applied to reflect the effects of construction expenditures on U.S. gross domestic product (GDP), the associated generation of new personal earnings and the jobs supported by these direct expenditures. (See Table 1.)

Table 1
Economic Contributions from Building and Nonbuilding Construction

Year	Direct Expenditures (In Billions of Dollars)	Total Economic Contribution ¹ to GDP (In Trillions of Dollars, Includes Multiplier Effect)	Percent Contribution to U.S. GDP	Personal Earnings ² (In Billions of Dollars, Includes Multiplier Effect)	Jobs Supported ³ (In Millions, Includes Multiplier Effect)
2016	\$1,160.0	\$3.376	18.3%	\$ 1,068.2	23.8
2015 ⁴	1,104.2	3.214	17.9	1,016.9	22.7
2014	993.4	2.891	16.6	914.8	20.4
2013	910.8	2.80	16.7	887.0	21.3
2012	857.0	2.65	16.3	836.9	20.1
2011	787.4	2.27	15.0	677.0	17.2
2010	803.6	2.31	15.9	691.0	17.6
2009	907.8	2.90	20.5	870.0	24.0
2007	1,160.0	3.97	28.8	1,225.0	33.2

Sources: U.S. Census, Value of Construction Put in Place; GMU Schar School of Policy and Government, Stephen S. Fuller Institute

¹ The total value of goods and services generated directly and indirectly as a result of construction and related expenditures within the U.S.

² The additional earnings (wages and salaries) generated within the U.S. from construction and related expenditures.

³ The jobs supported by the spending and re-spending of direct expenditures for all phases of development and operations.

⁴ Revised 2015 data for construction spending.

Note: Data include construction of residential and nonresidential buildings as well as infrastructure for water, sewer, highways and power. Values in all tables in this study may not add up due to rounding.

Zeroing in exclusively on commercial real estate — the core of this study — the analysis begins with Dodge Data & Analytics data relating to square footage and values for office, industrial, warehouse and retail projects. It examines expenditures made during four distinct phases of the development process, including pre-construction (soft costs), site development, on-site construction (hard costs) and tenant improvements. (Financing fees, insurance and taxes are not included in this analysis within the soft construction costs category, because they have little immediate economic impact.)

This study also examines the contribution of building operations, which are reported as a stand-alone phase that follows development. The impacts are shown for the estimated 410.1 million square feet of buildings that commenced construction in 2016, according to Dodge Data & Analytics.

Multipliers are applied to the direct expenditures to calculate the contribution to U.S. GDP, personal earnings and jobs supported during each distinct development phase. Apartment and hotel properties are not included in these calculations. (See Table 2.)

The full measure of the economic impact of office, industrial, warehouse and retail development includes all of the expenditures associated with each phase of the development process. In addition to the wide range of on-site construction services, these expenditures 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 spending for pre-construction, construction and post-construction activities required to deliver buildings ready for occupancy represents the development industry's total direct contribution to national, state and local economies. It provides the appropriate basis for calculating the economic impacts of this spending as represented by its contribution to GDP, personal earnings (wages and salaries) and employment.

Table 2
Economic Contributions to the U.S. Economy from Development of Commercial Real Estate Buildings

		Development Phases					Operations Phase
		Pre-Construction	Construction			Totals	Post-Construction
		Soft Construction (Soft Costs)	Site Development	Hard Construction (Hard Costs)	Tenant Improvements		Building Operations
		architecture, engineering, legal, marketing, management, administration	grading, paving, landscaping, roadway, parking, off-site improvements	labor, materials, construction management	interior design and construction (excludes furniture and equipment)		maintenance, repairs, custodial, utilities, property management
Direct Expenditures (In Billions of Dollars)	2016	\$25.06	\$21.42	\$ 82.96	\$30.60	\$ 160.04	\$1.42
	2015	23.84	20.20	81.17	29.80	155.01	1.39
	2014	27.64	28.56	87.76	30.35	174.31	1.34
	2013	19.66	21.07	61.65	21.84	124.22	1.11
	2012	15.88	17.34	49.18	17.73	100.13	0.96
In 2016, direct expenditures of \$160.041 billion contributed \$464.99 billion to U.S. GDP.							
Total Economic Contribution¹ to GDP (In Billions of Dollars, Includes Multiplier Effect)	2016	\$72.19	\$62.34	\$241.40	\$89.06	\$464.99	\$3.74
	2015	68.68	58.79	236.20	86.71	450.38	3.67
	2014	75.54	88.12	270.77	93.66	528.09	3.71
	2013	53.73	65.00	190.22	67.40	376.35	3.07
	2012	43.39	53.51	151.75	54.71	303.36	2.64
In 2016, direct expenditures of \$160.041 billion generated \$150.49 billion in personal earnings in the U.S.							
Personal Earnings² (In Billions of Dollars, Includes Multiplier Effect)	2016	\$26.18	\$19.73	\$76.39	\$28.18	\$150.49	\$1.07
	2015	24.91	18.60	74.75	27.44	145.70	1.05
	2014	25.18	27.89	85.70	29.65	168.42	1.17
	2013	17.91	20.57	60.21	21.33	120.02	0.97
	2012	14.46	16.94	48.03	17.32	96.75	0.83
In 2016, direct expenditures of \$160.041 billion supported 3.3 million jobs in the U.S. economy.							
Jobs Supported³ (Includes Multiplier Effect)	2016	538,680	439,801	1,703,149	628,352	3,309,982	27,833
	2015	512,509	414,765	1,666,470	611,755	3,205,499	27,299
	2014	508,712	668,953	2,055,112	710,831	3,943,608	29,398
	2013	361,866	493,314	1,443,779	511,530	2,810,510	24,285
	2012	292,219	406,107	1,151,784	415,236	2,265,346	20,929

Sources: NAIOP; Dodge Data & Analytics; GMU Schar Fuller

¹ The total value of goods and services generated directly and indirectly as a result of construction and related expenditures within the U.S.

² The additional earnings (wages and salaries) generated within the U.S. from construction and related expenditures.

³ The jobs supported by the spending and re-spending of direct expenditures for all phases of development and operations.

Note: Data include office, industrial, warehouse/flex and retail buildings under construction in the year indicated and excludes existing inventory. Operations figures are based on buildings delivered in the year indicated.

This study also includes the economic contributions of existing buildings. Based on the existing stock of commercial buildings, totaling 45.8 billion square feet in 2016, direct expenditures for building operations totaled \$150.1 billion and contributed \$396.0 billion to GDP. These direct expenditures also generated \$113.9 billion in personal earnings (wages and salaries) and supported a total of 2.944 million jobs. (See Table 3.)

Combining the economic contributions of new development with the economic contributions from operations of existing buildings in 2016 (data from Tables 2 and 3), direct expenditures of \$310.1 billion resulted in the following economic contributions to the U. S. economy:

- Contributed \$861.0 billion to U.S. GDP.
- Generated \$264.4 billion in personal earnings.
- Supported a total of 6.25 million jobs.

Table 3 Economic Contribution to the U.S. Economy from Operations of Existing Buildings, 2010-2016 (In Billions of Current Year Dollars)					
Year	Total Square Feet (In Billions)	Direct Expenditures for Building Operations	Total Economic Contribution ¹ to GDP	Personal Earnings ²	Jobs Supported ³ (In Millions)
2016	45.820	\$150.1	\$396.0	\$113.9	2.944
2015	45.070	145.6	384.1	110.1	2.856
2014	44.010	138.1	381.3	120.1	3.023
2013	43.934	134.3	370.9	116.8	2.941
2012	43.208	134.5	371.5	117.0	2.945
2011	42.098	140.7	366.6	107.6	2.758
2010	42.008	134.8	342.4	100.2	2.413

Sources: BOMA; Newmark Grubb Knight Frank (NGKF); GMU Schar Fuller

¹ The total value of goods and services generated directly and indirectly as a result of building operating expenditures within the U.S.

² The earnings generated within the U.S. from direct expenditures for building operations.

³ The jobs supported by the spending and re-spending of direct outlay associated with building operations.

Note: Building operations include maintenance repair, cleaning, utilities, security, building management and administrative expenses; see Appendices for state and building type data.

Economic Contributions

Building and Nonbuilding Expenditures (U.S. Census Data)

The U.S. economy continued its recovery during 2016 although it did not achieve as strong a growth rate as initially projected. Expectations for stronger growth at the beginning of the year were damped early by global uncertainty relating to the European and Asian economies' continuing weak performance, the Brexit vote in Great Britain, the strengthening of the U.S. dollar, continuing weakness in the energy sector, and the slow drawdown on excess domestic inventories. These factors and others combined to cap GDP growth in the first quarter at 0.8 percent followed by a weak 1.4 percent gain in the second quarter. GDP accelerated in the third quarter (3.2 percent) but slowed in fourth quarter with an estimated gain of 1.8 percent. Combined, for the full year, GDP growth is estimated at 1.6 percent for 2016, a full percentage point below beginning-of-the year projections.

Due to this weak performance, the Federal Reserve Board, which raised its benchmark rate a quarter point in December 2015 and expected to continue these increases three or four more times in 2016, raised the federal funds rate just one time, by a quarter point at its December 2016 meeting. However, there are signs of increasing inflationary pressures and the Fed has achieved its full employment goal, suggesting that the federal funds rate could be increased multiple times in 2017.

The wildcard for 2017 is the uncertainty surrounding the economic policies of the new Trump Administration. Expectations for a significant fiscal stimulus have brightened business optimism and pushed the U.S. stock market higher following the election in November. As a result of market gains and rising interest rates, the dollar has also strengthened, further undermining the growth of U.S. exports and increasing demand for imports. Rising commodity prices, especially for petroleum, are likely to fuel these market

dynamics even further. Faster global economic growth will likely result from these global price increases. Faster U.S. GDP growth may also occur in the short term although shortages of qualified labor, higher consumer prices and rising inflationary pressures may result in accelerating interest rate increases designed to dampen these growth pressures before they damage the economy's longer-term outlook.

Construction Activity Contributes to Ongoing Economic Growth in 2016. A key factor in the economy's growth in 2016 was the continuing expansion of the construction sector, with construction spending increasing each year since 2011, gaining 48.7 percent between 2011 and October 2016. For the year ending in October 2016, total construction spending was up 3.4 percent exceeding the GDP growth rate for this period.

Residential construction spending registered a gain of 4.6 percent for the 12-month period ending in October 2016, after gaining 17.4 in 2015. In 2016, residential starts are expected to reach 1.174 million, up 6.0 percent from 2015, for the third consecutive year in which starts exceeded 1 million units. Currently residential starts are projected to continue to increase each year through the end of the decade. However, a number of factors will contribute to a slowing rate of increase in housing starts over this period, including rising mortgage interest rates, a shift in the job mix to lower paying sectors and slower wage growth, restricted access to credit, student loan burdens, lower marriage rates, slower immigration and changing generational values and preferences. The rate of increase in housing starts is projected to moderate over this period, from 6.0 percent in 2016 and 4.9 percent in 2017 to 4.5 percent by 2020.

The value of **nonresidential building construction** continued its positive trend but slowed during 2016 increasing only 5.4 percent during the October 2015 to October 2016 period for an

increase in construction spending of \$23.5 billion. Since its recovery began in mid-2011, nonresidential building construction spending increased 32.9 percent through 2015, reflecting an increase of \$105.0 billion in construction spending. During this growth period, the largest of the ten building-type categories experienced growth; only public safety, religious, and educational building categories had larger construction totals in 2011 than in 2015. For 2016, public safety and religious building construction continued to decline but several major building categories also slowed: warehousing and flex buildings, and manufacturing respectively experienced a 8.9 percent and a 8.6 percent decline in construction spending reflecting excess inventories from five strong years of growth and slowing global demand for manufacturing products due to unfavorable exchange rates and the economic slowdown in Asia and Europe. (See Table 4.)

Table 4
U.S. Nonresidential Construction Spending: 2013-2016
(In Billions of Current Year Dollars)

Type of Structure	2013	2014 ¹	2015 ¹	2016 ²	% Change 2015-2016 ³
Transportation	\$39.4	\$42.0	\$45.6	\$42.2	- 7.4
Health Care	40.7	38.6	40.7	41.4	1.0
Retail	53.2	62.8	66.9	74.1	10.8
Manufacturing ⁴	50.5	58.6	78.2	73.9	- 5.5
Amusement/Recreation	15.2	16.8	19.9	21.9	9.0
Education	79.1	79.7	83.5	92.4	10.6
Public Safety	9.5	9.4	8.7	8.3	- 4.6
Office	38.0	46.6	55.2	70.7	28.1
Religious	3.6	3.4	3.7	3.3	- 10.8
Lodgings	13.5	16.7	21.7	27.4	26.3
Total⁵	\$342.7	\$374.6	\$424.1	\$455.3	5.4

Source: U.S. Census, *Value of Construction Put In Place, 2016*

¹ Revised in 2016 by the U.S. Census.

² Change in construction values between October 2015 and 2016.

³ Percentage change between October 2015 and 2016 calculated based on unrounded totals.

⁴ Includes warehouse/flex space.

⁵ Totals include some miscellaneous state and local government buildings but exclude spending for nonbuilding construction on items relating to communications, power, highways, sewer and water.

Building and Nonbuilding Construction, Output Multipliers, and GDP. The estimated total value of building and nonbuilding construction spending put in place in the U.S. in 2016, based on U.S. Census data, is \$1.16 trillion. This accounted directly for 6.3 percent of the nation's estimated GDP of \$18.45 trillion in 2016. With an output multiplier of 2.91, each \$1 of this construction spending generated a total of \$2.91 of value to the economy, reflecting the cumulative effects of the initial construction expenditures as

they are re-spent throughout the economy. Applying this multiplier to the total value of direct construction spending in 2016 increases the value of its overall contribution to GDP to \$3.376 trillion, accounting for 18.3 percent of the nation's economic activity.

Contribution of Building and Nonbuilding Construction Expenditures to GDP. The total impact of construction spending — direct, indirect and induced — on the U.S. economy accounted for 18.3 percent of all economic activity in 2016. For the year, GDP increased by \$403.4 billion from its 2015 value (in current dollars). In comparison to this overall gain in GDP during 2016, the total value of construction spending (\$1.16 trillion) was 2.3 times greater than the year's annual GDP growth in dollar value.

The Bottom Line. The total contribution to GDP of building and nonbuilding expenditures also generated new personal earnings and supported jobs across all sectors of the economy. (See Table 1 on page 1.) In 2016, the \$1.16 trillion in construction spending:

- Contributed \$3.4 trillion to U.S. GDP.
- Generated \$1.1 trillion in new personal earnings.
- Supported a total of 23.8 million jobs throughout the U.S. economy.

Office, Industrial, Warehouse and Retail Development Expenditures (Dodge Data & Analytics Data)

Construction data provided by Dodge Data & Analytics for office, industrial, warehouse and retail buildings offer a more refined definition of hard construction expenditures over time. As presented in Table 5, total hard construction expenditures for these four building types totaled \$83.0 billion and increased by \$1.8 billion or 2.2 percent from 2015.

Office construction expenditures totaled \$36.6 billion in 2016 increasing by 28.7 percent from 2015, building on their gains of 3.0 percent in 2015 and 29.8 percent in 2014.

Retail construction expenditures totaled \$17.2 billion in 2016, a decrease of 7.0 percent from their 2015 level, following gains of 8.2 percent in 2015 and a 1.1 percent gain in 2014.

Warehouse construction registered a sixth consecutive year of increased expenditures in 2016, gaining 12.7 percent from 2015 for an expenditure total of \$13.6 billion, following a 10.8 percent gain in 2015.

Industrial construction spending decreased sharply for a second year in 2016 to \$15.5 billion declining 29.9 percent from 2015; industrial construction expenditures in 2015 were down 46.2 percent from their peak level in 2014. This pullback in industrial/manufacturing construction in 2015 and 2016 can be attributed to the downturn in the energy sector and a weakening in global demand for U.S. manufactured goods due largely to unfavorable exchange rates with the United States' major trading partners.

Table 5
Comparing Construction Expenditures (Hard Costs), 2015 and 2016
(In Billions of Current Year Dollars)

Building Type	2015	2016	\$ Change
Office	\$28.44	\$36.61	\$8.17
Industrial	22.16	15.54	-6.62
Warehouse	12.04	13.57	1.53
Retail/Entertainment	18.53	17.24	-1.29
Total	\$81.17	\$82.96	\$1.79

Sources: Dodge Data & Analytics, GMU Schar Fuller

Expenditures and Square Footage (All Structures Combined). The total square feet of new construction in 2016 for these four building types posted a decline of 4.5 percent from 2015 while the value of this new construction increased by 2.2 percent. The amount of space built decreased for three of the building types (only office space increased in 2016) while the value of this added building space increased for two building types—office and warehouse. Industrial/manufacturing and retail building construction experienced decreases in both the square footage of space added and its value of construction compared to 2015. (See Table 6.)

Table 6
Office, Industrial/Manufacturing, Warehouse and Retail Construction, 2016

Building Type	Square Feet (In Millions)	Construction Value ¹ (In Billions of 2016 Dollars)
Office	102.8	\$36.61
Industrial/Manufacturing	53.5	15.54
Warehouse	167.0	13.57
Retail	86.8	17.24
Total	410.1	\$82.96

Sources: Dodge Data & Analytics; GMU Schar Fuller

¹ Hard costs.

Hard Construction Expenditures (All Structures Combined), Multipliers and GDP. The economic impact of this construction activity can be calculated by applying the U.S. Department of Commerce Bureau of Economic Analysis's (BEA's) national construction multipliers for its contribution to GDP (2.91), personal earnings (0.9209), and employment (20.5308 jobs per \$1,000,000 of construction expenditure).

State-level direct spending and associated economic impacts for pre-construction, construction and post-construction spending are included in the Appendices. It should be noted that individual state construction multipliers are smaller than the U.S. multipliers. They measure only the share of construction expenditures that are retained within the respective state economies. Construction-related spending flows that leak out of each state economy to other states are excluded. Smaller states and state economies that are less well developed tend to retain smaller portions of the benefits from construction spending than do states with larger and more complex economies; that is, a greater share of the smaller states' direct construction spending leaks out to other states.

The Bottom Line. The total contribution to U.S. GDP from the four phases of development tracked in this study is substantial. When the latest BEA multipliers are applied, direct expenditures of \$160.0 billion in 2016 resulted in a contribution of \$465.0 billion to U.S. GDP, generated \$150.5 billion in personal earnings and supported 3.3 million jobs. (See Table 7.)

Table 7
**Office, Industrial, Warehouse, and Retail Construction and
 Operations Contribution to the U.S. Economy, 2016**
 (In Billions of 2016 Dollars)

	Direct Expenditures	Total Economic Contribution to GDP ¹	Personal Earnings ²	Jobs Supported ³
Development Phase	\$160.04	\$464.99	\$150.49	3,309,982
Soft Construction (Soft Costs)	25.06	72.19	26.18	538,680
Site Development ⁴	21.42	62.34	19.73	439,801
Hard Construction (Hard Costs)	82.96	241.40	76.39	1,703,149
Tenant Improvements ⁵	30.60	89.06	28.18	628,352
Annual Operations	\$1.419	\$3.743	\$1.073	27,833

Sources: Dodge Data & Analytics; GMU Schar Fuller

¹ The total value of goods and services generated directly and indirectly as a result of direct construction expenditures within the U.S.

² The additional earnings generated within the U.S. from direct expenditures during the construction phase and post-construction phase for building operations.

³ The jobs supported nationwide by the spending and re-spending of direct expenditures associated with building construction or operations.

⁴ Site development includes grading, infrastructure, parking and landscaping.

⁵ Tenant improvements exclude furniture and equipment.

Note: See Appendices for state-level data.

Outlook: Residential and Nonresidential Construction and the U.S. Economy

The U.S. economy has been in recovery since July 2009 with this recovery extending to seven and one-half years with the coming of 2017, making it the third longest of the 12 business cycles dating from the end of World War II. This recovery has been characterized by uneven growth rates for GDP and personal earnings, a job growth trend that has continued through the fourth quarter of 2016 achieving an unemployment rate in November 2016 of 4.6 percent (down from 5.0 percent in November 2015) equaling the pre-recession unemployment level in 2007.

In 2016, an estimated 2.6 million net new workers entered the economy, for a 1.8 percent employment growth rate. While this growth rate slowed in 2016 from last year's 2.1 percent gain, the job base continues to perform well, given this late stage of the business cycle and the tightening of the labor market. Rising consumer confidence and continued low energy costs have supported increased consumer spending in 2016. Still, ongoing weakness in manufacturing, attributable primarily to decreased exports and lower demand for petrochemical products, dampened the GDP forecast in 2016 with annual GDP growth estimated at 1.6 percent, well below the beginning-of-the-year projection of 2.6 percent.

Factors that will constrain economic growth in 2017 include higher interest rates, a tightening labor force and resultant wage inflation, and slowly rising prices in general and for energy, specifically. Combining with the continued strength of the U.S. dollar (that is putting downward pressure on exports) and weakness in the global economy, these conditions are projected to keep economic growth in 2017 to 2.3 percent. In contrast to the above-cited conditions acting to constrain economic growth in 2017, the lengthy and continuing recovery of the residential and nonresidential construction sectors are projected to underpin the growth of the economy in 2017 as they did in 2016.

Residential building construction spending has increased each year since 2010 and is up 87.4 percent over this period through October 2016. Multifamily housing construction has increased its share of residential construction spending during the recovery and is expected to retain a larger share of residential construction spending even after single-family housing construction increases towards its equilibrium level of 1.5 million units annually by 2020. Current forecasts by IHS Economics (December 2016) indicate that residential construction spending is projected to increase 2.7 percent in 2017 after increasing an estimated 4.7 percent in 2016. While this trend is projected to remain positive through the end of the decade, it has slowed from an 11.7 percent increase in 2015. Going forward, it will reflect the weaker projected growth in the U.S. economy, increasing mortgage interest rates next year and beyond, changing demographics and long-term reduction of pent-up housing demand accumulated during the Great Recession.

Single- and multifamily housing starts in 2016 are estimated to have totaled 1.174 million units, a gain of 6.0 percent from 2015. Starts are projected to increase each of the next five years, with 1.231 million starts expected in 2017. By 2021, starts are projected to reach 1.5 million units. Still, just a year ago, 1.5 million starts had been expected in 2018. This underscores the slower-than-anticipated pace of growth in residential construction, dating back to the early years of the recovery. Thirty-year fixed home mortgage rates, which recently rose above 4.0 percent, are projected to exceed 5.0 percent by 2018 and to peak at 6.1 percent by 2020. These higher rates will contribute to slower gains in residential construction activity during the remainder of this business cycle.

Nonresidential construction expenditures turned positive in 2011, increased each year since, and have now gained a total of 30.6 percent through October 2016. Forecasts for 2017 confirm an

uneven pattern of investment across the broad range of building types. Construction spending for manufacturing structures increased steadily over the 2011 to 2015 period (up 92.8 percent) with fixed investment in manufacturing up 30.8 percent in 2015. In contrast to this high rate of increase, fixed investment in manufacturing structures is estimated to have decreased 4.3 percent in 2016 and to have decreased by 4.5 percent in 2017. Longer-term projections for manufacturing investment show it continuing to decline slightly in 2018 and 2019 and then turning positive in 2020.

Construction spending for office buildings was up sharply in 2016 (24.8 percent through October 2016) and is projected to continue to grow in 2017. The value of retail construction put in place in 2016 was also up from 2015, increasing 6.8 percent between October 2015 and October 2016. However, the outlook for continued growth of retail construction is for slower gains over the remainder of the decade. Construction spending for warehouse and flex space increased steadily between 2011 and 2016, but is estimated to have declined by 8.9 percent in 2016, based on the value of construction put in place. (See Table 4.)

The growth projections for nonresidential construction reflect the expected moderate performance of the U.S. economy over the next five years, with growth rates peaking in 2018 at 2.6 percent and returning to an annual growth rate in the range of 2.1 to 2.3 percent for the 2019-2021 period. The annual GDP growth rate for 2017 is forecast at 2.3 percent as of December 2016, higher than the 1.6 percent estimated for 2016 but lower than the 2.6 percent rates achieved in 2015.

Construction employment, which declined by 2.3 million jobs between 2006 and 2010, began to add new jobs in early 2011, according to the Bureau of Labor Statistics. Construction employment now has increased for a sixth year. Between November 2015 and November 2016, the construction sector added 155,000 net new jobs. From the low point in January 2011

through November 2016, a total of 1.3 million net new construction jobs were generated. Still, employment in the construction sector remained 985,000 jobs below its peak in March 2006.

The U.S. Economy. The importance of the construction sector to the recovery of the U.S. economy is well established. The recovery's sluggishness during its first seven and one-half years, dating from July 2009, can be partially attributed to the magnitude of the correction that the construction sector endured, with its recession extending to mid-2011. Now that residential and nonresidential building construction spending has increased steadily each year from its 2011 low, the U.S. economy has gained traction. This is in spite of its disappointing performance in 2013, when GDP increased only 1.7 percent, followed by a short-lived acceleration in 2014 and in 2015, with GDP up respectively 2.4 and 2.6 percent for those years, and with GDP growth in 2016 registering only 1.6 percent, a full point below the beginning-of-the-year projection of 2.6 percent. However, the outlook to the end of the decade remains positive but the rates of GDP growth are projected to remain below historic norms.

The ongoing recovery in construction activity has been the one consistently positive force in the national economy's performance since 2009 and it is expected to continue to strengthen. Over the next four years, the construction sector is projected to grow (by value) at annual rates ranging between 2.3 percent and 6.1 percent. This continuing expansion will support GDP gains during this same period ranging from 2.1 to 2.6 percent, according to IHS Economics (December 2016 forecast). By compensating for slower-growing sectors, the construction sector's gains will provide the foundation that should extend the economy's expansion into the next decade, making it the longest business cycle in history. (If the economy avoids recession through mid-2020, it will tie the previous longest business cycle record of 10 years, achieved in the 1980s).

Table 8
Total Impacts (Soft Costs, Site Development, Hard Costs, and Tenant Improvements)
on State Economies (in Four Categories), 2016
(In Billions of 2016 Dollars)

State	Direct Spending	Total Output	Personal Earnings	Jobs Supported
Alabama	1.244	2.634	0.884	21,293
Alaska	0.085	0.146	0.052	1,054
Arizona	2.113	4.359	1.507	35,411
Arkansas	0.813	1.603	0.533	13,074
California	14.340	30.792	10.459	211,341
Colorado	2.689	5.877	2.012	45,877
Connecticut	0.684	1.268	0.417	8,083
Delaware	0.171	0.303	0.084	1,803
District of Columbia	2.829	3.303	0.296	5,157
Florida	7.598	15.752	5.441	134,152
Georgia	5.720	13.188	4.419	103,519
Hawaii	0.356	0.659	0.233	5,018
Idaho	0.447	0.816	0.282	7,014
Illinois	4.916	11.340	3.665	75,881
Indiana	1.507	3.274	1.060	24,481
Iowa	1.222	2.339	0.776	17,990
Kansas	1.772	3.494	1.065	24,934
Kentucky	1.954	4.078	1.278	31,387
Louisiana	9.966	19.724	6.787	146,085
Maine	0.175	0.331	0.115	2,831
Maryland	2.454	4.679	1.522	30,938
Massachusetts	4.603	8.883	2.889	55,435
Michigan	5.721	12.143	4.136	97,830
Minnesota	1.441	3.149	1.033	22,377
Mississippi	0.287	0.559	0.187	4,613
Missouri	2.560	5.446	1.689	39,327
Montana	0.214	0.393	0.138	3,461
Nebraska	1.268	2.385	0.799	17,969
Nevada	2.105	3.911	1.339	28,914
New Hampshire	0.126	0.243	0.077	1,616
New Jersey	3.542	7.327	2.309	46,856
New Mexico	0.311	0.548	0.191	4,713
New York	24.805	46.058	14.557	284,135
North Carolina	3.963	8.651	2.879	70,856
North Dakota	0.316	0.554	0.181	3,709
Ohio	3.235	7.358	2.391	53,488
Oklahoma	1.204	2.464	0.846	19,281
Oregon	2.762	5.557	1.810	42,541
Pennsylvania	4.080	9.123	2.916	60,298
Rhode Island	0.317	0.563	0.170	3,620
South Carolina	1.938	4.191	1.379	34,740
South Dakota	0.817	1.497	0.510	12,644
Tennessee	2.990	6.713	2.162	47,657
Texas	18.504	44.399	14.877	310,944
Utah	0.831	1.845	0.623	14,834
Vermont	0.070	0.127	0.042	1,037
Virginia	3.680	7.210	2.292	51,442
Washington	3.021	6.261	2.101	43,130
West Virginia	0.167	0.298	0.095	2,163
Wisconsin	1.975	4.045	1.379	31,873
Wyoming	0.134	0.216	0.074	1,628
State totals	160.041	332.073	108.956	2,360,453
Interstate spillovers		132.915	41.532	949,530
U.S. Total	160.041	464.988	150.488	3,309,982

Sources: GMU Schar Fuller; Dodge Data & Analytics; BEA; NAIOP

Note: This table includes data for the District of Columbia, resulting in 51 states.

Table 9
Impacts of Operations on State Economies (in Four Categories), 2016
(In Billions of 2016 Dollars)

State	Direct Spending	Total Output	Personal Earnings	Jobs Supported
Alabama	10,686	19,877	6,193	187
Alaska	897	1,495	475	12
Arizona	26,019	49,665	15,857	438
Arkansas	8,869	15,622	4,800	146
California	142,159	288,248	90,048	2,138
Colorado	33,764	69,937	21,991	585
Connecticut	4,315	7,495	2,258	53
Delaware	3,240	5,417	1,371	37
District of Columbia	30,140	36,773	3,626	91
Florida	76,213	145,964	46,714	1,352
Georgia	62,120	129,118	40,144	1,079
Hawaii	2,308	4,035	1,288	35
Idaho	5,181	8,608	2,732	85
Illinois	53,444	113,148	34,142	836
Indiana	19,748	38,047	11,467	319
Iowa	13,724	23,426	7,142	209
Kansas	23,449	42,650	11,931	330
Kentucky	21,234	39,952	11,602	341
Louisiana	8,142	15,183	4,756	133
Maine	2,001	3,465	1,106	33
Maryland	37,223	67,017	20,022	493
Massachusetts	29,866	54,230	16,284	382
Michigan	30,672	58,405	18,482	500
Minnesota	17,456	34,757	10,596	276
Mississippi	3,151	5,573	1,703	52
Missouri	23,912	45,591	13,025	369
Montana	2,361	4,053	1,286	40
Nebraska	8,367	14,324	4,420	128
Nevada	19,455	33,334	10,469	287
New Hampshire	934	1,621	469	12
New Jersey	18,110	35,122	10,209	248
New Mexico	4,711	8,036	2,513	77
New York	87,860	154,970	44,096	1,052
North Carolina	56,591	110,004	34,132	1,000
North Dakota	4,671	7,814	2,295	62
Ohio	40,153	81,703	24,782	638
Oklahoma	19,977	38,550	12,035	337
Oregon	32,435	58,776	17,765	503
Pennsylvania	28,627	57,838	17,203	417
Rhode Island	585	978	271	7
South Carolina	20,178	38,443	11,693	355
South Dakota	4,393	7,187	2,242	69
Tennessee	37,736	75,383	22,707	595
Texas	208,173	462,046	142,677	3,646
Utah	11,883	24,503	7,645	222
Vermont	426	700	213	6
Virginia	55,540	100,359	29,048	747
Washington	34,179	64,220	19,980	506
West Virginia	1,499	2,499	728	20
Wisconsin	29,608	53,989	16,990	479
Wyoming	750	1,163	359	10
State Totals	1,419,132	2,761,315	835,979	21,975
Interstate Spillovers		982,057	236,955	5,859
U.S. Totals	1,419,132	3,743,372	1,072,934	27,833

Sources: GMU Schar Fuller; Dodge Data & Analytics; BEA; NAIOP

Note: This table includes data for the District of Columbia, resulting in 51 states.

Jobs Housed and Payroll Value

In addition to the annual operating expenditures associated with this new building space, these buildings represent new productive capacity within the national economy. While the value of this added capacity depends on how each building is used, two measures of this value are the number of jobs this new capacity can accommodate and the amount of payroll these new jobs have the potential to generate. 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 2016 can be estimated. The total payroll value of these new workers also can be calculated by multiplying this employment estimate by the U.S. average wage earnings per worker for jobs associated with each building category.

These calculations are presented in Table 10. They show that the 410.1 million square feet of new office, industrial, warehouse and retail building space constructed in 2016 have the capacity to house 1.073 million new workers with a total estimated annual payroll of \$57.6 billion.

Table 10 Jobs Accommodated and Payroll Generated in Office, Industrial, Warehouse and Retail Space Under Construction in 2016					
Building Type	Square Feet (In Millions)	Square Feet per Job	Jobs Accommodated (In Thousands)	Average Earnings per Job	Total Payroll (In Billions)
Office	102.8	190	541.0	\$68,129	\$36.858
Industrial	53.5	750	71.3	51,569	3.677
Warehouse	167.0	600	278.3	39,858	11.092
Retail	86.8	475	182.7	32,401	7.920
Total/Average	410.1	382	1,073.3	\$53,616	\$57,547

Sources: GMU Schar Fuller; U.S. Bureau of Labor Statistics; NGKF

Note on 2016 Methodology

Previous editions of this study were based on actual construction values in a calendar year.

For 2016, full-year construction values were *estimated* in order to publish the economic results in January 2017, so NAIOP members would have current data to use during their annual visit to Capitol Hill in Washington, D.C., which takes place in early February of each year.

The estimates are based on the following:

- actual construction values for the year's first nine months;
- the annual construction totals for the five preceding years (2011-2015); and
- the percentage of these values reported respectively for those years' first nine months, by building type (office, industrial/manufacturing, warehouse and retail) and by state were calculated and averaged for each independently.

These nine-month averages were applied to the actual 2016 values for nine months to estimate the year's 12-month values by building type and by state. (For details regarding the data cleaning, please contact the author.) The data utilized for these calculations were provided by Dodge Data & Analytics (previously McGraw Hill Construction).

Survey of NAIOP Members

NAIOP conducted a survey of its membership between Feb. 5 and Feb. 14, 2016, to determine the values of soft costs, site development improvements and expenditures for tenant improvements relative to the hard costs associated with building office, industrial, warehouse and retail buildings. The results of this survey are used in calculating the total building costs based on the value of hard construction data provided by Dodge Data & Analytics in order to capture the full economic value of building development on the U.S. and state economies. The distribution of these costs across the four building types differ and have changed over the past seven years in response to general economic conditions, changes in the marketplace and the locations where new building construction is occurring.

Questionnaires were emailed to 1,949 NAIOP members throughout the U.S.; 77 of these emails could not be delivered. Survey participants were mainly commercial real estate developers and owners involved in the construction of office, warehouse, manufacturing and retail buildings. There were a total of 123 responses to the survey, for a response rate of 6.31 percent. Forty-eight survey respondents indicated that their primary area of work was office building development; Nine indicated manufacturing facility development; 51 indicated warehouse or flex building development; and 16 indicated retail development.

The results of this survey are presented in the table on the next page as percentages of total building costs. These percent distributions by building type are used in this report to calculate soft construction costs, site improvement costs and costs of tenant improvements based on the value of hard construction costs provided by Dodge Data & Analytics.

Table 11
Survey of NAIOP Members
Building Cost Allocation Percentages (%), by Building Type
2006, 2008, 2013, 2016

Building Type	Soft Construction Costs ¹	Site Development Costs	Building Construction Costs	Tenant Improvement Costs
Office				
2016	16.44%	13.71%	49.21%	20.63%
2013	14.40	14.50	49.50	21.60
2008	17.43	14.24	49.74	18.58
2006	17.13	15.76	49.49	17.62
Manufacturing				
2016	12.25	9.38	57.13	21.25
2013	16.90	13.80	54.00	15.30
2008	14.34	19.32	52.59	13.75
2006	12.05	18.58	55.69	13.68
Warehouse/Flex				
2016	14.08	15.47	57.85	12.61
2013	14.60	19.00	53.30	13.10
2008	17.09	18.54	53.64	13.73
2006	14.23	16.81	55.00	14.07
Retail				
2016	17.70	14.41	49.26	18.63
2013	17.00	21.80	44.30	16.90
2008	15.76	20.82	47.00	16.41
2006	17.72	16.06	52.39	13.83
Combined²				
2016	15.37	14.19	53.24	17.20
2013	15.20	17.32	49.12	17.30
2008	15.62	17.19	51.24	15.94
2006	16.29	16.40	52.48	14.85

¹ Professional services and administrative and management processes required to support the construction project.

² Weighted average reflecting the numbers of responses by type.

Definitions

Area of Analysis — the geographic unit of analysis, normally a political unit, for which economic, demographic and fiscal information is reported.

Building Value — construction value would include hard costs (costs of the structure) and soft costs (management, architecture and engineering, legal fees, communications); the finished commercial value would reflect cash flow potential or current performance. Assessed valuation for tax purposes may be accepted as an appropriate substitute for actual market value.

Development Costs — includes all of the construction-related expenditures associated with developing a building, which include soft construction costs, site development costs, hard construction costs and tenant improvement expenditures.

Direct Expenditures — all spending in support of all phases of new construction required to deliver the final product as well as the operation phase (after the building delivers), including payroll of the workers directly involved and all nonpayroll spending for materials, management, overhead, utilities, equipment leasing or purchases and for or by subcontractors, suppliers and vendors.

Economic Impact — the generation of new spending within a jurisdiction as a result of investing in and operating new economic activity; in this case, office, industrial, warehouse and retail buildings.

Fiscal Impact — the effect of real estate development on the revenues and expenditures of the jurisdiction within which the building is located.

Gross Domestic Product (GDP), Gross State Product (GSP), Gross County Product (GCP) — the value of goods and services produced within the economy of the respective geographic area (nation, state, county/city).

Gross Square Feet — a measure of an individual building size or aggregate inventory of building space reflecting the total envelope of the structure, which is typically larger than the occupied or usable building area.

Hard Construction Costs — a category of construction costs that reflects the expenditures for the building's hard construction phase. Costs for labor, materials and construction management are the three basic types of hard costs. Soft construction costs, site development costs and tenant improvement expenditures are reported independently from hard construction costs.

Indirect Benefit — the additional economic benefits (measured in dollars or jobs) resulting from the accumulated additional value generated by direct expenditures, as these dollars are re-spent within the economy. Indirect effects are calculated using **Multipliers** and include sales and purchases by businesses supplying goods and services in support of building construction and operation as well as the re-spending of payroll by workers (**Induced Effects**) associated with the new building.

Induced Effects — the contributions of the payroll spending by workers in a specific industry or sector on local businesses providing goods and services to households.

Infrastructure — utilities, roads, parking lots, storm drainage structures; other site improvements could be included in estimating these costs if not included elsewhere. If these improvements are financed by the private sector, whether on-site or off-site, their costs should be included in the base values for calculating industry economic contributions.

Interstate Spillovers — economic contributions that are generated by direct construction expenditures in a given state that are realized by another state due to workers commuting across state lines (i.e., earning wages in one state and spending these earnings in their home state) and the importation of building materials from another state. These economic impacts are not reflected in the benefitting states' multipliers but are captured in the U.S. multipliers and reported in the U.S. totals.

Multiplier — a number used to calculate the final economic impact of one dollar spent. Types of multipliers include:

output multiplier measures the contribution of a direct expenditure on the overall economy (gross domestic product or gross state product).

employment multiplier measures the total number of jobs that can be supported by a direct expenditure (expressed in jobs supported per \$1 million in direct spending).

personal earnings multiplier measures the total personal earnings (wages and salaries) generated within the state or nation as a result of a direct expenditure and the jobs it supports.

Operating Costs — Costs (expenditures) associated with the day-to-day operation of an office, industrial, warehouse or retail building including building management, utilities, normal maintenance and repair, custodial services and security. These costs do not include the operating costs of building tenants.

Output — the goods and services produced for sale to other firms or industries as intermediate goods or services or for sale to consumers as final goods or services.

Personal Earnings — wages and salaries (payroll) paid out to all workers related directly or indirectly to the construction activity (pre-construction, construction, post-construction) for which direct expenditures are made. These wages and salaries include payment to the workers directly related to construction work being performed, employees of suppliers and vendors related to that work, and employees of businesses and organizations benefiting from the spending of these new wages and salaries generated as a result of these direct expenditures; that is, employees working in retail and consumer services, health care, education, local government and so on, whose business sales and cash flow have increased because of the new wages and salaries paid to workers in construction-related activities.

Sector — industries or firms grouped by similar characteristics of operations (e.g., retail trade sector, manufacturing sector, construction sector, services sector, government sector, etc.).

Site Development — a category of construction costs that reflect improvements made to the site before a building can be constructed. These costs include grading, infrastructure, landscaping, surface and structured parking, and other costs to prepare the site to support the functions of the building constructed on the site.

Soft Construction Costs — a category of development costs that reflects the professional services and administrative and management processes required to support the construction project. These may precede actual on-site construction by several years and may include legal and other consultant services, architectural and engineering services, management and administration.

Tenant Improvement Costs — a category of construction costs that reflects improvements made to the interior of a building to meet the needs of a specific tenant. Costs may include interior walls and partitions, floor coverings, and cabinets, but excludes furnishings. The building owner or the tenant may pay for these improvements.

Total Output — the sum of the direct and indirect benefits (expenditures) reflecting the combination of the initial expenditures by a firm and its subsequent accumulated value as this spending is recirculated throughout the economy. This includes benefits (induced) generated by the re-spending of personal earnings. This represents the total contribution to gross domestic product or gross state product.

Value Added — a measure of the incremental dollar value created by an industry, firm or individual employee as a result of its production process (work performed); the value created beyond the value of the individual inputs.

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