



2019 EDITION

Economic Impacts of Commercial Real Estate

Stephen S. Fuller, PhD

Dwight Schar Faculty Chair and University Professor
Director, Stephen S. Fuller Institute,
Schar School of Policy and Government
George Mason University | Arlington, Virginia

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

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

By
Stephen S. Fuller, PhD
Dwight Schar Faculty Chair and University Professor
Director, Stephen S. Fuller Institute,
Schar School of Policy and Government
George Mason University | Arlington, Virginia

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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 19,000 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 information about 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 established to support 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.

Contents

Introduction	1
Economic Contributions	5
Building and Nonbuilding Expenditures (U.S. Census Data)	5
Office, Industrial, Warehouse and Retail Development Expenditures (Dodge Data & Analytics Data)	7
Outlook: Residential and Nonresidential Construction and the U.S. Economy	10
Jobs Housed and Payroll Value	16
Note on 2018 Methodology	17
Economic Multipliers	17
Survey of NAIOP Members	19
Definitions	21

Appendices

Appendix A: Soft Costs Impacts by State	24
Appendix B: Site Development Impacts by State	29
Appendix C: Hard Costs Impacts by State	34
Appendix D: Tenant Improvement Impacts by State	39
Appendix E: Total Impacts by State	44
Appendix F: Operating Impacts by State	49
Appendix G: National and State Multipliers	54

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 to estimate 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. It applies several estimating and impact-assessment methodologies to take snapshots of the commercial real estate development industry from a variety of perspectives.

Building and Nonbuilding Construction. The broadest measure taken calculates the contribution of building and nonbuilding construction to the U.S. economy for the year in review. The product types included in this reading 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)
2018	\$1,302.3	\$3.744	18.1%	\$1,185.9	25.0
2017 ⁴	1,247.5	3.586	18.2	1,136.0	24.0
2016	1,160.0	3.376	18.3	1,068.2	23.8
2015	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

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 third-quarter 2017 value of construction put in place, U.S. Census.

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.

Development of New Commercial Real Estate Buildings. 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 construction values for office, industrial, warehouse and retail projects. These data provide the foundation for estimating expenditures made during four distinct phases of the development process: 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 531.7 million square feet of commercial buildings that commenced construction in 2018, according to Dodge Data & Analytics, and for the 49.2 billion-square-foot nationwide inventory of commercial space existing at the end of the third quarter of 2018, per Newmark Knight Frank.

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. Residential and hotel properties and government buildings 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 expenditures associated with each phase of the development process. In addition to the wide range of on-site construction services, these expenditures also support professional and business services, including:

- Architecture and engineering services;
- Legal services;
- Marketing and management services;
- Grading, paving and landscaping services;
- Site engineering services; and
- 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)	2018	\$31.71	\$27.88	\$109.01	\$38.27	\$207.77	\$1.76
	2017	28.58	24.73	98.55	35.23	187.09	1.66
	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
In 2018, direct expenditures of \$207.8 billion contributed \$600.8 billion to U.S. GDP.							
Total Economic Contribution¹ to GDP (In Billions of Dollars, Includes Multiplier Effect)	2018	\$94.66	\$80.15	\$315.96	\$110.03	\$600.80	\$4.47
	2017	85.33	71.09	283.31	101.28	541.01	4.22
	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
In 2018, direct expenditures of \$207.8 billion generated \$192.7 billion in personal earnings in the U.S.							
Personal Earnings² (In Billions of Dollars, Includes Multiplier Effect)	2018	\$32.39	\$25.39	\$100.08	\$34.85	\$192.71	\$1.39
	2017	29.20	22.52	89.74	32.08	173.54	1.32
	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
In 2018, direct expenditures of \$207.8 billion supported 4.0 million jobs in the U.S. economy.							
Jobs Supported³ (Includes Multiplier Effect)	2018	635,078	535,778	2,111,982	735,486	4,018,323	44,795
	2017	572,497	475,171	1,893,727	677,023	3,618,418	42,330
	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

Sources: NAIOP; Dodge Data and Analytics; GMU Schar School, 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.

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.

Existing Inventory of Commercial Real Estate Buildings. This study also includes the economic contributions of existing buildings. Based on the existing stock of commercial buildings — totaling 49.2 billion square feet in 2018 (at the end of the third quarter) — direct expenditures for building operations totaled an estimated \$168.2 billion and contributed \$427.2 billion to GDP. These direct expenditures also generated \$133.2 billion in personal earnings (wages and salaries) and supported a total of 4.3 million jobs. (See Table 3.)

Combining New and Existing Commercial Real Estate Buildings.

Combining the economic contributions of new development with the economic contributions from operations of existing buildings in 2018 (data from Tables 2 and 3), direct expenditures of \$376.0 billion resulted in the following economic contributions to the U. S. economy:

- Contributed \$1.0 trillion to U.S. GDP
- Generated \$325.9 billion in personal earnings
- Supported a total of 8.3 million jobs

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)
2018	49.190	\$168.2	\$427.2	\$1,33.2	4.285
2017	46.380	155.2	394.1	1,12.9	3.952
2016	45.820	150.1	396.0	1,13.9	2.944
2015	45.070	145.6	384.1	1,10.1	2.856
2014	44.010	138.1	381.3	1,20.1	3.023
2013	43.934	134.3	370.9	1,16.8	2.941
2012	43.208	134.5	371.5	1,17.0	2.945
2011	42.098	140.7	366.6	1,07.6	2.758

Sources: BOMA; Newmark Knight Frank; GMU Schar School, Stephen S. Fuller Institute

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 is estimated to have grown 2.9 percent in 2018 for its best performance of the decade, up from 2.2 percent in 2017. This strong performance resulted from the fiscal stimulus contained in the Tax Cuts and Jobs Act of 2017, increased federal government spending, rising consumer spending, a stronger global economy, increased exports, and continuing above-trend job growth and accelerating gains in personal earnings. These factors are expected to remain positive but not as strong in 2019, with economic growth slowing slightly to 2.5 percent (IHS Macroeconomic Advisors, January 2019).

In spite of the economy's best-of-the-decade performance in 2018, the construction sector saw residential activity slow unexpectedly in the second half of the year. For the full year, residential housing starts underperformed beginning-of-the-year forecasts, gaining 4.2 percent rather than the expected 6.4 percent (HIS Markit, January 2018). Reasons for this weaker-than-expected increase in residential building activity include higher interest rates, housing price increases that continue to outpace increases in household incomes, moderating consumer expectation (consumer confidence in the future) and growing economic uncertainty. In October 2018, the U.S. Census reported that the value of residential construction put in place was up only 1.7 percent from October 2017. In contrast, non-residential construction (including infrastructure) continued its strong recovery from the Great Recession and is estimated to have increased 7.3 percent during 2018, substantially outperforming the U.S. economy.

Construction Activity Contributes to Ongoing Economic Expansion in 2018.

Construction spending remained a key contributor to the U.S. economy's continuing expansion in 2018. It has increased each year since 2011, gaining 64.5 percent between October 2011 and October 2018. For the year ending in October 2018, total construction spending was up 4.9 percent, exceeding the GDP growth rate (2.9 percent) for the same period.

Residential construction spending registered a gain of 1.7 percent for the 12-month period ending in October 2018, after gaining 7.2 percent for the same period in 2017. For 2018, residential starts are estimated to reach 1.259 million units, up 4.2 percent from 2017, marking the fourth consecutive year in which starts exceeded 1 million units. Residential starts are projected to continue to increase each year through 2022, peaking at 1.437 million units.

A number of factors have contributed to a slowing rate of increase in housing starts in 2018, and these may continue to dampen residential building activity into the next decade. These include rising mortgage interest rates, wage growth that trails housing price growth, moderating consumer expectations (consumer confidence in the future), student loan burdens, changing demographic factors (lower marriage rates, slower immigration, lower fertility rates), and changing generational values and preferences. Housing starts in 2019 are projected to increase only 1.3 percent from their 2018 volume, but they will accelerate in 2020, gaining 8.2 percent. That reflects a stabilization of mortgage interest rates in combination with accelerating household formation and growing pent-up demand. Beyond 2020, housing starts appear to have reached their equilibrium at about 1.435 million units and are projected to grow only 3.6 percent in 2021 and 0.5 percent in 2022.

The value of **nonresidential building construction** continued its positive trend in 2018, increasing 7.9 percent. That reflects above-average gains in transportation/warehousing, amusement/recreation, education, office and lodgings, slower growth in manufacturing and retail construction, and an actual decline in health care construction spending for the year. (See Table 4.) Nonresidential building construction spending has increased 89.5 percent between October 2011 and October 2018, reflecting an increase of \$236.7 billion in construction spending over this period. All but one of the 10 building-type categories experienced growth. Only religious structure construction had larger construction value totals in 2011 than in 2018.

Table 4
U.S. Nonresidential Construction Spending, 2017–2018
(In Billions of Current Year Dollars)

Type of Structure	2017 ¹	2018 ²	% Change 2017-2018 ³
Transportation	\$47.5	\$53.4	12.5
Health Care	42.8	42.4	- 1.0
Retail	87.3	88.7	1.6
Manufacturing ⁴	65.4	67.1	2.6
Amusement/Recreation	24.0	27.9	16.2
Education	90.7	98.9	9.0
Public Safety	8.6	9.5	10.3
Office	66.2	76.0	14.8
Religious	3.2	3.0	- 9.1
Lodgings	28.9	34.3	18.9
Total⁵	\$464.6	\$501.2	7.9

Source: U.S. Census, Value of Construction Put In Place, 2018.

¹ Change in construction values between October 2016 and 2017.

² Change in construction values between October 2017 and 2018.

³ Percentage change between October 2017 and 2018 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 2018, based on U.S. Census data, is \$1.3 trillion. This accounted directly for 6.3 percent of the nation's estimated GDP of \$20.7 trillion in 2018 (third quarter). With an output multiplier of 2.87, each \$1 of this construction spending generated a total of \$2.87 of value to the economy, reflecting the cumulative effects of the initial construction expenditures as they are present throughout the economy. Applying this multiplier to the total value of direct construction spending in 2018 increases the value of its overall contribution to GDP — direct, indirect and induced — to \$3.744 trillion.

Contribution of Building and Nonbuilding Construction Expenditures to GDP. The total impact of this \$3.7 trillion in construction spending on the U.S. economy accounted for 18.1 percent of all economic activity in 2018. For the year, GDP is estimated to have increased by \$823.8 billion from its 2017 value (in current dollars). In comparison to this overall gain in GDP during 2018, the total value of construction spending (\$1.3 trillion) was 1.6 times greater than the year's annual GDP growth in dollar value, underscoring that growth in the construction sector outpaced growth in the overall economy.

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 2018, the \$1.3 trillion in construction spending:

- Contributed \$3.7 trillion to U.S. GDP;
- Generated \$1.2 trillion in new personal earnings; and
- Supported a total of 25 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 \$109.9 billion and increased by \$11.4 billion, or 11.5 percent, from 2017.

Office construction expenditures totaled \$41.2 billion in 2018, a strong 13.6 percent increase from 2017, after registering a slight decrease of 1.7 percent in 2017.

Retail construction expenditures totaled \$15.5 billion in 2018, a decrease of 9.5 percent from their 2017 level, after declining 0.8 percent in 2017 and 7.0 percent in 2016. These decreases follow gains in retail construction expenditures in 2015 (8.2 percent) and 2014 (1.1 percent).

Warehouse construction outlays declined in 2018 by 0.7 percent after having increased in each of the previous seven years.

Industrial construction spending, which had decreased sharply in 2015 and 2016, increased for a second consecutive year in 2018, gaining 34.2 percent after increasing 52.5 percent in 2017. The pullback in industrial/manufacturing construction in 2015 and 2016 was attributed to the downturn in the energy sector and weakening global demand for U.S. manufactured goods, while the gains made in 2017 and 2018 reflect a turnaround in the energy sector, the strengthening of the global economy and increased export sales, and continued growth of domestic consumer sales of durable goods, especially automobiles and trucks.

Table 5
Comparing Construction Expenditures (Hard Costs), 2017 and 2018
(In Billions of Current Year Dollars)

Building Type	2017	2018	\$ Change (2017-2018)
Office	\$36.45	\$41.42	\$4.97
Industrial	23.86	32.02	8.16
Warehouse	21.13	20.99	- 0.14
Retail/Entertainment	17.10	15.48	- 0.62
Total	\$98.55	\$109.91	\$11.37

Sources: Dodge Data & Analytics; GMU Schar School, Stephen S. Fuller Institute

Expenditures and Square Footage (All Structures Combined). The total amount of new construction in 2018, as measured in square feet for these four building types, increased just 1.5 percent from 2017 after having increased in 2017 by 27.4 percent following decreases in 2016 of 4.5 percent. The amount of space built increased for office (8.5 percent) and industrial (26.9 percent) building types, while it decreased for warehouse (- 2.2 percent) and retail (- 12.6 percent) buildings. Changes in the value of this added building space reflected this same pattern, increasing for office and industrial buildings and decreasing for warehouse and retail buildings. (See Table 6.)

Table 6
Office, Industrial/Manufacturing, Warehouse and Retail Construction, 2017 and 2018

Building Type	Square Feet (In Millions)		Construction Value ¹ (In Billions of Dollars)	
	2017	2018	2017	2018
Office	117.6	127.6	\$36.45	\$41.42
Industrial	53.9	68.4	23.86	32.02
Warehouse	267.9	262.1	21.13	20.99
Retail	84.2	73.6	17.10	15.48
Total	523.6	531.7	\$98.55	\$109.09

Sources: Dodge Data & Analytics; GMU Schar School, Stephen S. Fuller Institute

¹ Hard costs only

Hard Construction Expenditures (All Structures Combined), Multipliers and GDP. Applying national construction multipliers from the U.S. Department of Commerce Bureau of Economic Analysis (BEA) can help determine the economic impact of this construction activity. The multipliers are contribution to GDP (2.8748), personal earnings (0.9106), and employment (19.2163 jobs per \$1 million of construction expenditure).

State-level direct spending and associated economic impacts for pre-construction (soft costs), construction and post-construction (operations) 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-related expenditures that are retained within the respective state economies. This means that construction-related spending flows that leak out of each state economy to other states (spill-over effects) are excluded. Smaller states and state economies that are less well developed tend to retain smaller portions of the benefits from construction-related 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 \$207.77 billion in 2018 resulted in a contribution of \$600.80 billion to U.S. GDP, generated \$192.71 billion in personal earnings (labor income) and supported 4.0 million jobs. (See Table 7.)

Table 7
Office, Industrial, Warehouse, and Retail Construction and Operations Contribution to the U.S. Economy, 2018
(In Billions of 2018 Dollars)

	Direct Expenditures	Total Economic Contribution to GDP ¹	Personal Earnings ²	Jobs Supported ³
Development Phase	\$207.77	\$600.80	\$192.71	4,018,323
Soft Construction (Soft Costs)	31.71	94.66	32.39	635,078
Site Development ⁴	27.88	80.15	25.39	535,778
Hard Construction (Hard Costs)	109.91	315.96	100.08	2,111,982
Tenant Improvements ⁵	38.27	110.03	34.85	735,486
Annual Operations	\$1.759	\$4.466	\$1.393	44,795

Sources: Dodge Data & Analytics; GMU Schar School, Stephen S. Fuller Institute

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. This recovery now extends to nine and a half years as of January 2019, making it the second longest in U.S. history. If this business cycle continues through June 2019, as expected, it will become the longest in U.S. history at 120 months.

The first seven years of the recovery were characterized by uneven and below-average growth rates for GDP and personal earnings. In 2017, the economy's growth rate accelerated to 2.2 percent from a much slower 1.6 percent gain in 2016. In 2018, GDP growth is expected to be 2.9 percent, the greatest gain of the decade. Following continuing strong job growth in 2017, job growth has remained solid throughout 2018, achieving a monthly average of 195,000 jobs. Unemployment has declined over the year and held steady at 3.7 percent beginning in September, the lowest rate in almost 50 years. Personal income increased in 2018 by an estimated 4.5 percent but so did the rate of inflation, estimated at 2.2 percent for the year. As expected, the Federal Reserve raised interest rates four times during the year, although rates on construction loans and home mortgages did not increase as much. By December, they had retreated slightly from the year's high. Overall, the economy in 2018 registered its best performance since before the Great Recession. This above-trend growth rate is expected to continue in 2019 but is forecast to moderate slightly as the year proceeds.

In 2018, an estimated 2.45 million net new workers entered the economy, a 1.6 percent employment growth rate. This equaled the rate in 2017 but was slightly down from 2016, when job growth was 1.8 percent. That reflected a normal pattern for job growth — faster rates in the early years of the business cycle and slower rates as the cycle ages. A stronger global market helped increase exports in 2018 despite higher tariffs beginning at mid-year and the continuing

threats of a trade war. Most important to the year's performance has been strong consumer spending supported by increased wages and job growth, as well as tax reductions enacted in December 2017 under the Tax Cuts and Jobs Act. Increased domestic demand helped the manufacturing sector reverse its production growth rate from a negative 1.9 percent in 2016 to a positive 1.6 percent in 2017 and an estimated increase of 4.0 percent in 2018. The increase in industrial production pushed factory utilization up in 2018 to 75.8 percent from 74.8 percent in 2017; this rate is projected to increase further in 2019 to 76.5 percent. The increase will put further pressure on the construction industry to supply new industrial space to support the expanding economy.

Other factors will impact economic growth in 2019 and beyond. Several key variables to watch are: (a) **interest rates** that are projected to move higher in 2019 as the Federal Reserve raises its federal funds rate an additional one-half to three-quarters of a point in two or three increments over the year; (b) **labor shortages** that are already appearing in several key sectors — construction is one of them — and will tighten further in 2019 with resulting increases in wage inflation; (c) **energy prices**, which unexpectedly declined during the second half of 2018 are expected to rebound in 2019 to their highest levels since 2014; and (d) the resolution of **trade wars and higher tariffs** instituted in 2018 and how these might affect U.S. exports, which increased their contribution to GDP expansion in 2018.

The stimulus that resulted from increased **federal spending** and benefits that flowed to businesses and consumers from the **Tax Cuts and Jobs Act of 2017** will have a diminishing effect on GDP going forward. These stimuli were important to the economy's 2018 strong performance, but they will not be as impactful in 2019. That is because the tax cut benefits will have been largely realized after refunds

flow to taxpayers from their 2018 returns. These refunds will have found their way into the economy, to the extent that they are spent, by mid-2019. As a consequence, GDP growth is projected to slow during the year's second half.

IHS Markit (January 2019) projects that the U.S. economy will grow 2.5 percent in 2019, with this rate slowing to 2.0 percent in 2020 and moderating further in 2021 to 1.6 percent. Even the most pessimistic forecast at this time, which includes two quarters of slightly negative performance in early 2020, has GDP still achieving a moderate level of annual growth in 2020. Still, the consensus forecast for 2020 does not include a short recession but rather a gradual slowing from the above-trend gains registered in 2018 and 2019.

Residential building construction spending has increased each year since 2010 and is up 133.7 percent through October 2018 from its monthly low value in August 2010. Still, during the year, the value of residential construction has fluctuated, peaking in May and slipping 5.6 percent through October. The factors contributing to slower residential building during the year's second half were not anticipated at the beginning of the year and do not appear to support a permanent shift in the long-term trend; residential construction is projected to reach its equilibrium production level of approximately 1.437 million units in 2022, up from 1.259 million units in 2018.

Residential construction activity and related spending in 2018 fell substantially below forecast. In January, 1.289 million starts were forecast for a gain of 6.4 percent from 2017. This compares to the current estimated full-year gain of 4.2 percent. A broader measure of residential construction activity, including both new construction and renovation/remodeling outlays, is provided by residential

fixed investment. In January 2018, residential fixed investment was projected to increase 2.7 percent for the year; year-end estimates had residential fixed investment decreasing 0.2 percent.

Multiple factors are contributing to this slowdown in residential building activity, and these have negatively impacted the single-family housing resale market as well. Key among these have been rising home mortgage interest rates, changing demographic patterns (deferred household formation, slowing birth rates, growing cultural diversity), the financial condition of potential homebuyers (high student debt, lack of savings for down payments), growing gap between household incomes and housing prices, and economic uncertainty and softening consumer expectations.

Thirty-year fixed home mortgage rates, which hovered near 4.0 percent for most of 2017, rose to near 5.0 percent by the third quarter of 2018. While these retreated slightly in the fourth quarter, they are projected to continue rising through 2019 and peak in 2020 at 5.25 percent (plus points). These higher rates will continue to have a dampening effect on the residential market. However, home buyers are expected to adapt once other factors impacting their decisions to buy for the first time or trade up are overcome or diminish in importance. The continuing historically low unemployment rate, strong job market, and rising salaries and wages will ease some of the uncertainty in the economy that may have had a negative effect on the housing market. With household economics continuing to improve and millennials entering the market in greater numbers, the residential construction sector can expect to continue toward its equilibrium production level by 2022. After that, more normal market dynamics such as population growth and household formation will drive production, and the recovery from the Great Recession will be complete.

Nonresidential construction expenditures turned positive in April 2011 and have increased each year since. They have now grown a total of 46.5 percent through October 2018. During this period, investment has varied 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 2015 registering a one-year gain of 33.4 percent. In contrast to this high rate of increase in construction spending for new buildings, fixed investment in manufacturing structures decreased 5.1 percent in 2016 and declined 15.2 percent in 2017. It is estimated to have declined for a third year in 2018, falling 7.8 percent. Projections for manufacturing investment show it reversing this pattern to gain 2.2 percent in 2019, to decline 1.7 percent in 2020 and rebound in 2021 by 4.1 percent.

Construction spending for office buildings increased an estimated 14.8 percent in 2018 after declining 3.4 percent in 2017. Prior to 2017, office construction spending had increases at double-digit rates for consecutive years. In 2018, the value of retail construction put in place slowed but extended its upward trend to an eighth consecutive year, gaining 1.6 percent (third quarter to third quarter).

Construction spending for warehouse and flex space increased steadily starting in 2011 through 2015, declined by 9.6 percent in 2016, and then rebounded 13.5 percent in 2017, based on the value of construction put in place. In 2018, the value of construction put in place for this category of building type increased 12.5 percent. (See Table 4 listed as Manufacturing.)

The growth projections for nonresidential construction reflect the continued strong performance of the U.S. economy over the next year, followed by a more moderate growth rate between 2020 and 2023. With GDP growth projected at 2.5 percent in 2019, demands for additional building space will support continued growth in construction spending. Beyond 2019 through 2023, the economy's growth trajectory is currently projected to remain positive but at a below-trend rate of 1.65 percent. Forecasts for the period beyond 2019 open the door to an increasing number of uncertainties, but for the short term, the positive forces appear sufficiently strong to drive this business cycle beyond 120 months (July 2019) to become the longest in U.S. history.

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 an eighth consecutive year. Between November 2017 and November 2018, the construction sector added 282,000 net new jobs, a 4.0 percent gain (compared to 1.6 percent growth in total jobs for this same period). From the low point in January 2011 through November 2018, a total of 1.885 million net new construction jobs were generated. However, employment in the construction sector remained 489,000 jobs below its April 2006 peak.

Outlook: The U.S. Economy. The importance of the construction sector to the well-being of the U.S. economy is well established. The recovery's sluggishness between 2010 and 2016 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 since its 2011 low, it has contributed essential stimulus to the economy's sustained growth over the lengthy expansion. This is despite the economy's disappointing performance in 2016, when GDP increased only 1.6 percent. In 2017, higher construction spending helped to push the economy's growth up to 2.2 percent. Through the first three quarters of 2018, total construction spending is up 7.0 percent compared to the same period in 2017. That sector of the economy is estimated to be responsible for a 2.9 percent gain in GDP. With construction spending growing faster than GDP, it will continue to represent an increasing share of the year's economic growth.

The outlook for the economy in 2019 is for above-trend growth to continue. GDP growth is forecast to register between 2.3 and 2.5 percent for the year, although this growth rate is expected to be stronger in the first half of the year than the second half. This will lead to slower growth in 2020 through 2023, when GDP growth is currently projected to average 1.6 percent. Forecasting these next several years is complicated by concerns about the durability of a business cycle that by historical measures should be in its latter stages. More problematic may be the higher interest rates and their effect on the economy by 2020, weaker-than-projected residential building spending, lower energy costs, higher tariffs with resultant reductions in exports, and growing inflation pressures, especially on wages. Perhaps the greatest uncertainty in the forecast relates to the fiscal policies of the federal government and whether federal spending will be reined in by the newly-elected Congress.

The "canary in the coal mine" could be consumers' loss of confidence due to a long list of factors, but especially confidence in the future. Loss of confidence will be revealed in weaker consumer spending, especially for items typically purchased in installments such as automobiles and home furnishings. In time, consumers' aversion to risk could negatively impact housing sales — new homes and resales — and the ripple effects could have national and global economic ramifications.

Continued growth in construction activity has been the one continuously positive force in the national economy's performance since 2009. While the construction sector appears positioned for stronger growth in 2019, there are good reasons to monitor the performance of individual building types and their changing market conditions as the U.S. economy's current expansion extends its run into record territory.

Table 8
**Total Impacts (Soft Costs, Site Development, Hard Costs, and Tenant Improvements)
on State Economies (in Four Categories), 2018**
(In Billions of 2018 Dollars)

State	Direct Spending	Total Output	Personal Earnings	Jobs Supported
Alabama	5.433	11.476	3.809	88,906
Alaska	0.193	0.325	0.116	2,186
Arizona	3.905	8.073	2.736	62,420
Arkansas	1.689	3.338	1.094	25,211
California	11.873	25.287	8.510	160,190
Colorado	6.581	14.279	4.821	102,845
Connecticut	1.045	1.965	0.638	11,673
Delaware	0.297	0.510	0.141	2,859
District of Columbia	1.202	1.408	0.102	1,689
Florida	9.566	19.965	6.799	161,122
Georgia	6.938	15.931	5.273	122,892
Hawaii	0.606	1.111	0.387	7,725
Idaho	1.215	2.251	0.763	17,994
Illinois	6.514	15.052	4.814	91,748
Indiana	2.249	4.886	1.562	34,028
Iowa	2.044	3.880	1.275	28,104
Kansas	2.489	5.000	1.501	33,317
Kentucky	5.742	11.839	3.676	85,088
Louisiana	1.546	3.051	1.048	22,151
Maine	0.232	0.437	0.149	3,511
Maryland	2.716	5.117	1.607	31,437
Massachusetts	4.748	9.040	2.913	54,123
Michigan	3.632	7.736	2.599	56,160
Minnesota	4.100	9.010	2.915	57,950
Mississippi	1.845	3.594	1.173	27,759
Missouri	2.688	5.697	1.747	39,397
Montana	0.195	0.360	0.124	2,927
Nebraska	2.600	4.903	1.629	35,449
Nevada	1.159	2.157	0.725	16,144
New Hampshire	0.286	0.550	0.172	3,342
New Jersey	4.139	8.619	2.679	50,218
New Mexico	1.448	2.541	0.874	20,520
New York	19.825	36.196	11.303	207,915
North Carolina	5.550	12.120	3.963	91,468
North Dakota	0.650	1.154	0.368	7,019
Ohio	5.653	12.791	4.105	89,155
Oklahoma	3.511	7.248	2.449	52,951
Oregon	2.240	4.479	1.438	31,247
Pennsylvania	5.036	11.331	3.568	70,774
Rhode Island	1.333	2.344	0.694	14,135
South Carolina	4.049	8.748	2.843	67,029
South Dakota	0.631	1.158	0.390	8,655
Tennessee	17.645	40.038	12.677	268,146
Texas	25.745	62.183	20.615	400,986
Utah	0.996	2.203	0.734	16,492
Vermont	0.250	0.446	0.148	3,458
Virginia	7.782	15.357	4.808	101,052
Washington	3.019	6.201	2.060	39,780
West Virginia	0.131	0.233	0.073	1,606
Wisconsin	2.737	5.624	1.889	40,614
Wyoming	0.073	0.119	0.040	857
State Totals	207.769	439.364	142.537	2,974,423
Interstate Spillovers		161.436	50.177	1,043,900
U.S. Total	207.769	600.800	192.714	4,018,323

Sources: GMU Schar School of Policy and Government, The Stephen S. Fuller Institute; Dodge Data & Analytics; BEA; NAIOP

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

Table 9
Impacts of Operations on State Economies (in Four Categories), 2018
(In Billions of 2018 Dollars)

State	Direct Spending	Total Output	Personal Earnings	Jobs Supported
Alabama	42,959	76,627	24,577	1,002
Alaska	2,794	4,363	1,444	54
Arizona	44,764	84,196	27,512	968
Arkansas	15,461	26,108	8,303	340
California	119,308	235,191	75,760	2,587
Colorado	34,247	67,600	21,993	759
Connecticut	8,344	14,735	4,542	147
Delaware	1,930	3,122	845	31
District of Columbia	7,915	9,533	865	35
Florida	117,816	223,614	73,411	2,825
Georgia	81,714	168,601	53,327	1,998
Hawaii	5,191	8,928	2,927	102
Idaho	15,358	25,150	8,250	347
Illinois	54,494	114,818	35,448	1,103
Indiana	23,970	46,080	14,267	498
Iowa	23,057	38,782	12,160	479
Kansas	20,428	36,447	10,402	380
Kentucky	38,713	71,081	21,292	798
Louisiana	14,824	26,318	8,483	339
Maine	5,542	9,504	3,134	123
Maryland	41,980	73,515	22,052	747
Massachusetts	34,986	62,825	19,396	633
Michigan	30,997	59,148	19,137	682
Minnesota	18,926	37,749	11,821	400
Mississippi	6,501	10,996	3,466	145
Missouri	23,182	43,877	12,991	489
Montana	3,254	5,271	1,753	74
Nebraska	23,249	39,248	12,480	505
Nevada	15,586	26,328	8,536	328
New Hampshire	5,076	8,662	2,573	86
New Jersey	25,323	49,815	14,794	470
New Mexico	13,344	21,566	7,079	298
New York	132,221	230,356	67,539	2,218
North Carolina	70,871	138,276	43,685	1,695
North Dakota	3,160	4,984	1,529	53
Ohio	51,049	103,401	32,192	1,068
Oklahoma	30,827	56,555	18,373	699
Oregon	18,419	32,743	10,250	360
Pennsylvania	35,548	70,218	21,492	695
Rhode Island	2,284	3,836	1,110	38
South Carolina	45,628	86,059	26,601	1,062
South Dakota	7,634	12,151	3,832	158
Tennessee	41,620	83,626	25,679	879
Texas	231,808	493,124	156,563	5,290
Utah	12,849	25,403	8,161	307
Vermont	4,757	7,679	2,432	99
Virginia	80,247	143,137	42,820	1,443
Washington	31,900	58,212	18,700	641
West Virginia	1,263	2,004	607	23
Wisconsin	33,917	61,858	19,926	756
Wyoming	1,386	2,039	665	28
State Totals	1,758,619	3,345,460	1,047,178	37,286
Interstate Spillovers		1,120,729	345,473	7,509
U.S. Totals	1,758,619	4,466,190	1,392,651	44,795

Sources: GMU Schar School of Policy and Government, The Stephen S. Fuller Institute; Dodge Data & Analytics; BEA; NAIOP

Note: This table include 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 are the number of jobs this new capacity can accommodate and the amount of payroll these new jobs have the potential to generate. Using an average jobs-per-square-foot estimate for each category of building, it is possible to estimate the total number of employees that could be housed within the buildings built in 2018. The total payroll value of these new workers also can be calculated by multiplying this employment estimate by the U.S. average 2018 wage earnings per worker for jobs associated with each building category.

These calculations are presented in Table 10. They show that the 531.7 million square feet of new office, industrial, warehouse and retail building space constructed in 2018 have the capacity to house 1.5 million new workers with a total estimated annual payroll of \$83.2 billion.

Table 10 Jobs Accommodated and Payroll Generated in Office, Industrial, Warehouse and Retail Space Constructed in 2018					
Building Type	Square Feet (In Millions)	Square Feet per Job	Jobs Accommodated (In Thousands)	Average Earnings per Job	Total Payroll (In Billions of Dollars)
Office	127.6	190	671.6	\$71,953	\$48.324
Industrial	68.4	750	91.2	54,306	4.953
Warehouse	262.1	600	587.0	42,044	24.680
Retail	73.6	475	154.9	33,789	5.234
Total/Average	531.7	353	1,504.7	\$55,287	\$83.190

Sources: Dodge Data & Analytics; GMU Schar School, Stephen S. Fuller Institute; U.S. Bureau of Labor Statistics; Newmark Knight Frank

Note on 2018 Methodology

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

For 2018, full-year construction values were estimated in order to publish the economic results in January 2019 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 six preceding years (2012-2017); 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, calculated and averaged for each independently.

These nine-month averages were applied to the actual 2018 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.) Dodge Data & Analytics provided the data for these calculations. In 2014, Dodge Data & Analytics purchased McGraw-Hill Construction, which previously supplied the data. Dodge Data & Analytics has reported no changes to the McGraw-Hill Construction data or to the data-capture methodologies.

Please note that there are now just three listings of multipliers: construction, soft costs and operations. Management services and utilities, along with several other independent categories, are now combined into a single multiplier that is used to calculate the economic impacts for operations expenditures. In the past, these separate multipliers were weighted to reflect their respective share of operating costs. The newest listing of multipliers has made this extra calculation unnecessary.

Economic Multipliers

The output (GDP), personal earnings (wages and salaries) and jobs-supported multipliers used in the 2019 report reflect the most recent revisions that the U.S. Department of Commerce's Bureau of Economic Analysis (BEA) released in 2017. These multipliers reflect continuing post-recession trends of:

(1) Decreasing value of the output multipliers as the state and national economies have become more interdependent and global, resulting in more local benefits spilling over to adjacent states and increased use of imported materials; and

(2) Declining jobs and personal earnings multipliers as construction activities have become more efficient and incorporate new technologies, including off-site production.

These decreases in the multipliers suggest that the economic benefits of construction at the national level are leaking into the global economy while state-level benefits are leaking into other states' economies and are not as locally impactful as they were previously.

Other multipliers used in this study are described below.

- **Construction** multipliers are utilized for hard costs, site improvements and tenant improvements.
- **Architectural and engineering services** multipliers are utilized to represent the bundle of construction-related professional services considered in this report and identified as soft costs (pre-construction).
- **Services-to-buildings** multipliers are utilized to represent the bundle of building operations services (including building management, repair and maintenance, custodial, security, and sales and marketing, but excluding local taxes and finances costs).

Prior to the 2018 report, **utilities multipliers** were blended into these operating costs multipliers. Utilities are characterized by low job multipliers and high output multipliers because they reflect the production of electricity and heating fuels and not the impacts at the retail level. That can distort the impact calculations — higher output values and lower overall jobs supported. As a result of this methodological revision in the 2018 report that was carried forward in the 2019 report, the jobs supported by the operating outlays associated with new and existing commercial buildings are greater per \$1 million than those reported in the 2017 edition (or earlier), and the output values are lower per \$1 of expenditure.

Survey of NAIOP Members

NAIOP surveyed its membership between October 25 and November 9, 2018, to determine the value of soft costs, site development improvements, and expenditures for tenant improvements relative to the hard costs associated with office, industrial, warehouse and retail building. The results are used in calculating the total building costs based on the value of hard construction data provided by Dodge Data & Analytics to capture the full economic value of building development in the U.S. and state economies. The distribution of these costs across the four building types differ and have changed over the past two years in response to general economic conditions, changes in the marketplace and the locations where new building construction is occurring.

Questionnaires were emailed to 2,114 NAIOP members throughout the U.S.; 55 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 22 completed responses to the survey for a response rate of 1.07 percent.

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. To achieve more balanced results for use in these calculations, the survey results for 2018 and 2016 were combined and averaged.

Table 11
**Survey of NAIOP Members Building Cost Allocation Percentages (%),
 by Building Type 2006, 2008, 2013, 2016, 2018**

Building Type	Soft Construction Costs ¹	Site Development Costs	Building Construction Costs	Tenant Improvement Costs
Office				
2018	18.09%	11.61%	52.43%	17.87%
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				
2018	10.03	14.88	56.18	18.93
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				
2018	14.67	17.54	54.93	12.86
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				
2018	19.10	13.67	45.97	21.27
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				
2018	15.47	14.42	52.38	17.73
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.

Note: these percentages were averaged for 2016 and 2018 to broaden the survey response base for use in this analysis.

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 benefiting 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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Office Space Demand Forecast, Fourth Quarter (2018)

Industrial Space Demand Forecast, Third Quarter (2018)

Research Brief: Beacons and Sensors in Commercial Real Estate (2018)

The Office Property and Big Data Puzzle: Putting the Pieces Together (2018)

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Performance and Timing of Secondary Market Investment Activity (2013)

Stabilization of the U.S. Manufacturing Sector and Its Impact on Industrial Space (2013)

“The work of the Foundation is absolutely essential to anyone involved in industrial, office, retail and mixed-use development. The Foundation’s projects are a blueprint for shaping the future and a road map that helps to ensure the success of the developments where we live, work and play.”

Ronald L. Rayevich, Founding Chairman
NAIOP Research Foundation



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2355 Dulles Corner Boulevard, Suite 750
Herndon, VA 20171-3034

703-904-7100
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