



2018 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**

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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 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/contributions2018.**

- Appendix A: Soft Costs Impacts by State
- Appendix B: Site Development Impacts by State
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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. 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)
2017	\$1,217.3	\$3.499	18.0%	\$1,108.5	23.4
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
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.

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 figures relating to square footage and construction values for office, industrial, warehouse and retail projects. These data lay 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 523.6 million square feet of commercial buildings that commenced construction in 2017, according to Dodge Data & Analytics and for the nationwide 46.4 billion square foot inventory of commercial space existing in 2017 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 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)	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
	2012	15.88	17.34	49.18	17.73	100.13	0.96
In 2017, direct expenditures of \$187.09 billion contributed \$541.01 billion to U.S. GDP.							
Total Economic Contribution¹ to GDP (In Billions of Dollars, Includes Multiplier Effect)	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
	2012	43.39	53.51	151.75	54.71	303.36	2.64
In 2017, direct expenditures of \$187.09 billion generated \$173.54 billion in personal earnings in the U.S.							
Personal Earnings² (In Billions of Dollars, Includes Multiplier Effect)	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
	2012	14.46	16.94	48.03	17.32	96.75	0.83
In 2017, direct expenditures of \$187.09 billion supported 3.6 million jobs in the U.S. economy.							
Jobs Supported³ (Includes Multiplier Effect)	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
	2012	292,219	406,107	1,151,784	415,236	2,265,346	20,929

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 46.4 billion square feet in 2017 — direct expenditures for building operations totaled an estimated \$155.2 billion and contributed \$394.1 billion to GDP. These direct expenditures also generated \$112.9 billion in personal earnings (wages and salaries) and supported a total of 4.0 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 2017 (data from Tables 2 and 3), direct expenditures of \$342.3 billion resulted in the following economic contributions to the U.S. economy:

- Contributed \$935.1 billion to U.S. GDP.
- Generated \$286.4 billion in personal earnings.
- Supported a total of 7.57 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)
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
2010	42.008	134.8	342.4	1,00.2	2.413

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 was projected to grow 2.3 percent in 2017, and give a much stronger performance than it did in 2016 when the GDP gain was just 1.5 percent. Below-projection GDP growth in 2016 was the result of numerous factors including weak global economic growth, weakness in U.S. export markets (due in part to unfavorable exchange rates from the strong U.S. dollar), continuing softness in the energy sector, limited wage growth among U.S. workers (compounded by zero growth in worker productivity), and uncertainty generated by the U.S. presidential election.

However, it was not the result of weaker expenditures for residential and nonresidential construction. The construction sector continued its recovery from the Great Recession and in fact outperformed the U.S. economy helping to mitigate some of the downside from the conditions cited above. Construction spending continued to expand in 2017 with gains in residential and nonresidential construction offsetting decreased expenditures for nonbuilding construction (e.g., cutbacks to power generation facilities; state and local government outlays for highways and streets; and sewage treatment and waste disposal facilities).

Construction Activity Contributes to Ongoing Economic Expansion in 2017. Construction spending remained a key determinant of the U.S. economy's continuing expansion in 2017. Construction spending has increased each year since 2011, gaining 54.6 percent between 2011 and October 2017. For the year ending in October 2017, total construction spending was up 2.9 percent exceeding the GDP growth rate for this same period.

Residential construction spending registered a gain of 7.2 percent for the 12-month period ending in October 2017, after gaining 7.3 percent for the same period in 2016. For 2017, residential starts are estimated to reach 1.201 million, up 2.0 percent from 2016, making it the fourth consecutive year in which starts exceeded 1 million units. Residential starts are projected to continue to increase each year through 2022.

However, a number of factors could 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, lower fertility rates, and changing generational values and preferences. Nevertheless, the rate of increase in housing starts is projected to rebound from its slower-than-projected growth rate in 2017 to 5.7 percent in 2018, accelerating in 2019, gaining to 9.8 percent before slowing in 2020 to 3.4 percent, 1.9 percent in 2021 and 1.2 percent in 2022.

The value of **nonresidential building construction** continued its positive trend in 2017 increasing 3.4 percent reflecting a mixed performance with increases in transportation/warehousing, health care, retail, education, and lodgings partially offset by decreases in spending on manufacturing and office construction. Nonresidential building construction spending has increased 37.0 percent between 2013 through October 2017, reflecting an increase of \$126.7 billion in construction spending over this period with all but two of the 10 building-type categories experiencing growth. (See Table 4.)

Table 4
U.S. Nonresidential Construction Spending, 2016-2017
(In Billions of Current Year Dollars)

Type of Structure	2016 ¹	2017 ²	% Change 2016-2017 ³
Transportation	\$41.1	\$46.8	13.5
Health Care	38.4	41.9	9.3
Retail	78.9	84.2	6.8
Manufacturing ⁴	71.9	61.8	-14.1
Amusement/Recreation	22.9	23.3	1.7
Education	99.7	100.4	12.0
Public Safety	8.1	8.6	6.3
Office	71.5	69.1	-3.4
Religious	3.1	3.1	-0.1
Lodgings	26.7	30.2	12.3
Total⁵	\$453.8	\$469.4	3.4

Source: : U.S. Census, Value of Construction Put In Place, 2017

¹ Change in construction values between October 2015 and 2016.

² Change in construction values between October 2016 and 2017.

³ Percentage change between October 2016 and 2017 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 2017, based on U.S. Census data, is \$1.22 trillion. This accounted directly for 6.3 percent of the nation’s estimated GDP of \$19.4 trillion in 2017. 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 re-spent throughout the economy. Applying this multiplier to the total value of direct construction spending in 2017 increases the value of its overall contribution to GDP to \$3.499 trillion, accounting for 18.0 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 18.0 percent of all economic activity in 2017. For the year, GDP increased by \$763.6 billion from its 2016 value (in current dollars). In comparison to this overall gain in GDP during 2017, the total value of construction spending (\$1.22 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 2017, the \$1.22 trillion in construction spending:

- Contributed \$3.5 trillion to U.S. GDP.
- Generated \$1.1 trillion in new personal earnings.
- Supported a total of 23.4 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 \$98.6 billion and increased by \$15.6 billion or 18.9 percent from 2016.

Office construction expenditures totaled \$36.5 billion in 2017 slight decrease (-0.4 percent from 2016, after registering gains of 28.7 percent in 2016).

Retail construction expenditures totaled \$17.1 billion in 2017, a decrease of 0.8 percent from their 2016 level, after declining 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 registered its seventh consecutive year of increased expenditures in 2017, up 55.7 percent from 2016 following a gain of 12.7 percent in 2015.

Industrial construction spending that had decreased sharply for a two consecutive years — down 46.2 percent in 2015 and 29.9 percent in 2016 — rebounded in 2017 gaining 52.5 percent. This pullback in industrial/manufacturing construction in 2015 and 2016 was attributed to the downturn in the energy sector and a weakening in global demand for U.S. manufactured goods due largely to the strength of the U.S. dollar and unfavorable trade policies with the United States' major trading partners. Gains made in 2017 reflect the modest turnaround in the energy sector.

Table 5
Comparing Construction Expenditures (Hard Costs), 2016 and 2017
(In Billions of Current Year Dollars)

Building Type	2016	2017	\$ Change (2016-2017)
Office	\$36.61	\$36.45	-\$0.61
Industrial	15.54	23.86	8.32
Warehouse	13.57	21.13	7.56
Retail/Entertainment	17.24	17.10	-0.14
Total	\$82.96	\$98.55	\$15.59

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 2017, as measured in square feet for these four building types, increased 27.4 percent from 2016 after having declined 4.5 percent between 2016 and 2015. The amount of space built increased for three of the building types (only retail space decreased in 2017) while the value of this added building space increased for two building types — industrial and warehouse; office and retail building construction expenditures experienced small decreases in value compared to 2016, down 0.4 percent and 0.8 percent. (See Table 6.)

Table 6
Office, Industrial/Manufacturing, Warehouse and Retail Construction, 2016 and 2017

Building Type	Square Feet (In Millions)		Construction Value ¹ (In Billions of Dollars)	
	2016	2017	2016	2017
Office	102.8	117.6	\$36.61	\$36.45
Industrial	53.5	53.9	15.54	23.86
Warehouse	167.0	267.9	13.57	21.13
Retail	86.8	84.2	17.24	17.10
Total	410.1	523.6	\$82.96	\$98.55

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

¹ Hard costs only

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 (2.895), personal earnings (0.9106), and employment (19.2163 jobs per \$1,000,000 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 \$187.1 billion in 2017 resulted in a contribution of \$541.01 billion to U.S. GDP, generated \$173.54 billion in personal earnings and supported 3.6 million jobs. (See Table 7.)

Table 7
Office, Industrial, Warehouse, and Retail Construction and Operations Contribution to the U.S. Economy, 2017
(In Billions of 2017 Dollars)

	Direct Expenditures	Total Economic Contribution to GDP ¹	Personal Earnings ²	Jobs Supported ³
Development Phase	\$187.09	\$541.01	\$173.54	3,618,418
Soft Construction (Soft Costs)	28.58	85.33	29.20	572,497
Site Development ⁴	24.73	71.09	22.52	475,171
Hard Construction (Hard Costs)	98.55	283.31	89.74	1,893,727
Tenant Improvements ⁵	35.23	101.28	32.08	677,023
Annual Operations	\$1.661	\$4.220	\$1.316	42,330

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 with this recovery extending to eight and one-half years as of January 2018, making it the third longest of the 12 business cycles that date from the end of World War II.

The first seven years of this recovery were characterized by uneven growth rates for GDP and personal earnings. In 2017, the economy's growth rate accelerated to an estimated 2.3 percent from a much slower 1.5 percent gain in 2016. Job growth remained strong throughout the year and unemployment declined to 4.1 percent. Personal earnings increased in 2017 but so did the rate of inflation; the Federal Reserve raised interest rates three times during the year as was expected although rates on construction loans and home mortgages did not increase as much. Overall, the economy in 2017 registered its best performance since 2015 with its growth rate exceeding the post-recession average.

In 2017, an estimated 2.1 million net new workers entered the economy, for a 1.5 percent employment growth rate. While this growth rate slowed in 2017 from the previous year's 1.8 percent gain, this is a normal pattern for job growth — faster rates in the early years of the business cycle and slower rates as the cycle ages — given the late stage of the business cycle and the tightening of the labor market. Rising consumer confidence, continued low energy costs, and a surging stock market supported increased consumer spending in 2017. More competitive exchange rates (the dollar weakened) helped to increase exports in 2017 and lower the foreign trade deficit. Additionally, increased domestic demand helped the manufacturing sector to reverse its production growth rate from a negative 1.2 percent in 2016 to a positive 2.0 percent in 2017. The increase in industrial production augmented factory utilization in 2017 from 75.1 percent to 75.8 percent; this rate is projected to increase significantly in 2018 to 77.1 percent.

If this increase occurs, it should help to reverse the two-year decline in fixed investment in manufacturing and spur additional construction.

Other factors will impact economic growth in 2018 and beyond. Several key variables to watch are: (a) **interest rates** that are projected to move higher in 2018 as the Federal Reserve raises its rate three-quarters of a point in 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 2018 with resulting increases in wage inflation; (c) **energy prices** that are currently projected to stay relatively steady in 2018, averaging slightly lower for the full year than in December 2017, but still slightly above the full year 2017 average; and (d) the **impact of the new 2017 federal tax law** and the effects of lower tax rates on consumer spending and corporate investment.

In the absence of the economic impacts from the new federal tax law, the December GDP forecast for 2018 (IHS Markit) is for 2.6 percent growth followed by 2.3 percent in 2019. IHS Markit projects that the GDP growth effect of the new federal tax law in 2018 would be 0.3 percent additional growth. Adding these two rates would point to the economy growing 2.9 percent in 2018. If this rate is achieved, it would duplicate the GDP growth rate in 2015; these would be the highest rates since 2005 (3.3 percent).

Residential building construction spending has increased each year since 2010 and, from its monthly low value in August of 2010, is up 124.6 percent through October 2017. 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 1.45 million units annually by 2020.

Residential construction spending in 2017 fell substantially below forecast. At the beginning of the year, the increase in residential fixed investment was projected at 2.7 percent; the December 2017 estimate for the full year is only 1.2 percent. This sector's slow growth has been explained as a mid-to-late business cycle slump. A major factor affecting this slowdown may be the result of slower household formation rates among millennials. It may also be due to a shortage of building lots. Despite these trends, demand appears strong in the resale market. Prices will have risen on average 5 to 10 percent across the country in 2017 and total resales are projected to have risen 1.5 percent to their highest level since before the recession.

Single- and multifamily housing starts in 2017 are estimated to have totaled 1.201 million units, a gain of 2.0 percent from 2016. Starts are projected to increase in each of the next five years, with 1.269 million starts expected in 2018. By 2022, starts are projected to approach 1.5 million units. It's interesting to note that just a few years ago, 1.5 million starts had been expected in 2018. These figures illustrate 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 hovered near 4.0 percent for most of 2017, are projected to average 4.5 percent over 2018 and to peak at 5.3 percent by 2022. Their trajectory and peak are much lower than previously projected. While these modestly higher rates will have a dampening effect on the residential market, demographic factors affecting household formation, fertility rates, size of home, etc., as well as the length of the business cycle will be the primary determinants of whether the residential construction sector can realize its inherent potential before the next recession.

Nonresidential construction expenditures turned positive in 2011, increased each year since, and have now grown a total of 47.8 percent through October 2017. Estimates 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 a one-year gain of 33.4 percent being registered in 2015. In contrast to this high rate of increase, fixed investment in manufacturing structures decreased 6.4 percent in 2016 and is estimated to have decreased 13.9 percent in 2017. Longer-term projections for manufacturing investment show it reversing this pattern to gain slightly in 2018 (3.3 percent) and to accelerate in 2019 (11.0 percent), then slowing or declining slightly over the 2020-2022 period. The favorable provisions of the new federal tax law could provide a positive boost to this sector and alter its growth pattern going forward.

Construction spending for office buildings has been increasing for the past three years at double-digit rates. These were not sustained in 2017 with the value of office construction put in place between October 2016 and 2017, decreasing 3.4 percent. In contrast, the value of retail construction put in place in 2017 was up for a seventh consecutive year, increasing 6.8 percent between October 2016 and October 2017, a rate similar to its gain the previous year. However, the outlook for continued growth of retail construction expenditures is for slower gains over the remainder of the decade.

Construction spending for warehouse and flex space increased steadily starting in 2011 through 2015, declined by 9.6 percent in 2016, and then rebounded in 2017 increasing 13.5 percent, based on the value of construction put in place. (See Table 4.)

The growth projections for nonresidential construction reflect the expected improved performance of the U.S. economy over the next two years followed by a more moderate growth rate between 2020 and 2022. The current forecast has GDP growth peaking in 2018 at a rate that could reach 2.9 percent or possibly 3.0 percent (inclusive of the positive effects of the recently enacted federal tax law) with these positive effects extending into 2019. Beyond 2019, the economy's growth trajectory is current projected to remain positive but at a below-trend rate averaging 1.9 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 the economy to its best performance of the decade in 2018.

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 seventh consecutive year. Between November 2016 and November 2017, the construction sector added 184,000 net new jobs, a 2.7 percent gain (compared to 1.5 percent growth in total jobs for this same period). From the low point in January 2011 through November 2017, a total of 1.54 million net new construction jobs were generated. However, employment in the construction sector remained 771,000 jobs below its peak in April 2006.

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 during the past eight years 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 in spite of the economy's disappointing performance in 2016, when GDP increased only 1.5 percent. In 2017, had the construction sector achieved its beginning-of-the-year forecasted growth, GDP growth for the year would have exceeded its currently estimated gain of 2.3 percent by 0.1 or 0.2 points.

The outlook to the end of the decade remains positive with the rate of GDP growth projected to peak in 2018, remain above trend in 2019, and then slip slightly below trend in 2020. Forecasting these next several years is made more complicated by the yet-to-be-determined effects of the federal tax law on households, corporations and especially the residential and commercial real estate sectors. Adding more challenges to the forecast are questions about the durability of the business cycle that by historic measures is considered to be in its latter stages. Of note is that if the current cycle continues to February 2020 it will be longest in U.S. history.

Continued growth in construction activity has been the one positive force in the national economy's performance since 2009. While the construction sector appears to be poised for stronger growth in 2018 and 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), 2017**
(In Billions of 2017 Dollars)

State	Direct Spending	Total Output	Personal Earnings	Jobs Supported
Alabama	1.942	4.105	1.361	31,825
Alaska	0.036	0.060	0.021	404
Arizona	2.130	4.405	1.493	34,049
Arkansas	0.726	1.433	0.470	10,823
California	24.757	52.693	17.722	333,817
Colorado	3.359	7.303	2.469	52,555
Connecticut	1.645	3.094	1.005	18,376
Delaware	0.590	1.015	0.280	5,682
District of Columbia	1.972	2.304	0.167	2,756
Florida	9.261	19.321	6.578	155,926
Georgia	6.465	14.846	4.915	114,520
Hawaii	0.408	0.748	0.261	5,201
Idaho	0.379	0.703	0.238	5,619
Illinois	5.704	13.173	4.209	80,293
Indiana	1.702	3.700	1.182	25,756
Iowa	3.038	5.774	1.894	41,804
Kansas	1.843	3.702	1.112	24,658
Kentucky	1.998	4.116	1.280	29,579
Louisiana	6.429	12.682	4.350	92,153
Maine	0.188	0.354	0.120	2,845
Maryland	4.138	7.783	2.441	47,857
Massachusetts	4.761	9.047	2.912	54,180
Michigan	2.982	6.353	2.136	46,106
Minnesota	1.557	3.424	1.109	22,030
Mississippi	0.375	0.729	0.239	5,633
Missouri	3.797	8.047	2.468	55,674
Montana	0.244	0.450	0.155	3,663
Nebraska	2.638	4.973	1.650	35,966
Nevada	1.167	2.171	0.729	16,254
New Hampshire	0.261	0.503	0.157	3,049
New Jersey	5.140	10.708	3.328	62,381
New Mexico	0.306	0.538	0.185	4,342
New York	15.739	28.714	8.965	165,063
North Carolina	5.485	11.978	3.916	90,396
North Dakota	0.298	0.530	0.170	3,220
Ohio	3.191	7.219	2.317	50,325
Oklahoma	0.573	1.183	0.400	8,640
Oregon	1.547	3.092	0.993	21,571
Pennsylvania	16.174	36.382	11.440	227,188
Rhode Island	0.223	0.394	0.117	2,384
South Carolina	2.054	4.437	1.443	33,984
South Dakota	0.985	1.809	0.608	13,518
Tennessee	2.444	5.548	1.762	37,198
Texas	24.377	58.902	19.537	379,781
Utah	1.635	3.614	1.203	27,043
Vermont	0.145	0.259	0.086	2,009
Virginia	4.052	7.992	2.501	52,633
Washington	4.299	8.827	2.930	56,617
West Virginia	0.074	0.131	0.041	902
Wisconsin	1.818	3.736	1.255	26,981
Wyoming	0.039	0.064	0.022	462
State totals	187.090	395.066	128.343	2,625,688
Interstate spillovers		145.942	45.194	992,730
U.S. Total	187.090	541.008	173.537	3,618,418

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), 2017
(In Billions of 2017 Dollars)

State	Direct Spending	Total Output	Personal Earnings	Jobs Supported
Alabama	20,095	35,843	11,496	469
Alaska	241	377	125	5
Arizona	24,118	45,363	14,823	522
Arkansas	9,222	15,572	4,952	203
California	221,075	435,806	140,383	4,794
Colorado	37,794	74,601	24,271	838
Connecticut	12,535	22,135	6,823	221
Delaware	7,203	11,655	3,154	117
District of Columbia	17,662	21,272	1,930	77
Florida	99,782	189,385	62,174	2,392
Georgia	70,094	144,626	45,744	1,714
Hawaii	2,480	4,265	1,398	49
Idaho	5,237	8,577	2,813	118
Illinois	33,183	69,916	21,586	672
Indiana	22,748	43,731	13,540	472
Iowa	18,336	30,840	9,670	381
Kansas	19,028	33,950	9,689	354
Kentucky	24,210	44,452	13,316	499
Louisiana	11,151	19,796	6,381	255
Maine	3,073	5,270	1,738	68
Maryland	38,950	68,209	20,461	693
Massachusetts	25,535	45,853	14,156	462
Michigan	38,359	73,197	23,683	844
Minnesota	16,419	32,749	10,255	347
Mississippi	3,004	5,081	1,602	67
Missouri	35,485	67,162	19,886	749
Montana	5,385	8,721	2,901	122
Nebraska	19,122	32,282	10,265	415
Nevada	14,385	24,300	7,879	303
New Hampshire	2,713	4,630	1,376	46
New Jersey	33,595	66,089	19,626	624
New Mexico	3,041	4,914	1,613	68
New York	84,386	147,017	43,104	1,415
North Carolina	79,581	155,270	49,054	1,903
North Dakota	5,832	9,197	2,822	99
Ohio	42,912	86,917	27,060	898
Oklahoma	9,867	18,101	5,880	224
Oregon	16,554	29,428	9,212	324
Pennsylvania	45,764	90,398	27,669	895
Rhode Island	1,272	2,137	619	21
South Carolina	29,255	55,178	17,056	681
South Dakota	4,907	7,811	2,463	101
Tennessee	26,726	53,700	16,490	564
Texas	274,460	583,858	185,370	6,263
Utah	23,595	46,649	14,987	563
Vermont	1,494	2,411	764	31
Virginia	55,290	98,621	29,503	994
Washington	35,639	65,035	20,892	716
West Virginia	1,306	2,072	628	23
Wisconsin	27,572	50,285	16,198	614
Wyoming	205	302	98	4
State Totals	1,661,875	3,195,007	999,575	35,296
Interstate Spillovers		1,025,490	316,463	7,034
U.S. Totals	1,661,875	4,220,497	1,316,038	42,330

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 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 an average jobs-per-square-foot estimate for each category of building, the total number of employees that could be housed within the buildings built in 2017 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 2017 wage earnings per worker for jobs associated with each building category.

These calculations are presented in Table 10. They show that the 523.6 million square feet of new office, industrial, warehouse and retail building space constructed in 2017 have the capacity to house 1.3 million new workers with a total estimated annual payroll of \$70.9 billion.

Table 10
Jobs Accommodated and Payroll Generated in Office, Industrial, Warehouse and Retail Space Constructed in 2017

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	117.6	190	618.9	\$69,520	\$43.026
Industrial	53.9	750	71.9	52,622	3.783
Warehouse	267.9	600	446.5	40,819	18.226
Retail	84.2	475	177.3	33,062	5.862
Total/Average	523.6	398	1,314.6	\$53,930	\$70.897

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

Note on 2017 Methodology

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

For 2017, full-year construction values were estimated in order to publish the economic results in January 2018, 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 (2011-2016); 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 2017 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 was 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 2018 report utilize the most recent revisions prepared by the U.S. Department of Commerce Bureau of Economic Analysis (BEA) released in 2017. All multipliers were updated from those utilized in the 2017 report. These newest 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 from beyond the U.S.; 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 above-mentioned multipliers suggest that the economic benefits of construction work at the national level are leaking into the global economy while state-level benefits are leaking into other states' economies and hence 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 (preconstruction).
- **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).

In the past, utilities multipliers were blended into these operating costs multipliers. Utilities are characterized by low job multipliers and high output multipliers as they reflected the production of electricity and heating fuels and not the impacts at the retail level, thereby distorting the impact calculations — higher output values and lower overall jobs supported. As a result of this methodological revision in the 2018 report, the jobs supported by the operating outlays associated with new and existing commercial buildings are greater than those reported in the 2017 edition and the output values are lower per \$1 of expenditure.

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 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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