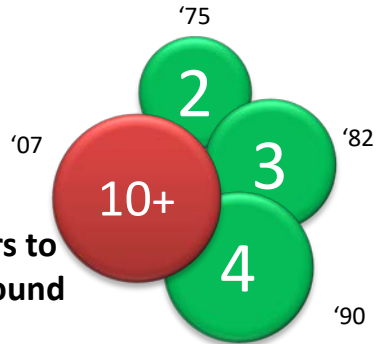
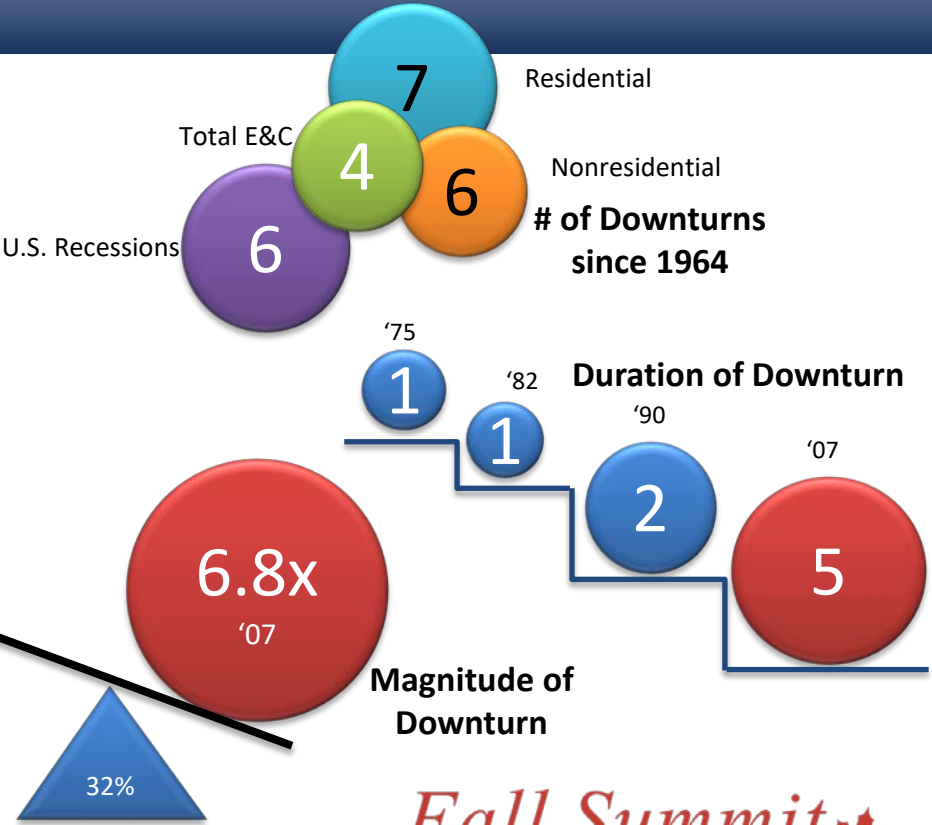


U.S. Markets Construction Overview

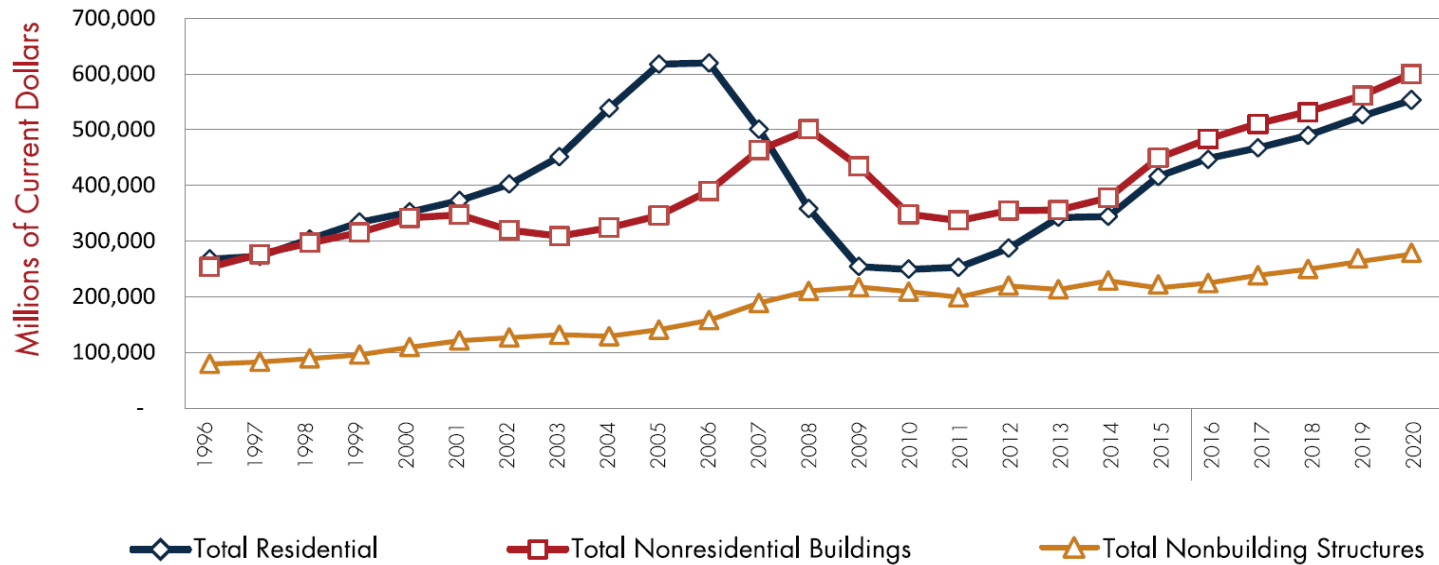
- Tenth year of growth
- Prosperity amidst uncertainty
- Uneven recovery
- Energy, industrial, civil infrastructure demand



Prior Three Industry Downturns



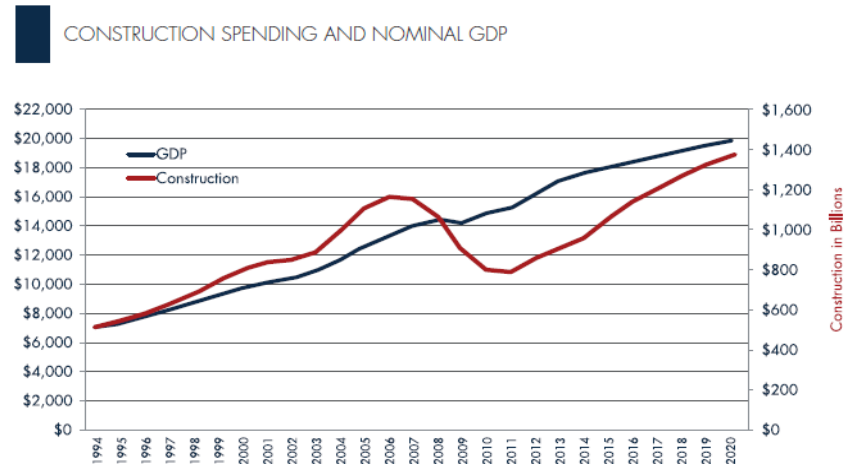
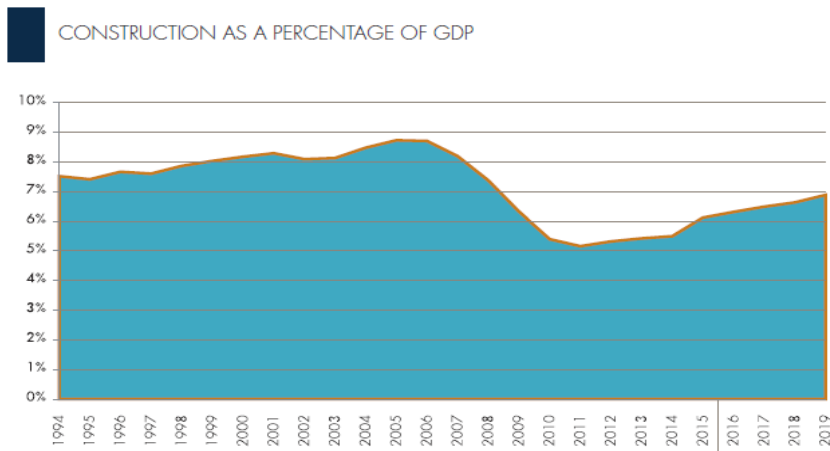
Construction Put in Place Through Time



Source: FMI Research Services

Has the Industry Lost its Place in the Broader Economy?

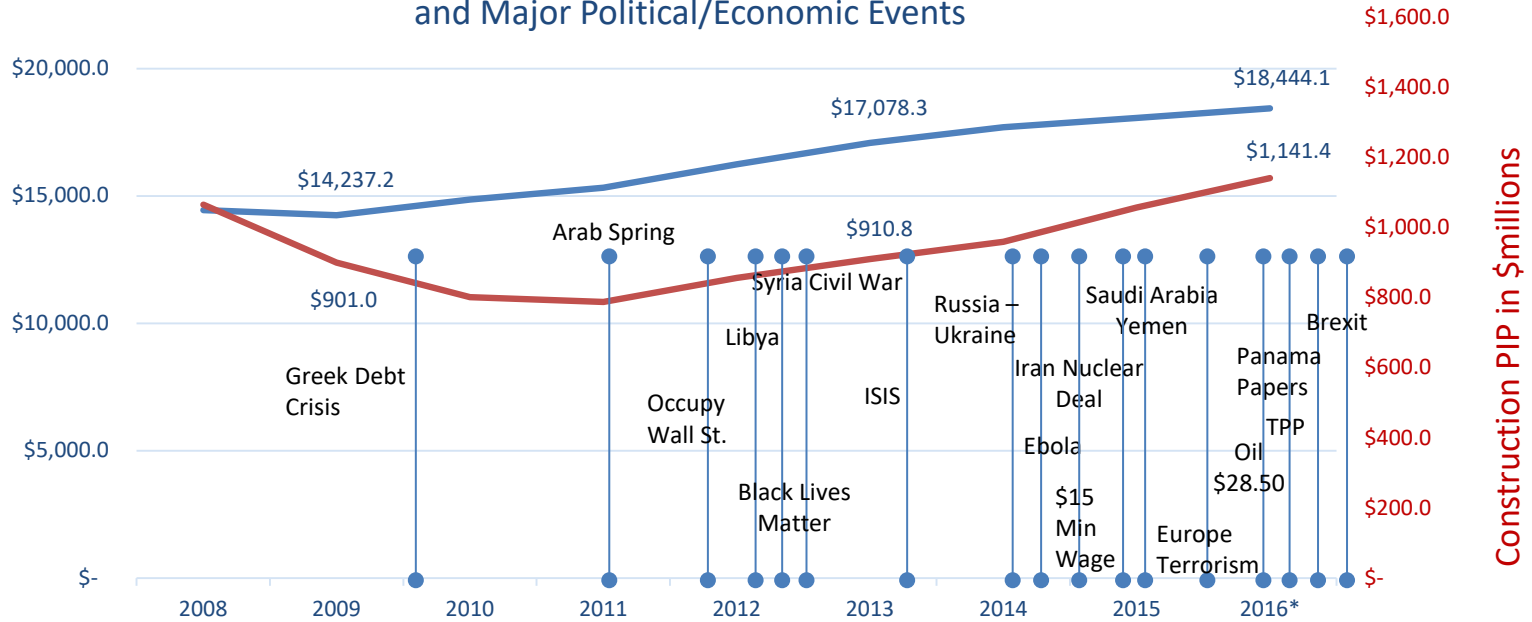
The overall economy has grown by \$4 trillion since 2007, but the construction industry has not recovered to 2007 spending



The E&C industry has declined as a % of the overall economy. What are the implications of an industry downturn prior to a full recovery?

A Persistent Recovery Amidst Global Chaos

U.S. GDP and Construction Spending and Major Political/Economic Events

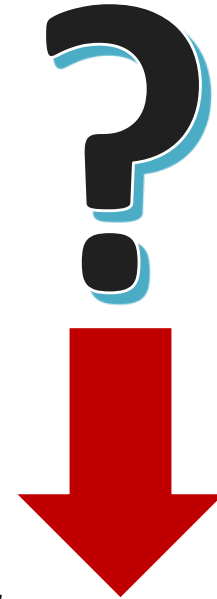


Anticipating the Next U.S. Recession and E&C Downturn

Perhaps some combination of the following

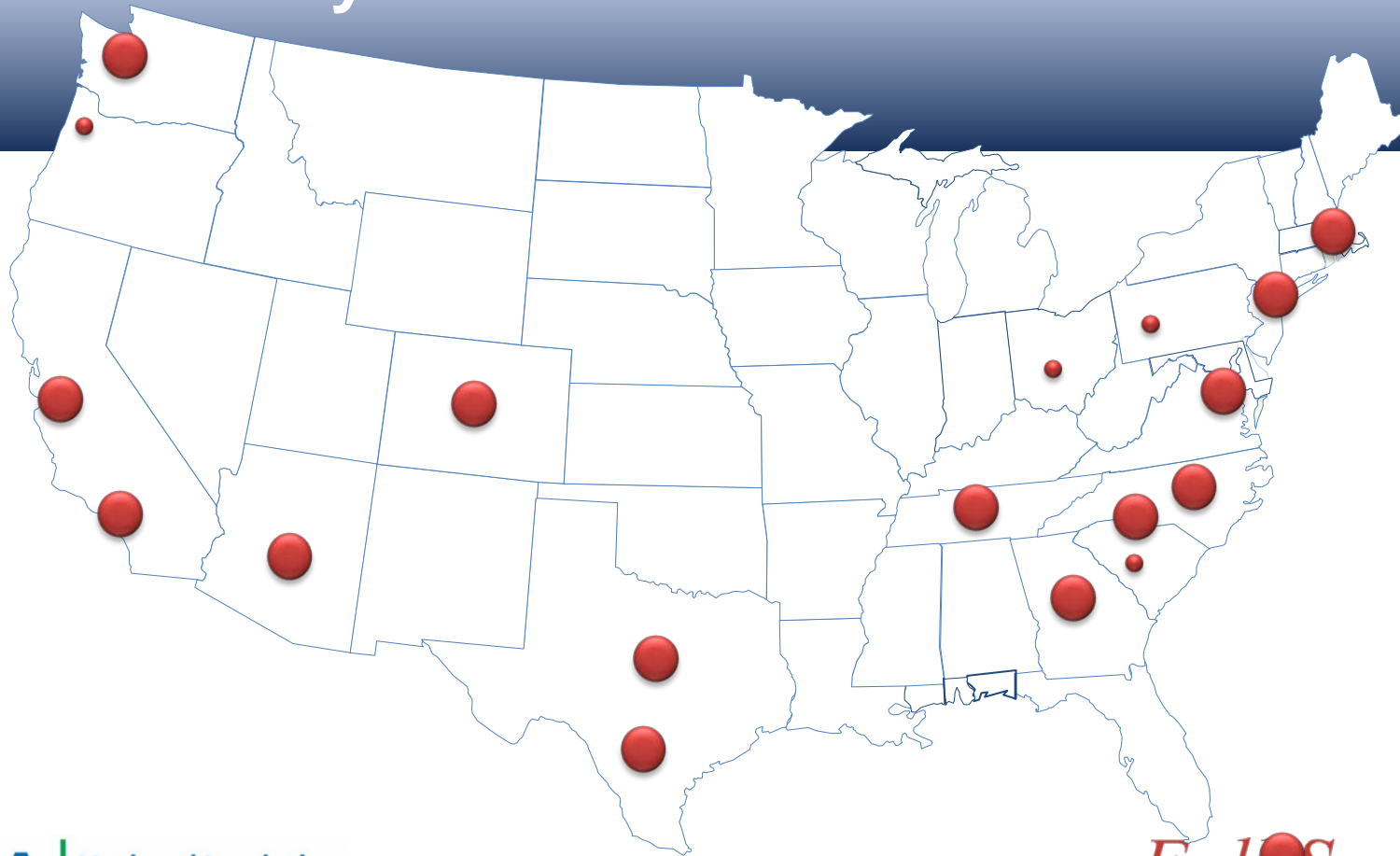
- Political dysfunction on the federal and state level
- Continuing major domestic or European terror events
- Rising energy prices and core inflation
- Premature/over action by the Fed on interest rates
- Commercial Real Estate Bubble/Debt
- Another European debt crisis

FMI's best "guess" is, barring an unpredictable event, a general recession followed by a relatively mild E&C industry downturn more than likely within next two years and most likely in second half of 2019 or first half of 2020.



Few Industry Trends

Recovery Concentrated in Select Metro Areas



International Focus on U.S. Building and Infrastructure Market Is Unprecedented

Impact of Megaprojects



M&A Activity Robust

Business Intelligence

Strategic Risk Management

Productivity Gains Will Happen through Accelerated Tech/Lean Process Adoption

Technological advances in pre-con and construction ops pivotal to maintaining competitive position

- Building Information and Modeling (BIM) is key to construction scheduling optimization.
- Job-site technologies to work faster, smarter, and safer are expanding at an accelerated pace.

Implications

- Tech-savvy firms becoming more essential and less elective.
- Talent selection and development needs to factor willingness to embrace and capacity to apply new practices.
- Without clarity of long-term direction, every innovation looks important and represents a potential distraction vs. benefit.

Adoption of these tools does not necessarily translate to productivity gains or margin expansion.



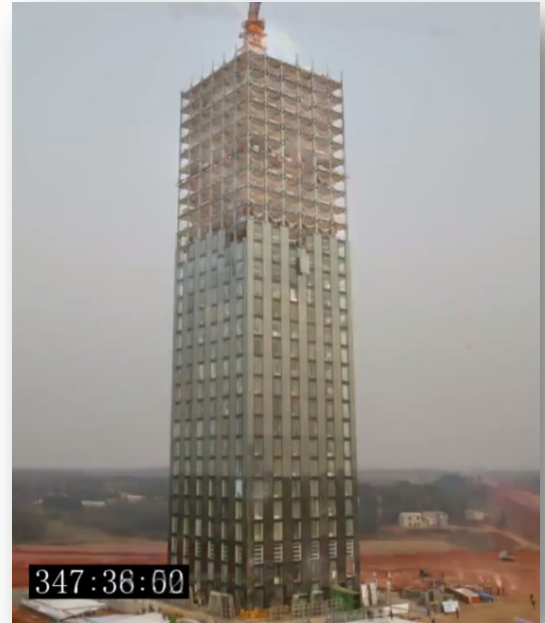
Expect More “Building Manufacturing” through Prefabrication

Use of prefabricated building components on the rise

- Higher quality
- Improved job-site performance
- Ideal for repetitive sections
- Architectural style NOT compromised

Implications

- Less skilled labor on jobsites
- Changing playing field—who will be contracting the work?
- Competencies in manufacturing process required
- Heightened ability to collaborate across trades



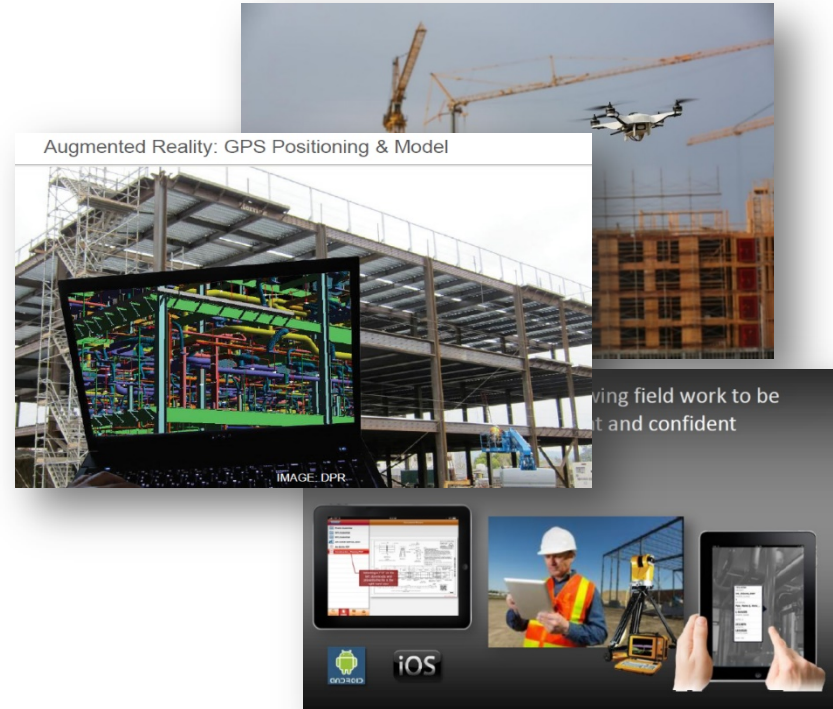
Jobsite Transparency Is Driving Productivity Increases and Improving Safety

Embedded GPS and real-time information improves production

- Merging of GPS and virtual imaging
- Mobility devices streamlining jobsite decision making
- Drones and robots in use to avoid costly mistakes in high-risk areas

Implications

- Greater daily production expected
- Job-site communication skills need to improve
- Staging of work is becoming key to profitable outcomes
- The more time sensitive your part of the project, the greater the need for adoption



Disruption through Technology Accelerating







Computing power gains are accelerating the creation of disruptive technologies

- Empowering the way we find and do work
- Industries will emerge FAST, others will be rendered obsolete

Implications

- Finding work, assessing project viability improving, driving smarter decisions
- Disruptive technologies represent opportunity to gain competitive advantage
- The disruptors represent future growth and new market opportunities
- Organizations will need talent that can think strategically to see and apply these disruptors effectively

Technologies' impact on the E&C industry appears to finally making inroads... but, to what end?

	Mobile Internet	Increasingly inexpensive and capable mobile computing devices and Internet connectivity
	Automation of knowledge work	Intelligent software systems that can perform knowledge work tasks involving unstructured commands and subtle judgments
	The Internet of Things	Networks of low-cost sensors and actuators for data collection, monitoring, decision making, and process optimization
	Cloud technology	Use of computer hardware and software resources delivered over a network or the Internet, often as a service
	Advanced robotics	Increasingly capable robots with enhanced senses, dexterity, and intelligence used to automate tasks or augment humans
	Autonomous and near-autonomous vehicles	Vehicles that can navigate and operate with reduced or no human intervention

SOURCE: McKinsey Global Institute analysis

Growth Impediments due to Talent Shortages

Availability has become a top impediment to performance

- Recession created industry exodus
- Baby boomers retiring
- Slowdown in U.S. immigration

Implications

- Top strategic leader focus—how do we attract and retain an “unfair” advantage of a limited talent pool?
- Understand what’s required to attract and effectively leverage Millennials
- Internal development of talent
- Can applied technology produce more with fewer people?

The E&C industry downturn occurred when Millennials were coming of age.

If you cannot reasonably meet the need for skilled labor and tradespeople in the next few years, what do you think will be the impact for your business?

61% believe the lack of skilled labor will impact competitiveness and / or slow ability to grow



Boomers Are Retiring, Millennials Are the Future

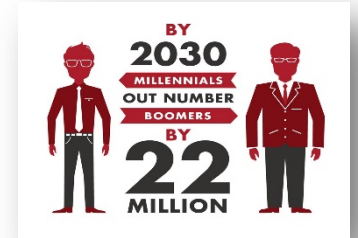
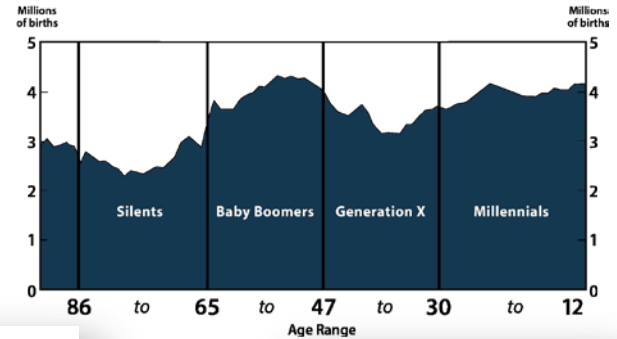
Majority of industry leadership retiring in the next 5 to 7 years

- Gen X insufficient to cover the gap
- Millennials think and work differently, but understand and can apply technology
- Millennials feel disenfranchised, not attracted to construction
- Millennials will be our customers in 10 to 15 years

Implications

- Leadership needs to quickly learn how to understand and effectively leverage this generation
- Mentoring and stretch assignments critical
- Clarifying a company's purpose and direction critical

Aging baby-boomers retained ownership through the past decade, largely forgoing the opportunity to transition ownership to Gen X, and are now behind the curve for a time-based transition.



Industry Division and Business Reinvention Continues

Large firms are becoming larger and more diversified, smaller firms are becoming more specialized

- Mid-tier firms are struggling to find a path of sustainable growth.
- Engineering firms are moving into construction.
- Contractors are pursuing opportunities across the facility life cycle.

Implications

- Vision and aligned strategic priorities have never been more critical.
- Leaders of mid-tier firms are under pressure to understand marketplace and where and how they will compete and grow in the future.
- Strategic thinking organizations becoming imperative.

Diseconomies of scale persist for large firms, leadership issues are magnified. Design firms assuming contract risk with mixed results.

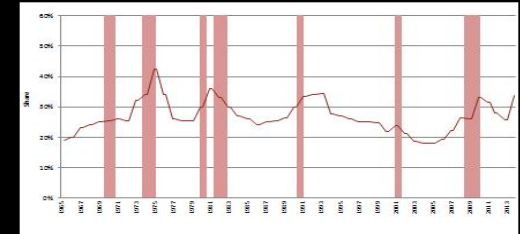
Bifurcation:

Convergence underway in design and construction

- Seventeen (17) of the top twenty-five (25) engineering firms are in the contracting business
 - This number will only increase in the coming years
- Growth of design-build and construction management
- Battle for dominance – designers versus contractors
- Designing for productivity and efficiency

Bifurcation:

ENR 400 Share is Growing of Total Construction Put in Place



Green Building 2.0—Sustainability Isn't Going Away

Green Building aka Smart Buildings Demand Remains

- \$3 billion by 2020
- Consumption of renewable energy growing faster than conventional energy
- New generation expect energy efficient, high performance facilities

Implications

- Demand will grow for those who can bring cost effective materials or methods to construction that:
 - Eliminate waste during building phase or,
 - Create greater energy performance efficiencies in the operating phase.



Leadership Succession Intensifying, but may Be too Late for Many

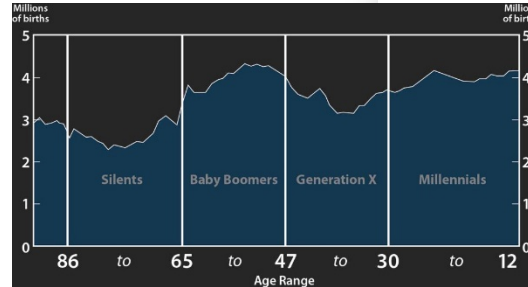
Majority of senior leaders will be retiring in the next 5 to 8 years

- Identification of future leaders and owners typically requires more time than planned.
- Succession planning requires selection and development with the future in mind.

Implications

- Formalizing management succession and building leaders for the future is the number one long-term priority for current leaders.
- Lack of bench strength will undermine near-term performance and long-term valuations.

How does a 70-year-old boomer transfer ownership of his specialty trade business over 10 years while passing over his 50-something key managers?



Global Interconnectedness Expanding, along with VUCA Norms

Construction outlook increasingly tied to global conditions and market dynamics

- As goes China, so goes... really?
- Terrorism and cyber-risk are new norm *wild cards*.

Implications

- Embedding organizational agility and performance discipline are becoming cultural requirements.
- Knowing what to preserve and what to change in organizational behaviors to adapt and deliver consistent quality is critical to long-term strategic direction.

Re-thinking traditional strategic planning in favor of creating agile organizations

And, if the pace of change wasn't enough, we're now operating in a **VUCA** world

Volatile

Uncertain

Complex

Ambiguous



Third Quarter Construction Overview

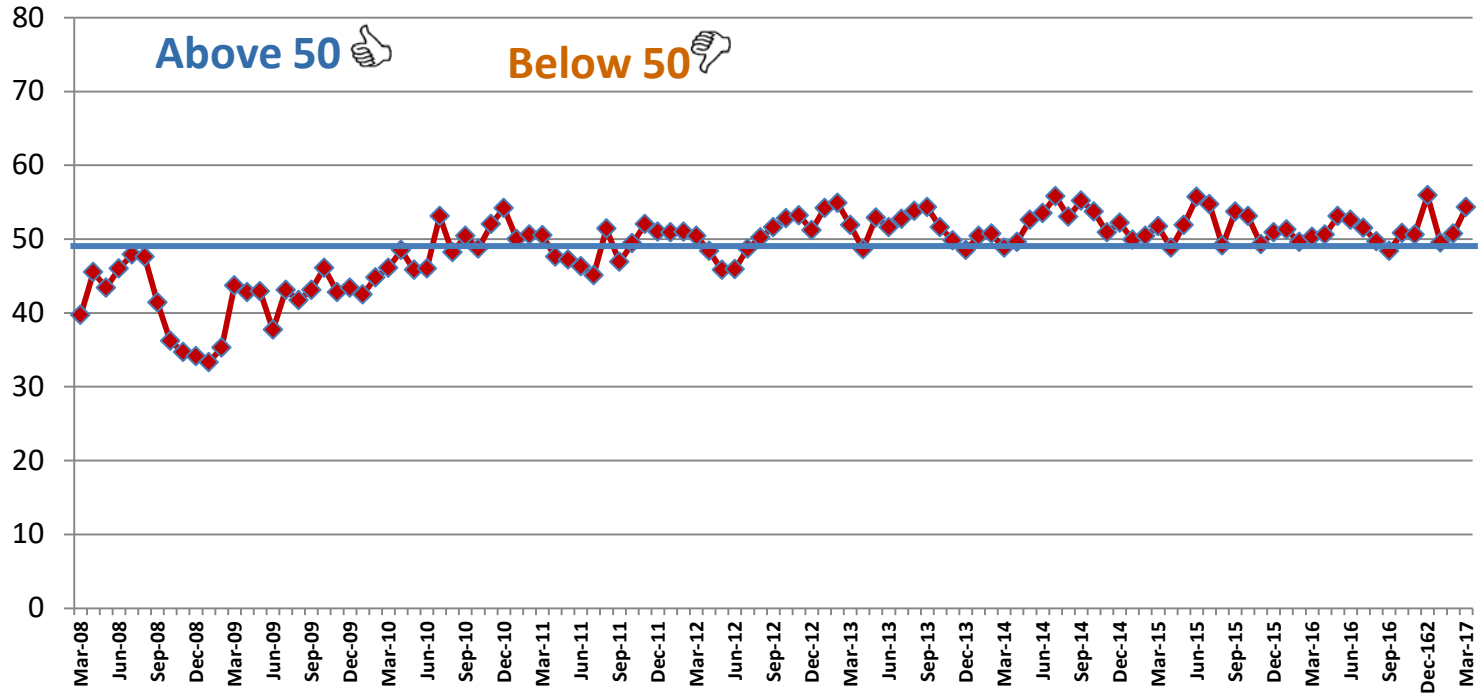
The Past as Prelude

Total Put in Place

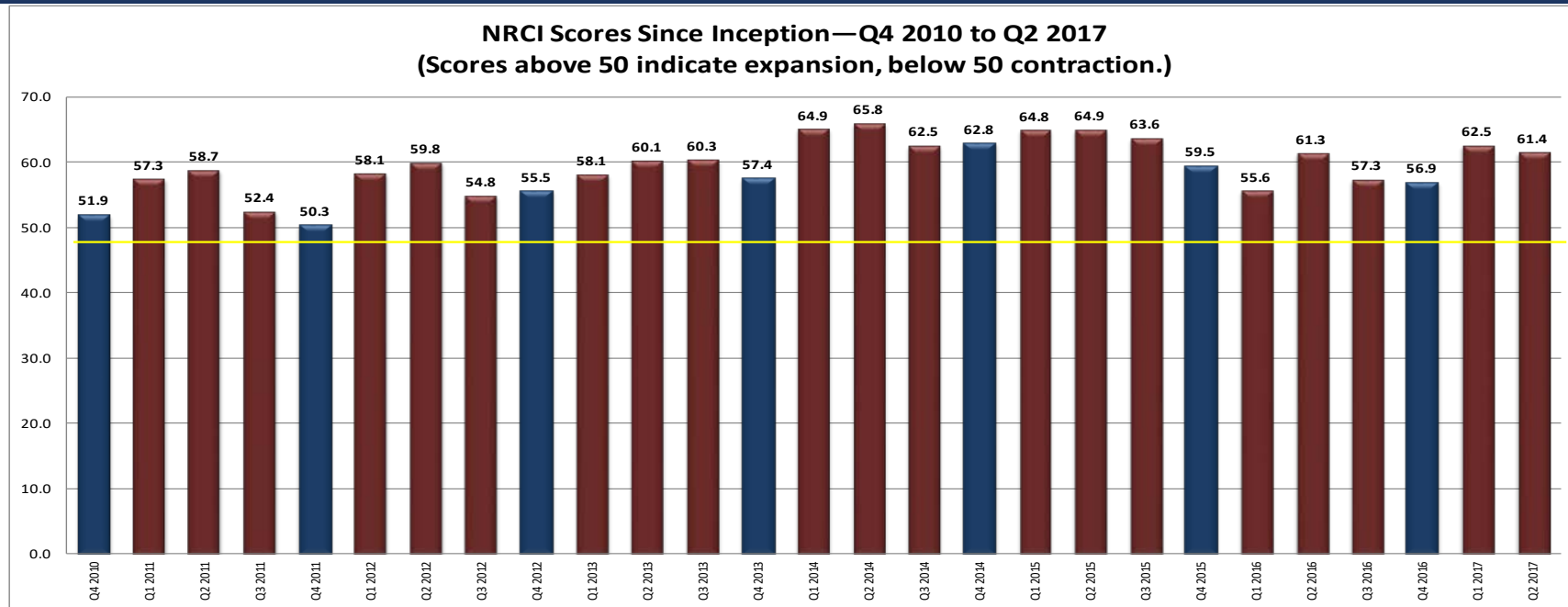
Year	%
2014	11
2015	11
2016	5

- **High-volume nonresidential segments in 2016**
 - Power (\$95.7 billion)
 - Highway and Street (\$90.9 billion)
 - Education (\$88.8 billion)
- **Strongest percentage gainers in 2016**
 - Lodging (25.0%)
 - Office (25.0%)
 - Amusement and Recreation (9.0%)
 - Power (4.0%)
- **Weakest segments in 2016**
 - Water Supply (-9.0%)
 - Sewage and Waste Disposal (-9.0%)
 - Public Safety (-4.0%)

Architecture Billing Index (ABI)



FMI Nonresidential Construction Index (NRCI)



Source: FMI Construction Outlook Q1 2017

Above 50  Below 50 

U.S. Construction Put in Place Estimated for the United States

Millions of Current Dollars

1st Quarter 2017 Forecast (based on Q4 2016 Actuals)

	2017	2018	2019	2020	2021
RESIDENTIAL BUILDINGS					
Single Family	260,725	277,566	288,193	298,715	310,806
Multifamily	69,771	70,889	72,770	75,780	78,600
Improvements*	159,595	162,462	166,469	168,744	172,874
Total Residential	490,091	510,917	527,432	543,240	562,280
NONRESIDENTIAL BUILDINGS					
Lodging	29,879	31,372	32,370	33,800	35,478
Office	77,438	80,970	83,143	84,950	88,664
Commercial	81,464	83,766	84,488	86,208	89,684
Health Care	42,540	44,249	47,220	50,067	52,544
Educational	94,088	99,129	102,258	106,586	112,216
Religious	3,788	3,914	4,009	4,101	4,217
Public Safety	7,799	7,920	8,342	8,767	9,139
Amusement and Recreation	23,144	23,751	24,264	24,854	25,424
Transportation	43,614	46,211	49,192	51,807	53,648
Communication	21,133	22,157	23,493	24,482	25,486
Manufacturing	78,217	83,371	87,927	89,606	92,828
Total Nonresidential Buildings	503,104	526,810	546,705	565,229	589,328
NONBUILDING STRUCTURES					
Power	100,162	108,230	116,276	121,815	126,575
Highway and Street	93,863	97,261	99,826	101,885	103,467
Sewage and Waste Disposal	22,683	23,531	24,240	25,405	26,532
Water Supply	12,009	12,351	12,695	13,191	13,710
Conservation and Development	8,009	8,718	9,262	9,787	10,269
Total Nonbuilding Structures	236,726	250,091	262,299	272,083	280,554
Total Put in Place	1,229,921	1,287,818	1,336,436	1,380,551	1,432,161

U.S. Construction Put in Place

1st Quarter 2017 Forecast (based on Q4 2016 Actuals)

	2017	2018	2019	2020	2021
RESIDENTIAL BUILDINGS					
Single Family	7%	6%	4%	4%	4%
Multifamily	6%	2%	3%	4%	4%
Improvements*	3%	2%	2%	1%	2%
Total Residential	6%	4%	3%	3%	4%
NONRESIDENTIAL BUILDINGS					
Lodging	10%	5%	3%	4%	5%
Office	12%	5%	3%	2%	4%
Commercial	9%	3%	1%	2%	4%
Health Care	3%	4%	7%	6%	5%
Educational	6%	5%	3%	4%	5%
Religious	1%	3%	2%	2%	3%
Public Safety	-4%	2%	5%	5%	4%
Amusement and Recreation	6%	3%	2%	2%	2%
Transportation	2%	6%	6%	5%	4%
Communication	7%	5%	6%	4%	4%
Manufacturing	4%	7%	5%	2%	4%
Total Nonresidential Buildings	7%	5%	4%	3%	4%
NONBUILDING STRUCTURES					
Power	5%	8%	7%	5%	4%
Highway and Street	3%	4%	3%	2%	2%
Sewage and Waste Disposal	2%	4%	3%	5%	4%
Water Supply	1%	3%	3%	4%	4%
Conservation and Development	5%	9%	6%	6%	5%
Total Nonbuilding Structures	4%	6%	5%	4%	3%
Total Put in Place	6%	5%	4%	3%	4%

Improvements includes additions, alterations, and major replacements. It does not include maintenance and repairs.

Source: Building permits, Construction Put in Place, and trade sources. This report is based on multiple sources, prepared and believed accurate by FMI, but accuracy is not guaranteed by FMI nor by its employees.

U.S. Markets Construction Overview

U.S. Construction Spending, \$ Billions (2016)

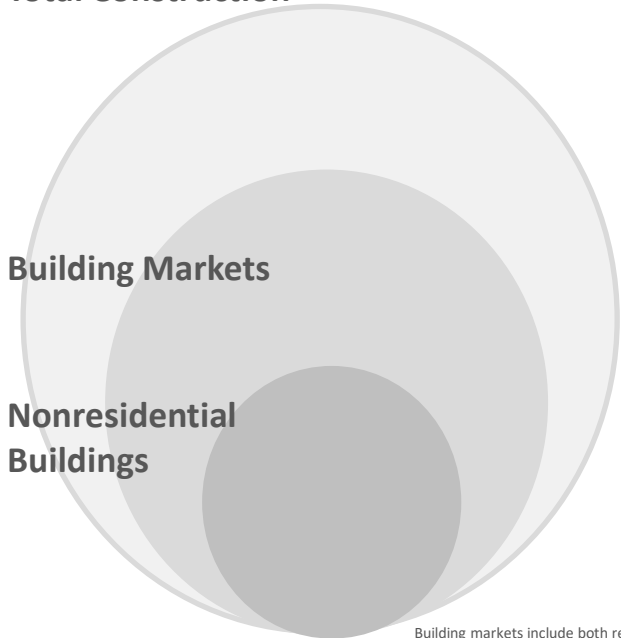
Source: FMI Corporation

U.S. Construction Spending Segmentation

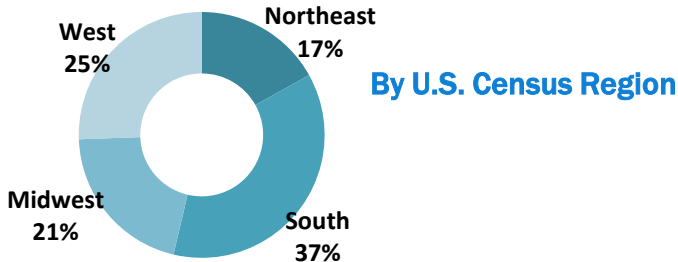
Source: FMI Corporation, U.S. Census Bureau

Total Construction

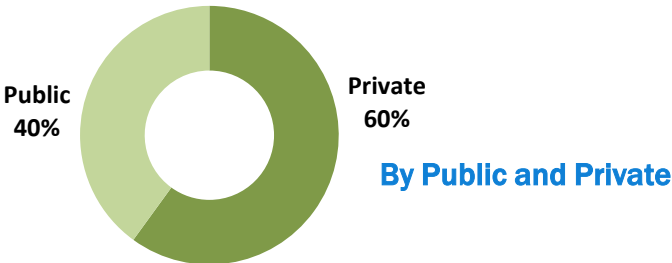
100%



Building markets include both residential and nonresidential



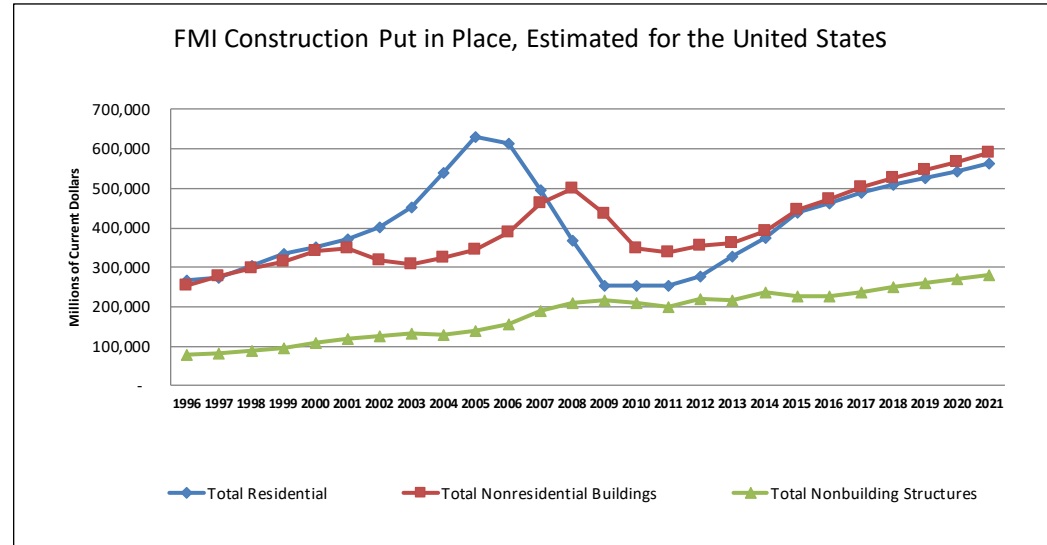
By U.S. Census Region



By Public and Private

Total Residential Construction

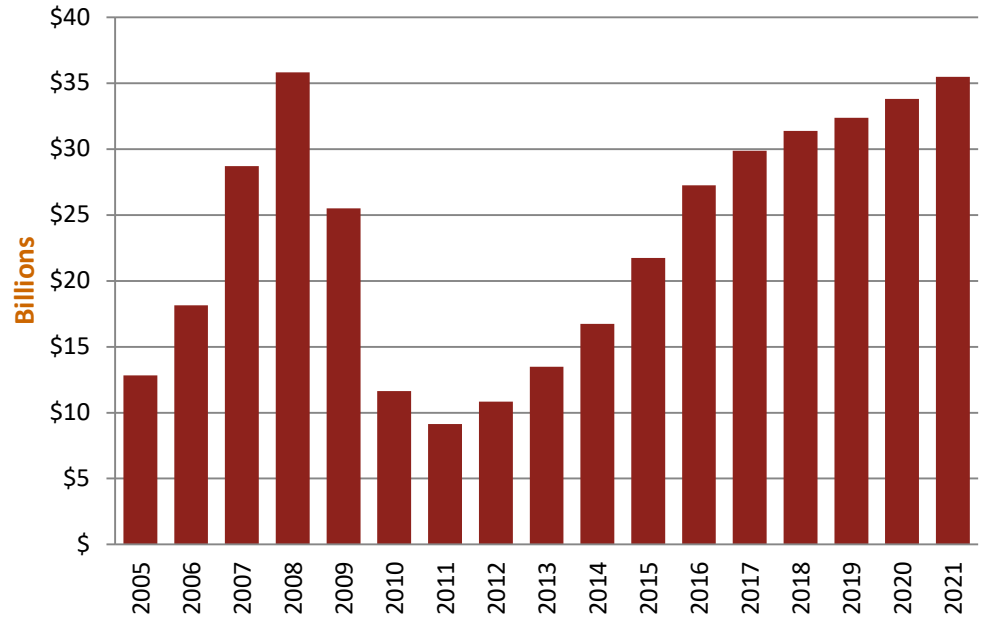
- Growth for 2018 is forecast to be 4% for a total of \$510.9 billion.
- Factors impacting residential activity:
 - Foreclosure rates slowing
 - Demand outpaces supply
 - Affordability high
 - Low mortgage rates
 - Changing demographics
 - Low household formation
 - Improving employment data
 - Multifamily rents are up



Source: FMI U.S. Construction Outlook Q2 2017

Lodging Construction

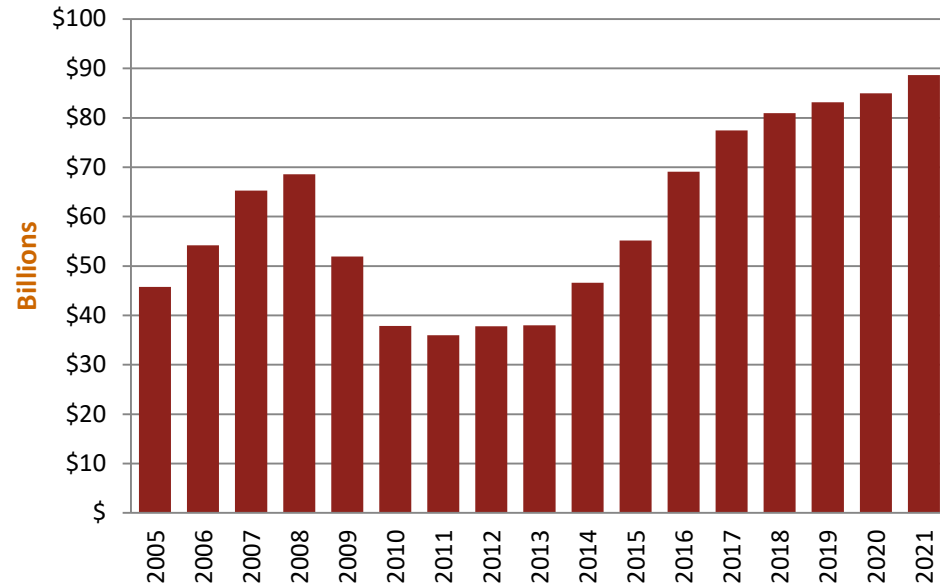
- At just 5% for 2018, lodging construction is expected to have its slowest year of growth since 2012, when it made a roaring comeback from negative 22% to a 19% improvement.
- According to STR, “Occupancy performance fell in line with expectations as supply growth outpaced demand, but that supply growth also looks to be placing added pressure on hotelier pricing power.” (Hotel News Now, March 21, 2017)
- “In 2016, RevPAR growth for the 60 markets covered by CBRE’s Hotel Horizons® forecast reports averaged 2.8 percent. This is below the aggregate 3.6 percent RevPAR growth achieved by hotels located outside of the 60 markets.” (CBRE Hotels’ Americas Research, reported in HospitalityNet, March 22, 2017)



Source: FMI U.S. Markets Construction Overview 2017

Office Construction

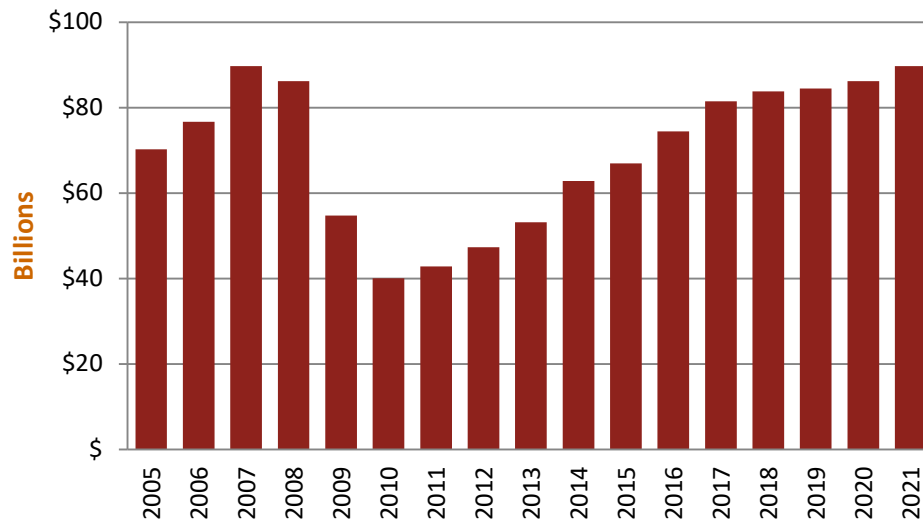
- Office construction will slow to 5% growth in 2018. That is much less than the 25% improvement enjoyed in 2016 and 12% in 2017. After three high-growth years post-recession, it appears office construction is on the downward leg of its current cycle.
- After several years of high-tech firm growth moving to the city, it is possible that there may be a growing interest in the suburbs again.
- CBRE reports, “Job creation in the primary office-using employment sectors (professional and business services, financial activities, and information services) accelerated to 169,000 in Q2 2016, above the previous quarter’s total of 122,000 and on par with the quarterly average of 175,000 office-using jobs added since the end of 2010. (CBRE Q3 2016 U.S. Office Occupier View)



Source: FMI U.S. Markets Construction Overview 2017

Commercial Construction

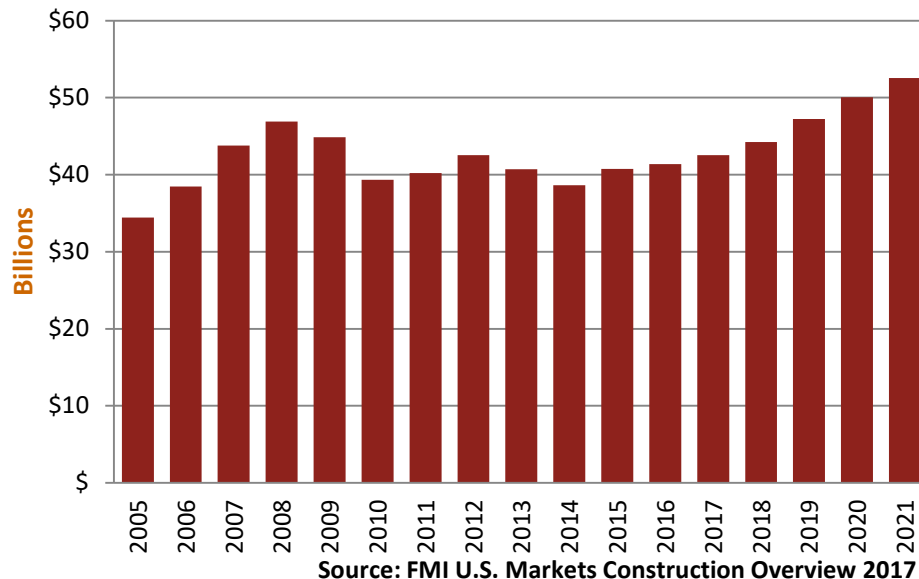
- Given the store closings and the rapidly evolving state of the retail environment, a forecast of 3% in 2018 looks like the tail of the cycle.
- Consumer confidence rose sharply to 125.6 in March.
- The Internet of Things (IoT) will be increasingly disruptive for commercial business, presenting both opportunities for new businesses and threats to traditional brick and mortar markets.
- The U.S. Census Bureau announced, “Retail trade sales were up 0.1 percent (± 0.5 percent)* from January 2017, and up 5.9 percent (± 0.7 percent) from last year. Gasoline Stations sales were up 19.6 percent (± 1.4 percent) from February 2016, while Nonstore Retailers were up 13.0 percent (± 1.8 percent) from last year.” (U.S. Department of Commerce, March 15, 2017)



Source: FMI U.S. Markets Construction Overview 2017

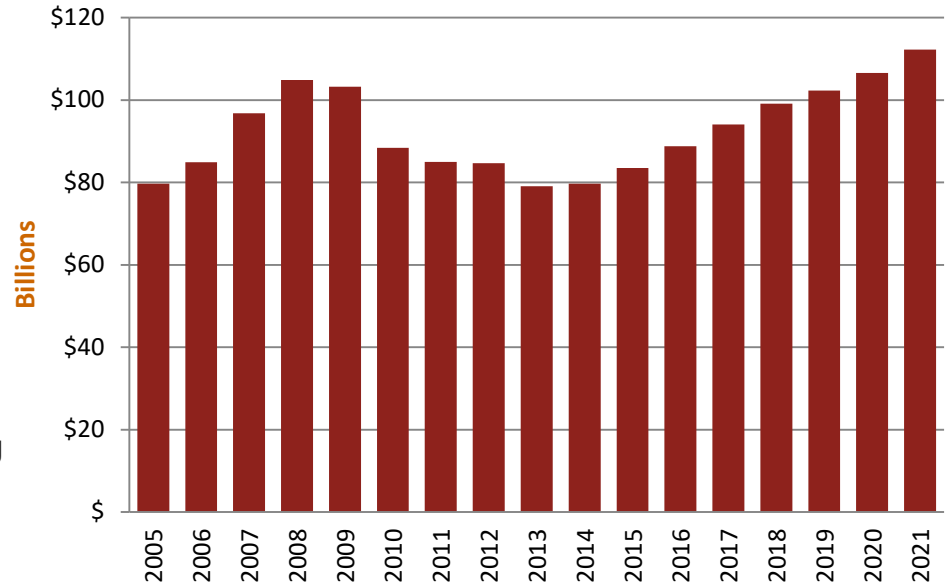
Health Care Construction

- FMI is forecasting 4% growth in 2018.
- The uncertain future of government health care policy and challenges of updating to the latest technologies and security measures will be top challenges in the years ahead.
- Health Facilities Management magazine says the “industry is moving away from large-scale new construction, according to survey results. While 70 percent of respondents said they have projects currently under construction or planned in the next three years, a full three-fourths of those were expansions or renovations.” (2016 Hospital Construction Survey, Health Facilities Management)



Education Construction

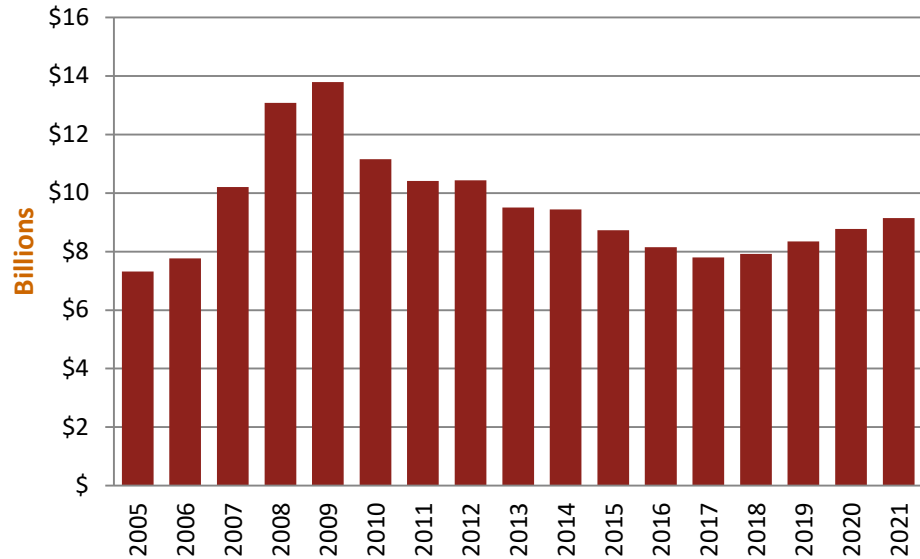
- FMI forecasts education construction put in place for 2018 is expected to be 5% for a total of \$99.1 billion by year-end.
- The National Center for Education Construction reports that, “Total public school enrollment in pre-K through grade 12 increased in 30 states and the District of Columbia from 2003–04 to 2013–14, with increases of 15 percent or more occurring in five states (Utah, Texas, Idaho, Nevada, and Colorado). During this period, total enrollment declined in the other 20 states, with decreases of 10 percent or more occurring in four states (Michigan, Rhode Island, Vermont and New Hampshire).” (NCES, May 2016)
- New designs for schools will be more flexible for changing classrooms and greater use of natural light. Expect more use of modular building designs.
- Greater focus on safe schools, as the threat for shootings on campus continues to rise.



Source: FMI U.S. Markets Construction Overview 2017

Public Safety Construction

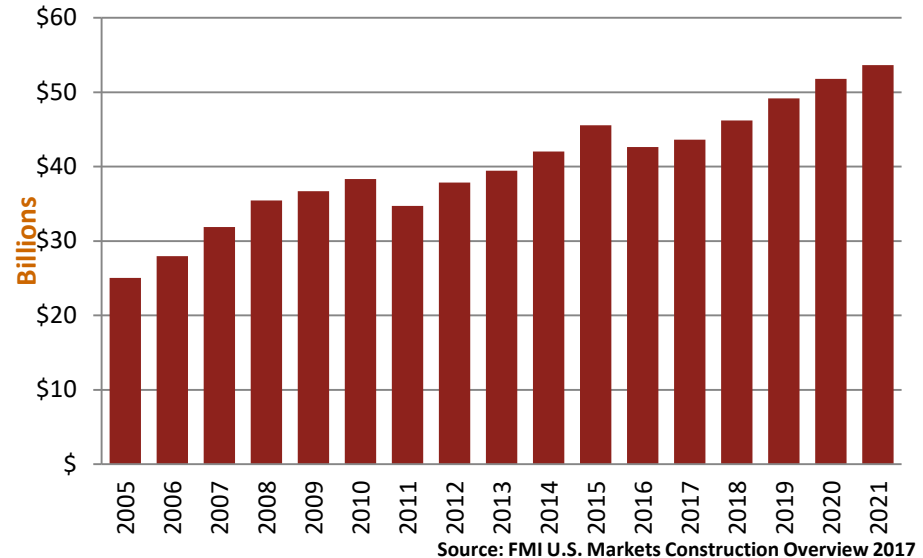
- Spending for public safety construction is expected to rebound slightly by 2% in 2018.
- Attorney General Sessions has been directed by President Trump to overturn the phaseout of privately run prisons and favors the greater use of private prisons.
- GSA Five-Year Courthouse Project Plan calls for \$1.27 billion for site planning, design, and construction for 10 facilities.
- Recent reports show the federal prison population dropped about 1% in 2014, but state prison population increased.
- The rise in deportations and the roundup of undocumented immigrants may greatly increase the need for prison capacity.



Source: FMI U.S. Markets Construction Overview 2017

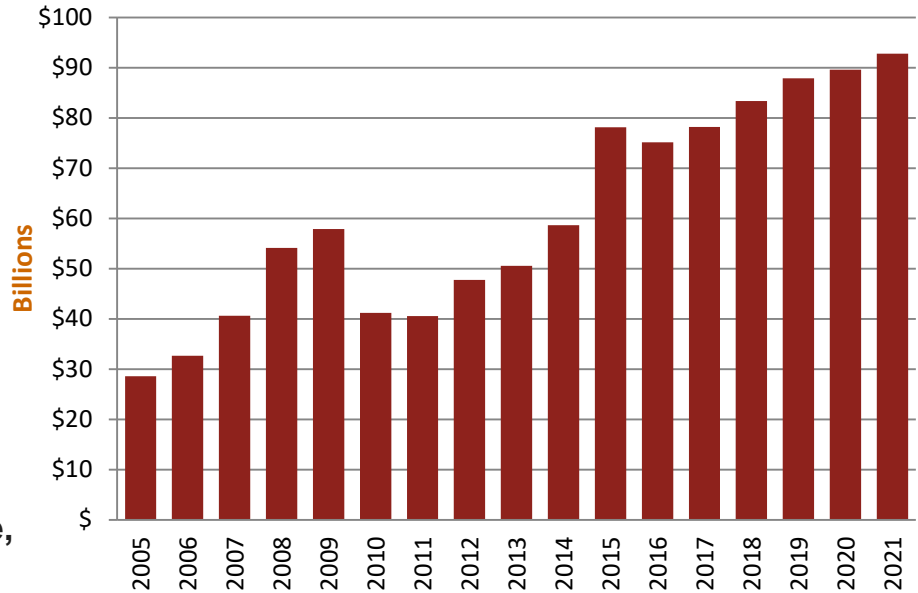
Transportation Construction

- Vertical transportation construction growth will continue its recovery with 6% growth in 2018 to reach \$46.2 billion.
- Aviation transportation for cargo and passengers will continue to grow at around the same pace as GDP growth; however, airports will increasingly need to be able to accommodate larger, wide-bodied aircraft as airlines replace older fleets.
- Although many people in the industry do not expect Trump's infrastructure plan to be taken up in Congress at least before the end of 2017, funding is in place from the Surface Transportation Reauthorization and Reform Act and other bills. Nonetheless, President Trump's current budget proposes to cut The Department of Transportation (DOT) by \$2.4 billion (13%). (The Hill, 3/16/17)



Manufacturing Construction

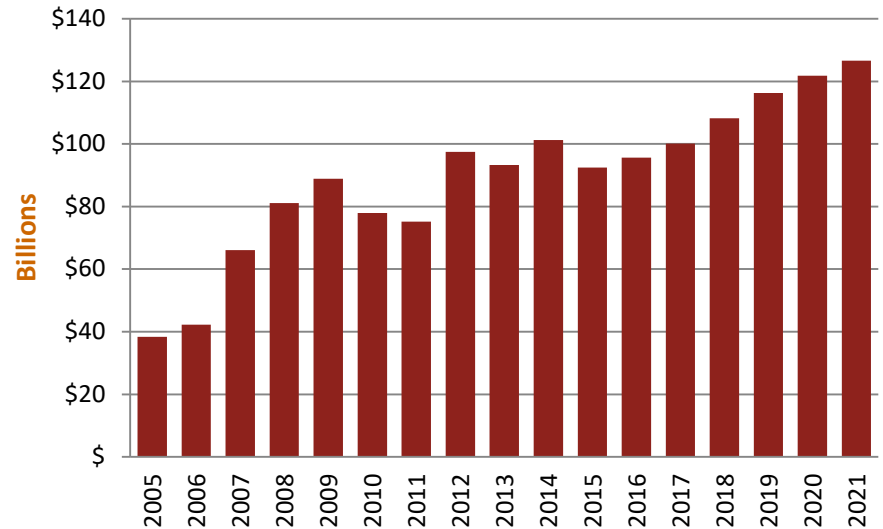
- Manufacturing construction growth has been subject to some sharp ups and downs in the last decade, but we expect growth to improve to 7% in 2018.
- With little change since last quarter, manufacturing capacity utilization rates are at 75.4% of capacity in February 2017, which is well below the historical average of 78.5 (1972–2015).
- The U.S. Department of Commerce reports, “Shipments of manufactured durable goods in February, up three of the last four months, increased \$0.6 billion or 0.3 percent to \$239.2 billion. This followed a 0.1 percent January decrease. Machinery, also up three of the last four months, led the increase, \$0.3 billion or 0.9 percent to \$31.1 billion.” (March 24, 2017)



Source: FMI U.S. Markets Construction Overview 2017

Power Construction

- Construction for power-generating facilities grew 5% in 2017 to reach \$100.1 billion for construction put in place. We expect another 8% growth in 2018.
- The Trump administration has approved the Keystone XI pipeline, which could increase construction by year's end.
- Electricity generated by gas, wind, and solar power led the added capacity put in place in 2016. Coal represents 24.62% of annual capacity in the U.S., while natural gas is up to 43.14%. Solar power represents only 2.04% capacity and wind, 6.99%. (Office of Energy Projects, Energy Infrastructure Update, December 2016)



Source: FMI U.S. Markets Construction Overview 2017

About FMI

Industry Focus. Powerful Results.™

For over 60 years, FMI has been the leading **management consulting and investment banking** firm dedicated exclusively to **engineering and construction, infrastructure, and the built environment**.

FMI serves all sectors of the industry as a trusted advisor. More than six decades of context, connections, and insights lead to transformational outcomes for clients and the industry.

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- Industrial
- Specialty Trades
- Utility T&D
- Cleantech and Energy Services
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- Oil and Gas
- Private Equity
- Owners

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