

# Construction

## Observer

May 2015

### U.S. Nonresidential Construction Outlook: Spending Will Disappoint as Key Sectors Do More With Less

One of two Observers covering Morningstar's U.S. construction outlook

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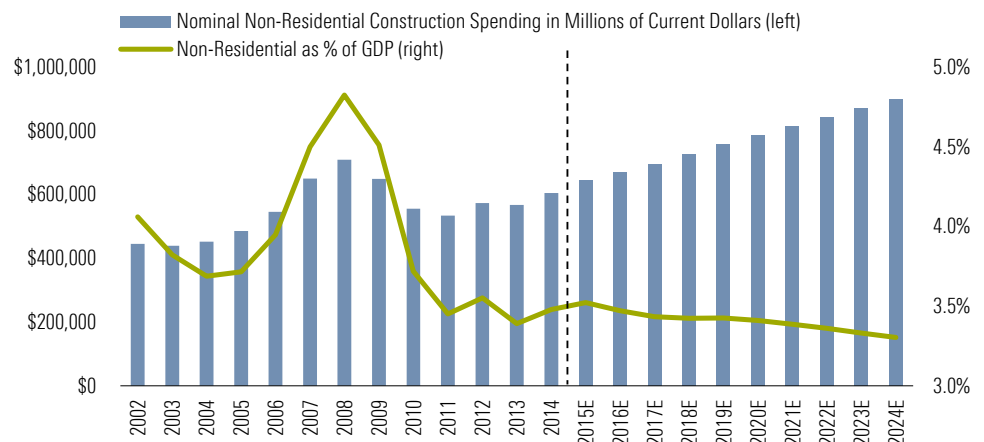
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The U.S. nonresidential construction recovery has been slow and uneven. Consensus foresees high-single-digit to low-double-digit nominal growth over the next several years as the nonresidential construction share of GDP recovers to long-term norms. We're more circumspect. Our bottom-up analysis reveals a secularly diminished need for new construction in many key sectors. While we see pockets of strength, we expect far lower total growth than most and a permanently lower nonresidential construction share of GDP. This might sound negative for the economy overall, but we view it as a positive. Sectors as diverse as health care and retail are delivering more goods and services for each construction dollar spent. This might weigh on construction spending, but it reflects improved economic productivity and frees up capital for other endeavors. Although total construction spending is likely to disappoint, companies that serve higher-growth areas such as manufacturing, and highway and street, should find profit expansion easier to come by. Aggregates, cement, and steel are likely to be relative winners.

**Exhibit 1** Nonresidential Construction Spending Will Grow More Slowly Than GDP



Source: U.S. Census Bureau, Morningstar

# Construction Observer

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## Key Takeaways

- ▶ **Nonresidential construction is likely to disappoint.** Consensus foresees high-single-digit to low-double-digit nominal growth over the next several years, as the construction share of GDP fully recovers to precrisis norms. Our bottom-up, sector-by-sector analysis suggests that a full recovery is unlikely. While we expect strong spending growth (7% nominal) in 2015 as pent-up demand is unleashed in certain sectors, we see construction spending trailing GDP growth in subsequent years due to a variety of secular shifts.
- ▶ **This might seem negative for the economy overall, but it isn't.** Efficiency gains, the ability to do more with a smaller construction footprint, are the key reason for nonresidential construction's declining share of GDP. While "doing more with less" may weigh on construction's contribution to growth, rising productivity and capital efficiency will be a net positive for the economy as a whole.
- ▶ **We expect the strongest growth from the manufacturing, commercial, and highway and street sectors.** We expect relatively weaker growth from the power, educational, and office sectors. Our outlook varies considerably among the 16 construction sectors due to diverse cyclical and secular drivers.
- ▶ **We identify 77 companies materially exposed to US construction and rate their leverage to residential and nonresidential activity.** Aggregates company Martin Marietta and steel company Nucor trade at a discount to our fair value estimates. Each is disproportionately exposed to higher growth sectors.
- ▶ **Amid diverse factors, five overarching themes emerge that will define nonresidential construction's outlook for the next decade:**
  1. **Doing more with less.** Several key sectors are making more efficient use of their construction spending, including health care, commercial, communications, and office. These are secular changes rather than cyclical responses to tepid economic growth.
  2. **More seniors, fewer children.** Demographic shifts will buoy construction for some sectors, such as health care, and diminish it for others, such as education.
  3. **Residential recovery begets nonresidential recovery.** Tight state and local government budgets have constrained spending. A full recovery in residential real estate should increase tax receipts and halt infrastructure underspending.
  4. **Pre-recession overbuild finally absorbed.** Substantial overbuilding prior to the Great Recession is finally receding, with many sectors soon requiring a return to new builds. The commercial, office, and lodging sectors all saw significant building activity leading up to the recession. Vacancy rates have fallen amid improving demand, which should spur a recovery in construction activity.
  5. **Shale revolution construction boom continues, but slows.** Cheap natural gas has triggered a construction boom in the power and manufacturing sectors. While spending on chemical manufacturing plants will remain high through the end of the decade, we expect waning outlays on gas-fired plants as regulatory-driven coal retirements slow.

## Nonresidential Construction Outlook

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### **Nonresidential construction should improve, but the recovery is likely to disappoint.**

The Great Recession ravaged nonresidential construction activity. In 2008, nominal nonresidential construction spending peaked at more than \$710 billion. By 2011, spending had fallen 25%. As the broader U.S. economy has recovered, nonresidential construction has shown signs of improvement, albeit slow and intermittent. In 2014, nonresidential construction was still 15% below peak on a nominal basis. Nonresidential construction's tepid recovery has been one of the reasons GDP growth has been so disappointing following the Great Recession.

Most see a robust recovery on the horizon. Consensus calls for high-single-digit to low-double-digit nominal growth over the next several years. Just as construction fared worse than the economy as a whole during the recession, the theory goes, it should do far better in a healthy environment.

The consensus outlook is strengthened further by the mean reverting tendency of nonresidential construction spending. Prior to the most recent cycle, it had averaged roughly 4% of GDP. If spending were to revert to that level in, say, three years amid 5% nominal annual GDP growth (3% real), nonresidential construction outlays would grow 10% annually on a nominal basis (8% real).

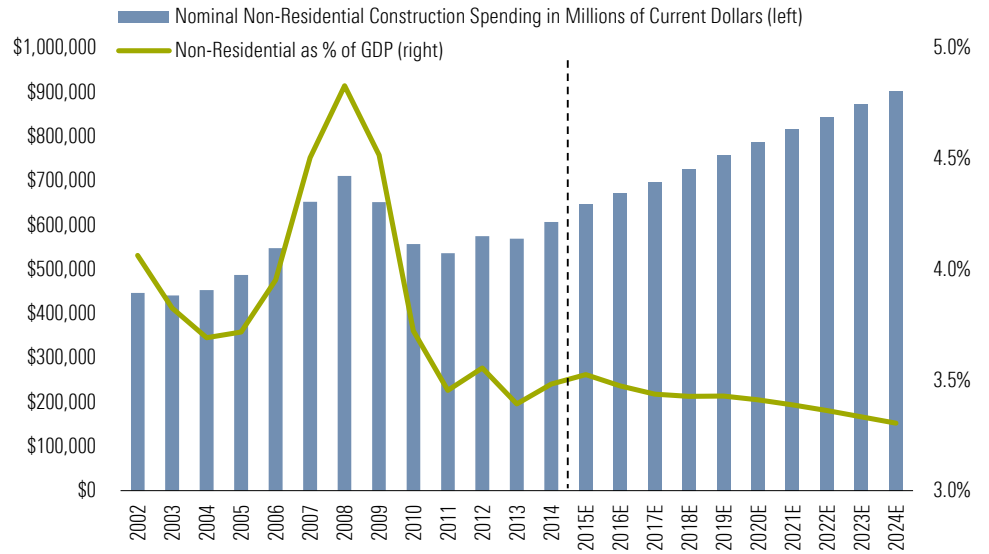
Undoubtedly, there are reasons for optimism. Falling vacancy rates in office, retail and lodging should spur new development. Industries as diverse as chemicals and power will be investing to take advantage of cheap shale gas for years to come. Even a federal compromise on highway spending looks within reach.

Despite pockets of near-term strength, we expect far lower total growth than most and a permanently lower non-residential construction share of GDP. Moderating oil and gas production growth, health-care services increasingly shifting to the outpatient channel, and unfavorable demographic trends are just some factors we expect to weigh on spending.

Whereas most expect nonresidential construction growth to exceed GDP growth over the next 10 years as nonresidential construction fully-recovers from its cyclical trough, we do not. We forecast 7% growth in 2015 and roughly 4% annual growth through 2024 (all figures nominal). In real terms, this works out to roughly 2% annually versus our GDP growth assumption of 2.25% annually. We think investors should temper expectations for broad robust construction growth and instead take a deeper look at construction activity to identify pockets of strength and weakness.

This might seem to suggest a bearish outlook for the U.S. economy as a whole. Yet weaker long-term nonresidential construction growth should not be regarded as a negative for GDP to the extent that it is a reflection of improving efficiency. Rising productivity frees up capital for other endeavors.

**Exhibit 2. Nonresidential Construction Spending Will Grow About 4% on a Nominal Basis Over the Next Decade**  
 Nonresidential construction put-in-place, in current dollars, in millions (left), and as % of GDP (right)



Source: U.S. Census Bureau, Morningstar

**Different drivers lead to substantially different growth outlooks among sectors.**

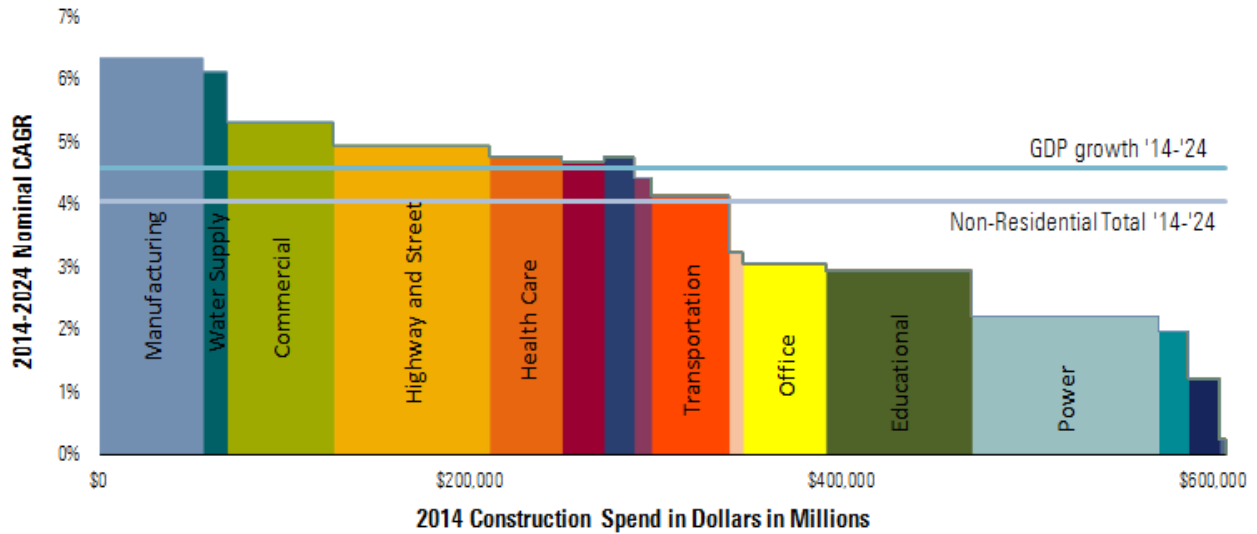
Growth is likely to be uneven as growth drivers differ considerably from sector to sector. Exhibit 3 charts our outlook by sector, with the width representing the current size of a construction sector and the height representing the average growth rate over the next decade. The area of each bar signifies the contribution of each sector to overall nonresidential construction spending growth over the next decade.

Among the larger construction sectors, we expect the strongest growth in manufacturing, commercial, highway and street, and health care. By contrast, we see more modest contributions from the large education, office, and power sectors.

The following sections of this report provide a 10-year detailed outlook for each of the 16 sectors that roll up to the Census Bureau's monthly survey of nonresidential construction put-in-place. We identify each sector's key factors and discuss how we expect them to drive our outlook.

Despite a dizzying array of growth drivers across the 16 sectors, divergent secular outlooks, and different cyclical considerations, patterns emerge from our bottom-up analysis. Here, we identify five broad themes that cut across sectors and are likely to shape nonresidential construction spending in the decade to come.

**Exhibit 3.** Hefty Sectors Office, Educational, and Power Will Provide Little Punch to Nonresidential Growth Over the Next Decade  
Sector contribution to total nonresidential growth for the next 10 years



Source: U.S. Census Bureau, IMF, Morningstar

**Theme 1: Doing more with less.**

All else equal, any improvement in a sector’s operating environment should translate into construction growth. For example, in the lodging sector, an increase in business and vacation travelers encourages the construction of additional space — more rooms for more travelers.

However, we observe in several sectors signs of a breakdown in the typical linkage and expect construction growth to trail underlying sector performance. We think this phenomenon will be most evident in the commercial, office, health care, and communication sectors.

**Retail — More online sales using less (and cheaper) space**

Efficiency gains will weigh most heavily on commercial-sector construction, particularly the retail subsector. Retail is the single largest component of the commercial sector at more than 60% of the total.

All else equal, the full increase in total retail sales in any year does not need to be addressed with incremental retail space due to productivity gains (i.e., selling more dollar-volume through the same retail footprint).

But even more significant is the shift in retail sales to online channels, which do not require physical stores. Although we expect average annual retail sales growth of roughly 5% (in line with nominal GDP growth), we expect brick-and-mortar sales to grow at a slower pace. Though e-commerce sales do not require physical retail space, they do require additional logistics space. However, as seen in Exhibit 4, the shift to online channels still results in a net decline to construction demand — the increase in logistics space is not enough to offset the decline in retail space. Indeed, we expect e-commerce’s growing share of retail sales to translate into more sales with less space. We expect growth for the commercial construction sector of 5% annually.

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**Exhibit 4.** With Every Shift of \$1 Billion From Physical Stores to Online Channels, an Estimated \$418 Million Is Lost From Commercial Construction Spending

Space requirements for \$1 billion in retail sales

	<b>Physical Retail Space</b>	<b>Logistics Space</b>
\$1 Billion In-Store Sales	2.9 Million Sq Ft	.325 Million Sq Ft
\$1 Billion E-Commerce Sales	0 Sq Ft	1 Million Sq Ft
Net Impact of Shift to E-Commerce	down 2.9 Million Sq Ft	up 0.675 Million Sq Ft

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Source: Prologis, Morningstar

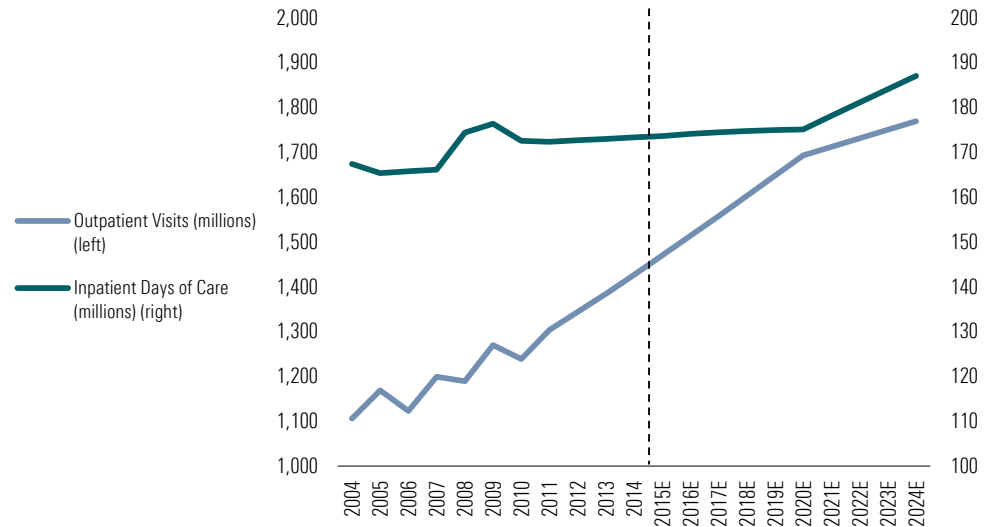
**Office— More telecommuting and less space per worker.**

We expect growth in office-using employment, the total jobs that typically use offices, of roughly 1% per year through our forecast period. However, we don't expect this growth to fully translate into office construction growth for two reasons. First, the continued adoption of full-time telecommuting means less office space will be needed to support the same level of office-using employment over time. Second, we expect less space per worker for those employees remaining in offices, driven by lower space requirements and additional flexibility from technology and mobile devices, shared workspace, and companies seeking to lower real-estate-related costs. Taken together, we expect the relationship between office-using employment growth and new office construction to weaken. We expect moderate growth for the office construction sector of 3% annually.

**Health Care— Shift to outpatient care.**

We expect strong growth in the demand for health-care services, driven by aging baby boomers. But we think growth in health-care construction will not fully reflect the growth in demand for services. We attribute this to a major shift in the health-care delivery model—away from expensive hospital-based care delivery to a more distributed model. We expect comparatively weak growth for hospitals as flattening inpatient volumes diminish the need for new construction. Hospitals account for 66% of total health-care construction spending (excluding federal spending, which does not have a detailed breakdown available). Stronger growth in nonhospital outlays will be only a partial offset, as outpatient buildings are roughly one third cheaper per square foot than hospitals.

**Exhibit 5.** Shifting Health-Care Delivery Model Amplifies Demographic Tailwinds for Outpatient Care and Portends Slow Growth in Hospital Usage  
Outpatient visits (left) and inpatient days of care (right) in millions



Source: CDC/NCHS, National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey, Morningstar

### Communications — Construction will get little of capital spend.

One might expect significant communications capital spend through our forecast period, as telecom companies upgrade systems to handle increasingly heavy data usage by consumers. However, we think a relatively small portion of these dollars will be directed to construction spending. Rather, most capital will be spent on technology, with companies being able to largely leverage the existing construction footprint. For example, cellular towers, which individually have relatively light construction footprints compared with other sectors, cover the U.S. such that 97% of consumers have a choice of at least three different wireless carriers, which suggests an appropriate physical footprint. Going forward, cellular companies can replace equipment during upgrade cycles rather than rebuild a tower. In addition, over time, towers have added more wireless companies per tower, allowing sharing of the same structure. We expect tepid growth for the communications construction sector of just 2% annually, reflecting the sector's declining need for new construction to support growth.

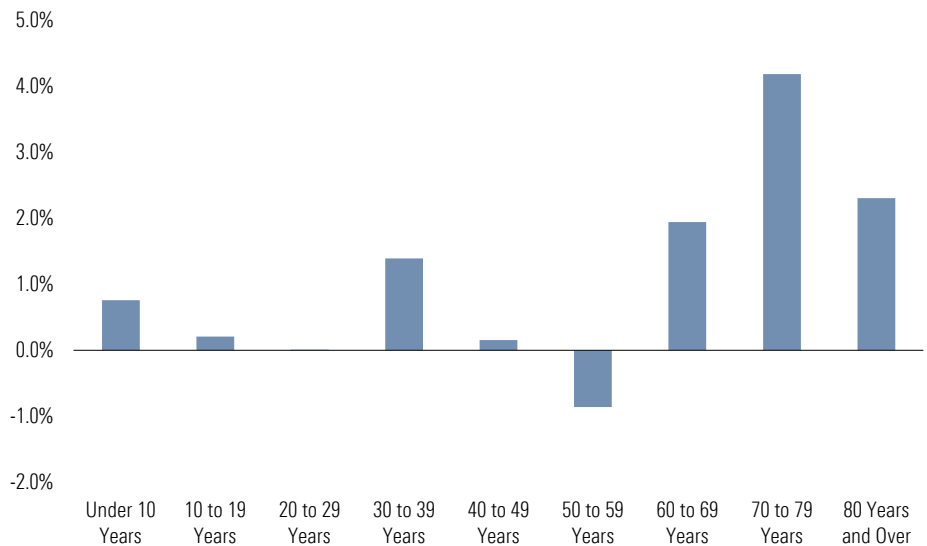
### Theme 2: More seniors, fewer children.

As baby boomers and millennials — the two largest population cohorts — age, we expect their significant size relative to the broader population will benefit construction spending for some sectors but hurt others. Health care and education will be most dramatically impacted by the demographic shift. Construction spending in both sectors has lagged in recent years, partly due to a reliance on constrained state and local government spending. Health-care and education construction spend peaked in 2008 at \$152 billion. Unlike other sectors that have seen construction levels stabilize or even recover, spending in these categories has continued to fall even as the broader economy has recovered. In 2014, health-care and educational construction was \$117 billion, 23% below peak levels.

For education, we expect demographics to weigh on any meaningful recovery. Driven by the aging of the millennial generation and low fertility rates in recent years, we project the population of the most relevant age group, 5- to 24-year-olds, to dip to 84.5 million by 2024 from approximately 85.0 million in 2014. Furthermore, we expect improved job prospects to reverse recent gains in postsecondary enrollment rates. Facing the headwind of a declining number of students, we expect just 3% annual growth in educational construction through our forecast period.

Conversely, demographics should provide a tailwind for health-care construction. The massive baby boomer population will increase its usage of the health-care system significantly over the next 10 years, underpinning strong demand growth for the country as a whole. Because the boomers will be replacing a far smaller demographic cohort, the U.S. population aged 65 and over is set to rise 37%, from 46 million to 63 million, by 2024. Adults 65–74 years old average 40% more outpatient visits and 75% more hospital days of care than those 55–64 years of age. However, we think the aforementioned shift in the health-care delivery model will partly offset this demographic-driven growth. We forecast nearly 5% annual growth for health-care construction through our forecast period.

**Exhibit 6.** Over the Next Decade, the Aging Population Will Need More Health Care and Fewer Educational Services  
2014–2024E population growth CAGR

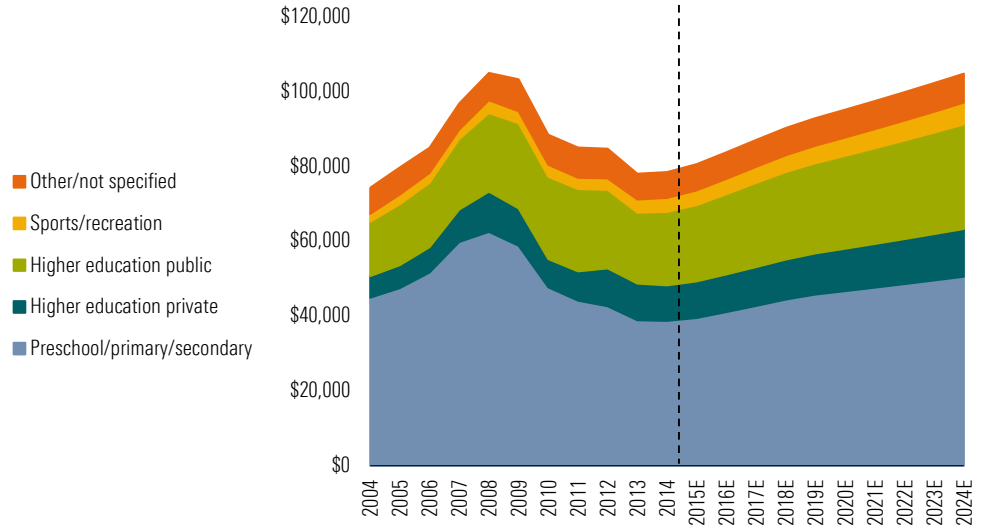


Source: U.S. Census Bureau, Morningstar



**Exhibit 7. Facing Demographic Headwinds, Education Construction Will Experience Meager Growth Over the Next Decade**

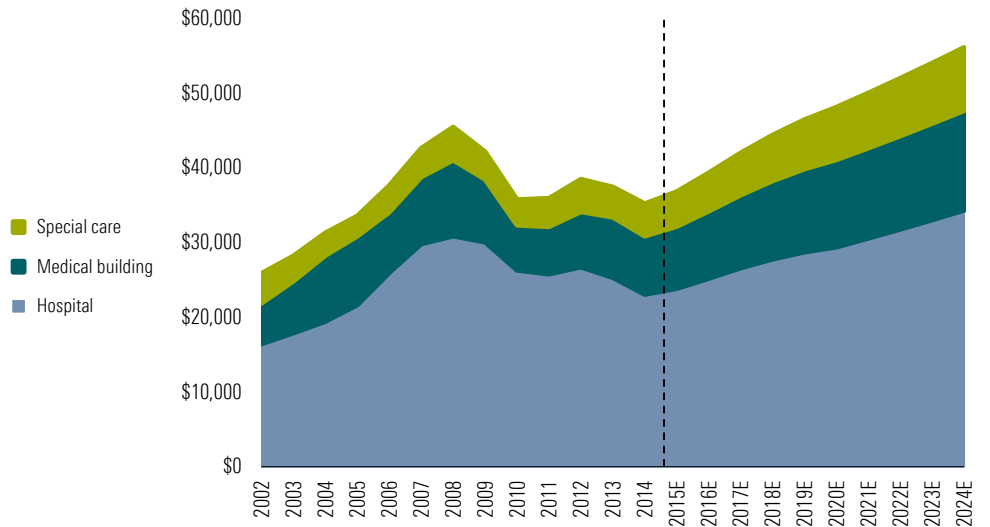
Educational construction put-in-place, in current dollars, in millions



Source: U.S. Census Bureau, Morningstar

**Exhibit 8. Health-Care Construction Will Grow to Meet the Rising Needs of the Aging Population**

Health-care construction put-in-place, in current dollars, in millions



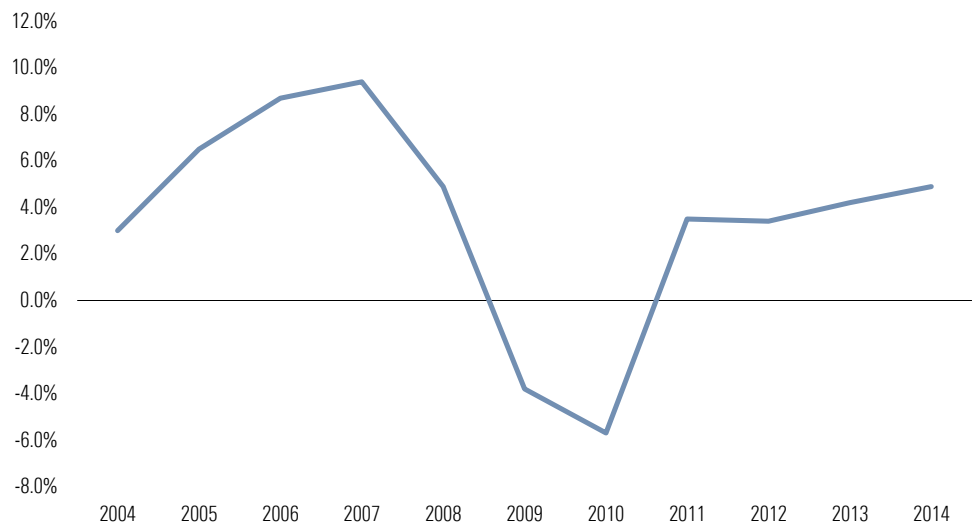
Source: U.S. Census Bureau, Morningstar

### Theme 3: Residential recovery begets nonresidential recovery.

During the Great Recession, state and local governments reined in spending as revenue declined for the fiscal years 2009 and 2010. As seen in Exhibit 9, state budget outlays declined by roughly 5% in each year. Since 2010, state general fund revenues have grown each year, as economic improvement has led to tax revenue increases from personal income, corporate income, and sales taxes. Under expectations for continued economic growth and an improved housing market, state and local budgets should be supported by higher revenue in the years to come.

#### Exhibit 9. State Spending Has Improved Alongside the Broader Economy

Nominal year-over-year state budget increases



Source: National Association of State Budget Officers: Fiscal Survey of States, Morningstar

Constrained budgets have had great impact on construction activity in sectors dependent on government funding. While state budgets have grown 3%–5% over the past four fiscal years, state spending on capital expenditures—which includes construction—has seen much lower growth. We think this largely reflects funding priority for expenses that cannot be deferred, like salaries and direct operating costs. It is much easier to defer replacement and renovation projects—keep using the current structure even if its quality deteriorates. Indeed, construction spending for highway and street, sewage and waste, water supply, public safety, education, health care, and amusement and recreation has failed to keep pace with inflation, with some sectors' spending declining even on a nominal basis. In aggregate, spending for these categories has declined 3% annually (nominal) since 2008.

Recovery in these construction categories has yet to develop. However, we are optimistic for the long-term prospects for these categories for three reasons:

**1. Many of these categories are critical to daily life and are reaching design limits.**

Weak funding has led to declining pavement conditions nationwide and the aging of water and sewage pipes past designed lifespans. We think that underfunding cannot continue for these categories, as continued deterioration would lead to a rise in costly auto accidents and burst water and sewage pipes.

**2. We expect strong increases in state and local tax revenue.**

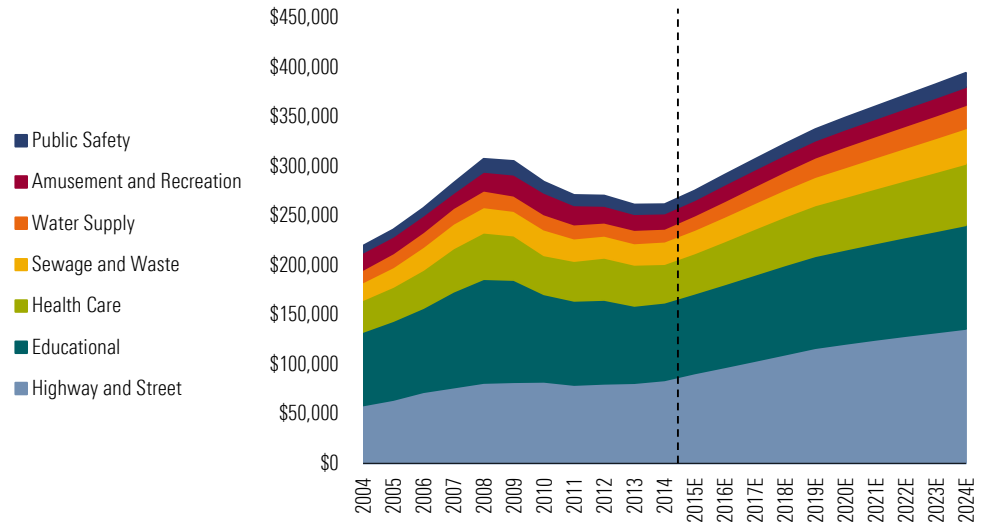
Increased economic activity since the recession has boosted personal incomes, corporate profitability, and retail sales, supporting individual income tax revenue, corporate income tax revenue, and sales tax revenue, respectively. In the absence of a recession, we expect continued low- to mid-single-digit increases in these revenue sources, especially from individual income tax revenue, which should receive a nice boost from the number of employed people.

**3. Bipartisan recognition of deteriorating quality and strong support for stronger long-term funding at the federal level.**

Although the actual funding solution has yet to be found, politicians from both sides of the aisle have voiced support for higher infrastructure investment. Federal funding is often distributed to match states' own spending, so we think federal support bodes well for the future of infrastructure spending.

Based on our expectations for strengthening government funding over the next decade, we expect highway and street spending to grow 5% through our forecast period as spending increases just to maintain current conditions. Similarly, we expect sewage and waste and water supply spending to increase 5% and 6% annually, respectively, as spending catches up with much needed replacement.

**Exhibit 10.** Despite Continued Weakness Since the Recession, Government-Dependent Construction Will See Improvement as Further Spending Deferrals Become Impractical  
 Construction put-in-place, in current dollars, in millions



Source: U.S. Census Bureau, Morningstar

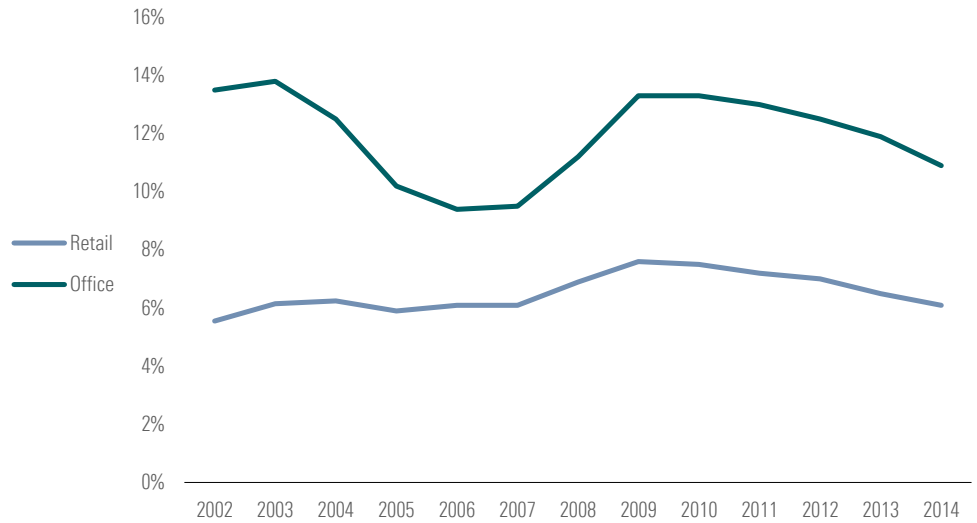
**Theme 4: Pre-recession overbuild finally absorbed.**

For many construction categories highly dependent on private spending, peak spending was achieved just prior to the Great Recession, as builders attempted to keep up with expectations for continued strong growth. Combined spending on construction for commercial, office, and lodging peaked in 2007–2008 at roughly \$190 billion. By 2011, these categories had declined by over 50%. By 2014, although some recovery had taken place, construction spending in these categories still remained 40% below peak levels.

Although construction spending in these categories remains considerably depressed, the commercial, office and lodging operating environment has improved dramatically since the depths of the recession. We think a significant overbuild leading up the recession has dragged on the demand for new construction over the past several years. With retail, office, and lodging occupancy rates finally approaching pre-recession levels, we expect new construction demand to better reflect each sector’s operating environment going forward. We forecast high-single-digit nominal growth per year for retail and lodging construction over the next three years and for office over the next year as companies return to building inventory, bringing capacity utilization rates closer to midcycle levels. Our longer-term forecast of low-single-digit growth more closely reflects our outlook for the operating environment for these sectors.

**Exhibit 11.** Retail and Office Vacancy Rates Are Approaching Pre-Recession Levels

Vacancy rate (%)



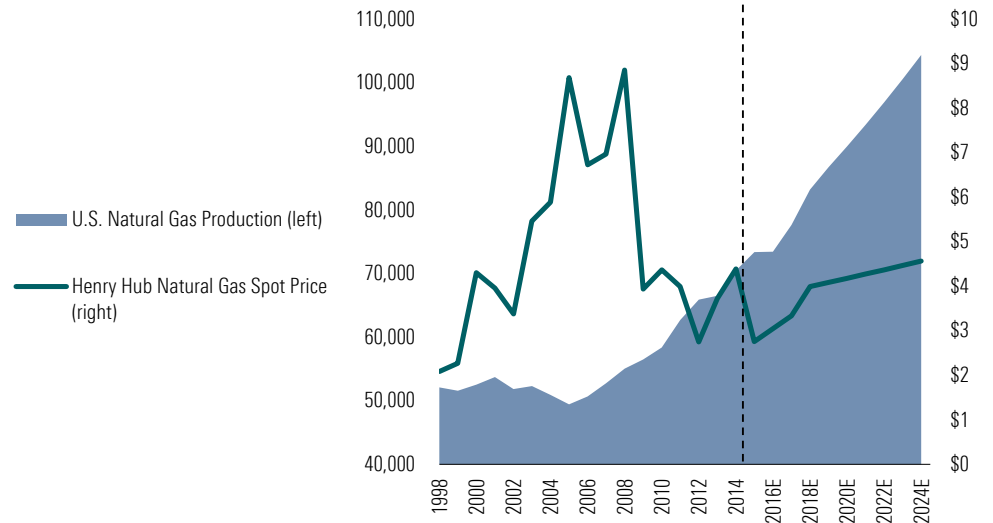
Source: CoStar, Marcus & Millichap, CBRE, Morningstar

**Theme 5: Shale revolution construction boom continues, but slows.**

The emergence of shale production and subsequent declines in gas field service costs in the U.S. have introduced an ample supply of natural gas at historically low prices. Natural gas production in 2014 was nearly 40% higher than a decade ago at roughly \$3 to \$4 per million BTU, compared with \$6 to \$8 per million BTU. Domestic consumers—chemical manufacturers and electric utilities—have benefited greatly.

We see much more production growth to come and expect gas to remain cheap. Our energy team forecasts natural gas production to increase 28% by 2020 at a midcycle price of \$4 per thousand cubic feet (or roughly \$3.91 per million BTU). This should underpin robust capacity expansion capitalizing on a low-cost advantage for U.S. chemical manufacturers. For the power sector, this leads to additional investment in support structures for gas production and increased economic attractiveness for combined cycle gas generation.

**Exhibit 12.** Shale Production Will Provide Ample Supply of Natural Gas at Historically Low Prices  
U.S. natural gas production (MMcf per day) and Henry Hub natural gas spot price (\$ per mMBTU)



Source: EIA, NYMEX Futures, Morningstar

In the manufacturing sector, cheap natural gas has given domestic chemical manufacturing — particularly methanol and ammonia — a low-cost advantage, as global competitors rely on higher-cost oil derivatives for inputs. According to the American Chemistry Council, 215 new chemical production projects with an associated \$135 billion of capital spending through 2019 have already been announced, compared with net capacity divestitures several years ago. We expect chemical-related construction spending to nominally grow at about 7% per year, driving overall manufacturing construction spending by 6% per year through our forecast period.

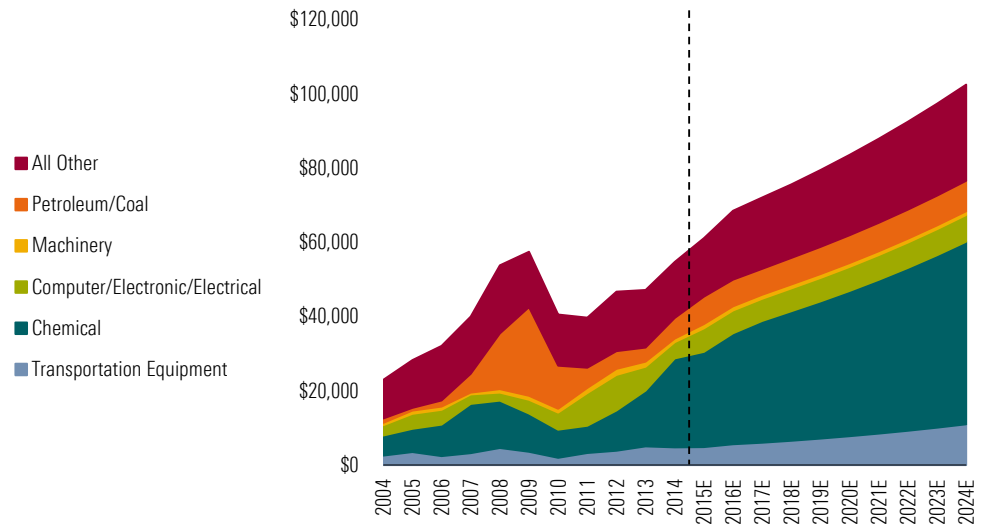
In the power sector, a combination of cheap natural gas and increasingly stringent environmental regulations have accelerated the retirement of coal-fired generation and construction of combined cycle gas generation. New gas-fired plants have underpinned much of the growth in power sector construction spending, which has been among the most resilient in recent years with average annual nominal growth of 11% over the past decade — the only sector with double-digit growth.

Over the next three years, North American power generation intelligence service GenerationHub estimates almost 33 GW of coming coal retirements, compared with roughly 37 GW over the previous decade. Two thirds of the expected retirements are expected in 2015 alone. We think the acceleration of retirements largely reflects the EPA's Cross State Air Pollution Rule, or CSAPR, and Mercury and Air Toxic Standards, or MATS, regulations, which targeted polluting agents emitted heavily by coal generation. However, with utilities already adjusting their power plant portfolios to meet requirements, we think the regulatory tailwind will wane over the next few years. Coal generation is expected to remain a meaningful source of electricity generation in the U.S. In its Clean Power Plan, the EPA expects coal to generate 30% of U.S. electricity by 2030, down from roughly 40% today.

The transformation of the U.S. power sector is a one-time event rather than a source of sustainable growth. After the capacity lost through coal retirements is replaced over the next few years, we expect the regulatory tailwind to dissipate for construction spending. In the long term, we expect power plant construction to more closely follow electricity generation demand growth of roughly 1.5% annually.

**Exhibit 13.** Chemical Manufacturing Construction Will Capitalize on Cheap American Shale Gas and Drive the Sector’s Outlook

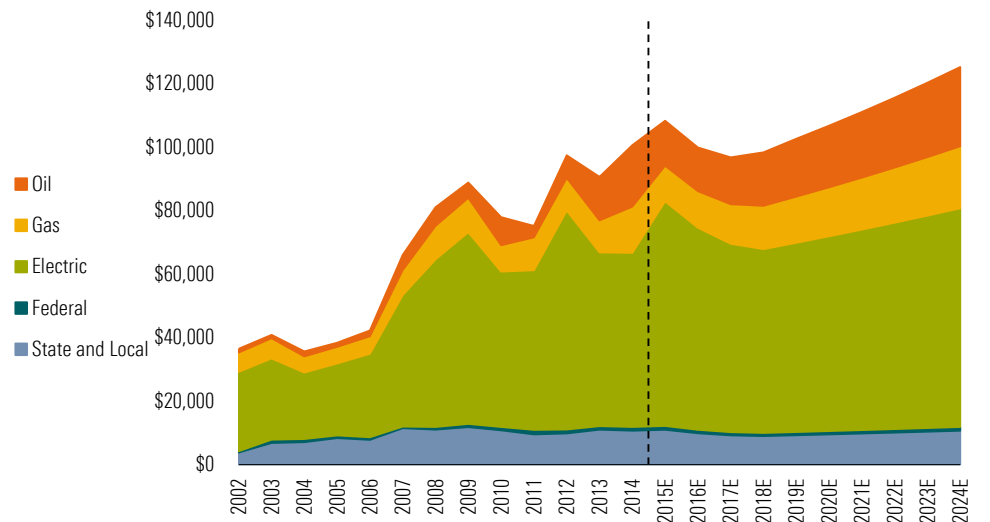
Manufacturing construction put-in-place, in current dollars, in millions



Source: U.S. Census Bureau, Morningstar

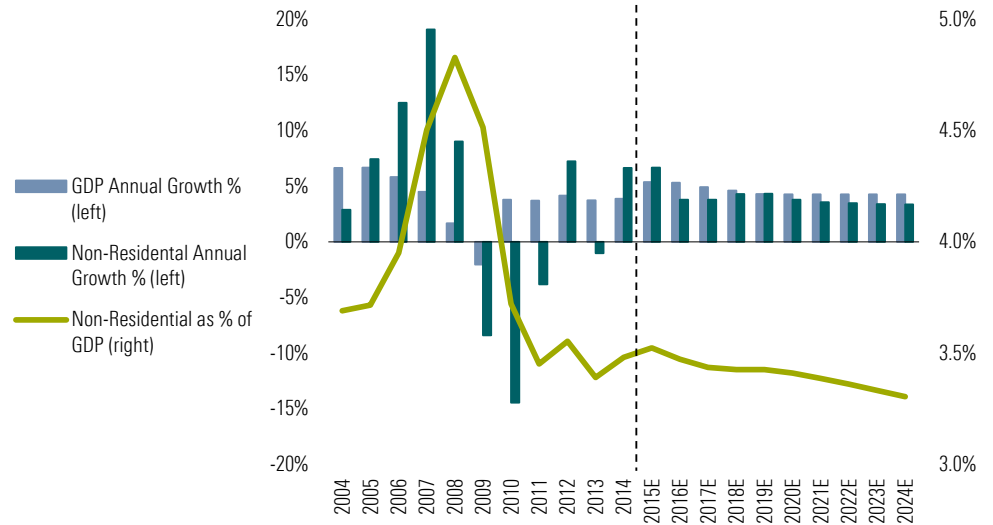
**Exhibit 14.** Power Construction Will Moderate Over the Next 10 Years

Power construction put-in-place, in current dollars, in millions



Source: U.S. Census Bureau, Morningstar

**Exhibit 15. Nonresidential Construction Will Grow More Slowly than GDP Over the Next Decade**  
GDP and non-residential annual growth percentage (left), and non-residential as % of GDP (right)



Source: U.S. Census Bureau, BEA, IMF, Morningstar

**Tepid nonresidential construction growth outlook isn't a long-term headwind for GDP.**

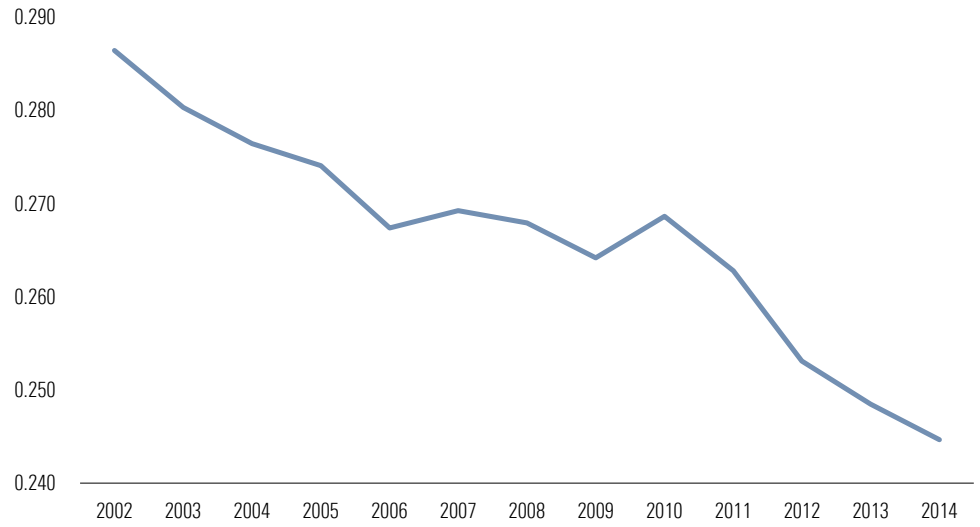
Despite our moderate expectations for nonresidential construction growth, we note that this is not a sign of slower economic growth to come. In fact, our forecast implies a decline in the relationship between nonresidential construction spending and GDP over the next decade. We think this can be largely summed up in one main theme—“more with less”. Going forward, we think economic growth across a number of sectors will require less construction spending growth. As we discussed in the section on Theme 1, many sectors will be increasingly able to support growth with a smaller physical footprint, requiring lower construction growth than had been needed in the past. We think this is analogous to energy intensity, as the relationship between nationwide net generation and GDP has continued to decline through the past decade or so, as shown in Exhibit 16. Lastly, we think that a decline in the importance of construction spending will not result in a decline in overall capital investment. As seen in many sectors including health care, commercial, and communications, we think capital spend will be directed to other areas, like technology.



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**Exhibit 16.** Similar to Our Expectations for Nonresidential Construction, the Relationship Between GDP and Net Generation Has Weakened Over Time

Net generation from the electric power sector (kilowatt hour) per real GDP dollar



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Source: EIA, BEA, Morningstar

# Power: The Fuel Tank for Power Construction Growth Will Run Out of Gas

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### Sector Snapshot

2014 PIP: \$100.7 billion  
 2004-2014 CAGR: 11.0%  
 2014-2024E CAGR: 2.2%

### 2014 Sector Breakdown

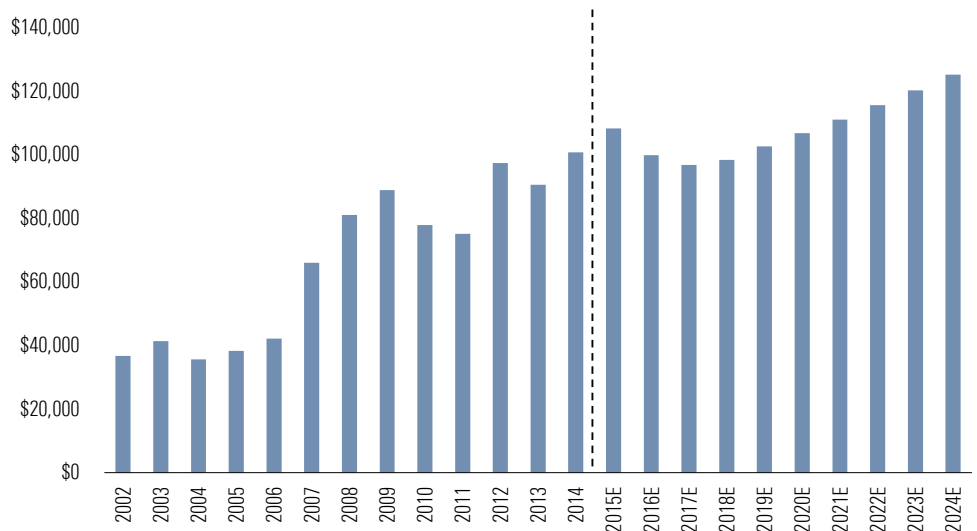
(Percentages based on private spending)  
 Electric (power plants, distribution systems, transmission systems): 62%  
 Gas (infrastructure for production and distribution of natural gas): 16%  
 Oil (infrastructure for production and distribution of oil): 22%

### Key Takeaways

- ▶ Unlike most other sectors, construction spending for power felt no ill effects from the Great Recession. In fact, 2014 spending levels were an all-time high in both nominal and real terms at \$101 billion.
- ▶ A combination of low natural gas prices and environmental regulation has pushed power plant construction. Indeed, a healthy pipeline of power plant construction remains and will benefit electric construction, driving the power sector to peak spending in 2015.
- ▶ However, we think the regulatory tailwinds have simply pulled construction activity forward, and we expect spending to moderate after 2015.
- ▶ Based on our outlook for moderate oil and gas production growth, we do not expect recent spikes in construction spending growth to continue.
- ▶ We expect power spending to grow more slowly than inflation at a nominal rate of roughly 2% per year, with power construction spending reaching \$125 billion by 2024.

**Exhibit 17.** Power Construction Will Moderate From the Rapid Growth of Recent Years

Construction put-in-place, in millions of current dollars



Source: U.S. Census Bureau, Morningstar

**Power construction spending has grown by double digits in the past decade, but tailwinds won't last.**

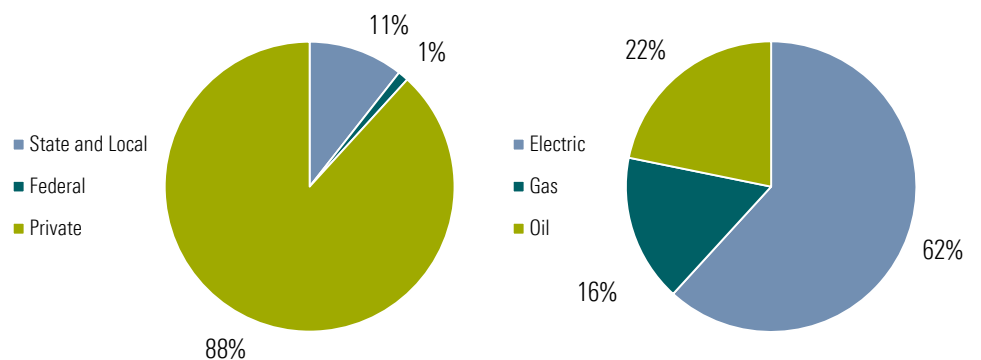
In 2004, the power sector was the fifth largest construction sector, accounting for 8% of total spending. By 2014, the power sector had grown into the single largest sector, accounting for 17% of total construction spending. Furthermore, while most sectors contracted in the aftermath of the Great Recession, the power sector was resilient and exhibited the second-fastest growth rate in construction spending.

We think power's meteoric growth can be attributed to three key trends. First, low natural gas prices have made the fuel an economically viable alternative, even to historically cheap coal. Second, increasingly stringent pollution standards for power plants passed by the EPA accelerated the retirement of coal plants that would have otherwise retired over a much longer time frame. In response, and supported by continued subsidies for wind turbines, utilities rebalanced their plant portfolios with a heavy reliance on natural gas and wind power. Third, the growth of domestic oil and gas production through the shale revolution drove an uptick in construction, especially for infrastructure needed to support higher production levels. Together, these trends drove significant growth in power construction. Yet we think these trends are temporal by nature, and high levels of construction spending now are pulling from and will weigh on future construction levels. In all, we expect meager construction spending growth in the longer term.

**What constitutes power construction?**

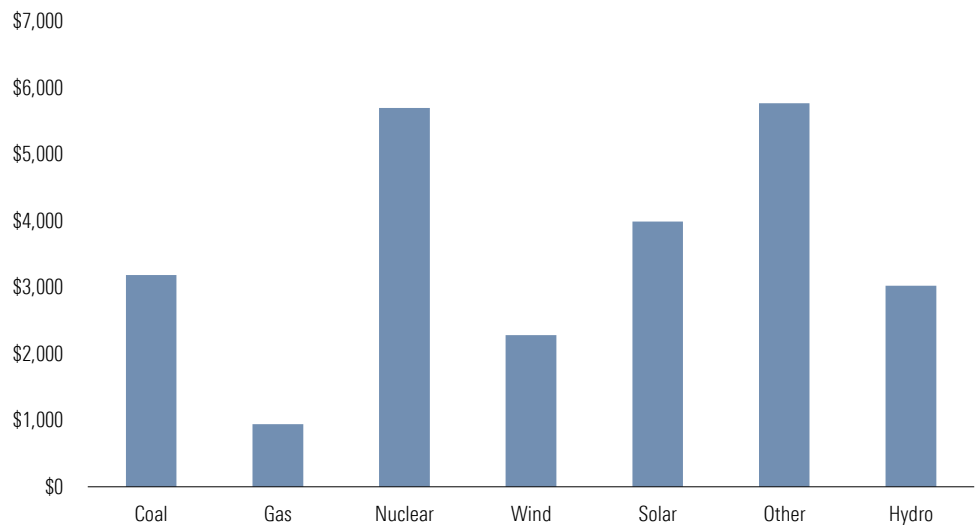
The private sector is responsible for the bulk of power construction spending, accounting for 88% in 2014. Of that amount, electric construction accounts for more than 60%, with oil and gas accounting for the remaining 40%. The major categories of electric construction are power plants, transmission, and distribution.

**Exhibit 18.** Private Sector Funds Most Power Construction, With Most Spending Focused on the Electric Sector  
Percentage of 2014 construction spending



Power plants include those that use fossil fuels such as coal and natural gas and those that rely on renewable energy such as wind and solar. Utilities take a number of factors into consideration when choosing what type of power plant to build, including capital costs, fuel and other operating costs, and regulations. Although different power plant types ultimately all generate electricity, they differ in their construction intensity. In other words, increases in generation capacity are not created equal from a construction point of view. In Exhibit 19, we can see the differing construction costs of various power plants according to EIA estimates. Therefore, construction spending is affected not only by how much generation capacity will be constructed, but by the energy mix as well.

**Exhibit 19.** Low Capital Costs Make Combined Cycle Gas Plants Attractive Alternatives for New Power Generation  
Dollars per kilowatt hour



Source: EIA, Morningstar

Transmission and distribution are the systems and structures that carry electricity from the plant to the end user. Transmission generally consists of the power grid and the connections from the power plant to the grid, whereas distribution consists of connections for the “last mile” from transmission lines to each customer. We think future transmission construction growth is inherently tied to new power plant construction, and distribution construction is tied to population growth.

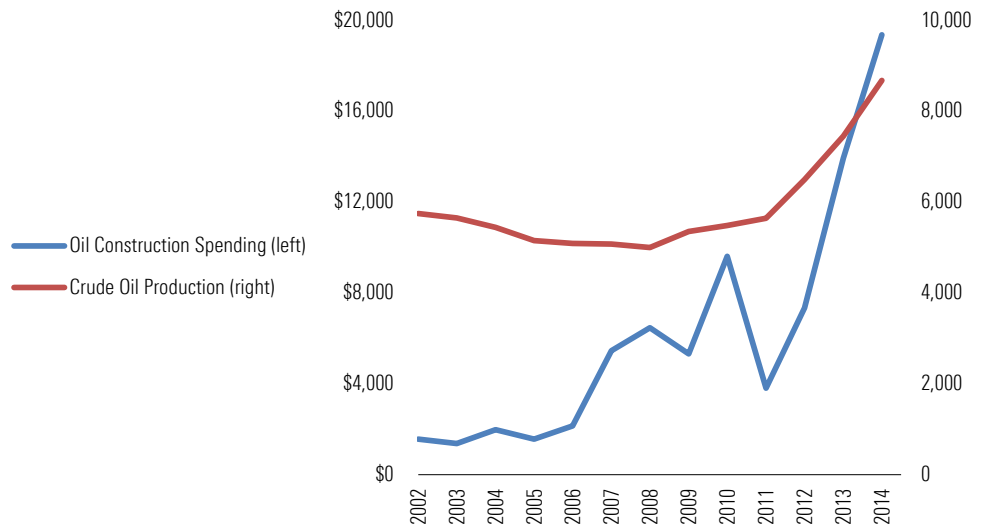
For the most part, oil and gas construction spending was roughly flat in real terms in the early 2000s. However, in the past few years, with the significant growth in domestic oil and gas production, construction spending for these categories also rose, as additional structures were built to distribute, transmit, and store the increased production levels. In 2014 alone, oil and gas production rose 16% and 6%, respectively, leading to construction spending increases of 39% and 42%.

**Exhibit 20.** Construction Spending on Gas Infrastructure Steadily Grew to Support Rising Production  
Gas construction spending in millions of current dollars and dry gas production in MMcf per day



Source: EIA, U.S. Census Bureau, Morningstar

**Exhibit 21.** Similarly, Construction Spending on Oil Infrastructure Has Jumped to Support the Spike in Oil Production  
Oil construction spending in millions of current dollars and crude oil production in Mbbbl per day

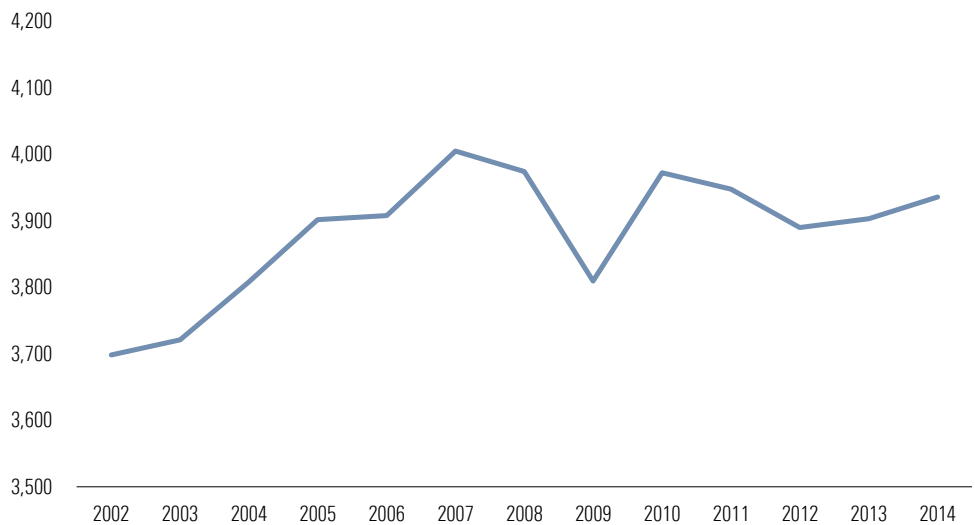


Source: EIA, U.S. Census Bureau, Morningstar

**Near-term power construction reflects acceleration from regulation, but this is not a long-term trend.**

In the simplest terms, with the United States' mature power generation footprint, demand for new power plants is dependent on electricity demand growth and the replacement of aged facilities. We estimate future electricity demand growth of roughly 1% annually, composed of about 2% gross demand growth driven by economic growth and offset by about a 1% increase in usage efficiency. Although net power generation grew just 0.6% annually from 2000 to 2014, we expect economic growth to push generation demand higher in the coming years. Nevertheless, we don't expect additional electricity demand to be a significant driver of new power plant construction.

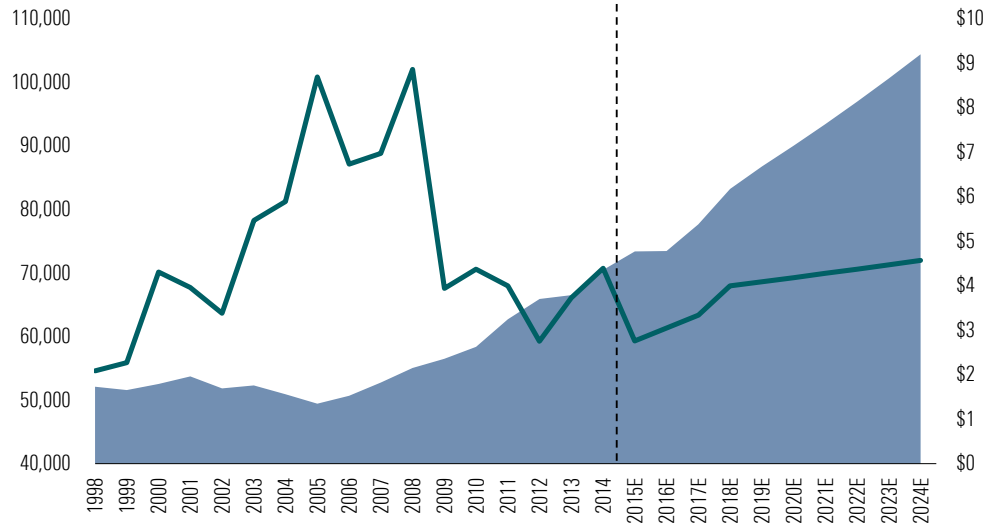
**Exhibit 22.** Net Electricity Generation Has Grown Less Than 2% per Year Over the Past Decade  
Billions of kilowatt hours



Source: EIA, Morningstar

In general, power plants have long operating lives. In fact, the BEA estimates 40- to 45-year lives for most power plants and 30-year lives for wind and solar generation. Therefore, all else equal, we think there shouldn't be significant changes in power plant construction from year to year. Under this scenario, we'd expect natural gas' historically low prices and ample supply to result in the gradual replacement of aging coal and other fossil fuel plants with new combined cycle natural gas turbines that operate with superior economics. However, all things are not equal, and new government regulations have altered the landscape, accelerating retirements.

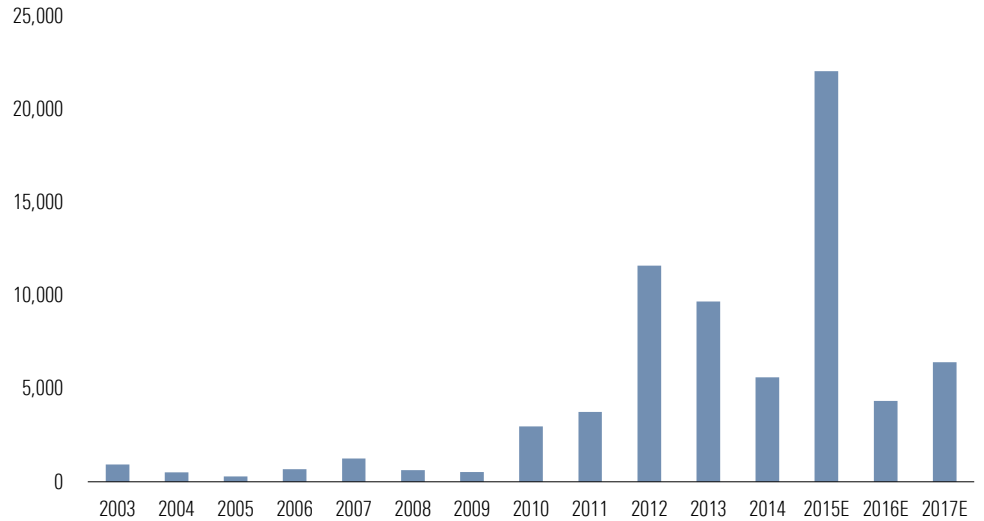
**Exhibit 23.** Robust Growth in Low-Cost Natural Gas Production Has Led to Prices Lower Than Historical Levels  
 U.S. natural gas production in MMcf per day (left) and Henry Hub spot price in current dollars per million BTU (right)



Source: EIA, Morningstar

Under the current presidential administration, a number of EPA regulations have been proposed or implemented that are designed to reduce the pollution emitted by power generation. Particularly significant, the Mercury and Air Toxics Standards, or MATS, and the Cross-State Air Pollution Rule, or CSAPR, targeted polluting agents emitted heavily by coal generation. Had natural gas prices been higher, utilities would have likely installed environmental scrubbers that reduce the emission of the targeted pollutants. However, with natural gas prices in the \$3 to \$4 per million BTU range, it's simply easier and more economical to retire some of these coal plants and replace them with a combined cycle gas turbine. In fact, the impact can already be seen in planned and completed coal retirements. From 2003 to 2011, there were only roughly 12 GW of coal plant retirements. From 2012 through 2017, roughly 60 GW of coal plant retirements are expected.

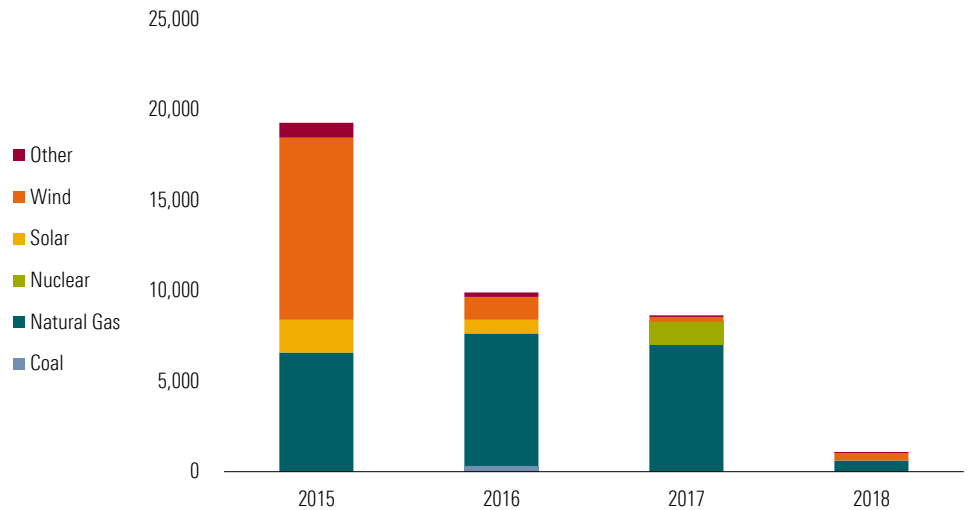
**Exhibit 24.** Environmental Regulations Have Led to a Marked Rise in Coal Plant Retirements  
Nameplate capacity in MW



Source: GenerationHub, Morningstar

We think regulation has created a vacuum for new generation that can meet proposed and implemented EPA regulations. The two biggest winners have been natural gas and wind generation. According to the Nuclear Energy Institute, of planned capacity additions currently under construction, site preparation, and testing from 2015 to 2018, roughly 55% is expected to come from natural gas generation and roughly 30% from wind power.

**Exhibit 25.** A Robust Pipeline of Natural Gas Plants Are Expected to be Built to Replace Retiring Coal Capacity  
Expected generating capacity in MW



Source: ABB Velocity Suite, Nuclear Energy Institute, Morningstar



Regulation has accelerated power plant construction, as the country reduces its portfolio exposure to coal due to regulation and replaces it primarily with natural gas. However, we think this shift represents a medium-term trend, and we expect power plant construction to slow in the future. In fact, in its proposed Clean Power Plan, the EPA expects coal to generate about 30% of the country's electricity by 2030 from roughly 40% today. After the capacity lost through coal retirements is replaced over the next few years, we expect the regulatory tailwind to dissipate for construction spending.

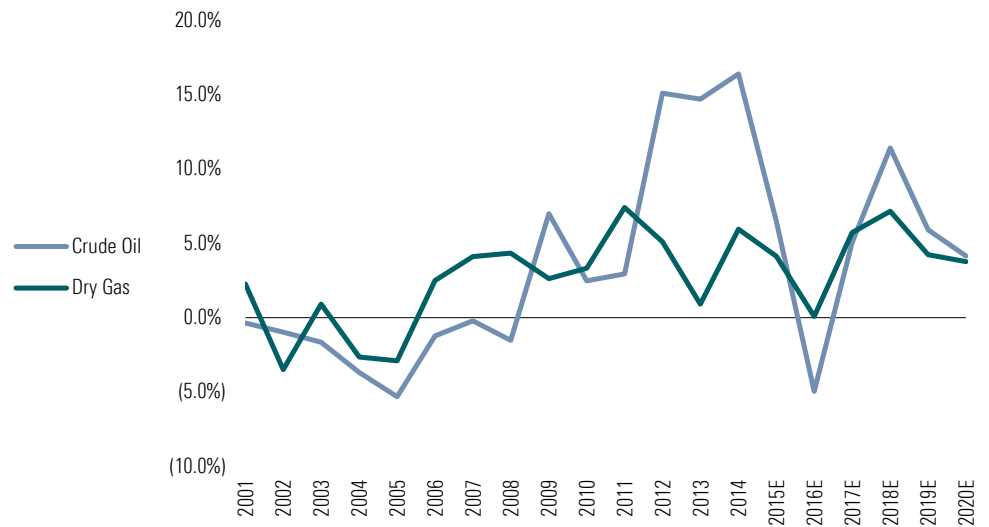
**Oil and gas construction has picked up with growth in domestic production, but should moderate as production growth settles.**

From 2004 to 2014, natural gas and oil construction spending grew at a compound annual growth rate of 11% and 29% on a nominal basis, respectively. This was largely driven by annual natural gas and oil production growth of 5% and 3%, respectively, over the same time frame. By 2014, these categories accounted for roughly one third of power construction spending.

In recent pieces "Game Change: Low-Cost U.S. Oil Is Here to Stay" and "Lower for Longer: A New Normal for U.S. Natural Gas Prices," we detailed our outlook for natural gas and oil production through 2020.

**Exhibit 26.** We Expect Moderate Growth for Both Oil and Natural Gas Through 2020

Year-over-year change in production



Source: EIA, Morningstar

Due to the drop in oil prices at the end of 2014, U.S. E&Ps have significantly reduced capital spending, which should halt production growth and subsequent decline over the next few months. As a result, we expect to see oil-related construction spending pull back from its peak reached in 2014. However, we expect global oil supply and demand to rebalance over the next few quarters, stabilizing prices at a level high enough to incentivize higher levels of investment, eventually resuming production growth. Despite

near-term weakness, we expect annual oil production growth of roughly 4.5% through 2020. Similarly, we expect annual construction growth of roughly 4.5% from 2015 to 2024 on a real basis. However, after including the near-term impact of lower oil prices on capital spend, we expect construction growth to remain roughly flat from 2014 through the end of our forecast period.

Unlike the recent production spike in oil, natural gas production has grown at a solid rate for the past several years, driven by development of highly productive areas like the Marcellus Shale and associated gas production from oil-rich plays like the Eagle Ford Shale. Although we expect production growth to slow in the near term as investment in oil-directed drilling falls over the next few months, we continue to expect strong long-term production growth of roughly 4% through 2020. We expect continued production growth from low-cost areas like the Marcellus and Utica, and an eventual return to associated gas production from oil drilling to drive growth. Based on our outlook for natural gas production growth, we expect gas-related construction spending to grow slightly less than 1% annually from 2014 to 2024 on a real basis. However, when excluding the near-term fall in construction spending related to associated gas production, we expect gas-related construction spending to grow 4% annually.

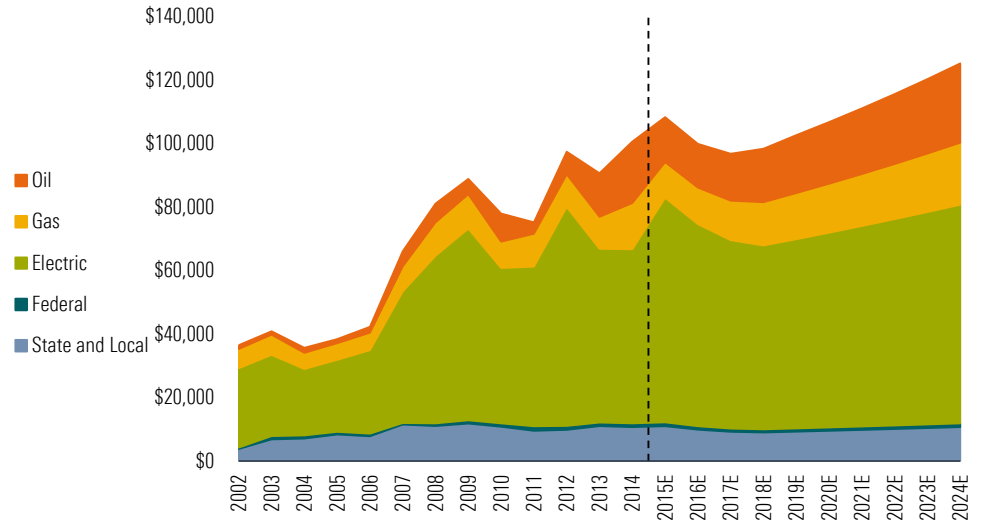
#### **Outlook for power construction spending**

Over the past several years, power spending has grown at a spectacular rate, driving total nonresidential construction spending at a time while other categories have shrunk. However, we think power construction spending is nearing peak levels, and we don't expect it to be a significant driver of growth going forward. In fact, we expect the category to grow just 2% on a nominal basis through 2024 — compared with the meteoric 11% compound annual growth rate from 2004 to 2014.

With EPA regulations accelerating the pace of coal plant retirements, electric construction spending surged, as utilities built new plants — mostly natural gas and wind — to rebalance their portfolios. Yet, we think the pace of retirements will ease over the next 10 years, slowing construction of new power plants from the levels of recent years. Similarly, we'd also expect transmission construction to ease as slower growth in power plants requires fewer connections to the grid. We expect electric construction spending to grow roughly 2% annually on a nominal basis through 2024.

And while oil and gas production growth has driven near-term spikes in construction, our outlook for a more moderate pace of production growth leads us to believe that related construction spending will also grow at a much more moderate pace than seen in recent years. In fact, we expect annual oil and gas construction spending growth of roughly 3% on a nominal basis through 2024.

**Exhibit 27. Power Construction Will Not Grow at the Robust Rate of the Past Several Years**  
Year-over-year change in production



Source: U.S. Census Bureau, Morningstar

# Highway and Street: Construction Spending Will Rise to Keep the System From Crumbling

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**Sector Snapshot**

2014 PIP: \$84.0 billion  
 2004-2014 CAGR: 3.7%  
 2014-2024E CAGR: 4.9%

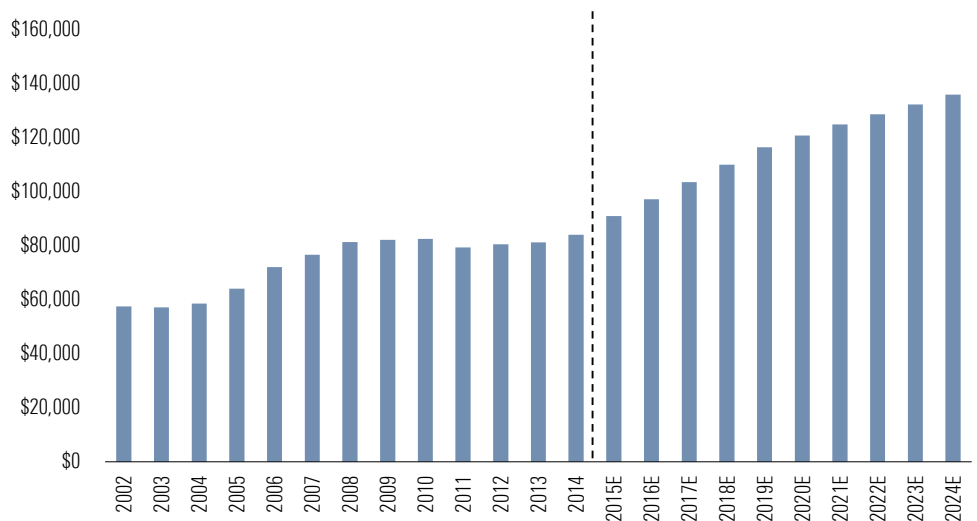
**2014 Sector Breakdown**

(Percentages based on state and local spending)  
 Pavement: 60%  
 Bridge: 35%  
 Other (lighting, retaining wall, tunnel, toll/weight, maintenance building, rest facility): 5%

**Key Takeaways**

- ▶ From 2004 to 2014, highway and street construction spending grew at roughly 1.5% per year on a real basis. Peak spending was in 2009 at over \$90 billion in real 2014 dollars. Spending in 2014 was roughly 7% below that.
- ▶ Yet, spending has clearly remained below adequate levels, as road quality across the entire system has deteriorated over the past decade. Under constrained budgets, spending has been focused on the most used roads and structurally deficient bridges. Although this has helped address the most critical repairs, we think higher spending is necessary for further improvement, as the lowest-hanging fruit has likely been addressed.
- ▶ Long-term funding remains highly uncertain, and true improvement is unlikely to happen unless a long-term solution is put in place. However, we believe the government will find a way to stabilize funding, given continued road decay and strong bipartisan support.
- ▶ We forecast spending to increase from \$85 billion in 2014 to \$136 billion by 2024 in current dollars. We think this 5% per year nominal increase is needed in order to maintain current road conditions.
- ▶ Over this same time frame, we think current funding methods can provide the Highway Trust Fund, the federal program that disburses tax dollars to states to finance highway and street construction, roughly \$327 billion of net tax receipts. However, the Trust Fund would face a significant shortfall and would require \$267 billion in total additional funds from 2015 to 2024.

**Exhibit 28.** Highway and Street Construction Set to Rise to Stem the Tide of Deteriorating Roads  
 Construction put-in-place, in millions of current dollars

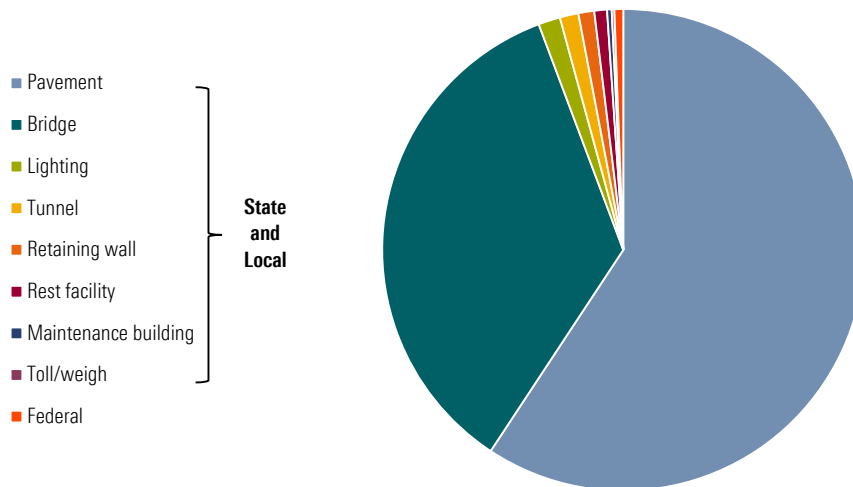


Source: U.S. Census Bureau, Morningstar

**What is highway and street construction, and what determines spending levels?**

The U.S. Census Bureau defines highway and street construction as pavement, lighting, retaining walls, tunnels, bridges, toll and weigh facilities, maintenance buildings, and rest facilities. Despite the numerous categories, just two categories cover almost 95% of spending, with pavement constituting 60% and bridges constituting 35%. Given their outsize importance, we focus our discussion on these two segments.

**Exhibit 29.** Pavement and Bridge Are the Bulk of Construction, With Most Activity on the State and Local Level  
Percentage of 2014 construction put-in-place



Source: U.S. Census Bureau, Morningstar

As the transportation system of a developed country, highway and street construction is composed primarily of replacement and renovation, and to a lesser extent, new construction. Based on 2012 state spending data, the latest available, we estimate that just 14% and 6% of pavement and bridge construction dollars are spent on new construction. The need to maintain or improve the quality of existing streets and bridges therefore plays a dominant role in total construction spending.

With a heavy weighting on the renovation and repair of existing structures, yearly construction spend should be predictable. However, funding availability remains a key constraint on the number of projects that ultimately get funded. Construction levels are dependent on state and local departments of transportation’s projects. Indeed, 99% of spending is undertaken by states and localities. Federal spending is limited to national parks and other federal property that falls outside of state and local jurisdictions. Yet, while spending is almost exclusively done on the state and local level, roughly one fourth of all highway expenditures are funded by the federal government through disbursements of the Highway Trust Fund.

Given their outsize importance to highway and street construction, we focus our analysis on two categories: pavement and bridges. We tie the forecasts for all other, and relatively minor, categories to our spending level forecasts for pavement and bridges. In addition, we've built our analysis at the state level, as detailed information concerning construction activities is available. We tie our assumptions for local and federal spending based on our state-level forecast.

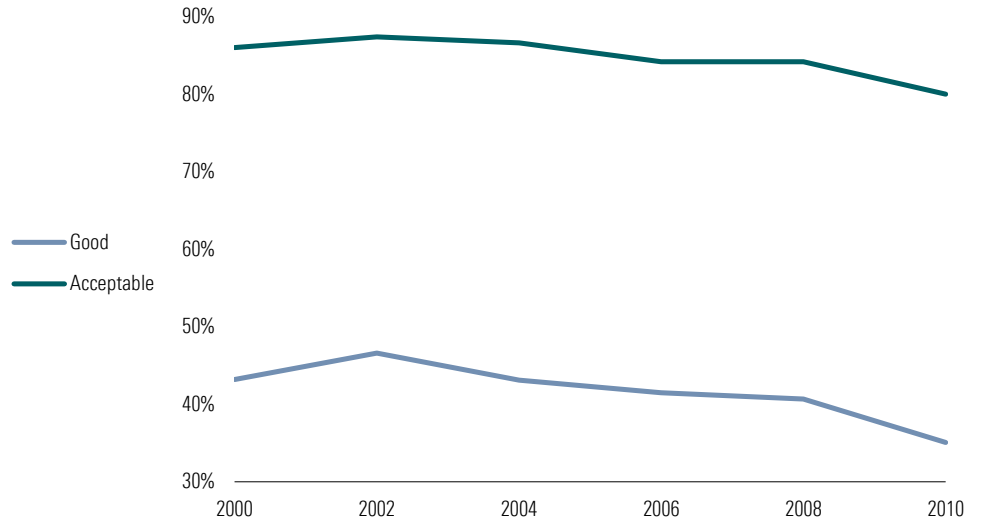
**Under inadequate spending levels, road quality has deteriorated.**

Because the drivers that determine construction activity are quite different, we've separated pavement construction into two categories: new roads, and existing road repair and improvement. New road construction has historically constituted only roughly 10%–20% of state highway spending. By the end of 2013, there were about 4.1 million centerline miles (length of roads excluding the number of lanes) and 8.7 million lane miles (length including the impact of the number of lanes) in the U.S. From 2003 to 2013, centerline miles have grown fairly consistently at roughly 0.3% per year. Furthermore, the relationship between lane miles and centerline miles has stayed relatively stable at about 2.1 new lane miles for every new centerline mile. Meanwhile, the U.S. driving-age population grew at roughly 1% per year from 2003 to 2013. Because we expect a similar growth rate from 2014 to 2024, we assume an annual growth rate of 0.3% of new centerline miles based on the historical rate.

Existing road repair and improvement includes relocation, reconstruction, major widening, and 3R (resurfacing, restoration, and rehabilitation). Despite the differences in project types, we think the key metric for quantifying the need for road improvement is road quality. The Federal Highway Administration measures the quality of U.S. roads under its Highway Performance Monitoring System. Ratings are based on measurements under the International Roughness Index and the Present Serviceability Ratings, two systems used to determine the smoothness and ride quality of roads. Road quality is measured under two different metrics — by mileage, based on actual road length; and by vehicle miles of travel, or VMT, based on road usage.

Over the past several years, repair and improvement spending has been below levels necessary to even maintain current road conditions, let alone improve on the system. As shown in Exhibit 30, the percentage of roads by mileage rated Good or Acceptable has declined from 2000 to 2010.

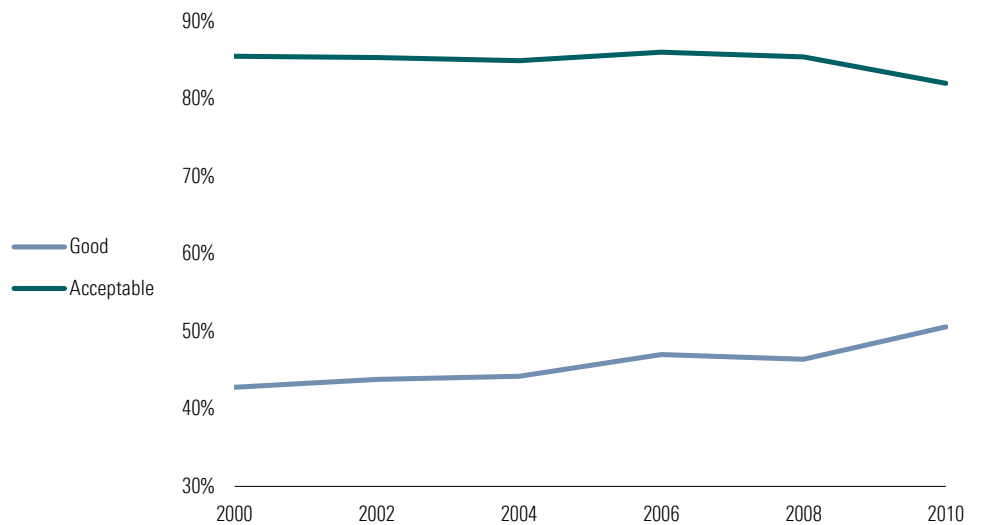
**Exhibit 30.** By Mileage, Road Quality Has Steadily Deteriorated Over the Past Decade  
Percentage of roads measured by actual mileage



Source: Federal Highway Administration, Morningstar

We think funding constraints have led states to focus their limited budgets on the most traveled roads. Indeed, while the quality of the entire road system has deteriorated, from a VMT perspective the percentage of roads rated Good has actually increased, and roads rated Acceptable have declined at a slower pace than the roads rated Acceptable from a mileage perspective, as seen in Exhibit 31.

**Exhibit 31.** By Focusing on the Most Heavily Trafficked Roads, Road Quality by Vehicle Miles Traveled Has Improved  
Percentage of roads measured by vehicle miles traveled

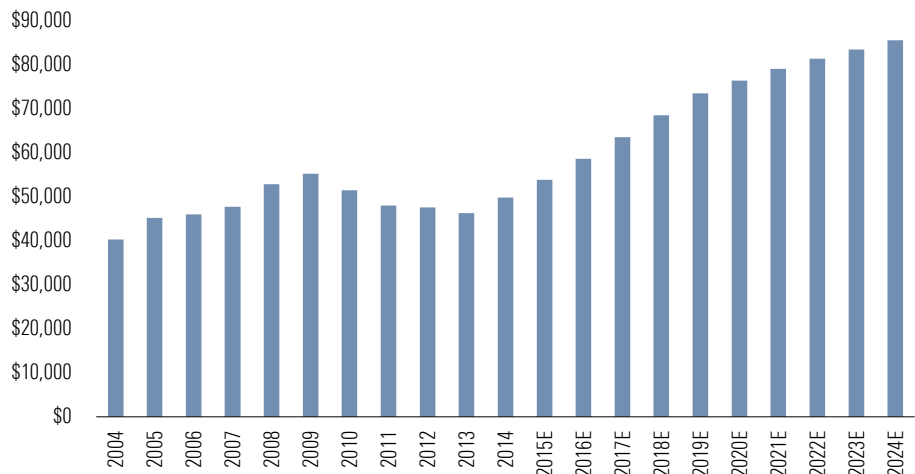


Source: Federal Highway Administration, Morningstar

Given the degradation of road conditions, funding has clearly restrained adequate spending for road repair and improvement. We think it's important to note that any forecast we make includes an implicit assumption of future funding levels. We've premised our forecast on our expectation that funding levels do not fall from current levels, which we believe would accelerate the degradation of road conditions at an alarming rate. Furthermore, we expect funding levels to increase to levels that maintain current road quality. We acknowledge that an obvious funding solution remains elusive, but we think need will trump political inaction.

We've built our repair and improvement spending forecast on the basis of attempting to maintain current road conditions by mileage. Since historical spending levels have led to deterioration, we forecast an increase in spending. Indeed, we expect funding to increase 6% per year on a nominal basis as shown in Exhibit 32.

**Exhibit 32.** State and Local Spending Will Grow Significantly to Halt Deterioration of Road Quality  
State and local pavement spending in millions of current dollars

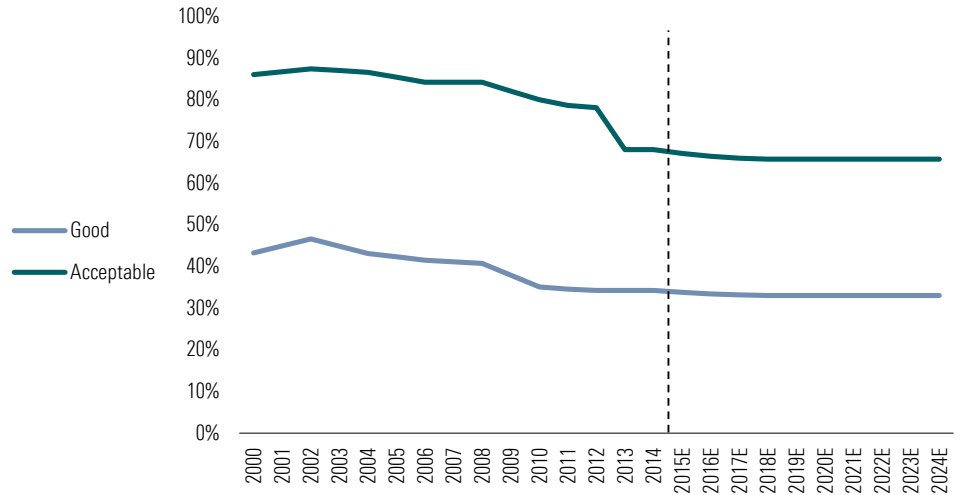


Source: Federal Highway Administration, Morningstar

Despite the healthy increase, we still think this level of spending will simply stabilize current conditions rather than lead to system-wide improvement. A much larger spending increase would be needed to fund quality improvement—an increase we think is unlikely to happen given the difficulty even obtaining adequate maintenance spending. In Exhibit 33, we show that road quality by mileage stabilizes near current levels under our forecast.



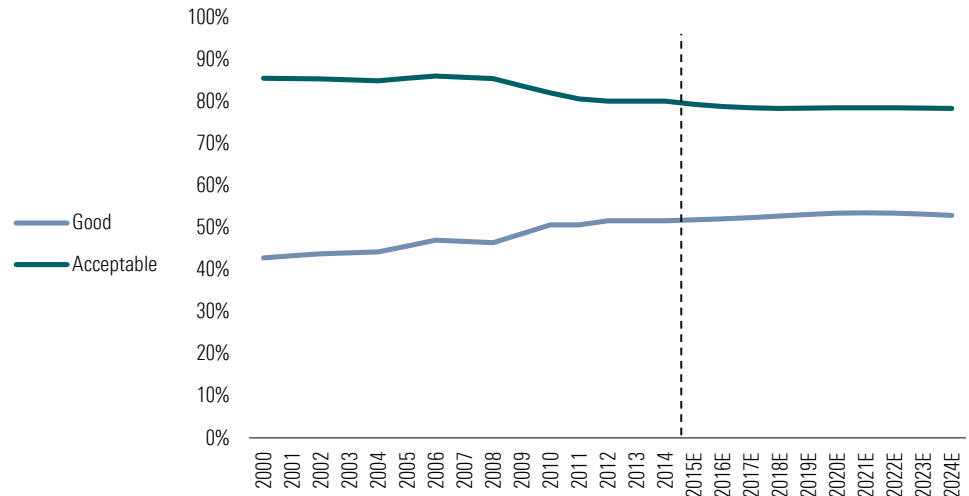
**Exhibit 33.** Our Higher Spending Forecast Only Maintains Current Road Quality  
 Percentage of roads measured by actual mileage



Source: Federal Highway Administration, Morningstar

In the past several years, road quality measured by VMT has fared much better than quality measured by mileage. We think state and local departments of transportation have focused their budgets on the projects with greatest impact — that is, the most heavily used roads in their systems. However, we don’t think this divergence can continue. We believe projects face diminishing returns on a VMT basis, as each subsequent project is less and less heavily used. As shown in Exhibit 34, we expect the trend of increasing Good roads by VMT to slow, and overall road quality to stabilize.

**Exhibit 34.** Road Improvement by VMT Will Slow as Subsequent Projects Offer Diminishing Returns  
Percentage of roads measured by vehicle miles traveled



Source: Federal Highway Administration, Morningstar

### **Bridges have fared better under constrained budgets than pavement has.**

Similar to our analysis for pavement construction, we've separated bridge construction into two categories: new bridges, and existing bridge repair and improvement. Because bridges differ in size, length, and design, we look at the U.S. bridge inventory by area rather than number of bridges. We believe this helps better quantify the construction opportunity, as larger bridges are more construction intensive—a fact not captured in the bridge count.

New bridges are a relatively minor category in highway and street construction spending. In fact, new bridges have constituted only 1% to 5% of state highway spending in recent years. At the end of 2014, roughly 363 million square feet of bridges existed in the U.S. Over the past 10 years, total U.S. bridge square footage has grown at roughly 1% per year. Similar to our reasoning for our new road construction forecast, we assume the historical rate will continue, based on our expectations for steady growth rates of the U.S. driving population compared with the past 10 years.

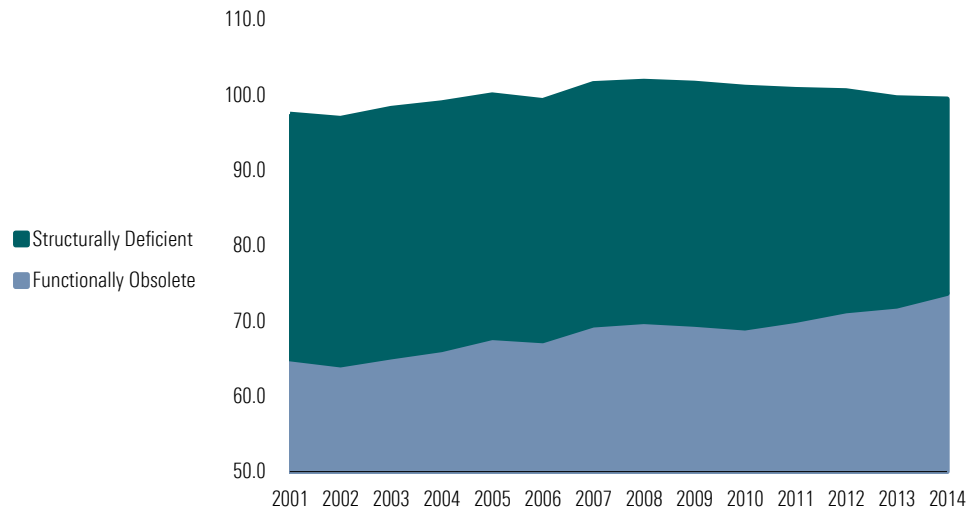
Existing bridge repair and improvement includes replacement and rehabilitation. For the purposes of forecasting construction levels, we think the key metric for quantifying the need for bridge repair and improvement is bridge quality. The Federal Highway Administration maintains a database of all bridges and tunnels in the U.S. in the National Bridge Inventory. As part of the data, the agency assigns a rating from 0 to 9 (9 being superior to desired criteria) evaluating the condition of the deck, superstructure, and substructure. Based on these ratings, over 27% of U.S. bridges were rated Deficient at the end of 2014.

Although one fourth of bridges are considered Deficient, we think it is important to understand the level of deficiency to have a proper view of the construction opportunity. Deficient bridges are divided into

two subcategories: Structurally Deficient and Functionally Obsolete. Bridges are considered structurally deficient if parts of the structure are rated 0–4, load carrying capacity is significantly below current standards, or the bridge is prone to flooding. Bridges are considered functionally obsolete if the design is outdated for characteristics like load carrying capacity, shoulder area, or clearance under the bridge. We consider structurally deficient bridges to be in higher need of critical repairs, whereas functionally obsolete bridges are outdated but functionally adequate.

Unlike the underinvestment in roads that has led to steady deterioration, bridges have fared much better in the past several years. From 2001 to 2010, the total square footage of structurally deficient bridges remained largely unchanged at around 32 million–33 million square feet. However, from 2010 to 2014, structurally deficient bridge area declined by 19% to 26 million square feet. In comparison, the total square footage of functionally obsolete bridges has actually increased 13% from 2001 to 2014. In Exhibit 35, the reduction in structurally deficient bridges is shown to be largely offset by the increase in functionally obsolete bridges. Similar to the trends seen in pavement conditions, we believe this trend reflects constrained state budgets focusing limited funding on the most critical projects.

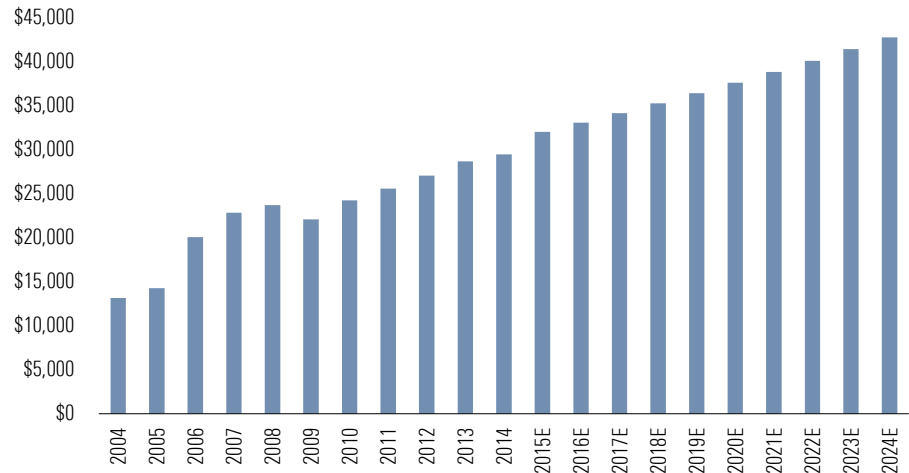
**Exhibit 35.** Although Deficient Bridges Have Grown, Higher-Risk Structurally Deficient Bridges Have Decreased  
Bridge area in millions of square feet



Source: Federal Highway Administration, Morningstar

Although bridge repairs share the same funding sources and budgets as road repair, we think bridges have not suffered from severe underfunding in recent years, as evidenced by the continuing reduction of structurally deficient bridges. Since current spending levels have been adequate, we forecast spending to grow 4% on a real basis as shown in Exhibit 36.

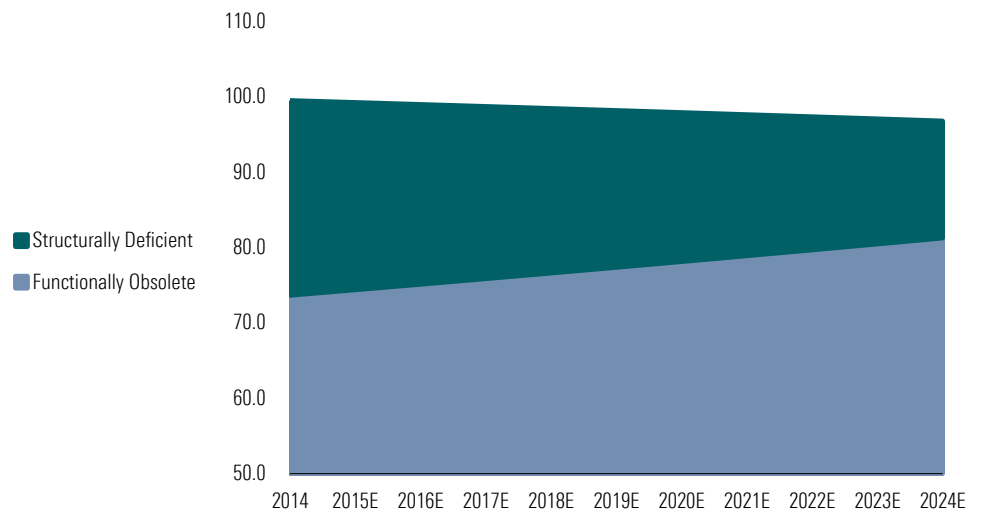
**Exhibit 36.** Historical Growth Rates for State and Local Bridge Spending Can Support System Improvement  
State and local pavement spending in millions of current dollars



Source: Federal Highway Administration, Morningstar

As shown in Exhibit 37, we expect the number of structurally deficient bridges to decrease by about 5% per year, in line with the rate seen from 2010 to 2014. We expect the number of functionally obsolete bridges to grow at roughly 1% per year, in line with the historical rate, as funding continues to be directed to more critical structurally deficient bridges.

**Exhibit 37.** Spending Will Continue to Be Directed to Critical Projects, Reducing Structurally Deficient Bridges  
Bridge area in millions of square feet



Source: Federal Highway Administration, Morningstar

### **Understanding the financing constraint**

In 2010, the latest available year of detail, roughly 25%, 50%, and 25% of funding has come from federal, state, and local sources, respectively. Despite generating one fourth of all funding, nearly all federal dollars are distributed to and actually spent by state departments of transportation, making federal funding an important source for state highway and street construction activity. Because the fiscal health of each state varies, funding stability and strength can differ greatly among states. However, roughly 73% of state-generated revenues came from user-based fees when excluding revenue from bond issue proceeds. Therefore, we focus our analysis of the funding constraint for highway and street construction at the federal level.

Federal funding is generated and distributed through the Highway Trust Fund, a federal program that operates differently than most. Two key characteristics of every federal program are budget authority, or the ability to incur financial obligations, and outlays, or the actual spending to satisfy those obligations. Budget authority and outlays are classified either as mandatory, established by permanent law, or as discretionary, established by appropriation acts in every annual budget. Typically, federal programs have both mandatory budget authority and outlays, or both discretionary budget authority and outlays.

Why does this matter? Congress has two primary tools for controlling spending by federal programs. First, it can place statutory caps on programs with discretionary budget authority. Second, it can make across-the-board cuts that reduce spending by programs with mandatory outlays. However, the Highway Trust Fund is unique in having split budgetary treatment—mandatory budget authority and discretionary outlays—which makes its ability to incur obligations and pay those obligations immune to typical spending controls.

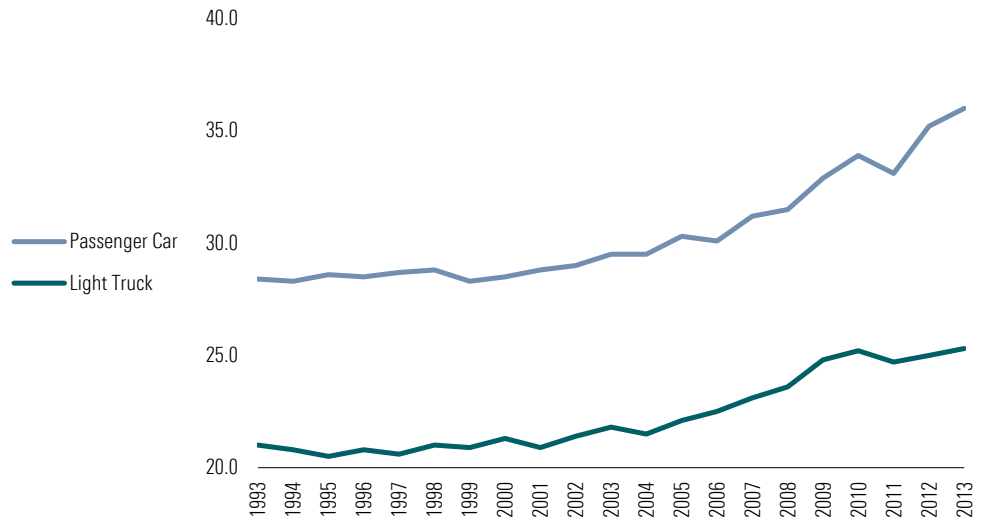
The Highway Trust Fund generates most of its revenue through fuel taxes, roughly 60% to 65% from an 18.4 cent per gallon gasoline tax and 25% from a 24.4 cent per gallon diesel tax. Other revenues come from vehicle and tire taxes. Given the outsize importance of the fuel taxes to the Highway Trust Fund's ability to generate revenue, we focus our analysis of future funding on fuel taxes.

Fuel taxes are designed as a user-based fee—users who drive more create more wear and tear while also purchasing more fuel, so they pay more for road construction. However, the funding power of fuel taxes has diminished over time, as the current per-gallon gas tax and diesel tax have not been increased since 1993, not even for inflation. We estimate that the value of the per-gallon fuel taxes fell 39% from 1993 to 2014 on a real basis. In 1993 dollars, we estimate that the fuel taxes generate just 11.2 cents per gallon for gasoline and 14.9 cents per gallon for diesel.

Compounding the impact of the diminishing power of the unadjusted per-gallon fuel tax, fuel efficiency has improved and driving intensity has declined. First, both passenger cars and light trucks have been steadily improving fuel efficiency since 1993. From 1993 to 2013, light-duty vehicle fuel efficiency has improved roughly 1% per year as shown in Exhibit 38. As a volume-based and not price-based tax, improving vehicle mileage clearly weakens the fuel taxes' strength as a user-based fee. Second, driving intensity has been declining for the past decade. As shown in Exhibit 39, miles driven per year by driver has declined 1% per year since reaching a peak in 2004. We note that while lower driver intensity is also

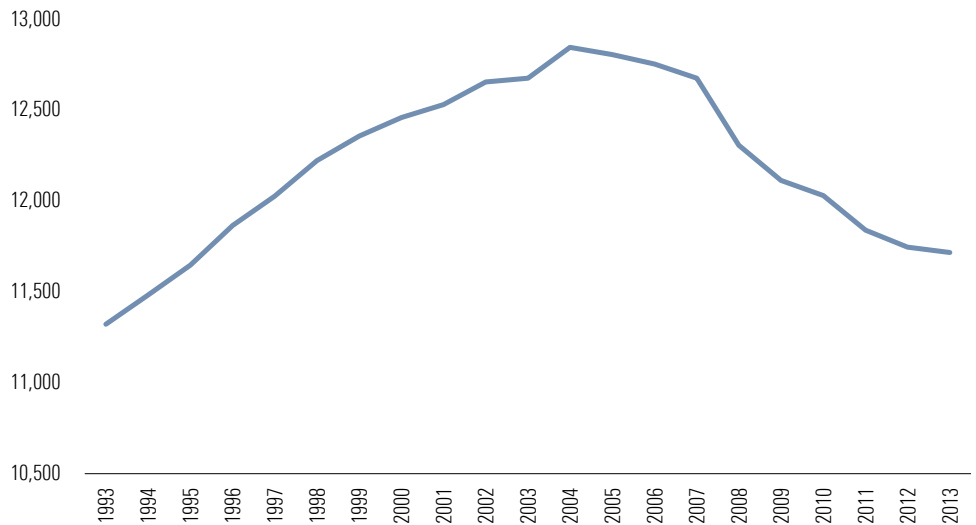
likely to help reduce the wear and tear on roads, we still think it helps worsen the fuel tax’s funding effectiveness.

**Exhibit 38.** Vehicle Mileage Has Continued to Improve, Further Weakening the Gas Tax’s Effectiveness  
Average miles per gallon



Source: Federal Highway Administration, Morningstar

**Exhibit 39.** Driving Intensity Has Fallen, Reducing Road Use but Also Weakening the Gas Tax’s Effectiveness  
Miles driven per year per driving-age person



Source: Federal Highway Administration, Morningstar

We think it is important to note that the current fuel taxes are set to expire on October 1, 2016. On that date, the taxes would drop to 4.3 cents per gallon for both gasoline and diesel. We expect the current rates to be extended before the expiration, as it has been in the past. Clearly, a failure by the government to extend the rates would have a devastating impact on the Highway Trust Fund.

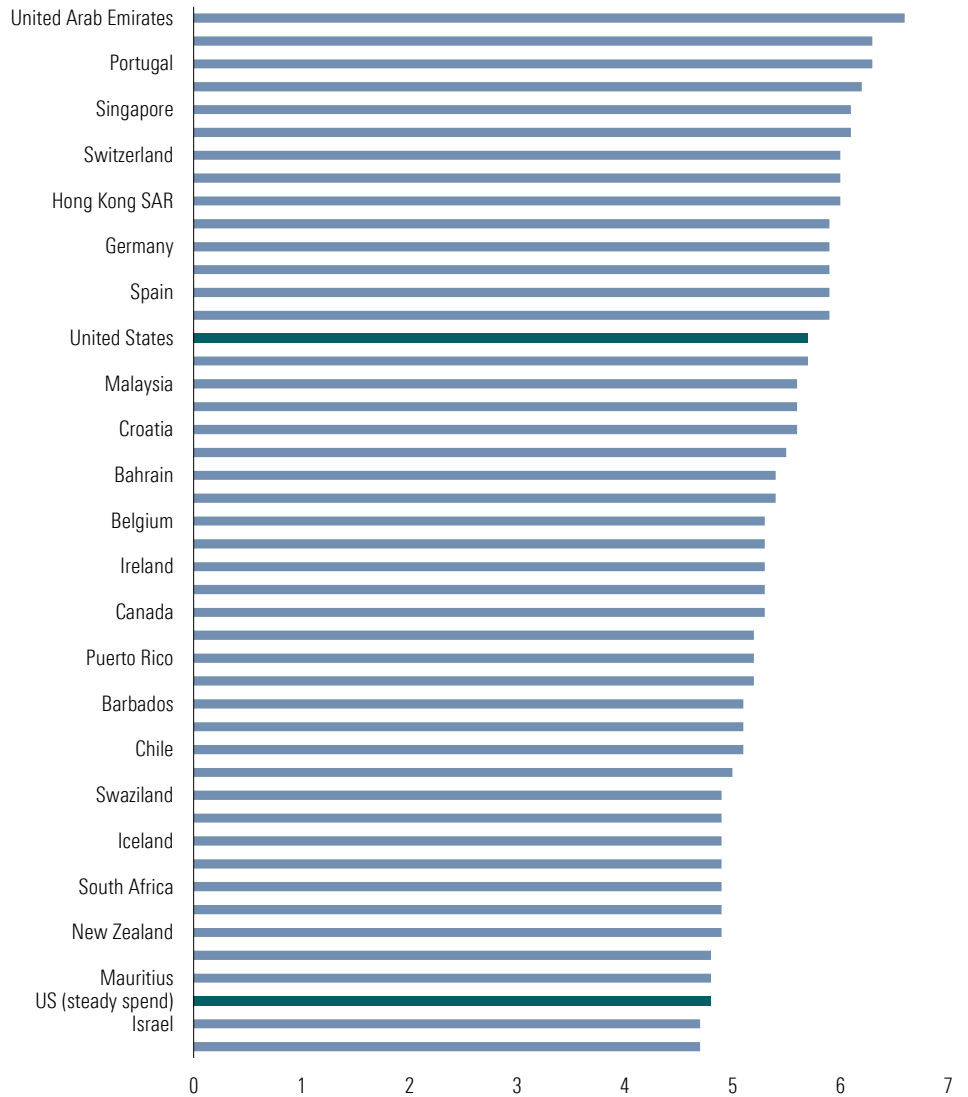
Rather than attempt to make an explicit prediction about how or when the government puts a longer-term solution into place, we've estimated the funding shortfall under our construction forecast. We note that at current spending levels, overall road and bridge quality has deteriorated. Admittedly, the quality of the most used roads has improved, and the number of structurally deficient bridges has declined. However, this is due to the fact that limited funding has been directed at the most critical projects, allowing the government to make the most impact and minimizing the impact of the overall decay in the average citizen's view. However, we think this strategy is unsustainable. With the lowest-hanging fruit addressed, we expect future projects to have diminishing returns in terms of overall system improvement. Said another way, we think it's going to take more dollars to maintain let alone improve current conditions.

Based on our forecast for increased spending to stabilize current conditions, we estimate that the Highway Trust Fund will have a cumulative funding shortfall of \$267 billion from 2015 to 2024. This compares with the Congressional Budget Office's forecast funding shortfall of \$167 billion. Although our shortfall estimation differs, we think the point is the same — there's a significant funding gap to come if the status quo is left in place.

According to the CBO, outlays from the Highway Trust Fund have exceeded revenues by a total of \$52 billion from 2005 to 2014. Over that time frame, to keep the Trust Fund solvent, Congress has transferred \$54 billion from the general fund into the Trust Fund. This reliance on transfers was necessary, given that the fund cannot legally incur a negative balance or borrow.

The government has transferred over \$65 billion from the general fund and other trust funds since 2008. The most recent transfer was \$11 billion, passed in the summer of 2014 and funding the Trust Fund only through around May 2015. Although this option allows officials to continue to delay on the politically risky issue, the requirement for infusions of increasing size would make the Trust Fund even more unstable. Yet, though we think inaction probably makes this the most likely short-term solution, we think the issue's strong bipartisan support will lead to a longer-term solution. Furthermore, we estimate that only maintaining current spending would lead to a severe decline in road quality. As seen in Exhibit 40, we think status quo spending would drop the U.S. from 16th in the World Economic Forum's road quality survey to somewhere in the low 40s.

**Exhibit 40.** Maintaining Current Spending Would Significantly Worsen U.S. Road Quality on a Relative Basis  
 World Economic Forum survey road-quality rating (higher numbers represent higher-quality roads)



Source: World Economic Forum, Morningstar

As prices at the pump dropped while oil prices fell in late 2014 and early 2015, many politicians floated the idea of using the opportunity to raise the fuel tax. Strong opposition from citizens seems to have halted the idea, but we think an increase could still be a viable solution. We think roughly a 12 cent and 15 cent increase of the gas and diesel tax to roughly 30 cents and 40 cents, respectively, would be enough to allow the Highway Trust Fund to fully fund itself—assuming the new tax includes an annual inflation adjustment of about 2%. Although this would be a roughly 60% increase on current fuel taxes, we note that much of the increase is just bringing the tax back up to its original value. In fact, the increase is less than 5%, had the 1993 tax been adjusted for inflation to this day.



Other potential ideas for fixing the Highway Trust Fund's funding have focused on better connecting usage to taxes. States have done this to some extent by building more toll roads. However, while toll roads are possible for the more heavily used roads, it's an unlikely solution for funding all roads. Another idea has been to implement a vehicle miles traveled (VMT) tax. Using GPS and wireless technology, cars would be tracked for their mileage, and potentially the actual roads used. Advocates claim that this would better connect the tax to usage, while opponents point to privacy concerns. At the least, the Congressional Budget Office points out that a VMT-based tax should be scaled to account for vehicle weight. Although a VMT-based tax may be a future solution, we think both the technology and acceptance are not far enough along for solving the Highway Trust Fund's very immediate funding problem.

### **Conclusion**

Highway and street construction spending did not experience the same significant declines many other sectors did during the Great Recession. In fact, 2014 actually represented peak spending levels on a nominal basis. However, looking at spending levels alone hides the meaningful underinvestment for roads and bridges that has led to deteriorating systemwide conditions. We think spending will increase over the next decade, as the government attempts to at least stem quality decline and maintain current conditions. In fact, we expect the category to grow roughly 5% annually on a nominal basis through 2024.

Our bullish outlook for highway and street construction spending is anchored in our belief that the government will increase spending to stem the tide of deteriorating conditions. In fact, our forecast calls for only the maintenance, not improvement, of current road conditions. A government initiative to improve systemwide quality could provide significant upside to our forecast, although we consider this unlikely given the difficulty in finding enough funding to even maintain current conditions.

# Educational: New School Spending Unlikely to Reach Old School Levels

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**Sector Snapshot**

2014 PIP: \$78.4 billion  
 2004-2014 CAGR: 0.5%  
 2014-2024E CAGR: 2.9%

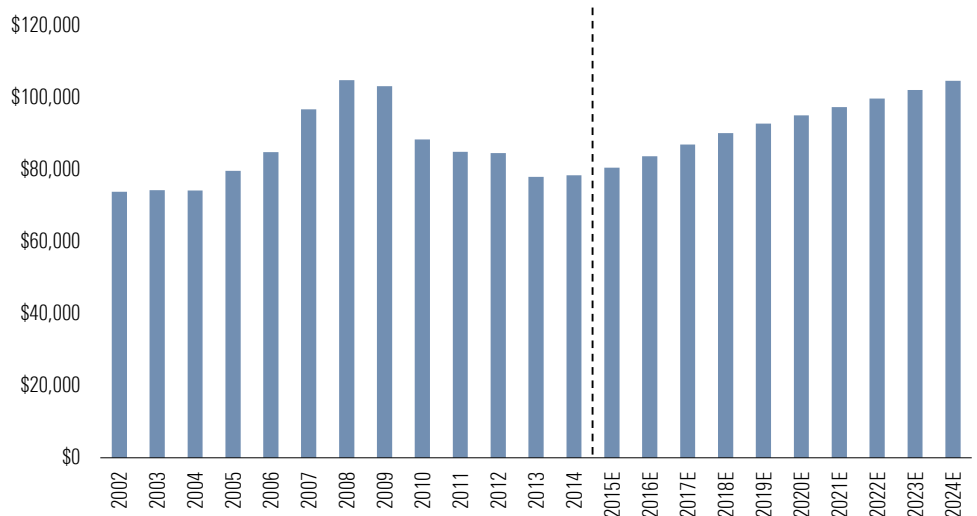
**2014 Sector Breakdown**

Preschool/Primary/Secondary: 49%  
 Higher Education: 37%  
 Sports/Recreation: 5%  
 Other (trade and other school, museum, library): 9%

**Key Takeaways**

- ▶ Age demographics are a meaningful headwind for elementary, secondary, and postsecondary educational facility spending. Driven by the aging of the large millennial generation and low fertility rates in recent years, we project the U.S. population of the most relevant age group, 5- to 24-year-olds, to decline to 84.5 million in 2024 from approximately 85.0 million in 2014.
- ▶ Further, the proportion of people enrolled in elementary and secondary school has plateaued, and improved job prospects are beginning to reverse the robust gains in postsecondary enrollment rates. We believe that enrollment rates among 20- to 34-year-olds will fall an additional 1.5–2.0 percentage points over the next three to five years.
- ▶ However, the financial constraints to educational building spend should ease mostly due to expanding state and local tax revenue, which should be enhanced by lagged home price appreciation. Still, education spending must compete with other government funding priorities, namely underfunded pensions.

**Exhibit 41.** Facing Demographic Headwinds, Educational Construction Faces Meager Growth in the Coming Years  
 Construction put-in-place, in millions of current dollars



Source: U.S. Census Bureau, Morningstar

**Overview**

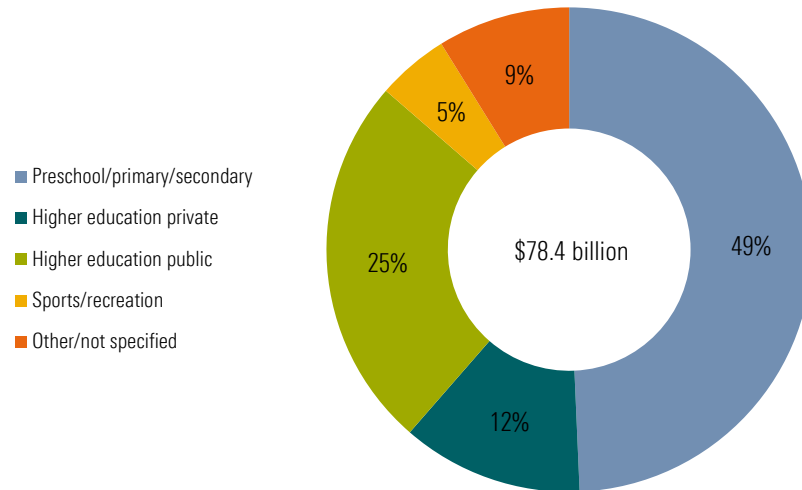
The education category has been one of the primary reasons why U.S. nonresidential construction has continued to languish well below historical highs six years after the Great Recession. Indeed, nominal education construction spending was 25% below its 2008 peak levels in 2014. With heavy government influence, education construction spending is very late-cycle, explaining some of the underperformance. However, we believe increasingly unsupportive age demographics are also at play, with the population of 5- to 24-year-olds now in decline. Further, we believe that the improved economy will compel a smaller percentage of young adults to pursue higher education, depressing school enrollment even more. We do see some construction spending recovery ahead, but at pedestrian low-single-digit rates over the next 10 years.

**What is education spending?**

Historically, education spending is the largest category of U.S. nonresidential spending, contributing an average 15.3% of total spending from 2002 to 2014. It includes not only more obvious components of spending, such as preschool through higher education facility construction, but also health centers and clinics, parking garages and power plants, and gymnasiums and stadiums, as long as they are located at schools or colleges. The U.S. Census also prescribes the education category zoos, arboreta, botanical gardens, planetariums, art galleries, museums, and libraries, which may or may not be located at schools or colleges.

We divide the education category into five subcategories for forecasting purposes: preschool through secondary, higher education private-funded, higher education public-funded, sports and recreation, and other/not specified. The "other" subcategory primarily includes galleries, museums, and libraries, as well as federal spending with unspecified education spending uses. Exhibit 42 provides a snapshot of 2014 spending by subcategory.

**Exhibit 42.** Preschool to Higher Education Subcategories Constitute 84% of Total Education Spending  
Educational spending by subcategory in 2014



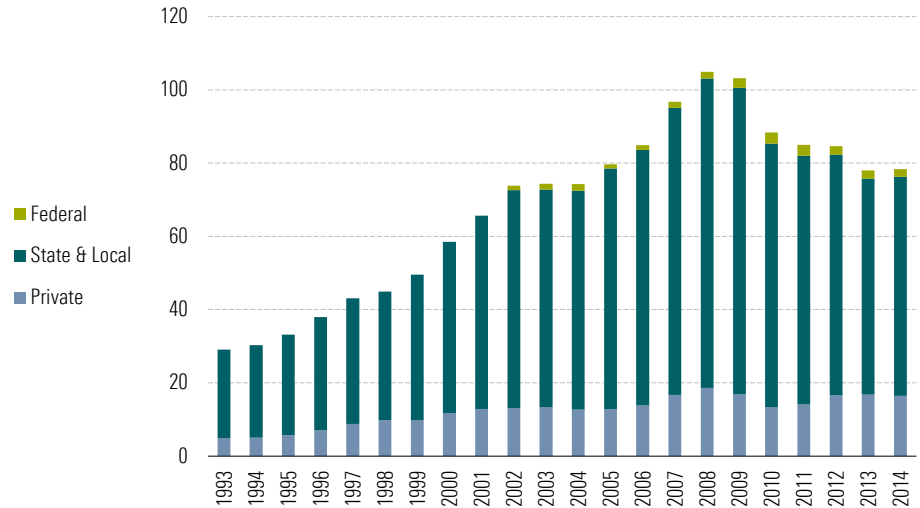
Source: U.S. Census Bureau, Morningstar

### How does education spending compare with historical levels?

Education spending has gone through a boom and bust cycle over the past 21 years. As Exhibit 43 illustrates, nominal education spending steadily increased from 1993, the first year in which the U.S. Census reports state- and local-funded and private-funded education spending data (federal-funded and total education spending data was first reported in 2002), to the peak in 2008. Over these 15 years, nominal education spending (excluding federal-funded) increased at an 8.8% cumulative average growth rate. Since 2008, total education spending has languished, down 25% from its peak in 2014.

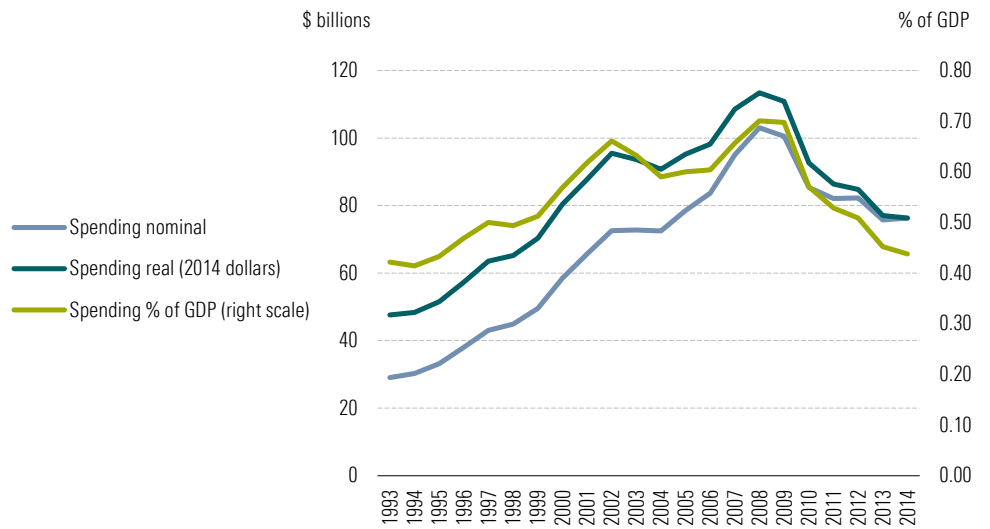
By taking into account inflation, and benchmarking spending to GDP and total enrolled students, we discover a similar story. As captured in Exhibit 44, education spending through 2008 grew at a faster pace than inflation and contributed 66% more to GDP in 2008 than in 1993. Education spending as a percentage of GDP made a round trip to mid-1990s levels, contributing 0.44% to GDP. Real education spending's decline from peak levels appears less dramatic when comparing education spending with enrollment, as depicted in Exhibit 45.

**Exhibit 43.** Education Spending’s Decline Led by Constrained State and Local Government Funding  
Education spending by funding source in billions of current dollars



Source: U.S. Census Bureau, Morningstar

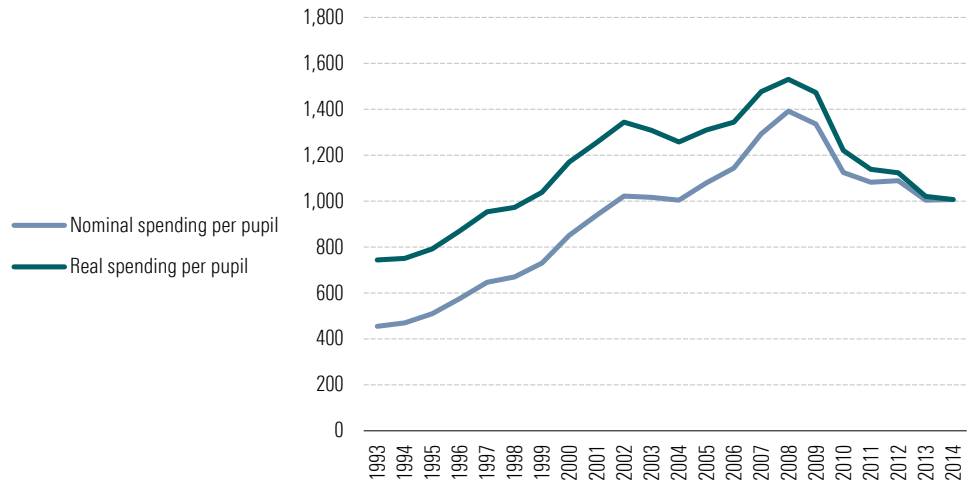
**Exhibit 44.** Education Spending’s Share of GDP Back to Mid-1990s Levels  
Education spending, measured by nominal dollars, real dollars, and percentage of GDP



Source: U.S. Census Bureau, U.S. Bureau of Labor Statistics, U.S. Bureau of Economic Analysis, Morningstar

\*Includes just state & local and private spending data since federal spending data only dates to 2002 and contributes just 3% of total education spending.

**Exhibit 45.** Real Education Spending per Pupil at 1999 Levels  
Nominal and real spending per pupil



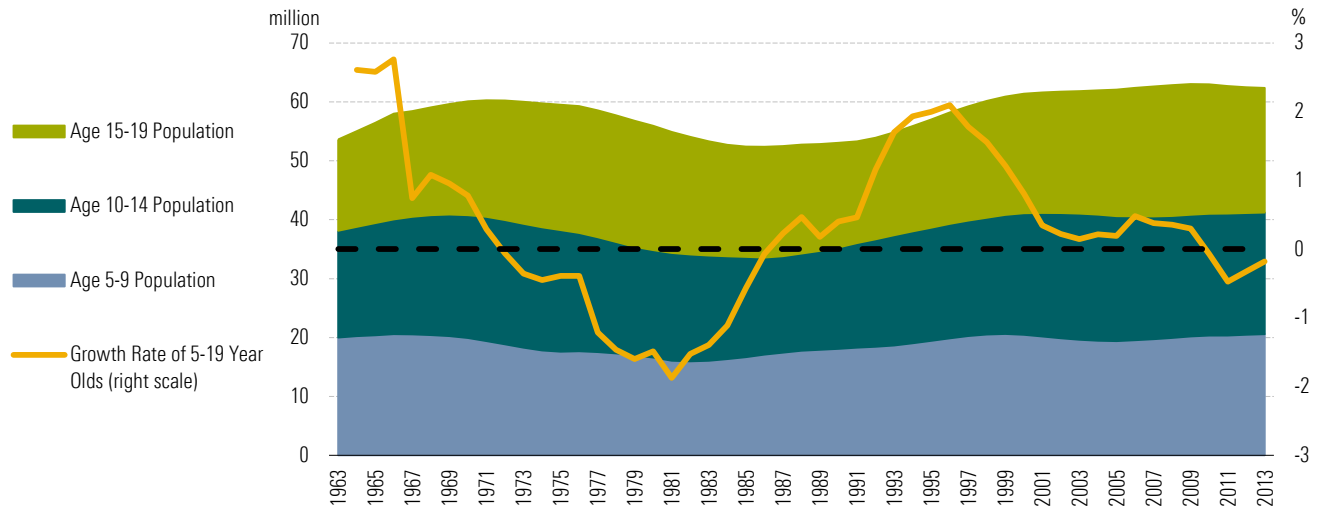
Source: U.S. Census Bureau, U.S. Bureau of Labor Statistics, U.S. Department of Education, National Center for Education Statistics, Morningstar

**What drove the education construction boom?**

We believe the education spending boom was primarily driven by favorable age demographics, an increased share of 3- to 34-year-olds attending school, and booming state and local tax revenue, partly boosted by rapidly appreciating home prices.

Growth in the school-aged population provided a modest tailwind for the construction of schools and school additions, especially during the earlier years of this period. The population of 5- to 19-year-olds, the prime school-going ages with 90%-plus enrollment rates, expanded by 14.6% from 1993 to 2008, or 0.91% annually. This period benefited from the growth of the millennial generation, offspring of the large baby boomer generation born after 1985. As Exhibit 46 illustrates, the growth rate among 5- to 19-year-olds peaked in 1996 at 2.1%, then decelerated to 0.1%–0.5% for much of the 2000s before beginning its decline in 2010.

**Exhibit 46. Prime School-Aged Population Growth Peaked in 1996**  
 U.S. population time series by 5-year time series

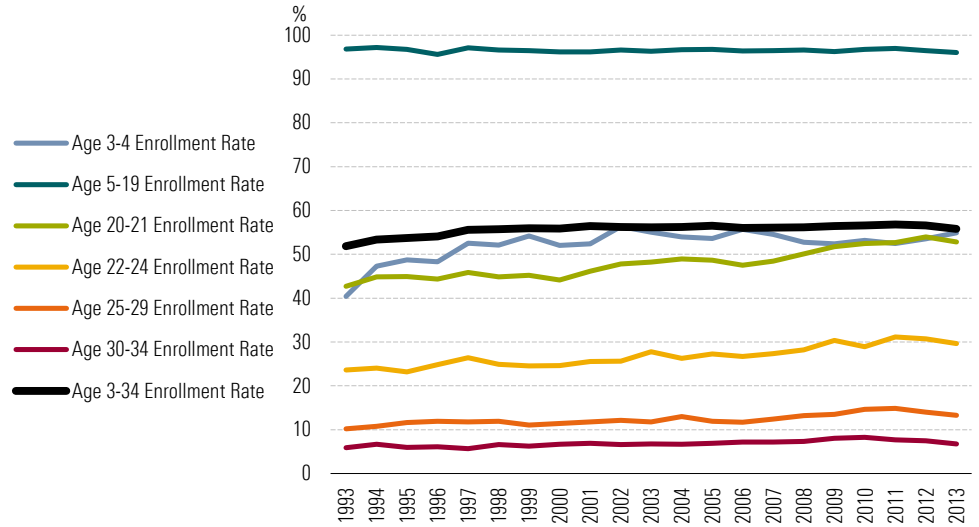


Source: U.S. Census Bureau, Morningstar

A higher proportion of young people attending school compounded favorable age demographics during the boom years. Overall enrollment rates among 3- to 34-year-olds expanded from 51.8% in 1993 to 56.2% in 2008. This was almost entirely driven by an increased proportion of children under age 5 and young adults aged 20–34 receiving education, as illustrated in Exhibit 47. The number of associates, bachelor’s, master’s, and doctorate degrees conferred has expanded markedly over the years, with women leading the charge, as shown in Exhibit 48. Total enrollment levels across all age groups, aided by the growing number of young people and expanding proportion attending school, increased to a 75.9 million peak in 2010 from 63.8 million in 1993, a 1.03% CAGR.

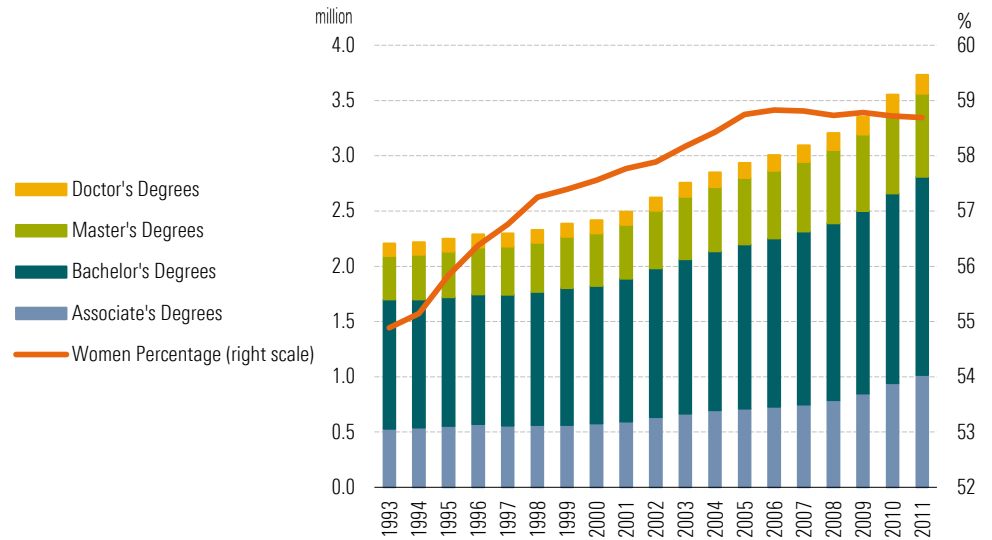
We believe there were bullish cyclical and secular components to the enrollment rates. The long term trend toward higher education is noticeable in Exhibit 47; it grew faster than the rate of population growth among specific age cohorts, but a big acceleration took place during the economic recession and resulting “jobless recovery.” The percentage of 22- to 24-year-olds and 25- 29-year-olds attending school spiked to 31.1% and 14.8%, respectively, in 2011, from 27.3% and 12.4% in 2007. After graduating with a bachelor’s degree with challenging job prospects, or getting laid off and becoming one of the long-term unemployed, many people opted to layer on more education and hope that their job prospects would improve several years later.

**Exhibit 47. Enrollment Rates Among Young Adults Have Declined in Recent Years**  
School enrollment rates among 3- to 34-year-olds



Source: U.S. Department of Commerce, U.S. Census Bureau, Morningstar

**Exhibit 48. Postsecondary Degrees Accelerated Through the Latest Recession**  
Annual degrees granted



Source: U.S. Department of Education, Morningstar

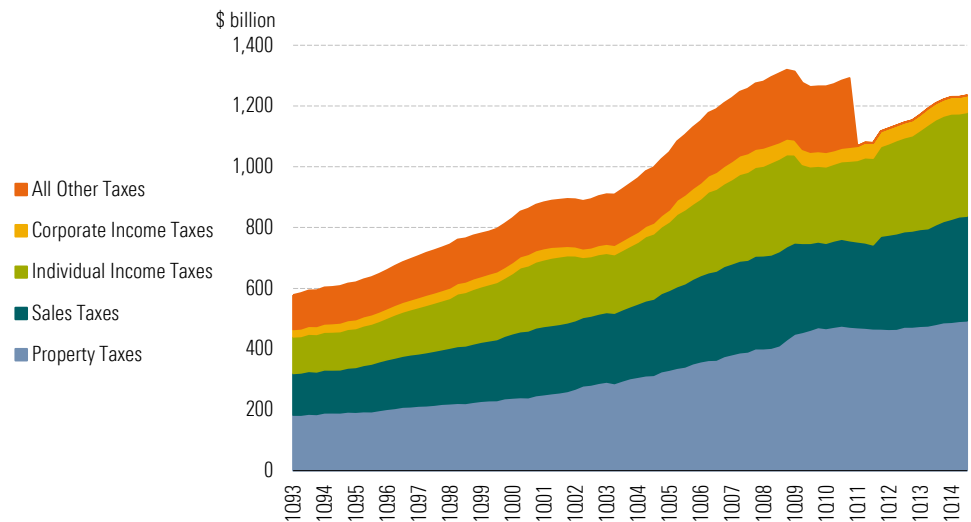
Booming state and local tax revenue also strongly contributed to the education construction spending binge of 1993–2008. According to the most recent data from the Department of Education in 2011, state and local taxes funded 90% of public elementary and secondary school expenditures, 28% of public postsecondary institution spending, and 1% of private postsecondary institution spending. As seen in



Exhibit 49, total state and local tax revenue steadily expanded through 2008, rising at a 5.4% CAGR since 1993, well above CPI's (all items) 2.7% CAGR over the same time period.

The rise of property taxes is particularly significant, since this source has funded an average of 35% of public elementary and secondary school spending. Approximately 44% of property tax revenues are directed towards schools. Property tax revenue grew at a 5.6% CAGR in 1993–2008, driving much of the growth in state and local tax revenue. Surely supporting property tax revenue were the rapid and unsustainable growth in home prices. Indeed, average national existing home prices increased at a 7.3% nominal CAGR from 1993 to 2006, according to Case-Schiller.

**Exhibit 49.** State and Local Tax Revenue Expanded at a Healthy Clip  
State and local tax revenues, by funding source, trailing four quarters



Source: U.S. Department of Commerce, Morningstar  
\*\*"All Other Taxes" categories' data only runs through 4Q10

**Will the education construction bust persist?**

The primary drivers that supported education spending from 1993 to 2008—population of prime school-aged people, enrollment rates, and state and local tax revenue—all slowed or reversed in the past six years. Looking forward to the next 10 years, we expect the first two drivers to act as headwinds, with state and local tax revenue growth allowing for positive growth in education construction spending.

First depicted in Exhibit 46, the population of 5- to 19-year-olds actually declined 0.7% from 2008 to 2013 to 63.4 million as many millennials reached their 20s. The U.S. Census projects that this age cohort will fall further to 62.0 million in 2020, before bouncing back somewhat to 62.6 million in 2025. Projected population change among 20- to 29-year-olds should fare better, with an expectation for 45.1 million people in 2025 versus 44.4 million in 2013. However, that is still just a 0.2% average annual population growth over that time period, and their numbers are less influential to school enrollment since the

percentage attending school in 2013 only averaged 52.8%, 29.7%, and 13.3% for 20- to 21-year-olds, 22- to 24-year-olds, and 25- to 29-year-olds, respectively, versus 96.0% for 5- to 19-year-olds.

We expect that the recent declines in higher education enrollment rates from historical peak levels will persist over the next few years. As of the latest data from 2013, enrollment rates for 20- to 21-year-olds, 22- to 24-year-olds, 25- to 29-year-olds, and 30- to 34-year-olds have already crested by 1.2, 1.4, 1.5, and 1.6 percentage points from their peak levels in 2012, 2011, 2011, and 2010, respectively. We believe the retracements are largely a function of the much-improved labor market in which the unemployment rate has fallen to 5.5% in March, down from the 10.0% peak in October 2009. We expect the improved labor market to continue to compel less young people to attain further education and rack up student loan debt that carried a median value of \$15,000 for the 39% of households aged 25–34 that had student debt in 2010. Further, real tuition prices have increased by 40% at public institutions and 15% at private institutions for the 2011–12 school year from 10 years prior (to \$14,300 and \$33,000 per year, respectively), pressuring expected return on education investment. And many of the industries that were hardest hit, such as construction, stand to benefit the most from expected recoveries in residential and nonresidential construction, which typically do not require postsecondary education. We believe that enrollment rates among 20- to 34-year-olds will fall an additional 1.5–2.0 percentage points over the next three to five years before reaching what we consider to be normalized levels of the mid-2000s.

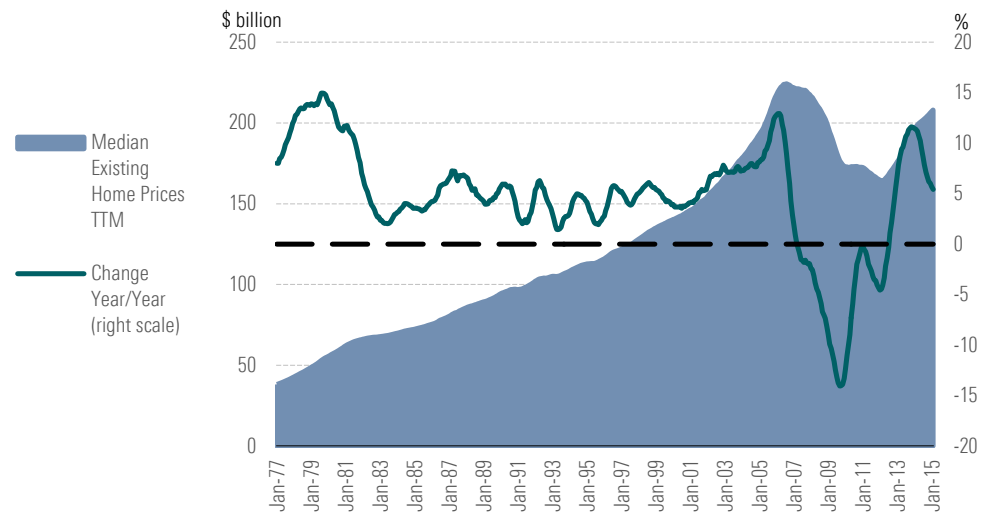
We estimate that total school enrollment among 3- to 34-year-olds will decline to 76.7 million in 2019 from our estimate of 78.0 million in 2013, then rise to 77.3 million in 2024. Our analysis utilizes U.S. Census age-group-specific population estimates, holds enrollment rates constant for 3- to 19-year-olds, and assumes 1.8 percentage points further contraction in 20- to 34-year-olds' average enrollment rates. The almost no expected change in total U.S.-born student enrollment should act as a significant headwind to education construction.

Giving us confidence that there will be some growth ahead are prospects for strong increases in state and local tax revenue. Trailing-four-quarter state and local tax revenue has been growing at 2%–6% rates since the first quarter of 2011. Increased economic activity since the recession has boosted personal incomes, corporate profitability, and retail sales, supporting individual income tax revenue, corporate income tax revenue, and sales tax revenue, respectively. In the absence of a recession, we expect continued low- to mid-single-digit increases in these revenue sources, especially from individual income tax revenue, which should receive a nice boost in the number of employed people.

The fourth state and local tax revenue source in which we have recent data, property taxes, should particularly benefit. As Exhibit 50 illustrates, existing home prices have rebounded considerably in recent years. We believe existing home prices are currently near normalized levels, as the median home price/median income ratio's low affordability indicator is roughly offset by the mortgage payment/income and mortgage payment/rent indicators' high affordability levels. The course of 30-year mortgage rates, which are typically priced off 10-year U.S. Treasury yields, should strongly influence the trajectory of future home prices given their sensitivity to home prices—every 100-basis-point change in 30-year mortgage rates adds approximately 12% to mortgage payments assuming 20% down. Higher

home prices tend to reflect in higher assessed home values for tax purposes with at least a couple years' lag, so we expect property tax revenue to increase more significantly over the next few years.

**Exhibit 50.** Home Price Recovery Should Drive Improved Property Tax Revenue  
Median existing home prices, trailing 12 months



Source: National Association of Realtors, Morningstar

Still, education spending must contend with other spending needs of governments, such as plugging underfunded pensions. The most recent data from the Census on Governments on state pension funded levels indicates that total state pensions were underfunded by \$889 billion in 2013. The funded level has not improved much since 2009 despite sharply higher asset prices because lower interest rates have reduced the discount rate used to calculate the benefit obligation. Indeed, the aggregate benefit obligation has increased 17% since 2009 to \$3.6 billion in 2013. Contributions to pension plans represented 10% of total state government expenditures in 2013, and ongoing uncertainty regarding pension spending needs may constrain education construction spending, especially in kindergarten through 12th grade schools, where state education spending makes up a disproportionate funding source.

There are additional supportive drivers to higher education spending. One is the growth in international students attending universities. According to the Institute of International Education, there were 764,000 foreign-born individuals in U.S. postsecondary institutions in 2011, up 39% from 2000 levels, representing 3.7% of the total college student body. Much of the influx has come from China, which has more than tripled the number of students studying in the U.S. from 2000 to 2011, now making up 25% of foreign-born students attending universities. We expect continued enrollment growth among the foreign born to supplement slow enrollment growth among young Americans.

Further supporting higher education spending is rising tuition levels. Tuition funded 46% of private not-for-profit higher education spending in 2012 and 21% of public higher education spending in 2011, the

last years in which we have such data. Tuition revenue has grown by 42% at private not-for-profit higher education schools from 2005 to 2011, or 6.0% annually, and by 57% at public higher education schools, or 7.8% annually. Tuition growth has not slowed (up 5.0% and 8.5%, respectively, in 2011), and we expect continued tuition increases to provide construction spending tailwinds.

The aforementioned primary drivers to education construction demand mostly affect the preschool/primary/secondary and higher education private and public categories, 86% of total education construction spending. We separately model sports recreation construction spending and "other/not specified" spending categories, 5% and 9% of total education construction spending, respectively. We expect spending on stadiums, arenas, and such to continue growing at rates near nominal GDP growth, above other education categories, given their influence in attracting the most promising student athletes to attend that school and fans to spend growing sums to attend sporting events. Finally, we expect slow growth in the "other" category given its weak historical propensity to grow and inclusion of certain low growth prospect structures such as libraries.

All in, we project average annual education construction spending growth of 2.9% over the next 10 years, ahead of the 0.5% CAGR of 2002–14. We believe there is some pent-up construction demand that should unleash with the ongoing cyclical expansion in state and local tax revenues, supporting above-average growth near 4% in 2016–18. However, we expect construction spending to then settle into a more sustainable growth rate of 2.4% given unsupportive demographics and normalizing enrollment rates among young adults.

#### Exhibit 51. Education Construction Spending Has Room for Modest Recovery

Morningstar forecasts for annual construction spending, by subcategory

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2002-14 CAGR
Preschool/primary/secondary	46.2	44.2	44.9	47.4	51.6	59.7	62.4	58.7	47.6	44.1	42.6	38.8	38.7	-1.5%
Higher education private	6.1	6.6	5.8	6.1	6.8	8.7	10.7	10.0	7.5	7.8	10.1	9.8	9.5	3.8%
Higher education public	12.7	14.1	14.5	16.3	17.2	18.8	21.0	22.7	22.0	22.0	21.0	18.9	19.6	3.7%
Sports/recreation	2.3	2.0	2.1	2.6	2.6	2.5	3.4	3.2	3.2	3.0	3.1	3.5	3.7	4.0%
Other/not specified	6.5	7.4	7.0	7.3	6.8	7.1	7.3	8.6	8.1	8.1	8.0	6.9	6.9	0.5%
<b>Total</b>	<b>73.9</b>	<b>74.3</b>	<b>74.3</b>	<b>79.7</b>	<b>84.9</b>	<b>96.8</b>	<b>104.9</b>	<b>103.2</b>	<b>88.4</b>	<b>85.0</b>	<b>84.7</b>	<b>78.0</b>	<b>78.4</b>	<b>0.5%</b>
<b>y/y change</b>		<b>0.6%</b>	<b>-0.1%</b>	<b>7.3%</b>	<b>6.6%</b>	<b>13.9%</b>	<b>8.4%</b>	<b>-1.6%</b>	<b>-14.3%</b>	<b>-3.9%</b>	<b>-0.4%</b>	<b>-7.9%</b>	<b>0.6%</b>	
	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	2014-24 CAGR			
Preschool/primary/secondary	39.5	41.0	42.7	44.4	45.7	46.6	47.6	48.5	49.5	50.5	2.7%			
Higher education private	9.8	10.1	10.4	10.7	11.0	11.3	11.7	12.0	12.4	12.7	2.9%			
Higher education public	20.4	21.4	22.5	23.4	24.1	24.8	25.5	26.3	27.1	27.9	3.6%			
Sports/recreation	3.9	4.1	4.3	4.5	4.7	4.9	5.1	5.3	5.6	5.8	4.5%			
Other/not specified	7.0	7.1	7.2	7.3	7.4	7.5	7.6	7.6	7.7	7.8	1.4%			
<b>Total</b>	<b>80.5</b>	<b>83.7</b>	<b>87.0</b>	<b>90.2</b>	<b>92.8</b>	<b>95.1</b>	<b>97.4</b>	<b>99.8</b>	<b>102.2</b>	<b>104.7</b>	<b>2.9%</b>			
<b>y/y change</b>	<b>2.7%</b>	<b>3.9%</b>	<b>3.9%</b>	<b>3.7%</b>	<b>2.9%</b>	<b>2.4%</b>	<b>2.4%</b>	<b>2.4%</b>	<b>2.4%</b>	<b>2.4%</b>				

Source: U.S. Census Bureau, Morningstar

# Commercial: Retail Sales' Shift to Online a Net Negative to Commercial Construction

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**Sector Snapshot**

2014 PIP: \$57.3 billion  
 2004-2014 CAGR: 1.9%  
 2014-2024E CAGR: 4.8%

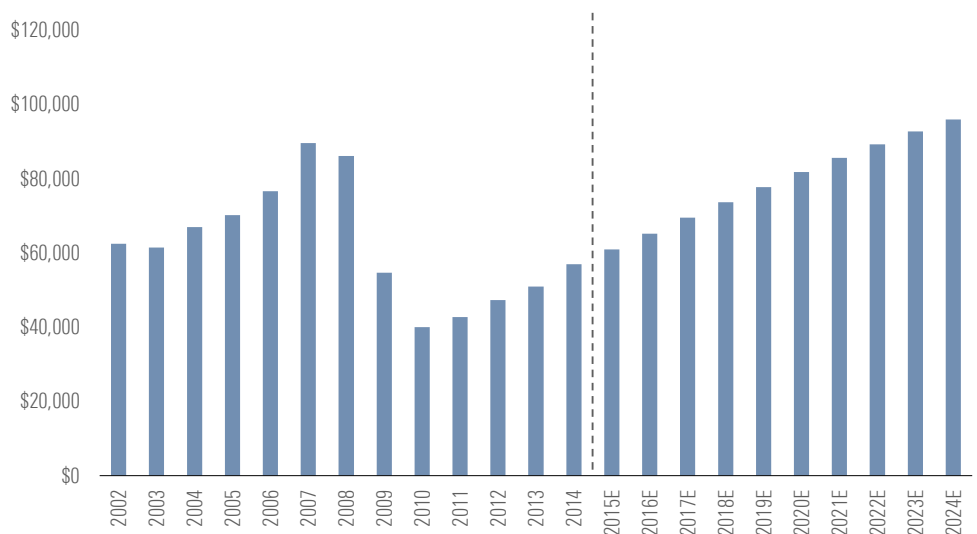
**2014 Sector Breakdown**

Retail: 61%  
 Warehouse: 23%  
 Farm: 16%

**Key Takeaways**

- ▶ Retail developers were slow to react to the changing market dynamics brought by the shift in retail sales to online channels, resulting in overbuilding through 2008, a glut in retail space during the downturn, and a dearth of construction since. However, with vacancy rates now near record low levels, retail construction is set to pick up, despite retailer productivity gains and the overall drag on space needs due to the shift in sales toward online channels.
- ▶ According to industrial landlord Prologis, online retailers require roughly 3 times the logistics space as traditional retailers. We estimate that the shift in retail sales toward online channels will provide a tailwind to warehouse construction over the coming decade, resulting in 4% higher levels of construction in this sector, on average.
- ▶ The net impact of the shift in retail sales to online channels is negative for commercial construction overall, as the value of retail construction spending lost due to this shift is greater than the warehouse construction spending gained.
- ▶ Overall, we expect commercial construction to remain at the somewhat muted levels (0.3%–0.4% of GDP) observed since 2009 as opposed to returning to the higher levels of 2008 and before (0.5%–0.6% of GDP), but the absolute dollar level of commercial construction spending is headed higher, with headier growth rates in the near term relative to our longer-term expectations.

**Exhibit 52.** Commercial Construction Set to Improve, but Shift to Online Sales Weighs on Growth  
 Construction put-in-place, in millions of current dollars

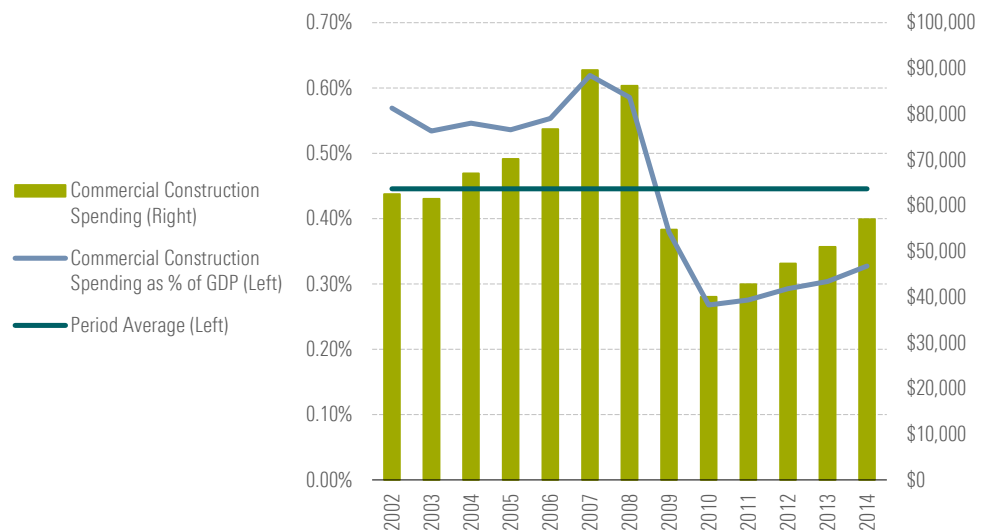


Source: U.S. Census Bureau, Morningstar

### Defining commercial construction

Commercial construction has ranged between 7% and 15% of total nonresidential construction spending since 2002, with an average of 11%. In 2014, commercial construction spending was below historical average levels on both a raw dollar amount and percentage-of-nonresidential-construction-spending basis, at \$57.1 billion and 9.4%, respectively. Commercial construction levels have remained below their historical average level relative to GDP (of 0.45%) since 2009, although they have recovered slightly recently.

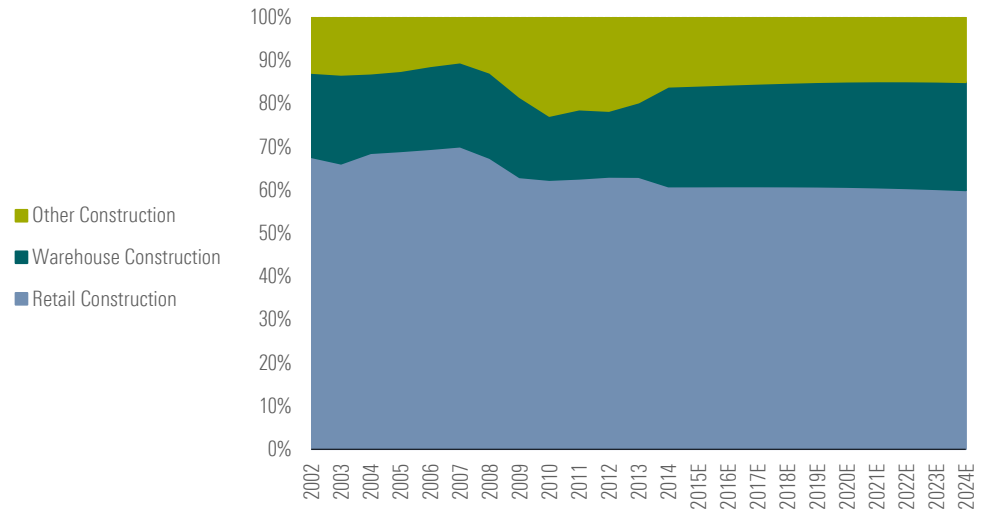
**Exhibit 53.** Commercial Construction Has Not Fully Recovered Since the Downturn  
Commercial construction spending in raw dollars (right axis) and as a percentage of GDP (left axis)



Source: U.S. Census Bureau, Morningstar

For our analysis, we segment commercial construction into three groups: retail (including automotive, food and beverage, multi-retail, and other retail); warehouse; and other (farm and other unclassified commercial). While we expect other commercial construction to remain at recent levels as a percentage of GDP, we think the main factors driving retail and warehouse construction spending include the level of retail sales and the secular shift in consumer spending toward online channels and away from physical stores. We expect retail to remain the largest driver of overall commercial construction spending, but its importance is likely to remain below its historical average. Warehouse construction spending’s importance should remain elevated at the expense of both retail and other construction spending.

**Exhibit 54.** While Retail Construction Spending Will Remain the Largest Driver of Commercial Construction Spending, the Importance of Warehouse Construction Spending Will Increase  
 Importance of retail, warehouse, and other construction spending as a percentage of total commercial construction spending

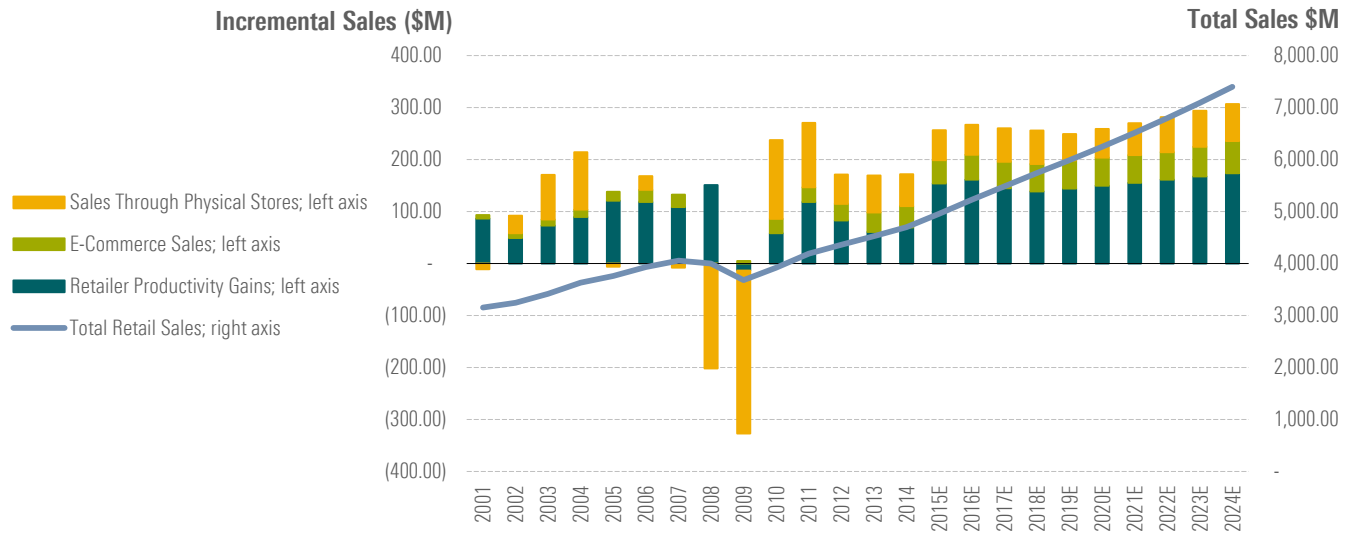


Source: U.S. Census Bureau, Morningstar

**Far from dead, incremental retail space will be needed for decades to come to meet increased retail sales through physical stores.**

The full increase in total retail sales in any year does not need to be addressed with incremental retail space, due to retailer productivity gains (i.e., selling more dollar-volume through the same retail footprint) and the shift in retail sales to online channels, which do not require physical stores. However, the combination of expected retailer productivity gains and the impact of sales lost to online channels does not fully account for our projected increases in total retail sales, suggesting that the economy will need incremental retail space. We expect this dynamic to persist for decades to come.

**Exhibit 55. Only Part of the Total Increase in Retail Sales Each Year Needs to be Addressed With Incremental Physical Space, but Incremental Physical Retail Space Will Likely Be Needed for Decades to Come**  
 Total retail sales (right axis) and components of incremental retail sales (left axis)

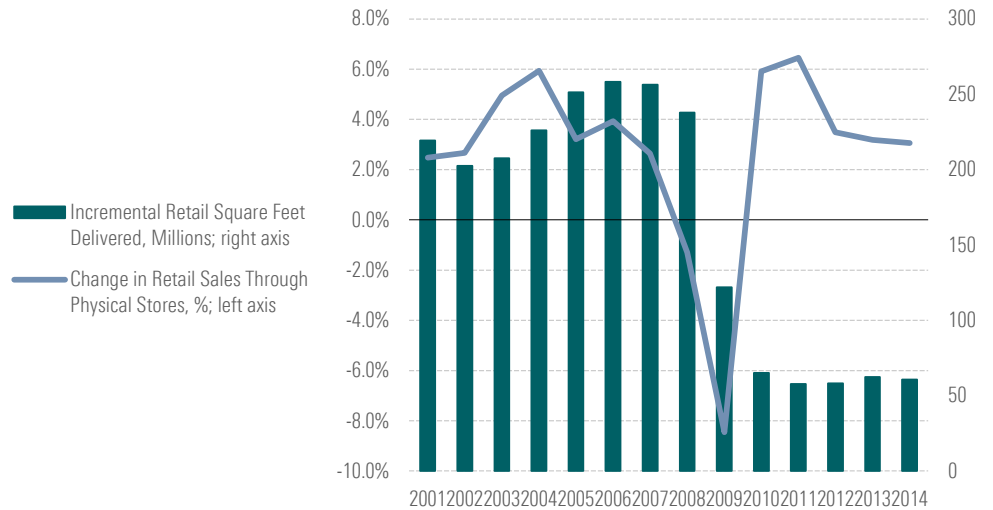


Source: U.S. Census Bureau, Bureau of Labor Statistics, Morningstar estimates.

By our estimation, retailer productivity may increase somewhat in the near term due to a number of factors. The lack of incremental space built recently suggests that retail sales through physical channels will be growing at a faster rate than the retail footprint, resulting in higher retailer productivity. Longer-term, the trend toward urbanization suggests that infill, urban retail locations may see higher demand, boosting productivity in these locations at the expense of suburban development. While some new urban retail centers are likely to be developed, it is generally more difficult to build in these already-dense areas, so we expect an increase in overall retailer productivity to compensate.



**Exhibit 56.** Recently, Retail Deliveries Have Been Low While Sales Through Physical Stores Have Been Expanding  
 Incremental retail deliveries (right axis) and retail sales growth through physical stores (left axis)

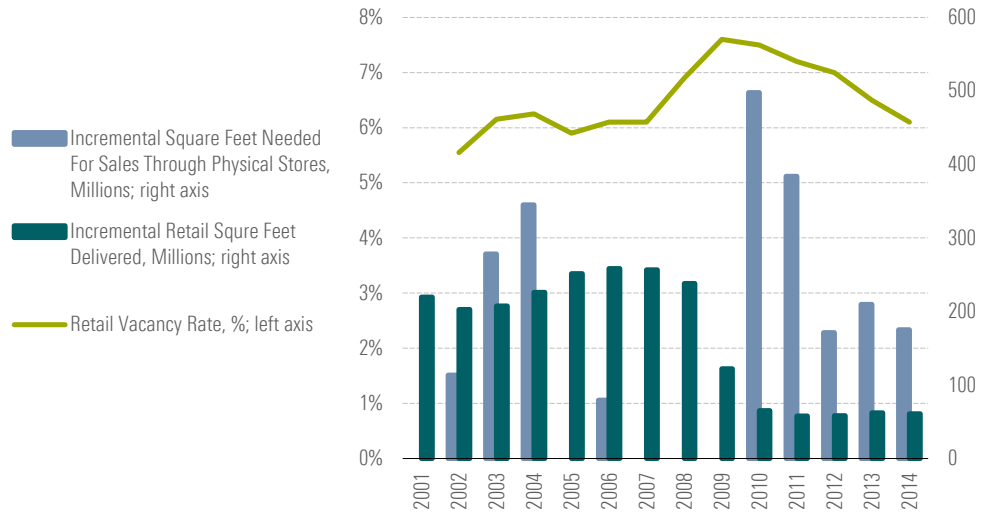


Source: U.S. Census Bureau, CoStar, Morningstar estimates.

In addition to retailer productivity gains, our projected need for future physical space is also diminished by the continued shift in sales to online channels, which do not require a physical storefront. By our estimation, retail developers were slow to adjust to the changing dynamics introduced by rapidly-growing e-commerce sales, resulting in an oversupply of physical space through 2009 relative to underlying demand for retail sales through physical stores. This situation has been rectifying itself since, as macroeconomic improvements have benefited retail sales generally and implied the need for more incremental physical retail space than developers have delivered. This minimal recent construction has restored tight space markets and a favorable bargaining position for landlords, supporting future levels of retail construction at higher levels than seen since 2009 and more in line with incremental demand requirements, net of retailer productivity gains.

**Exhibit 57. Retail Vacancy Has Fallen, as Recent Deliveries of New Stock Have Remained Below Estimated Incremental Demand for Physical Space**

Incremental demand for and actual deliveries of physical retail space (right axis) and retail vacancy rate (left axis)



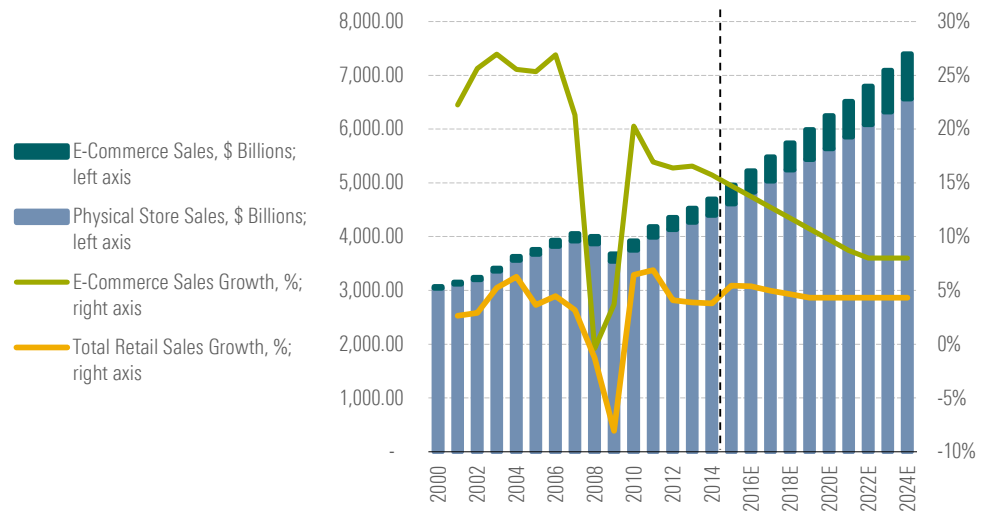
Note: Periods of zero estimated space requirements represent periods of falling estimated retail sales through physical stores.  
 Source: CoStar, Marcus & Millichap, Morningstar estimates.

**The shift in retail sales to online channels boosts warehouse demand but is a net negative to commercial construction overall.**

The secular shift in retail sales from traditional to online channels is a major driver affecting our forecasts for retail and warehouse construction. Sales through online channels have been rising quickly from a small base in 2000, and we think this trend will continue, albeit with lower growth rates in future years as the base of online sales rises.

**Exhibit 58.** The Secular Shift to E-Commerce Sales Will Continue, Albeit With Lower Expected Levels of Future Growth

Components of retail sales and their levels (left axis) and growth rates (right axis)



Source: U.S. Census Bureau, Morningstar

This tempers future demand for incremental physical retail space but boosts future demand for incremental warehouse space, as functions once performed within physical stores move to logistics facilities. As sales move from physical stores to virtual channels, the need for incremental physical space to showcase, stock, and ultimately sell merchandize diminishes, but the need to handle some of these functions in logistics facilities increases.

Global industrial landlord Prologis estimates that online sales require roughly 3 times the amount of warehouse space as sales through physical stores, as functions once handled in the physical store shift to logistics space instead, including inventory stocking; housing buffer supplies; order picking, packing, and shipping; and, sometimes return acceptance and restocking (Prologis, E-Commerce and Logistics Real Estate, July 2014, Inside the Global Supply Chain: E-Commerce and a New Demand Model for Logistics Real Estate).

**Exhibit 59.** With Every Shift of \$1 Billion From Physical Stores to Online Channels, an Estimated \$418 Million Is Lost from Commercial Construction Spending

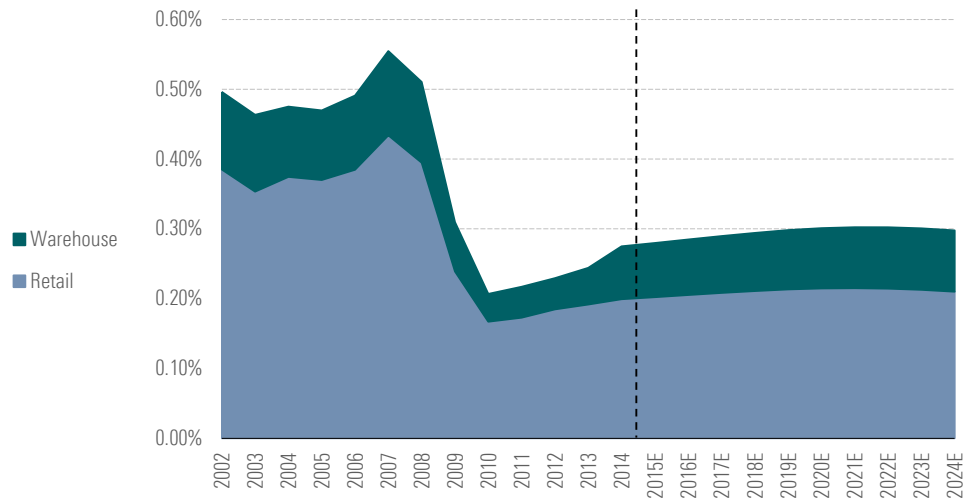
Space Requirements for \$1 Billion in Retail Sales

	Physical Retail Space	Logistics Space
\$1 Billion In-Store Sales	2.9 Million Sq Ft	.325 Million Sq Ft
\$1 Billion E-Commerce Sales	0 Sq Ft	1 Million Sq Ft
Net Impact of Shift to E-Commerce	down 2.9 Million Sq Ft	up 0.675 Million Sq Ft

Sources: Prologis, Morningstar

In aggregate, we expect the continued rise in e-commerce to reduce the future need for and impact of retail construction while increasing the future need for and impact of warehouse construction.

**Exhibit 60.** We Expect the Relative Importance of Retail Construction Spending to Remain Low While the Relative Importance of Warehouse Construction Should Increase Somewhat in Importance  
Retail and warehouse construction as a percentage of GDP

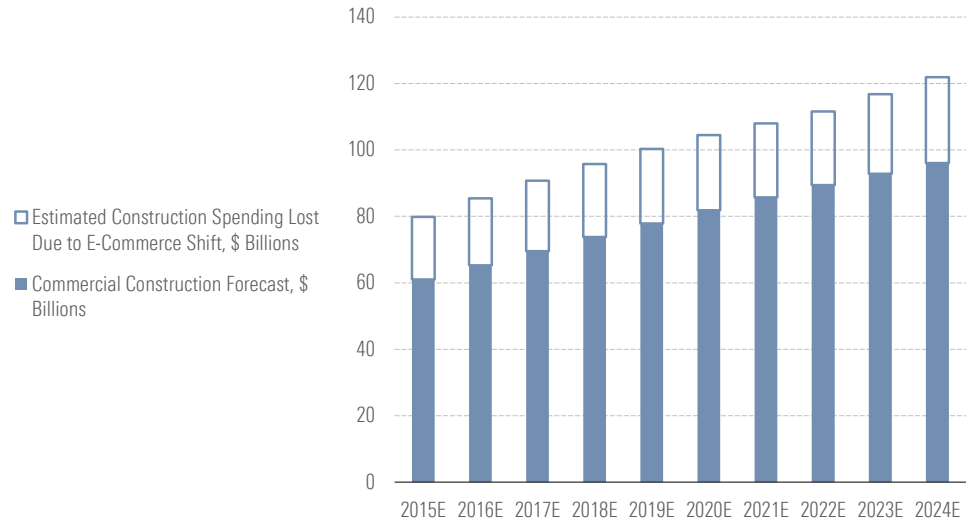


Source: U.S. Census Bureau, Morningstar

However, the net impact of increased online sales is a negative for commercial construction overall, as the amount of construction spending lost in the retail sector exceeds the incremental warehouse space construction requirements. We estimate that with every shift of \$1 billion in retail sales from physical to online channels, \$418 million in commercial construction value is lost. Overall, we estimate that the shift in retail sales to online channels depresses our commercial construction forecast by roughly 22%.

**Exhibit 61.** The Shift to Online Sales Results in Lower Overall Levels of Forecast Commercial Construction Spending

Commercial construction forecast and construction spending lost due to increased e-commerce

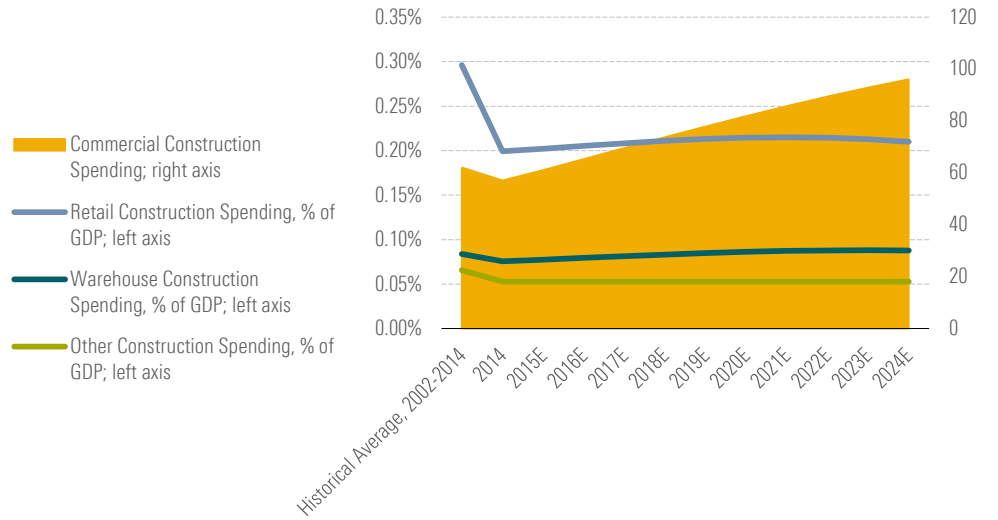


Source: Morningstar

**Conclusion**

Although we expect commercial construction overall to recover to a level that matches its long-term average level as a percentage of GDP, we think the composition will shift somewhat from retail and other to warehouse, due to the continued influence of the shift in retail sales toward e-commerce. Moreover, we expect growth in commercial construction spending to remain robust for the next few years, before tapering off. In aggregate, we think commercial construction activity is unlikely to reach the heady levels observed in the early to mid-2000s as a percentage of GDP, although we do expect the aggregate dollar level of spending during the peak years of 2007 and 2008 to be exceeded within the next 10 years.

**Exhibit 62.** We Expect Commercial Construction to Increase but Remain Below Historical Levels as a Percentage of GDP  
 Total commercial construction spending (right axis) and components of commercial construction spending as a percentage of GDP (left axis)



Source: U.S. Census Bureau, Morningstar

# Manufacturing: Expect Manufacturing Construction Spending to Rise With Cheap Natural Gas

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**Sector Snapshot**

2014 PIP: \$55.5 billion  
 2004-2014 CAGR: 9.0%  
 2014-2024E CAGR: 6.3%

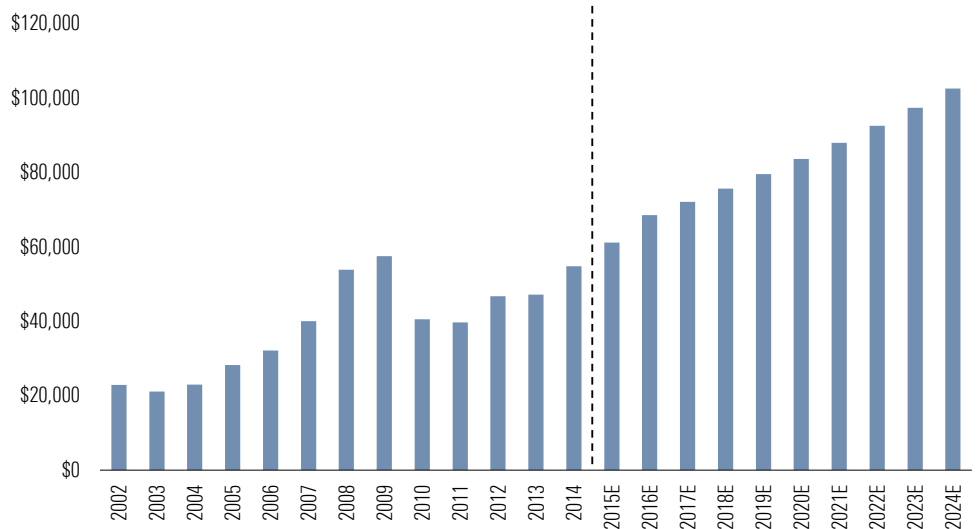
**2014 Sector Breakdown**

Transportation Equipment: 9%  
 Chemical: 44%  
 Computer/Electronic/Electrical: 8%  
 Machinery: 2%  
 Other (food/beverage/tobacco, paper/print/publishing, plastic/rubber, metal, other): 28%

**Key Takeaways**

- ▶ Manufacturing construction spending should grow at an average 6% annual rate through 2024 to \$103 billion, a slower growth rate than last decade's 9% growth rate.
- ▶ We have above-consensus growth expectations for 2015 and 2016 where we see spending growing 11.7% and 12.1%, respectively, relative to a consensus 10.5% and 10.1% growth outlook.
- ▶ We expect construction spending on chemical plants, which capitalize on cheap American shale gas, to be the primary driver of the outlook, as we expect this spending to grow from 2014's 44% of manufacturing construction spending to 48% of manufacturing construction spending by 2024.
- ▶ The long-awaited U.S. manufacturing renaissance continues to be elusive and a relatively insignificant driver of our outlook.

**Exhibit 63.** Manufacturing Construction Will See Meaningful Growth, Driven by Expanding Chemical Capacity  
 Construction put-in-place, in millions of current dollars

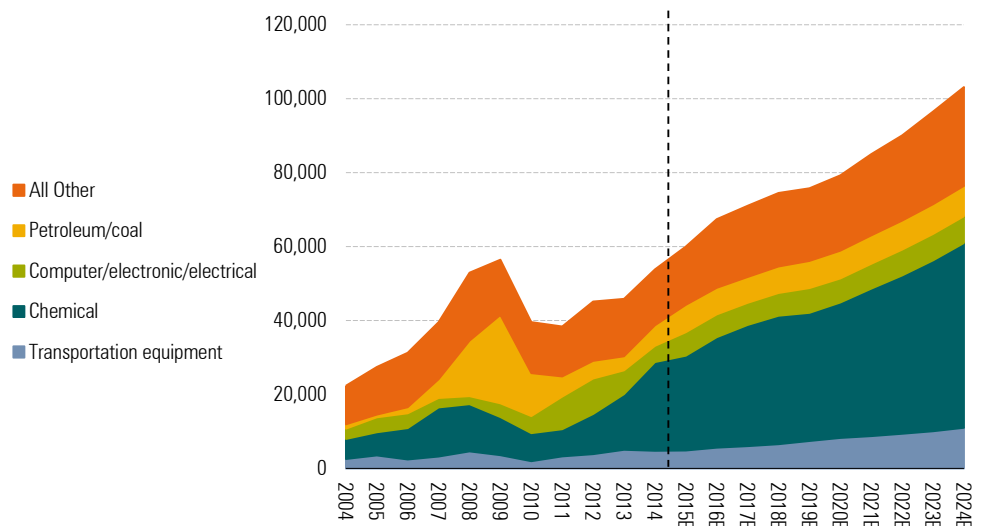


Source: U.S. Census Bureau, Morningstar

### Overview

In 2014, \$54.8 billion was spent on U.S. manufacturing-related construction, a figure 4.7% below the 2009 nominal spending peak. On a real basis, we estimate that 2014 spending is 18% below the 2007 peak. Although manufacturing represents 12% of U.S. GDP, construction spending to erect new factories and chemical plants was only 5.8% of overall U.S. construction spending and 9.8% of nonresidential construction spending. This small overall level of spending relative to manufacturing’s contribution to GDP comes from declining U.S. manufacturing cost competitiveness and increased factory throughput from automation. Spending in this category definitely tracks the rising and falling fortunes of American industry. Nearly a decade ago, paper manufacturing, printing, and publishing were a steady 5% of construction spending, but today they are under 1%. The metals and minerals finishing industries experienced the opposite fate, growing from 10% of spending in 2004 and peaking at 19% of spending by 2010. More recently the slowdown in the global mining complex has pushed that portion of spending to a more modest 9% of manufacturing-related construction spending. While paper making and metal finishing caused prior gyrations in spending, all eyes should now be focused on the build-out of the chemical industry. Over the past decade it has grown to 44% of U.S. manufacturing-related construction spending, relative to 23% roughly a decade ago, and we see it making up 48% of category spending by 2024. The chemical industry’s health is largely a function of cheap shale gas and the global chemical industry’s push to get closer to this relatively cheap input. As spending categories like metals finishing, machinery, and publishing continue to wane, we expect the prior decade’s 9.1% spending CAGR to decelerate to 6.5% and result in \$103 billion of nominal construction spending by 2024 (Exhibit 64).

**Exhibit 64.** Chemical Manufacturing Is the Largest Contributor to Our Construction Spending Growth Outlook  
Manufacturing construction spending by subcategory (\$ millions)



Source: U.S. Census Bureau, Morningstar



**Our 2015 and 2016 growth expectations are 120–200 basis points higher than the consensus outlook.**

We expect manufacturing-related construction spending to be particularly high in 2015 and 2016. As we've previously highlighted on a real basis, industry spending remains 18% below its real peak. In 2014 we saw pent-up construction spending demand spur 16% construction spending growth. We expect 11.7% and 12.1% nominal growth in 2015 and 2016, but we expect growth to decelerate to 5% average annual growth over the 2017–24 time frame. The near-term spending surge is partially related to our chemical spending outlook but also related to strong 2015 and 2016 construction spending expectations in the autos, aerospace, computer, electronic, and petroleum manufacturing industries. Although we have seen relatively few of our competitors' manufacturing spending estimates, we would note that the American Institute of Architects generates a consensus spending outlook from roughly seven forecasters for industrial-related construction spending. In the AIA's latest survey, consensus expectations are for 10.5% and 10.1% growth in 2015 and 2016, respectively.

**The future looks good, but it isn't as bright as the past.**

Through 2014, total manufacturing-related construction spending grew at a 9.1% nominal rate and a 6.4% real rate. Although U.S. manufacturing construction spending grew far faster than the U.S. manufacturing sector's 0.6% annual growth pace as tracked by the Federal Reserve's Industrial Production measure, much of this is related to spending growth in the capital-intensive and long moribund chemical industry. Over the past decade chemical-related construction spending grew at a nominal 16.1% rate. The petroleum refining segment generated comparable growth, rising at a nominal 16.8% annualized pace; however, at \$5.5 billion of annual spending in 2014, relative to \$24.0 billion of spending on chemicals, it is not a significant driver in our forecast. Going forward, we expect chemical-related spending to slow down. With U.S. chemical production representing 15% of global totals and the country only recently flipping back into a net chemical exporter position, we think this growth rate will eventually subside as deferred maintenance spending has largely been completed and we think many of the companies building for an export opportunity likely have to balance accessing a cheap shale gas feedstock while still facing the realities of currency volatility, something that is a real risk given recent strength in the U.S. dollar. On a nominal basis we expect 7.5% annual growth in chemical construction spending as the figure reaches \$49 billion by 2024. Going forward, we also expect transportation equipment spending to be a growth category. Continued strong U.S. demand for automobiles (44% of transportation-related industrial production) and global demand for aircraft (33% of transportation industrial production) should spur continued investment in U.S. transportation equipment manufacturing infrastructure, generating an 8.7% nominal growth outlook and \$11.0 billion of spending by 2024.

**Our outlook is based on a combination of U.S. Census Bureau and Federal Reserve data as well as Morningstar industry analyst views.**

To create our forecast we reviewed the U.S. Census Bureau's past 10 years of manufacturing construction spending data. The Bureau discloses construction spending in 14 separate categories; however, we focused on discrete forecasts for the transportation, chemical, computer/electronic, and petroleum/coal categories. These four categories make up 72% of 2014 manufacturing construction spending and 74% of 2024 construction spending. We found it simplest to lump the other 10 categories together based on their relatively small size or the relative predictability of spending (food-related

manufacturing is a great example). In Exhibit 65, we provide a visual depiction of our forecasting model, which largely assumes that the most capacity-constrained industries and industries experiencing above-trend growth will see the largest increases in construction spending.

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**Exhibit 65.** The Mechanics of Our Manufacturing Construction Spending Outlook

Step:

1	U.S. Real GDP Growth
2	x Manufacturing Output Growth Based on Its 10-Year Average Multiple of GDP
	<hr/> = Industrial Production Estimate
3	Maximum Industrial Production Capacity
4	- Industrial Production Estimate
	<hr/> = Needed Incremental Industrial Capacity
5	x A Regression of Real Construction Spending as Correlated to Incremental Industrial Capacity
	<hr/> = Real Manufacturing Construction Spending
6	x Morningstar's 2.25% Long-term Inflation Forecast
	<hr/> = Nominal Manufacturing Construction Spending

Source: Morningstar

Our forecast also incorporates the U.S. Federal Reserve's Industrial Production Survey data. On a monthly basis, the U.S. Federal Reserve surveys numerous private market enterprises to assess their month-over-month increases in manufactured products and production capacity. Seventy-five percent of the survey's weight is based on manufacturing, while the remaining 25% is based on natural resource extraction and power generation. To create our forecast we studied the manufacturing portion of survey responses. In general we like the Industrial Production Survey because it is based on the value added to a product by a specific industry. For example, if a cellphone were assembled in the United States from foreign-sourced components, the survey only shows industrial production proportionate to the value of that assembly process. If the cellphone's semiconductors, memory, screen, and case were all manufactured in the U.S., the survey would show growth in industrial production proportionate to the manufacturing all of those subcomponents as well as the assembly process. Although this survey isn't perfect, we think it is one of the best ways to assess whether the U.S. manufacturing sector is growing, contracting, or adding capacity. We also like the fact that the survey provides a somewhat quantitative assessment of an industry's excess capacity typically based on what percentage of capacity is utilized relative to 100% utilization.

To begin our subsector forecasts, we examined each manufacturing segment's 10 year average output growth relative to real GDP growth. On average, our 2.3% real GDP outlook through 2024 correlated with a 2.8% increase in U.S. manufacturing output with the divergence largely due to our expectations for U.S. chemical production to grow roughly 70 basis points per year on a real basis relative to no growth over the past decade. We also modestly adjusted the model's transportation spending forecast lower.

Our model predicted 10% annual growth in transportation-related manufacturing output (largely automobile and aerospace sales). With Morningstar's analysts projecting 3%–4% real long-term spending on global aerospace (the U.S. is a significant aerospace equipment exporter) and 1% long-term real demand growth in U.S. automobile sales, we overrode our model to reflect a 2.5% long-term real demand outlook for transportation equipment. While the model was correct in noticing that the automobile industry has historically overspent on capital expenditures to satisfy unrealistic sales expectations, going forward our analysts believe that the U.S. auto industry is much more disciplined. In contrast to the past, labor groups appear more sympathetic to the view that automakers should profitably manufacture cars in response to real industry demand rather than overly optimistic demand expectations set by labor group leadership.

Our model next looks at industry utilization as quantified by the Federal Reserve's capacity utilization survey measurement. In aggregate the U.S. manufacturing sector finished 2014 at 78% utilization relative to a 78.8% peak utilization level in 2007. On a subsector-by-subsector basis our model determined the amount of excess capacity needed to meet demand based on our forecast production outlook. We estimated the real value of incremental construction spending based on creating a sum of least squares regression between historical capacity expansion and real construction spending. Once we had a real forecast of subsector construction spending, we multiplied this figure by Morningstar's long-term 2.25% inflation forecast to create a nominal construction spending forecast.

### **Cheap natural gas drives our chemical manufacturing construction outlook.**

We initially planned to ignore the chemical category when we began our analysis, as we assumed chemical production simply follows a wide breadth of other manufacturing and construction sectors. For some perspective, the American Chemistry Council estimates that \$3,500 of chemistry is present in every light vehicle and \$15,000 of chemistry goes into every new home start. However, the bigger trend driving growth in chemical manufacturing plant construction is cheap natural gas. Fracking technology and recent declines in gas field service costs are likely to keep natural gas prices that were \$6.00–\$8.00 per MMBTU a few years ago at \$4.00 or less per MMBTU for the next decade. According to the American Chemistry Council, 215 new chemical production projects with an associated \$135 billion of capital spending through 2019 have already been announced. This compares with net capacity divestitures several years ago. In our forecast we expect the prior decade's 0% growth in chemical output to be replaced by a roughly 0.7% annual growth rate in output to satisfy growing export opportunities for methanol and ammonia. European and Asian competitors use higher-cost oil derivatives to produce these chemicals, which will make them less competitive relative to this low-cost chemical production.<sup>1</sup>

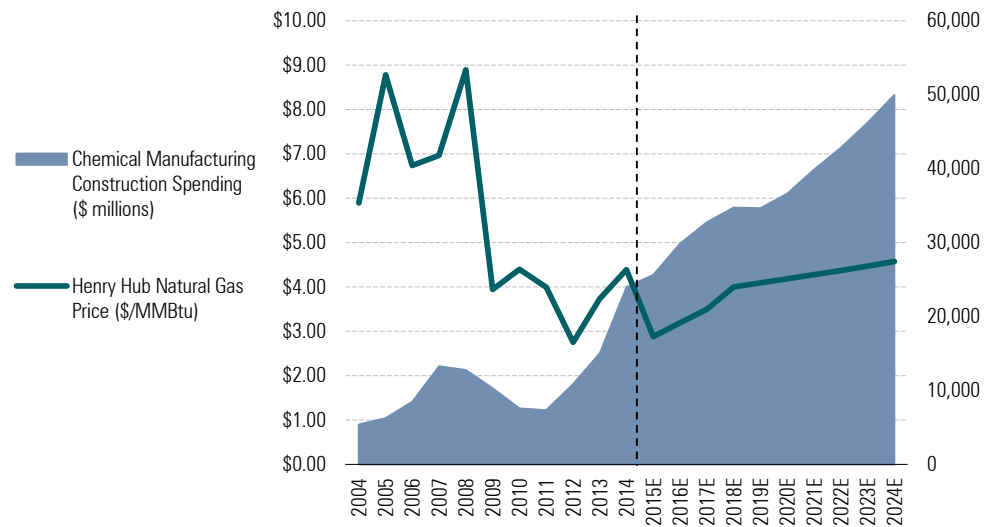
Between 2004 and 2014, chemical-related construction spending grew at a 16.1% compound average annual growth rate to \$24 billion. In 2004, this figure was only \$5.4 billion as the U.S. chemical industry was largely mature and necessitated relatively little incremental capital expenditures to expand. The law of large numbers will make the category growth outlook less robust going into 2024; however, we

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<sup>1</sup> As detailed in "Lower for Longer: A New Normal for U.S. Natural Gas Prices," March 13, 2015, Morningstar.

expect chemical-related construction spending to grow at a 7.5% pace and reach \$49 billion by 2024 (Exhibit 66).

**Exhibit 66.** Low Natural Gas Prices in the U.S. Have Spurred an Increase in Chemical Construction Spending  
Chemical manufacturing construction spending (right axis) relative to natural gas prices (left axis)



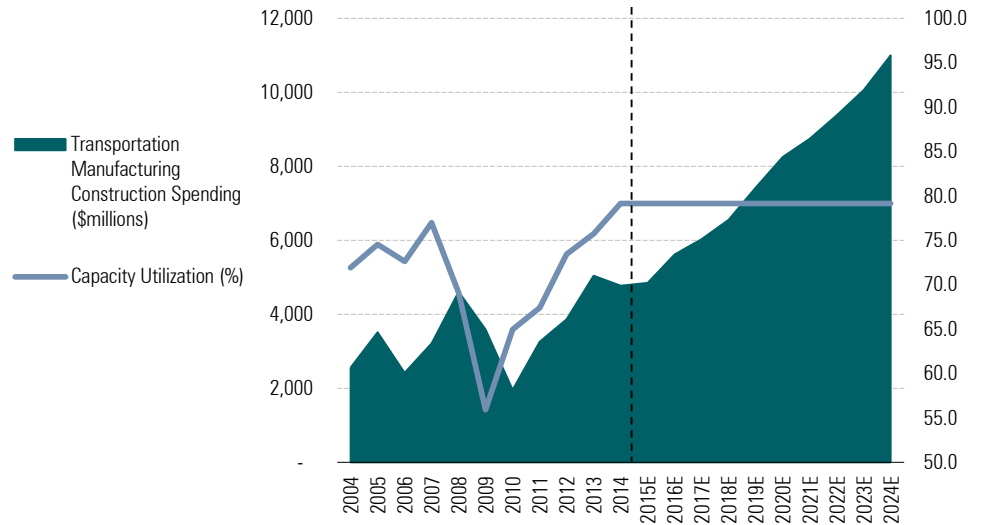
Source: Morningstar, U.S. EIA, U.S. Census Bureau

Although China, Argentina, and Algeria each has shale gas deposits greater than the United States, we don't see any of these countries displacing the United States cost advantage for the foreseeable future. While they may have extensive reserve bases, the division of mineral and landowner rights, the absence of gas pipelines, less advantageous geology, geopolitical concerns, and cost-prohibitive oilfield services remain long-term headwinds to development.

#### **Expect growth in aerospace and auto sales to be a secondary driver in our forecast.**

Over the past decade, transportation equipment manufacturing (predominantly automobiles and airplanes) output has grown at a 2.2% average rate per year. We expect a relatively similar 2.5% growth rate going forward. However, relatively high capacity utilization in both automobile and aerospace manufacturing should translate into higher capital expenditures going forward. For example, over the past decade, industry capacity utilization has averaged 71.1% relative to the 10-year high of 79.1% in 2014. Assuming that this utilization level is relatively maintained, we are forecasting increases in capital expenditures over the next decade. In particular, we expect the past decade's 6.4% average annual increase in nominal spending to be replaced with an 8.7% average annual growth rate through 2024, resulting in \$11 billion of nominal construction spending in the transportation equipment manufacturing sector (Exhibit 67).

**Exhibit 67.** All-Time Highs in Capacity Utilization Should Spur More Transportation-Related Construction Spending  
 Transportation manufacturing construction spending (left) relative to transportation manufacturing capacity utilization (right)



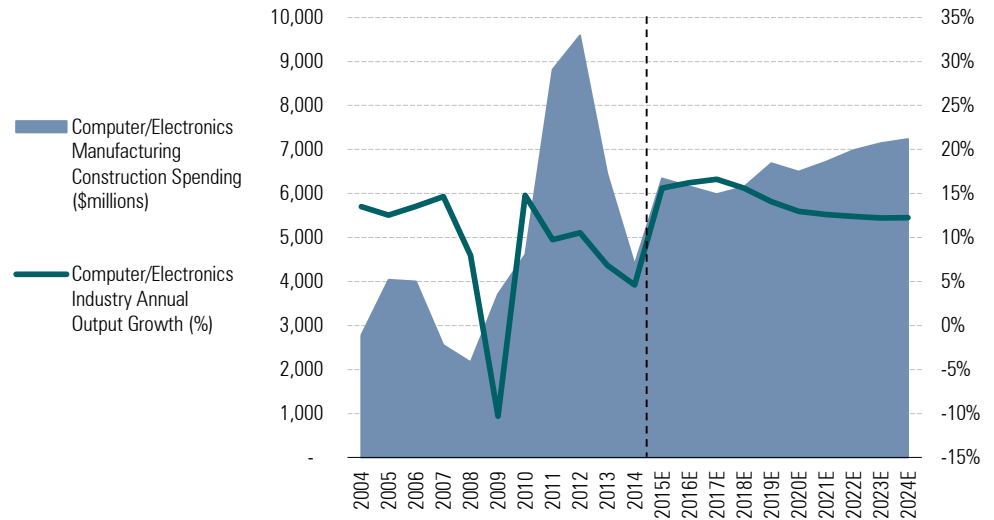
Source: Morningstar, U.S. Census Bureau, Federal Reserve

**Declining capital intensity in the computer and electronics industry makes it a relatively slow growth category in our outlook.**

While we expect overall manufacturing-related construction spending to grow at a nominal 6.5% rate, we anticipate only 5.1% nominal growth in computers and electronics-related manufacturing construction spending. Oddly, industry output has grown at an 8.1% average annual growth rate for the past decade, but manufacturing-related construction spending has grown at only 4.7%. We believe the mismatch is largely due to the industry’s declining capital intensity and the amount of automation that has undoubtedly emerged from an industry that is synonymous with productivity gains. After industry manufacturing construction spending peaked at \$9.6 billion in 2012, it has recently fallen to \$4.3 billion in 2014. By 2024, we expect computer and electronics-related manufacturing spending to reach only \$7.2 billion (Exhibit 68).

**Exhibit 68.** Excluding Lumpy Project Timing, We Are Unlikely to Repeat the 2012 Spending Buge Over the Next Decade

Computer/electronics manufacturing construction spending (left) relative to manufacturing output growth (right)



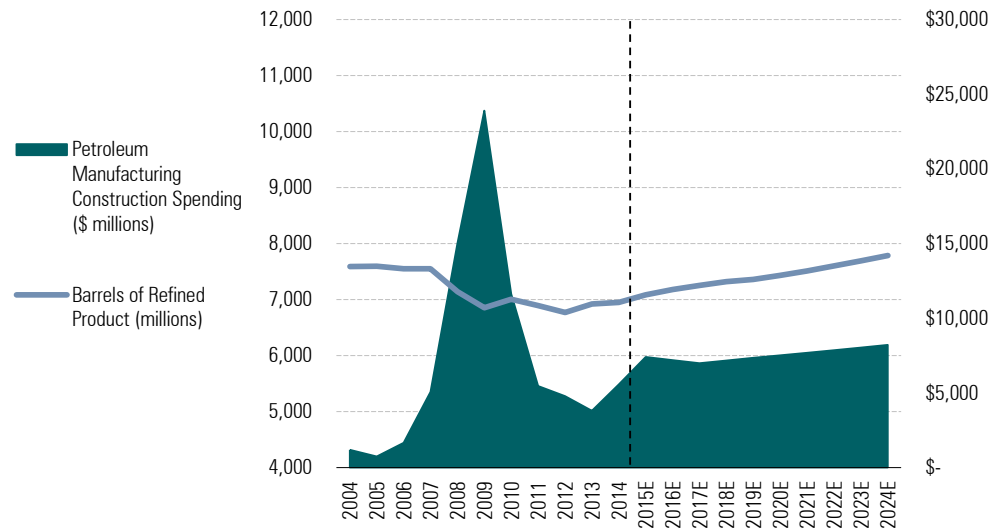
Source: Morningstar, U.S. Census Bureau, Federal Reserve

**Expect unspectacular growth from petroleum product manufacturing.**

Over the past decade, petroleum industry refined product growth has mirrored real GDP trends. Industry output has grown at a 1.5% rate relative to real GDP’s 1.6% growth rate. Over the past decade, petroleum manufacturing spending has grown at a 16.8% nominal growth rate through 2014. We believe this high growth rate is largely explained by the low spending level in 2004 that somewhat distorts measuring the prior 10 years’ growth rate (see Exhibit 6 for perspective on how lumpy spending is in this industry). We would also note that the industry’s lumpy spending was influenced by the 2005 Energy Policy Act and the 2007 Energy Independence and Security Act, which basically laid the path for 10% of U.S. gasoline production to be displaced by ethanol over a relatively short span of time and caused spending to spike from \$1.6 billion in 2004 to \$27.0 billion in 2009, before receding to a more normalized \$5.6 billion in 2014. Over the next decade we expect only 1.0% average industry output growth relative to 2.3% average annual real GDP growth. Our subdued outlook is largely related to a slow growth outlook in automobile production. As a reminder, our auto analysts are expecting only 1% growth in U.S. automobile sales, which should limit the demand outlook for refined petroleum products. In our outlook, we expect industry capital spending to grow at a 4.0% rate. While we expect an approximately 29% spending increase in the 2015–16 time period, we expect 2%–3% growth in our outlook through 2024, when total industry spending should reach \$8.2 billion on a nominal basis.

**Exhibit 69.** Excluding Any Major Changes in U.S. Energy Policy, We Do Not Expect the Industry to Repeat the 2005-2009 Spending Surge

Petroleum manufacturing construction spending (right axis) relative to U.S. production of refined crude products (left axis)



Source: Morningstar, U.S. EIA, U.S. Census Bureau

**Excluding chemical manufacturing, we remain reluctant believers in the reshoring thesis.**

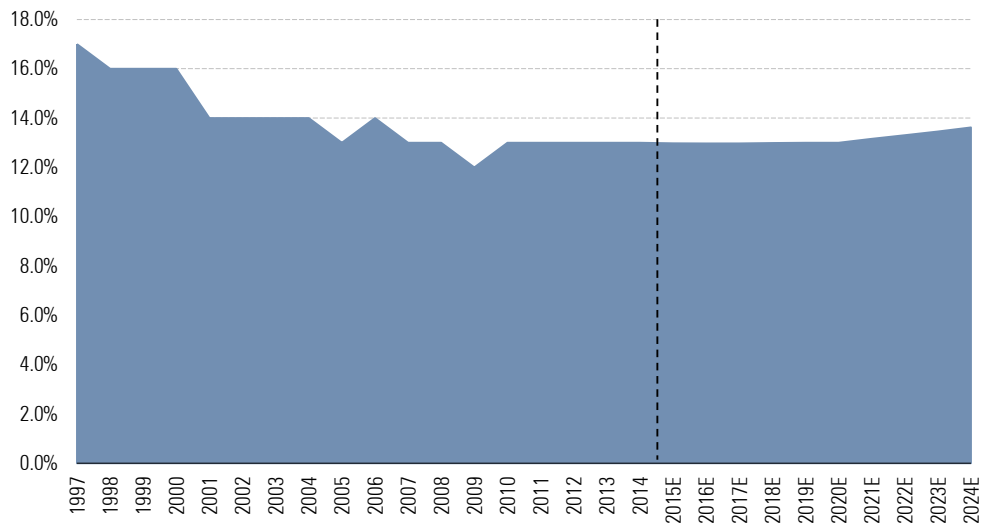
In our March 2014 Industrials Observer, we predicted that the reshoring trend was overblown.<sup>2</sup> The reshoring hypothesis was that China's soaring wages would erode its manufacturing cost-competitiveness and would substantially relocate production to the U.S. We refuted that hypothesis by noting that (1) there are multiple places around the globe that could match and beat China's low wages, though they couldn't beat its manufacturing and export infrastructure, and (2) more Mexican manufacturing and near-shoring were the most likely response to China's declining cost competitiveness. Our Mexican near-shoring hypothesis was based on the fact that Mexico's wages were lower than the United States, and that due to NAFTA, logistics costs were similar to producing in the United States. In our outlook we estimated that the decline in U.S. manufacturing-related activity experienced in years prior to 2009 would likely slow, but we did not expect a dramatic increase in U.S. manufacturing activity. In short, excluding highly skilled or rare tradesmen, we could never understand why a manufacturer would produce in the U.S. where according to the BLS wages and benefits average \$40/hour versus in Mexico, where they average \$6/hour.

One year after creating our prediction, our opinion is largely intact. Although we cannot do perfect causation analysis, U.S. and Mexican manufacturing growth trends seem consistent with our expectations. In 2014, U.S. manufacturing-related IP grew 2.2%, relative to 2.5% real GDP growth in the U.S. In contrast, Mexican manufacturing-related IP grew 1.8% relative to 0.5% real GDP growth. With the United States as Mexico's largest trading partner, we believe Mexican manufactured exports into

<sup>2</sup> As detailed in "Industrials Observer: The Nuts and Bolts of Industrial Distributor Moats," March 17, 2014, Morningstar.

the U.S. largely explain strong Mexican manufacturing relative to the country's GDP. One of the central premises of our March 2014 research work was that we expected Mexico to be the disproportionate beneficiary of formerly Chinese manufacturing that moved closer to North America. Although 2014's data points do not fully prove our thesis, we think they support our view.

**Exhibit 70.** After Many Years of U.S. Manufacturing's Declining Contribution to the Economy We Continue to Believe Growth Trends Can Keep Up With Broader GDP Growth Going Forward  
U.S. manufacturing output as a percentage of U.S. GDP



Source: Morningstar, World Bank



# Office: Multiple Headwinds Will Crimp Office Construction Spending

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**Sector Snapshot**

2014 PIP: \$44.6 billion  
 2004-2014 CAGR: 0.5%  
 2014-2024E CAGR: 3.0%

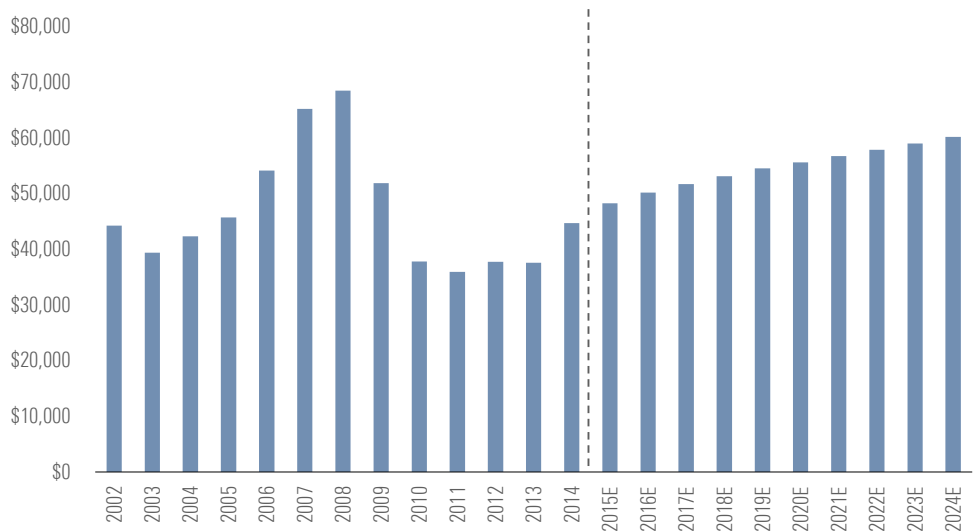
**2014 Sector Breakdown**

(percentages based on private spending)  
 General (administration buildings, computer centers, office buildings): 95%  
 Financial (banks, financial institutions): 5%

**Key Takeaways**

- ▶ We expect construction levels over the next 10 years to remain below the prior peak levels seen during 1999–2001 and 2007–2009, with future construction levels constrained by low growth in office-using employment, the shift toward telecommuting, and reductions in allocated space per worker.
- ▶ Despite reports suggesting the contrary, we estimate that office space per office worker has increased slightly over the past 24 years and is now at near-peak levels. Nonetheless, we expect pressure on this metric in coming years, which damps the prospects for future office construction.
- ▶ Near the end of our forecast, we expect office construction to mainly address depletion from wear-and-tear of existing office stock, with minimal incremental new construction, as the longer-term impact of office worker space densification largely offsets the impact of growth in office-using positions, at least for a time.

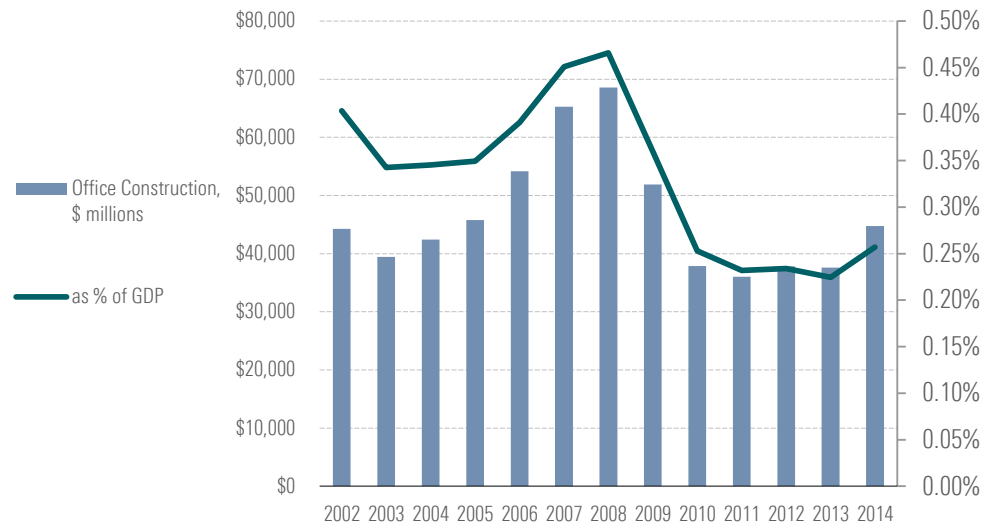
**Exhibit 71. Office Construction Will See Just Moderate Growth Over the Next Decade**  
 Construction put-in-place, in millions of current dollars



Source: U.S. Census Bureau, Morningstar

Office construction has ranged between 6.6% and 10.0% of total nonresidential construction spending since 2002, with an average of 8.4%. In 2014, office construction spending was below its historical average level based on percentage of nonresidential construction, at 7.4%, but it was near the average of raw dollar spending levels at roughly \$45 billion. Since 2009, office construction levels have remained near 0.25% of GDP, below their 0.33% average since 2002. We expect future construction levels to remain low relative to historical averages.

**Exhibit 72.** Office Construction Has Remained Below Historical Average Levels Since 2010  
Office construction spending in millions of dollars (left axis) and as a percentage of GDP (right axis)



Source: U.S. Census Bureau, Morningstar

Though office construction levels were robust through 2009, they have been muted since. We think they are likely to remain low relative to historical norms, due to expected continued slow growth in office-using employment, the relatively faster growth in full-time telecommuters, and potential for declines in office space allocated per worker, offset somewhat by construction costs that rise slightly faster than general inflation and a return to normalized office vacancy rates. As such, we expect overall office construction to remain at levels of GDP that are low relative to long-term historical averages and to contribute relatively less to our overall nonresidential construction forecast than it has historically.

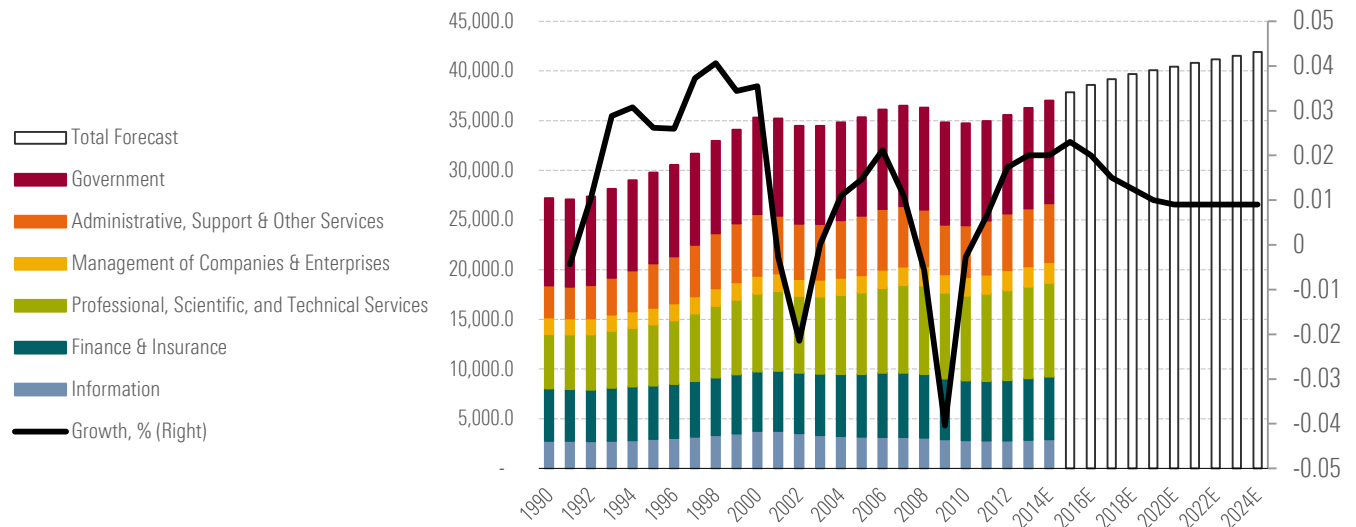
**Following a solid recovery since the downturn, growth in office-using employment will slow, presenting a headwind to office construction spending.**

We estimate the level of office-using employment by aggregating employment among categories most likely to require space within office structures, including the BLS industries of Information; Finance and Insurance; Professional, Scientific, and Technical Services; Management of Companies and Enterprises; a portion of Government (where we exclude workers that fall into other nonresidential construction areas, defense workers, and local and state government workers unlikely to require office space); and a

portion of Administrative and Support and Waste Management and Remediation Services. We estimate that there were roughly 37 million U.S. office-using employees in 2014.

**Exhibit 73. Office-Using Employment Has Expanded at a Robust Rate Since 2012, but We Expect Growth to Eventually Slow**

Historical and forecast levels (left axis) and growth of office-using employment



Source: Bureau of Labor Statistics, Wells Fargo, Morningstar

Although the rate of growth in office-using employment has been relatively robust lately, we think this is largely attributable to the recovery in office-using employment since the big decline experienced in the 2008–2010 time frame. Consequently, we expect growth to slow in future years to a rate over the medium term that is more in line with BLS expectations (of 0.9%<sup>3</sup>) and also near the expected future rate of population growth in general (of 0.8%<sup>4</sup>). The longer-term average annual rate of growth (back to 1990) in office-using employment is 1.3%, but this includes a number of earlier years of 3% or greater growth, a level not experienced for 13 years. Since 2002, the average annual rate of growth has been 0.6%. We expect office-using employment to continue growing at an elevated level for a while as the recovery in office-using employment extends a few more years before tapering off to a normalized level of growth of 0.9% by 2020. This low level of growth in the number of office-using workers suggests that the need for incremental office space will be similarly muted, all else equal.

**Continued adoption of full-time telecommuting will crimp future demand for office space.**

But, in our analysis, office-using employment is not the same as office-using positions, mainly due to workers who have jobs that require an office but work from home and do not require permanent space in an office building. The gap between office using employment and office-using positions is filled by full-time telecommuters.

<sup>3</sup> Bureau of Labor Statistics Current Employment Statistics survey.

<sup>4</sup> U.S. Census Bureau, Projections of the Population and Components of Change for the United States: 2015 to 2060, December 2014.

Working from home is becoming an increasingly important factor in determining ultimate demand for office space, even though its impact to date has been muted. We use data from the U.S. Census Bureau to estimate the number of workers holding traditional office-using jobs who do not require a permanent allocation of office space within an office building, which we call telecommuters. We estimate that there were 3.3 million such telecommuters in 2014, which is below reported figures from many other sources. Different sources' definition of telecommuters varies, but we attempt to estimate the impact of telecommuting on the need for physical office space within office buildings, so we focus on full-time telecommuters, whose main place of work is their home.<sup>5</sup>

To get to our estimate, we use data and disclosures from the U.S. Census Bureau, which asks workers how they got to work in the past week, with one of the answers being "worked at home." Furthermore, roughly half the workers that "worked at home" recently were self-employed, which we exclude from our calculations because they likely don't represent workers leaving traditional office settings. By our view, then, the number of telecommuters that no longer require dedicated space in office buildings was 2.9 million in 2010, the latest year consistent data are available. Moreover, we estimate the number at less than 2.1 million in 2000, for a net gain of roughly 830,000 workers to the work-at-home pool over that decade, which represents roughly 257 million square feet of space no longer needed in the office stock. This amounts to a 5% headwind to square feet under construction per year, or roughly \$2.7 billion of potential construction per year. By our view, telecommuting to date appears to have had a small, negative impact on office construction.

On a go-forward basis, however, we estimate that the impact of telecommuters will be more meaningful. If we project that the number of telecommuters continues to grow at an annual rate of 3.4% (the rate from the 2000s), potential space displaced totals 423 million square feet across our forecast and potential construction dollars displaced total \$51 billion, representing a drag of 8%–11% of office construction spending per year.

---

**Exhibit 74.** Muted to Date, We Expect Telecommuting to Have a Growing Impact on Office Construction  
Estimated impact of telecommuting on office space markets and construction spending

	<b>2000s</b>	<b>2015-2024E</b>
Total Estimated Square Feet Displaced, Millions	256.6	422.8
Foregone Office Construction Spending, Aggregate, \$ Billions	26.6	51.3
Average Annual Foregone Office Construction Spending, \$ Billions	2.7	5.1
Drag on Office Construction Spending	~5%	8%-11%

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Source: U.S. Census Bureau, Morningstar

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<sup>5</sup> Note that our definition of telecommuters is different from many others' use of the term. In our research, we came across many references to telecommuters that included workers who worked from home just one day per week or even one day per month. Although some refer to these workers as telecommuters, we do not count them as telecommuters in our estimates because they likely have permanent allocations of office space in office buildings, because they work from home only occasionally. For our purposes, we estimate telecommuters as the number of workers whose normal place of work is the home, not the office, and who therefore do not require a permanent allocation of dedicated space within an office building.

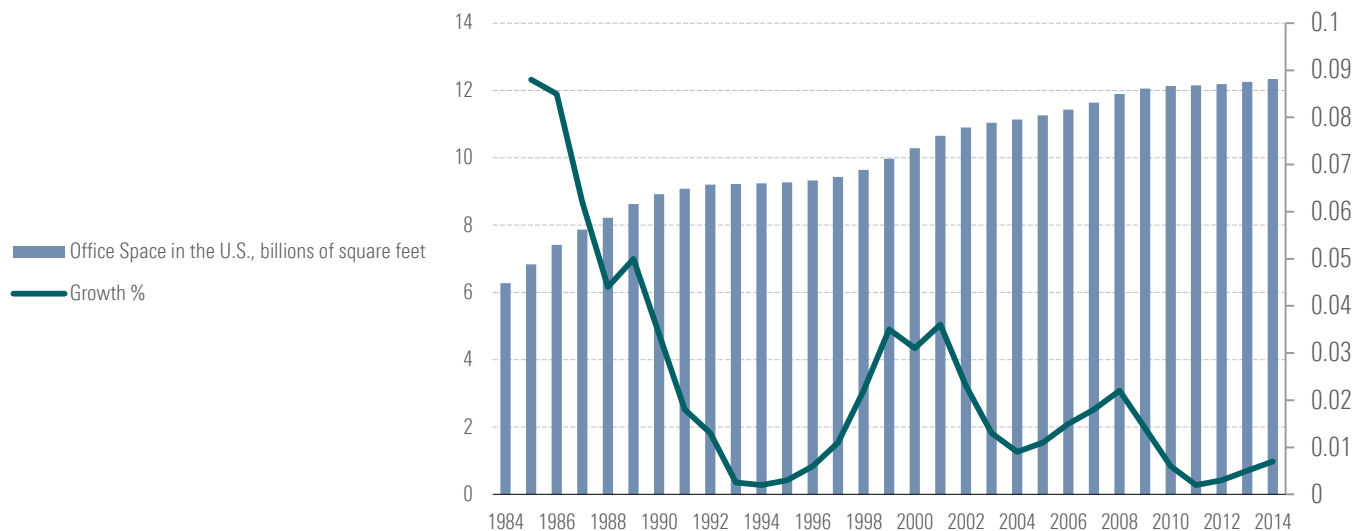
**Surprisingly, office space per worker has risen historically, but future declines are likely, which presents another headwind to office construction.**

From our overall assessment of office-using employment, we deduct our estimate of telecommuters, which leaves us with workers holding office-using jobs that also require a permanent allocation of office space, which we call office-using positions. While overall office-using employment has increased at an average rate of 0.35% per year since 2000, our estimate of office-using positions has increased at just 0.1% per year, reflecting the relatively faster growth of work-from-home employees within traditional office-using employment categories.

To develop our view of the amount of square feet per worker, we use office data from CoStar,<sup>6</sup> which incorporates a broader view of office space than many other estimates we’ve seen, the latter of which tend to focus only on top markets or top properties. In 2014, there was an estimated 12.3 million square feet of office space in the U.S., up from 6.3 million in 1984, representing an average rate of growth in stock of 2.3% annually. The headiest rates of growth are far in the past, however, and the average rate of expansion since 2002 has been half the long-term rate.

**Exhibit 75.** Total Square Feet of Office Space Has Been on a Steady Rise, With Slower Rates of Growth Recently

Total square feet of office space (left axis) and annual growth (right axis)



Source: CoStar, University of San Diego and Norman Miller, PhD, Morningstar

Lately, we observe a mismatch between growth in office-using positions<sup>7</sup> and growth in square feet of office stock. Employees in office-using positions have barely increased since 2000, while the office stock footprint has increased by roughly 20%. Consequently, office space per worker has been on the rise and is at near peak levels of 326 square feet. We conclude that office developers were slow to react to both

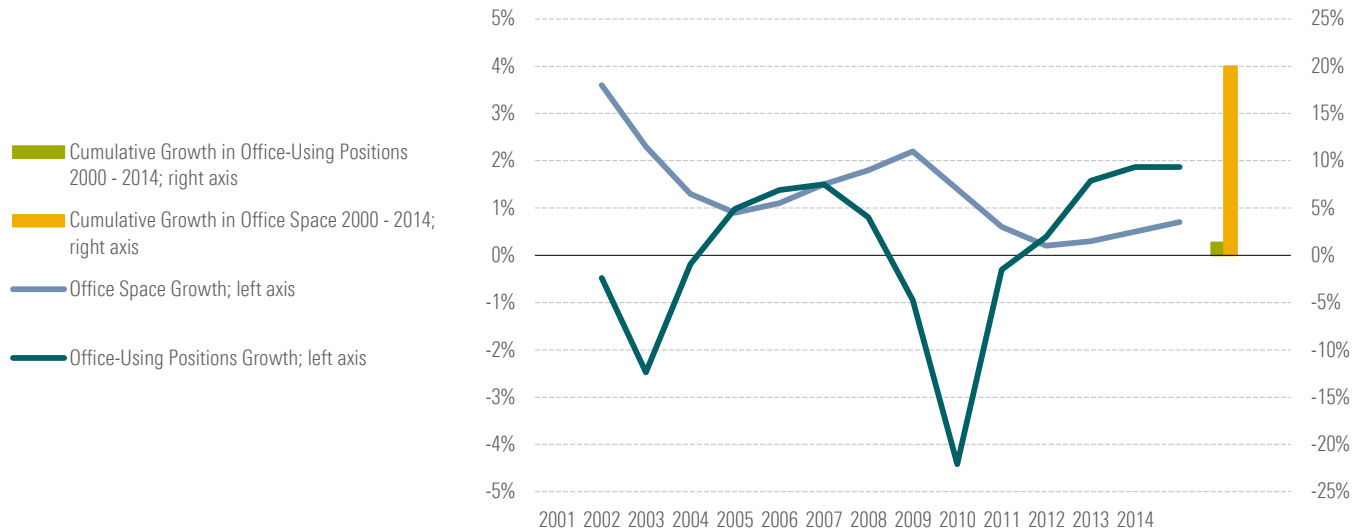
<sup>6</sup> Florance, Andrew, Norm Miller, Jay Spivey, and Ruijue Peng of CoStar Group. "Slicing, Dicing, and Scoping the Size of the U.S. Commercial Real Estate Market." Draft: April 26, 2010. Also see Miller, Norm, "Estimating Office Space per Worker." Draft: May 1, 2012.

<sup>7</sup> We estimate office-using positions as office-using employment less full-time telecommuters.

the reduced prospects for growth in office-using employment as the economy soured as well as the adverse impact of telecommuters on the need for incremental office space.

**Exhibit 76.** Growth in Office Stock Has Recently Outpaced Growth In Office-Using Positions

Annual (left axis) and cumulative (right axis) growth in office-using positions and office space



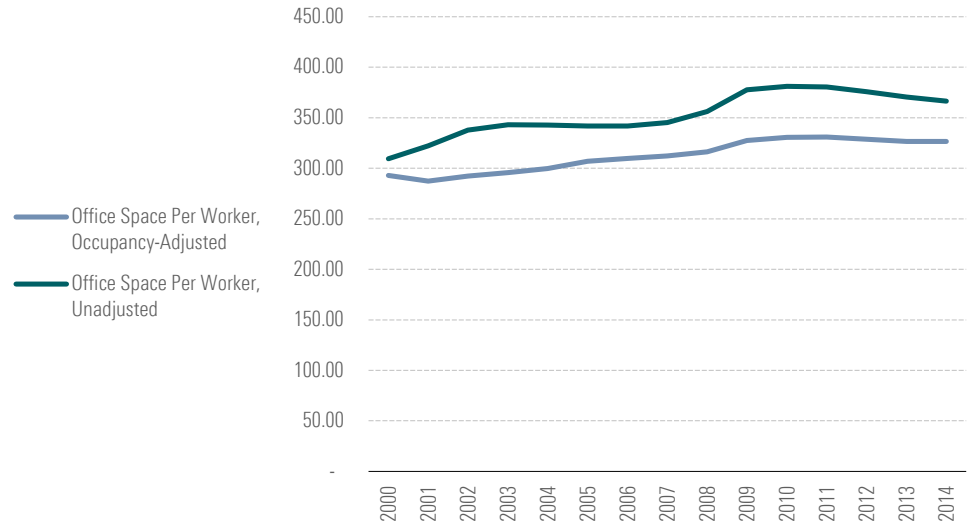
Source: U.S. Department of Commerce, Bureau of the Census, St. Louis Federal Reserve, CoStar, University of San Diego and Norman Miller, PhD, Morningstar

Combining our take on office-using positions with the size of the office market, we can evaluate the amount of space per worker over time. As shown in Exhibit F, our data suggest that the amount of office space per worker has largely been on a slow, steady upward trajectory since 2000. This general finding is corroborated by a University of San Diego study.<sup>8</sup> Nonetheless, this view is contrary to many recent press reports and surveys that suggest that office space per worker is decreasing.

<sup>8</sup> University of San Diego study, "Estimating Office Space per Worker," Draft: May 1, 2012, by Norman Miller, PhD.

**Exhibit 77. Office Space per Worker Is Near All-Time Highs**

Estimated levels of office space allocated per worker



Source: U.S. Department of Commerce, Bureau of the Census, St. Louis Federal Reserve, CoStar, University of San Diego and Norman Miller, PhD, Morningstar

While there are certainly examples of individual companies reducing space per employee, there may be other factors that counter this trend at the aggregate level. While telecommuting is on the rise, telecommuters often nonetheless have space to use when visiting the office, and some companies (most notably Yahoo!, for example) have reined in telecommuting arrangements. So too might companies plan space for travelling colleagues visiting from other cities. And while dedicated office space per worker may be under pressure, companies also generally plan open space and common areas for more casual interactions among employees. Additionally, in an expanding economy, companies often plan for future office space requirements to accommodate expected future hiring, which inflates space per current office worker. Furthermore, some of the research on office space per worker reflects the space plans of tenants related to future leases, which would not yet be reflected in current numbers.

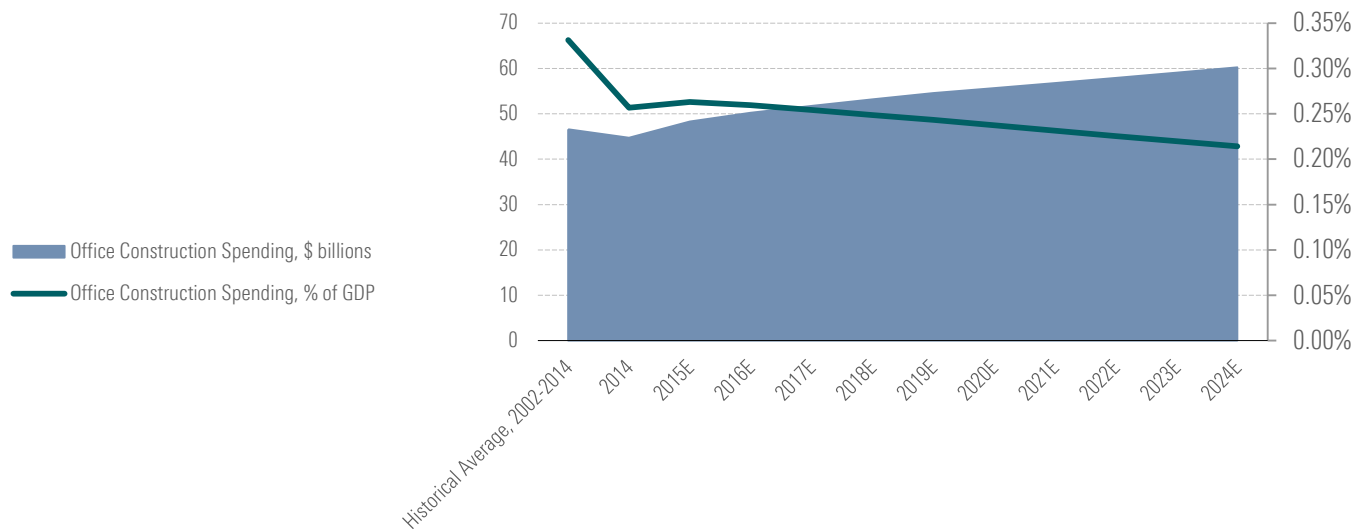
Nonetheless, we think a trend toward office worker space densification is coming. Organizations have generally become increasingly open to flexible work situations over the years, with an increase in telecommuting or job-sharing arrangements. Technology advances reduce the size of the footprint needed for computers, and mobile devices allow workers to accomplish a lot of work away from their computers. As the workforce composition shifts toward younger workers, who are generally comfortable with technology and mobile computing, newer concepts such as hoteling and shared workspaces may gain acceptance. Technology can also be used to monitor space utilization, highlighting for organizations how space utilization can be improved. Some jobs which previously required office space are being pushed to other types of real estate (think about call center functions being farmed out to individuals working from home, with technology managing inbound calls). And firms continue to look at real estate as a potential source of cost savings for the enterprise. We think these trends support a case that office worker space densification is coming despite the fact that it has not shown up in the data to date. But

we think it will be less pronounced and will occur over a longer time frame than many others think. The bottom line is that the potential for the recent trend in increased allocated office space per worker to reverse represents another headwind to office construction spending.

**Our forecast for office construction suggests growth below overall GDP growth, at least for a while.**

Partly offsetting the potential negative impact of the aforementioned factors on future levels of office construction spending is the potential for faster-than-inflationary levels of growth in the cost of office construction (due to green building initiatives<sup>9</sup>) and a return to higher, normalized levels of vacancy in office stock. Nonetheless, these countering factors have a minimal impact on our overall view that future levels of office construction will remain below historical levels as a percentage of GDP, due to the headwinds from lower growth in office-using employment, the increasing importance of full-time telecommuters, and potential for smaller allocations of space per worker.

**Exhibit 78.** We Expect Office Construction Spending to Remain Below Historical Levels as a Percentage of GDP, Due to a Variety of Headwinds  
Office construction spending in billions of dollars (left axis) and as a percentage of GDP (right axis)



Source: U.S. Census Bureau, IMF, Morningstar

<sup>9</sup> In our research, we came across a number of sources looking at the incremental cost associated with green construction. While some estimates suggested a cost premium as high as 15%, we think the average incremental direct construction costs are lower, representing an overall direct construction cost premium in the low-single-digit range.



# Water Supply, Wastewater, and Conservation: Spending Accelerates to Replace Crumbling Pipes

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### Sector Snapshot

*Water Supply*  
 2014 PIP: \$12.9 billion  
 2004-2014 CAGR: 0.3%  
 2014-2024E CAGR: 6.1%

*Sewage and Waste*  
 2014 PIP: \$22.7 billion  
 2004-2014 CAGR: 2.4%  
 2014-2024E CAGR: 4.7%

*Conservation*  
 2014 PIP: \$7.5 billion  
 2004-2014 CAGR: 6.4%  
 2014-2024E CAGR: 3.2%

### 2014 Sector Breakdown

(percentages based on state and local spending)

#### Water Supply

Plant: 34%  
 Line: 45%  
 Other (well, pump station, reservoir, tank tower): 21%

#### Sewage and Waste

Sewage/Dry Waste: 57%  
 Waste Water: 43%

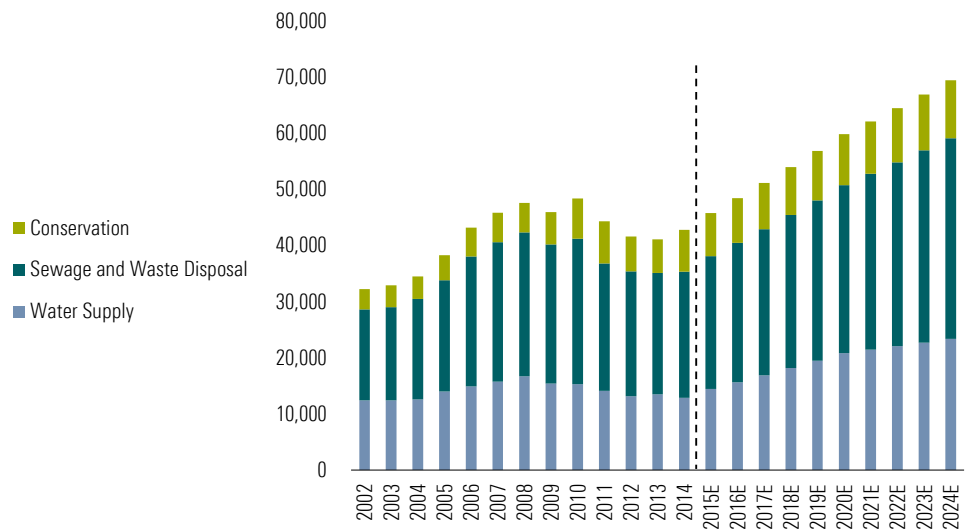
#### Conservation

Dam/Levee: 35%  
 Breakwater/Jetty: 37%  
 Other (dredging, etc.): 28%

### Key Takeaways

- ▶ We estimate that water infrastructure spending will need to increase 5% annually from \$35 billion in 2014 to \$60 billion by 2024 to replace old pipes operating beyond design and to accommodate population growth and migration, though lower water usage per person is an offset.
- ▶ Many of the pipes that funnel water into and out of our homes are nearing 100 years old, the end of their usable lives. They are reaching the point when unscheduled maintenance and emergency repairs are more costly than replacing pipe itself.
- ▶ A growing population needs more pipes and plants. This is augmented by migration, as people continue to move from small, rural communities to larger urban and suburban water systems.
- ▶ People are becoming more efficient with their water use. Water use per person has decreased since 1990, and we project that it will continue to decline with greater use of water-efficient appliances.
- ▶ Conservation spending needs to increase to repair deficient, high-hazard dams.

**Exhibit 79.** Robust Growth in Water Construction Is Needed to Address Aging Systems  
 Construction put-in-place, in millions of current dollars

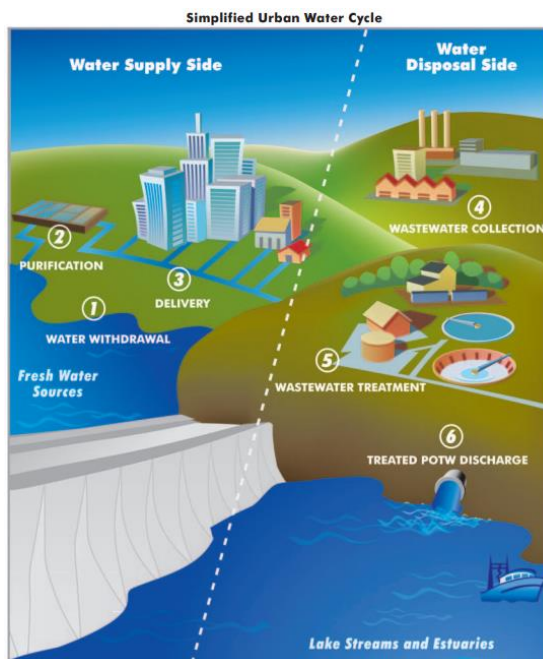


Source: U.S. Census Bureau, Morningstar

**Water in...water out: Our drinking water system is combined with our wastewater system.**

The vast majority of Americans (>90%) live in areas with combined water systems that provide clean drinking water into homes (water supply), and collect water exiting the home in the form of wastewater and sewage. Because water supply and wastewater are built in integrated systems, we combine our analysis of construction spending for these categories.

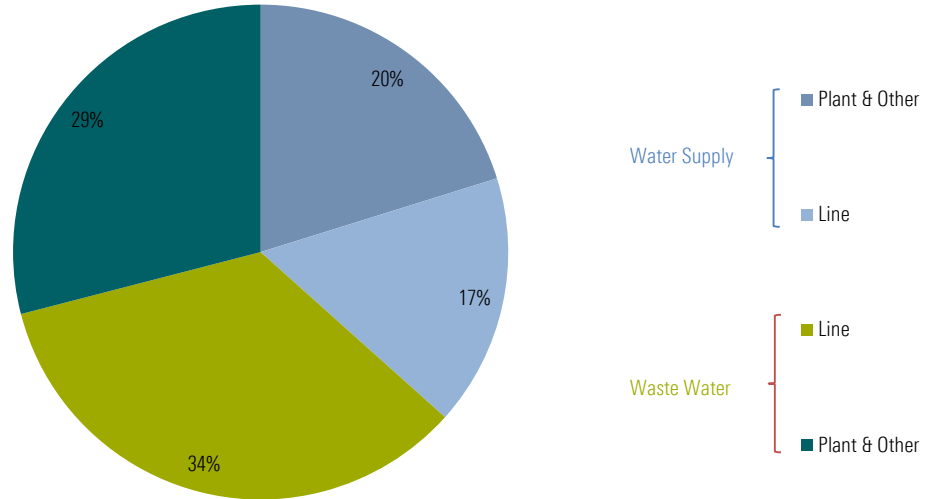
**Exhibit 80.** Urban Water Cycle



Source: U.S. Environmental Protection Agency

Water supply infrastructure is composed mainly of water treatment plants and pipelines. These systems are operated by water utilities and funded by local residents. State and local governments also play a role in capital investments, which are spent on plants and lines, including transmission and distribution pipes. Wastewater makes up more of the spending because it needs to accommodate storm water and treat more harmful discharge. We estimate that water transmission and distribution lines make up about half of all investment spending, a notable figure because it is the line infrastructure in water systems that has deteriorated the most.

**Exhibit 81. Lines Need Replacing and Make Up Half of Spending**  
Water supply spending breakdown (%)

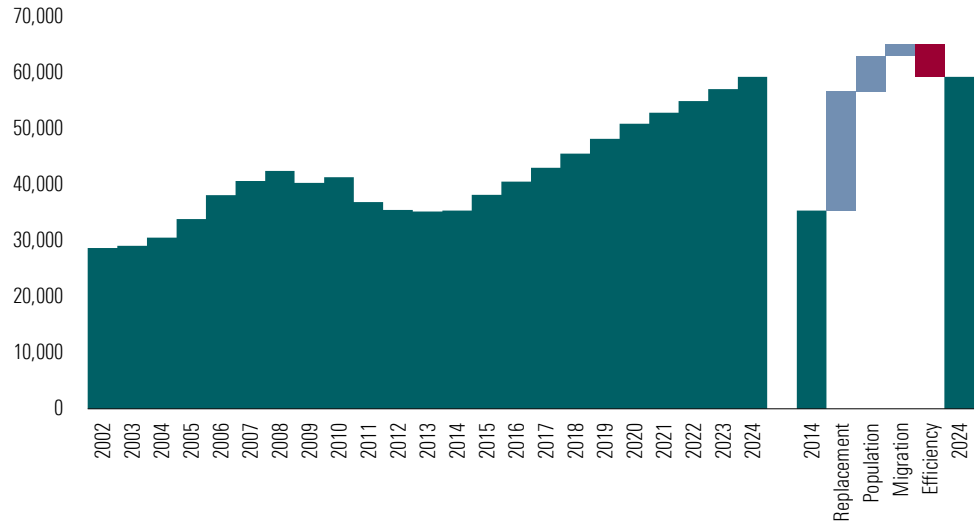


Source: U.S. Census Bureau, Morningstar

**Investments need to rise above ground.**

The state of the water supply infrastructure is poor, but this is tough to see when the pipes lie below ground. We believe there will be two primary trends in water supply construction: growth and replacement. Replacement plays the bigger role. Following significant underinvestment in past decades, we now need to replace about a quarter of the 2.3 million miles of pipes in the next decade as they reach the end of their useful life. Investments also need to account for population growth and migration. These factors are somewhat offset by lower water consumption per person. We think water infrastructure spending will need to increase 5.3% annually, driven by 6.1% annual growth in water supply spending and 4.8% annual growth in sewage and waste disposal spending.

**Exhibit 82.** Growth and Replacement Drive Higher Spending; Fixing Old Pipes Is the Key  
 Water supply construction spending waterfall in millions of current dollars



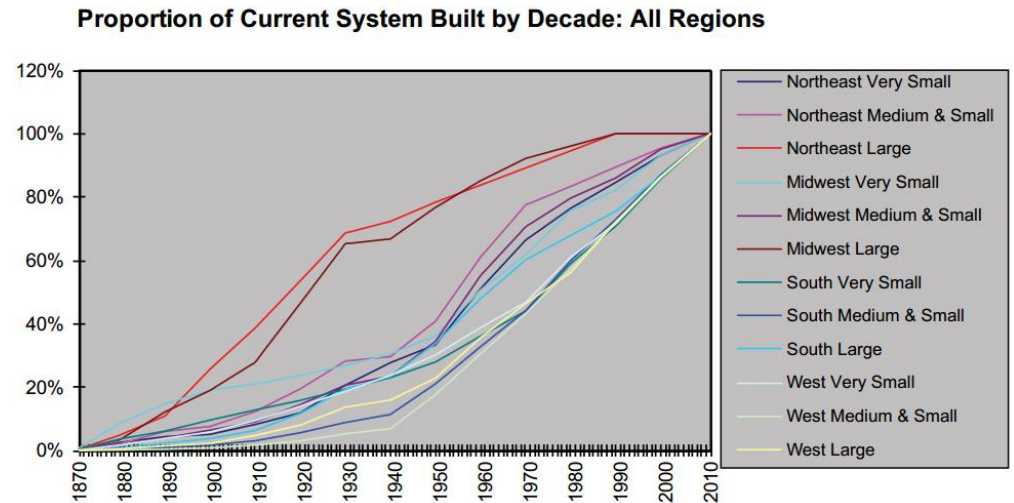
Source: U.S. Census Bureau, U.S. Environmental Protection Agency, U.S. Geological Survey, United Nations Food and Agricultural Association, Morningstar

**Old pipes need replacing.**

By and large, the bulk of the current water systems were built in two phases. The large systems in the Northeast and Midwest saw tremendous growth from 1900 to 1930, by which time about 70% of the current system had been built. By our estimates, a significant portion of the Northeast and Midwest system pipes are in need of replacement. They are primarily made of steel, cast iron, and reinforced concrete, which have useful lives of around 100 years,<sup>10</sup> suggesting that much of the replacement should occur by 2030. The American Water Works Association defines useful life as when replacement or rehab becomes less expensive than the cost of unscheduled breaks and emergency repairs. Due to these economic considerations, we believe water utilities will take the necessary steps to begin replacing outdated pipes. Most of these pipes have not yet been replaced. Based on a 2006 EPA study (the latest one available), less than 3% of the miles of pipes had been replaced from 2000 to 2005. We believe that little replacement has been done from 2008 to 2014 due to declining spending per system, given tight state and local budgets. While a portion of the capital expenditures are funded by utility rate hikes, federal funding assistance is required for large-scale projects. We believe most of the work will need to come over the next decade.

<sup>10</sup> We take the average of American Water Works Association estimates of 70–130 years.

**Exhibit 83.** Most of Northeast and Midwest Pipes Are Too Old  
 Proportion of current system built by decade

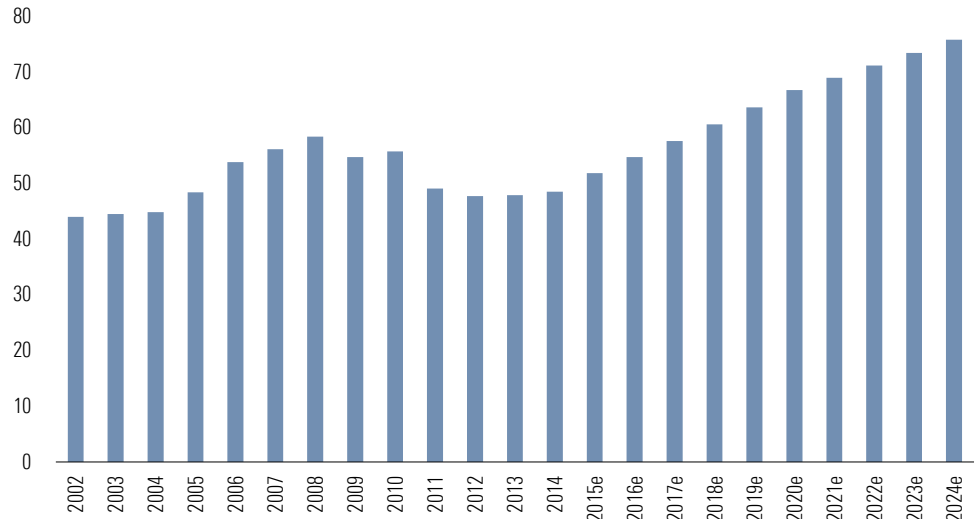


Source: U.S. Census Bureau, U.S. Environmental Protection Agency, U.S. Geological Survey, United Nations Food and Agricultural Association, Morningstar

Over the past decade, spending per system has ranged between \$40 million and \$60 million per year. We saw a significant increase from 2004 to 2008 due to the housing boom as new suburban developments required new water systems. This sharply fell off from 2009 to 2014 as state and local government funding dried up and put off spending for later. We estimate that normalized levels near \$58 million per system (in 2014 dollars<sup>11</sup>) will be required to account for the work that has been put off for decades and believe much of the funding for these fixes will come from the Clean Water Act State Revolving Fund and Drinking Water State Revolving Fund.

<sup>11</sup> We expect this to grow nominally at 2.25% inflation.

**Exhibit 84.** Replacement of Old Pipes Drives Increase in Spending per System  
Water construction spending per system in millions of current dollars



Source: U.S. Census Bureau, U.S. Environmental Protection Agency, U.S. Geological Survey, Morningstar

#### **Migration amplifies spending growth from population increases.**

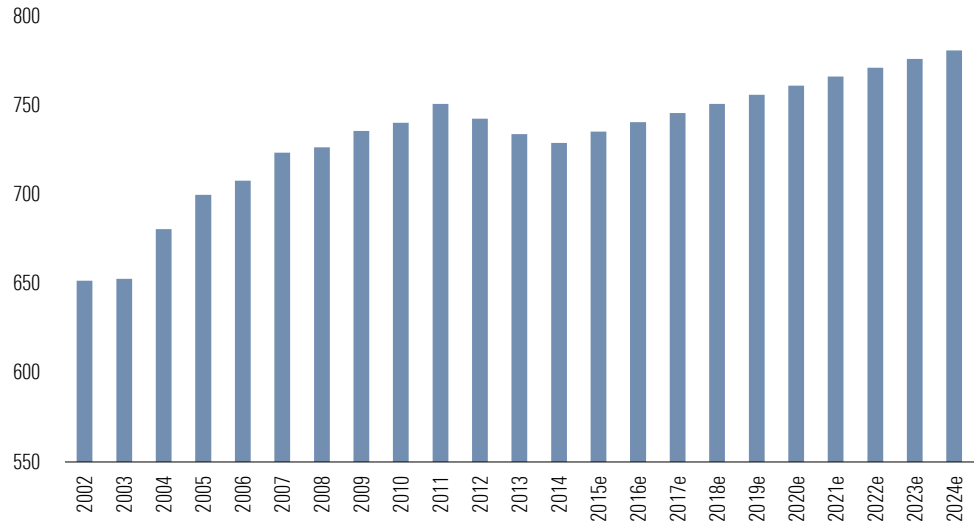
We estimate that growth will be driven by population increases, offset by water usage efficiency. We believe that there is significant "catch-up" required, as spending fell to its lowest levels from 2010 to 2013 as the U.S. population grew by 15 million over the same time span.

We believe continued migration means that the population served by the large systems will continue to grow faster than the overall population. We use the Census Bureau's forecast for population (0.7% CAGR to 345 million people through 2024). Furthermore, people are migrating from small towns to larger cities, with the urban population increasing from 80% in 2002 to 83% in 2014. At the same time, the number of people served by large systems has increased from 75% to 79%. The United Nations projects that the U.S. urban population will increase further to 85% of the population by 2024, and we project a similar growth rate in the population served by urban water systems.

Going forward, the U.S. Census estimates that the population will grow by a further 10 million people by 2024. Combined with a greater mix shift of people joining the large systems, we estimate that five new large systems will be required each year at a cost of about \$3 billion dollars.<sup>12</sup>

<sup>12</sup> 52 new systems from 2014 to 2024 at about \$50 million–\$60 million each.

**Exhibit 85. More Systems Are Needed to Accommodate Population Growth and Migration**  
 Number of large water systems<sup>13</sup>



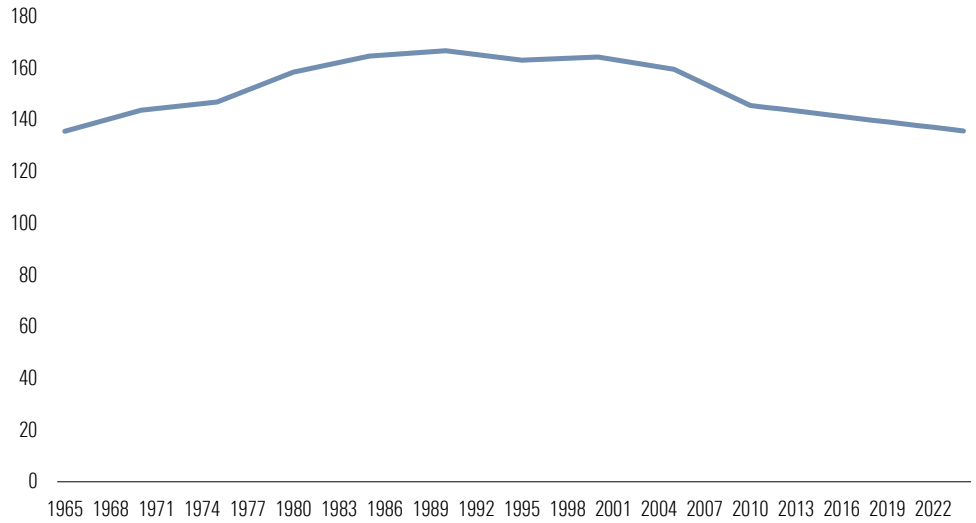
Source: U.S. Census Bureau, U.S. Environmental Protection Agency, U.S. Geological Survey, Morningstar

**More efficient water use is an offset.**

Water consumption per person increased steadily from 1950 to 1990, which we attribute to increased use of water-intensive appliances, such as washing machines, showers, and toilets, as well as increased landscape irrigation. Since the 1990s, greater public awareness of water conservation and use of efficient appliances have led water consumption to decrease to levels not seen since 1975. These factors are augmented by decreased in water leaks in homes, as well as improvements in water supply systems' efficiency. Going forward, we believe that efficiency will continue on the consumer end, though at a rate of change slower than before, as many of the efficiencies have probably already been realized.

<sup>13</sup> 300,000 people equivalent system.

**Exhibit 86.** Americans Will Continue to Improve Efficiency in Water Consumption  
 Public supply per person, gallons/capita/day (includes self-supplied domestic)



Source: U.S. Geological Survey, Morningstar

**Conservation: Build them up and dam it.**

Conservation makes up just 17% of water infrastructure spending. The state of our dams (which make up most of conservation) is not good. Deficient, high-hazard dams<sup>14</sup> made up 2,000 of the 84,000 dams in the country. We estimate that conservation spending will need to grow at 3.25% annually from \$7 billion in 2014 to \$10 billion in 2024 to mitigate these potential issues.

<sup>14</sup> Deficient dams have a greater likelihood of failing. High-hazard dams are dams that are anticipated to cause loss of life should the dam fail.



# Transportation: Rail and Mass Transit Will Be the Key Growth Drivers for Construction Spending

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**Sector Snapshot**

2014 PIP: \$41.9 billion  
 2004-2014 CAGR: 5.3%  
 2014-2024E CAGR: 4.1%

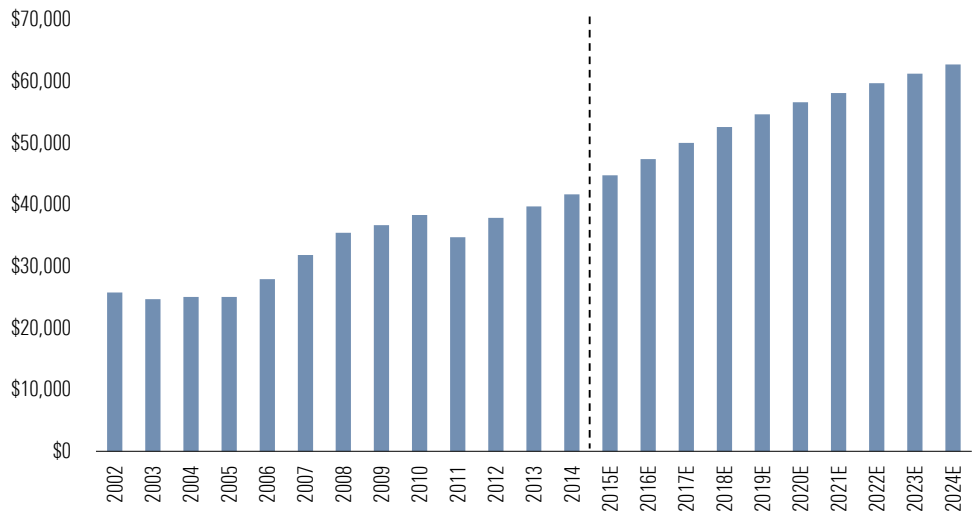
**2014 Sector Breakdown**

(percentages based on state and local spending)  
 Air (terminal, runway): 39%  
 Land (terminal, mass transit, railroad): 55%  
 Water (terminal, dock, marina): 7%

**Key Takeaways**

- ▶ We forecast that transportation construction spending will grow at an average 4% annual rate through 2024 to \$62.8 billion, a modest deceleration from last decade's 5% growth rate.
- ▶ Growth in transportation construction tends to lag U.S. GDP growth by roughly two years, which portends above-trend spending growth in the near term.
- ▶ Due to urbanization trends, railroad and mass transit projects will be the key growth drivers for construction spending over the next decade.

**Exhibit 87.** Railroad and Mass Transit Projects Will Drive Continued Growth in Transportation Construction  
 Construction put-in-place, in millions of current dollars



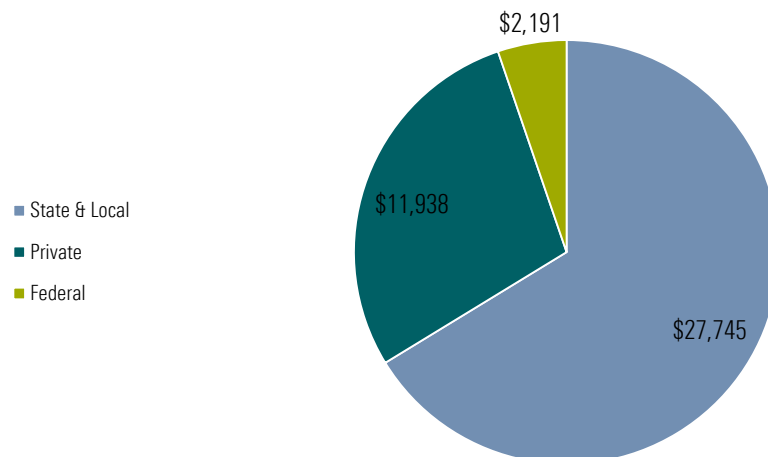
Source: U.S. Census Bureau, Morningstar

**The transportation segment has been a source of steady growth for the overall nonresidential construction market.**

Transportation spending accounted for \$41.9 billion, or 7%, of the total U.S. nonresidential construction spend in 2014, having increased at a 5.3% CAGR over the previous decade. The key drivers of transportation-related construction activity are the construction and maintenance of railroads, airports, and mass transit systems. Combined, projects associated with these three classifications contribute roughly 70% of the total construction spend for the transportation segment.

Regarding the sources of capital, 66% of the total U.S. construction spend within this segment was funded at the state and local level in 2014. Twenty-nine percent of the total expenditure was funded by private institutions and only 5% was funded at the federal level. This split has been effectively unchanged over the past decade and is unlikely to change materially in the decade to come. State and local spending stems largely from the construction and maintenance of airports and mass transit systems. Private spending is almost exclusively associated with railroad capacity expansions and maintenance while federal spending, the smallest piece of the pie, flows into projects for all major transportation modes. It is important to note, however, that some of the funding from the state and local bucket is actually derived from the federal government's coffers. The mass transit account of the Highway Trust Fund receives 16% of U.S. gasoline tax revenue, and the federal government transfers this capital to the state and local level in the form of grants. Exhibit 88 reflects each classification's spend, but with regard to the sources of funding, federal contributions are higher than the federal spend shown.

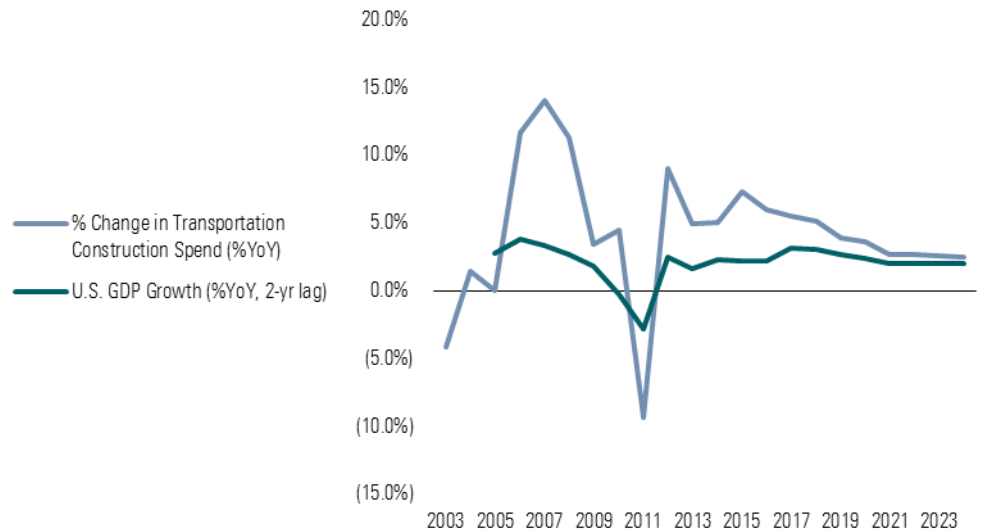
**Exhibit 88.** The Majority of Transportation Construction Spending Is Funded at the State and Local Level  
2014 construction spending by source



**We expect funding for the transportation segment to grow at a 4.2% annual rate over the next decade.**

To forecast the trajectory of U.S. construction expenditures for the transportation segment, we apply unique annual growth forecasts based on our long-term outlook for each method of transportation. Overall, the transportation-related construction spend tends to track U.S. economic growth with roughly a two-year lag due to the time required to obtain funding and complete planning before actual construction activity takes place. Accordingly, the only years during which transportation construction expenditures declined since the turn of the century were 2003 and 2011. Construction expenditures for the transportation segment declined 4.2% in 2003, after GDP growth had briefly dipped below zero in the first and third quarters of 2001. Construction expenditures for the transportation segment declined by 9.4% in 2011 after a recessionary environment took hold in 2008 and 2009. Consistent with this theme, transportation construction spending still grew at a 6.4% average annual rate from 2008 to 2010 amid adverse GDP growth. On the other side of the coin, above-trend GDP growth from 2004 to 2006 drove robust construction expenditures that grew by over 10% each year from 2006 to 2008.

**Exhibit 89.** Transportation Construction Spending Lags U.S. GDP Growth by Roughly Two Years  
 Transportation construction spending and GDP growth



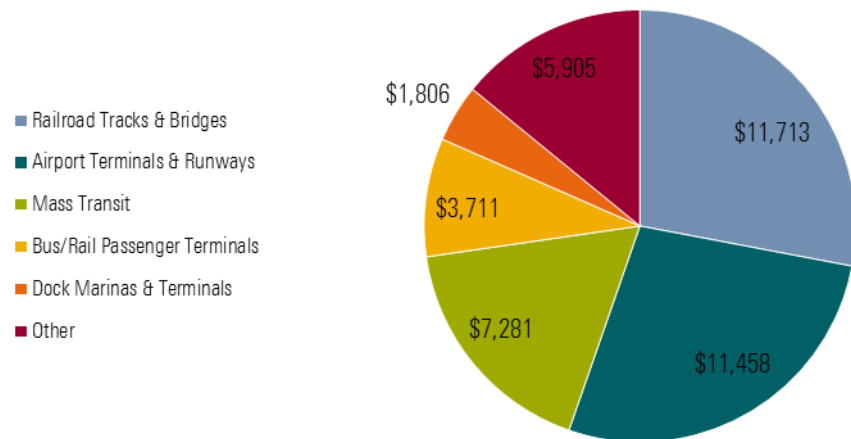
Source: U.S. Census Bureau, Morningstar

Given IMF forecasts for U.S. GDP growth modestly above the historical trend in 2015, 2016, and 2017, we expect a larger share of the incremental construction spend for transportation to be realized in the first five years of our 10-year explicit forecast period. From 2015 to 2019, we anticipate that expenditure growth will average a 5.5% annual rate before slowing to an average 2.6% annual rate from 2020 to 2024. We anticipate that the growth rate associated with U.S. transportation construction expenditures will peak at a 6.9% annual rate in 2015 before gradually decelerating toward the GDP growth trend line. In total, we forecast the total transportation construction spend to grow at 4.2% over the next decade to \$62.8 billion from \$41.7 billion.

**We expect land projects to capture a growing share of the total transportation construction spend over the next decade.**

Per Exhibit 90, the construction of tracks and bridges for railroads accounted for the largest share of total U.S. transportation construction spend in 2014, narrowly edging out expenditures associated with airport terminals and runways.

**Exhibit 90.** Railroad Investments Account for the Largest Share of Transportation Construction Spending  
Share of 2014 transportation construction spending



Source: U.S. Census Bureau, Morningstar

In total, the U.S. railroad system consists of over 140,000 rail miles operated by seven Class I railroads, 21 regional railroads, and 510 local railroads. Eighty-six percent of the total spend on railroad construction is privately funded, as U.S. railroad operators are largely responsible for their own maintenance and improvement projects. Although passenger service once played a vital role in railroad usage, its role is now very limited, as freight shipments are the key driver of track and bridge construction and maintenance for railroads. The rail network transports roughly 40% of U.S. freight shipments by ton-miles and 16% by raw tonnage.<sup>15</sup> A capital-intensive industry that reinvests at five times the rate of the average manufacturer,<sup>16</sup> U.S. freight railroads spent \$13.1 billion on growth projects in 2013 and \$8.9 billion on maintenance alone. These figures include spending on the construction of rail, ties, switches, positive train control systems, ballast, and intermodal yards. Profits are a key driver of capacity increases, and due to strong earnings in recent years, railroads have been spending more on maintenance and growth projects than ever before.

The Federal Highway Administration estimates that total U.S. freight shipments will rise roughly 40% over the next three decades. Railroads will likely constitute the most cost-effective mode of

<sup>15</sup> U.S. Department of Transportation Federal Railroad Administration.

<sup>16</sup> Association of American Railroads.

transportation to meet these demands, particularly given urbanization trends that require high volumes of bulk goods to be transported long distances to major civic centers. The total spend will be boosted over the medium term as mandatory positive train control, or PTC, technologies are deployed. These technologies are designed to automatically stop or slow a train before accidents occur and were mandated by Congress in the Rail Safety Improvement Act of 2008 (RSIA). As of mid-2014, railroads had already spent \$4.5 billion on PTC development, roughly half of the expected total.<sup>17</sup> Although much of the initial spend will fall under capital expenditures for operation rather than construction, PTC deployment will likely require higher maintenance expenditures going forward.

Overall, the demands of increasing urbanization on currently installed rail capacity will be partially offset by slowing population growth. Even so, railroads will retain an attractive value proposition for the movement of raw materials and heavy freight over long distances. With these factors in mind, we forecast that private railroad construction spend will increase at a 5.4% CAGR over the next decade, just below the 6.4% CAGR observed since 2004. In large part, this forecast is predicated on our view that Class I railroad companies' capital expenditures as a percentage of revenue will remain in the historical 17%–18% range.

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**Exhibit 91.** Land Projects Account for the Majority of the Total Transportation Construction Spend

Transportation Method	% of 2014 Spend	Classification
Land	62.1%	Passenger Terminal - bus & railroad
		Mass Transit - light rail, monorail, streetcar, subway
		Railroad - tracks & bridges
Air	27.4%	Passenger Terminal - airports
		Runway - pavement & lighting
Water	4.3%	Dock/Marina - docks, piers, wharves, marinas
		Dry Dock/Marine Terminal - boatels & maritime freight terminals
Other	6.2%	Largely federal funding that is not classified

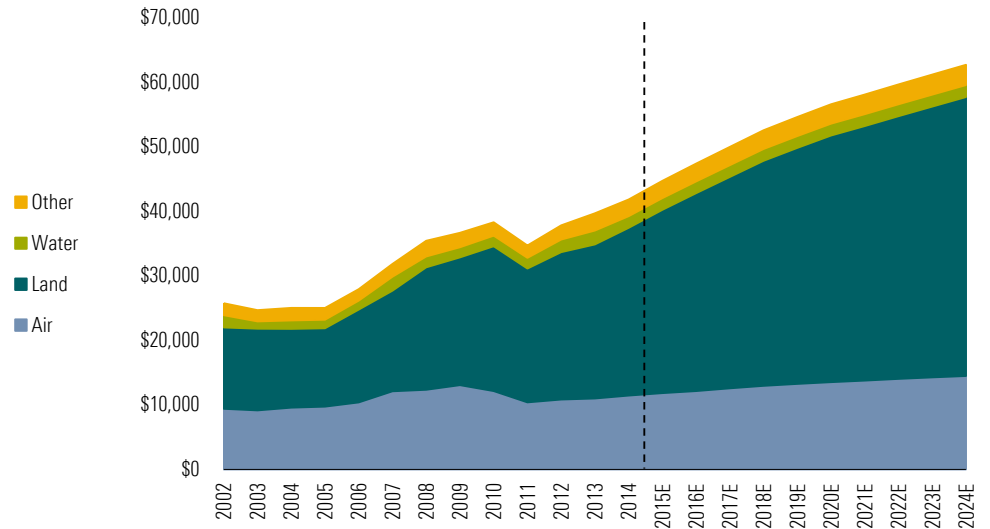
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Source: U.S. Census Bureau, IMF, Morningstar

<sup>17</sup> Association of American Railroads.

**Exhibit 92.** We Expect Land Projects to Capture a Growing Share of Transportation Construction Over the Next Decade

Transportation construction spending in millions of current dollars



Source: U.S. Census Bureau, Morningstar

The construction and maintenance of airport terminals and runways is also a key driver of transportation-related construction expenditures. Since 2002, commercial aircraft departures have increased at only a 0.1% CAGR, domestic passenger enplanements have increased at a 1.5% CAGR, and air freight ton-miles have decreased at a 4.5% CAGR.<sup>18</sup> Even so, the U.S. state and local construction spend for airports and runways grew at a 2.1% annual rate over the past decade from \$8.7 billion to \$10.7 billion. This total is split nearly evenly between expenditures related to air passenger terminals and expenditures associated with airport runway pavement and lighting. We anticipate that the construction spend associated with air travel will grow at a 2.6% CAGR through 2024, driven largely by globalization trends. In our view, air travel demand growth will be supported by higher employment levels than those witnessed in recent years. In large part, however, this will be offset by the growing adoption of video conferencing services.

The third key contributor to construction expenditures for the transportation segment is the development of mass transit projects, which include light rail, monorail, streetcar, and subway facilities. Driven by increasing urbanization and declining urban driving rates, U.S. construction spending for mass transit projects has increased at a 9.0% CAGR over the past decade. We expect this growth rate to moderate to a 6.5% CAGR through 2024. Robust growth will be driven by a continuation of key trends, as millennials embrace transportation modes other than driving, baby boomers return to urban areas, and the unemployment rate remains well below levels witnessed in the wake of the financial crisis, thereby supporting commuter demand. From 1995 to 2013, public transportation ridership increased 37%, well above the 23% increase of the U.S. population as well as the 20% growth in the use of the nation's

<sup>18</sup> U.S. Bureau of Transportation Statistics.

highways over the same time period.<sup>19</sup> Roughly 80 major transit investment projects are planned over the next decade, including the construction of seven light rail or streetcar systems.<sup>20</sup>

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<sup>19</sup> American Public Transportation Association/

<sup>20</sup> Located in Charlotte, Cincinnati, Dallas, Detroit, Honolulu, Kansas City, and Washington, D.C.

# Health Care: Shift Away From Hospital-Based Care Diminishes an Otherwise Strong Outlook for Health-Care Construction

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### Sector Snapshot

2014 PIP: \$39.0 billion  
 2004-2014 CAGR: 1.9%  
 2014-2024E CAGR: 4.8%

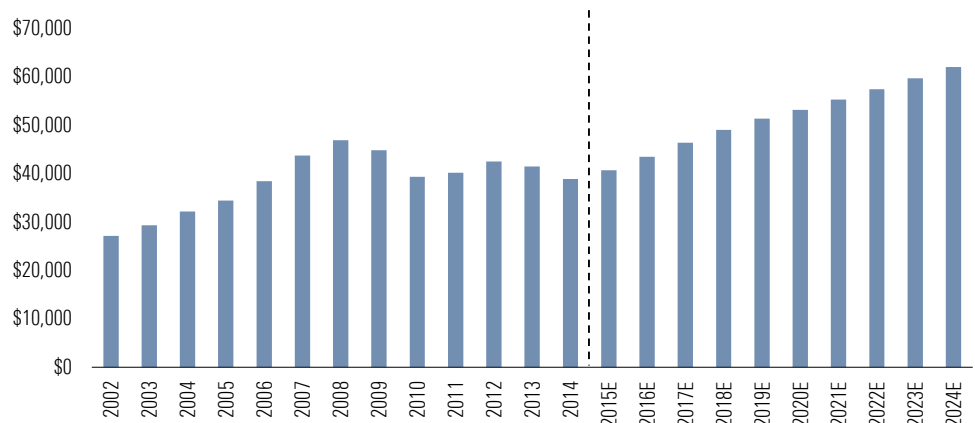
### 2014 Sector Breakdown

(percentages based on private and state and local spending)  
 Hospital: 66%  
 Medical Building: 22%  
 Special Care: 13%

### Key Takeaways

- ▶ Health-care construction has been slow to recover following the recession, weighed down by a post-boom hangover and uncertainty surrounding the Affordable Care Act, or ACA. Spending in 2014 totaled \$38.9 billion, the lowest level in nearly a decade and 17% lower than the peak of \$46.9 billion in 2008.
- ▶ Diminished uncertainty surrounding ACA implementation seems likely to catalyze a health-care construction spending recovery in the near term, while two secular tailwinds portend sustained growth in the longer term: improved access to health-care services among the previously uninsured and the aging U.S. population.
- ▶ While improved access to care and an aging population portend strong U.S. health-care demand growth, a major shift in the health-care delivery model, away from expensive hospital-based health-care delivery to a more distributed model, suggests a more muted trajectory for health-care construction.
- ▶ For hospitals, which account for two thirds of construction spending, we expect comparatively weak growth as flattening inpatient volumes diminish the need for new construction. The ACA only catalyzes an existing trend. Hospital admission rates have been drifting lower for all age groups, and the average length of stay at U.S. community hospitals has declined.
- ▶ By contrast, we expect construction spending on medical buildings and special care facilities to grow robustly. However, outpatient facilities are only one third of health-care construction spending today and are one-third cheaper to build per square foot than hospitals, diminishing the impact on total health-care construction outlays.

**Exhibit 93.** Secular Tailwinds Support Robust Growth for Health Care, Muted by a Shift in the Delivery Model  
 Construction put-in-place, in millions of current dollars



Source: U.S. Census Bureau, Morningstar



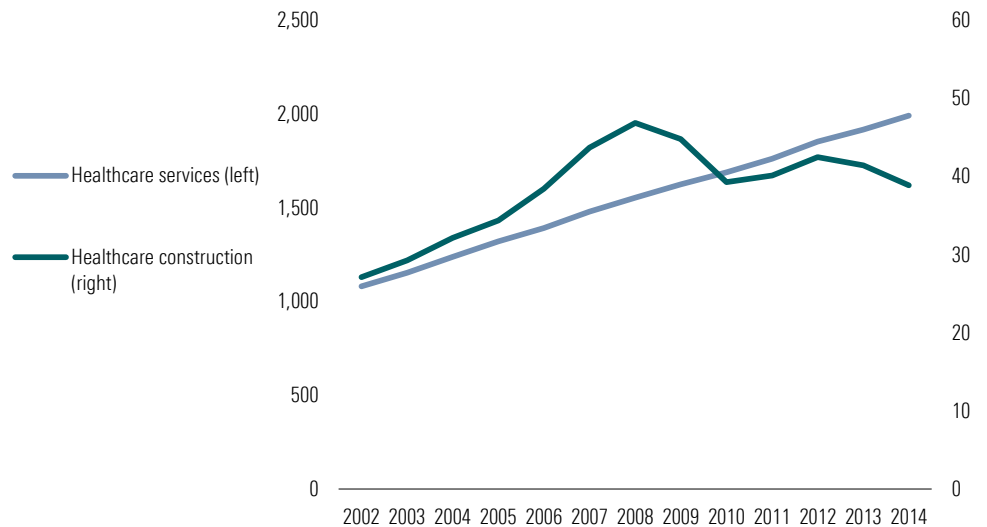
**Construction recovery has bypassed health care, but diminished ACA uncertainty portends near-term recovery.**

Belying its reputation for recession resilience, health-care construction was hit just as hard as other sectors in the financial crisis. But while other sectors have recently shown signs of life, health care has not. Total nonresidential construction spending rebounded 6.6% in 2014, but health-care construction spending continued to descend. Spending fell 6.2% to \$38.9 billion in 2014, the lowest outlay in nearly a decade and 17% lower than the peak of \$46.9 billion in 2008.

Health care's nonexistent recovery is a combination of a couple factors. First, the sector heavily overbuilt during the last cycle, increasing the odds of a post-boom hangover. Health care was one of the fastest-growing construction sectors in the building boom, rising 72.8% from 2002 to 2008 versus growth of 59.4% for nonresidential construction as a whole. As health systems gorged on cheap debt, health-care construction outlays outstripped growth in health-care demand. Health-care services spending rose a cumulative 43.7% from 2002 to 2008.

Second, uncertainty surrounding the Affordable Care Act dampened enthusiasm for construction projects just when the outlook for the U.S. economy was starting to turn. As a result, whereas animal spirits seem to have come roaring back for most construction sectors, caution remains the watchword among health systems and hospitals.

**Exhibit 94.** Health-Care Construction Spending Remains Well Below Prior Highs  
Health-care services and health-care construction spending in billions of current dollars



Sources: U.S. Census Bureau, Federal Reserve Bank of St. Louis

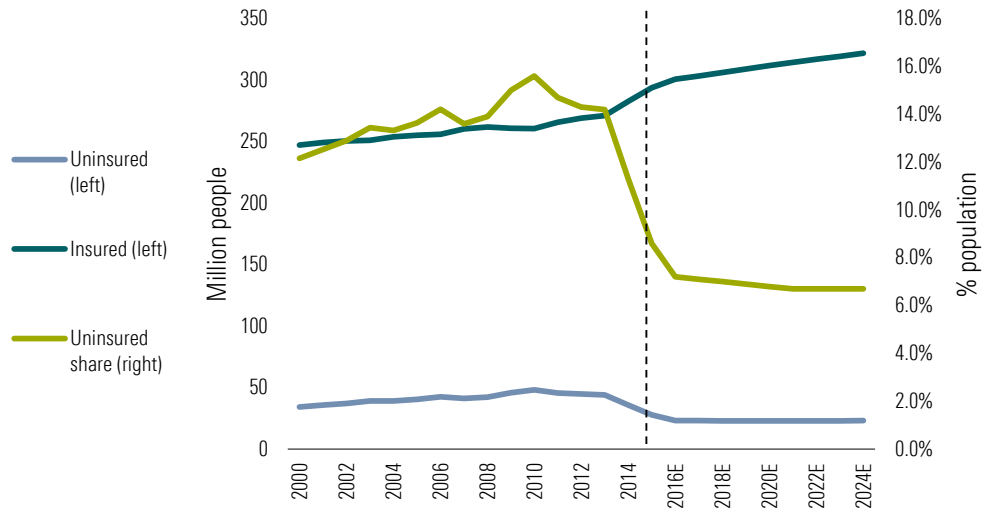
The causes of health care's poor recent performance suggest scope for "catch-up" growth in the years to come. Steady, if underwhelming, economic growth and diminished uncertainty surrounding ACA implementation seem likely to unleash pent-up health-care construction spending.

There are also secular forces that favor robust growth in health-care construction in the decade to come: improved access to health-care services and the aging baby boomer generation.

**ACA implementation will boost usage of the health-care system.**

The Affordable Care Act should boost health insurance enrollment significantly. The uninsured share of the U.S. population had already fallen to 11.3% in 2014, down from a peak of 15.6% in 2010. The Centers for Medicare and Medicaid Services, or CMS, expects the share of uninsured to drop to 8.6% this year on its way to 6.8% by the end of the decade. CMS expects U.S. insured rolls to increase to 322 million by 2024 from 283 million in 2014, an increase of 14%.

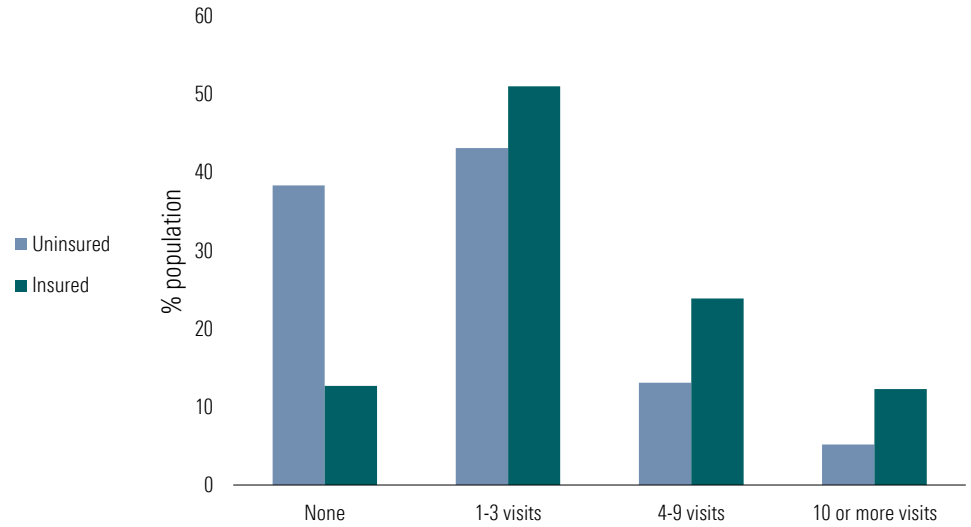
**Exhibit 95.** U.S. Insured Rolls Should Increase by Nearly 40 Million People by 2024  
Insured and uninsured share of U.S. population, 2000–2024



Source: Centers for Medicare and Medicaid Services

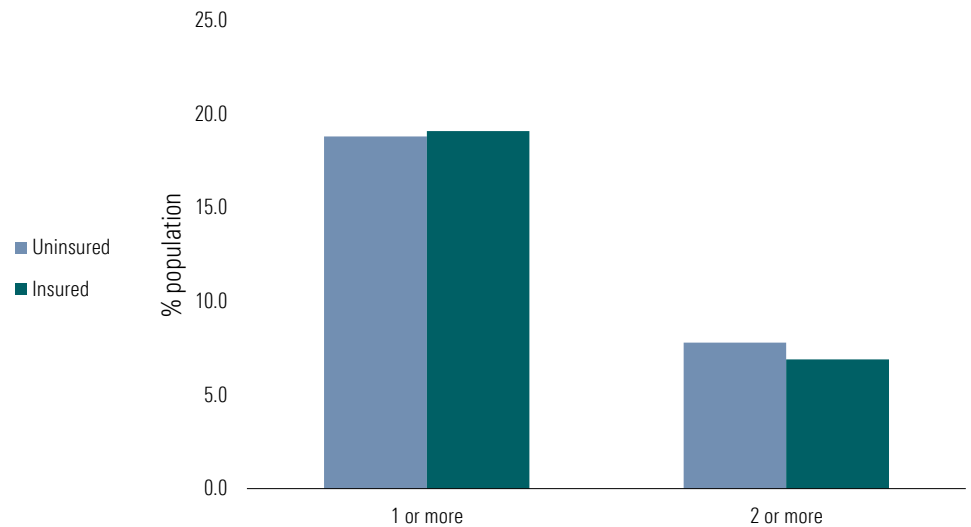
Rising health insurance enrollment should drive increased demand for health-care services and facilities in which to deliver those services. Uninsured individuals make far less use of the health-care system than their insured counterparts. Nearly 40% of the uninsured population hasn't made a single health-care visit in the past year. The same can be said for only 13% of the insured population. And despite headlines to the contrary, diminished uninsured rolls won't mean a downdraft for emergency room usage. The uninsured are only marginally more likely to make use of emergency departments.

**Exhibit 96.** Insured Individuals Make Far Greater Use of Health Care  
Health-care visits in the past 12 months, 2012



Source: CDC/NCHS, National Health Interview Survey

**Exhibit 97.** Uninsured Aren't the Heavy ER Users They're Made Out to Be  
Emergency department visits in the past 12 months, 2012



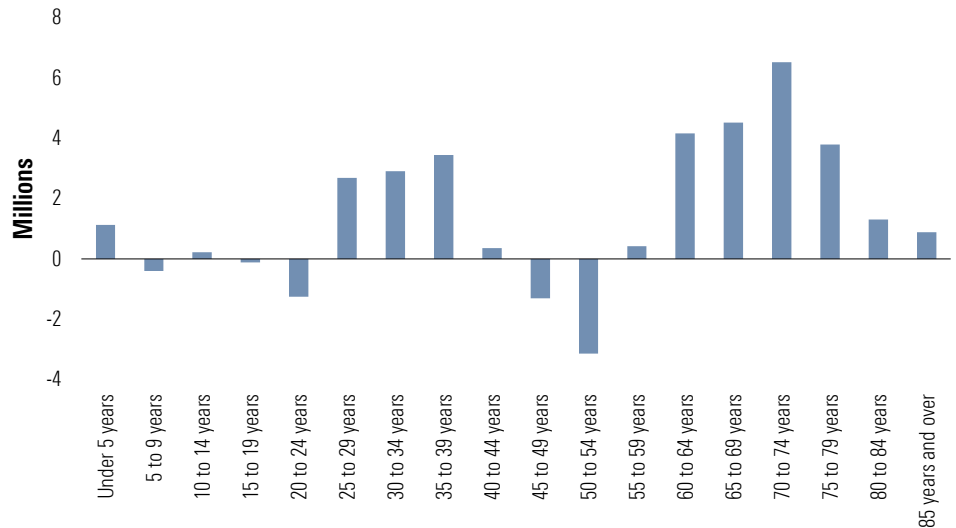
Source: CDC/NCHS, National Health Interview Survey

**Aging baby boomer population portends sharp increase in health-care services demand.**

The baby boomers will be the other big health-care demand driver in the next 10 years. This cohort, born from 1946 to 1964, is 51 to 69 years old today. By 2024, they will be 61 to 79 years old. Because the boomers will be replacing a far smaller demographic cohort, the U.S. population aged 65 and over will

grow enormously. The Census Bureau's most recent forecast expects the population 65 and over to increase by 17 million by 2024: from 46 million to 63 million. That's good for 37% cumulative growth versus a more modest 8% growth for the U.S. population as a whole.

**Exhibit 98.** U.S. Senior Population Is Set to Surge  
Population change by age group, 2014–2024

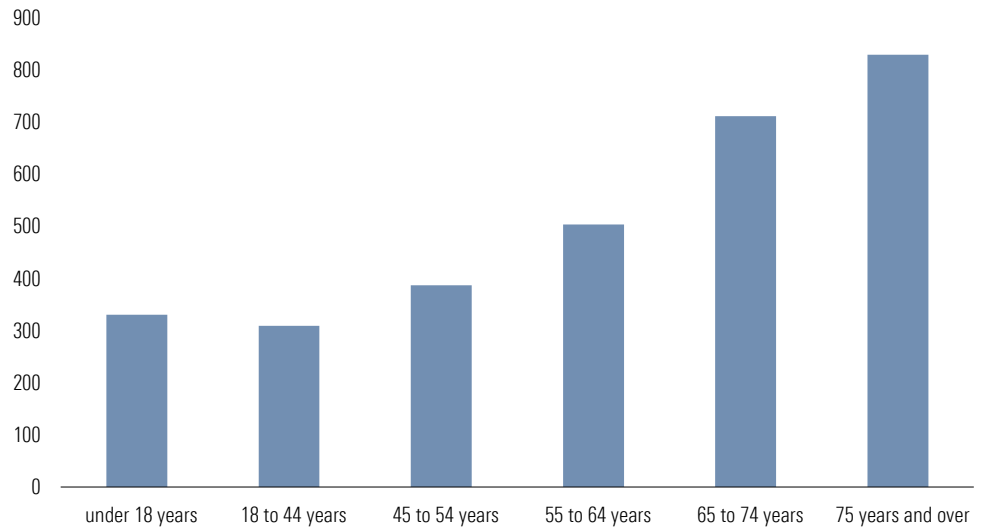


Source: U.S. Census Bureau

How much will the boomers boost health care? Age-specific health-care usage statistics offer a glimpse into specific implications for health-care demand. According to the most recent data from the National Center for Health Statistics, the average 55- to 64-year-old averages 5.0 outpatient visits per year.<sup>21</sup> The average rises to 7.1 visits among 65- to 74-year-olds and 8.3 visits for those 75 and older. All else equal, and holding usage rates constant for each age group, we estimate that demographic factors alone (population growth and population aging) imply a 21% increase in total outpatient visits by 2025 compared with 2010, the most recent complete dataset from NCHS.

<sup>21</sup> An outpatient is a patient who is not hospitalized for 24 hours or more but who visits a hospital, clinic, or associated facility for diagnosis or treatment. Treatment provided in this fashion is called ambulatory care.

**Exhibit 99.** Outpatient Visits Are Far More Frequent Among Seniors  
Outpatient visits per 100 population, 2011

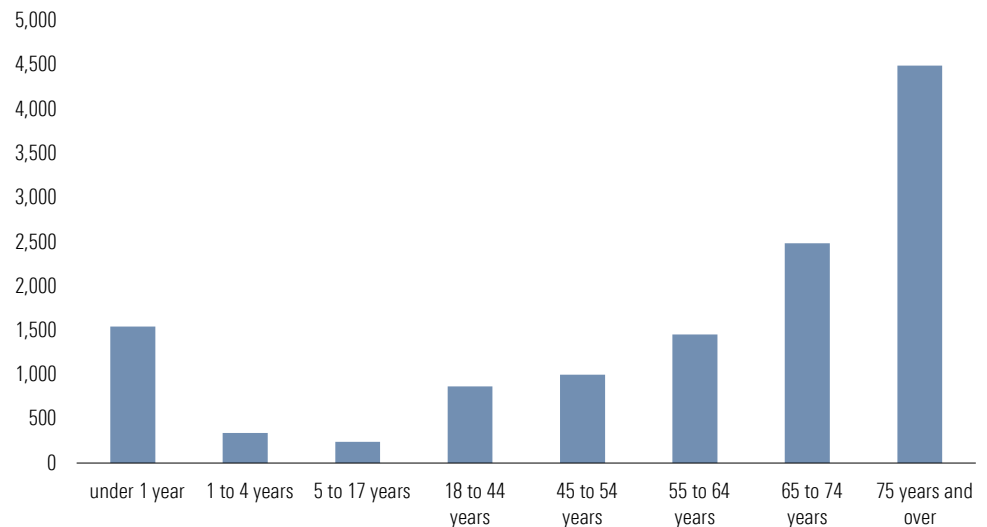


Source: CDC/NCHS, National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey

Hospital inpatient visits are also more frequent among older adults.<sup>22</sup> Individuals aged 55–64 years old average 0.15 hospital stays annually. The rate leaps 71% to 0.25 stays among 65- to 74-year-olds and another 81% to 0.45 visits for those 75 and older. Once admitted, older adults stay longer. Today's 50-year-old baby boomer has an average hospital stay of 4.7 days. A 60-year-old's average stay is 13% longer at 5.3 days. All else equal, an older and slightly larger U.S. population would have 27% more hospital admissions in 2025 than in 2010 and 30% more total days of hospital care.

<sup>22</sup> An inpatient is "admitted" to the hospital and stays overnight or for an indeterminate time. Treatment provided in this fashion is called inpatient care. The admission to the hospital involves the production of an admission note. The leaving of the hospital is officially termed discharge and involves a corresponding discharge note.

**Exhibit 100.** Hospital Visits Are Far More Frequent Among Seniors Too  
Hospital discharges per 10,000 population, 2010



Source: CDC/NCHS, National Hospital Discharge Survey

**Health-care delivery is already shifting away from hospitals. ACA will catalyze a further shift.**

However, all else is unlikely to be equal. While an aging population, higher utilization from newly insured patients under the Affordable Care Act, and improving macroeconomic conditions portend strong U.S. health-care demand growth, changes in health-care delivery suggest a more muted trajectory for health-care construction.

Two big developments are afoot thanks largely to the Affordable Care Act. First, health-care reform in the U.S. seeks to slow the growth of health-care spending, which has negatively influenced hospital and service provider profitability through reimbursement pressure. Measures to slow and reduce Medicare payments, the budget sequester's cut to Medicare payments, and budget-neutrality adjustments from the Centers for Medicare and Medicaid Services are just a few of the measures slowing, or even reducing, service provider pricing power. Second, U.S. health care is amid a transition from a fee-for-service model that has incentivized costly and sometimes unnecessary tests to a value-based payment model that disincentivizes such behavior.

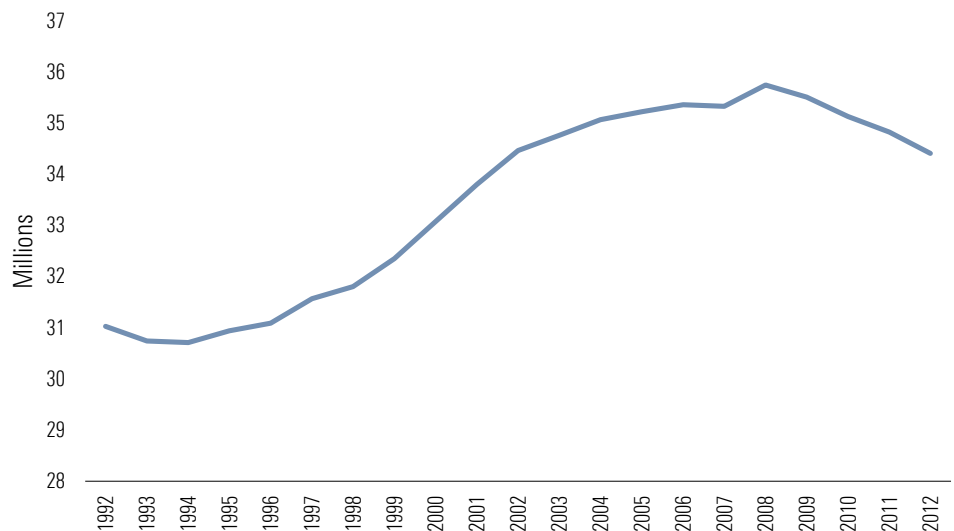
Both trends have largely shifted strategies toward more efficient and cost-effective care. And both entail a shift away from expensive hospital-based health-care delivery to a more distributed model.

This trend is likely to weigh heavily on hospital construction spending and partly offset the demographic tailwinds for health-care spending overall. That's because hospital construction spending accounts for roughly two thirds of health-care construction spending overall. Growth prospects should be better for clinics, medical offices, and nursing homes (collectively the other third). But medical offices are roughly one-third cheaper to build than hospitals per square foot (\$219.70 versus \$314.60 according to data from

Reed Construction); the net effect of a changing health-care delivery model is negative for total health-care construction spending.

While the ACA's emphasis on value-based care is likely to catalyze the transition away from hospital-centered care, the process has been in place for quite some time. Nationwide community hospital admissions have been declining since 2008, according to the American Hospital Association.<sup>23</sup> Digging deeper into the data suggests that the underlying trend began at least a decade before that. Hospital admission rates have been drifting lower for all age groups since 1995. Population growth and population aging simply masked this trend until 2008.

**Exhibit 101.** Hospital Admissions Peaked in 2008  
Community hospital admissions, 1992–2012

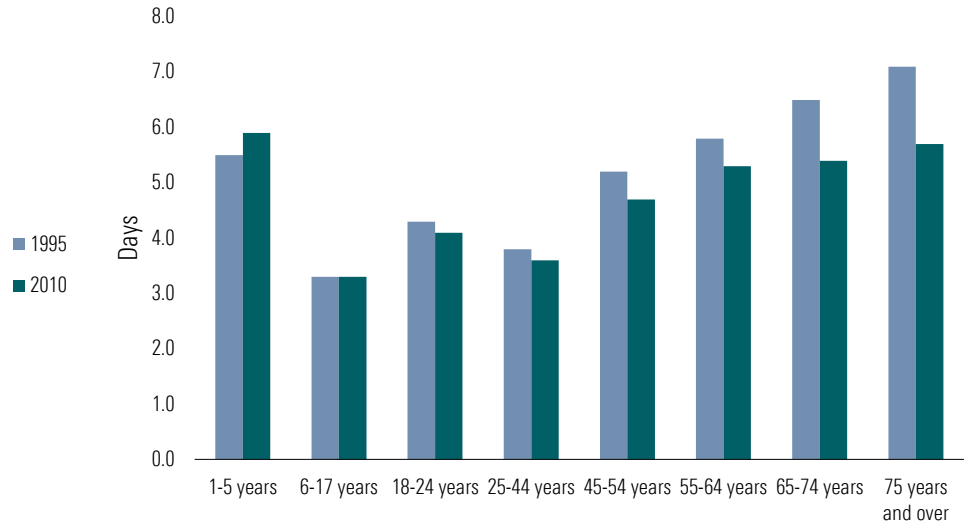


Source: American Hospital Association (AHA) Annual Survey of Hospitals

Shorter hospital stays have magnified the impact of falling admissions on total hospital usage. The average length of stay at U.S. community hospitals declined from 6.5 days in 1995 to 5.4 days in 2012. The average length of stay has declined for all age groups with the exception of the very young (1–5 years old). Declines have been most pronounced among older adults. The average hospital stay for someone aged 65 to 74 has fallen from about 6.5 days to about 5.4 days. The average hospital stay for someone 75 or older declined from 7.1 days in 1995 to 5.7 days in 2010.

<sup>23</sup> Community hospitals are nonfederal short-term general and special hospitals whose facilities and services are available to the public.

**Exhibit 102.** Hospital Stays Have Gotten Shorter for Nearly All Age Groups  
Average length of hospital stay, 2010 vs. 1995



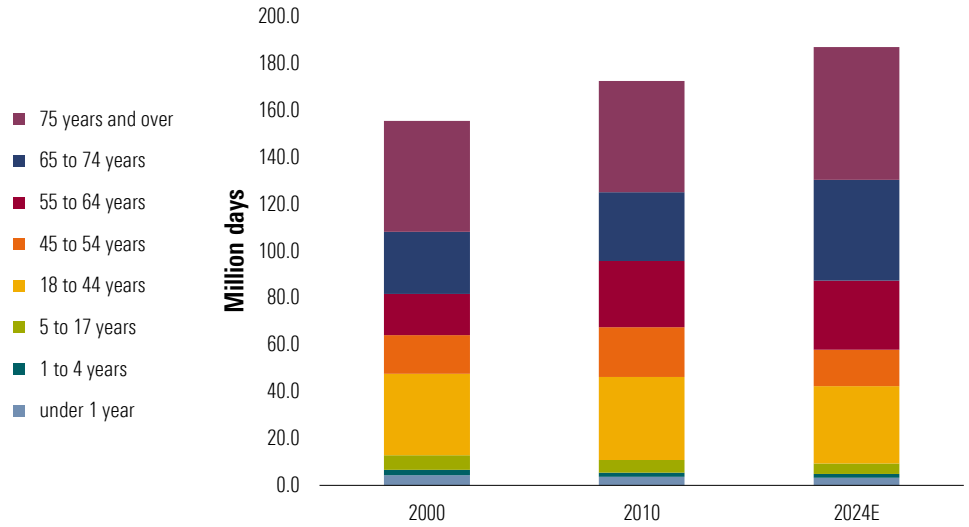
Source: CDC/NCHS, National Hospital Discharge Survey

**Outlook for inpatient and outpatient care**

We expect hospital admission rates and hospital days of care per stay to continue to decline for all age groups as cost-pressured hospitals and health systems fully implement value-based health care. As a result, while the aging boomer demographic portends strong growth in hospital-based health care, the outlook is more modest than it might otherwise seem. We forecast that the total days of U.S. hospital inpatient care will have risen only 8% cumulatively by 2024 from 2010, equivalent to a 0.06% CAGR versus a 1.0% CAGR from 2000 to 2010.



**Exhibit 103.** Shifting Health-Care Delivery Model Portends Slow Growth in Hospital Usage  
Days of inpatient care

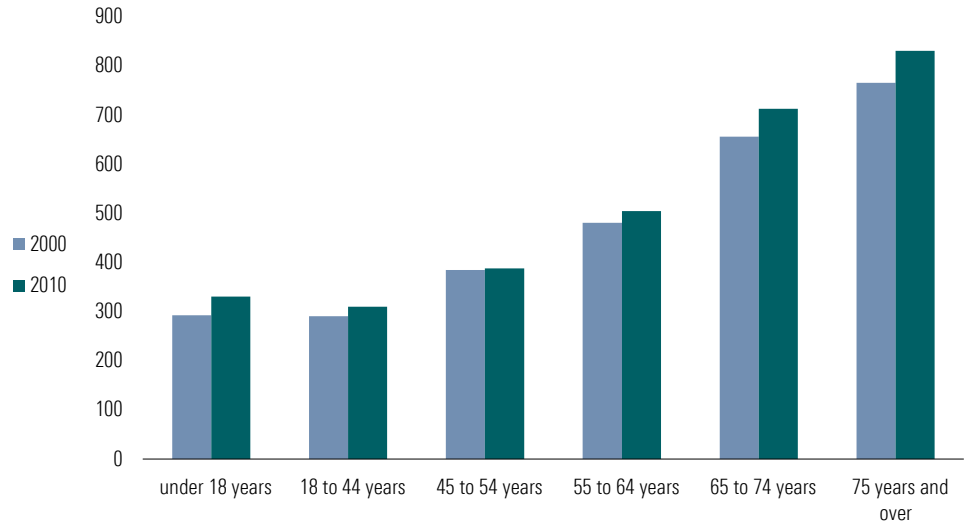


Source: CDC/NCHS, National Hospital Discharge Survey, Morningstar

The outlook for outpatient care is stronger, benefiting from favorable demographic trends as well as the changing health-care delivery model. Just as inpatient visits have been on the decline, outpatient visits have been on the rise. From 2000 to 2010, the last year of full data availability from the National Center for Health Statistics, outpatient visits rose 22% cumulatively to 1.24 billion, compared with 4% growth in community hospital admissions over the same interval.

Sources of outpatient care growth have been broad based. All age groups make more outpatient visits now than they did in 2000. And whereas older adults have seen the biggest declines in hospital stays, they've seen the biggest increases in outpatient visits.

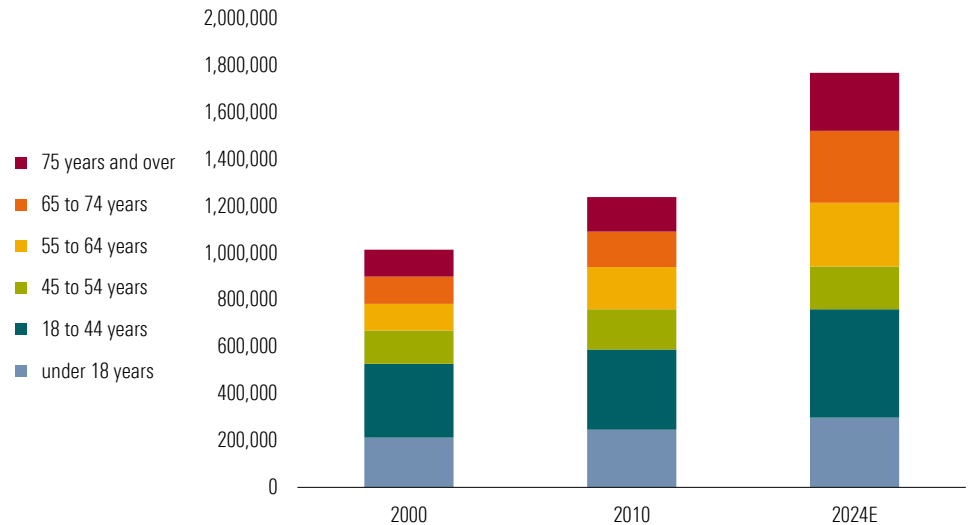
**Exhibit 104.** Outpatient Visit Frequency Has Risen for All Age Groups  
 Outpatient visits per 100 persons, 2010 vs. 2010



Source: CDC/NCHS, National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey

We expect outpatient visits to continue to increase for all age groups, catalyzed by (1) rising insurance enrollment and (2) a further shift away from hospital-based care. We forecast a 10% cumulative increase in annual visits for individuals 65 and older and a 15% increase in annual visits for individuals under 65, a cohort that will see the bigger drop in the share of uninsured. The aging boomer demographic will magnify the growth in outpatient visit rates. In total, we expect total U.S. outpatient visits to increase by 43% by 2024 versus 2010 levels, a 2.6% CAGR versus the 2.0% CAGR notched from 2000 to 2010.

**Exhibit 105.** Shifting Health-Care Delivery Model Amplifies Demographic Tailwinds for Outpatient Care  
Outpatient visits



Source: CDC/NCHS, National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey, Morningstar

### Outlook for health-care construction spending

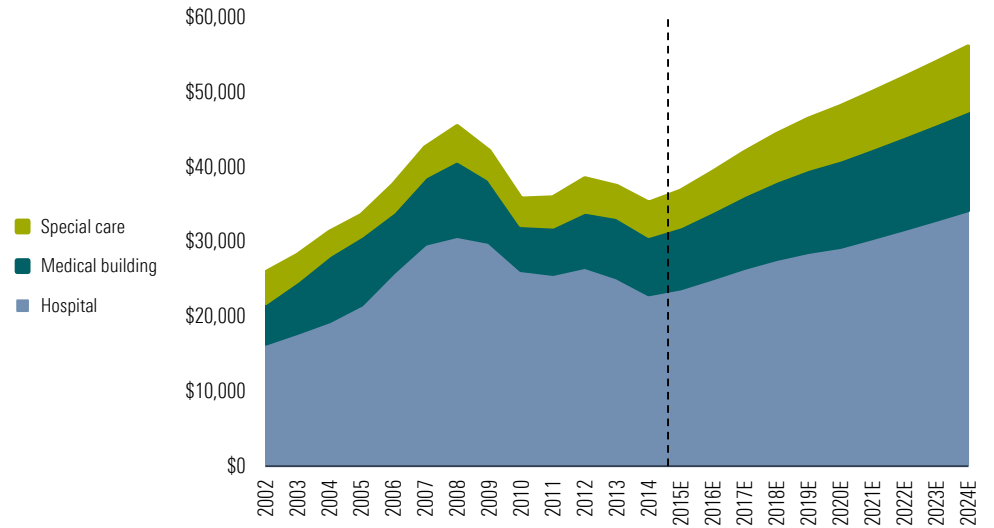
We believe health-care construction spending toughed in 2014. We expect pent-up demand to drive solid growth in the next several years as projects delayed due to economic weakness and ACA-related legislative and legal uncertainty proceed. We forecast 4.6% nominal growth in 2015, 6.8% in 2016, and 6.8% in 2017.

Longer-term, growth is likely to be more modest as the outlook is mixed by construction type. For hospitals, which account for two thirds of construction spending, we expect comparatively weak growth as flattening inpatient volumes diminish the need for new construction. Less costly renovation and remodeling is likely to drive an increasing share of hospital construction as health systems adapt existing facilities to meet surging demand for outpatient services. We expect some catch-up growth in hospital spending over the next few years as projects that had been placed on hold are consummated, but we don't expect hospital spending to reclaim prior peaks in nominal terms until 2021.

By contrast, we expect construction spending on medical buildings and special care facilities (one third of total spending today) to grow robustly, with outlays hitting record levels by 2018. The aging boomer demographic, rising insurance enrollment, and continued efforts to push health care out of hospitals are the key drivers. Nursing homes and hospices, included in the "special care" category, should enjoy particularly strong growth. For nonhospital health-care construction, we forecast an average 6.0% annual nominal growth spending to 2024, or 3.7% in real terms, outpacing average yearly GDP growth by about nearly a full percentage point annually.

But because hospitals account for such a large share of total construction spending, our outlook for total health-care construction spending is more modest. We forecast 4.8% nominal growth (2.5% real) on average through 2024.

**Exhibit 106.** Shift Away From Hospital-Based Care Partly Diminishes Upside for Health-Care Construction spending  
Health-care construction spending by type (private and state and local only)



Source: U.S. Census Bureau, Morningstar

# Amusement and Recreation: Less Spending on Parks and Meeting Space Here to Stay

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### Sector Snapshot

2014 PIP: \$16.7 billion  
 2004-2014 CAGR: (0.0%)  
 2014-2024E CAGR: 1.2%

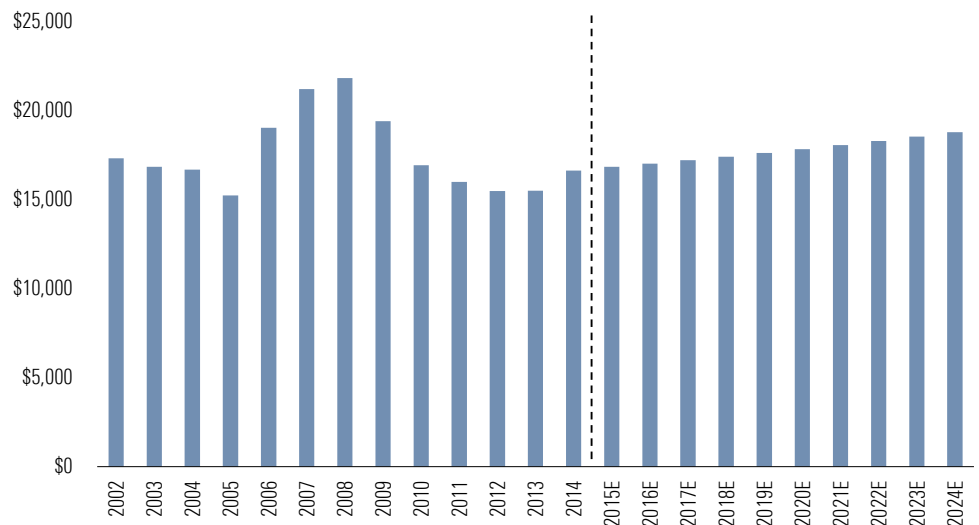
### 2014 Sector Breakdown

Sports: 22%  
 Social (community center, country club, park): 34%  
 Consumer (theme park, movie theater): 10%  
 Meeting (convention center): 14%  
 Fitness: 7%  
 Other (other amusement categories, federal): 13%

### Key Takeaways

- ▶ We forecast a CAGR of 1.2% (nominal) from 2014 to 2024 for amusement and recreation, or A&R, construction spending. Although this would mark a slight step up from essentially flat growth in the past decade, we don't expect a return to peak A&R spending, even in nominal terms. Nominal spending peaked at \$21.8 billion in 2008. We think 2024 spending will only reach \$18.8 billion.
- ▶ Areas of weakness in A&R spending include park and meeting facility spending. Parks seem to get cut from more and more state and local budgets — a trend we see continuing given belt tightening and the limited revenue opportunities afforded by parks. Convention centers have arguably been overbuilt in the U.S over the past couple decades, and we expect real spending declines in this category.
- ▶ Consumer and sports are two slightly brighter spots in A&R spending. Sports spending should be relatively flat in real terms, and consumer spending, driven by higher ticket sales at amusement parks, should see continued growth.

**Exhibit 107.** Amusement and Recreation Faces Meager Growth Over the Next Decade  
 Construction put-in-place, in millions of current dollars



Source: U.S. Census Bureau, Morningstar

**A&R spending is still well below peak levels.**

Amusement and recreation spending peaked in 2008 at \$21.8 billion and continued to slide for several years, reaching a trough of \$15.5 billion in 2012. A&R spending has recovered modestly since 2012. At \$16.6 billion in 2014, construction spending in this category is still roughly 25% below peak activity. During the period from 2002 to 2014, nominal private spending growth outpaced public spending. State and local A&R spending actually declined at an annual rate of 0.5% from 2002 to 2014, and federal A&R spending slipped at a faster annual rate of 6.1%. Comparatively, private A&R spending was flattish, growing at an annual rate of just 0.2%. Surprisingly, amusement and recreation spending has held up relatively well compared with other categories that we consider discretionary, such as lodging.

**Parks, sports stadiums, movie theaters, meeting spaces, and social centers are all included in the A&R category.**

The U.S. Census breaks down amusement and recreation construction spending into a number of different subcategories including theme/amusement parks, sports, fitness, performance/meeting centers, social centers, parks/camps, movie theaters/studios, and other (casinos, racetracks, bowling alleys, and so on).

We see A&R spending driven both by demand factors (the pull for more facilities) and by funding (available resources to build the facilities). Broadly, we would expect demand for A&R construction to be driven by several factors, including population, personal consumption expenditures, and demographics. Additionally, the age of current facilities will drive replacement cycles for current structures. On the funding side, state and federal budgets will help determine public A&R spending, while general economic health and access to affordable financing should drive the availability of private funding.

**Government budgets will likely limit park spending; rosier outlook for consumer-based spending.**

To simplify our forecasting for A&R we grouped the U.S. Census categories into our own structure based on common factors. Our categories include Social, Sports, Meeting, Consumer, Fitness, Federal, and Other. We provide a brief explanation of the dynamics affecting the first four categories, which combined accounted for 80% of A&R spending in 2014:

- ▶ **Social (34% of A&R spending):** We grouped parks and social centers together for forecasting purposes. Construction spending in this category has not shown any sign of recovery postrecession. In real terms, spending is down about 40% from the peak of 2007. We don't see this as surprising given the discretionary nature of the category and the fact that revenue generation possibilities after construction are often very small. State and local governments simply don't generate much revenue from a park after it's built. As such, this is an easy category to cut when budgets get tight. With state and local budgets still challenged, we don't see a reversal in the pressure this category has seen over the past several years. Over the next decade, we expect this category to decline at 0.8% per year.
- ▶ **Sports (22%):** Professional sports stadiums/arenas can represent substantial construction outlays. For example, Levi's Stadium in Santa Clara, California, was built at a total cost of \$1.3 billion, which amounts to about 8% of annual average spending for the A&R category as a whole. We think age of

stadiums is the best gauge for predicting replacement.<sup>24</sup> Often teams want to upgrade fan experience, even when the integrity of the structure is intact. In Major League Baseball, we estimate that three new stadiums through our forecast period (2014–2024) will be completed, compared with eight that were completed from 2004 to 2014. In the National Football League, we estimate six new stadiums to be built over the next decade, compared with the same number built in the 10 years prior to 2004. Finally, in the National Basketball Association, we expect three to four new arenas constructed versus four in the previous decade. We use these estimates to inform our sports category forecast. Our growth forecast for this category is 2.25% per year from 2014 to 2024.

- ▶ **Meeting (14%):** This category includes both performance and meeting centers. Construction spending in this category has been on a steady downward trajectory in real terms since the beginning of the 2000s. Interestingly, the recession didn't seem to accelerate the trend. We think this decline is secular and that the convention center space in particular is suffering from overbuild. According to CityLab, convention space in the U.S. has increased by 50% since 2005. Many cities have participated in an arms race to attract conventions, but the number of conventions hosted has fallen in the past decade, and attendance at the 200 largest conventions peaked in the mid-1990s and has fallen steadily since. Given oversaturation in the convention center market, we think declines (in real terms) in this category will persist. We think growth over the next 10 years will be roughly flat, advancing just 0.2% per year from 2014 to 2024.
  
- ▶ **Consumer (10%):** This category includes theme/amusement parks and movie theaters/studios. Spending in this category peaked in 2006, before being hit extremely hard by the recession. Spending in real terms was more than \$2 billion in 2006 and dipped all the way to below \$700 million in 2009. Construction has since recovered nicely to \$1.6 billion in 2014. Without a reliable source for the age of amusement parks and movie theaters, we turn to trends in attendance figures to forecast construction spending in this category. Amusement park attendance globally has increased from 335 million people in 2006 to 377 million in 2013—an increase of 12%. In North America, attendance at the top 20 amusement parks has increased 15% from 2006 to 2013 for an annual growth rate of nearly 2.5%.<sup>25</sup> Amusement park attendance seemed to be recession-resistant in North America, increasing each year from 2006 to 2013. On the other, hand movie attendance has trended in the opposite direction. U.S. movie attendance peaked in 2002 at 1.58 billion tickets sold. By 2014, that number had dropped to 1.27 billion. Our forecast for the construction category takes into account the opposing trends in amusement park and movie theaters. We forecast relatively robust construction spending growth in this category at 5.3% over the next 10 years.

### **We expect real declines in amusement and recreation spending.**

Based on our outlook for each of the major spending categories within A&R construction, we forecast a CAGR of 1.2% (nominal) from 2014 to 2024. Given our forecast for inflation of 2.25% per annum, we see real spending declines in this category, driven by pressure in social and meeting categories. Weakness in these areas is offset by gains in consumer. Our forecast marks a slight step up from nominal growth over the past 10 years, when spending was essentially flat between 2004 and 2014. That said, we don't

<sup>24</sup> Although perhaps not in the case of Wrigley Field or Fenway Park.

<sup>25</sup> Canada's Wonderland in Ontario is the only non-U.S. park, ranking #14.

expect a return to peak A&R spending, even in nominal terms. Nominal spending peaked at \$21.8 billion in 2008. We think 2024 spending will reach only \$18.8 billion.



# Communication: Few Capital Dollars Will Go to Construction Over the Next Decade

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### Sector Snapshot

2014 PIP: \$16.1 billion  
 2004-2014 CAGR: 0.3%  
 2014-2024E CAGR: 2.0%

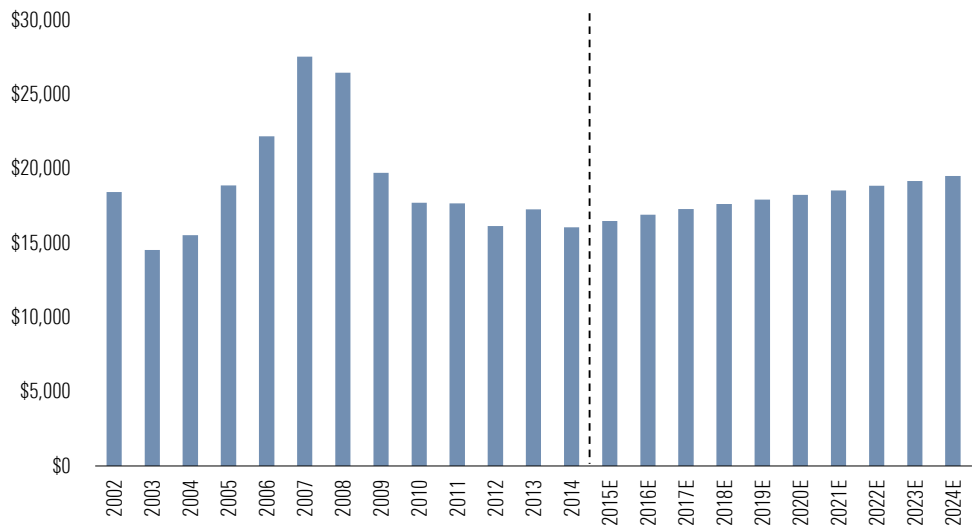
### 2014 Sector Breakdown

(no detailed breakdown available)  
 Includes telephone, television, and radio distribution and maintenance buildings

### Key Takeaways

- ▶ Communications construction spending peaked in 2007 at roughly \$28 billion. The Great Recession ravaged construction activity, with an average 14% decline over the following three years.
- ▶ Construction spending remains depressed, having averaged roughly \$16 billion to \$17 billion over the past five years.
- ▶ We think much of future capital expenditures for the industry will be directed to equipment and technology. Therefore, we expect growth of just 2% for communications construction spend, and we do not expect peak spending to return.

**Exhibit 108.** Communication Construction Spending Will See Weak Growth Over the Next Decade  
 Construction put-in-place, in millions of current dollars



Source: U.S. Census Bureau, Morningstar

**What is communication construction?**

The U.S. Census Bureau defines communications construction as telephone, television, and radio distribution and maintenance buildings and structures. From a funding perspective, the private sector accounts for nearly all (99% or more) of construction spending in communications. Beyond this data, the U.S. Census provides no additional detail on the spending between particular structures or functions, limiting our analysis of communications construction activity to a sectorwide basis.

**Communications construction spending tracks broader economic performance.**

The Department of Homeland Security identifies the communications sector as an integral component of the U.S. economy, given its importance and enabling function across all businesses and government. Indeed, as a “connector” across industries, communications construction spending has roughly tracked broader economic activity, as seen in Exhibit 109.

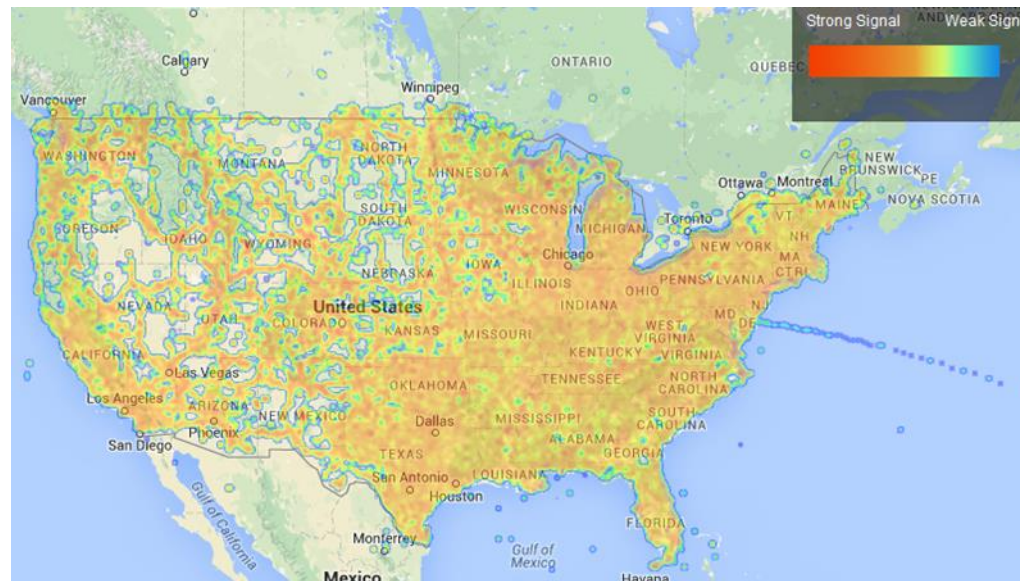
**Exhibit 109.** Communications Construction Has Largely Followed Broader Economic Performance  
Year-over-year growth



Source: U.S. Census Bureau, BEA, Morningstar

For the most part, we think communications infrastructure in the United States is fairly mature and built out. For example, the CTIA estimates that 97% of U.S. consumers have a choice of at least three different wireless carriers, with wireless penetration of over 104%. As shown in Exhibit 110 from OpenSignal, coverage across the United States is strong in the country’s most populated areas.

**Exhibit 110.** Wide Cellular Coverage Weighs on the Need for Additional Towers  
Signal strength across the continental U.S.



Source: OpenSignal

In addition, household Internet penetration has continued to grow over time, with high-speed Internet continuing to become the majority of internet connections. Of homes without Internet access, we do not think lack of access is the major factor. In fact, in a 2013 Pew Center research study, just 7% of offline adults cited lack of access as the reason they do not use the Internet. Nearly two thirds cited a lack of relevance and low ease of use as the main reason they do not access the internet. With Internet and wireless reaching high penetration rates, we expect future construction to be mostly limited to the replacement and repair of current systems.

**Future communications capital spending is likely to be technology-heavy and construction-light.**

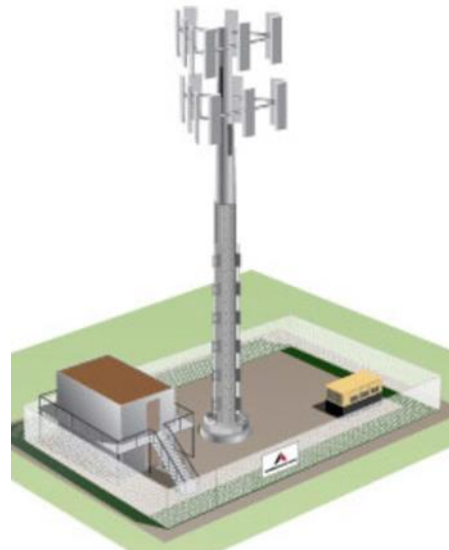
We think the majority of communications capital will be directed to servicing growing data usage trends. For example, driven by increasing data-intensive video viewing, Cisco expects mobile data traffic to grow 47% each year through 2019. Fixed IP traffic is still expected to grow, albeit at one-third the pace of mobile. Yet despite this meteoric growth, we think this is unlikely to translate into significant growth for construction, largely due to low construction intensity.

The total number of cellular towers has grown over the years as mobile phone usage, and particularly data intensity, has grown. However, we think the impact of cellular tower growth on construction activity is minimal. As shown in Exhibit 111, the footprint of a cellular tower site is fairly small. Indeed, construction is pretty much limited to the tower, its foundation, and any supporting structures. We think a bulk of the cost is actually attributable to the equipment installed—a figure not included in construction. Furthermore, after a tower has been built, the structure allows for upgrades and expansions that require little to no construction. Upgrading a tower for faster wireless communication

standards requires swapping out equipment. Towers can also support multiple customers, with two to three different carriers installing equipment on the same structure.

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**Exhibit 111.** Cellular Towers Have Relatively Small Construction Footprints  
Diagram of a cellular tower



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Source: American Tower

In addition to the growth of cellular towers, companies nationwide are upgrading old copper-based telephone networks, originally designed to service one specific purpose (phone calls), to IP-based networks built to handle a variety of purposes like broadband, video, data, voice, and so on. However, we don't think this has a huge impact on construction either. Similar to cellular towers, we think much of the cost is equipment based. In fact, the process of laying fiber, primarily consisting of digging a path into the ground then filling it, is a relatively simple construction process compared with structures in other sectors. Therefore, we don't anticipate even a nationwide upgrade to significantly benefit communications construction levels.

### **Conclusion**

Communications construction has largely tracked broader economic growth, and we don't anticipate that relationship to change going forward. For the purposes of forecasting, we've assumed the relationship between communications construction spending and GDP, particularly investment in nonresidential structures, to hold into the future. In all, we expect communications construction to grow roughly 2% annually on a nominal basis. Despite the capital investments expected to occur in the sector over the next several years, we think the low construction intensity of communications infrastructure will lead to few dollars ending up in the construction bucket.

# Lodging: Growing Number of Travelers Will Drive the Need for More Rooms

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**Sector Snapshot**

2014 PIP: \$16.1 billion  
 2004-2014 CAGR: 2.7%  
 2014-2024E CAGR: 4.8%

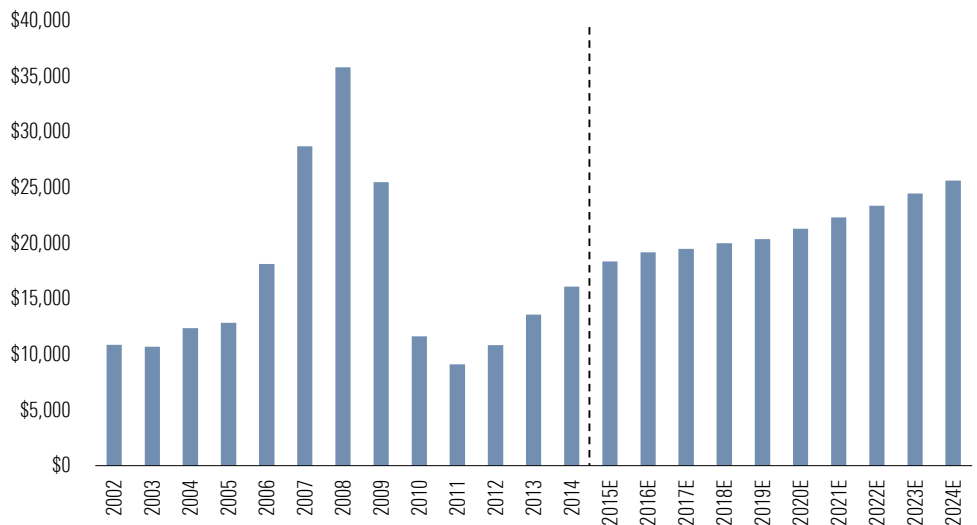
**2014 Sector Breakdown**

(no detailed breakdown available)  
 Includes hotels, motels, resorts, etc.

**Key Takeaways**

- ▶ Lodging has been one of the most volatile construction spending categories in recent years. Indeed, peak spending reached \$36 billion in 2008, and the Great Recession has ravaged construction activity, with 2014 spending less than half of peak levels.
- ▶ Despite continued weakness in lodging construction, we think continued economic improvement since the recession will be a tailwind for travel, which subsequently drives demand for more guestrooms.
- ▶ We expect lodging construction spending to increase roughly 5% per year from \$16 billion in 2014 to \$26 billion by 2024 to support growth in travel.

**Exhibit 112.** Lodging Construction Spending Will See Weak Growth Over the Next Decade  
 Construction put-in-place, in millions of current dollars



Source: U.S. Census Bureau, Morningstar

**What is lodging construction and what determines it?**

The U.S. Census Bureau defines lodging construction as hotels, motels, resort lodging, tourist courts and cabins, and similar facilities. Construction reflects a mix of replacement/renovation and new construction needed to meet additional growth from more travel.

For the purposes of our analysis, we measure lodging demand by the number of guestrooms available. However, we think it's important to note that the industry operates with natural friction to capacity utilization—historically, occupancy rate hovers at about 60% or so. Nevertheless, we think the demand for guestrooms is ultimately a function of the number of travelers.

**International and leisure travel growth will be the main sources of growth for travel demand.**

We segment travel demand into three categories: international, domestic business, and domestic leisure.

We define international demand as visits from travelers outside of the U.S. Historically, this group has accounted for roughly 20% of lodging sales. With the exception of 2009 during the height of the Great Recession, international travel has been growing every year. Indeed, by 2010, the category had already returned to growth. For the purposes of our forecast, we use the U.S. Travel Association's forecast for international travelers through 2017, which estimates annual growth of roughly 4% per year. We apply this same rate through the end of our forecast period. This rate is roughly in line with the historical annual growth rate of about 4% year from 2008 to 2014.

Given the differences in travel characteristics, we've divided domestic travel into business and leisure. For domestic business, the number of business person-trips is highly dependent on business activity. Although the number of business trips is just one third of the number of leisure trips, business travelers are more intense users. In fact, the average nights stayed is roughly 2.5 nights per trip. Since companies are likely to foot the bill, we think business travelers are unlikely to explore alternative lodging options based on cost. We've forecast the growth in business person-trips using a multiple of growth in the gross private domestic investment portion of GDP. We also assume that 100% of business travelers stay in hotels. Although we anticipate demand from domestic business to grow, we think the pace will be slower than it has been in the past. We attribute this to two main factors. First, the advancement of technology has made remote collaboration easier. Second, we think tighter business travel budgets implemented during the recession have raised the bar so that only necessary trips make the cut.

For domestic leisure, we think the number of leisure person-trips is related to personal income and spending. Although there are three times more leisure trips than business trips, leisure travelers are less intense users. In fact, the average nights stayed is slightly more than 2 nights per trip. But, more importantly, nights stayed at hotels are just 50% of total nights stayed. We think this reflects the significant alternative accommodations common in leisure travel, including staying with family, staying at an owned vacation home, and renting a room or home. We forecast the growth for domestic leisure travel as a multiple of growth in the personal consumption expenditures portion of GDP. We expect the growth of leisure travel to be strong, with high correlation to general economic growth. Despite lower intensity, we anticipate demand from leisure travel to grow faster than business travel.

**Key forecast assumptions**

Since peak construction demand in 2008, new guestroom builds have lagged overall demand growth, as the market grew into existing capacity. However, we think new guestroom builds will better match demand growth going forward. Although occupancy rates fell significantly during the recession, rates have grown back to pre-recession levels. In addition, room prices have continually increased over the past four years.

To construct our forecast, we've made several key assumptions. First, we assume constant occupancy rates from 2014 of 63%. Historically, construction of new guestrooms has capped occupancy rates in the 60% range. Second, we assume that 6% of rooms are removed from the system in any given year for demolitions and renovations. We've estimated this rate by looking at the change in total guestrooms and the pipeline of guestrooms expected to be completed in any given year. Third, we've forecast the growth in guestroom demand by weighing our forecast demand growth rates for international, domestic business, and domestic leisure travel. Currently, roughly 20%, 30%, and 50% of guestroom demand comes from international, domestic business, and domestic leisure, respectively. Lastly, we've estimated the construction spend per new room based on historical levels, with growth in costs limited to inflation.

**Conclusion**

We forecast lodging construction spend to grow about 5% annually on a nominal basis. Despite several recent years of weakness, we think the lodging market has been working through excess supply and that the market will soon return to needing new guestrooms constructed. Furthermore, this need for new guestrooms will be supported by increasing levels of travel, with strong growth from international and domestic leisure to offset slower growth from domestic business travel.

# Public Safety: Moderate Spending Growth Won't Ease Prison Overcrowding

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**Sector Snapshot**

2014 PIP: \$9.3 billion  
 2004-2014 CAGR: 2.9%  
 2014-2024E CAGR: 4.4%

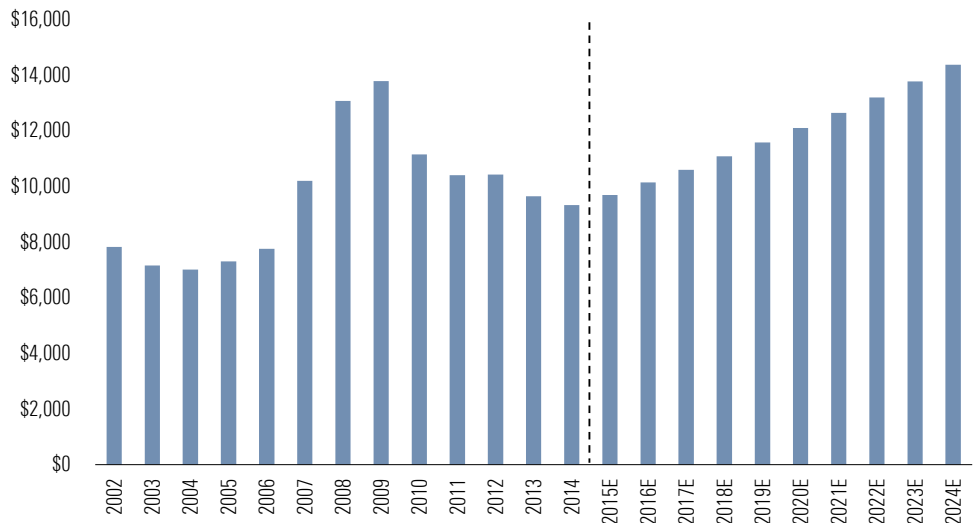
**2014 Sector Breakdown**

(percentages based on state and local spending)  
 Correctional (detention, police/sheriff): 64%  
 Other Public Safety (fire/rescue): 36%

**Key Takeaways**

- ▶ Public safety construction has been one of the hardest-hit categories during the recession, with construction spending falling 19% from 2009 to 2010. Unlike many other categories, the category has continued to decline even as the broader economy has recovered.
- ▶ We think that with many states facing constrained budgets amid higher-priority spending categories such as education and infrastructure, public safety construction is unlikely to return to peak levels on a real basis.
- ▶ We forecast that public safety spending will grow 4% annually from \$9 billion in 2014 to \$14 billion by 2024, driven largely by population growth.

**Exhibit 113.** Public Safety Construction Will Return to Normalized Levels as State and Local Budgets Improve  
 Construction put-in-place, in millions of current dollars



Source: U.S. Census Bureau, Morningstar



**What is public safety construction and what determines it?**

The U.S. Census Bureau segments public safety construction into two major categories: correctional and other public safety. The correctional category includes detention buildings (cell blocks, detention centers, jails, penitentiaries, and prisons) and police-related buildings (police stations and sheriffs' offices). Other public safety construction primarily consists of fire and rescue (fire stations, rescue squads, and dispatch and emergency centers) but also includes armories and military structures that could not be assigned to other categories.

State and local spending constitutes over two thirds of public safety construction. In addition, because the state and local spending data has a detailed breakout available, we focus our analysis on state and local spending for detention, police-related, and fire and rescue buildings.

We think that for the most part, public safety can be considered one of the most mature and developed construction categories. We don't think there are any meaningful trends that will require a significant change to the level of public safety required going forward. Rather, we believe new construction demand is largely determined by appropriate coverage levels. Therefore, we think population growth is likely the largest growth driver. In addition, while prisons are currently running at capacity utilization rates significantly higher than their designs, we expect that this trend will continue and will not provide a boost to construction going forward.

**Police-related and fire safety construction demand**

We think the drivers behind police-related and fire and rescue construction are largely similar. As a form of emergency services, the need for both services is largely driven by population coverage, in our view. In addition, we believe these services are mature, with a wide footprint and significant resources already in place. Therefore, we believe any growth in construction demand will be limited to increases in coverage required by population growth.

We forecast future construction spending on a dollar-per-population basis, assuming that this stays flat on a real basis through our forecast period. By using historical levels as our basis, we believe this approach also captures the replacement and rehabilitation construction costs of existing police-related and fire and rescue facilities. For our population growth forecast, we rely on the U.S. Census forecast.

We expect construction demand from police-related and fire and rescue to grow at 3% annually on a nominal basis, largely driven by annual population growth of less than 1% and inflation.

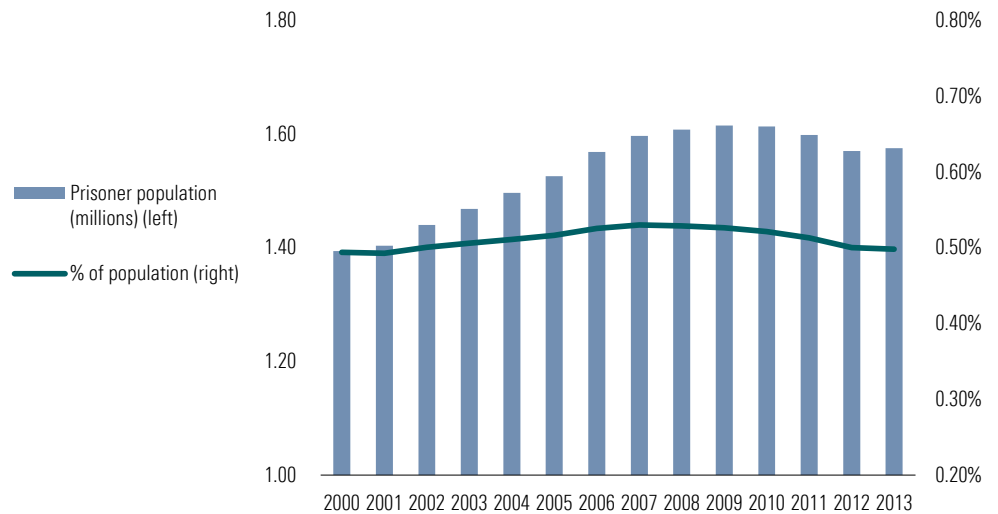
**Detention construction demand**

We think the main drivers behind detention construction are the prison population and states' budget health.

As shown in Exhibit 114, the U.S. prisoner population has remained relatively consistent relative to the total U.S. population rate over time. We forecast this proportion to remain within historical boundaries, barring a significant change in laws or law enforcement that drive incarceration rates higher. Therefore,

with annual population growth of less than 1%, we do not anticipate a growing prison population to drive detention construction growth.

**Exhibit 114.** The Number of Prisoners Has Remained Relatively Steady Over the Past Several Years  
Prisoner population in millions and as a percentage of the total U.S. population



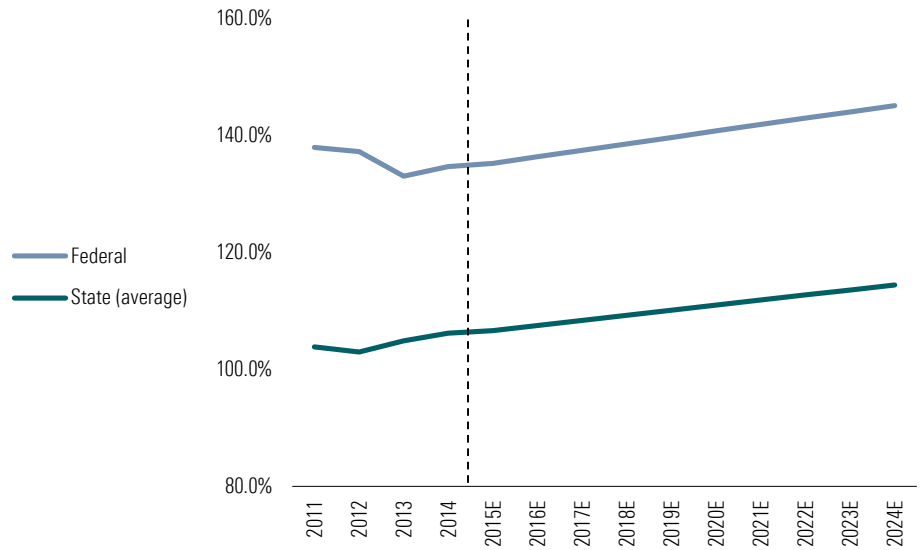
Source: U.S. Census Bureau, Bureau of Justice Statistics, Morningstar

Despite the relative stability of the number of prisoners, capacity utilization significantly exceeds rated design capacity. In 2013, federal and state prison systems operated at 133% and 105% of capacity, respectively. Yet, despite prison overcrowding, we don't anticipate an increase in detention facilities to alleviate strained capacity. Our belief is based on two assertions. First, prison overcapacity is not a new problem. Had governments viewed this as a high-priority issue, we believe budgets would have been expanded as the U.S. economy improved. However, detention spending remains well below peak levels. Second, state budgets are constrained. Although fiscal health varies by state, with some states facing significantly underfunded pension liabilities, state spending budgets have increased only roughly 3.5% annually on a nominal basis since 2000. Furthermore, any increase in detention spending would come at the expense of other categories. We think taxpayers are likely to favor spending on categories that directly benefit them, like education or roads, than pay for additional detention capacity.

We've built our forecast for detention construction spending by looking at construction dollars spent per prisoner. Given that there has been little capacity expansion in recent years, we think construction spending levels mainly represent replacement and refurbishment. Because we do not expect any capacity expansion, we believe these levels are appropriate for projecting future construction spending per prisoner. We note that from 2012 to 2014, detention construction spend has fallen 36%. Current levels remain well below the historical average. However, we assume that construction spend per prisoner recovers to historical levels rather than remaining at today's depressed levels.

We forecast construction demand for detention facilities to grow 4.5% per year on a real basis, driven by population growth and a return to historical levels of construction spending per prisoner. However, we note that our forecast construction spend would not be enough to support any meaningful detention capacity expansion. In fact, as shown in Exhibit 115, our forecast would imply additional strain on the overcapacity already seen in the detention system today.

**Exhibit 115.** We Think Capacity Expansion Is Unlikely, Further Straining Federal and State Prison Capacity  
Capacity utilization based on rated, operational, and design capacity



Source: U.S. Census Bureau, Bureau of Justice Statistics, Morningstar

However, our expectations for increasing overcapacity in the detention system may be partially alleviated by changes in laws and legal enforcement. For example, with many states passing laws decriminalizing marijuana possession, the incarceration rate may fall below historical levels. Drug arrests peaked in 2006 at nearly 1.2 million. By 2013, drug arrests had fallen 22.5%, half of which can be attributed to fewer marijuana possession arrests. Further decriminalization of marijuana can still alleviate overcapacity, as 13% of 2013 arrests were drug abuse violations, with 41% of those arrests attributable to marijuana possession alone.

**Conclusion**

Although public safety construction spending in 2014 remained well below the peak achieved in 2009, we expect moderate growth over the next decade. We forecast construction spending to grow 4.4% annually on a nominal basis, largely driven by population growth and a return to historical levels of detention facility construction spending per prisoner.

# Religious: Demographic Trends Lead to Permanent Reduction in Religious Construction

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**Sector Snapshot**

2014 PIP: \$3.6 billion  
 2004-2014 CAGR: (7.9%)  
 2014-2024E CAGR: 0.2%

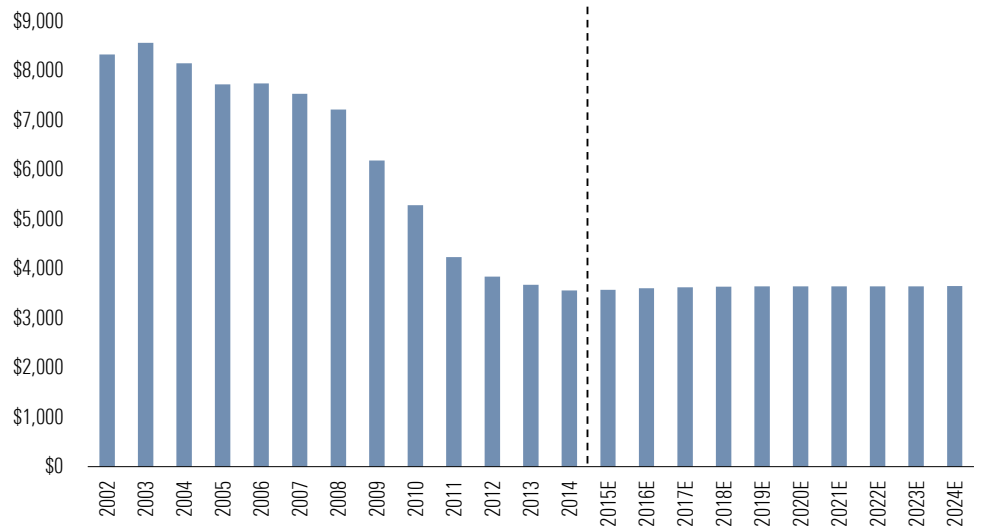
**2014 Sector Breakdown**

(percentages based on private spending)  
 Houses of worship: 85%  
 Other Religious (auxiliary buildings): 15%

**Key Takeaways**

- ▶ Even prior to the Great Recession, construction spending for religious purposes had been declining, with peak spending achieved in 2003. The Great Recession accelerated this decline, but spending levels seem to have stabilized in recent years.
- ▶ However, due to the shifts in demographics and lower religious rates among younger people, we expect nominal construction demand to remain roughly flat.

**Exhibit 116.** Religious Construction Will Remain Low in the Long Run, as Demographic Trends Weaken Demand  
 Construction put-in-place, in millions of current dollars



Source: U.S. Census Bureau, Morningstar

### What is religious construction and what determines it?

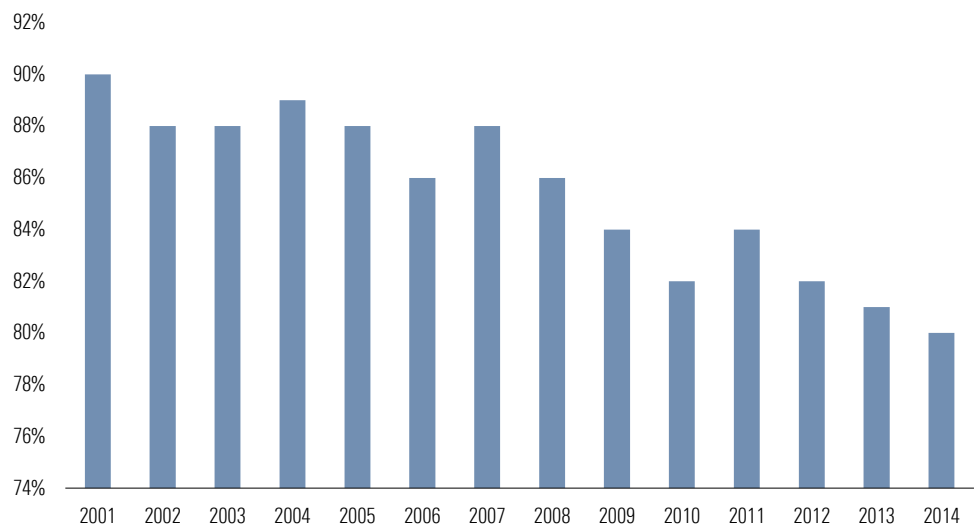
The U.S. Census Bureau defines religious construction as houses of worship (churches, mosques, synagogues, temples, and so on), other religious (sanctuaries, abbeys, convents, and so on), and auxiliary buildings. However, houses of worship constitute the majority of construction spend. It is important to note that this category does not include religious-affiliated buildings that serve other functions, such as schools and hospitals. These buildings are included in their functional categories.

We think the key driver for religious construction spending growth is the growth in religious charitable contributions. In our analysis, we've segmented the growth in religious charitable contributions into two parts: the growth in total charitable contributions and the portion of that directed to religious purposes. In other words, we've analyzed growth in the whole pie of charitable contributions and religion's slice of that pie.

For all charitable contributions, the biggest determinant is household income—people have to earn the money to donate it. In fact, the amount people give to charity as a percentage of their adjusted gross income, or AGI, has stayed relatively constant over the past several years at a little more than 2%. We forecast improving income to drive an increase in total charitable contributions of roughly 3% annually, and we assume that charitable contributions as a percentage of income remain in line with historical levels.

We think religion's share of charitable contributions will face secular headwinds in the coming years. As shown in Exhibit 117, a Gallup poll has shown a marked decrease in the percentage of people claiming a religion since 2000. Clearly, people who do not claim a religion are highly unlikely to direct their charitable donations to religion.

**Exhibit 117.** Over Time, Fewer and Fewer People Claim to Have a Religion  
Percentage of survey respondents who claim a religious preference



Going forward, we think demographic trends will only further erode potential religious contributors. In the Pew Research Center's U.S. Religious Landscape Survey from 2008, roughly 30% to 40% of respondents from the 18–29 and 30–49 age groups identified themselves as unaffiliated, including atheist and agnostic. In comparison, less than 10% to 20% of respondents from the 50–64 and 65 and over age groups identified themselves in the same way. Going forward, we think it is likely for the unaffiliated percentage to grow rather than decline. According to the Pew Research Center, historically, there have been a higher percentage of people who drop religion entirely than who convert to one having not had one.

We expect a slow secular decline of religion's share of charitable contributions. Despite a roughly 3% annual real increase in charitable contributions, we expect religious contributions to grow at a slower pace of roughly 2%.

### **Conclusion**

The percentage of religious contributions spent on construction has been declining over time. We think this makes sense, as contributions likely need to be above some operating expense level to fund something significant like new construction. With our expectation for religion's share of charitable contributions to decline over time, we expect the constraints for new construction to remain. In fact, we assume that construction as a percentage of contributions declines at 3.5% per year based on historical rates.

In all, we expect religious construction to remain nearly flat on a nominal basis. Our outlook is based on our expectation for a secular decline in the religious population, partially offset by an increase in household income. ■■■

## Detailed 10-Year Forecast

### Exhibit 118. Nonresidential Construction Long-Term Forecast

Construction put-in-place, in billions of current dollars

	2010	2011	2012	2013	2014	2015E	2016E	2017E	2018E	2019E	2020E	2021E	2022E	2023E	2024E	'04-'14	'14-'24E
<b>Nominal Construction Spending (\$ in billions)</b>																	
Lodging	\$11.6	\$9.1	\$10.8	\$13.6	\$16.1	\$18.4	\$19.2	\$19.5	\$20.0	\$20.4	\$21.3	\$22.3	\$23.4	\$24.5	\$25.6	2.7%	4.8%
Office	\$37.9	\$36.0	\$37.8	\$37.6	\$44.6	\$48.3	\$50.2	\$51.8	\$53.2	\$54.6	\$55.7	\$56.8	\$57.9	\$59.1	\$60.3	0.5%	3.0%
Commercial	\$40.1	\$42.8	\$47.3	\$51.0	\$57.3	\$61.0	\$65.3	\$69.5	\$73.7	\$77.8	\$81.8	\$85.7	\$89.4	\$92.8	\$96.0	-1.6%	5.3%
Health Care	\$39.3	\$40.2	\$42.5	\$41.5	\$39.0	\$40.7	\$43.5	\$46.4	\$49.1	\$51.3	\$53.2	\$55.3	\$57.5	\$59.7	\$62.0	1.9%	4.8%
Educational	\$88.4	\$85.0	\$84.7	\$78.0	\$78.4	\$80.5	\$83.7	\$87.0	\$90.2	\$92.8	\$95.1	\$97.4	\$99.8	\$102.2	\$104.7	0.5%	2.9%
Religious	\$5.3	\$4.2	\$3.8	\$3.7	\$3.6	\$3.6	\$3.6	\$3.6	\$3.6	\$3.6	\$3.6	\$3.6	\$3.7	\$3.7	\$3.7	-7.9%	0.2%
Public Safety	\$11.2	\$10.4	\$10.4	\$9.7	\$9.3	\$9.7	\$10.1	\$10.6	\$11.1	\$11.6	\$12.1	\$12.6	\$13.2	\$13.8	\$14.4	2.9%	4.4%
Amusement and Recreation	\$16.9	\$16.0	\$15.5	\$15.5	\$16.7	\$16.9	\$17.0	\$17.2	\$17.4	\$17.6	\$17.8	\$18.1	\$18.3	\$18.5	\$18.8	0.0%	1.2%
Transportation	\$38.3	\$34.7	\$37.9	\$39.7	\$41.9	\$44.8	\$47.4	\$50.0	\$52.6	\$54.7	\$56.6	\$58.2	\$59.7	\$61.2	\$62.8	5.3%	4.1%
Communication	\$17.7	\$17.7	\$16.2	\$17.3	\$16.1	\$16.5	\$16.9	\$17.3	\$17.7	\$18.0	\$18.3	\$18.6	\$18.9	\$19.2	\$19.5	0.3%	2.0%
Power	\$77.9	\$75.2	\$97.4	\$90.6	\$100.8	\$108.3	\$99.9	\$96.8	\$98.4	\$102.6	\$106.8	\$111.1	\$115.6	\$120.3	\$125.3	11.0%	2.2%
Highway and Street	\$82.5	\$79.3	\$80.5	\$81.2	\$84.0	\$91.0	\$97.2	\$103.5	\$110.0	\$116.5	\$120.8	\$124.9	\$128.8	\$132.3	\$136.0	3.7%	4.9%
Sewage and Waste	\$26.0	\$22.7	\$22.3	\$21.7	\$22.7	\$23.6	\$24.8	\$26.1	\$27.3	\$28.6	\$30.0	\$31.4	\$32.8	\$34.3	\$35.8	2.4%	4.7%
Water Supply	\$15.3	\$14.2	\$13.2	\$13.5	\$12.9	\$14.5	\$15.7	\$16.9	\$18.2	\$19.5	\$20.9	\$21.5	\$22.1	\$22.8	\$23.4	0.3%	6.1%
Conservation	\$7.2	\$7.5	\$6.2	\$6.0	\$7.5	\$7.7	\$8.0	\$8.2	\$8.5	\$8.8	\$9.1	\$9.4	\$9.7	\$10.0	\$10.3	6.4%	3.2%
Manufacturing	\$41.2	\$40.6	\$47.7	\$47.9	\$55.5	\$61.2	\$68.6	\$72.2	\$75.7	\$79.6	\$83.7	\$88.0	\$92.6	\$97.5	\$102.6	9.0%	6.3%
<b>Total</b>	<b>\$556.9</b>	<b>\$535.7</b>	<b>\$574.4</b>	<b>\$568.6</b>	<b>\$606.4</b>	<b>\$646.8</b>	<b>\$671.3</b>	<b>\$696.8</b>	<b>\$726.7</b>	<b>\$758.2</b>	<b>\$786.8</b>	<b>\$814.8</b>	<b>\$843.2</b>	<b>\$871.9</b>	<b>\$901.2</b>	<b>3.0%</b>	<b>4.0%</b>
<b>Y-o-Y Growth %</b>																	
Lodging	-54.4%	-21.5%	18.7%	25.4%	18.6%	13.9%	4.5%	1.7%	2.5%	1.9%	4.6%	4.7%	4.7%	4.7%	4.7%		
Office	-27.1%	-4.9%	5.0%	-0.5%	18.6%	8.2%	4.0%	3.0%	2.8%	2.6%	2.0%	2.0%	2.0%	2.0%	2.0%		
Commercial	-26.7%	6.8%	10.6%	7.7%	12.3%	6.6%	7.0%	6.5%	6.0%	5.6%	5.1%	4.7%	4.3%	3.9%	3.4%		
Health Care	-12.3%	2.2%	5.8%	-2.5%	-6.0%	4.4%	6.8%	6.8%	5.7%	4.7%	3.6%	4.0%	3.9%	3.9%	3.9%		
Educational	-14.3%	-3.9%	-0.4%	-7.9%	0.6%	2.7%	3.9%	3.9%	3.7%	2.9%	2.4%	2.4%	2.4%	2.4%	2.4%		
Religious	-14.6%	-19.8%	-9.3%	-4.4%	-3.0%	0.4%	0.9%	0.6%	0.3%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%		
Public Safety	-19.1%	-6.7%	0.2%	-7.5%	-3.3%	3.9%	4.6%	4.6%	4.5%	4.5%	4.5%	4.4%	4.4%	4.4%	4.4%		
Amusement and Recreation	-12.7%	-5.6%	-3.2%	0.2%	7.5%	1.1%	1.1%	1.1%	1.1%	1.2%	1.2%	1.3%	1.3%	1.3%	1.4%		
Transportation	4.5%	-9.4%	9.0%	4.9%	5.4%	6.9%	6.0%	5.5%	5.2%	3.9%	3.6%	2.7%	2.7%	2.6%	2.5%		
Communication	-10.2%	-0.3%	-8.6%	7.0%	-7.0%	2.7%	2.6%	2.2%	2.0%	1.7%	1.7%	1.7%	1.7%	1.7%	1.7%		
Power	-12.3%	-3.5%	28.6%	-7.0%	11.2%	7.5%	-7.8%	-3.1%	1.6%	4.4%	4.0%	4.0%	4.1%	4.1%	4.1%		
Highway and Street	0.4%	-3.9%	1.5%	0.8%	3.4%	8.3%	6.8%	6.5%	6.2%	5.9%	3.7%	3.4%	3.1%	2.8%	2.8%		
Sewage and Waste	4.7%	-12.6%	-2.0%	-2.6%	4.7%	4.2%	5.0%	5.0%	4.9%	4.8%	4.7%	4.6%	4.6%	4.5%	4.4%		
Water Supply	-1.0%	-7.6%	-6.7%	2.2%	-4.2%	12.2%	8.2%	7.8%	7.5%	7.2%	6.9%	2.9%	2.9%	2.9%	2.9%		
Conservation	24.7%	5.1%	-17.4%	-3.2%	24.6%	3.0%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%	3.3%		
Manufacturing	-28.9%	-1.5%	17.7%	0.4%	15.8%	10.2%	12.1%	5.2%	4.9%	5.1%	5.2%	5.2%	5.2%	5.2%	5.3%		
<b>Total</b>	<b>-14.5%</b>	<b>-3.8%</b>	<b>7.2%</b>	<b>-1.0%</b>	<b>6.6%</b>	<b>6.7%</b>	<b>3.8%</b>	<b>3.8%</b>	<b>4.3%</b>	<b>4.3%</b>	<b>3.8%</b>	<b>3.6%</b>	<b>3.5%</b>	<b>3.4%</b>	<b>3.4%</b>		

Source: U.S. Census Bureau, Morningstar

## Relevant Coverage and Top Picks

The tables below show U.S. residential and non-residential construction exposure across Morningstar's coverage list, including companies from the materials, industrials, consumer, and financial sectors.

For non-financials, inclusion in the table requires residential or non-residential construction individually account for at least 10% of revenue. Since investors are buying shares in a company rather than a stake in revenues, we augment the revenue figure with operating leverage and financial leverage metrics to arrive at a better gauge of equity exposure. Operating leverage, rated as "High," "Medium," or "Low", represents our analyst's assessment of leverage over fixed costs. We measure financial leverage as the ratio of net debt to market enterprise value.

Among non-financials levered to US construction, our top picks include Weyerhaeuser, Nucor, and NVR. Weyerhaeuser's highly-productive timberland holdings and large lumber and panel business give it significant leverage to rising U.S. lumber demand and Canadian lumber supply constraints. Nucor, a low-cost steelmaker, manufactures a wide variety of steel products for construction and is currently emerging from a cyclical trough within the broader steel industry. Land-light NVR stands out as the only homebuilder able to produce economic profits and healthy free cash flow generation over a full housing cycle.

For financial firms, we focus on mortgage and construction lending exposure--both income statement and balance sheet. Since financial firms are highly levered, we deem those with at least 5% of loans in construction lending or those that we expect to produce 5% of revenue via mortgage origination as having "Medium" exposure to housing. Firms with similar levels of exposure to both, or those that derive 10% of revenue from mortgage lending or with over 10% of their loan books devoted to construction receive "High" ratings.

Among financials, our top construction-levered picks include US Bank, BB&T, and Fifth Third. US Bank generates a high percentage of revenue from housing-related lines of business and is one of the most profitable banks we cover. BB&T is particular levered to a rebounding housing market in the Southeast. Fifth Third's exposure to manufacturing employment in the Midwest makes it a twofold play on an improving economy.



## Exhibit 119 Relevant Coverage

General		Economic Moat				Valuation		Rating		Equity exposure		Revenue exposure (Unlevered)		Leverage	
Company	Industry	Analyst	Mkt cap (\$B)	Moat	Moat trend	Price	FVE Uncertainty	Rating	Res	Non-Res	Res	Non-Res	Operating	Financial	
<b>Sector: Basic Materials</b>															
Plum Creek PCL	Timberland	Rohr	7.43	None	Stable	42.18	35.00 High	★★	High	Medium	60%	15%	Low	24%	
Rayonier RYN	Timberland	Rohr	3.28	None	Stable	25.86	26.00 High	★★★	High	Medium	60%	15%	Low	16%	
Weyerhaeuser WY	Timberland	Rohr	16.77	None	Stable	32.01	39.00 High	★★★★	High	Medium	60%	15%	Medium	16%	
Albemarle ALB	Chemicals	Wang	6.73	Initiating Coverage	Initiating Coverage	60.01	Initiating Coverage		Low	Low	10%	5%	Medium	6%	
Chemours CC	Chemicals	Wang	n/a	Initiating Coverage	Initiating Coverage	n/a	Initiating Coverage		Low	Low	10%	10%	Medium	n/a	
Huntsman HUN	Chemicals	Wang	5.64	Initiating Coverage	Initiating Coverage	22.97	Initiating Coverage		High	Low	20%	10%	Medium	44%	
PPG Industries PPG	Chemicals	Stafford	30.15	Narrow	Stable	221.58	180.00 High	★★	Medium	Low	15%	5%	Medium	10%	
Sherwin-Williams SHW	Chemicals	Wang	25.62	Initiating Coverage	Initiating Coverage	274.93	Initiating Coverage		High	Medium	60%	15%	Medium	6%	
Valspar VAL	Chemicals	Wang	6.63	Initiating Coverage	Initiating Coverage	81.56	Initiating Coverage		High	Low	25%	10%	Medium	18%	
Westlake WLK	Chemicals	Wang	9.91	Initiating Coverage	Initiating Coverage	74.38	Initiating Coverage		Medium	Low	20%	10%	High	-1%	
CRH CRH	Cement	Inton	20.81	None	Stable	28.10	30.00 High	★★★	Medium	High	16%	37%	High	12%	
CEMEX CX	Cement	Inton	121.02	Narrow	Stable	9.73	12.00 Very High	★★★	Low	High	3%	18%	High	50%	
Heidelberg Cement ETR.HEI	Cement	Inton	EUR 13.31	Narrow	Stable	EUR 70.81	EUR 78.00 High	★★★	Low	High	3%	16%	High	34%	
Holcim VTX.HOLN	Cement	Inton	CHF 24.53	Narrow	Stable	CHF 75.00	CHF 84.00 High	★★★	Low	High	3%	14%	High	23%	
Lafarge EPA.LG	Cement	Inton	EUR 18.93	Narrow	Stable	EUR 65.84	EUR 73.00 High	★★★	Medium	High	1%	7%	High	33%	
Martin Marietta MLM	Aggregates	Inton	9.89	Narrow	Stable	146.88	168.00 High	★★★	Medium	High	12%	76%	Medium	14%	
Vulcan Materials VMC	Aggregates	Inton	11.34	Narrow	Stable	85.50	82.00 High	★★★	Medium	High	12%	88%	Medium	14%	
Commercial Metals CMC	Steel	Lane	1.94	None	Stable	16.23	19.00 High	★★★	Low	High	10%	80%	High	38%	
Gerdau GGB	Steel	Lane	5.99	None	Negative	3.52	4.60 Very High	★★★	Low	High	5%	25%	High	43%	
Nucor Corp. NUE	Steel	Lane	15.61	Narrow	Positive	48.90	62.00 Medium	★★★	Low	High	5%	35%	High	19%	
Reliance Steel RS	Steel	Lane	4.84	None	Stable	64.76	69.00 High	★★★	Low	High	5%	25%	Medium	31%	
Schnitzer SCHN	Steel	Lane	0.46	None	Stable	17.26	15.00 High	★★	Low	High	0%	15%	Medium	41%	
Steel Dynamics STLD	Steel	Lane	5.32	Narrow	Stable	22.01	22.00 High	★★★	Low	High	5%	35%	High	32%	
United States Steel X	Steel	Lane	3.50	None	Negative	24.01	28.00 Very High	★★★	Low	Low	0%	10%	High	36%	
<b>Sector: Consumer</b>															
Home Depot HD	Home Improvement	Katz	140.3	Wide	Stable	108.06	104.00 Medium	★★★	High	Low	80%	0%	Low	10%	
Lowe's Companies LOW	Home Improvement	Katz	67.03	Wide	Stable	70.43	71.00 Medium	★★★	High	Low	81%	0%	Low	14%	

Source: Company Reports, Morningstar  
Data as of 5/5/2015

Exhibit 120 Relevant Coverage

General		Economic Moat			Valuation		Rating		Equity exposure		Revenue exposure (Unlevered)		Leverage	
Company	Industry	Analyst	Mkt cap (\$B)	Moat	Moat trend	Price	FVE	Uncertainty	Rating	Res	Non-Res	Res	Non-Res	Operating Financial
<b>Sector: Industrials</b>														
D.R. Horton DHI	Homebuilding	Krapfel	9.20	None	Stable	25.18	23.00	High	★★★	High	Low	100%	0%	Low
Lennar LEN	Homebuilding	Krapfel	9.30	None	Stable	45.32	47.00	High	★★★	High	Low	100%	0%	Low
NVR NVR	Homebuilding	Krapfel	5.37	None	Stable	1,321.00	1,600.00	Medium	★★★★	High	Low	100%	0%	Low
PulteGroup PHM	Homebuilding	Krapfel	7.13	None	Stable	19.46	23.00	High	★★★★	High	Low	100%	0%	Low
Taylor Morrison TMHC	Homebuilding	Krapfel	0.60	None	Stable	18.26	21.00	High	★★★★	High	Low	100%	0%	Low
Toll Brothers TOL	Homebuilding	Krapfel	6.24	None	Stable	35.54	34.00	High	★★★★	High	Low	100%	0%	Low
Fortune Brands H&S FBHS	Building Supplier	Krapfel	7.11	Narrow	Stable	44.63	48.00	High	★★★★	High	Low	65%	5%	Medium
Lennox LI	Building Supplier	Krapfel	4.81	Narrow	Stable	106.80	114.00	High	★★★★	High	High	50%	26%	Medium
Masco MAS	Building Supplier	Krapfel	9.33	Narrow	Stable	26.76	24.00	High	★★★★	High	Low	70%	4%	Medium
Mohawk MHK	Building Supplier	Krapfel	12.90	None	Stable	176.55	120.00	High	★★	High	Medium	56%	14%	Medium
Owens Corning OC	Building Supplier	Krapfel	4.60	None	Stable	38.95	38.00	High	★★★★	High	Medium	57%	20%	Medium
USG USG	Building Supplier	Krapfel	3.92	Narrow	Stable	26.98	31.00	High	★★★★	High	High	45%	37%	High
Allegion ALLE	Security	Krapfel	5.93	Narrow	Stable	61.50	59.00	Medium	★★★★	Medium	High	20%	42%	Medium
Graco GGG	Diversified Industrial	Krapfel	4.24	Wide	Stable	72.23	77.00	Medium	★★★★	Medium	Medium	16%	16%	Medium
Ingersoll Rand IR	Diversified Industrial	Krapfel	17.33	Narrow	Stable	65.83	71.00	High	★★★★	Medium	High	13%	30%	Medium
Tyco TYC	Diversified Industrial	Krapfel	16.59	Narrow	Stable	39.50	40.00	Medium	★★★★	Low	Medium	0%	17%	Medium
Zillow Group Z	Real Estate Information	Krapfel	5.37	Narrow	Positive	92.84	114.00	Very High	★★★★	High	Low	100%	0%	High
Fastenal FAST	Industrial Distribution	Webb	12.24	Wide	Stable	41.64	47.00	Medium	★★★★	Low	High	5%	25%	Low
HD Supply HDS	Industrial Distribution	Webb	6.39	Narrow	Stable	32.38	26.00	Medium	★★	Low	High	10%	20%	Medium
Wesco Int'l WCC	Industrial Distribution	Webb	3.15	Narrow	Stable	71.14	82.00	Medium	★★★★	Low	Medium	6%	12%	Low
Caterpillar CAT	Construction Machinery	Webb	52.52	Wide	Negative	87.00	79.00	High	★★★★	Low	Low	4%	9%	Medium
Terex Corp TEX	Construction Machinery	Webb	2.95	None	Stable	27.85	34.00	High	★★★★	Low	Medium	5%	20%	Medium
Ritchie Bros RBA	Business Services	Webb	2.76	Wide	Stable	25.59	30.00	Medium	★★★★	Low	High	10%	30%	Low
Boral BLD.ASX	Buildings Materials	Mann	AUD 4.87	None	Stable	AUD 6.22	4.90	Very High	★★	Medium	Low	18%	0%	High
James Hardie JHX.ASX	Buildings Materials	Mann	AUD 6.60	Narrow	Stable	AUD 14.83	14.00	High	★★★★	High	Low	72%	5%	Medium

Source: Company Reports, Morningstar

Data as of 5/5/2015

Exhibit 121 Relevant Coverage

General			Economic Moat			Valuation			Loan Exposure			Financial Leverage		
Company	Industry	Analyst	Mkt cap (\$B)	Moat	Moat Trend	Price	FVE	Uncertainty	Rating	Equity Exposure	Mortgage Income / Rev.	Const. Loans / Total Loans	Res. Mortgage / Total Loans	Equity / Assets
Wells Fargo WFC	Banks	Sinegal	287.14	Narrow	Stable	55.73	58.00	Medium	★★★	High	8%	2%	33%	11%
Bank of America BAC	Banks	Sinegal	172.65	Narrow	Stable	16.35	17.00	High	★★★	Low	2%	0%	19%	12%
JP Morgan Chase JPM	Banks	Sinegal	241.30	Narrow	Stable	64.40	62.00	High	★★★	Medium	5%	0%	13%	9%
Citigroup Inc C	Banks	Sinegal	164.34	Narrow	Stable	53.35	57.00	High	★★★	Low	0%	0%	28%	11%
M&T Bank MTB	Banks	Sinegal	17.18	Narrow	Stable	120.30	117.00	Medium	★★★	High	8%	8%	13%	13%
U.S. Bancorp USB	Banks	Werner	66.55	Narrow	Stable	43.25	50.00	Medium	★★★	High	5%	4%	22%	11%
PNC Financial PNC	Banks	Werner	48.56	Narrow	Stable	93.11	106.00	Medium	★★★	Medium	4%	0%	7%	13%
Capital One Financial COF	Consumer Finance	Werner	45.37	Narrow	Stable	82.26	93.00	Medium	★★★	Low	0%	0%	15%	15%
Firstmerit FIMER	Banks	Werner	3.19	Narrow	Stable	19.15	21.00	Medium	★★★	Low	0%	0%	7%	11%
Webster Financial WBS	Banks	Werner	3.23	None	Stable	35.79	31.00	Medium	★★	Low	0%	0%	25%	10%
Valley National Bancorp VLY	Banks	Werner	2.20	None	Stable	9.38	10.00	Medium	★★★	Medium	0%	4%	19%	10%
TCF Financial TCF	Banks	Werner	2.63	None	Stable	15.56	19.00	High	★★★	Low	0%	0%	19%	11%
BB&T	Banks	Werner	28.27	Narrow	Stable	38.97	43.00	Medium	★★★	Medium	4%	0%	26%	13%
SunTrust Banks STI	Banks	Werner	22.20	None	Stable	42.17	42.00	Medium	★★★	High	14%	1%	23%	12%
Regions Financial RF	Banks	Werner	13.40	None	Stable	9.91	10.00	Medium	★★★	Medium	4%	2%	17%	13%
BOK Financial BOKF	Banks	Puls	4.49	Narrow	Stable	64.43	64.00	Medium	★★★	High	10%	2%	16%	11%
Comerica CMA	Banks	Puls	8.59	Narrow	Stable	47.95	51.00	Medium	★★★	Medium	0%	4%	4%	11%
Cullen/Frost Bankers CFR	Banks	Puls	4.68	Narrow	Stable	73.48	67.00	Medium	★★★	Medium	0%	7%	0%	10%
Fifth Third Bancorp FITB	Banks	Puls	16.65	Narrow	Stable	20.35	23.00	Medium	★★★	Medium	5%	2%	14%	11%
Fulton Financial FULT	Banks	Puls	2.19	None	Stable	12.16	12.00	Medium	★★★	Medium	3%	5%	11%	12%
Huntington Bancshares HBA	Banks	Puls	8.95	Narrow	Stable	10.98	11.00	Medium	★★★	Medium	3%	2%	12%	10%
KeyCorp KEY	Banks	Puls	12.51	None	Positive	14.65	14.00	Medium	★★★	Low	1%	2%	4%	11%
New York Community Banco Thrifts and Mortgage Fin: Puls	Thrifts and Mortgage	Fin: Puls	7.65	Narrow	Stable	17.22	15.00	Medium	★★	Medium	6%	1%	66%	12%
People's United Financial PBI Thrifts and Mortgage Fin: Puls	Thrifts and Mortgage	Fin: Puls	4.67	Narrow	Stable	15.07	15.00	Medium	★★★	Low	0%	0%	19%	13%
Trustmark TRMK	Banks	Puls	1.62	Narrow	Stable	23.80	25.00	Medium	★★★	High	4%	10%	24%	12%
Zions Bancorp ZION	Banks	Puls	5.84	None	Stable	28.64	30.00	Medium	★★★	Medium	0%	6%	13%	13%

Source: Company Reports, Morningstar Data as of 5/5/2015

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Morningstar Institutional Equity Research provides independent, fundamental equity research differentiated by a consistent focus on sustainable competitive advantages, or Economic Moats.

**For More Information**

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