Powered by UBS Evidence Lab

Machinery, Engineering & Construction

Non-Res Construction: Getting more positive on 2017 as private sector signals are supportive

Equities

Americas
Heavy Machinery

Steven Fisher, CFA
Analyst
steven.fisher@ubs.com
+1-212-713 8634

Cleve Rueckert
Associate Analyst
cleve.rueckert@ubs.com
+1-212-713 4913

Ajit Agrawal, PhD
Strategist
ajit.agrawal@ubs.com
+1-212-713 2053

Shannon O'Callaghan
Analyst
shannon.ocallaghan@ubs.com
+1-212-713 2716

Erika Jackson
Associate Analyst
erika.jackson@ubs.com
+1-212-713 1426

Raising our 2017 non-res forecast to +2%, from flat

We continue to expect a slow-down in US non-residential construction spending in 2017 to 2% growth, from 4% in 2016, but we are more positive than we were six months ago, and raise our forecast to 2% growth from flat. We think the Private sector could remain stronger for longer as office construction still has a robust pipeline of completions ahead; healthy consumer spending and required structures to support online shopping mitigate store closings/support commercial construction; and automotive construction returns to the US. Additionally, we expect Public sector spending to have some support from a sustained economic recovery, delayed FAST Act impact, and more recent state initiatives. Our views are shaped by UBS Evidence Lab analysis, expert discussions, and subsector data gathering.

Cycle may plateau; still cautious on the Gulf Coast; infrastructure swing factor

A 2% advance in 2017 would be the fourth year of growth after three years of trough. 2017 would be the 6th year of private sector upcycle. We are still concerned about a Gulf Coast slowdown, as the number of major project approvals in the region has been limited over the last 12-18mo. We think office construction could soften exiting 2017. Infrastructure remains a wild card, as federal support is a possibility, but timing and amounts are uncertain. Our base case assumes a modest stimulus, but it might not be visible until 2019. Accordingly, we think non-res activity could plateau at current levels.

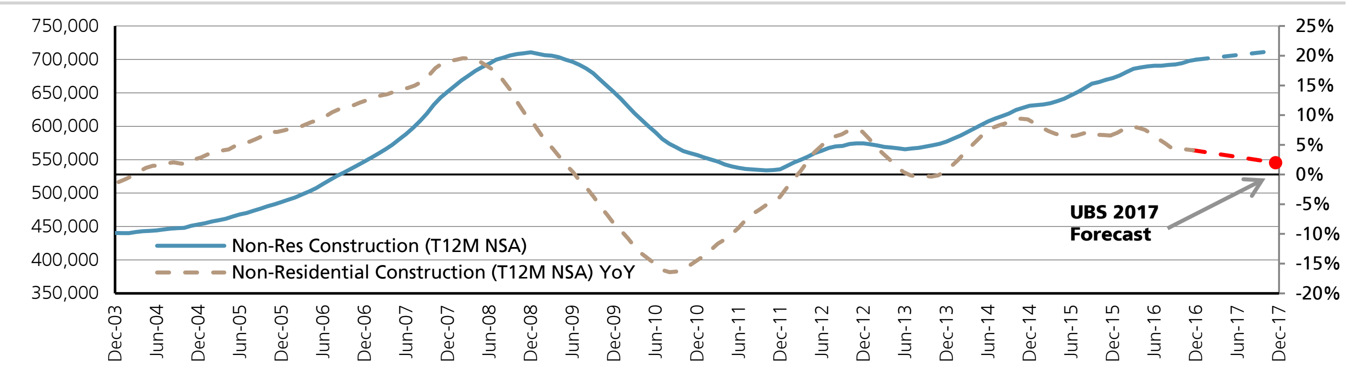
UBS Evidence Lab Macro: Forecasting flattening private activity

UBS Evidence Lab Macro data tends to lead monthly private non-residential construction spending (ex-Power) as reported by the Value of Construction Put in Place Survey by US Census Bureau by 6-9 months. Our data indicate a likely flattening of growth in non-res spending over the coming year. The analysis suggests the YoY growth of non-res spending ex-Power will slow from 8.2% in 2016 to flat over the next six to nine months.

The US non-residential market's breadth includes a variety of stocks

Industrial stocks with exposure to US non-res construction include: Machinery (HEES, URI, TEX, CAT, MTW, ITW, KMT, DE, CMI), E&C (TPC, PWR, BW, CBI, JEC, ACM, FLS, KBR, FLR), Other Industrial (LII, NCS, IR, ETN, JCI), and Steel (RS, NUE, STLD).

Figure 1: US Non-Residential Construction – Trailing 12 Months (Not Seasonally Adjusted)



Source: US Census, UBS estimates

www.ubs.com/investmentresearch

Contents

Steven Fisher, CFA
Analyst
steven.fisher@ubs.com
+1-212-713 8634

Cleve Rueckert
Associate Analyst
cleve.rueckert@ubs.com
+1-212-713 4913

Ajit Agrawal, PhD
Strategist
ajit.agrawal@ubs.com
+1-212-713 2053

Shannon O'Callaghan
Analyst
shannon.ocallaghan@ubs.com
+1-212-713 2716

Erika Jackson
Associate Analyst
erika.jackson@ubs.com
+1-212-713 1426

Summary and Conclusions

Non-residential construction is a key indicator of demand for engineering and construction services and heavy machinery.

We expect modest growth in 2017 and 2018, with 2017 driven by a continuation of Private spending growth.

(1) We expect a modest 2% growth rate in 2017 as ongoing growth in Office construction offsets a further decline in Manufacturing.

(2) We think the public infrastructure categories, including Highway and Street, Transportation and Water, Sewage & Waste could grow slightly in 2017 and then accelerate somewhat in 2018. That said, 2018 remains uncertain and dependent on government (Federal/State/Local) actions this year.

(3) Timing of public funding and federal spending and a potential rollover in Office construction are the main source of uncertainty in our forecast assumptions.

Forecasting 2017 Non-Residential Construction +2.0%

The non-residential construction market grew 4.1% in 2016, with strong growth in Office spending (+24.9%) more than offsetting weakness in Manufacturing and Transportation (-4.3% and -6.2% respectively).

- **Expecting continued Private growth in 2017 (+2-3%).** Office construction had the largest impact of any category on 2016 growth. We expect the growth rate to slow, but continue to expect the Office market to rise in 2017 based on scheduled project completions. We expect Manufacturing to be the biggest drag on 2017 Private spending, as we think new project starts are unlikely to replace LNG and chemical projects nearing peak levels on the Gulf Coast.

- **Expecting modest Public spending growth in 2017 (+1-2%).** Our initial forecast had contemplated ~6.5% growth in public spending, driven by Highway & Street and Transportation growth of 10% in each category. Public spending declined slightly in 2016, with Highway and Street up 1.9% and Transportation down 6.1%. We think the FAST Act passed in December 2015 could have sparked a wave of project planning, and combined with the election may have slowed down spending. We expect some recovery in 2017.

Figure 2: UBS 2017 Non-Residential Construction Forecasts

	Dec 2016	Pct of	2016	UBSe			
	T12M	Total	Growth	2017	Prior	2018	Prior
Office	68,937	10%	24.9%	10.0%	3.0%	-5.0%	-5.0%
Transportation	42,794	6%	-6.1%	2.0%	2.0%	6.0%	6.0%
Education	88,692	13%	6.2%	2.0%	0.0%	1.0%	1.0%
Health Care	41,415	6%	1.7%	2.0%	0.0%	1.0%	1.0%
Commercial	74,243	11%	10.9%	2.0%	-2.0%	-1.0%	-1.0%
Highway and Street	91,431	13%	1.9%	2.0%	2.0%	6.0%	6.0%
Power	95,261	14%	3.1%	2.0%	0.0%	5.0%	5.0%
Water, Sewage & Waste	34,019	5%	-9.0%	1.0%	1.0%	5.0%	5.0%
Manufacturing	74,829	11%	-4.3%	-5.0%	-7.0%	-5.0%	-5.0%
Other	88,105	13%	6.8%	2.0%	1.0%	3.0%	0.0%
Total	**699,726**	**100%**	**4.1%**	**2.0%**	**-0.1%**	**1.5%**	**1.3%**

Source: US Census, UBS estimates

What drives our forecast?

We use variety of inputs to analyze the non-residential construction market and generate our forecasts by category for the coming year. These include, but are not limited to:

(1) **UBS Evidence Lab Macro:** The UBS Evidence Lab Macro team uses a quantitative model based on a sampling of local building permits from around the country. The forecast, discussed and presented in further detail later, has been an accurate indicator of growth in private non-residential construction spending, excluding the Power category, with a lead time of six to nine months.

(2) **Industry expert discussions:** We have an ongoing dialogue with industry experts throughout the year to update our view on both construction categories and regional markets. Recently we have spoken with experts in the energy market (link to LNG report), office market (link to office report), and infrastructure market (link to infrastructure report).

(3) **Data point digging:** We analyze news articles from around the country in an effort to track corporate development plans, upcoming capital expenditures, and government policy focus. We augment this work with periodic deep dives into specific end markets, such as our December report: Q-Series: How could a new wave of infrastructure spending impact the construction sector?

(4) **Trend analysis:** We have assembled our US Non-Residential Construction Dashboard (page 25) of roughly 30 data series we track and believe have relevance to the construction market. Additionally we follow the subcategories within the construction market (page 52 and page 56) to try and understand the trends driving growth or contraction and whether these are likely to persist.

Details on our outlook and views for 2017

We explain some of the drivers (not an exhaustive list) of the six largest categories that make up 70% of the total spending.

- **Office construction:** Our industry discussions indicate that completions are expected to more than double in 2017 vs. 2016. Office vacancy rates are at a structurally low level. The UBS REIT team believes New York is improving.
- **Education:** Education construction is funded in large part by taxes and bond issuances. Muni bond issuances have improved; tax revenues have improved; and we have identified some major new spending programs in large urban school districts (i.e. Boston and Baltimore). Overall, we forecast growth, but a moderation as a school refurbishment cycle has already been underway.
- **Commercial:** While some major department stores and retail chains are closing locations, some of the largest (i.e. Walmart) are now expanding again. Additionally, warehousing is continuing to expand, and there is a steady stream of news items citing Amazon expansion plans.
- **Power:** The number of planned gas fired power plants remains robust and utility capex remains at a high level. We expect growth to come from the pipeline category.
- **Highway & Street:** We forecast steady, low single digit growth. We see potential for better growth once any federal stimulus program gets passed, but in the meantime, we think the impact of the FAST Act and state level initiatives will keep growth in this category slow but steady.
- **Manufacturing:** We forecast another year of decline (slight moderation) as the first wave of Gulf Coast chemical projects winds down, partly offset by some auto and other factory construction returns to the US, prompted by new administration policies.

10 data points on Non-Residential Construction as we begin 2017

(1)	Office completions are expected to more than double in 2017	(6)	Dodge Construction starts trended better
(2)	New York office sentiment is improving	(7)	Boston and Baltimore have started $1b+ school construction programs
(3)	Houston retail market is weathering the downturn better than expected	(8)	Auto capex is coming back to the US
(4)	Walmart now increasing the number of stores	(9)	CMBS spreads have come down from peak levels
(5)	Amazon is making a big push into logistics	(10)	But still no new major Gulf Coast LNG/Chemical awards yet

Our preferred exposure is mid and small cap. Buy ratings include mid-caps TEX, ACM, and TPC; and small-cap NCS.

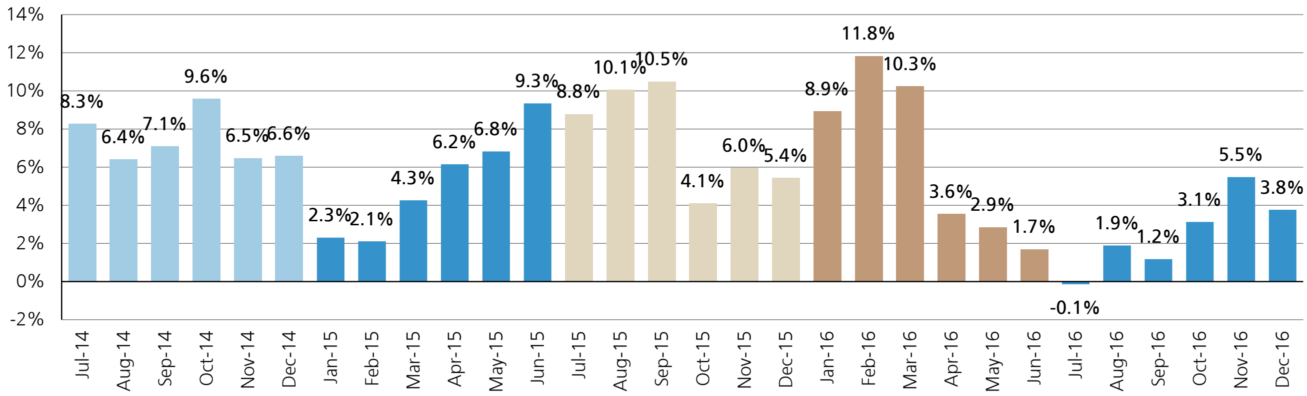
How did 2016 play out?

Private: Steady and strong

Public: Volatile and generally weak

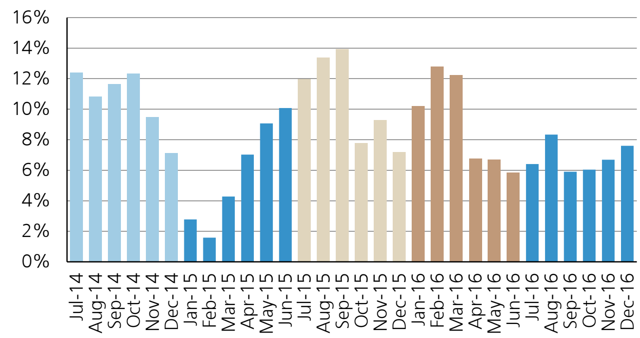
The overall pace of spending in 2016 was roughly as we expected. The year started off strong, but the growth rate slowed mid-year before recovering and ending the year up roughly 4%. Public spending drove volatility as private markets remained on a relatively steady growth trajectory, and even accelerated into the end of the year. We had expected a more significant slow-down in private spending, and public markets underperformed our expectations on a mid-year slowdown in Highway and Street spending. The biggest curveball was the US election result and the renewed speculation on incremental infrastructure investment.

Figure 3: Total Non-Residential Construction Spending (YoY)



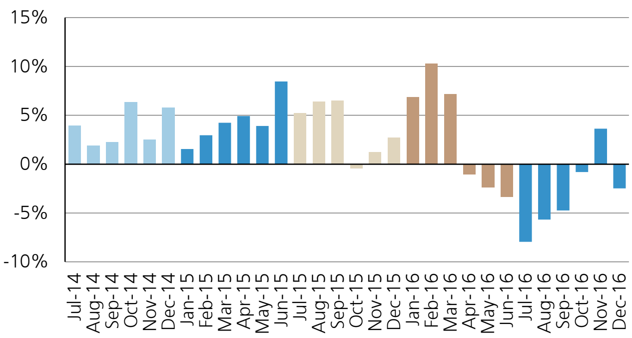
Source: US Census Bureau, UBS estimates

Figure 4: Private Non-Res Spending (YoY)



Source: US Census Bureau, UBS estimates

Figure 5: Public Non-Res Spending (YoY)



Source: US Census Bureau, UBS estimates

Figure 6: US non-residential construction growth rate by month (not seasonally adjusted)

Total Non-Residential	% of Total	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	2016
Total Non-Residential		**4.1%**	**6.0%**	**5.4%**	**8.9%**	**11.8%**	**10.3%**	**3.6%**	**2.9%**	**1.7%**	**-0.1%**	**1.9%**	**1.2%**	**3.1%**	**5.5%**	**3.8%**	**4.1%**
Public	40%	-0.5%	1.3%	2.7%	6.9%	10.3%	7.2%	-1.1%	-2.4%	-3.4%	-7.9%	-5.7%	-4.7%	-0.8%	3.6%	-2.5%	-1.0%
Private	60%	7.8%	9.3%	7.2%	10.2%	12.8%	12.2%	6.8%	6.7%	5.8%	6.4%	8.3%	5.9%	6.0%	6.7%	7.6%	7.8%
Lodging	4%	21.7%	22.1%	20.7%	23.7%	30.7%	36.1%	30.1%	30.5%	20.4%	23.1%	20.8%	22.1%	20.1%	27.0%	17.9%	24.8%
Office	10%	15.9%	24.2%	15.9%	17.8%	25.5%	24.3%	20.9%	16.5%	24.0%	23.3%	27.8%	29.9%	30.5%	25.6%	29.9%	24.9%
Commercial	11%	1.3%	0.1%	2.4%	11.3%	16.7%	13.0%	7.2%	6.1%	8.3%	8.8%	11.1%	9.8%	10.5%	16.8%	13.4%	10.9%
Health Care	6%	2.5%	9.8%	0.1%	-1.8%	4.8%	8.2%	2.6%	5.2%	-1.2%	-4.7%	2.1%	-0.7%	2.9%	-1.7%	6.3%	1.7%
Educational	13%	1.2%	7.5%	7.8%	10.2%	15.8%	13.9%	6.8%	1.1%	2.9%	-0.9%	3.4%	5.2%	9.2%	10.1%	5.4%	6.2%
Religious	1%	10.9%	5.1%	2.1%	9.6%	9.1%	17.3%	19.6%	5.7%	3.4%	-4.8%	3.7%	-9.6%	-13.8%	-0.3%	-4.9%	1.9%
Public Safety	1%	-7.4%	-7.1%	-5.9%	-3.6%	-3.0%	-10.4%	-6.9%	-3.6%	-7.8%	-10.0%	-11.9%	-11.4%	-10.8%	-3.8%	-2.7%	-7.4%
Amusement and recreation	3%	14.9%	11.7%	12.0%	14.8%	15.1%	16.0%	11.5%	9.7%	3.8%	3.7%	7.2%	4.0%	8.2%	14.6%	12.7%	9.6%
Transportation	6%	6.0%	5.7%	4.3%	-0.3%	2.7%	0.9%	-7.2%	-3.7%	-4.3%	-5.1%	-13.1%	-14.4%	-9.3%	-6.3%	-6.2%	-6.1%
Communication	3%	30.2%	31.3%	26.3%	19.5%	13.4%	2.1%	-8.9%	-8.0%	-6.5%	-13.6%	-7.1%	-13.3%	-10.7%	-2.0%	1.2%	-3.9%
Power	14%	-9.0%	-2.5%	0.0%	10.5%	10.5%	7.8%	4.1%	5.9%	6.4%	0.8%	-1.6%	-1.8%	0.8%	-1.7%	-1.3%	3.1%
Highway & Street	13%	1.5%	-1.3%	9.3%	15.8%	15.6%	15.8%	-1.9%	-1.2%	-3.3%	-6.1%	-3.7%	-0.2%	3.2%	13.1%	0.3%	1.9%
Sewage and Waste Disposal	3%	-0.9%	-6.8%	-8.9%	7.0%	7.6%	-0.5%	-0.9%	-9.7%	-16.3%	-16.8%	-10.0%	-15.4%	-12.6%	-10.0%	-18.8%	-8.8%
Water Supply	2%	-3.8%	-9.8%	-16.1%	-12.5%	4.2%	-3.5%	-8.0%	-9.4%	-16.0%	-17.9%	-14.3%	-12.7%	-9.8%	-5.1%	1.2%	-9.4%
Conservation & Development	1%	-3.9%	5.3%	-10.2%	0.2%	-0.5%	1.6%	-6.6%	1.9%	2.5%	-18.2%	-16.3%	-8.2%	-8.5%	-2.2%	14.0%	-4.0%
Manufacturing	11%	16.3%	13.9%	6.9%	3.0%	2.1%	2.2%	-4.7%	-3.9%	-8.0%	-2.7%	0.9%	-7.2%	-10.1%	-10.2%	-9.4%	-4.3%

Source: US Census Bureau, UBS Estimates

Public spending

Public spending started strong in Q1, in-line with our positive expectations, but the Highway and Street category (which makes up 22% of public spending) swung sharply to a decline in April. Every public sector category declined in July 2016, possibly a result of indecision and uncertainty during an election year. Growth has since recovered, and public markets ended 2016 roughly flat with 2015.

Figure 7: Public spending heat map

Public	% of Total	Oct-15 -0.5%	Nov-15 1.3%	Dec-15 2.7%	Jan-16 6.9%	Feb-16 10.3%	Mar-16 7.2%	Apr-16 -1.1%	May-16 -2.4%	Jun-16 -3.4%	Jul-16 -7.9%	Aug-16 -5.7%	Sep-16 -4.7%	Oct-16 -0.8%	Nov-16 3.6%	Dec-16 -2.5%	2016 -1.0%
Amusement and recreation	2%	5.8%	1.7%	9.0%	2.8%	2.4%	-0.5%	2.2%	0.0%	-8.1%	-8.9%	-7.6%	-10.5%	0.6%	5.8%	-1.0%	-2.4%
Commercial	1%	25.1%	28.6%	46.4%	76.1%	75.2%	76.2%	66.7%	37.9%	8.2%	-17.3%	3.0%	11.5%	9.6%	17.7%	5.3%	23.7%
Conservation & Development	2%	-4.1%	6.9%	-9.3%	1.0%	0.8%	2.8%	-6.0%	2.7%	2.0%	-18.5%	-16.7%	-7.8%	-7.0%	-1.2%	14.3%	-3.5%
Educational	17%	0.8%	8.7%	8.6%	10.5%	15.7%	14.2%	6.3%	-0.5%	2.6%	-2.7%	1.9%	2.2%	7.7%	6.8%	1.6%	4.7%
Health Care	2%	-13.9%	-9.2%	-6.0%	-5.1%	-0.6%	3.9%	1.1%	-7.3%	-5.8%	-2.8%	12.8%	7.7%	0.6%	4.7%	2.4%	1.0%
Highway & Street	22%	1.4%	-0.8%	9.8%	15.8%	15.7%	16.0%	-1.9%	-1.1%	-3.3%	-5.9%	-3.6%	0.1%	3.5%	13.2%	0.5%	2.0%
Office	2%	2.9%	1.8%	-4.7%	-8.0%	0.9%	-3.7%	-9.3%	-12.4%	-4.4%	-6.3%	5.4%	3.2%	-3.0%	10.2%	2.1%	-2.2%
Power	2%	-30.0%	-0.4%	-23.4%	-3.0%	-6.5%	-25.6%	-14.2%	-1.5%	9.1%	-32.7%	-45.5%	-38.8%	-17.8%	-30.3%	-30.6%	-20.6%
Public Safety	2%	-5.1%	-4.4%	-3.9%	-0.6%	-0.3%	-7.5%	-4.0%	-1.2%	-6.4%	-9.5%	-11.6%	-11.4%	-10.6%	-4.2%	-2.0%	-6.1%
Sewage and Waste Disposal	6%	-1.8%	-7.5%	-9.4%	6.4%	6.5%	-1.2%	-1.6%	-10.2%	-17.0%	-17.7%	-10.8%	-15.5%	-12.5%	-9.9%	-19.0%	-9.3%
Transportation	8%	5.4%	6.0%	7.1%	3.3%	8.5%	5.2%	-9.0%	-3.6%	-4.9%	-5.5%	-11.9%	-14.1%	-9.7%	-6.3%	-5.8%	-5.2%
Water Supply	3%	-3.4%	-9.6%	-12.3%	-10.1%	7.9%	-0.1%	-5.2%	-6.6%	-13.8%	-15.3%	-10.6%	-9.6%	-7.3%	-2.0%	0.7%	-6.7%

Source: US Census Bureau, UBS estimates

Private spending

Private spending growth remained relatively steady in 2016, slowing only moderately from 10-12% in Q1 to 6-8% for the balance of the year. As we expected, Manufacturing growth slowed as fewer petrochemical and LNG export plants started construction in 2016. Spending in the Office category remained particularly robust. The monthly YoY growth rate in Office spending has exceeded 10% since October 2013 in what has been the most protracted advance in spending of the current construction cycle.

Figure 8: Private spending heat map

	% of	Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	2016
Private	Total	7.8%	9.3%	7.2%	10.2%	12.8%	12.2%	6.8%	6.7%	5.8%	6.4%	8.3%	5.9%	6.0%	6.7%	7.6%	7.8%
Amusement and recreation	3%	25.7%	23.4%	15.0%	27.1%	27.9%	34.6%	21.6%	21.0%	17.4%	17.2%	23.9%	19.7%	15.8%	23.1%	25.9%	22.4%
Commercial	17%	0.5%	-0.8%	1.0%	9.4%	14.7%	10.8%	5.4%	4.9%	8.3%	9.9%	11.5%	9.8%	10.5%	16.7%	13.8%	10.4%
Communication	5%	30.9%	31.7%	26.6%	19.5%	12.9%	2.8%	-8.9%	-8.2%	-6.4%	-13.4%	-7.1%	-12.9%	-10.4%	-1.8%	1.3%	-3.8%
Educational	4%	2.8%	2.8%	5.0%	9.4%	15.8%	12.9%	8.6%	6.8%	4.0%	7.1%	10.0%	17.9%	15.2%	22.9%	19.7%	12.2%
Health Care	8%	7.8%	15.6%	2.0%	-0.9%	6.4%	9.5%	3.0%	8.7%	0.0%	-5.2%	-0.4%	-2.7%	3.5%	-3.3%	7.4%	1.9%
Lodging	6%	21.8%	22.4%	21.3%	25.5%	31.2%	37.8%	31.0%	31.3%	22.0%	25.2%	22.7%	25.9%	21.6%	27.7%	18.7%	26.4%
Manufacturing	19%	16.1%	13.7%	6.7%	2.6%	1.8%	2.2%	-4.9%	-3.9%	-8.0%	-2.4%	0.7%	-7.2%	-9.8%	-10.2%	-9.4%	-4.3%
Office	13%	18.2%	28.3%	20.0%	22.9%	30.1%	29.2%	26.5%	22.0%	28.9%	28.2%	31.3%	34.3%	35.7%	27.9%	34.1%	29.5%
Power	21%	-6.0%	-2.8%	3.1%	12.1%	12.7%	12.3%	6.7%	6.8%	6.0%	5.5%	5.7%	3.3%	2.8%	1.2%	1.6%	6.1%
Religious	1%	11.3%	5.1%	2.1%	9.6%	9.5%	17.7%	19.6%	6.0%	3.8%	-4.8%	4.0%	-9.4%	-13.5%	-0.3%	-4.9%	2.1%
Transportation	3%	7.5%	5.0%	-1.5%	-8.6%	-12.1%	-10.1%	-2.8%	-3.9%	-2.7%	-4.0%	-15.9%	-15.2%	-8.3%	-6.5%	-7.0%	-8.1%

Source: US Census Bureau, UBS estimates

Figure 9: Annual construction spending and YoY growth

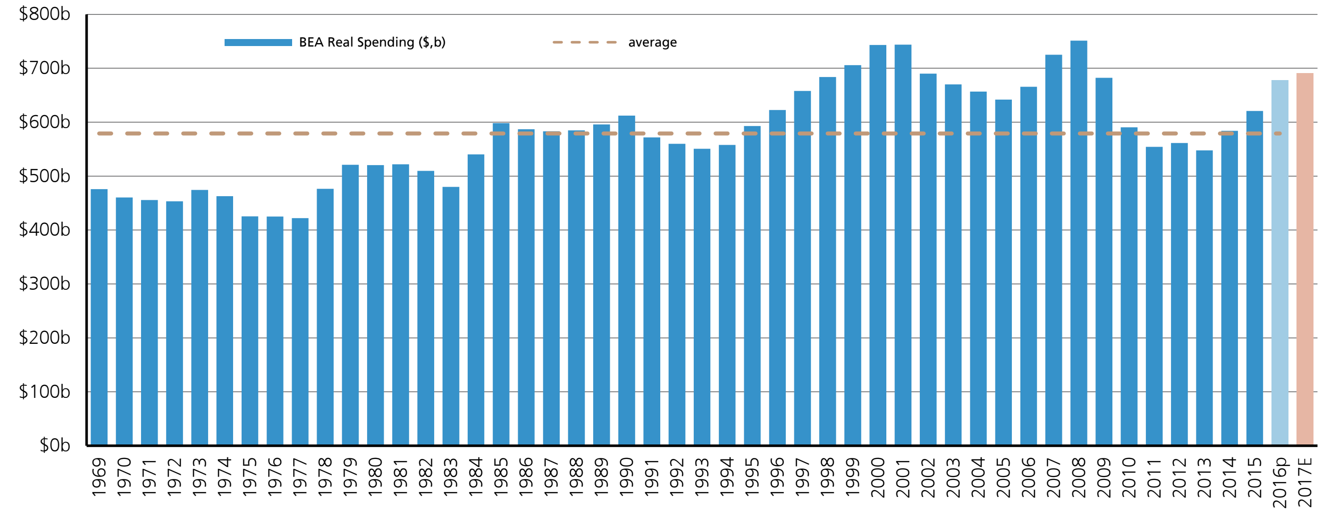
	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total Construction	1,161,282	1,147,953	1,077,351	906,544	809,254	788,331	850,456	906,351	1,005,629	1,112,433	1,162,351
Residential	613,875	496,068	366,661	255,543	252,330	252,646	276,057	329,218	374,859	440,255	462,640
Non-Residential	547,409	651,884	710,690	651,003	556,930	535,688	574,401	577,135	630,768	672,177	699,710
YoY	*12.5%*	*19.1%*	*9.0%*	*-8.4%*	*-14.5%*	*-3.8%*	*7.2%*	*0.5%*	*9.3%*	*6.6%*	*4.1%*
Total Public	249,303	281,852	301,250	306,881	293,674	277,885	273,038	264,847	271,062	282,329	279,563
Total Private	298,106	370,033	409,439	344,122	263,258	257,805	301,362	312,288	359,707	389,850	420,146
Manufacturing	32,676	40,633	54,105	57,898	41,179	40,560	47,741	50,547	58,648	78,179	74,829
Lodging	18,139	28,708	35,806	25,498	11,635	9,130	10,836	13,486	16,737	21,728	27,123
Amusement and recreation	19,033	21,214	21,829	19,406	16,943	15,995	15,482	15,206	16,776	19,878	21,794
Office	54,187	65,262	68,565	51,909	37,849	36,010	37,800	37,979	46,584	55,189	68,937
Communication	22,219	27,581	26,490	19,755	17,730	17,687	16,166	17,783	17,298	20,506	19,699
Conservation & Development	5,129	5,263	5,232	5,752	7,172	7,540	6,229	5,968	7,310	7,988	7,669
Commercial	76,713	89,684	86,213	54,736	40,102	42,816	47,335	53,160	62,843	66,926	74,243
Sewage and Waste Disposal	23,186	24,872	25,697	24,831	25,991	22,710	22,263	22,427	23,172	24,284	22,143
Transportation	27,964	31,879	35,472	36,700	38,341	34,738	37,862	39,460	42,044	45,566	42,794
Highway & Street	72,039	76,682	81,362	82,166	82,529	79,324	80,546	81,364	84,743	89,751	91,431
Educational	84,929	96,758	104,891	103,203	88,405	84,986	84,673	79,059	79,681	83,518	88,692
Religious	7,750	7,539	7,225	6,193	5,289	4,241	3,848	3,590	3,388	3,667	3,736
Health Care	38,472	43,767	46,902	44,846	39,344	40,203	42,545	40,689	38,647	40,735	41,415
Water Supply	14,961	15,799	16,753	15,470	15,323	14,164	13,219	13,597	13,380	13,106	11,876
Public Safety	7,768	10,203	13,085	13,789	11,154	10,409	10,432	9,507	9,438	8,728	8,084
Power	42,242	66,056	81,075	88,862	77,946	75,186	97,436	93,319	110,089	92,436	95,261
Total Construction	4.0%	-1.1%	-6.2%	-15.9%	-10.7%	-2.6%	7.9%	6.6%	11.0%	10.6%	4.5%
Residential	-2.6%	-19.2%	-26.1%	-30.3%	-1.3%	0.1%	9.3%	19.3%	13.9%	17.4%	5.1%
Non-Residential	12.5%	19.1%	9.0%	-8.4%	-14.5%	-3.8%	7.2%	0.5%	9.3%	6.6%	4.1%
Total Public	9.1%	13.1%	6.9%	1.9%	-4.3%	-5.4%	-1.7%	-3.0%	2.3%	4.2%	-1.0%
Total Private	15.5%	24.1%	10.6%	-16.0%	-23.5%	-2.1%	16.9%	3.6%	15.2%	8.4%	7.8%
Manufacturing	14.4%	24.4%	33.2%	7.0%	-28.9%	-1.5%	17.7%	5.9%	16.0%	33.3%	-4.3%
Lodging	41.3%	58.3%	24.7%	-28.8%	-54.4%	-21.5%	18.7%	24.5%	24.1%	29.8%	24.8%
Amusement and recreation	24.9%	11.5%	2.9%	-11.1%	-12.7%	-5.6%	-3.2%	-1.8%	10.3%	18.5%	9.6%
Office	18.4%	20.4%	5.1%	-24.3%	-27.1%	-4.9%	5.0%	0.5%	22.7%	18.5%	24.9%
Communication	17.5%	24.1%	-4.0%	-25.4%	-10.3%	-0.2%	-8.6%	10.0%	-2.7%	18.5%	-3.9%
Conservation & Development	15.2%	2.6%	-0.6%	9.9%	24.7%	5.1%	-17.4%	-4.2%	22.5%	9.3%	-4.0%
Commercial	9.2%	16.9%	-3.9%	-36.5%	-26.7%	6.8%	10.6%	12.3%	18.2%	6.5%	10.9%
Sewage and Waste Disposal	16.7%	7.3%	3.3%	-3.4%	4.7%	-12.6%	-2.0%	0.7%	3.3%	4.8%	-8.8%
Transportation	11.6%	14.0%	11.3%	3.5%	4.5%	-9.4%	9.0%	4.2%	6.5%	8.4%	-6.1%
Highway & Street	12.3%	6.4%	6.1%	1.0%	0.4%	-3.9%	1.5%	1.0%	4.2%	5.9%	1.9%
Educational	6.6%	13.9%	8.4%	-1.6%	-14.3%	-3.9%	-0.4%	-6.6%	0.8%	4.8%	6.2%
Religious	0.2%	-2.7%	-4.2%	-14.3%	-14.6%	-19.8%	-9.3%	-6.7%	-5.6%	8.2%	1.9%
Health Care	11.7%	13.8%	7.2%	-4.4%	-12.3%	2.2%	5.8%	-4.4%	-5.0%	5.4%	1.7%
Water Supply	6.7%	5.6%	6.0%	-7.7%	-1.0%	-7.6%	-6.7%	2.9%	-1.6%	-2.0%	-9.4%
Public Safety	6.2%	31.3%	28.2%	5.4%	-19.1%	-6.7%	0.2%	-8.9%	-0.7%	-7.5%	-7.4%
Power	10.1%	56.4%	22.7%	9.6%	-12.3%	-3.5%	29.6%	-4.2%	18.0%	-16.0%	3.1%

Source: US Census Bureau

The Big Picture: Where are we in the Cycle?

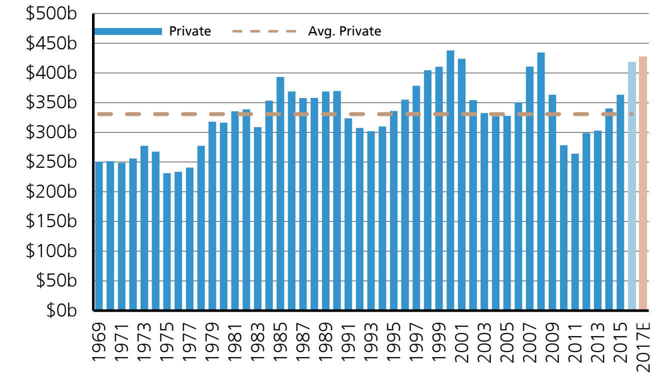
On a real basis, we think private spending has peaked, and we think the non-residential construction market could be roughly flat in 2017. In the first three quarters of 2016, real private spending averaged 8.4% growth, versus public spending averaging a 0.1% decline. Real private spending is now up 58% from the 2011 trough, the strongest run of private growth since the decade from 1975 to 1985. Public spending disappointed in 2016, and after a promising start it remains only slightly above trough levels. While we expect another year of modest growth in 2017, we also see less downside risk to public spending.

Figure 10: Non-residential spending (real 2009 $)



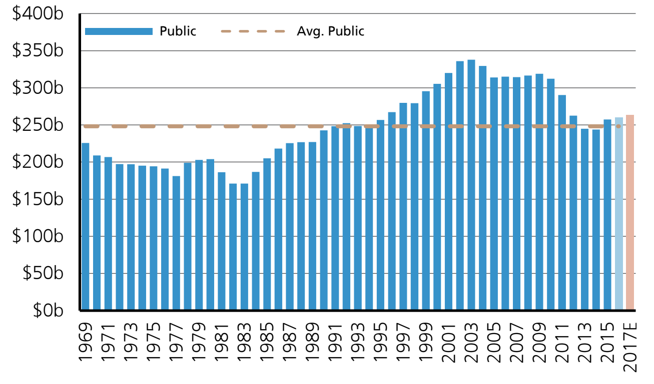
Source: BEA

Figure 11: Private non-residential spending (real 2009 $)



Source: BEA

Figure 12: Public non-residential spending (real 2009 $)



Source: BEA

We think it is informative to examine non-residential construction cycles in terms of real spending (which we have done in the past - link); however, real spending data on the individual categories within non-residential construction are less available on historical basis. In Figure 13 we look at the nine key categories considered in our forecasts, and the market as a whole on a nominal basis.

Several trends stand out:

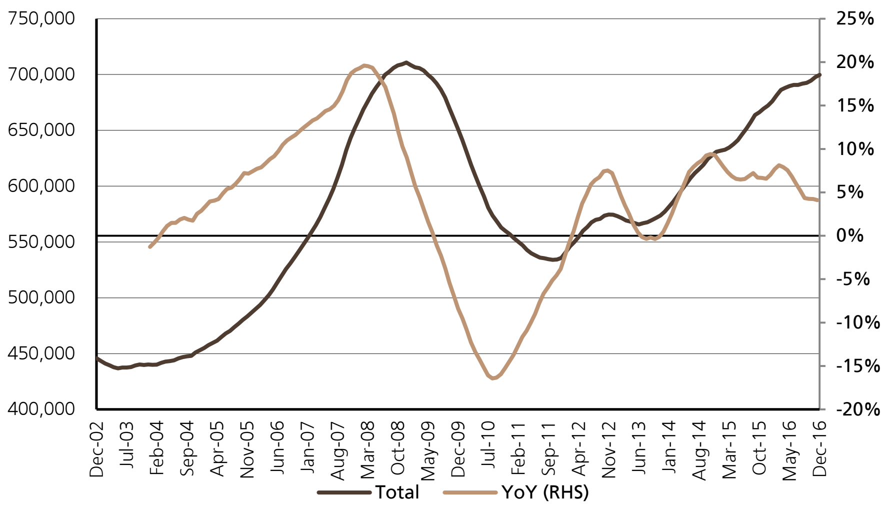
- The nominal market is within 5% of its prior peak.
- Two categories are within 5% of the prior peak. Manufacturing has peaked and is declining.
- Three categories are showing slowing growth rates or accelerating declines. Only two categories are showing meaningful acceleration in growth.
- Trailing 12 month year-over-year growth in the office category was significantly stronger than any other category in the most recent month.

Figure 13: Current non-residential construction cycles (T12M basis)

	Current Level	Current Trend	Direction	Peak / Trough	Peak Level	Peak Date	Trough Level	Trough Date
Commercial	74,243	10.9%	2.3%	66%	92,141	4/1/08	39,218	3/1/11
Education	88,692	6.2%	0.0%	44%	107,474	7/1/09	73,848	5/1/04
Health care	41,415	1.7%	-0.5%	71%	47,369	4/1/09	27,139	12/1/02
Highway and street	91,431	1.9%	0.6%	99%	91,698	3/1/16	56,840	2/1/04
Manufacturing	74,829	-4.3%	-3.3%	93%	78,600	3/1/16	20,927	7/1/03
Office	68,937	24.9%	1.2%	100%	69,059	9/1/08	35,505	10/1/11
Power	95,261	3.1%	0.0%	77%	113,230	9/1/14	35,256	1/1/05
Transportation	42,794	-6.1%	-1.8%	86%	45,665	3/1/16	24,579	6/1/04
Water, Sewage & Waste	34,019	-9.0%	-0.1%	38%	42,577	1/1/09	28,664	5/1/03
Other	88,105	6.8%	-0.8%	55%	110,102	9/1/08	61,557	1/1/04
Total	699,710	4.1%	-0.2%	96%	710,690	12/1/08	436,852	5/1/03

Source: US Census, UBS

Figure 14: Non-residential construction spending (T12M)



Source: US Census

We think the non-residential construction market could be at somewhat of a crossroads. On a trailing twelve month basis, growth in spending slowed for most

of 2016. However, the growth rate began to stabilize in September as declines in the Public sector improved. The most important question is whether growth will reaccelerate in 2017, possibly driven by Highway and Street spending and easier public sector comparisons in the summer, or whether growth will continue to weaken if Office spending slows and the Manufacturing category continues to decline.

Below we look more closely at the longer-term trends of the key categories.

Accelerating Growth Trajectory

We observe four non-residential construction categories that are exhibiting an accelerating growth trajectory. We define accelerating growth as the sequential change in the growth rate. A categories shifting to +5% from +4% or to -4% from -5% would both qualify as showing accelerating growth.

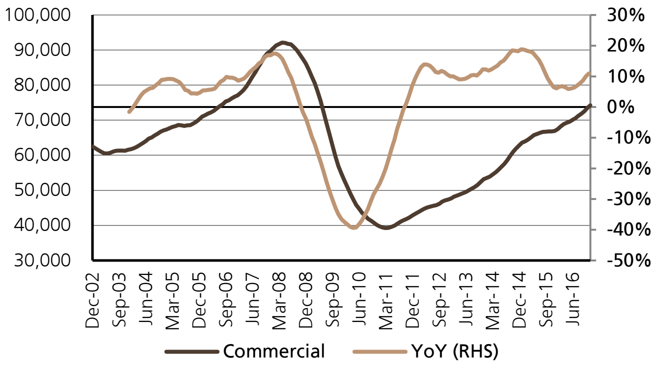
- **Commercial** growth slowed from nearly 20% YoY in late 2014 to roughly 6% in the middle of 2016. Since May 2016, the growth rate has been steadily accelerating, and was up 10.9% in December. The commercial construction cycle seems to be intact for the time being.

- **Highway and Street** growth was a major disappointment in 2016, as we had expected the 2015 passage of the FAST Act to help civil infrastructure investment. Trailing twelve month growth slowed from 8.1% in March 2016 to just 1.1% in September and October. However, YoY growth improved to 1.9% in December, and the monthly growth rate has also seen improvement. We think there could be some pent up investment, resulting from delayed spending due to project planning in 2016, which could see growth accelerate further in 2017. 1Q16 comps are still tough, but YoY growth could improve as 2017 progresses.

- **Office** growth continues to impress us. The growth rate slowed from the low 20%s in late 2014 to the high teens in 2015 and early 2016, which we thought could be the beginning of a broader slowing in office construction. Growth began to re-accelerate in early 2016, and continued to do so in November and December. We do not expect Office construction growth to continue at the current rate.

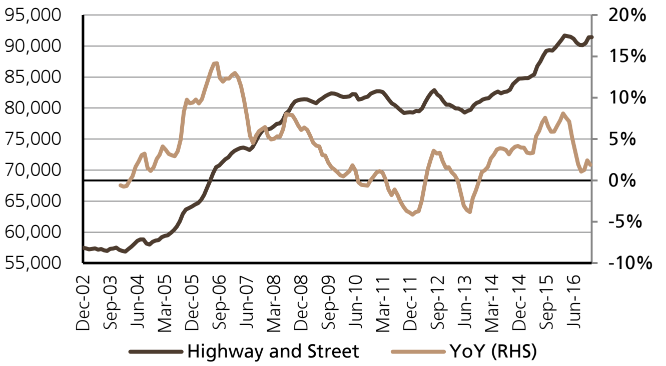
- **Education** growth has been a little bit more choppy in recent months, but is still seeing an acceleration since September. The growth rate is up to 6.2% in November. Given the low base and relative trajectory of the prior cycle, we think the Education category could continue growing modestly for several more years.

Figure 15: Commercial has accelerated over the last several months



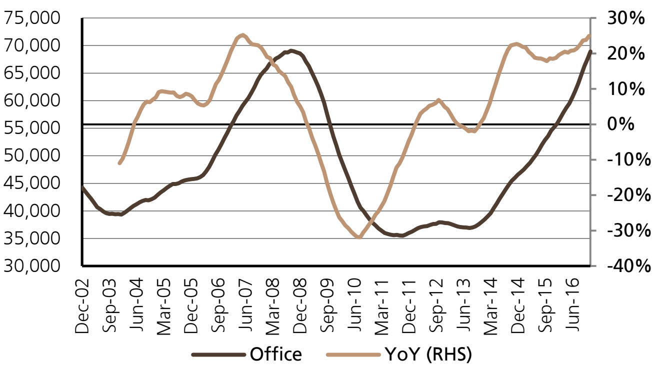
Source: US Census Bureau

Figure 16: Highway and Street growth only recently troughed, but could accelerate further in the summer



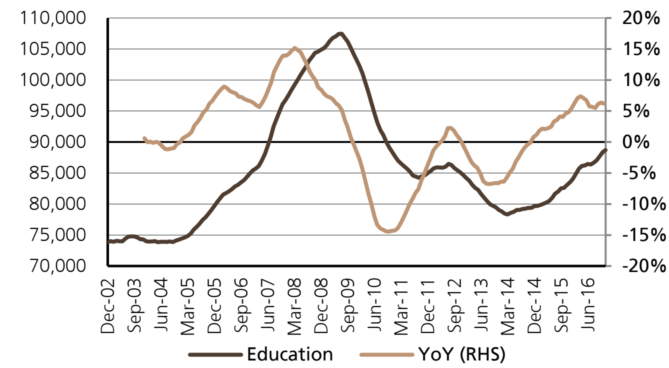
Source: US Census Bureau

Figure 17: Office construction growth continues to accelerate, albeit at a slower rate



Source: US Census Bureau

Figure 18: Education spending growth is reaccelerating modestly



Source: US Census Bureau

Neutral Growth Trajectory

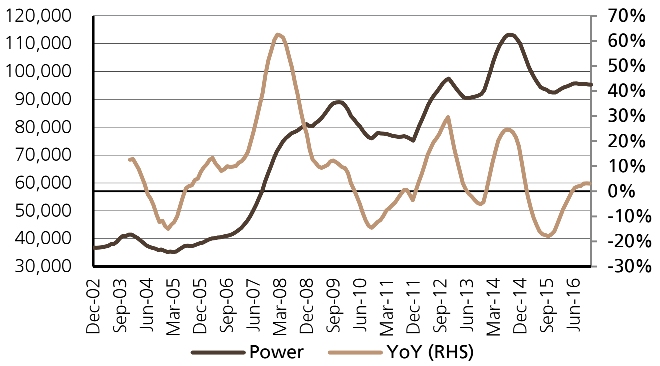
We see two categories with neutral growth, which we define as a stable growth rate, so a category growing 20% YoY or one showing no YoY growth could be counted if the rate of change is stable from month to month. Categories with neutral growth could be at inflection points.

- **Power** growth had been improving from sharp YoY declines that troughed at nearly -20%. Power spending slowed significantly as oil prices declined, but has since stabilized at a trailing twelve month dollar value averaging ~$95b/year. Based on the slowing growth rate and turning trajectory of underlying investment dollars, we think there is some risk that Power could roll over, but our base case is for modest growth in 2017.

- **Water, Sewage & Waste** was the weakest growing category in 2016 and posted a ~9% decline. On a more positive note, the rate of decline stabilized at ~8.8% from October to November. While spending is still declining (both YoY and on a sequential basis), we think many of the assets considered in the

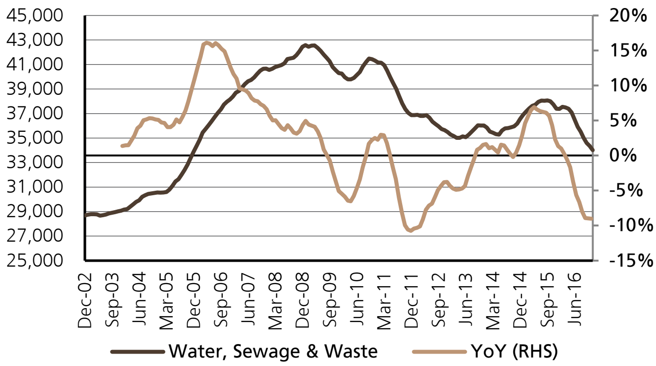
category fall into the infrastructure bucket, and therefore could benefit if a new infrastructure spending bill is passed at the Federal level.

Figure 19: Power spending growth had been accelerating but the trend could be rolling over



Source: US Census Bureau

Figure 20: Water, Sewage & Waste is declining the fastest of any category, but the rate of decline could be slowing



Source: US Census Bureau

Weakening Growth Trajectory

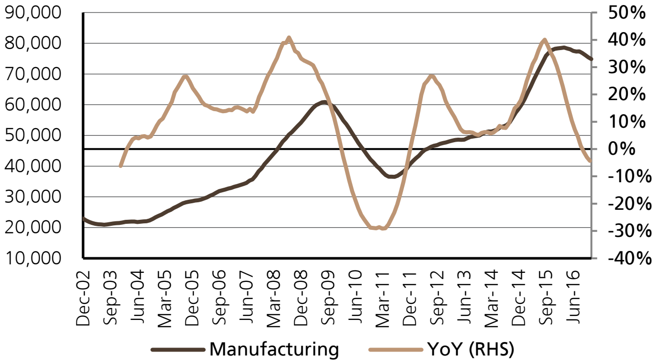
- **Manufacturing** spending weakened the most of all the key categories we track. The large LNG and petrochemical projects being constructed on the Gulf Coast are classified in Manufacturing, and we think a lack of new project FIDs over the last twelve months will result in a longer-term slowdown in spending. Year over year comparisons start to ease in the second half of 2017, but we see spending coming down off a high level with relatively few new projects ready to replace the ones that are nearing completion.

- **Transportation** spending growth is also weakening sharply, and is now declining 6.1% YoY; down from -4.3% YoY in October. The category includes facilities such as airports, railroad tracks and bridges, and ports. We think spending could have slowed partially as a result of a slowdown in crude-by-rail investment, and it is not immediately clear how much LNG port construction is classified in the category. There are several airport projects that are just starting, and we think rail investment could be a part of a broader infrastructure plan, so we would not assume that the category is necessarily headed towards prior trough levels.

- **Health Care** spending has been choppy over the last three to five years, and we think is continuing a secular decline that started in late 2008. After a year and a half of growth, the rate of increase began to slow in May 2016 and weakened again in November.

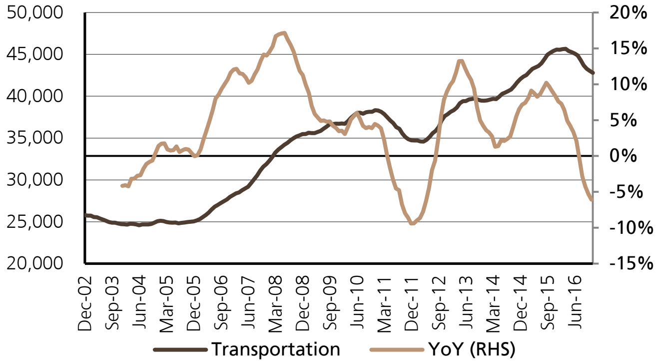
- **Other** includes Lodging, Religious, Public Safety, Amusement and Recreation, Communication and Conservation and Development. The growth rate in the Other category peaked in January 2016 and has been slowing since then.

Figure 21: Manufacturing is weakening the fastest of all the categories we follow



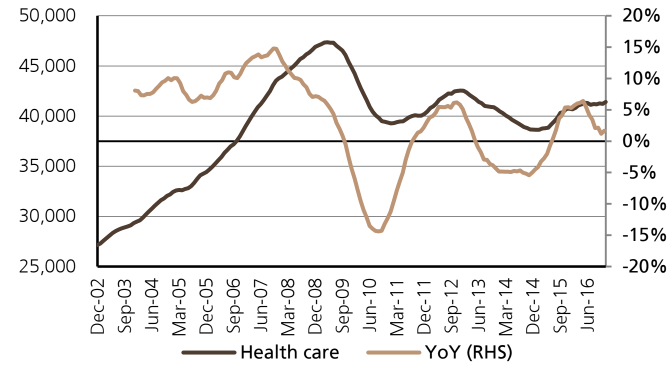
Source: US Census Bureau

Figure 22: Transportation spending posted the second weakest decline of any category in the most recent month



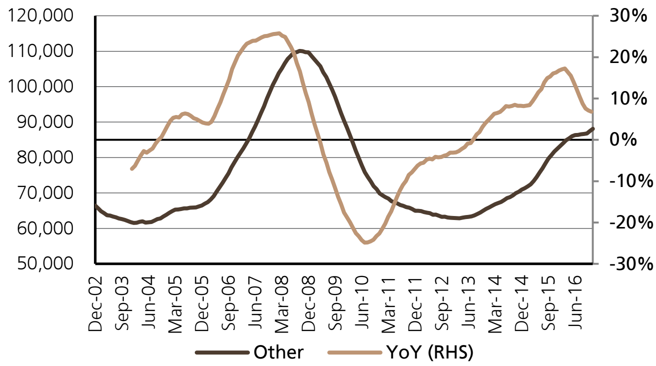
Source: US Census Bureau

Figure 23: Health care spending growth is slowing, but construction in the category has been more stable



Source: US Census Bureau

Figure 24: Growth in the "other" category is slowing after several years of improvement



Source: US Census Bureau

2017 Outlook: How has our view changed?

Growth in the Office category has been impressive over the last four years, and we expect growth to continue in 2017, leading to ongoing strength in the Private sector. We think there are some uncertainties around energy related spending in private markets, as oil prices could continue to be volatile in 2017 and lack of a FERC leadership quorum could limit approvals for major planned pipeline projects.

Stronger for longer on Private spending

- We expect Office to continue growing in 2017, but think 2017 could represent a peak. We hosted a call on 11/14/16 with JLL to discuss the outlook for office construction (click here for our summary). A key conclusion was that technology firms have been driving rents higher in the leasing market, and rent growth is not yet starting to slow (CBRE does forecast a slowdown after 2017). That said, completions are expected to add to available square footage in 2017, and increasing supply is expected to lead to a higher vacancy rate and fewer ground breakings.

- We think Manufacturing could be mixed, but continue to expect weakness. Auto plant construction in the US could remain elevated or even pick up, but we continue to expect weakness on the Gulf Coast from a slowdown in downstream energy and LNG investments.

- Commercial construction is holding up better than expected, as warehouse and multi-retail growth have held up. That said, residential construction growth is slowing, and could be a leading indicator of a coming slowdown in Commercial construction growth. We think consumers remain relatively confident, and warehouse construction combined with some retail investment could offset closures and lead to Commercial growth.

Two key questions to consider in 2017

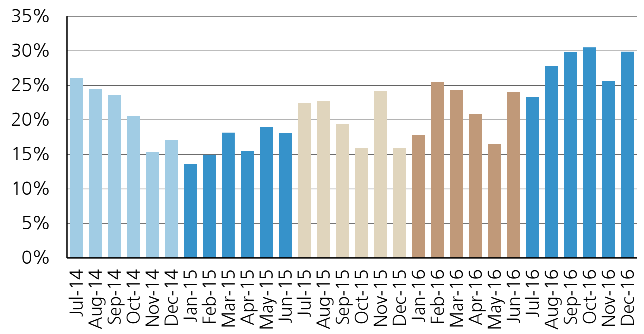
1) Can a 2018 rollover in Office be prevented?

Office construction spending growth continues to exceed our expectations. On a basic level, rents are good, jobs are being created, and interest rates are low. We also think part of the growth experienced in 2016 could have resulted from an expected increase in interest rates, which may have in turn driven a rush to start projects while interest rates were still low and rental rates were still rising.

We think trends are in place for strength to continue in 2017. CBRE expects nearly 60% YoY growth in 2017 completions, and a peak in the vacancy rate in 2016 or 2017. The comparisons do not start getting tougher until the second half of the year, so we think momentum could continue in the Office market, but we also think that 2017 could mark the peak.

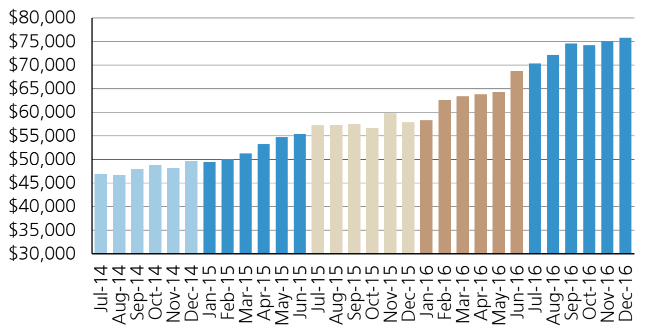
As for 2018, if economic growth accelerates, job growth remains robust, and capital market conditions remain favorable, we think Office construction could continue to have upside.

Figure 25: Office (YoY)



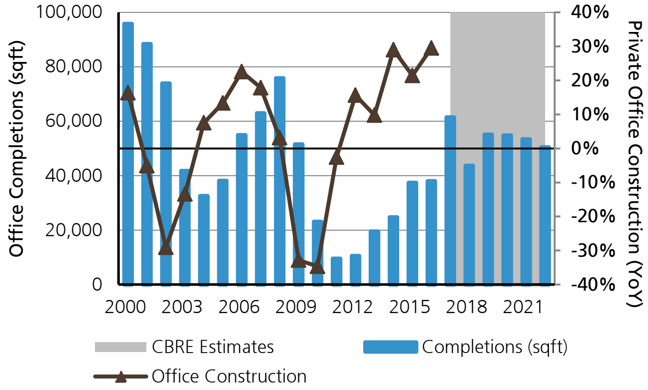
Source: US Census Bureau, UBS

Figure 26: Office (SAAR)



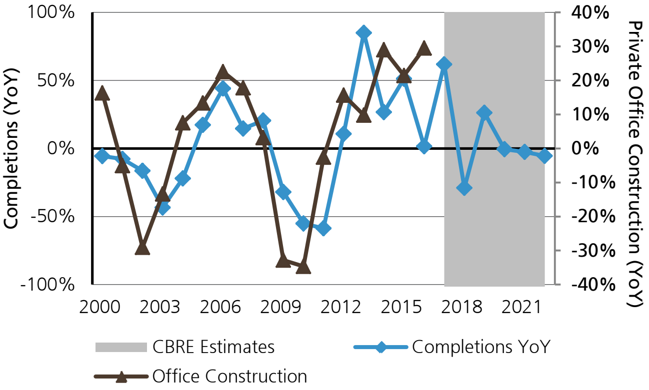
Source: US Census Bureau, UBS

Figure 27: Office completions are positively correlated to office construction growth



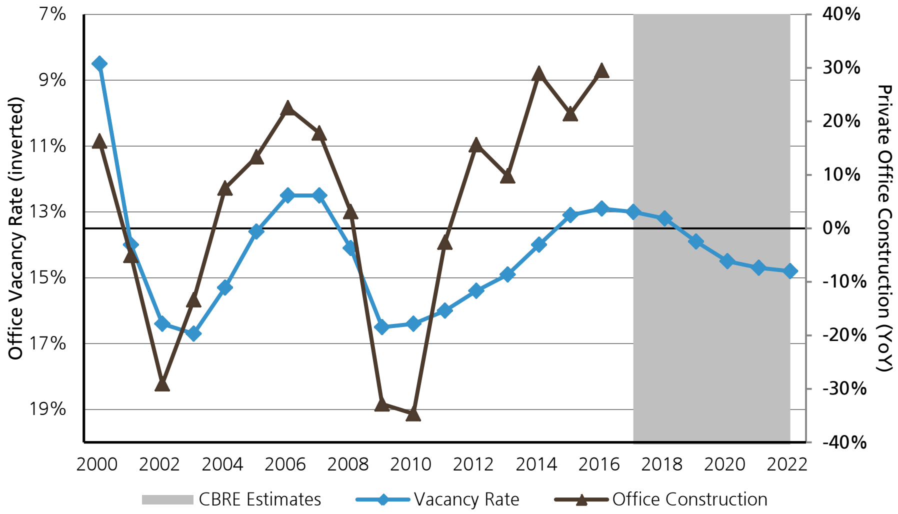
Source: CBRE, US Census Bureau, UBS

Figure 28: The YoY change in completions is expected to be strong in 2017, before declining in 2018



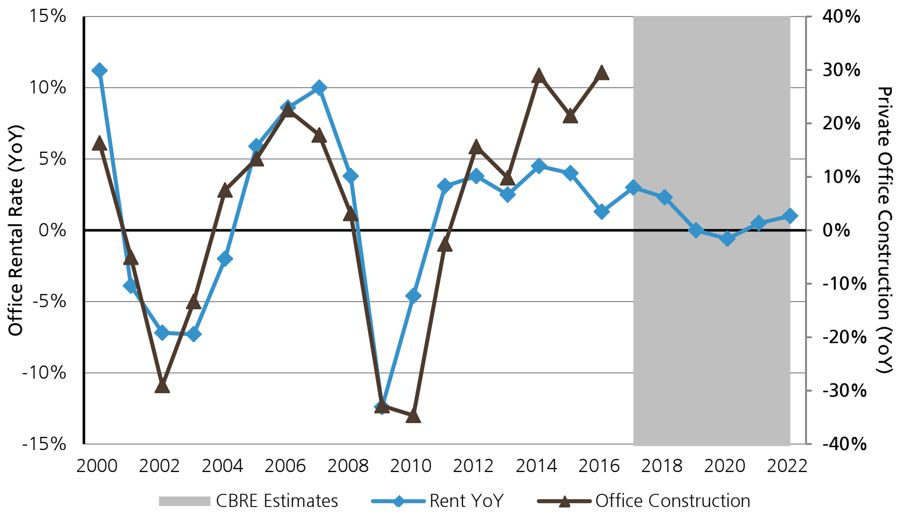
Source: CBRE, US Census Bureau, UBS

Figure 29: Office vacancy rates are expected to rise and are inversely correlated to Office construction



Source: CBRE, US Census Bureau, UBS

Figure 30: Office rental rate growth is correlated to office construction and is expected to slow



Source: CBRE, US Census Bureau, UBS

2) How does job growth and the interest rate environment affect construction?

Over the longer term, we observe that private construction generally follows the economic cycle. The conventional wisdom would assume that capacity is added when it is needed, and increased economic activity likely consumes capacity. Public markets are far less cyclical and following a long-term growth cycle in the 1980s and 90s (Figure 12), spending growth has slowed. We think lower interest rates may be positively impacting Office construction, but given relatively limited history

and precedent, we are not able to draw firm conclusions. Ultimately we would expect the cyclical peaks and troughs in construction to follow the economic cycle, with public markets remaining more stable and dependent on policy objectives.

Public sector could be more uncertain

Our initial forecast is for 1-2% growth in Public construction, followed by acceleration to +5-6% in 2018. We continue to view the public markets as uncertain, and a variety of factors are likely to influence these markets in 2017. These include:

- **State budgets and spending decisions:** Several state budgets continue to be burdened with uncertainties ranging from lower oil prices to declining sales and income tax receipts. While reimbursement and aid comes from the Federal government, 92% of all public spending in 2016 was ultimately directed at the state level.

- **Federal policy decisions:** While infrastructure spending has been a widely discussed topic over the last three to six months, its priority in Congress's policy agenda for 2017 remains uncertain. Infrastructure investment is just one objective in a list that includes replacing the Affordable Care Act, immigration reform, and corporate tax reform.

- **Timing of Congressional actions:** The operational efficiency at the Federal level is a key consideration this year. The UBS office of public policy believes an incremental infrastructure plan could be part of a corporate tax reform bill, with potential to be passed in the fall. However, we think that a bill passed in September 2017 may not make funding available before the 2018 construction season, which would lead to a disappointment in Highway and Street growth in 2018.

Highway & Street spending

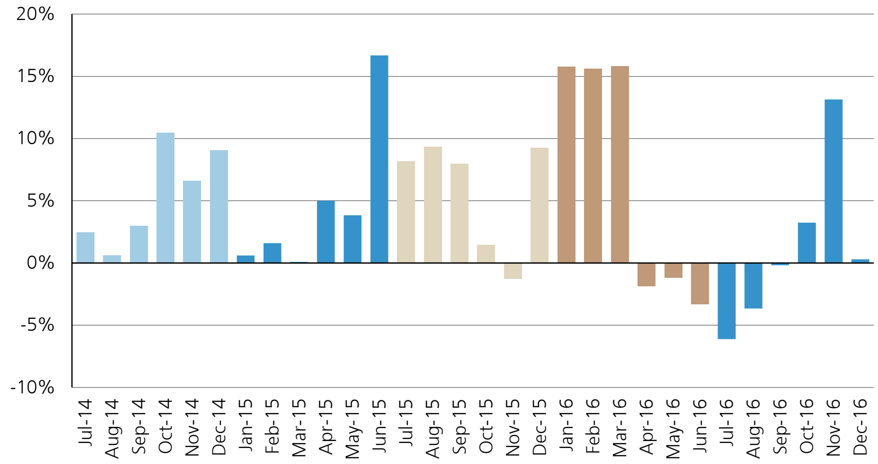
Without a doubt, spending in the Highway & Street category was the biggest disappointment in 2016. After the passage of the FAST Act in early December 2015, highway spending growth accelerated to over 15% YoY in the first quarter. As the year over year comparisons began to get slightly more difficult, spending growth slowed quickly (Figure 31).

We do not think we can identify the specific cause for the spending slowdown, but we think our discussions throughout the year have resulted in a plausible explanation. We think it is likely that the longer-term visibility of funding provided by the FAST Act, and the process by which funds are allocated from the Federal level down to the states, resulted in a shift in spending intentions at the state level away from lower cost regular maintenance programs towards planning for higher cost replacement projects. As shown in Figure 32, the two largest components of Highway & Street spending, Pavement and Bridges, are both highly seasonal. We think planning for large infrastructure investments takes several months at minimum, and as a result construction could not begin ahead of the summer construction season, effectively delaying projects until 2017.

We believe the Highway & Street category is well positioned for growth in 2017 but we think in actuality it could remain choppy. On a SAAR basis, spending has stepped up to levels slightly above recent peaks (on average) and we think the

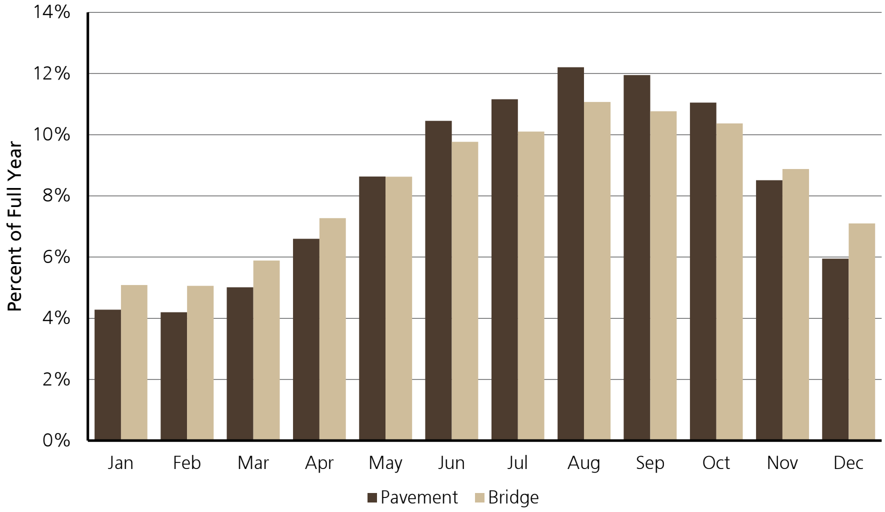
combination of recent project starts and easier comparisons during the summer construction season could result in stronger growth towards the middle of 2017.

Figure 31: Highway & Street spending YoY



Source: US Census

Figure 32: Seasonality of pavement and bridge spending (1993-2015) – makes up >90% of highway & street spending



Source: US Census

Our view is also supported by AECOM's comments on its 11/14/16 earnings call. When asked whether the company had seen "a material impact yet from the FAST Act," management noted:

"No, we have not seen a material impact in terms of producing revenue, but what we are seeing is a significant increase in the amount of activity around projects that we're starting to bid on. But not unlike the rest of our competitors, our peer group just had the same experience and through FY 2016 it's not producing

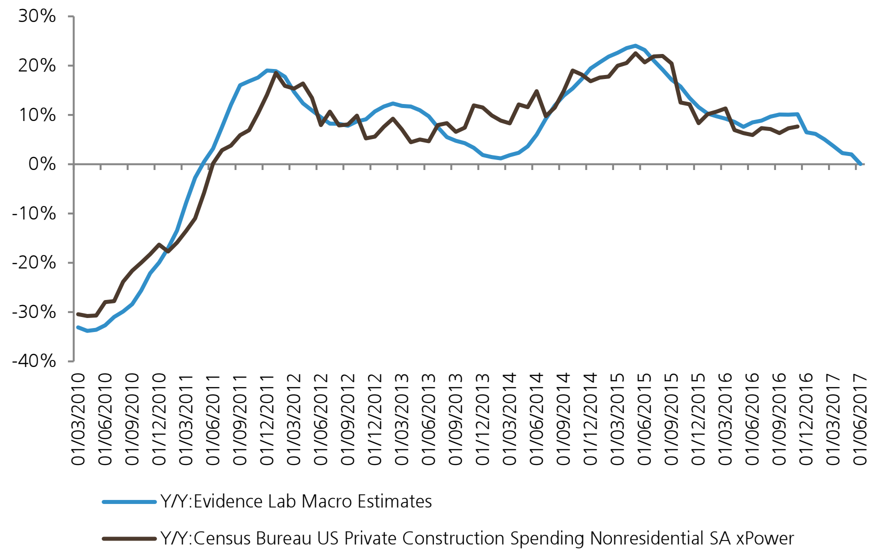
revenue just yet. But these are long-term projects that take a while to get started up. And so, I think you'll see a slow ramp on that type of activity." – AECOM earnings call 11/14/16

Evidence

UBS Evidence Lab Macro

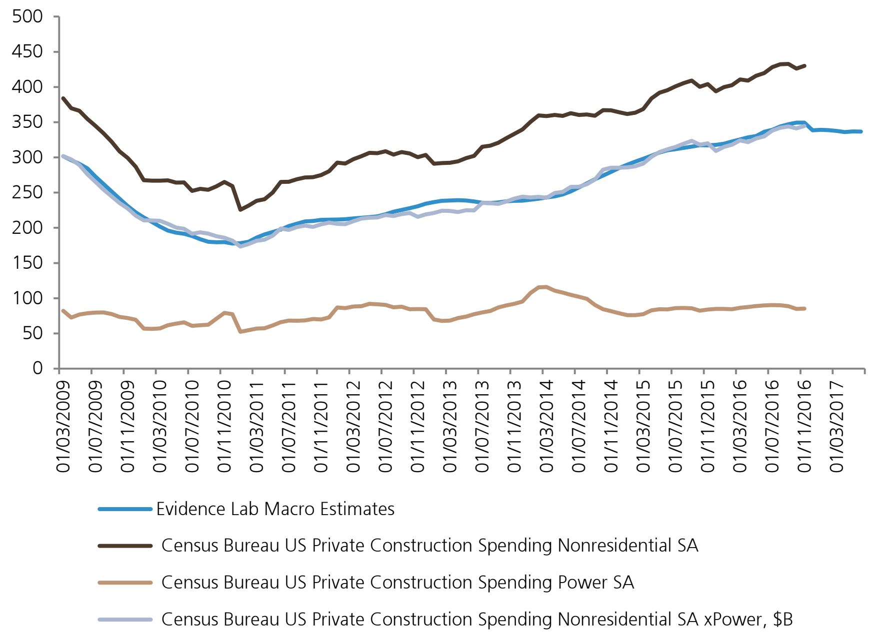
UBS Evidence Lab has developed a leading indicator of Private Non-Res Construction, excluding Power (Launching Big-Data Driven Early Read on US Economy, Nov 11 2015). The typical lead time is 6-9 months. The UBS Evidence Lab analysis is pointing towards a meaningful slowdown in spending as 2017 progresses. While the forecasts do at times show some divergence from the actual reported data in late 2013 and early 2014, we note that the UBS Evidence Lab Macro model accurately predicted the 2015 slowdown in spending growth, followed by a slight uptick in 2H16.

Figure 33: UBS Evidence Lab Macro analysis is calling for a 1H17 slowdown in private non-residential construction (excluding power)



Source: UBS Evidence Lab Macro

Figure 34: UBS Evidence Lab Macro forecasts a roughly flat level of private non-residential spending in 1H17 (excluding power)

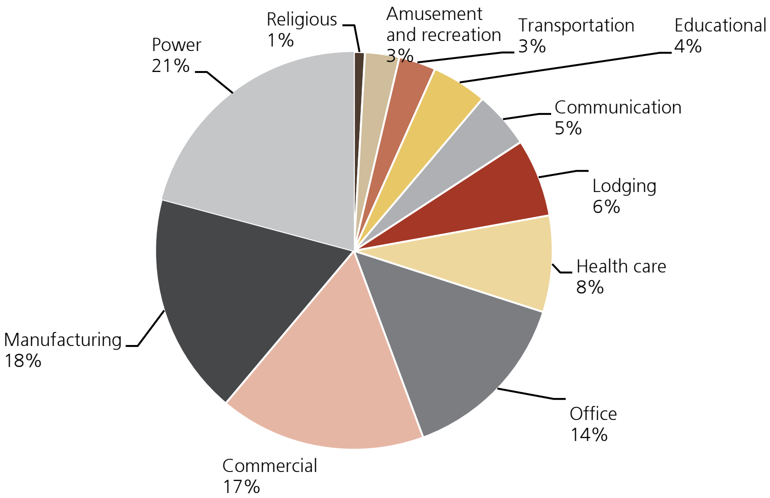


Source: UBS Evidence Lab Macro

What does the Evidence Lab Macro analysis mean for the categories?

While the Power category makes up over 20% of the private side of non-residential spending, Manufacturing, Commercial and Office are also significant. The Evidence Lab Macro analysis is relevant to all of the private market outside of Power, but we think, given the skew in weight towards some of the larger categories, the analysis is more relevant to the three or four largest. Figure 36 shows the last 12 months of growth for the private market. With Office and Construction driving the majority of the recent growth, we think the Evidence Lab analysis could be pointing towards a slowdown in one of these areas, or perhaps a faster decline in the Manufacturing category.

Figure 35: Manufacturing, Commercial and Office make up 62% of the Private non-residential construction market excluding Power



Source: US Census Bureau, UBS

Figure 36: Private non-residential construction detail (excluding Power)

	T12M	YoY												
	($,b)	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
Private Non-Res	**420.15**	**7.2%**	**10.2%**	**12.8%**	**12.2%**	**6.8%**	**6.7%**	**5.8%**	**6.4%**	**8.3%**	**5.9%**	**6.0%**	**6.7%**	**7.6%**
Private Non-Res Ex-Power	**333.22**	**8.4%**	**9.6%**	**12.8%**	**12.2%**	**6.8%**	**6.7%**	**5.8%**	**6.6%**	**9.0%**	**6.6%**	**6.9%**	**8.2%**	**9.3%**
Manufacturing	**74.18**	**6.7%**	**2.6%**	**1.8%**	**2.2%**	**-4.9%**	**-3.9%**	**-8.0%**	**-2.4%**	**0.7%**	**-7.2%**	**-9.8%**	**-10.2%**	**-9.4%**
Chemical	35.77	20.5%	2.4%	0.0%	6.4%	-2.4%	-8.7%	-2.4%	0.2%	5.7%	-7.2%	-11.3%	-10.1%	-9.5%
Transportation Equipment	11.49	12.6%	16.0%	27.6%	19.2%	5.1%	22.4%	-5.0%	1.6%	-9.6%	-8.8%	-8.0%	-10.2%	-16.1%
Other	26.91	-10.6%	-2.0%	-5.1%	-8.2%	-11.6%	-7.1%	-15.9%	-7.3%	-1.4%	-6.7%	-8.6%	-10.3%	-6.2%
Commercial	**70.97**	**1.0%**	**9.4%**	**14.7%**	**10.8%**	**5.4%**	**4.9%**	**8.3%**	**9.9%**	**11.5%**	**9.8%**	**10.5%**	**16.7%**	**13.8%**
Automotive	6.34	-14.7%	12.3%	6.4%	22.0%	-1.0%	-10.5%	3.7%	15.7%	31.0%	25.5%	22.3%	29.4%	34.7%
Food/beverage	7.45	-19.0%	2.3%	18.0%	-3.5%	-0.7%	-6.6%	-15.7%	2.7%	18.9%	23.8%	16.0%	10.4%	8.8%
Multi-retail	20.60	3.6%	5.9%	11.2%	1.5%	-3.5%	-5.0%	4.5%	3.6%	5.8%	3.0%	10.4%	19.7%	10.4%
Warehouse	19.66	10.0%	12.7%	23.9%	23.7%	19.2%	32.8%	30.7%	24.5%	16.5%	13.3%	15.7%	28.7%	26.3%
Other	16.91	4.5%	12.5%	11.3%	13.1%	9.2%	4.5%	5.5%	5.0%	3.8%	3.5%	-0.8%	0.1%	-0.4%
Office	**61.12**	**20.0%**	**22.9%**	**30.1%**	**29.2%**	**26.5%**	**22.0%**	**28.9%**	**28.2%**	**31.3%**	**34.3%**	**35.7%**	**27.9%**	**34.1%**
General	58.89	20.6%	23.6%	30.2%	29.0%	27.1%	21.5%	28.3%	28.7%	30.8%	35.4%	35.8%	27.9%	33.5%
Financial	1.76	-3.4%	-11.1%	8.9%	13.3%	-1.5%	8.1%	3.0%	-5.5%	2.8%	-8.5%	15.0%	15.1%	37.9%
Other	0.47	nmf												
Health care	**32.82**	**2.0%**	**-0.9%**	**6.4%**	**9.5%**	**3.0%**	**8.7%**	**0.0%**	**-5.2%**	**-0.4%**	**-2.7%**	**3.5%**	**-3.3%**	**7.4%**
Hospital	21.36	9.0%	5.7%	10.3%	13.8%	3.5%	10.4%	6.0%	6.3%	10.4%	8.8%	-0.8%	0.3%	11.9%
Medical building	7.61	-3.4%	-1.3%	16.6%	13.4%	11.1%	14.4%	-10.1%	-28.8%	-21.5%	-27.7%	12.3%	-12.1%	2.8%
Special care	3.85	-17.2%	-24.6%	-20.3%	-13.4%	-12.0%	-9.1%	-6.9%	0.3%	0.6%	4.8%	11.0%	-4.2%	-7.6%
Lodging	**26.75**	**21.3%**	**25.5%**	**31.2%**	**37.8%**	**31.0%**	**31.3%**	**22.0%**	**25.2%**	**22.7%**	**25.9%**	**21.6%**	**27.7%**	**18.7%**
Communication	**19.56**	**26.6%**	**19.5%**	**12.9%**	**2.8%**	**-8.9%**	**-8.2%**	**-6.4%**	**-13.4%**	**-7.1%**	**-12.9%**	**-10.4%**	**-1.8%**	**1.3%**
Educational	**18.97**	**5.0%**	**9.4%**	**15.8%**	**12.9%**	**8.6%**	**6.8%**	**4.0%**	**7.1%**	**10.0%**	**17.9%**	**15.2%**	**22.9%**	**19.7%**
Primary/Secondary	3.42	-12.9%	0.0%	8.2%	1.2%	-2.8%	-3.6%	-16.9%	-10.9%	-7.2%	6.1%	16.5%	33.8%	16.5%
Higher Education	12.82	7.5%	4.6%	13.0%	12.5%	8.7%	4.8%	4.8%	9.4%	15.5%	21.8%	11.7%	20.9%	15.3%
Other	2.73	21.9%	55.4%	43.1%	34.2%	28.0%	37.6%	42.4%	28.6%	13.5%	16.0%	32.0%	19.4%	45.1%
Transportation	**12.43**	**-1.5%**	**-8.6%**	**-12.1%**	**-10.1%**	**-2.8%**	**-3.9%**	**-2.7%**	**-4.0%**	**-15.9%**	**-15.2%**	**-8.3%**	**-6.5%**	**-7.0%**
Land	11.18	-0.5%	-9.5%	-14.2%	-12.2%	-3.2%	-5.8%	-5.2%	-6.9%	-19.0%	-17.7%	-10.5%	-7.8%	-8.3%
Other	1.26	-12.4%	0.0%	7.1%	6.8%	1.0%	18.5%	31.3%	32.6%	24.7%	15.6%	18.8%	8.9%	9.4%
Amusement and recreation	**11.80**	**15.0%**	**27.1%**	**27.9%**	**34.6%**	**21.6%**	**21.0%**	**17.4%**	**17.2%**	**23.9%**	**19.7%**	**15.8%**	**23.1%**	**25.9%**
Sports	4.34	49.8%	72.7%	76.3%	50.2%	27.1%	27.0%	28.8%	6.1%	5.4%	2.0%	-8.6%	15.2%	24.2%
Other	7.46	-0.4%	8.5%	9.0%	26.7%	18.5%	17.7%	11.3%	24.7%	36.8%	31.1%	33.0%	28.3%	27.0%
Religious	**3.74**	**2.1%**	**9.6%**	**9.5%**	**17.7%**	**19.6%**	**6.0%**	**3.8%**	**-4.8%**	**4.0%**	**-9.4%**	**-13.5%**	**-0.3%**	**-4.9%**
House of worship	3.22	1.7%	4.9%	10.3%	22.2%	25.2%	1.9%	3.3%	-1.3%	4.0%	-6.9%	-7.1%	6.7%	-1.3%
Other religious	0.51	4.3%	36.1%	2.6%	-4.8%	-6.4%	31.7%	6.5%	-24.5%	6.8%	-22.6%	-45.0%	-30.4%	-22.4%
Power	**86.93**	**3.1%**	**12.1%**	**12.7%**	**12.3%**	**6.7%**	**6.8%**	**6.0%**	**5.5%**	**5.7%**	**3.3%**	**2.8%**	**1.2%**	**1.6%**
Electric	65.62	-0.3%	11.6%	14.2%	16.5%	12.3%	14.1%	13.6%	13.1%	14.3%	11.0%	11.8%	9.4%	9.9%

Source: US Census Bureau

Non-Residential Construction Dashboard

Figure 37: UBS Construction Indicator and Outlook Dashboard (construction figures are seasonally adjusted annual rate)

Indicator	Current	Previous	Trend		Trend Period	Trend Indication	UBS 2017 Forecast	2018 Direction
General	708,244	713,060	Dec 16	1.6%	last 6mo / prev 6mo		**2.0%**	▲
Architectural Billings	55.9	50.6	Dec 16	-0.4%	last 6mo / prev 6mo	►		
Architectural Inquiries	57.2	59.5	Dec 16	0.7%	last 6mo / prev 6mo	►		
UBS Rental Survey: Business Conditions	5.00	5.44	Dec 16	-8.1%	last 6mo / prev 6mo	▼		
UBS Rental Survey: Rental Rates	4.62	4.64	Dec 16	-1.9%	last 6mo / prev 6mo	▼		
UBS E&C Coverage Total Backlog	136,493	138,453	Dec 16	-3.4%	last 2Q / prev 2Q	▼		
Non-Residential Construction Starts (T12M)	306,087	362,569	Dec 16	4.6%	last 6mo / prev 6mo	▲		
Construction Employment	6,699	6,702	Dec 16	0.5%	last 6mo / prev 6mo	►		
Office / Commercial	154,511	153,312	Dec 16	10.6%	last 6mo / prev 6mo		**5.9%**	▼
Office	75,796	75,069	Dec 16	16.0%	last 6mo / prev 6mo		**10.0%**	▼
Commercial	78,715	78,243	Dec 16	5.4%	last 6mo / prev 6mo		**2.0%**	▼
Federal Reserve Lending Standards Survey	-1.5	-8.5	Dec 16	-7.4%	2Q Avg	▼		
Federal Reserve Loan Demand Survey	-5.9	4.3	Dec 16	-5.4%	2Q Avg	▼		
Office Vacancy Rate	13	13	Dec 16	0.4%	last 2Q / prev 2Q	►		
Educational / Highway & Trans / Water	258,244	262,815	Dec 16	-1.3%	last 6mo / prev 6mo		**1.9%**	▲
State Tax Receipts (T12M)	932.5	929.5	Sep 16	-0.1%	last 2Q / prev 2Q	►		
Education	90,638	92,626	Dec 16	1.5%	last 6mo / prev 6mo		**2.0%**	▲
Municipal Bond Issuances (T12M)	453.2	445.8	Jan 17	10.8%	last 6mo / prev 6mo	▲		
Endowment Returns (FY15)	2.4%	15.5%	Dec 15	2.4%	FY 2015 return	▲		
College Enrollments	21,946	21,586	Dec 17E	1.4%	2016-2020E avg	►		
Transportation, Highway & Street	136,645	137,853	Dec 16	-1.2%	last 6mo / prev 6mo		**2.0%**	►
Federal Highway Awards (T12M)	42,907	43,831	Dec 16	-9.5%	T12M YoY	▼		
Federal Airport Awards (T12M)	1,432	1,482	Dec 16	-34.3%	T12M YoY	▼		
Federal Bridge & Tunnel Awards (T12M)	14,459	14,652	Dec 16	-22.4%	T12M YoY	▼		
FAST Act Spending	43.1	40.9	Dec 16	5.3%	FY 2016 / FY 2015	▲		
Water, Sewage & Waste	30,961	32,336	Dec 16	-10.2%	last 6mo / prev 6mo		**1.0%**	▲
Manufacturing	68,745	71,072	Dec 16	-0.8%	last 6mo / prev 6mo		**-5.0%**	▼
Institute for Supply Management PMI	56.0	54.5	Jan 17	2.4%	last 6mo / prev 6mo	▲		
ISM Manufacturing New Orders	60.4	60.3	Jan 17	-1.6%	last 6mo / prev 6mo	▼		
Industrial Production	104.6	103.7	Dec 16	0.3%	last 6mo / prev 6mo	►		
Capacity Utilization	75.5	74.9	Dec 16	0.1%	last 6mo / prev 6mo	►		
Power	93,545	92,480	Dec 16	-1.8%	last 6mo / prev 6mo		**2.0%**	▲
Utility Company Capex	71.13	74.14	Dec 17E	-4.1%	2016E YoY	▼		
Electric Generation	11.2	11.2	Dec 17E	0.5%	2016E YoY	►		
Transmission Spending	22,500	21,500	Dec 17E	4.7%	2016E YoY	▲		
Pipeline Company Capex	31,997	33,526	Dec 17E	-4.6%	2016E YoY	▼		
Residential	473,279	471,374	Dec 16	1.6%	last 6mo / prev 6mo			
5+ Unit Building Permits (6 mo avg)	407.7	411.8	Dec 16	-3.4%	last 6mo / prev 6mo	▼		
5+ Unit Building Starts (6 mo avg)	375.2	374.7	Dec 16	4.9%	last 6mo / prev 6mo	▲		

Source: AIA, Federal Reserve, US Census, US Department of Labor, ISM, SIFMA, ARTBA, McGraw-Hill, SHEEO, NACUBO, UBS

Figure 38: UBS Non-Res Construction Outlook

	Dec 2016 Value*	Pct of Total	UBSe Growth 2017	UBSe Growth 2018
Office	75,796	11%	10.0%	-5.0%
Education	90,638	13%	2.0%	1.0%
Commercial	78,715	11%	2.0%	-1.0%
Highway and Street	94,530	13%	2.0%	6.0%
Power	93,545	13%	2.0%	5.0%
Health Care	41,899	6%	2.0%	1.0%
Transportation	42,115	6%	2.0%	6.0%
Water, Sewage & Waste	30,961	4%	1.0%	5.0%
Manufacturing	68,745	10%	-5.0%	-5.0%
Other	91,299	13%	2.0%	3.0%
Total	**708,244**	**100%**	**2.0%**	**1.5%**

Source: US Census, UBS estimates
*Seasonally Adjusted Annual Rate

Figure 39: Company Exposure to US Non-Res

Steel	
Nucor	65%
Steel Dynamics	34%
Reliance Steel	30%

Machinery	
H&E Equipment	80%
United Rentals	45%
Manitowoc	26%
Deere	16%
Caterpillar	14%
Terex	13%
Trinity	12%
Kennametal	10%
ITW	7%
Cummins	2%

E&C	
Tutor Perini	92%
Quanta Services	77%
AECOM	51%
Babcock & Wilcox	50%
Jacobs	46%
CB&I	36%
Flowserve	34%
KBR	26%
Fluor	17%

Industrial / Distributors	
NCI Building Systems	93%
Acuity Brands	90%
WESCO	40%
Ingersoll-Rand	29%
HD Supply	26%
Fastenal	25%
Lennox	17%
Stanley Black & Decker	9%

Source: UBS estimates, Company reports

What do the data points tell us?

In 2016 we presented twenty data points we think sent negative signals about the non-residential construction market (shown below). Interestingly, some of these data points have turned more positive in recent months, and in the following pages we revisit each one to analyze how it has changed.

What we presented in 2016:

10 data points to be concerned about for private non-res construction heading into 2017

(1)	The tech sector is showing signs of slowing	(6)	Lending standards are tightening as demand weakens
(2)	Hedge fund closures are up, and performance is down	(7)	Anchor tenants are cutting back
(3)	CMBS spreads have widened significantly over Treasuries	(8)	Some construction projects are delayed/shelved in FL and CA
(4)	Hotel RevPAR growth has been trending lower through 2015	(9)	Hospital capex growth is expected to slow
(5)	Manufacturing comps get tougher in 1H16/energy capex headwinds; subprime auto loan headwinds	(10)	Ashtead commentary is more cautious

More: Non-Res Construction: We expect a good year in 2016, but concerned on private outlook for 2017 (3/14/2016)

The next 10 data points on Non-Res construction

(1)	The New York office construction market is softening	(6)	Auto sales growth and auto capex growth are expected to slow
(2)	The total number of hedge funds continues to decline	(7)	Dodge Construction Starts trending down on a trailing basis
(3)	Houston office construction is slowing	(8)	Retail store closures are intensifying
(4)	Hotel RevPAR growth continues to slow	(9)	Utility Capex is expected to peak in 2016
(5)	Construction Lending: CMBS spreads are down but still elevated	(10)	Highway Awards are trending below the 5y average

More: Reducing Non-Res Construction forecast on the Great Gulf Coast Slowdown and weak Public Sector (8/12/2016)

10 Data Points on Non-Res Construction

(1) Tech sector was showing signs of slowing, but now may be stabilizing

We think a strong technology/start up market has been a driver of demand for new office space. According to various media reports, 2015 had the fewest technology IPOs since 2009; however, venture capital funding picked back up in 2016 and the market seems like it may have stabilized. The following headlines and articles detail the market over the last few years. 2017 could see an acceleration in tech IPOs that may help Office construction:

Positive:

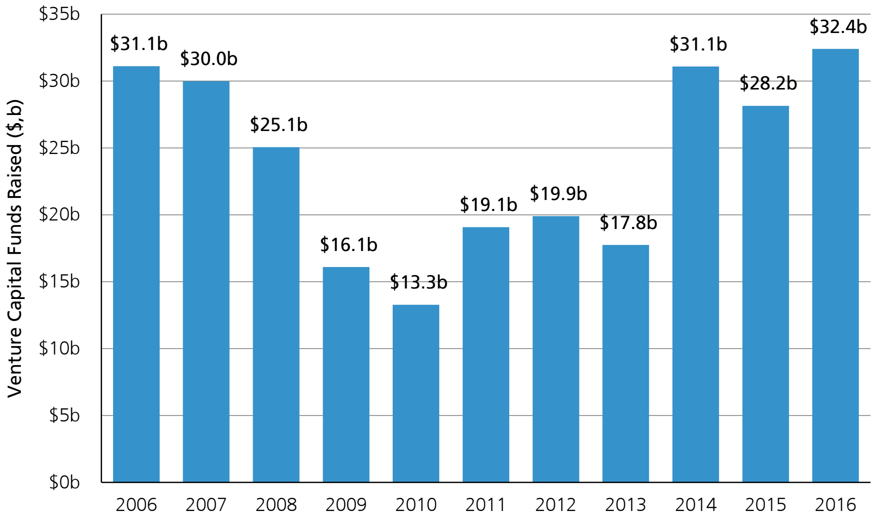
- "Tech IPOs to Surge Next Year, Investment Banker Says" – *WSJ* (10/26/16)
- "Tech to Boost 2017 IPO Market" – *Nasdaq* (12/30/16)
- "Old-line Companies Like Wal-Mart and GM Acquire Taste for Tech Startups" – *WSJ* (12/30/16)
- "Bankers Expect a Trump Bump for IPO Market" – *WSJ* (1/10/17)

Negative:

- "Options walloped at tech IPO companies, leaving many underwater" – *Silicon Valley Business Journal* (12/9/15)
- "Worst Year For Tech IPOs Since 2009" – *TechCrunch* (12/11/15)
- "Tech Startups Face Fresh Pressure on Valuations" – *WSJ* (1/3/16)
- "Tech Pain: Startups Are Buying Back a Lot More Employee Stock" – *WSJ* (2/2/16)
- "Technology stocks selloff may turn IPO chill into IPO freeze" – *Reuters* (2/16/16)
  - "Of the 87 tech IPOs that debuted over 2014-2015, about 80 percent are underwater from their IPO price."
- "IPO Market Dries Up as Investors Retreat" – *WSJ* (2/18/16)
- "For Silicon Valley, the Hangover Begins" – *WSJ* (2/19/16)
- "Zynga to Sell Its San Francisco Headquarters" – *WSJ* (2/24/16)
- "Mutual Funds Sour on Startup Investments: Fidelity, BlackRock and other giants cut value of their stakes at faster pace, make fewer new investments" – *WSJ* (3/3/16)
- "Tech IPO Market Shows Promise After Dead First Half of 2016" – CNBC (9/9/16)
- "Wall Street's IPO Business: The Worst in 20 Years" – *WSJ* (9/22/16)
- "The Tech IPO Market Hasn't Been This Weak Since The Financial Crisis" – *Yahoo Finance* (10/14/16)
- "Where Are the Tech IPOs" – *WSJ* (10/30/16) (article suggested a return in 2017)
- "Why 2016 Was a Watershed Year for Tech" – *WSJ* (12/18/16)
- "Year in Review: IPOs Struggled Again in 2016" – *WSJ (*12/29/16)
- "Startup Funding Frenzy Cools" – *WSJ* (1/13/17)

Venture capital fundraising slowed in 2015, but has picked up again in 2016.

Figure 40: Venture capital funding fell sharply in 2H15 but rose in 2016



Source: Thomson Reuters and National Venture Capital Association, UBS Estimates

(2) Hedge funds closures are still increasing, but performance is improving

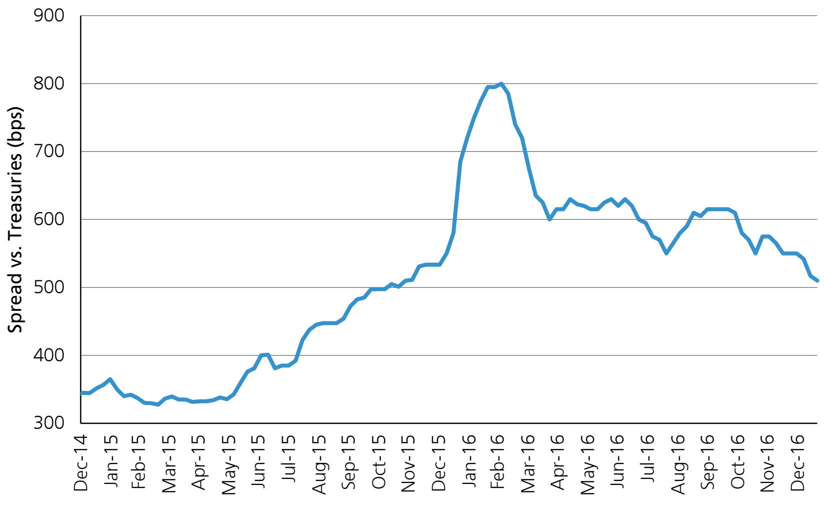
Hedge fund closures increased in 3Q16 to 252 (up from 239 in 2Q16). Liquidations totalled 782 through the first three quarters of 2016 – on pace for the highest number of liquidations since the financial crisis. Further, new launches declined sequentially and YoY (170 new launches in 3Q16 vs. 200 in 2Q16 and 269 in 3Q15). The number of launches in 3Q16 was the lowest since 1Q09. The total number of hedge funds declined to 9,925 in 3Q, falling below 10,000 funds for the first time since 2014.

That said, hedge fund performance in 2016 was the highest since 2013. The HFRI FWC annual return was 5.6%. Hedge fund industry capital also rose for the 3rd consecutive quarter. Total hedge fund industry capital increased to $2.979 trillion – setting a new record (previous record of $2.969t in 2Q15). Despite increased hedge fund closures, we think performance growth at hedge funds could help spur demand for more office construction, especially as a large component of the closures relates to consolidation within the fund of hedge funds space.

(3) CMBS spreads have narrowed versus Treasuries

The CMBS market is a benchmark of borrowing costs for some real estate developers. Widening spreads indicate increased costs for borrowing and could lead to less investment in new construction. In early 2016 spreads were widening, but since then spreads have narrowed.

Figure 41: BBB- CMBS Spreads vs. Treasuries

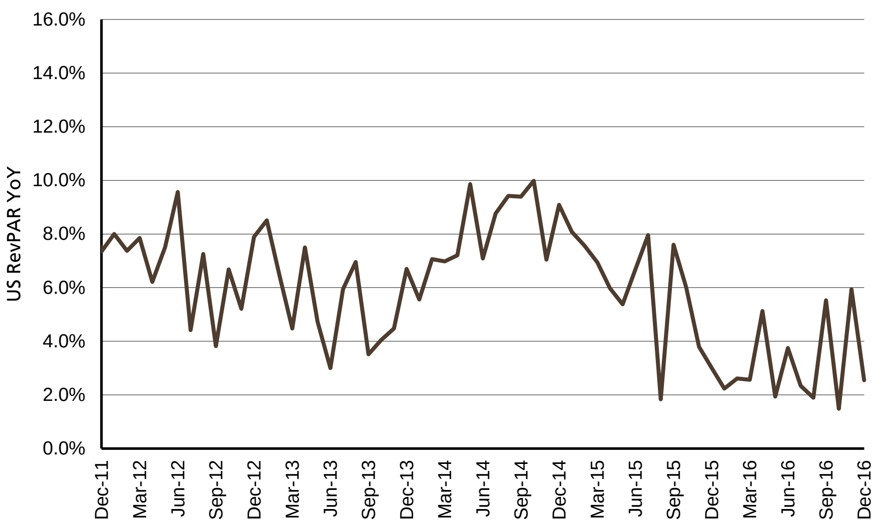


Source: Bloomberg, UBS Estimates

(4) Hotel RevPAR growth has been trending lower through 2016

Hotel revenue per available room (RevPAR) growth has been slowing since a peak in late 2014. We think slower RevPAR growth could lead to slower growth in hotel construction. While the growth rate in 2016 remained below 2014 and 2015 levels and is still a negative factor in our view, recent months have been choppy, but in a range, suggesting some stability.

Figure 42: US hotel revenues per available room (RevPAR)

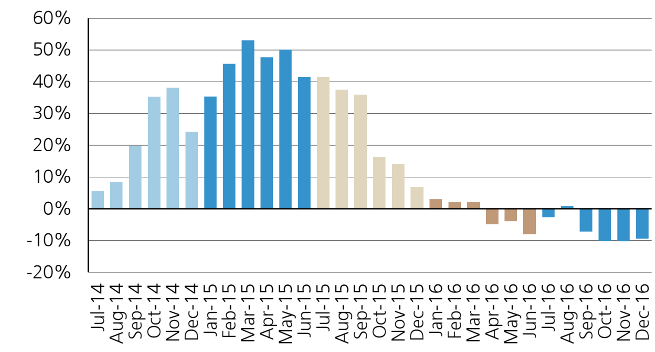


Source: UBS Gaming and Lodging team, UBS Estimates

(5) Manufacturing comps starting to ease, but the spending level has peaked

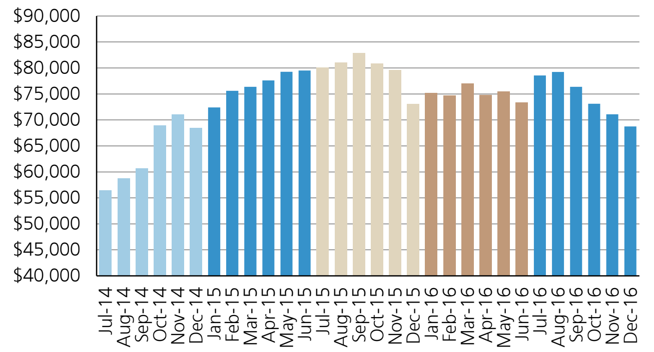
In early 2016 we noted that the year over year comparisons from 2015 were significantly more challenging, and we saw the growth rate in Manufacturing spending decline through most of 2016. Comparisons are easier in 2017, but we note that Manufacturing has clearly peaked on a SAAR basis, and we do not think recent new project starts are sufficient to offset what will likely be a gradual decline in spending as project activity peaks. We expect a continued ramp down in 2017.

Figure 43: Manufacturing (YoY)



Source: US Census Bureau

Figure 44: Manufacturing (SAAR)

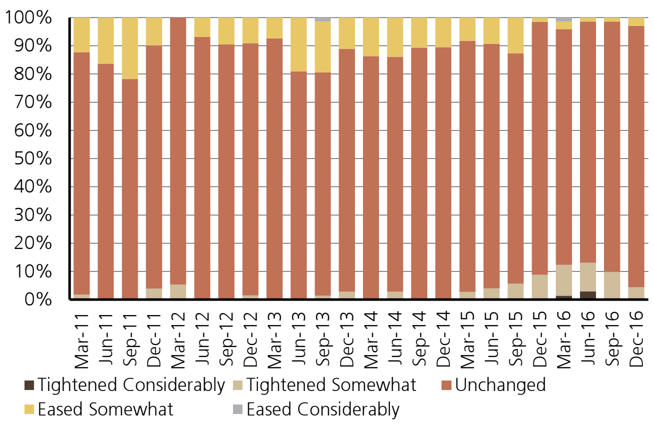


Source: US Census Bureau

(6) Lending demand is still weakening, but standards are unchanged

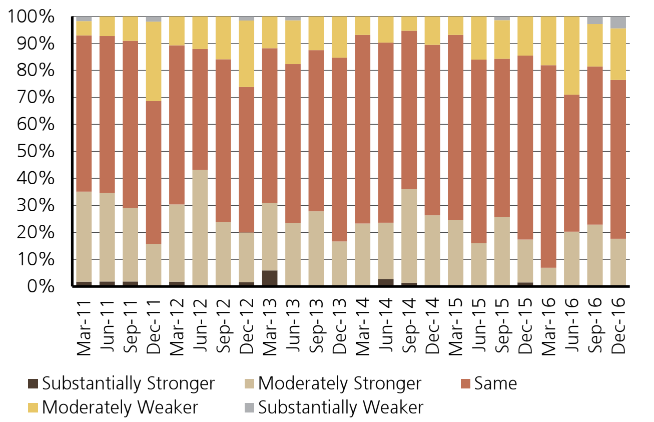
Tighter lending standards and weakening demand could be indicative of borrowing and construction from real-estate developers. Standards were tightening in mid-2016, but lending standards appear to have stabilized in more recent results. That said, loan demand is weaker than it was in 2014 and 2015, but may have stabilized in 2016. We think the loan demand and standards surveys could be moderately supportive, but mostly point towards a continuation of the status quo.

Figure 45: Lending Standards



Source: Federal Reserve, UBS Estimates

Figure 46: Loan Demand



Source: Federal Reserve, UBS Estimates

(7) Anchor tenants are still cutting back, but there are some positives

Various articles throughout 2016 and early 2017 have continued to highlight weakness in the big box retail market, as malls close and retailers reduce square footage. However, we have also seen several articles discussing expansion plans at large retailers, including Walmart's plan to invest $6.3b in 2017. We think some of the negative factors could limit the amount of growth in the Commercial category, but we expect the positive trends to continue.

Negative updates

- "Neiman Marcus Loss Widens as Sales Slide" – *WSJ* (12/13/16)
- "As Last-Minute Shoppers Go Online, Retailers Brace for Trouble" – *WSJ* (12/15/16)
- "Macy's and Kohl's Are Hit by Weak Holiday Sales" – *WSJ* (1/4/17)
- "Sears Buys Time With Craftsman Brand Sale, Store Closures" – *WSJ* (1/5/17)
- "Vacancy Rates Rise at Shopping Centers" – *WSJ* (1/6/17)
- "In-Store Declines Drag Down Traditional Retailers" – *WSJ (*1/11/17)
- "Lowe's to Cut Thousands of Store Workers, Shuffle Jobs" – *WSJ* (1/12/17)
- "Mall Closures Ripple Through Small Town America" – *WSJ* (1/19/17)
- "Retail Malaise Puts Pressure on Chains to Shutter More Stores" – *Bloomberg* (1/23/17)
- "Mall Owners Rush To Get Out of the Mall Business" – *WSJ* (1/24/17)

Positive Updates

- "More stores coming to Houston as retails plan to grow in 2017" – *Houston Chronicle* (1/11/17)
- "Walmart's 2017 expansion calls for 10,000 new jobs" – *CBS News* (1/17/17)
- "Brookfield common council approves Brookfield Square expansion plans" – *USA Today* (1/17/17)
- "Tractor Supply planning big expansion in Waverly" – *Lincoln Journal Star* (1/4/17)
- "Big Apple Monitor: NYC Sentiment on the Rise" – UBS (1/18/17)

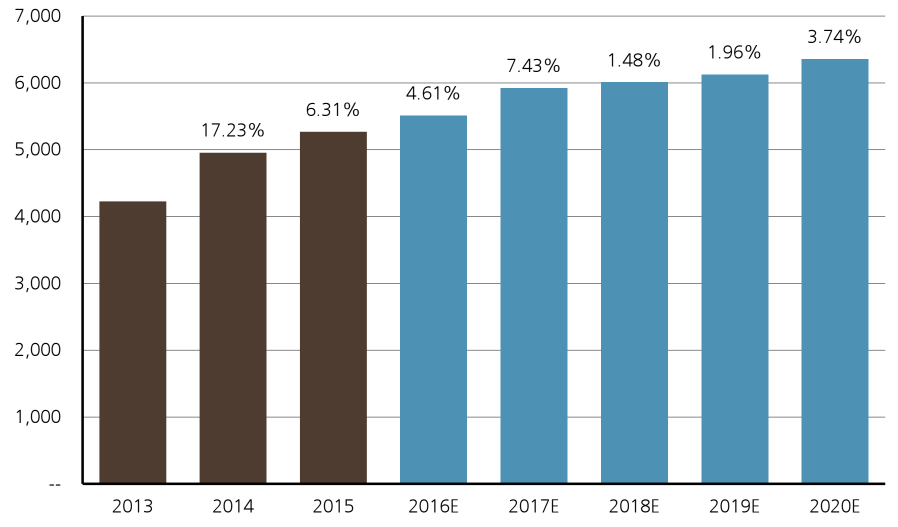
(8) Construction delays seem to be less of an issue this year

Last year we noted that construction of several large multi-family residential complexes was being delayed. While earnings season is still ongoing, we have not heard anecdotally that this is as big of an issue going in to 2017.

(9) Hospital capex could re accelerate in 2017 before slowing in 2018

UBS health care analysts expect that aggregate capex growth at publicly traded hospital and nursing home companies slowed in 2016, but are forecasting a reacceleration in 2017. One risk to Heath Care spending we anticipate in 2017 is the potential repeal and replacement of the Affordable Care Act and uncertainty that process may generate. We think Health Care companies are less likely to invest during periods of uncertainty, and the result could be a temporary slowdown in spending.

Figure 47: Hospital/Nursing Management Capex (UBSe)



Source: UBS Estimates

(10) Ashtead's commentary is now less cautious, but UBS now has a Sell rating

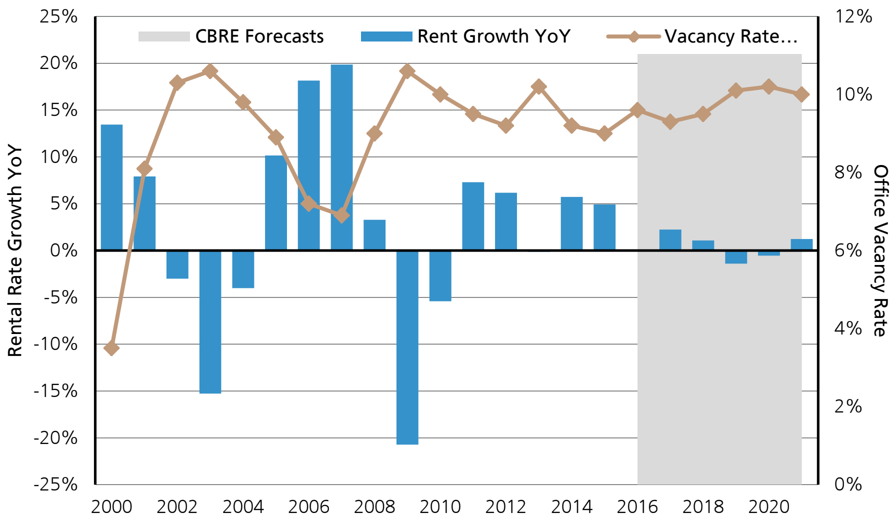
In early 2016 we noted that Ashtead viewed the US as being "very much mid-cycle from a non-residential construction perspective." The stock traded down after guidance missed consensus estimates. Ashtead's commentary later in 2016 was more bullish on expansion plans, and management expects to invest in US organic growth regardless of the cycle, but UBS currently has a Sell rating on the stock: Ashtead Group PLC - UBS Evidence Lab: what did management and investors say to our downgrade?

The Next 10 Data Points

(1) The New York office construction market is softening

In our August 2016 report, we highlighted CBRE's forecast that the New York office vacancy rate could bottom in 2017 or 2018. CBRE now believes that the New York office vacancy bottomed in 2015, and rental rate growth is expected to be minimal over the next four to five years. We think rising vacancies and limited rent growth could limit investors' willingness to pursue office construction projects, and reinforces our view that Office construction may peak in 2017.

Figure 48: CBRE now expects that New York's office vacancy rate has bottomed



Source: CBRE, UBS Estimates

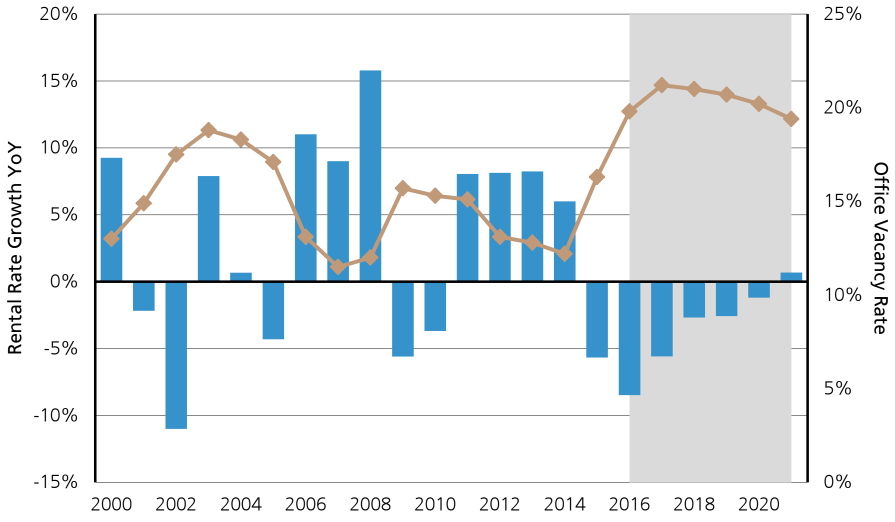
(2) The total number of hedge funds continues to decline but performance is increasing, suggesting that the hedge fund environment may be stabilizing (previously discussed)

(3) Houston office construction is slowing

CBRE continues to project a decline in Houston rental rates though 2020, and an increasing vacancy rate though 2017. We think new office construction in Houston will continue to be limited until the current supply is absorbed.

According to Transwestern (a real estate broker), 32 projects were completed in Houston 2015, but only 9 projects were under construction as of Q3 2016. Total available sublease space grew by 1.2 million square feet in Q3 2016. Subleases space is expected to exceed 12 million square feet by the end of 2016 (11.9 million square feet available as of Q3) compared to ~8 million available square feet in 2015.

Figure 49: CBRE expects Houston rental rates to decline though 2020



Source: CBRE, UBS Estimates

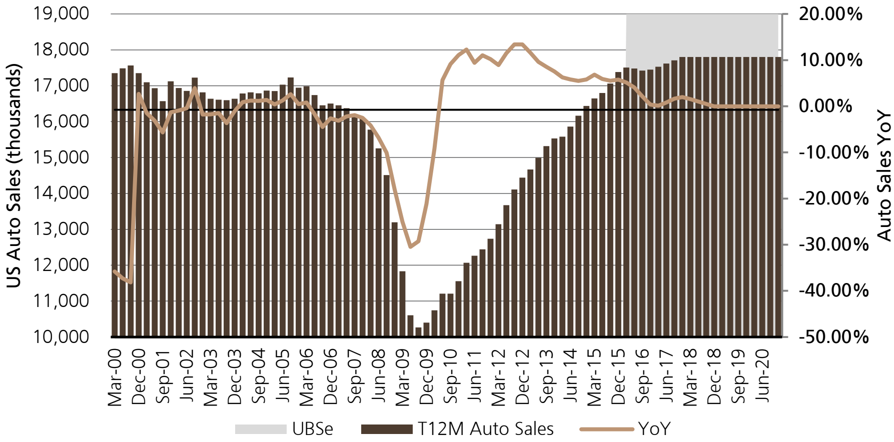
(4) Hotel RevPAR growth continues to slow (previously discussed, see Figure 42 on page 29)

(5) Construction Lending: CMBS spreads are down but still elevated (previously discussed, see Figure 41 on page 29)

(6) Auto sales growth and auto capex growth are expected to remain relatively flat

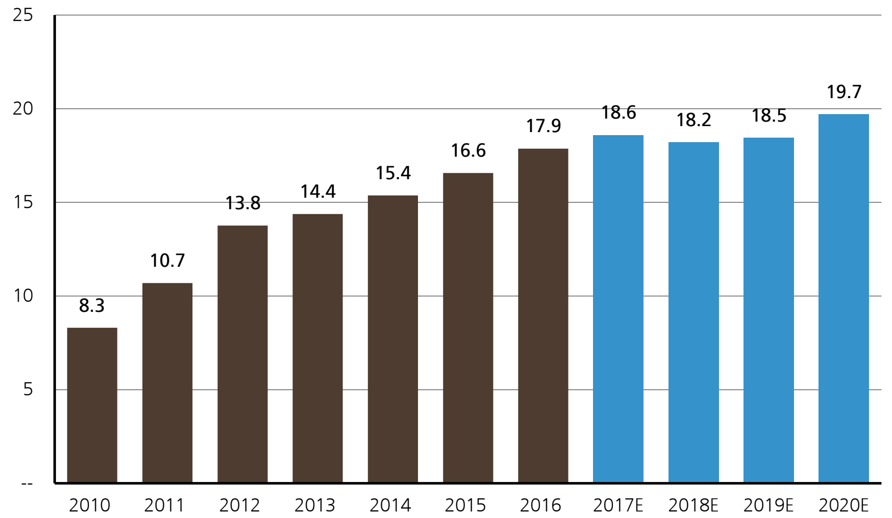
UBS forecasts relatively flat YoY growth in auto sales, with slight increases in 2H17-1H18. Similarly, as shown in Figure 50, UBS expects capex to be slightly up in 2017 but remain flat going forward.

Figure 50: UBS forecasts flat US auto sales growth with slight increase in 2H17, from lows



Source: UBS estimates

Figure 51: UBS forecasts a near-term peak in US auto company capex

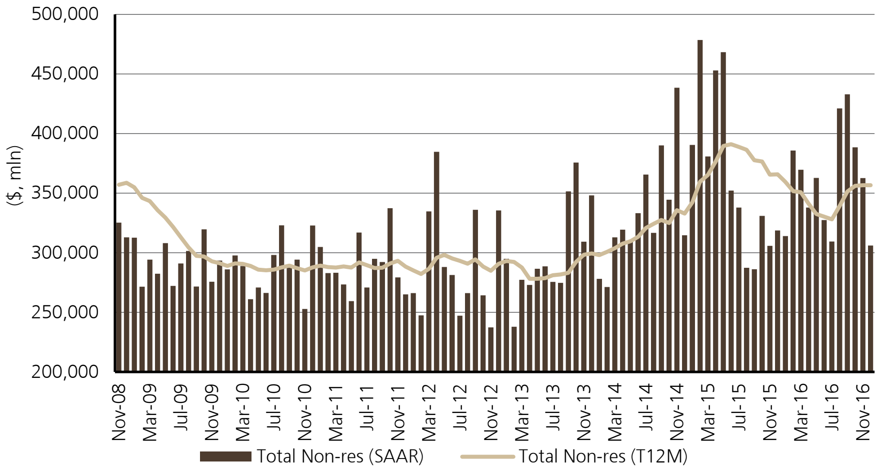


Source: UBS estimates

(7) Dodge Construction Starts are now rising, but still choppy

On a trailing 12 month basis, Dodge Non-Residential Construction Starts (non-res buildings plus non-buildings) are mixed. Data points in August, September and October ticked up from the earlier run rate, but December slowed and the T12M run rate is flat after rising from a mid-2016 low. Notable project starts in late 2016 included the Elba Island LNG plant, the Lake Charles Ethane Cracker, a $1.2b pharma plant in North Carolina, the Los Angeles Rams football stadium, several New York office towers, the Sabal Trail natural gas pipeline, and various other transit and highway projects.

Figure 52: Non-Residential construction starts (SAAR)



Source: Dodge Data & Analytics, UBS Estimates

(8) Retail store closures are intensifying

Recent articles have indicated that retail store closures are the highest they have been since 2010, and that intensifying competition from online retailers could lead to even more closures going forward. We think more vacant retail space could lead to lower levels of construction.

Several companies have recently announced store closures:

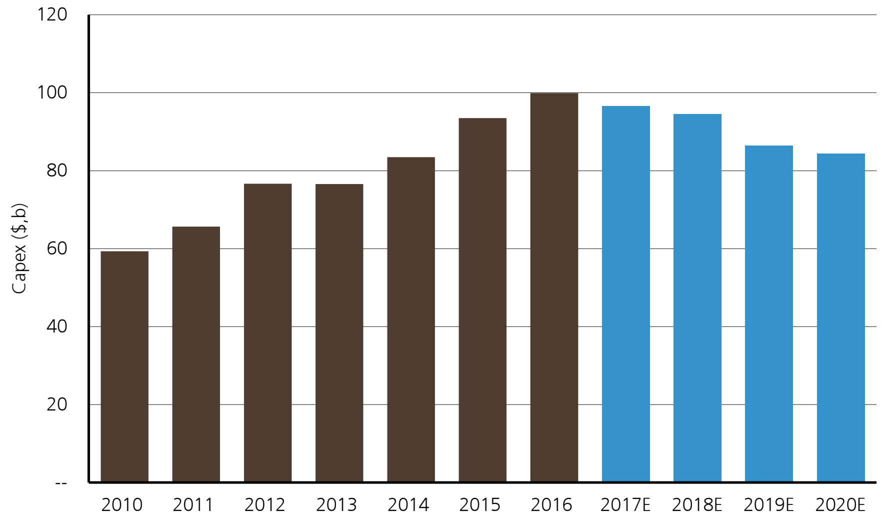
- 8/10/16 Macy's plans to close 100 stores in 2017
- 11/11/16 Kenneth Cole plans to close 63 stores (leaving just 2 brick and mortar stores in the US)
- 1/5/17 Sears plans to close 150 Sears & Kmart stores
- 1/7/17 The Limited closed all 250 stores (filed for bankruptcy)

Additionally we have seen articles citing potential store closures at American Eagle, Abercrombie & Fitch, Claire's, CVS and JC Penney.

(9) Utility Capex is expected to peak in 2016

UBS capex estimates for 20 US electric and gas utility companies are showing a peak in spending in 2016, followed by a slow (~3-8% per year) ramp down until 2020. While plans could change depending on Federal regulations, permitting and macro factors, the current outlook is not supportive for growth.

Figure 53: US Gas & Electric Utility capex is expected to peak in 2016

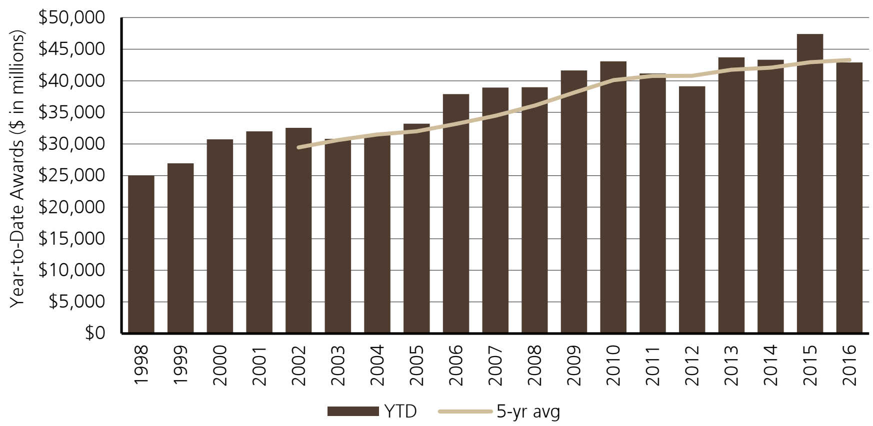


Source: UBS Estimates

(10) Highway Awards are trending below the 5 year average

Highway awards are trending below the five year average and below last year. It is possible that projects could pick up later in 2017 as states catch up on awarding potentially unallocated 2016 funds, but the 9.5% YoY decline in awards sets the 2017 up for a slower start. The 1Q16 comparisons in Highway & Street spending are also challenging.

Figure 54: Highway awards



Source: ARTBA, UBS Estimates

Company commentary so far

Vulcan Materials Q3 2016 Earnings Conference Call – November 2, 2016

- "Construction starts are back on the upswing and there will ultimately be improvements in state funding for roads along with local highway improvement initiatives. In fact, we're already seeing early signs of improvement. Highway contract awards in California were up 98% in September as these new FAST Act funds are starting to flow into the system."

- "We've noted that construction start data points have recently turned back up after several months of softening. And highway contract awards in our key states have also turned up recently. And on top of that, longer-term project pipelines continue to strengthen from our already strong levels. But the relative start weakness we've experienced earlier this year combined with strong first quarter 2016 comparisons suggest that 2017's volume growth on a year-over-year basis could be back half loaded."

Reliance Steel & Aluminium Q3 2016 Earnings Conference Call – October 20, 2016

- "We are hopeful that demand trends in the road construction equipment market may improve in 2017 due to the five-year infrastructure bill that was passed in December of 2015."

- "Demand in non-residential construction market has been characterized by steady upward growth with improvements in our tons shipped. We anticipate the slow but steady growth in demand will continue to improve in 2017. The volume is still far below peak levels. As such, we are continuing to invest in processing equipment for the business we sell into this market to ensure we are providing the highest possible level of service to our customers. Increased volume will be absorbed into our existing cost structure as this end market improves over time."

Nucor Corp Q3 2016 Earnings Conference Call – October 20, 2016

- "Residential construction is robust, while non-residential construction activity is expected to continue its slow but steady pace of improvement."

- "In terms of non-residential construction, we really don't see it much more improved than last year. In fact, if you go through the course of the year, particularly towards the middle of 2016 there was actually a decrease in the activity on non-residential construction."

Steel Dynamics Q4 2016 Earnings Conference Call – January 25, 2017

- "Non-residential construction demand continues to be steady throughout much of the United States. We continue to see strong quote and order entry activity even considering the seasonally slower winter timeframe."

- "The strength of this business provides positive insight also into the continuous strength in non-residential construction activity, which means steady with the opportunity for growth in 2017."

- "We believe there will be additional growth in the construction sector, especially for larger public sector infrastructure projects, which will greatly benefit our Long Products Group."

H&E Equipment Q3 2016 Earnings Conference Call – October 27, 2016

- "We continue to believe that the non-residential construction markets remain healthy based on current bidding activity levels, strong backlogs, positive customer sentiment and the robust activity associated with ongoing large projects."
- "While non-residential construction activity is healthy across our entire footprint, demand in our Mid-Atlantic and Southeast regions is the strongest. Even though, non-residential Gulf Coast project starts are down year-over-year; this region remained highly active, compared to historic levels."
- "The American Rental Association forecasts a 7% increase in total construction spending in 2017. Total construction employment data indicates demand for workers is running above 2015 levels and holding steady thus far into 2016. And the FAST Act will also eventually be a positive for the industry with $305 billion in funding to fix much needed infrastructure nationwide. Approximately, $230 billion has been appropriated for highways alone. "
- "In summary, demand remains healthy in the non-residential construction markets we serve and our rental business continues to generate solid returns. We also firmly believe the Gulf Coast market remains an attractive market and will continue to be for several years especially when the energy markets recover."

United Rentals Q4 2016 Earnings Conference Call – January 26, 2017

- "The external pull came from broad-based demand across geographies and project types led by commercial construction. And we were pleased to see our confidence in the cycle reflected in the market behavior and we believe the cycle remains intact and that demand will continue to trend up in 2017. In the U.S., there's obviously some industry optimism about the focus of the new administration. In our opinion, it's too early to call. If the government spending stimulates construction, it'll be incremental to a cycle that we already see as positive for our business."
- "There are a number of favorable U.S. indicators for 2017, including the Dodge Construction Outlook, contractor backlogs, national surveys by key trade groups and importantly, CEO confidence surveys. These are the people making spending decisions that create jobs for our customers. IHS Markit, our industry's primary forecasting firm, projects 3% to 4% growth for the U.S. equipment rental industry this year."
- "In the U.S., the coastal states continue to outpace the country as a whole. This is particularly true in the Southeast where double-digit revenue growth was driven by commercial construction of warehousing, data centers, and mixed-use facilities. Further up the coast, we are on a casino project, power plants as well as a major airport expansion."
- "Out West, we saw nearly $7 billion of large multi-year projects start up in California last quarter, with Washington, Oregon, and Arizona expected to follow suit by March. These range from stadiums and transit projects to healthcare, solar, automotive and corporate campuses. And we are cautiously optimistic that Canada has turned the corner."

AECOM Q4 2016 Earnings Conference Call – November 14, 2016

- "We expect another strong year of performance in the Building Construction business, with double-digit revenue growth driven by the 15% increase in our contracted backlog in fiscal 2016. We're also anticipating improved performance in our power, energy, and industrial construction businesses."
- "The commercial construction what we call our Building Construction group had its second year of double-digit organic growth in FY 2016. So, the commercial construction is not coming off. And so, the commercial construction is a little different than it was going back a couple of years ago. We've diversified away from the high-rise construction and we're moving into a whole host of different types of construction..."

Hubbell Q4 2016 Earnings Conference Call – January 31, 2017

- "When we look at some of the broad economic indicators, we're seeing strength in the residential construction market driven by single-family and improvements. And the leading indicators for the non-residential markets generally point to growth. We've seen in the fourth quarter, the ABI trends recently indicated growth in billings, the Dodge Data is more promising, and the non-res permits continue to slope higher."
- "So, I think those non-res markets are mixed, and as I said, I think there is an optimistic bias overall, and I think that's what we're generally seeing at least from December into January."
- "And the resi market continuing to show us favorability both from the construction side as well as the rental side."
- "And Dave made comments on the non-res side and I think we're seeing a little bit of bifurcation there, where in the Commercial & Construction side, we're still seeing some decent growth, and Dave referred to some of the Lighting experience being much flatter."
- "We did bump up our expectations on the construction side both on the residential and non-residential from our outlook back in October to a point more of growth on both of those markets. And I think there is a lot of support for that. Certainly, some of the indicators are there, the general sentiment is there. And I think, to the extent that some of the proposed policies and investments in more stimulus and infrastructure could certainly support improvement in there. But I don't think we'd see that until the end of the year, at best, that would be more of a 2018 impact for us."

Commercial Metals Q1 2017 Earnings Conference Call – January 9, 2017

- "Seasonally adjusted non-residential spending improved 9% and non-residential construction starts improved 29% year-over-year for the quarter ending November 30, 2016, in the U.S., while non-building spending pulled back 1%, non-building starts improved 5% year-over-year during that same period. The streets and highway sector showed signs of promise with state level gas tax and $203 billion of state level bond ballot items earmarked for infrastructure spending that were passed in the recent November elections."
- "2017 street and highway construction starts, our forecast's to be up 5% from 2016 and 2018 through 2020 is forecast to experience continued growth, as a result of increased funding from the FAST Act."

- "Non-residential construction, our primary end use market in the U.S., has improved over the last several months. Additionally, the Architecture Billings Index for the southern United States, an important geography for CMC, has remained strong for the last several quarters and continues to outpace similar measures in other regions."
- "We're also optimistic about potential investments in infrastructure during our fiscal 2017, as a result of the Fixing America's Surface Transportation Act."

Martin Marietta Materials Q3 2016 Earnings Conference Call – November 1, 2016

- "Of moment, we believe we're in a more durable construction-centric recovery across most of our markets."
- "This optimism is anchored in positive macroeconomic facts, including that employment growth nationally, a catalyst for construction activity, added 8 million jobs during the past three years. We expect infrastructure growth to be bolstered as funding from the $305 billion FAST Act begins to meaningfully impact construction projects in 2017 and beyond. Additionally many states, notably Texas and Georgia, continue to approve alternative funding sources to finance much-needed infrastructure projects to support growing populations."
- "We see broad positive trends in non-residential growth, despite some markets experiencing a slowdown in energy-related demand, and the omnipresent varying interpretations of construction start data. For example, both Texas and Georgia are still attracting large corporate headquarter relocations, which is fueling construction activity. In fact, Dallas leads the nation in non-residential construction growth, with Atlanta not far behind, ranked number four. Similarly, we're particularly pleased to observe positive trends across our markets in North Carolina and South Carolina, with increased investment, notably in office, retail, manufacturing and industrial development. We believe construction start data is being affected by the natural ebb and flow of megaprojects through the construction cycle."
- "We believe our markets have room for continued growth and we're well-positioned to capitalize on this increased construction activity."
- "We believe overall construction markets in our geographies have broadly stabilized, and anticipate steady volume growth in 2017."
- "Our expectation for increased levels of construction activity is underpinned by strong employment gains in our top markets and concurrence by third-party forecasters. Of our key states, Florida ranks second nationally in growth, while Texas ranks third, Georgia ranks fourth and North Carolina ranks eighth."
- "Our longer-term outlook is consistent with those of Dodge NPCA, which forecasts growth in construction starts for the remainder of 2016 and the next several years. The Dodge Momentum Index, which measures the initial report of non-residential construction projects and tends to lead non-residential construction spending by one full year, increased over 5% in September to 129, signaling additional growth in what we view as a multi-year recovery. The notion of slowing growth in residential construction in the United States has been influenced by a decline in multifamily development, with the decrease largely concentrated in a few metro areas such as Miami, Houston, and New York."

- "Infrastructure activity should accelerate as the FAST Act and other state funding initiatives in key Martin Marietta markets drive increased construction of highways, streets, roads and bridges."
- "Equally, people need to remember the construction industry across the U.S. is going to have a very difficult Q1 compare."

WESCO International Q4 2016 Earnings Conference Call – January 26, 2017

- "Construction sales declined 2% in the fourth quarter with the U.S. down 3% and Canada flat to prior year in local currency. Sales growth with commercial contractors in the U.S. again partially offset declines with industrial-oriented contractors, whose customers have been deferring or cutting capital investments in response to lackluster demand and ample capacity last year."
- "Our outlook for the nonresidential construction market is modestly positive this year with the overall market still below its prior peak."
- "Recently, we've been hearing of increased front-end engineering activities at some of our customers, which is certainly a positive sign for future nonresidential construction activity."

Acuity Brands Q1 2017 Earnings Conference Call – January 9, 2017

- "We have recent information from organizations including the U.S. Census Bureau and NEMA, which suggest construction put in place for September and October were very sluggish, while shipments of lighting fixtures were actually flat to slightly down in the third calendar quarter."
- "We continue to see signs that give us optimism regarding the future growth of the markets we serve in our business. Leading indicators for the North American market, such as Architectural Billing Index, vacancy rates, office absorption, lending availability and favorable employment trends continue to improve at varying paces. Forecasts from independent third-parties continue to project positive growth rates for the residential and non-residential construction markets in our fiscal 2017. So, key assumption number one is positive growth for the key markets we serve in our fiscal 2017."
- "We believe the lighting and lighting-related industry, as well as the building management systems market will experience significant growth over the next decade because of continued opportunities for new construction and more importantly, the conversion of the installed base, which is enormous in size, to more efficient and effective solutions."

Honeywell Q4 2016 Earnings Conference Call – January 27, 2017

- "Regarding construction, while commentators have been expecting a slowdown in growth rates in 2017, recent indicators have been more positive. The U.S. Dodge Momentum Index has risen for three consecutive months, reaching a new high in December, with a surge in commercial planning intentions. Nevertheless, we continue to plan conservatively in this space and continue to forecast low single-digit growth in residential and commercial construction, leading to low to mid single-digit growth in HBT."

HD Supply Q3 2016 Earnings Conference Call – December 6, 2016

- "Our Construction & Industrial team has performed very well, but did begin to see a modest slowdown in non-residential construction growth rates with several priority districts in the third quarter."

- "HD Supply Waterworks and Construction & Industrial are very well positioned to benefit from incremental infrastructure spending. We believe benefit from this spending will likely occur late 2017 or beyond."

- "We are seeing similar mix signals in the non-residential construction market as others, including starts, commercial lending data, construction employment and third-party data such as Dodge and ABI. From our ground intelligence, we continue to see pockets of strength throughout our 15 priority districts, particularly in parts of the northeast and southeast. Growth in some select markets appears to be moderated. We are therefore revising our non-residential construction end-market growth rate expectations to a low to mid single digit growth rate as opposed to our previous guidance of a mid single digit growth rate."

- On the outlook for non-residential construction: "As far as moderating conditions, keep in mind, we're not saying that the market is not growing. It is still a growing market. We're seeing that it may be growing at a slightly slower rate. And what we're seeing is a sun-setting of several large projects across the country. And the new larger projects that would normally take its place are showing up a little more slowly than we've seen over the past couple of years. That could be temporary. It could be indicative of a moderating growth rate. So we thought it's prudent to lower our estimate to low to mid-single digits from mid-single digits. Particularly, geographically, we're seeing a little more weakness in the Midwest in the Houston and Gulf Coast regions, and then parts of California."

The Manitowoc Co. Q4 2016 Earnings Conference Call – February 2, 2017

- "We are cautiously optimistic regarding the priorities of the new U.S. administration to invest in infrastructure."

- "With regards to the actual market for the large packages, there are still a number of those out there. Unfortunately, they're moving to the south as far as timing is concerned. In fact, I'm not sure if everyone has seen or not that Paul Ryan came out this morning and said that they're not even going to be talking about infrastructure to the mid-spring. So, that's going to cause the large projects that are counting on that funding to continue to move to the south and we're continuing to go after those."

What are the experts saying?

Consensus expectations are pointing towards 5.6% non-residential construction growth in 2017, followed by 4.9% growth in 2018. 2017 forecasts are driven by robust growth in the office, Commercial and Educational categories. We think the 10.6% expected growth in Office construction in 2017 is noteworthy. We also note that it is not clear how comparable the forecasts in Figure 55 and Figure 56 are to our forecasts or the US Census non-residential construction data that we track. Specifically, we think the AIA consensus forecasts focus primarily on building construction, and do not include many of the chemical and LNG projects classified in the Manufacturing category or the public projects classified in the Highway & Street category.

Figure 55: Non-Residential Construction – 2017 consensus forecasts

	Consensus	Dodge Data & Analytics	IHS	Moody's	FMI	Construct Connect	Associated Builders & Contractors
Non-residential Total	5.6%	8.2%	4.2%	5.7%	4.4%	5.6%	5.3%
Commercial Total	8.3%	11.9%	4.6%	9.8%	4.7%	10.8%	5.8%
Office	10.6%	14.4%	8.9%	8.7%	4.9%	12.9%	6.5%
Retail & Other Commercial	6.8%	10.9%	2.9%	11.1%	4.5%	8.3%	5.6%
Hotel	7.2%	8.6%	-1.4%	9.5%	5.5%	12.4%	4.5%
Industrial Total	4.0%	2.5%	-3.7%	1.6%	3.0%	-7.2%	6.6%
Institutional Total	5.7%	7.0%	7.2%	6.6%	4.7%	6.9%	4.3%
Health	4.9%	2.1%	12.2%	2.5%	5.1%	12.6%	2.8%
Education	6.3%	8.9%	9.6%	4.5%	4.7%	5.2%	5.2%
Religious	-1.9%	2.3%	-16.2%	0.5%	0.0%	3.1%	1.8%
Public Safety	-7.0%	2.0%	N/A	2.8%	1.2%	2.9%	-3.0%
Amusement & Recreation	7.7%	11.2%	-6.8%	24.4%	5.6%	5.5%	6.7%

Source: AIA

Figure 56: Non-Residential Construction – 2018 consensus forecasts

	Consensus	Dodge Data & Analytics	IHS	Moody's	FMI	Construct Connect	Associated Builders & Contractors
Non-residential Total	4.9%	7.3%	2.4%	6.4%	4.1%	6.3%	4.1%
Commercial Total	4.4%	5.8%	-1.2%	8.5%	2.5%	5.4%	3.4%
Office	4.6%	9.0%	-2.9%	3.5%	3.7%	4.7%	4.3%
Retail & Other Commercial	5.3%	5.8%	2.2%	14.2%	2.1%	6.6%	3.1%
Hotel	1.8%	-2.6%	-5.1%	6.7%	1.5%	4.3%	2.2%
Industrial Total	3.3%	6.7%	-3.8%	3.2%	5.2%	7.6%	3.4%
Institutional Total	5.8%	9.3%	7.7%	5.1%	5.8%	6.6%	5.0%
Health	4.9%	4.4%	11.2%	3.0%	6.7%	10.9%	3.3%
Education	6.7%	12.3%	8.9%	5.3%	6.4%	5.0%	5.5%
Religious	0.6%	3.7%	-12.8%	11.5%	2.6%	4.6%	2.5%
Public Safety	4.0%	6.7%	N/A	5.9%	4.8%	5.7%	4.0%
Amusement & Recreation	4.3%	7.4%	-3.5%	6.5%	2.2%	5.4%	6.9%

Source: AIA

What does the US election mean?

More visibility on public sector if included in tax reform…

The results of the US election, and the Republican majority in Congress, mostly give us more confidence in public sector spending over the next few years. There has been virtually unwavering support for infrastructure investment from both the Republicans and Democrats, but the ongoing impasse has been around product funding or financing. The UBS public policy office in Washington, DC believes that increased infrastructure investment could be part of a broader US tax reform bill that could be voted on in late 2017. Timing remains a major uncertainty, and we see some risk that a bill passed in late 2017 would only have a small impact on the 2018 construction market, as project planning could push incremental spending beyond the summer construction window. For additional details on US infrastructure investment, please see our recent report Q-Series: How could a new wave of infrastructure spending impact the construction sector?

…but deregulation could help energy projects

While the focus has been on the federal government's ability to drive fiscal stimulus, we also think private construction market could see an uptick in growth as a result of deregulation. Particularly on the power and energy side of the construction market, we expect that various projects have been slowed down as a result of environmental reviews and permitting. The Keystone XL pipeline is a main example.

In the private markets, project economics remain the key uncertainty, and we think commodity prices in particular for energy projects will need to be supportive for work to progress.

Current government initiatives

At both the Federal and State levels, aside from President Trump's initiatives, there are several initiatives and dynamics that could impact non-residential construction. These include:

- **The Federal Dimension:** The Fast Act; Senate Democrats' proposal
- **The State Dimension:** Ballot initiatives; Fuel tax revisions; Public-Private-Partnerships; Municipal bond offerings

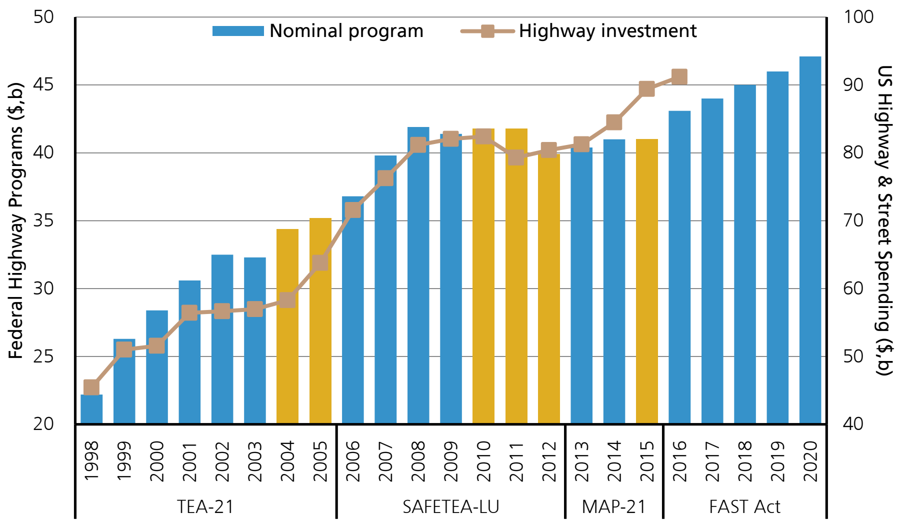
The FAST Act

The FAST Act was passed in December 2015 and is the first multi-year highway program enacted at the Federal level since 2009. Federal highway spending levels were flat from 2008 through 2015, and Highway & Street spending languished as a result. States began to find alternative sources of funding, such as raising gas taxes or offering infrastructure bonds, but 2016 was the first year of meaningful increase in Federal funding.

We think 2016 was likely a year of project planning, and it is possible that a more active slate of project starts will flow throughout 2017, leading to higher growth in Highway & Street spending. Figure 57 shows a history of Federal highway programs. We think the most relevant period could be 2004-2006, where Federal

spending began its last upward cycle. It is interesting to note that spending growth in 2004, the first year of a higher level of Federal spending, was only slightly positive, but construction spending growth accelerated in the years that followed. We will be watching for potential acceleration in 2017, but our base case is for more modest growth.

Figure 57: Historic Federal highway spending programs



Source: ARTBA, US Census Bureau
Note: Reauthorizations are highlighted in gold

Senate Democrats' proposal

Senate Democrats unveiled their own $1 trillion infrastructure plan in January to rebuild the nation's infrastructure over ten years (possibly meant to mirror Trump's $1 trillion plan previously discussed here). The plan includes:

- $210b for roads and bridges
- $180b for rail and bus systems
- $110b for water and sewer systems
- $100b for energy infrastructure
- $65b for ports, airports, and waterways
- $20b for public and tribal lands

The main difference between Trump's $1 trillion plan and the Democrats' plan lies in funding and financing. Senate Democrats propose building on existing government programs and adding to the deficit, whereas Trump has proposed tax credits and private investment. The Democratic plan would create new tax benefits for clean energy, include labor and environmental protections, and expand grants that originated from Obama's stimulus plan – programs Republicans have historically opposed. Further, the Democrats proposed spending $10b on an infrastructure bank, an idea that, according to news articles, also has not historically received Republican support.

Trump suggested that he prefers the "fix-it-first" approach to prioritizing infrastructure (which Obama also supported). Trump advisors have proposed paying for an infrastructure plan with a repatriation holiday – also supported by

Democrats – though some politicians note it would not provide enough funding. Despite the bipartisan support for an infrastructure plan of some kind, we note that an infrastructure package was not included in House Speaker Paul Ryan's GOP legislative agenda plan for the first 100 days.

State ballot initiatives

In 2016, states included ballot proposals for various budgeting and funding proposals regarding road and transportation funding. According to ARTBA, the 360 transportation related ballot initiatives in the 2016 primaries and general election (280 were part of the general election) represented a record. The dollar amount related to these initiatives was $247b across 31 states. Within the proposed funding measures, 51% related to property taxes, 23% related to sales or income taxes, and the remainder was split roughly evenly between bond issuance, gas taxes and other sources.

The key points to note from this year's state level transportation funding initiatives are:

- 74% of the 360 measures were approved (74% is in line with the average approval rate since 2005, according to ARTBA), representing $201b in transportation funding initiatives approved. Initiatives were approved in 24 states.
- There were 15 initiatives with potential revenue exceeding $1b. Eight of them were approved. 18 out of 23 initiatives with potential revenue between $100m-$1b were approved.
- With $133b in approved funding measures, CA had the highest value of an state in 2016, followed by WA at $54b.

The largest approved measure was for an increase in sales tax in Los Angeles by $120b over 40 years.

Fuel tax revisions

At both the Federal and State level, taxes on gasoline sales are a key source of funding for highway and street spending. The Federal fuel tax has been 18.4 cents per gallon of gasoline and 24.4 cents per gallon of diesel since 1993. As cars have become more efficient, and as costs have inflated, the Federal fuel tax revenue is insufficient to replenish annual spending out of the Highway Trust Fund. Congress has been reluctant to raise the fuel tax, but several states have successfully pursued fuel tax increases to help boost their own budgets.

Figure 58: Select changes to state gas taxes

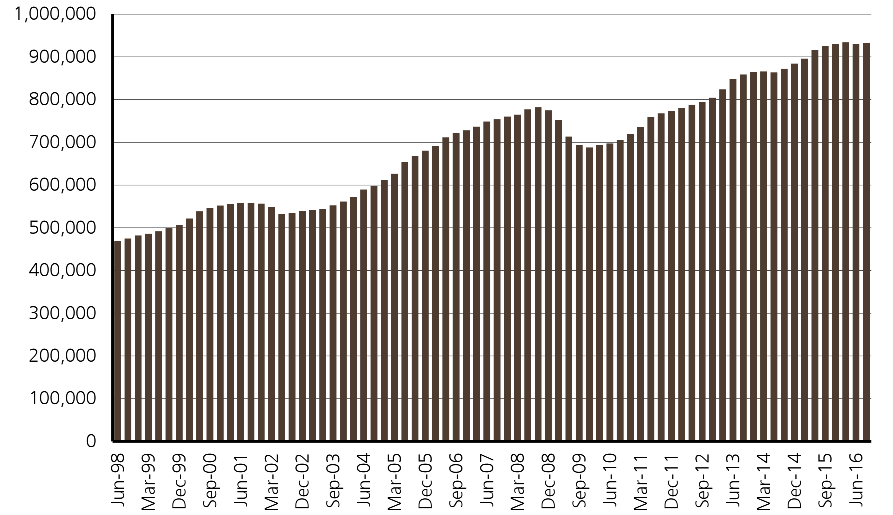
State	Year of legislation	gas tax (cents/gallon unless indicated)		Gas tax structure
		To	From	
New Jersey	2016	37.5	14.5	Variable (going forward)
Georgia	2015	26.0	7.5	Variable (going forward)
Idaho	2015	32.0	25.0	Fixed
Iowa	2015	30.0	20.0	Fixed
Michigan	2015	26.3	19.0	Variable (starting 2022)
South Dakota	2015	28.0	22.0	Fixed
Utah	2015	12%*	24.5	Variable
Washington	2015	49.4	37.5	Fixed
Nebraska	2015	16.3	10.3	Fixed (increase by 2019)
Kentucky	2015	changed variable/indexed structure		Variable
North Carolina	2015	changed variable/indexed structure		Variable
New Hampshire	2014	22.2	18.0	Fixed
Rhode Island	2014	changed variable/indexed structure		Variable
Massachusetts **	2013	24.0	21.0	Fixed
Virginia	2013	3.5%*	17.5	Variable
Wyoming	2013	24.0	14.0	Fixed
D.C.	2013	8.3%*	23.5	Variable
Maryland	2013	changed variable/indexed structure		Variable
Pennsylvania	2013	changed variable/indexed structure		Variable
Vermont	2013	changed to a combination of variable & fixed structure		

Source: NCSL data, UBS
Note: The changes to tax structures were presumably implemented to limit decreasing revenues
* as a percentage of average/wholesale per gallon price of gasoline
** The 2013 Massachusetts legislation also set a variable gas tax structure which was overturned by voters in a 2014 ballot measure

State tax receipts are rising

On a trailing basis, state tax receipts are trending higher from a 2009 trough. While they have leveled off in recent quarters, we think the long-term trend is still intact and should be supportive overall for public sector spending.

Figure 59: US State Tax Receipts (T12M)



Source: US Census

Public Private Partnerships (P3s)

Public Private Partnerships are increasingly being utilized as a means of financing for infrastructure projects. We think the P3 market is limited by projects' necessity to generate revenues (primarily through tolls or user fees), but they may be an integral part of both Trump's and future state initiatives.

P3s are contractual agreements between a public agency and a private entity that allow for greater private participation in the delivery of transportation projects. Typically, P3s involve the private sector taking on additional project risks such as design, construction, finance, long-term operation and traffic revenue. As of 2016, there are more than 40 current or anticipated P3 projects in the US, ranging from a few million to a few billion dollars.

The typical P3 payment structures of Toll/Shadow-Toll and Availability Payment are explained in Figure 60 below.

Figure 60: Compensation models for P3

Model	Description
Toll Concession	Private partner takes on project in exchange for receiving tolls. Public sector usually limits rate of toll increase in some way.
Shadow Toll Concession	Private partner receives payment for each vehicle that uses the facility. Sometimes payment is adjusted based on safety, congestion, or pre-established floors and ceilings.
Availability Payment	Private partner receives payment based on availability of the facility at a specified performance level.

Source: US DoT, Federal Highway Administration – Center for Innovative Finance Support Fact Sheets

Figure 61: Existing (brownfield) P3s

Project	Type	Location	Sponsor	Current/Former Private Partners
Indiana Toll Road	Toll Road	Indiana	Indiana Finance Authority (IFA)	IFM Investors
Chicago Skyway	Toll Highway	Illinois	City of Chicago	Skyway Concession Company, LLC (SCC)
Northwest Parkway	Toll Highway	Colorado	Northwest Parkway Public Highway Authority	Brisa Auto-Estradas de Portugal, Companhia de Concessões Rodoviárias
Pocahontas Parkway / Richmond Airport Connector	Toll Road	Virginia	Virgnina DoT, Pocahontas Parkway Association	Transurban USA, DBi Services, Macquarie Capital
PR-22 & PR-5	Toll Highway	Puerto Rico	Puerto Rico Public-Private Partnerships Authority, Puerto Rico Highways and Transportation Authority	Goldman Sachs Infrastructure Partners II. L.P., Abertis Infraestructuras

Source: US DoT, Federal Highway Administration – Center for Innovative Finance Support

Figure 62: New (greenfield) P3s

Project	Location	Estimated Project Cost (US$ million)
Operational		
U.S. 36 Express Lanes	Colorado	521
Presidio Parkway	California	852
91 Express Lanes*	California	135
South Bay Expressway*	California	658
North Tarrant Express (I-820 and SH 121/183)	Texas	2,122
SH 130 (Segments 5-6)	Texas	1,328
IG 635 Managed Lanes	Texas	2,645
Port of Miami Tunnel	Florida	1,113
I-595 Corridor Roadway Improvements	Florida	1,834
I-95 HOV/HOT Lanes	Virginia	923
I-495 Capital Beltwat HOT Lanes	Virginia	2,068
Dulles Greenway	Virginia	350
Teodoro Moscoco Bridge	Puerto Rico	127

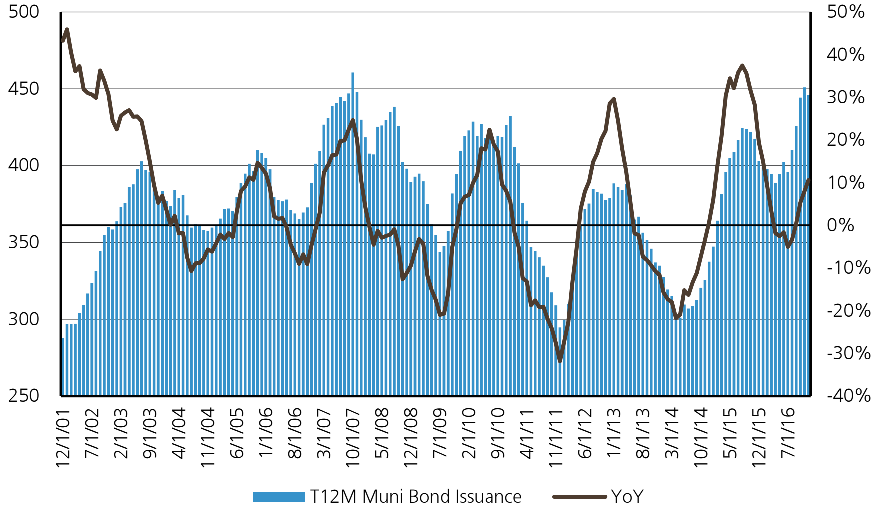
Project	Location	Estimated Project Cost (US$ million)
Under Construction / Financial Close		
North Tarrant Express 35W Project	Texas	1,641
SH 288 Toll Lanes	Texas	1,064
I-4 Ultimate	Florida	2,877
I-77 HOT Lanes	North Calorina	636
Elizabeth River Tunnels	Virginia	2,089
Goethals Bridge Replacement **	New Jersey / New York	1,436
Rapid Bridge Replacement Project	Pennsylvania	1,118
Ohio River Bridges East End Crossing	Indiana	1,319
Southern Ohio Veternas Memorial Highway	Ohio	646
I-69 Section 5	Indiana	466

Source: US DoT, Federal Highway Administration – Center for Innovative Finance Support

Municipal bond offerings

As shown in Figure 34, municipal bond issuance has been rising since a trough in early 2014. We think at least some of these funds are being put towards various construction projects, most likely in the Education and Highway & Street categories.

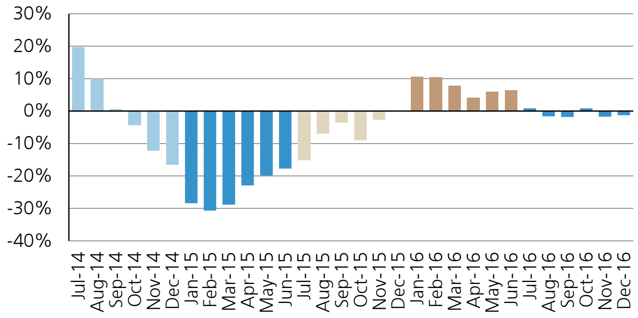
Figure 63: Muni bond issuance is rising



Source: SIFMA

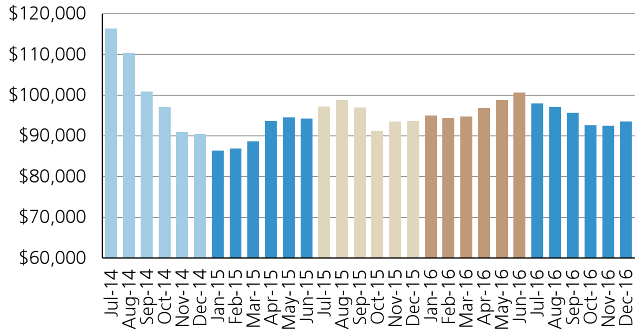
Appendix: 2016 in charts and the setup into 2017

Figure 64: Power (YoY)



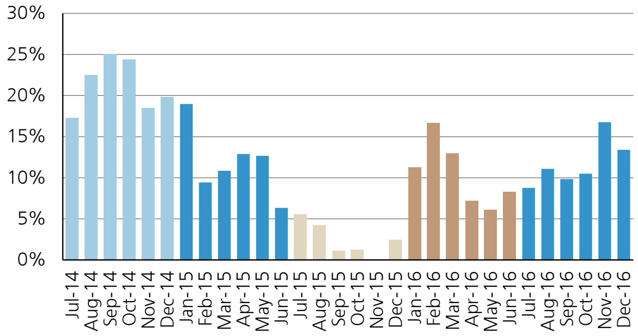
Source: US Census Bureau

Figure 65: Power (SAAR)



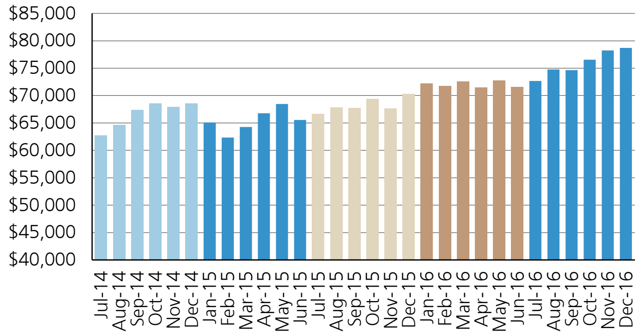
Source: US Census Bureau

Figure 66: Commercial (YoY)



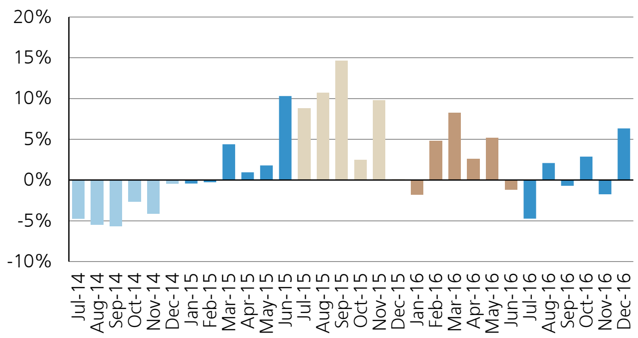
Source: US Census Bureau

Figure 67: Commercial (SAAR)



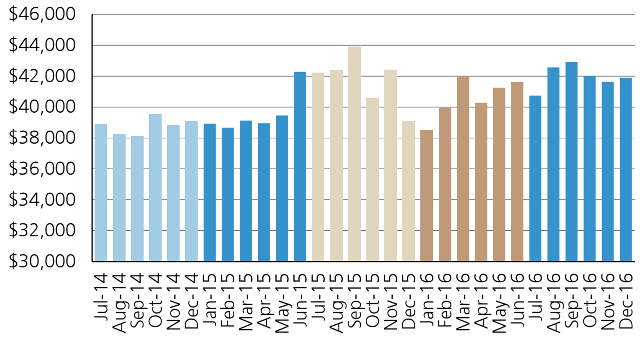
Source: US Census Bureau

Figure 68: Healthcare (YoY)



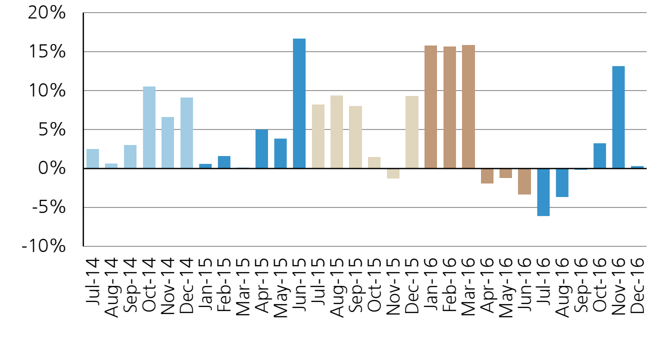
Source: US Census Bureau

Figure 69: Healthcare (SAAR)



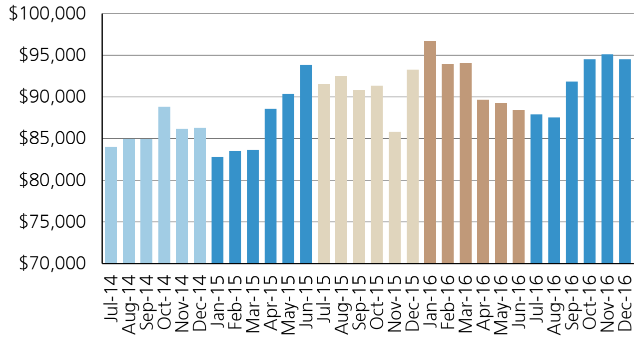
Source: US Census Bureau

Figure 70: Highway & Street (YoY)



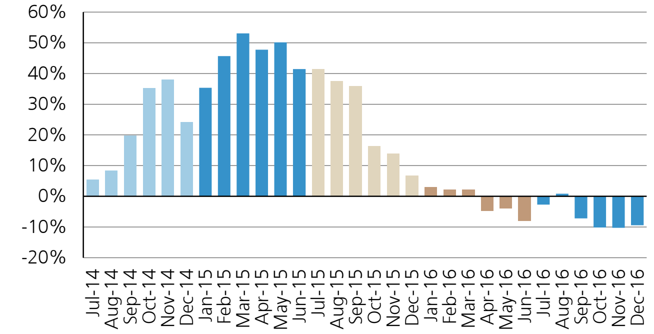
Source: US Census Bureau

Figure 71: Highway & Street (SAAR)



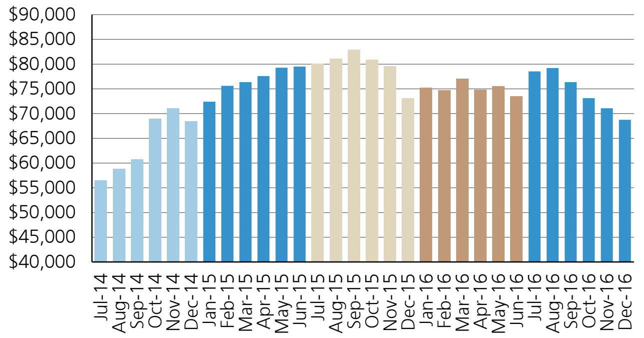
Source: US Census Bureau

Figure 72: Manufacturing (YoY)



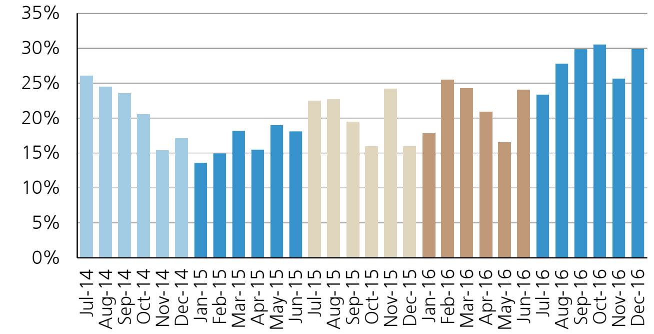
Source: US Census Bureau

Figure 73: Manufacturing (SAAR)



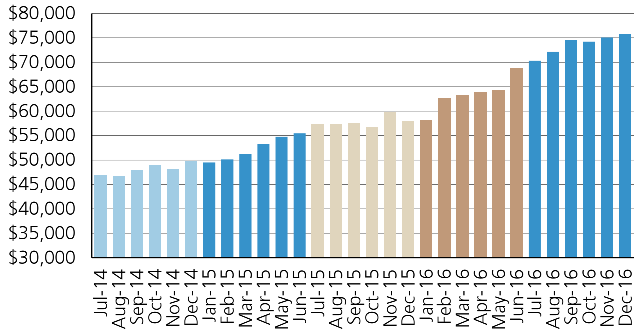
Source: US Census Bureau

Figure 74: Office (YoY)



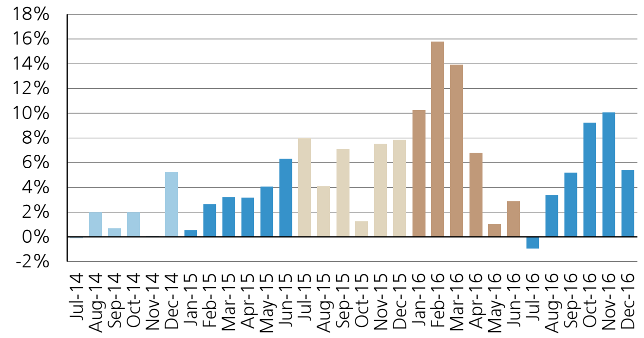
Source: US Census Bureau

Figure 75: Office (SAAR)



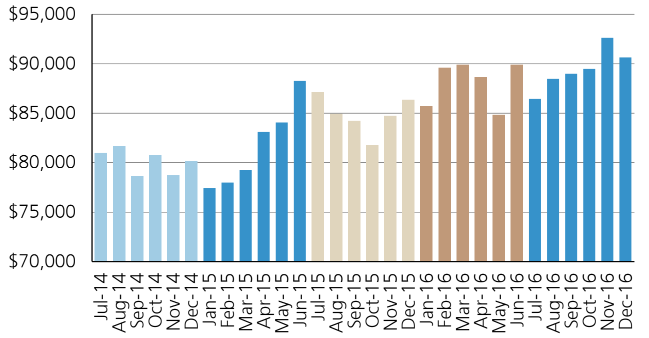
Source: US Census Bureau

Figure 76: Education (YoY)



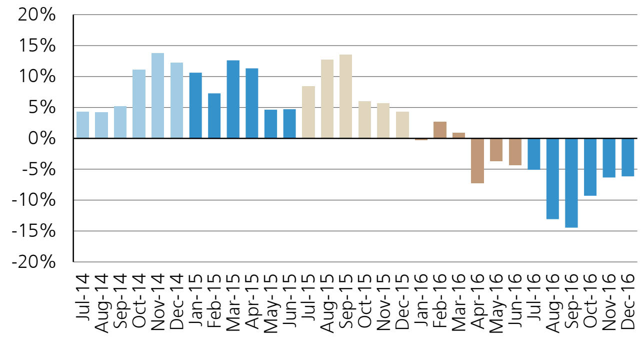
Source: US Census Bureau

Figure 77: Education (SAAR)



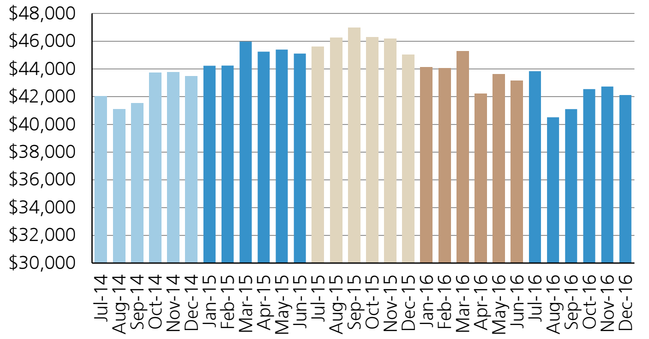
Source: US Census Bureau

Figure 78: Transportation (YoY)



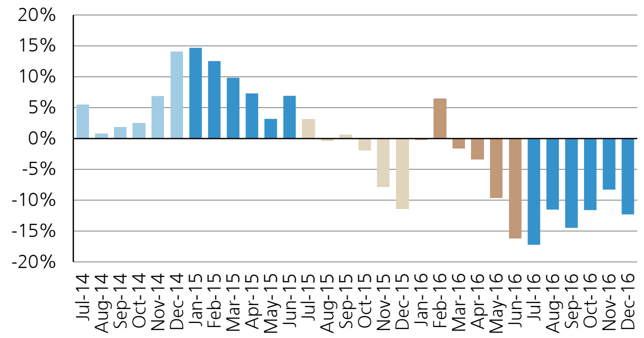
Source: US Census Bureau

Figure 79: Transportation (SAAR)



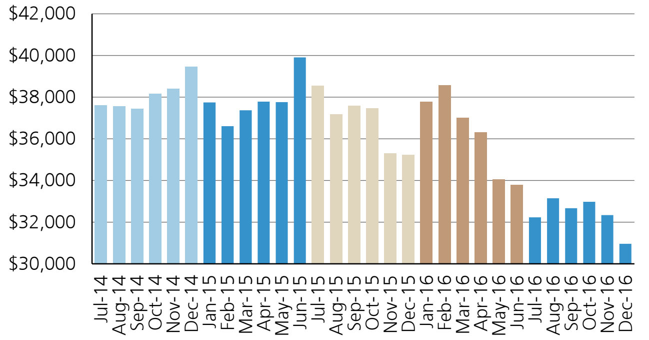
Source: US Census Bureau

Figure 80: Water, Sewage & Waste (YoY)



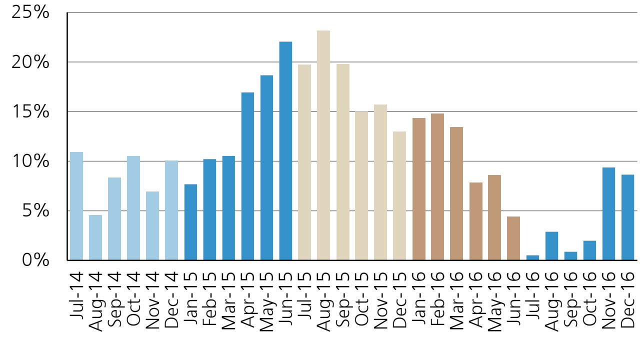
Source: US Census Bureau

Figure 81: Water, Sewage & Waste (SAAR)



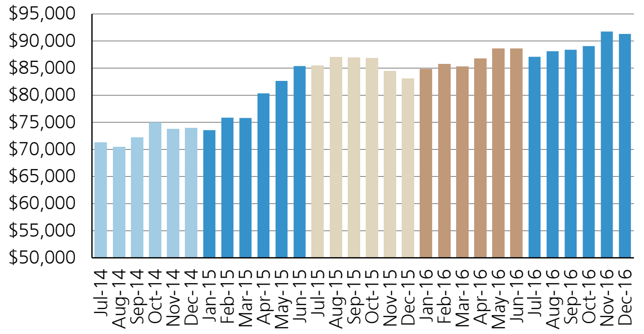
Source: US Census Bureau

Figure 82: Other (YoY)



Source: US Census Bureau

Figure 83: Other (SAAR)



Source: US Census Bureau

Appendix: Detailed construction spending dashboard

Figure 84: Detailed US Construction Dashboard (section 1 of 3)

	% of Total	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
Total Construction	**100%**	**8.4%**	**10.0%**	**12.3%**	**11.6%**	**4.4%**	**3.0%**	**2.4%**	**1.6%**	**2.1%**	**0.4%**	**2.8%**	**4.9%**	**4.2%**
Private	75.4%	10.2%	11.0%	12.9%	13.0%	6.3%	4.9%	4.6%	5.4%	5.2%	2.4%	4.1%	5.4%	6.3%
Public	24.6%	3.1%	6.9%	10.4%	7.1%	-1.2%	-2.4%	-3.4%	-8.0%	-5.6%	-4.8%	-0.7%	3.5%	-2.5%
State and Local	22.7%	3.7%	7.1%	11.0%	7.9%	-1.1%	-2.8%	-3.7%	-8.0%	-6.0%	-5.1%	0.0%	3.9%	-3.6%
Federal	1.9%	-2.6%	5.0%	5.7%	0.3%	-3.2%	2.3%	0.6%	-9.1%	0.4%	-1.7%	-9.2%	-1.0%	8.4%
Residential	**39.8%**	**13.4%**	**11.8%**	**13.0%**	**13.5%**	**5.7%**	**3.3%**	**3.3%**	**4.2%**	**2.4%**	**-0.8%**	**2.4%**	**4.1%**	**4.8%**
Private	98.6%	13.4%	11.8%	13.0%	13.6%	5.9%	3.4%	3.5%	4.5%	2.5%	-0.7%	2.4%	4.2%	4.9%
New single family	52.5%	17.7%	14.5%	15.3%	15.7%	9.8%	6.6%	4.2%	1.8%	-1.5%	-3.2%	-1.4%	-0.1%	0.7%
New multi-family	13.1%	22.6%	24.7%	23.2%	28.1%	18.1%	23.2%	17.6%	15.9%	13.4%	8.5%	9.2%	10.4%	10.9%
Public	1.4%	19.5%	9.9%	16.2%	5.2%	-7.9%	-3.9%	-7.0%	-12.2%	-2.2%	-8.4%	6.0%	0.2%	-3.6%
State	1.2%	23.1%	10.6%	19.0%	6.4%	-6.8%	-1.7%	-5.1%	-7.9%	3.5%	-4.3%	10.2%	7.3%	-3.1%
Multi-family	1.1%	25.6%	8.6%	10.8%	12.0%	-11.3%	-0.5%	-2.5%	-6.2%	8.2%	-0.7%	21.2%	22.7%	5.0%
Federal	0.2%	0.0%	5.1%	0.0%	-2.7%	-15.1%	-15.9%	-19.0%	-37.8%	-34.8%	-31.6%	-22.7%	-38.8%	-7.4%
Non- Residential	**60.2%**	**5.4%**	**8.9%**	**11.8%**	**10.3%**	**3.6%**	**2.9%**	**1.7%**	**-0.1%**	**1.9%**	**1.2%**	**3.1%**	**5.5%**	**3.8%**
Private	60.0%	7.2%	10.2%	12.8%	12.2%	6.8%	6.7%	5.8%	6.4%	8.3%	5.9%	6.0%	6.7%	7.6%
Public	40.0%	2.7%	6.9%	10.3%	7.2%	-1.1%	-2.4%	-3.4%	-7.9%	-5.7%	-4.7%	-0.8%	3.6%	-2.5%
State	36.8%	3.3%	7.1%	10.8%	7.9%	-0.9%	-2.8%	-3.7%	-8.0%	-6.2%	-5.1%	-0.2%	3.9%	-3.6%
Federal	3.1%	-2.7%	5.0%	6.0%	0.4%	-2.7%	3.2%	1.5%	-7.8%	2.1%	-0.5%	-8.7%	0.9%	9.0%
Lodging	**3.9%**	**20.7%**	**23.7%**	**30.7%**	**36.1%**	**30.1%**	**30.5%**	**20.4%**	**23.1%**	**20.8%**	**22.1%**	**20.1%**	**27.0%**	**17.9%**
Private	3.8%	21.3%	25.5%	31.2%	37.8%	31.0%	31.3%	22.0%	25.2%	22.7%	25.9%	21.6%	27.7%	18.7%
Public	0.0%													
Office	**9.9%**	**15.9%**	**17.8%**	**25.5%**	**24.3%**	**20.9%**	**16.5%**	**24.0%**	**23.3%**	**27.8%**	**29.9%**	**30.5%**	**25.6%**	**29.9%**
Private	8.7%	20.0%	22.9%	30.1%	29.2%	26.5%	22.0%	28.9%	28.2%	31.3%	34.3%	35.7%	27.9%	34.1%
General	8.4%	20.6%	23.6%	30.2%	29.0%	27.1%	21.5%	28.3%	28.7%	30.8%	35.4%	35.8%	27.9%	33.5%
Financial	0.3%	-3.4%	-11.1%	8.9%	13.3%	-1.5%	8.1%	3.0%	-5.5%	2.8%	-8.5%	15.0%	15.1%	37.9%
Public	1.1%	-4.7%	-8.0%	0.9%	-3.7%	-9.3%	-12.4%	-4.4%	-6.3%	5.4%	3.2%	-3.0%	10.2%	2.1%
State	0.8%	-1.2%	-3.8%	-4.8%	-2.7%	-11.9%	-13.4%	-6.7%	-9.8%	-2.5%	-4.5%	-8.7%	8.0%	1.0%
Federal	0.3%	-11.5%	-17.0%	14.8%	-6.1%	-1.2%	-9.7%	2.3%	4.4%	29.8%	20.1%	17.7%	17.3%	4.5%
Commercial	**10.6%**	**2.4%**	**11.3%**	**16.7%**	**13.0%**	**7.2%**	**6.1%**	**8.3%**	**8.8%**	**11.1%**	**9.8%**	**10.5%**	**16.8%**	**13.4%**
Private (inc. Farm)	10.1%	1.0%	9.4%	14.7%	10.8%	5.4%	4.9%	8.3%	9.9%	11.5%	9.8%	10.5%	16.7%	13.8%
Automotive	0.9%	-14.7%	12.3%	6.4%	22.0%	-1.0%	-10.5%	3.7%	15.7%	31.0%	25.5%	22.3%	29.4%	34.7%
Sales	0.4%	-5.4%	21.8%	0.0%	42.0%	6.9%	19.2%	24.6%	37.0%	32.4%	21.4%	16.9%	11.7%	17.0%
Service/parts	0.4%	-19.9%	7.3%	3.2%	0.6%	-16.2%	-32.8%	-5.9%	1.2%	39.0%	29.1%	20.2%	29.4%	30.5%
Parking	0.1%	-23.8%	3.6%	35.2%	38.3%	35.5%	13.6%	-7.8%	10.8%	8.0%	24.6%	50.8%	100.0%	114.6%
Food/beverage	1.1%	-19.0%	2.3%	18.0%	-3.5%	-0.7%	-6.6%	-15.7%	2.7%	18.9%	23.8%	16.0%	10.4%	8.8%
Food	0.5%	-36.5%	-19.7%	-6.7%	-7.6%	-3.0%	-9.1%	-10.2%	-12.9%	-0.7%	34.2%	45.8%	57.5%	49.2%
Dining/drinking	0.4%	-26.1%	18.2%	21.9%	-13.8%	-10.0%	0.0%	-1.5%	42.9%	37.9%	3.3%	-0.4%	-8.4%	-9.1%
Multi-retail	2.9%	3.6%	5.9%	11.2%	1.5%	-3.5%	-5.0%	4.5%	3.6%	5.8%	3.0%	10.4%	19.7%	10.4%
General merchandise	0.4%	11.2%	0.7%	-13.9%	-16.2%	-13.0%	-0.9%	17.8%	37.0%	44.3%	8.8%	-1.8%	-15.5%	-17.3%
Shopping center	2.0%	5.8%	10.1%	17.6%	5.6%	7.4%	4.7%	11.0%	-1.4%	2.5%	3.5%	11.8%	21.0%	5.4%
Shopping mall	0.4%	-13.7%	-17.3%	7.5%	1.3%	-35.5%	-39.7%	-18.9%	0.7%	7.3%	17.1%	39.8%	68.1%	68.9%
Other commercial	0.9%	30.1%	52.8%	46.6%	48.6%	29.0%	14.9%	28.0%	27.5%	16.9%	5.4%	-7.7%	0.0%	-1.5%
Drug store	0.1%	-23.5%	-35.6%	-17.9%	9.4%	-14.6%	-11.9%	21.6%	20.0%	-13.0%	-18.2%	-14.9%	24.3%	5.1%
Building supply store	0.1%	-10.6%	0.0%	44.8%	22.6%	-20.8%	-5.5%	15.8%	20.4%	14.6%	-36.2%	-37.0%	-25.0%	-19.0%
Other stores	0.6%	48.2%	84.8%	62.4%	55.3%	53.2%	32.6%	34.5%	43.7%	34.6%	28.4%	11.8%	11.0%	12.5%
Warehouse	2.8%	10.0%	12.7%	23.9%	23.7%	19.2%	32.8%	30.7%	24.5%	16.5%	13.3%	15.7%	28.7%	26.3%
General commercial	2.5%	5.7%	8.9%	20.5%	19.3%	11.7%	28.7%	26.1%	19.6%	12.5%	9.4%	11.9%	26.6%	24.1%
Mini-storage	0.3%	148.0%	117.9%	110.5%	173.1%	203.5%	115.5%	116.7%	102.6%	82.4%	76.3%	73.6%	58.9%	54.0%
Public	0.5%	46.4%	76.1%	75.2%	76.2%	66.7%	37.9%	8.2%	-17.3%	3.0%	11.5%	9.6%	17.7%	5.3%
State	0.2%	54.1%	106.1%	97.1%	98.7%	69.7%	36.1%	-11.9%	-29.0%	-22.8%	-0.7%	-15.5%	-9.3%	-17.6%
Automotive	0.1%	41.7%	102.9%	88.2%	86.1%	61.7%	22.8%	-25.7%	-50.0%	-57.0%	-53.1%	-44.0%	-27.6%	-20.6%
Parking	0.1%	88.2%	28.1%	26.7%	56.3%	13.6%	-36.5%	-21.4%	-48.0%	-56.4%	-51.9%	-41.9%	-24.5%	-15.6%
Federal	0.2%	39.8%	47.1%	55.7%	56.7%	63.2%	39.6%	31.4%	-0.9%	36.6%	23.3%	50.5%	62.0%	30.2%
Health Care	**5.9%**	**0.1%**	**-1.8%**	**4.8%**	**8.2%**	**2.6%**	**5.2%**	**-1.2%**	**-4.7%**	**2.1%**	**-0.7%**	**2.9%**	**-1.7%**	**6.3%**
Private	4.7%	2.0%	-0.9%	6.4%	9.5%	3.0%	8.7%	0.0%	-5.2%	-0.4%	-2.7%	3.5%	-3.3%	7.4%
Hospital	3.1%	9.0%	5.7%	10.3%	13.8%	3.5%	10.4%	6.0%	6.3%	10.4%	8.8%	-0.8%	0.3%	11.9%
Medical building	1.1%	-3.4%	-1.3%	16.6%	13.4%	11.1%	14.4%	-10.1%	-28.8%	-21.5%	-27.7%	12.3%	-12.1%	2.8%
Special care	0.5%	-17.2%	-24.6%	-20.3%	-13.4%	-12.0%	-9.1%	-6.9%	0.3%	0.6%	4.8%	11.0%	-4.2%	-7.6%
Public	1.2%	-6.0%	-5.1%	-0.6%	3.9%	1.1%	-7.3%	-5.8%	-2.8%	12.8%	7.7%	0.6%	4.7%	2.4%
State	0.8%	4.4%	2.9%	2.0%	1.8%	-0.2%	-14.3%	-8.7%	-5.7%	6.2%	-3.5%	3.0%	1.8%	-12.1%
Hospital	0.5%	1.4%	-4.4%	0.3%	0.0%	-5.6%	-15.5%	-17.8%	-16.3%	-3.6%	-13.0%	-4.7%	-7.8%	-19.2%
Medical building	0.1%	12.3%	9.7%	-12.5%	-7.4%	18.8%	-22.6%	21.1%	23.9%	22.4%	5.3%	14.6%	35.8%	9.6%
Special care	0.1%	16.7%	72.4%	66.7%	41.2%	15.4%	18.9%	31.6%	39.5%	72.7%	83.9%	54.3%	30.8%	11.9%
Federal	0.5%	-22.1%	-19.3%	-4.9%	7.3%	3.6%	7.5%	0.4%	1.9%	23.6%	24.0%	-3.8%	9.8%	32.3%

Source: US Census
Note: Due to rounding, statistical analysis, and selective reporting, not all figures add to the total

Figure 85: Detailed US Construction Dashboard (section 2 of 3)

	% of Total	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
Educational	**12.7%**	**7.8%**	**10.2%**	**15.8%**	**13.9%**	**6.8%**	**1.1%**	**2.9%**	**-0.9%**	**3.4%**	**5.2%**	**9.2%**	**10.1%**	**5.4%**
Private	2.7%	5.0%	9.4%	15.8%	12.9%	8.6%	6.8%	4.0%	7.1%	10.0%	17.9%	15.2%	22.9%	19.7%
Preschool	0.1%	81.3%	121.7%	68.0%	7.4%	0.0%	16.1%	13.2%	47.1%	-18.2%	43.3%	79.2%	40.0%	117.2%
Primary/Secondary	0.5%	-12.9%	0.0%	8.2%	1.2%	-2.8%	-3.6%	-16.9%	-10.9%	-7.2%	6.1%	16.5%	33.8%	16.5%
Higher Education	1.8%	7.5%	4.6%	13.0%	12.5%	8.7%	4.8%	4.8%	9.4%	15.5%	21.8%	11.7%	20.9%	15.3%
Instructional	0.9%	-3.1%	-7.4%	5.0%	6.1%	7.3%	-2.9%	5.8%	19.1%	23.2%	33.5%	16.5%	26.4%	29.5%
Dormitory	0.6%	18.9%	16.5%	20.6%	20.4%	12.5%	17.7%	15.0%	20.2%	26.0%	34.3%	22.8%	25.0%	2.9%
Sports/Recreation	0.1%	0.0%	9.5%	-4.1%	-5.4%	-3.6%	2.3%	-15.0%	-26.5%	0.0%	15.6%	-9.6%	4.4%	17.8%
Other Educational	0.3%	18.5%	45.5%	40.2%	44.4%	35.1%	56.9%	50.0%	19.4%	16.3%	3.2%	15.7%	7.1%	28.1%
Gallery/Museum	0.2%	10.3%	42.2%	28.4%	41.7%	34.2%	67.1%	64.0%	45.9%	26.0%	17.1%	27.1%	18.2%	50.0%
Public	10.0%	8.6%	10.5%	15.7%	14.2%	6.3%	-0.5%	2.6%	-2.7%	1.9%	2.2%	7.7%	6.8%	1.6%
State	9.7%	8.5%	10.6%	16.6%	15.2%	6.8%	0.2%	3.2%	-2.1%	2.3%	3.1%	8.0%	7.4%	2.1%
Primary/Secondary	6.0%	13.9%	16.9%	22.4%	22.9%	15.1%	9.6%	13.0%	4.1%	2.4%	6.5%	11.8%	10.4%	6.8%
Elementary	1.8%	11.9%	14.2%	24.0%	26.8%	11.6%	22.9%	39.4%	31.1%	30.2%	9.6%	9.7%	25.1%	4.2%
Middle/Junior high	1.3%	1.6%	10.7%	28.7%	38.3%	41.5%	16.6%	22.5%	-0.5%	-1.1%	11.1%	22.4%	24.1%	35.8%
High	2.8%	20.2%	21.7%	20.4%	16.0%	6.5%	-0.1%	-6.5%	-12.4%	-12.0%	2.6%	7.6%	-3.0%	-2.8%
Higher Education	3.4%	2.9%	3.4%	2.4%	2.9%	-3.3%	-10.0%	-8.3%	-14.1%	2.0%	-2.8%	3.4%	1.8%	-4.4%
Instructional	1.9%	4.1%	8.3%	8.3%	10.1%	2.1%	-4.1%	0.3%	-14.1%	-5.9%	-8.0%	3.8%	3.3%	3.3%
Dormitory	0.6%	7.0%	8.2%	6.1%	6.8%	10.4%	0.6%	-4.9%	-2.8%	47.0%	10.7%	-7.2%	-3.6%	-17.0%
Sports/Recreation	0.4%	-8.2%	-19.6%	-18.8%	-7.3%	-21.9%	-22.8%	-24.2%	-15.3%	2.3%	18.7%	12.7%	12.4%	0.0%
Infrastructure	0.2%	-15.3%	-48.1%	-35.8%	-56.8%	-47.5%	-43.8%	-39.0%	-40.2%	-23.9%	12.7%	46.3%	9.0%	-17.2%
Other Educational	0.3%	-14.6%	3.8%	94.0%	54.0%	-9.0%	-36.7%	-16.1%	-4.9%	-2.4%	-8.1%	-7.1%	25.0%	-13.4%
Library/Archive	0.2%	50.9%	46.4%	177.6%	87.1%	42.9%	29.0%	24.0%	16.2%	-16.0%	-1.7%	-20.0%	7.9%	-16.3%
Federal	0.2%	12.8%	6.4%	-7.7%	-14.7%	-9.5%	-22.9%	-21.0%	-31.7%	-16.9%	-25.5%	-5.1%	-15.0%	-13.8%
Religious	**0.5%**	**2.1%**	**9.6%**	**9.1%**	**17.3%**	**19.6%**	**5.7%**	**3.4%**	**-4.8%**	**3.7%**	**-9.6%**	**-13.8%**	**-0.3%**	**-4.9%**
Private	0.5%	2.1%	9.6%	9.5%	17.7%	19.6%	6.0%	3.8%	-4.8%	4.0%	-9.4%	-13.5%	-0.3%	-4.9%
House of Worship	0.5%	1.7%	4.9%	10.3%	22.2%	25.2%	1.9%	3.3%	-1.3%	4.0%	-6.9%	-7.1%	6.7%	-1.3%
Other Religious	0.1%	4.3%	36.1%	2.6%	-4.8%	-6.4%	31.7%	6.5%	-24.5%	6.8%	-22.6%	-45.0%	-30.4%	-22.4%
Auxiliary Building	0.0%	-15.8%	-19.4%	-37.1%	-41.0%	-30.2%	-18.9%	-34.1%	-35.0%	-22.5%	-24.4%	-32.6%	-13.5%	-6.3%
Public Safety	**1.2%**	**-5.9%**	**-3.6%**	**-3.0%**	**-10.4%**	**-6.9%**	**-3.6%**	**-7.8%**	**-10.0%**	**-11.9%**	**-11.4%**	**-10.8%**	**-3.8%**	**-2.7%**
Private	0.0%													
Public	1.1%	-3.9%	-0.6%	-0.3%	-7.5%	-4.0%	-1.2%	-6.4%	-9.5%	-11.6%	-11.4%	-10.6%	-4.2%	-2.0%
State	0.8%	2.1%	1.8%	3.5%	-8.7%	1.7%	0.0%	-2.1%	-9.0%	-9.7%	-5.6%	-1.7%	-1.5%	-9.1%
Correctional	0.5%	5.0%	4.6%	13.3%	-13.9%	4.1%	-1.4%	-0.6%	-7.7%	-5.5%	-7.2%	-3.9%	1.3%	-13.6%
Detention	0.3%	26.4%	13.1%	14.4%	-10.8%	1.2%	5.5%	8.7%	4.7%	2.2%	-3.4%	4.5%	-10.9%	-12.8%
Police/sheriff	0.2%	-16.2%	-6.5%	10.5%	-17.1%	7.9%	-10.7%	-12.9%	-21.0%	-13.6%	-11.4%	-12.6%	19.2%	-15.5%
Other public Safety	0.3%	-2.2%	-2.9%	-10.8%	0.6%	-1.7%	2.2%	-4.0%	-11.1%	-17.3%	-2.4%	1.5%	-6.3%	-1.1%
Fire/rescue	0.2%	4.1%	-5.2%	-4.7%	7.1%	3.5%	-0.8%	-0.7%	-3.5%	-7.7%	18.1%	7.0%	1.3%	13.4%
Federal	0.3%	-16.2%	-6.8%	-9.0%	-5.0%	-17.5%	-3.1%	-16.7%	-11.3%	-15.6%	-22.1%	-30.6%	-10.9%	15.8%
Amusement and Recreation	**3.1%**	**12.0%**	**14.8%**	**15.1%**	**16.0%**	**11.5%**	**9.7%**	**3.8%**	**3.7%**	**7.2%**	**4.0%**	**8.2%**	**14.6%**	**12.7%**
Private	1.7%	15.0%	27.1%	27.9%	34.6%	21.6%	21.0%	17.4%	17.2%	23.9%	19.7%	15.8%	23.1%	25.9%
Theme/Amusement park	0.3%	19.2%	61.3%	26.4%	54.3%	112.3%	95.3%	86.3%	144.7%	122.5%	63.6%	58.0%	22.7%	70.1%
Sports	0.6%	49.8%	72.7%	76.3%	50.2%	27.1%	27.0%	28.8%	6.1%	5.4%	2.0%	-8.6%	15.2%	24.2%
Fitness	0.2%	-19.3%	-30.0%	-33.0%	-2.4%	-18.9%	-20.4%	-15.1%	-6.2%	46.3%	17.6%	32.2%	50.6%	23.9%
Performance/Meeting center	0.1%	0.0%	11.1%	53.7%	40.0%	23.1%	32.7%	32.7%	49.1%	87.5%	85.7%	48.9%	71.4%	61.7%
Social center	0.1%	8.6%	12.3%	17.2%	29.2%	0.0%	5.6%	-16.0%	-16.9%	-4.7%	1.2%	20.8%	-4.0%	-28.9%
Movie theater/studio	0.1%	0.0%	-1.8%	-8.6%	-21.9%	-10.8%	-15.6%	-15.3%	-1.5%	-7.8%	47.6%	66.2%	28.8%	3.0%
Public	1.4%	9.0%	2.8%	2.4%	-0.5%	2.2%	0.0%	-8.1%	-8.9%	-7.6%	-10.5%	0.6%	5.8%	-1.0%
State	1.4%	10.0%	3.9%	3.3%	0.0%	3.6%	1.1%	-6.2%	-7.7%	-7.4%	-11.0%	1.8%	8.3%	-2.0%
Sports	0.2%	-19.0%	-13.4%	11.4%	9.2%	-4.2%	-2.6%	-41.2%	-7.2%	-18.5%	-15.0%	-9.0%	10.6%	-26.9%
Performance/Meeting center	0.2%	26.8%	-16.9%	-11.9%	-2.3%	13.8%	13.6%	39.4%	-5.6%	9.3%	-4.1%	34.8%	42.9%	9.9%
Convention Center	0.1%	-6.5%	-29.2%	-27.8%	-10.3%	-5.4%	16.2%	15.5%	11.0%	-7.6%	8.7%	0.0%	9.5%	25.0%
Social Center	0.2%	29.7%	44.3%	14.5%	7.5%	34.5%	28.4%	12.4%	-2.0%	-1.0%	-20.0%	5.6%	-7.3%	9.6%
Neighborhood Center	0.1%	25.4%	28.8%	0.0%	-9.6%	13.6%	13.1%	-5.9%	-11.7%	-14.7%	-33.6%	1.0%	-19.4%	12.2%
Park/camp	0.7%	11.2%	11.5%	-0.6%	-3.7%	-5.5%	-6.5%	-1.0%	-9.4%	-10.4%	-6.3%	1.2%	7.0%	0.3%
Federal	0.1%	-7.7%	-23.1%	-14.3%	-11.1%	-27.0%	-22.7%	-45.8%	-35.0%	-10.3%	4.9%	-28.9%	-33.3%	19.4%
Transportation	**6.1%**	**4.3%**	**-0.3%**	**2.7%**	**0.9%**	**-7.2%**	**-3.7%**	**-4.3%**	**-5.1%**	**-13.1%**	**-14.4%**	**-9.3%**	**-6.3%**	**-6.2%**
Private	1.8%	-1.5%	-8.6%	-12.1%	-10.1%	-2.8%	-3.9%	-2.7%	-4.0%	-15.9%	-15.2%	-8.3%	-6.5%	-7.0%
Air	0.2%	4.5%	28.1%	35.7%	36.6%	30.1%	46.3%	54.0%	54.9%	43.8%	41.9%	45.9%	30.0%	26.1%
Land	1.6%	-0.5%	-9.5%	-14.2%	-12.2%	-3.2%	-5.8%	-5.2%	-6.9%	-19.0%	-17.7%	-10.5%	-7.8%	-8.3%
Public	4.3%	7.1%	3.3%	8.5%	5.2%	-9.0%	-3.6%	-4.9%	-5.5%	-11.9%	-14.1%	-9.7%	-6.3%	-5.8%
State	4.0%	6.3%	1.4%	7.2%	4.7%	-11.5%	-5.3%	-6.7%	-5.9%	-13.5%	-13.6%	-10.0%	-6.5%	-5.3%
Air	1.4%	-21.4%	-14.0%	-10.1%	-16.1%	-8.4%	-7.0%	2.6%	5.9%	-23.3%	-13.7%	-9.8%	2.2%	17.3%
Passenger Terminal	0.8%	-19.3%	-11.2%	-1.7%	-5.4%	7.0%	1.9%	12.8%	23.1%	1.3%	22.9%	32.2%	32.5%	51.4%
Runway	0.6%	-22.8%	-13.1%	-18.0%	-34.1%	-25.7%	-20.9%	-7.2%	-7.0%	-43.2%	-37.6%	-37.2%	-27.8%	-20.6%
Land	2.3%	26.1%	11.1%	18.7%	14.8%	-12.6%	-2.9%	-12.2%	-13.3%	-9.2%	-14.3%	-11.5%	-13.2%	-17.4%
Passenger Terminal	0.7%	83.4%	67.3%	69.8%	35.5%	-8.0%	-5.4%	-12.5%	-17.5%	-24.5%	-29.2%	-24.4%	-26.0%	-37.0%
Mass transit	1.0%	-0.2%	-10.4%	-2.2%	4.4%	-13.2%	6.6%	-9.2%	-12.8%	-9.1%	-10.6%	-9.8%	-6.3%	4.7%
Water	0.2%	19.2%	-2.3%	3.4%	32.5%	-17.6%	-16.2%	-8.8%	-4.0%	-7.5%	-22.7%	-15.4%	-12.5%	-7.6%
Dock/marina	0.2%	29.9%	22.8%	2.3%	30.4%	-16.2%	-24.1%	-1.1%	0.0%	10.4%	-20.2%	-5.7%	-3.3%	5.7%
Federal	0.3%	17.7%	32.3%	25.2%	11.4%	30.1%	20.7%	20.8%	0.0%	12.2%	-19.9%	-6.0%	-4.2%	-11.7%

Source: US Census
Note: Due to rounding, statistical analysis, and selective reporting, not all figures add to the total

Figure 86: Detailed US Construction Dashboard (section 3 of 3)

	% of Total	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16
Communication	**2.8%**	**26.3%**	**19.5%**	**13.4%**	**2.1%**	**-8.9%**	**-8.0%**	**-6.5%**	**-13.6%**	**-7.1%**	**-13.3%**	**-10.7%**	**-2.0%**	**1.2%**
Private	2.8%	26.6%	19.5%	12.9%	2.8%	-8.9%	-8.2%	-6.4%	-13.4%	-7.1%	-12.9%	-10.4%	-1.8%	1.3%
Public	0.0%													
Power	**13.6%**	**0.0%**	**10.5%**	**10.5%**	**7.8%**	**4.1%**	**5.9%**	**6.4%**	**0.8%**	**-1.6%**	**-1.8%**	**0.8%**	**-1.7%**	**-1.3%**
Private	12.4%	3.1%	12.1%	12.7%	12.3%	6.7%	6.8%	6.0%	5.5%	5.7%	3.3%	2.8%	1.2%	1.6%
Electric	9.4%	-0.3%	11.6%	14.2%	16.5%	12.3%	14.1%	13.6%	13.1%	14.3%	11.0%	11.8%	9.4%	9.9%
Public	1.2%	-23.4%	-3.0%	-6.5%	-25.6%	-14.2%	-1.5%	9.1%	-32.7%	-45.5%	-38.8%	-17.8%	-30.3%	-30.6%
State	1.0%	-26.9%	-3.1%	-7.1%	-28.1%	-15.1%	-6.0%	5.8%	-41.1%	-47.7%	-43.4%	-15.1%	-32.4%	-30.3%
Federal	0.2%	7.1%	-2.3%	-1.0%	-11.2%	-6.8%	28.1%	34.9%	48.9%	-22.5%	-4.2%	-37.8%	-16.3%	-33.3%
Highway and Street	**13.1%**	**9.3%**	**15.8%**	**15.6%**	**15.8%**	**-1.9%**	**-1.2%**	**-3.3%**	**-6.1%**	**-3.7%**	**-0.2%**	**3.2%**	**13.1%**	**0.3%**
Private	0.0%													
Public	13.0%	9.8%	15.8%	15.7%	16.0%	-1.9%	-1.1%	-3.3%	-5.9%	-3.6%	0.1%	3.5%	13.2%	0.5%
State	12.9%	9.6%	15.4%	15.1%	15.2%	-2.2%	-1.3%	-3.2%	-5.7%	-3.7%	-0.5%	3.3%	12.8%	-0.3%
Pavement	7.6%	7.4%	14.1%	14.6%	25.2%	-0.8%	0.8%	-7.4%	-10.5%	0.1%	0.3%	2.7%	7.8%	-0.8%
Lighting	0.3%	31.6%	36.1%	-23.5%	-43.0%	-56.6%	-40.0%	4.6%	20.1%	41.6%	77.7%	94.4%	62.4%	133.0%
Bridge	4.5%	6.8%	14.1%	12.0%	2.5%	-5.4%	-4.8%	3.5%	4.7%	-10.0%	-3.9%	-0.2%	15.5%	-7.3%
Rest facility	0.1%	13.6%	18.6%	32.6%	57.8%	73.7%	20.3%	23.1%	2.8%	4.9%	3.7%	-17.4%	-18.8%	32.0%
Federal	0.1%	54.8%	126.7%	140.0%	237.5%	60.0%	48.6%	-8.9%	-25.6%	15.8%	77.9%	46.2%	80.4%	97.9%
Sewage and Waste Disposal	**3.2%**	**-8.9%**	**7.0%**	**7.6%**	**-0.5%**	**-0.9%**	**-9.7%**	**-16.3%**	**-16.8%**	**-10.0%**	**-15.4%**	**-12.6%**	**-10.0%**	**-18.8%**
Private	0.0%													
Public	3.1%	-9.4%	6.4%	6.5%	-1.2%	-1.6%	-10.2%	-17.0%	-17.7%	-10.8%	-15.5%	-12.5%	-9.9%	-19.0%
State	3.0%	-8.4%	7.0%	8.1%	2.4%	-0.4%	-9.5%	-16.6%	-17.4%	-10.4%	-15.6%	-12.3%	-9.7%	-18.8%
Sewage/dry waste	1.8%	-1.8%	4.9%	22.2%	8.2%	6.1%	-11.0%	-15.3%	-19.6%	-12.8%	-21.1%	-17.3%	-16.4%	-22.3%
Plant	0.3%	-6.7%	29.7%	17.2%	1.6%	6.5%	0.9%	-21.8%	-20.8%	-23.0%	-21.9%	-18.9%	-23.3%	-29.5%
Line/pump station	1.4%	-0.8%	0.5%	22.7%	8.2%	5.3%	-15.2%	-14.6%	-20.4%	-11.3%	-20.4%	-16.1%	-15.3%	-21.3%
Waste water	1.2%	-17.2%	9.8%	-7.2%	-4.8%	-8.4%	-7.5%	-18.4%	-14.0%	-6.2%	-6.0%	-3.9%	1.6%	-13.2%
Plant	1.0%	-20.2%	5.7%	-13.2%	-6.5%	-5.3%	-7.8%	-13.9%	-8.3%	1.4%	-5.2%	-0.3%	4.9%	-8.2%
Line/drain	0.3%	-6.0%	24.2%	11.8%	0.5%	-18.0%	-6.2%	-32.9%	-30.5%	-26.4%	-8.6%	-12.7%	-6.7%	-28.1%
Federal	0.7%	-2.0%	23.6%	6.6%	0.6%	-18.8%	5.1%	8.2%	-16.7%	-13.7%	-7.8%	-15.7%	-9.0%	13.9%
Water Supply	**1.7%**	**-16.1%**	**-12.5%**	**4.2%**	**-3.5%**	**-8.0%**	**-9.4%**	**-16.0%**	**-17.9%**	**-14.3%**	**-12.7%**	**-9.8%**	**-5.1%**	**1.2%**
Private	0.0%													
Public	1.7%	-12.3%	-10.1%	7.9%	-0.1%	-5.2%	-6.6%	-13.8%	-15.3%	-10.6%	-9.6%	-7.3%	-2.0%	0.7%
State	1.7%	-12.5%	-10.3%	8.0%	-0.2%	-5.2%	-6.9%	-14.5%	-15.8%	-11.8%	-10.3%	-7.6%	-2.5%	0.3%
Plant	0.6%	-30.7%	-15.8%	-7.8%	-22.7%	-16.6%	-17.6%	-27.7%	-18.4%	-9.6%	-6.0%	-3.2%	14.1%	17.5%
Line	0.8%	-2.0%	-13.8%	14.4%	7.1%	-3.1%	-10.3%	-15.0%	-20.6%	-17.8%	-20.9%	-13.1%	-15.1%	-14.3%
Pump station	0.1%	16.7%	41.7%	63.2%	75.6%	22.2%	82.9%	38.2%	14.3%	15.8%	12.3%	38.3%	26.9%	1.6%
Federal	0.0%													
Conservation and development	**1.1%**	**-10.2%**	**0.2%**	**-0.5%**	**1.6%**	**-6.6%**	**1.9%**	**2.5%**	**-18.2%**	**-16.3%**	**-8.2%**	**-8.5%**	**-2.2%**	**14.0%**
Private	0.0%	-50.0%	-40.0%	-50.0%	-53.8%	-50.0%	-55.6%	42.9%	12.5%	33.3%	-44.4%	-68.8%	-70.0%	-14.3%
Public	1.1%	-9.3%	1.0%	0.8%	2.8%	-6.0%	2.7%	2.0%	-18.5%	-16.7%	-7.8%	-7.0%	-1.2%	14.3%
State	0.4%	-21.8%	-27.9%	-8.3%	6.2%	14.2%	-0.7%	-6.3%	-21.1%	-20.7%	-7.1%	6.1%	14.1%	15.3%
Dam/levee	0.1%	-16.9%	9.7%	11.6%	78.4%	51.6%	-8.6%	-12.0%	-29.9%	-24.3%	-11.9%	-7.8%	-5.6%	-5.8%
Breakwater/jetty	0.2%	-18.1%	-24.2%	2.9%	-15.3%	9.8%	18.0%	-4.8%	-8.9%	-17.6%	-14.3%	5.1%	19.0%	28.6%
Federal	0.7%	-2.0%	23.6%	6.6%	0.6%	-18.8%	5.1%	8.2%	-16.7%	-13.7%	-7.8%	-15.7%	-9.0%	13.9%
Manufacturing	**10.7%**	**6.9%**	**3.0%**	**2.1%**	**2.2%**	**-4.7%**	**-3.9%**	**-8.0%**	**-2.7%**	**0.9%**	**-7.2%**	**-10.1%**	**-10.2%**	**-9.4%**
Private	10.6%	6.7%	2.6%	1.8%	2.2%	-4.9%	-3.9%	-8.0%	-2.4%	0.7%	-7.2%	-9.8%	-10.2%	-9.4%
Food/beverage/tobacco	0.9%	-20.8%	-18.1%	-18.7%	-4.9%	-15.2%	-5.3%	-13.3%	-6.0%	4.9%	-3.0%	4.5%	15.0%	8.4%
Chemical	5.1%	20.5%	2.4%	0.0%	6.4%	-2.4%	-8.7%	-2.4%	0.2%	5.7%	-7.2%	-11.3%	-10.1%	-9.5%
Plastic/rubber	0.5%	14.1%	-1.2%	-1.2%	2.3%	30.0%	20.3%	15.8%	5.6%	37.4%	24.1%	21.3%	1.5%	7.9%
Nonmetallic mineral	0.1%	12.6%	-7.9%	-1.4%	5.7%	-24.2%	-37.4%	-33.9%	-5.9%	-36.3%	-22.3%	2.8%	-6.1%	-27.1%
Fabricated metal	0.3%	44.1%	108.2%	98.2%	138.7%	275.6%	311.5%	253.7%	271.0%	156.8%	91.0%	76.9%	41.9%	37.8%
Computer/electronic/electrical	0.3%	3.2%	-13.4%	-18.8%	-30.3%	-41.0%	-41.4%	-16.3%	-51.4%	-43.0%	-31.2%	-51.6%	-61.0%	-64.8%
Transportation equipment	1.6%	12.6%	16.0%	27.6%	19.2%	5.1%	22.4%	-5.0%	1.6%	-9.6%	-8.8%	-8.0%	-10.2%	-16.1%
Other	1.8%	-18.4%	2.7%	-1.2%	-15.6%	-21.6%	-16.7%	-31.8%	-16.1%	-11.4%	-16.1%	-20.4%	-16.4%	-2.0%
Public	0.0%													

Source: US Census
Note: Due to rounding, statistical analysis, and selective reporting, not all figures add to the total

Appendix: Construction Definitions from US Census

Definitions of Construction

Construction includes the following:

- New buildings and structures.
- Additions, alterations, conversions, expansions, reconstruction, renovations, rehabilitations, and major replacements (such as the complete replacement of a roof or heating system).
- Mechanical and electrical installations such as plumbing, heating, electrical work, elevators, escalators, central air-conditioning, and other similar building services.
- Site preparation and outside construction of fixed structures or facilities such as sidewalks, highways and streets, parking lots, utility connections, outdoor lighting, railroad tracks, airfields, piers, wharves and docks, telephone lines, radio and television towers, water supply lines, sewers, water and signal towers, electric light and power distribution and transmission lines, petroleum and gas pipelines, and similar facilities that are built into or fixed to the land.
- Installation of the following types of equipment: boilers, overhead hoists and cranes, and blast furnaces.
- Fixed, largely site-fabricated equipment not housed in a building, primarily for petroleum refineries and chemical plants, but also including storage tanks, refrigeration systems, etc.
- Cost and installation of construction materials placed inside a building and used to support production machinery; for example, concrete platforms, overhead steel girders, and pipes to carry paint, etc. from storage tanks.

The following are excluded from construction:

- Maintenance and repairs to existing structures or service facilities.
- Cost and installation of production machinery and equipment items not specifically covered above, such as heavy industrial machinery, printing presses, stamping machines, bottling machines, and packaging machines; special purpose equipment designed to prepare the structure for a specific use, such as steam tables in restaurants, pews in churches, lockers in school buildings, beds or X-ray machines in hospitals, and display cases and shelving in stores.
- Drilling of gas and oil wells, including construction of offshore drilling platforms; digging and shoring of mines (construction of buildings at mine sites is included); work that is an integral part of farming operations such as plowing and planting of crops.
- Land acquisition.

Value of Construction Put in Place

The "value of construction put in place" is a measure of the value of construction installed or erected at the site during a given period. For an individual project, this includes—

- Cost of materials installed or erected.
- Cost of labor (both by contractors and force account) and a proportionate share of the cost of construction equipment rental.
- Contractor's profit.
- Cost of architectural and engineering work.
- Miscellaneous overhead and office costs chargeable to the project on the owner's books.
- Interest and taxes paid during construction (except for state and locally owned projects).

The total value-in-place for a given period is the sum of the value of work done on all projects underway during this period, regardless of when work on each individual project was started or when payment was made to the contractors. For some categories, published estimates represent payments made during a period rather than the value of work actually done during that period. For other categories, estimates are derived by distributing the total construction cost of the project by means of historic construction progress patterns.

Classification of Construction

Residential Buildings

New single family

Includes new houses and town houses built to be sold or rented and units built by the owner or for the owner on contract. The classification excludes residential units in buildings that are primarily non-residential. It also excludes manufactured housing and houseboats.

New multi-family

Includes new apartments and condominiums. The classification excludes residential units in buildings that are primarily non-residential.

State and local includes remodeling, additions, and major replacements to multi-family properties subsequent to completion of original building as well as construction of additional housing units in existing residential structures, the addition of swimming pools and garages, and replacement of major equipment items such as water heaters, furnaces, and central air-conditioners. Maintenance and repair work is excluded.

Improvements

Includes remodeling, additions, and major replacements to owner occupied properties subsequent to completion of original building. It includes construction

of additional housing units in existing residential structures, finishing of basements and attics, modernization of kitchens, bathrooms, etc. Also included are improvements outside of residential structures, such as the addition of swimming pools and garages, and replacement of major equipment items such as water heaters, furnaces and central air-conditioners. Maintenance and repair work is not included.

Improvements to state and locally owned multi-family units are included in the state and local multi-family category.

Non-Residential

Lodging

Includes hotels, motels, resort lodging, tourist courts and cabins, and similar facilities.

Office

In addition to the types of offices listed below, it also includes motion picture, television, and radio offices.

Office buildings at manufacturing sites are classified as "manufacturing"; however, an office building owned by a manufacturing company and not located at a manufacturing site is classified as "office."

General - Includes administration buildings, computer centers, office buildings, and professional buildings.

State and local and federal also includes city halls, borough halls, municipal buildings, courthouses, and state capitol buildings.

Financial - Includes banks, financial institutions, building & loans, saving & loans, and credit unions.

Commercial

Includes buildings and structures used by the retail, wholesale and selected service industries.

Automotive - Includes the following:

- **Sales** – includes auto dealerships, motorcycle dealerships, auto showrooms, and truck dealerships.
- **Service/parts** – includes auto service centers, auto parts centers, auto repair centers, tire service centers, car washes, car rental centers, gas stations, and emissions testing centers.
- **Parking** – includes commercial parking lots and garages.

Food/beverage - Includes the following:

- **Food** – includes supermarkets, bakeries, dairies, markets, convenience stores, and delicatessens.
- **Dining/drinking** – includes liquor stores, bars, nightclubs, cafés, diners, restaurants, cafeterias, taverns, inns (eat & drink only), and bistros.

- **Fast food** – includes drive-in restaurants and fast food restaurants.

Multi-retail - In addition to the types of multi-retail establishments listed below, it also includes warehouse-type retail stores.

- **General merchandise** – includes department stores and variety stores.

- **Shopping center** – includes shopping centers, shopping plazas, and town centers.

- **Shopping mall** – includes shopping malls.

Other commercial - In addition to the types of stores listed below, it also includes beauty salons, nail shops, crematories, funeral homes, animal shelters, kennels, veterinary clinics, florists, nurseries, pawnshops, photo shops, dance schools, dry cleaners, laundromats, and post offices.

- **Drug store** – includes drug stores and pharmacies.

- **Building supply store** – includes hardware stores and lumber yards.

- **Other stores** – includes clothing stores, jewelry stores, salesrooms (non-auto), furniture stores, office supply stores, storerooms, and electronics stores.

Warehouse - Warehouses and storage buildings, cold storage plants, grain elevators, and silos located at manufacturing sites are included in the manufacturing category.

In addition to the types of warehouses listed below, it also includes grain elevators and greenhouses.

- **General commercial** – includes commercial warehouses, storage warehouses, and distribution buildings.

- **Mini-storage** – includes mini-storage centers and self-storage centers.

Farm - Includes buildings and structures such as barns, storage houses, smokehouses, and fences; land improvements such as land leveling, terracing, tile drainage; and the construction of ponds, roads and lanes on establishments having annual agricultural sales of $1,000 or more.

Health Care

Hospital - Includes hospitals, mental hospitals, infirmaries, and infrastructure.

Medical building - Includes clinics, medical offices, medical labs, doctor & dentist offices, outpatient clinics, and research labs (non-manufacturing, non-educational, or non-hospital).

Special care - Includes nursing homes, hospices, orphan homes, sanatoriums, drug clinics, rehabilitation centers, rest homes, and adult day-care centers.

Educational

In addition to the types of educational facilities listed below, it also includes nursing schools, cosmetology and beauty schools, trade schools, military training facilities, schools for the handicapped, and modeling schools.

Schools on Indian reservations are included in federal construction.

Preschool - Includes childcare and day-care centers, nurseries, and preschools.

Primary/secondary - In addition to the types of primary and secondary schools listed below, it also includes academies, parochial schools, and vocational schools.

- **Elementary** – includes elementary schools.
- **Middle/junior high** – includes middle and junior high schools.
- **High** – includes high schools.

Higher education - In addition to the types of higher education facilities listed below, it also includes health centers and clinics located at colleges (including junior and community colleges) and universities.

- **Instructional** – includes instructional buildings and laboratories.
- **Parking** – includes parking lots and garages.
- **Administration** – includes administration buildings.
- **Dormitory** – includes dormitories, living/learning centers and residence halls.
- **Library** – includes libraries (school).
- **Student union/cafeteria** – includes student union buildings and cafeterias.
- **Sports/recreation** – includes gymnasiums and athletic field houses, arenas, coliseums and stadiums, outdoor courts or fields, racquetball courts, rinks, tennis courts, and swimming pools.
- **Infrastructure** – includes power plants, water supply facilities, sewage and other infrastructure.

Other educational - In addition to the types of facilities listed below, it also includes zoos, arboreta, botanical gardens, planetariums and observatories.

- **Gallery/museum** – includes art galleries, cultural centers, and museums.
- **Library/archive** – includes libraries (nonschool) and archives.

<u>Religious</u>

Certain buildings, although owned by religious organizations, are not included in this category. These include educational or charitable institutions, hospitals, and publishing houses.

House of worship - Includes churches, chapels, mosques, synagogues, tabernacles, and temples.

Other religious - In addition to the types of facilities listed below, it also includes sanctuaries, abbeys, convents, novitiates, rectories, monasteries, missions, seminaries, and parish houses.

- **Auxiliary building** – includes fellowship halls, life centers, camps and retreats, and Sunday schools.

<u>Public Safety</u>

Correctional - Includes the following:

- **Detention** – includes cell blocks, detention centers, jails, penitentiaries, and prisons.
- **Police/sheriff** – includes police stations and sheriffs' offices.

Other public safety - In addition to the types of facilities listed below, it also includes armories and military structures that could not be assigned to a specific type of construction.

- **Fire/rescue** – includes fire stations, rescue squads, dispatch and emergency centers.

Amusement and Recreation

In addition to the types of facilities listed below, it also includes racetracks, equestrian centers, riding academies, bowling alleys, rifle ranges, casinos, pool halls, and driving ranges.

Theme/amusement park - Includes amusement buildings or rides, theme parks, and arcades.

Sports - Includes the following types of structures not located at schools or colleges: gymnasiums and athletic field houses, arenas, coliseums and stadiums, outdoor courts or fields, racquetball courts, rinks, tennis courts, and swimming pools.

Fitness - Includes fitness centers, health or athletic clubs, YMCAs, YWCAs, cabanas, saunas, and spas.

Performance/meeting center - In addition to the types of facilities listed below, it also includes civic centers, concert halls, opera houses, theaters for the performing arts, amphitheaters, pavilions, and auditoriums.

- **Convention centers** – includes convention and trade centers.

Social center - In addition to the types of facilities listed below, it also includes banquet halls, lodge buildings, golf courses, community houses, community centers, fraternal halls, and country clubs.

- **Neighborhood center** – includes community houses, community centers, and neighborhood centers.

Park/camp - Includes parks, seasonal camps, and tourist camps.

Movie theater/studio - Includes movie theaters, drive-ins, and movie, radio, and television studios.

Transportation

Air - In addition to the types of facilities listed below, it also includes pavement and lighting, hangars, air freight terminals, space facilities, air traffic towers, aircraft storage and maintenance buildings.

- **Passenger terminal** – includes air passenger terminals.
- **Runway** – includes airport runway pavement and lighting.

Land - In addition to the types of facilities listed below, it also includes maintenance facilities and freight terminals (bus, railroad, or truck).

- **Passenger terminal** – includes bus and railroad passenger terminals.
- **Mass transit** – includes light rail, monorail, streetcar, and subway facilities.
- **Railroad** – includes railroad track and bridges.

Water

- **Dock/marina** – includes docks, piers, wharves, and marinas.
- **Dry dock/marine terminal** – includes dry docks, boatels, and maritime freight terminals.

Communication

Includes telephone, television, and radio, distribution and maintenance buildings and structures.

Power

Electric - In addition to the types of facilities listed below, it also includes power plants (nuclear, oil, gas, coal, wood), nuclear reactors, hydroelectric plants, dry-waste generation, thermal, wind and solar energy facilities.

- **Distribution** – includes electric distribution systems, electrical substations, switch houses, transformers, and transmission lines.

Gas - Includes buildings and structures for the distribution, transmission, gathering, and storage of natural gas.

Oil - Includes buildings and structures for the distribution, transmission, gathering, and storage of crude oil.

Highway and Street

Pavement - includes highways, roads, streets, culverts, gutters, and sidewalks.

Lighting -includes traffic lights, signals and highway lighting systems.

Retaining wall - includes retaining walls and fences.

Tunnel - includes highway tunnels (vehicular or pedestrian).

Bridge - includes bridges and overhead crossings (vehicular or pedestrian).

Toll/weigh - includes toll facilities, weigh and inspection stations. Federal includes border-crossing stations.

Maintenance building - includes maintenance and storage buildings and salt domes.

Rest facility - includes rest facilities, travel centers, median improvements, beautification projects, and welcome centers.

Sewage and Waste Disposal

Sewage/dry waste- In addition to the types of facilities listed below, it also includes resource recovery and recycling centers, and pond sewage systems.

- **Plant** – includes solid waste disposals (incinerator or burial), sewage treatment plants, and sewage disposal plants.

- **Line/pump station** – includes sanitary sewers, sewage pipeline, interceptors and lift/pump stations.

Waste water

- **Plant** – includes waste water disposal plants.

- **Line/drain** – includes water collection systems (nonpotable water) and storm drains.

Water Supply

Plant - includes filtration, treatment, water supply, and water softening plants.

Well - includes water wells.

Line - includes culverts (water supply), water transmission pipelines, tunnels and water lines.

Pump station - includes gatehouses and lift/pump stations.

Reservoir - includes potable water supply reservoirs.

Tank/tower - includes water storage tanks and towers.

Conservation and Development

In addition to the types of projects listed below, it also includes facilities constructed for irrigation (draining, dredging, water collection systems, nonpotable reservoir), mine reclamation, fish hatcheries and wetlands.

Dam/levee - includes non-power dams, dikes, levees, locks and lock gates.

Breakwater/jetty - includes breakwaters, bulkheads, tide-gates, jetties, erosion control, retaining walls, and sea walls.

Dredging - includes non-irrigation related dredging.

Manufacturing

Includes all buildings and structures at manufacturing sites. Office buildings and warehouses owned by manufacturing companies but not constructed at a manufacturing site are classified as "office" and "commercial" respectively. Includes LNG export terminals.

Food/beverage/tobacco - Food industries transform livestock and agricultural products into products for intermediate or final consumption. These products are typically sold to wholesalers or retailers for distribution to consumers.

Beverage industries include manufacturing of nonalcoholic and alcoholic beverages. Ice manufacturing is included with nonalcoholic beverage manufacturing.

Tobacco industries include the redrying and stemming of tobacco and the manufacturing of tobacco products, such as cigarettes and cigars.

Textile/apparel/leather/furniture - Textile industries transform a basic fiber (natural or synthetic) into a product, such as yarn or fabric.

Apparel industries purchase fabric to cut and sew to make a garment.

Leather and allied industries transform hides into leather products. Also included are leather substitutes, such as rubber (ex. rubber footware) and plastic (ex. plastic purses or wallets).

As of 2009, furniture is in textile/apparel/leather/furniture.

Wood - Wood industries manufacture wood products, such as lumber, plywood, veneers, wood containers, wood flooring, wood trusses, manufactured homes (i.e., mobile home), and prefabricated wood buildings.

Paper - Paper industries manufacture pulp, paper, or converted paper products.

Print/publishing - Print/publishing industries print products, such as newspapers, books, periodicals, business forms, greeting cards, and other materials, and perform support activities, such as bookbinding, platemaking services, and data imaging.

Petroleum/coal - Petroleum/coal industries transform crude petroleum and coal into usable products.

Chemical - Chemical industries transform organic and inorganic raw materials by a chemical process and form products.

Plastic/rubber - Plastic/rubber industries make goods by processing plastics materials and raw rubber.

Nonmetallic mineral - Nonmetallic mineral industries transform mined or quarried nonmetallic minerals, such as sand, gravel, stone, clay, and refractory materials, into products for intermediate or final consumption.

Primary metal - Primary metal industries smelt and/or refine ferrous and nonferrous metals from ore, pig or scrap, using electrometallurgical and other process metallurgical techniques. The output of smelting and refining, usually in ingot form, is used in rolling, drawing, and extruding operations to make sheet, strip, bar, rod, or wire, and in molten form to make castings and other basic metal products.

Fabricated metal - Fabricated metal industries transform metal into intermediate or end products, other than machinery, computers and electronics, and metal furniture or treating metals and metal formed products fabricated elsewhere.

Machinery - Machinery industries create end products that apply mechanical force, for example, the application of gears and levers, to perform work.

Computer/electronic/electrical - Computer/electronic industries manufacture computers, computer peripherals, communications equipment, and similar electronic products, and the components for such products.

Electrical industries manufacture products that generate, distribute, and use electrical power. Included are manufacturers of electric lighting equipment, household appliances, and other electrical equipment and components.

Transportation equipment - Transportation equipment industries produce equipment for transporting people and goods.

Furniture - Furniture industries make furniture and related articles, such as mattresses, window blinds, cabinets, and fixtures. As of 2009, furniture is in textile/apparel/leather/furniture.

Miscellaneous - Miscellaneous industries make a wide range of products that are not produced in the specified manufacturing categories. Examples are medical equipment and supplies, jewelry, sporting goods, toys, and office supplies.

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For this report, Evidence Lab Macro estimates of US economic indicators, including NonResi spending, are based upon high-frequency public data sources being collected from a diverse set of sources - transaction data being aggregated and made available by third parties, business and consumer surveys, on-line activities - that contain real-time information on economic activities. We continually evaluate new data sources for their efficacy and value to our estimation process. Our process relies on obtaining data sets pertinent to specific economic indicators, and then transforming, calibrating and combining them using statistical techniques. Our estimates for NonResi spending are based upon the details of permits filed with a sample of jurisdictions in the country. Since Permits contain information on planned future construction projects and future spending intentions, we believe it is a good early indicator for private residential and non-residential construction. For more information on Evidence Lab Macro research, see our note "Launching Big-Data Driven Early Read on US Economy, Nov 11 2015".

Valuation Method and Risk Statement

The primary risks to the sector include potential declines in commodity prices (particularly oil), slowing US and global economic activity, weaker than expected industrial and non res construction markets, failure to execute on backlogs/cost overruns on fixed price contracts, potential for constrained growth due to rising construction costs and labor availability. We value stocks in our coverage on P/E and EV/EBITDA methodologies.

As it is an asset-intensive company, we set Ashtead's Price Target using EV/IC vs. ROIC/WACC methodology. Our through-cycle WACC is 8.1%, while ROIC is clearly cyclical. We believe the most significant risk to our forecasts and investment case is the sensitivity to the economic cycle via the US non-residential construction market. Ashtead typically only has visibility of 1-2months. The cycle also drives considerable gearing in the business, as investments and costs can be difficult to adjust quickly to reflect changing outlooks. Regulation changes can driver both greater complexity for Ashtead and demand, but add to the market uncertainty. The end market is exposed to exogenous shocks such as weather or other natural events. With c90% of earnings in the US and a GDP-reporter, there is significant translational FX risk. We also do not have any changes to the tax rate in our base case forecasts at this point; there is equally significant earnings upside risk from any changes in US tax regime.

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12-Month Rating	Definition	Coverage[1]	IB Services[2]
Buy	FSR is > 6% above the MRA.	45%	29%
Neutral	FSR is between -6% and 6% of the MRA.	39%	27%
Sell	FSR is > 6% below the MRA.	15%	16%
Short-Term Rating	**Definition**	**Coverage[3]**	**IB Services[4]**
Buy	Stock price expected to rise within three months from the time the rating was assigned because of a specific catalyst or event.	<1%	<1%
Sell	Stock price expected to fall within three months from the time the rating was assigned because of a specific catalyst or event.	<1%	<1%

Source: UBS. Rating allocations are as of 31 December 2016.
1:Percentage of companies under coverage globally within the 12-month rating category.
2:Percentage of companies within the 12-month rating category for which investment banking (IB) services were provided within the past 12 months.
3:Percentage of companies under coverage globally within the Short-Term rating category.
4:Percentage of companies within the Short-Term rating category for which investment banking (IB) services were provided within the past 12 months.

KEY DEFINITIONS: Forecast Stock Return (FSR) is defined as expected percentage price appreciation plus gross dividend yield over the next 12 months. **Market Return Assumption (MRA)** is defined as the one-year local market interest rate plus 5% (a proxy for, and not a forecast of, the equity risk premium). **Under Review (UR)** Stocks may be flagged as UR by the analyst, indicating that the stock's price target and/or rating are subject to possible change in the near term, usually in response to an event that may affect the investment case or valuation. **Short-Term Ratings** reflect the expected near-term (up to three months) performance of the stock and do not reflect any change in the fundamental view or investment case. **Equity Price Targets** have an investment horizon of 12 months.

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UBS Securities LLC: Steven Fisher, CFA; Cleve Rueckert; Ajit Agrawal, PhD; Shannon O'Callaghan; Erika Jackson.

Company Disclosures

Company Name	Reuters	12-month rating	Short-term rating	Price	Price date
Ashtead Group PLC	AHT.L	Sell	N/A	1,619p	02 Feb 2017

Source: UBS. All prices as of local market close.
Ratings in this table are the most current published ratings prior to this report. They may be more recent than the stock pricing date

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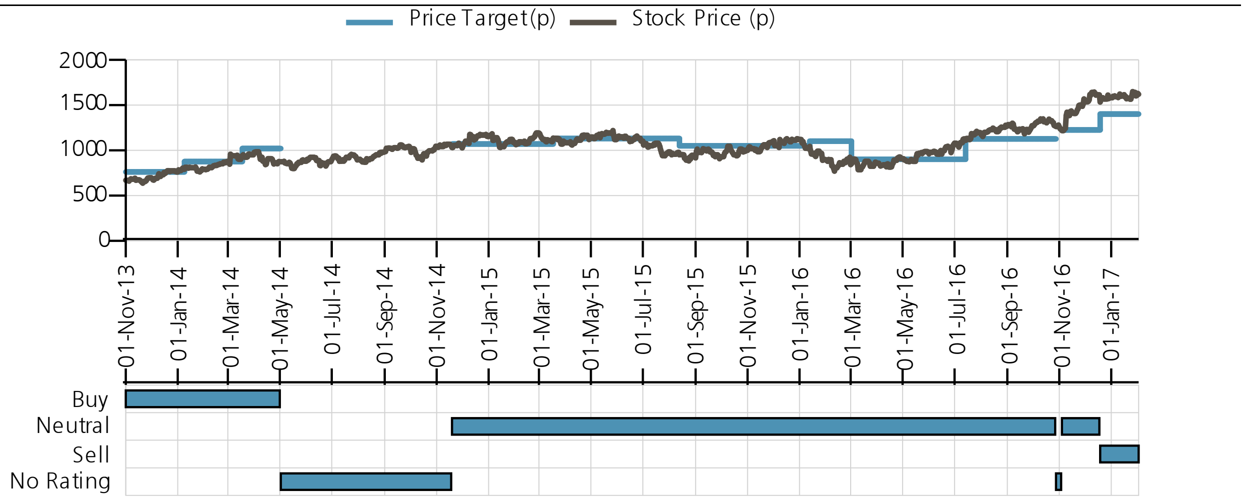
Ashtead Group PLC (p)



Date	Stock Price (p)	Price Target (p)	Rating
2013-11-01	669.0	760.0	Buy
2014-01-09	791.0	875.0	Buy
2014-03-18	941.0	1020.0	Buy
2014-05-02	873.0	-	No Rating
2014-11-19	1030.0	1070.0	Neutral
2015-03-18	1134.0	1130.0	Neutral
2015-08-13	951.0	1050.0	Neutral
2016-01-13	1043.0	1100.0	Neutral
2016-03-02	851.0	900.0	Neutral
2016-07-14	1110.0	1125.0	Neutral
2016-10-28	1263.0	-	No Rating
2016-11-04	1217.0	1225.0	Neutral
2016-12-19	1534.0	1400.0	Sell

Source: UBS; as of 02 Feb 2017

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