Winter 2019-2020

U.S. Put-in-Place Construction Forecasts

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ConstructConnect expects growth of the U.S. economy to slow in 2020 and 2021, before picking up steam once again in 2022. Total construction activity will receive support from homebuilding work and mega projects underway.

Highlights

- ConstructConnect expects growth of the U.S. economy to slow in 2020 and 2021, before picking up steam once again in 2022.
- The pullback in total PIP construction in 2019 has been mainly due to residential weakness. A mild positive reversal in residential, thanks to lower interest rates once again, will help support the 'total' in future years.
- Except for attaining boom years in 2007-2009 (i.e., carry-overs of work already initiated even as the Great Recession devastated other segments of the economy), total nonresidential construction spending has stuck to a consistent path.
- The flattening in nonresidential building PIP spending that has become evident in 2019 will continue for another couple of years, before reviving in 2022.
- Institutional PIP construction spending has been proceeding close to an almost level trend line for the past couple of years and is expected to continue to do so out to 2020.
- Given that America's population is aging (i.e., every still-living 'baby boomer' will be 55 or older in 2020), there can be little doubt about the ongoing and mounting need for health care facilities.
- New infrastructure will always be needed to accommodate demographic influences such as population growth growth — although the latest annual population increase scaled back to only +0.6% y/y.

Note: Table 1 with all the numbers appears at the end of this article (on Page 6).

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A Slowing Economy's Impact on Construction

ConstructConnect expects growth of the U.S. economy to slow in 2020 and 2021, before picking up steam once again in 2022. Total construction activity, as measured by put-in-place capital spending, will be negatively affected to some degree, although it will receive support from homebuilding work that is generating 'new shoots' and mega projects that are underway and planned in the industrial and heavy engineering type-of-structure categories.

ConstructConnect calculates and publishes 'starts' statistics. But this article features put-in-place (PIP) numbers that come from the Census Bureau. 'Starts' focus on projects which break ground in any given month. The PIP approach, however, is analogous to monitoring progress payments as projects proceed over several months or even years.

PIP numbers follow behind, or lag, up-front 'starts' statistics. They are less volatile than 'starts', with smaller amplitudes between peaks and troughs.

Best Trend Line 'Fits' are in Engineering Construction

ConstructConnect's PIP forecasts are set out in Graphs 1 through 20. Each graph shows 'actuals' from the Census Bureau through 2019 (although 2019 is an estimate based on year-to-date 'actuals' through October) and projections for 2020-2022 made by ConstructConnect.

Each graph also contains an Excel-generated trend line out to 2022. In many instances, the trend line offers little more than a loose visual guideline to the pattern of the PIP numbers. But in some cases, the trend line captures the path of the 'actuals' and forecasts' to a striking degree.

When there is a strong relationship between trend line and observation points, there will be a high R^2 value. R^2 is calculated according to a statistical formula and it runs between 0.00 and 1.00. The closer R^2 is to 1.00, the better the fit. A call-out with R^2 values has been added to the graphs in this report where the correlation is particularly notable (i.e., close to 0.90 and above).

Nonresidential PIP construction has an outstanding R^2 value (0.9208) thanks to several sub-categories (transportation, power and roadwork) within engineering.

'Bullets' setting out the factors driving the forecasts for the various PIP categories of construction accompany each graph.

Table 1 with all the numbers appears at the end of this article.

Grand Total PIP Construction Forecast

- The pullback in total PIP construction in 2019 has been mainly due to residential weakness;
- A mild positive reversal in residential, thanks to lower interest rates once again, will help support the 'total' in future years;
- In the overall economy, construction is a lagging sector;
- Even in a slowing economy, construction activity will continue to receive support from large projects already initiated and well underway.

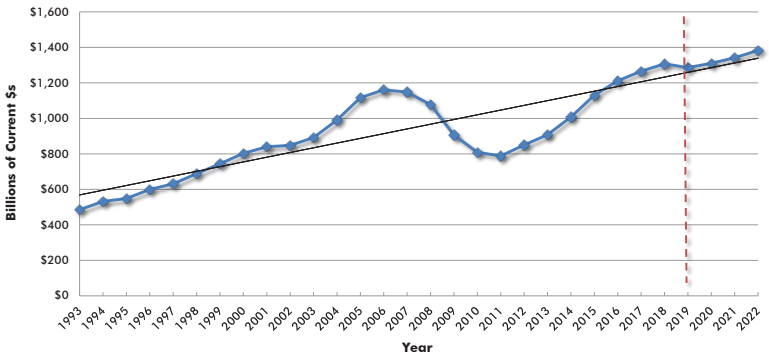
Residential PIP Construction Forecast

- Stimulus will be coming from recent declines in interest and mortgage rates;
- Millennials are forming families and moving to the suburbs;
- But jobs growth is decelerating; and
- There is a negative impact from a moderation in population growth.

Nonresidential PIP Construction Forecast

- Except for attaining boom years in 2007-2009 (i.e., carry-overs of work already initiated even as the Great Recession devastated other segments of the economy), total nonresidential construction spending has stuck to a consistent path;
- The 'fit' for nonresidential construction's PIP dollars versus its trend line is notably tight at 0.9208.

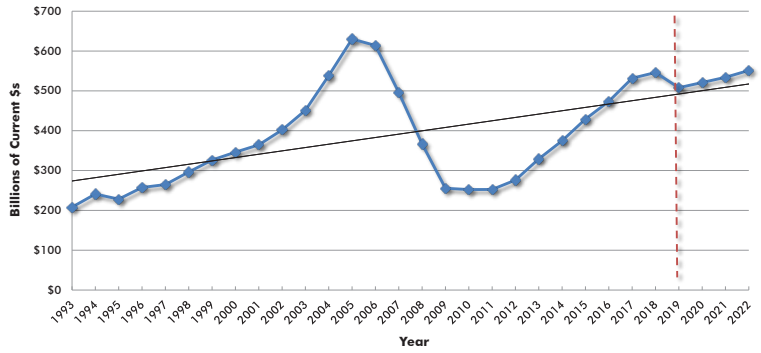
GRAPH 1: U.S. GRAND TOTAL CONSTRUCTION SPENDING PUT-IN-PLACE (PIP) INVESTMENT



Graph includes a 'best fit' linear trend line.

Source of actuals: U.S. Census Bureau/Forecasts: ConstructConnect/Chart: ConstructConnect.

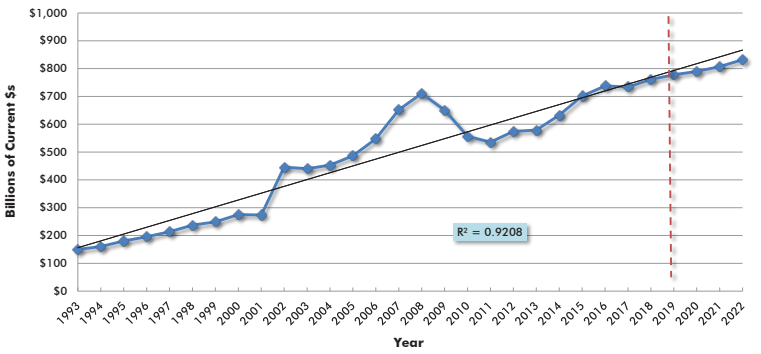
GRAPH 2: U.S. CONSTRUCTION SPENDING: TOTAL RESIDENTIAL PUT-IN-PLACE (PIP) INVESTMENT



Graph includes a 'best fit' linear trend line.

Source of actuals: U.S. Census Bureau/Forecasts: ConstructConnect/Chart: ConstructConnect.

GRAPH 3: U.S. CONSTRUCTION SPENDING: TOTAL NONRESIDENTIAL PUT-IN-PLACE (PIP) INVESTMENT



Graph includes a 'best fit' linear trend line.

Source of actuals: U.S. Census Bureau/Forecasts: ConstructConnect/Chart: ConstructConnect.

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Nonresidential Building PIP Construction Forecast

- The flattening in nonresidential building PIP spending that has become evident in 2019 will continue for another couple of years, before reviving in 2022;
- The drag in nonresidential building work is originating in some 'commercial' categories but can be blamed even more on lethargy in institutional work (see Graph 8).

Lodging PIP Construction Forecast

- Hotel/motel work is one of the most cyclical sectors within all construction;
- A cyclical peak was reached in 2019 – 'starts' began their downturn in 2018;
- A weaker economy in the next two years will mean less business and tourism travel.

Office Building PIP Construction Forecast

- Office vacancy rates in many major cities have tightened considerably;
- High-tech activity has become a major driver of the overall economy;
- Most high-tech jobs require office space;
- Office construction has been strong of late and will maintain good momentum moving forward.

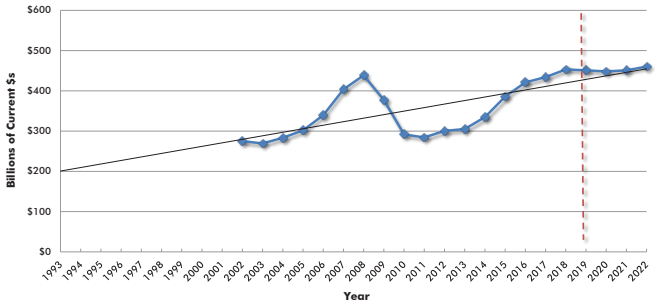
Retail-Warehouse-Restaurant PIP Construction Forecast

- Closures of 'bricks and mortar' retail locations point to reduced need for more square footage;
- The problem for retail isn't just the shuttering of locations, it's the 'overhang' – vacant footprints must be filled with new tenants before additional building space will be warranted;
- Giant fulfilment and distribution centers have been filling in where traditional retail has been disappearing.

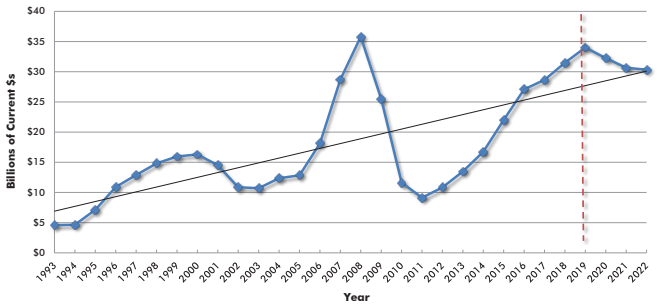
Total Institutional PIP Construction Forecast

- 'Institutional' is the combination of health care, education, religious, public safety and amusement and recreation;
- There is a large government spending component to institutional construction;
- Demographic factors, such population change and age structure, also play key roles;
- Institutional PIP construction spending has been proceeding close to an almost level trend line for the past couple of years and is expected to continue to do so out to 2020.

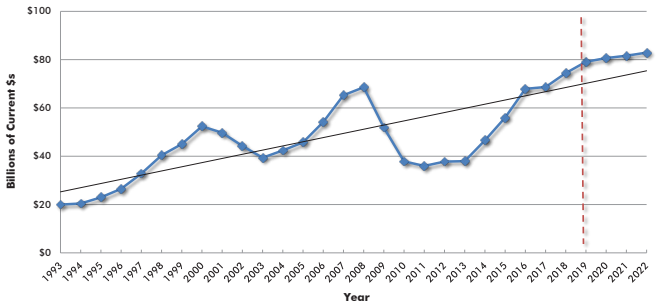
GRAPH 4: U.S. CONSTRUCTION SPENDING: NONRESIDENTIAL BUILDING PUT-IN-PLACE (PIP) INVESTMENT



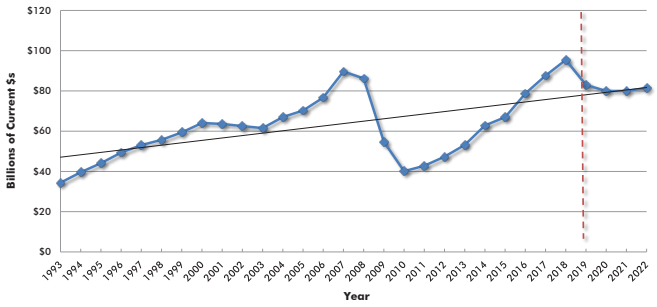
GRAPH 5: U.S. CONSTRUCTION SPENDING: LODGING PUT-IN-PLACE (PIP) INVESTMENT



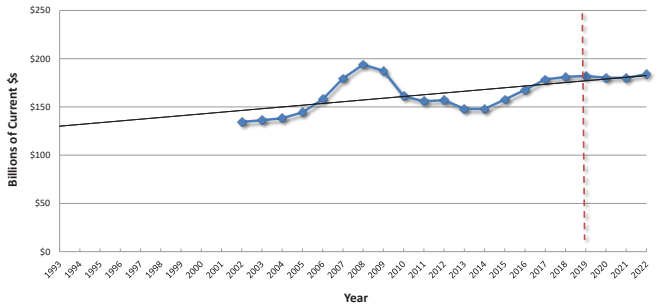
GRAPH 6: U.S. CONSTRUCTION SPENDING: OFFICE BUILDINGS PUT-IN-PLACE (PIP) INVESTMENT



GRAPH 7: U.S. CONSTRUCTION SPENDING: COMMERCIAL (RETAIL, WAREHOUSES, RESTAURANTS) PUT-IN-PLACE (PIP) INVESTMENT



GRAPH 8: U.S. CONSTRUCTION SPENDING: TOTAL INSTITUTIONAL PUT-IN-PLACE (PIP) INVESTMENT



Graphs include a 'best fit' linear trend line. For Graph 8: *Numbers for this series prior to 2002 are no longer consistent with more current data.*

Source of actuals: U.S. Census Bureau/Forecasts: ConstructConnect/Charts: ConstructConnect.

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Health Care PIP Construction Forecast

- Given that America's population is aging (i.e., every still-living 'baby boomer' will be 55 or older in 2020), there can be little doubt about the ongoing and mounting need for health care facilities;
- Recent health-related construction, however, has been weighted more towards 'acute' care facilities and medical clinics (for cataract and hernia surgeries, as well as hip and knee replacements) as opposed to hospitals;
- New hospitals have been located at large academic institutions, where they serve as teaching centers;
- Private owners of hospitals remain in doubt as to where they will source the revenue for their services (i.e., from private insurance companies or from government?);
- The debate over achieving broader and perhaps universal health care continues at the political level.

Educational Facilities PIP Construction Forecast

- A leveling in educational construction spending has become evident over the past two years;
- A fourth year in a row of birth declines points to less demand for elementary school space;
- The ultra-low unemployment rate is an incentive for college and university students to abandon their studies and leap into the jobs market; and
- Enrolments by foreign students are on the decline.

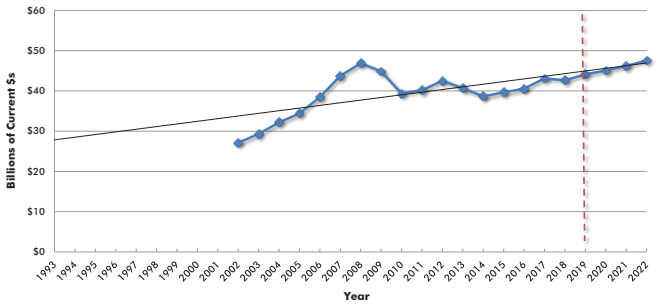
Religious Buildings PIP Construction Forecast

- 'Religious buildings' is the only sub-category of PIP construction spending with a downwards sloping trend line;
- With the economy softening, jobs growth easing and income gains becoming less reliable, the 'offerings' needed to fund church expansions will be in shorter supply.

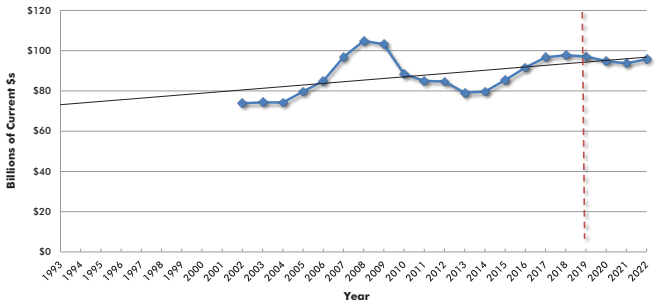
Amusement and Recreation PIP Construction Forecast

- Construction of some major sports venues continues (e.g., for teams in the NFL, NBA and NHL) and go-aheads for some other facilities (e.g., soccer stadiums) are pending, often dependent on local government (financial) backing;
- Coincident with the sharp rise in employment and incomes since the recession, consumer 'entertainment' spending has been largely bullish since the recession.
- From Graph 12, PIP construction spending skyrocketed from 2013 to 2018, but has petered out in 2019;
- A lengthening of the pause is forecast from 2020 on that will return 'amusement and recreation' PIP construction spending to its long-term trend line.

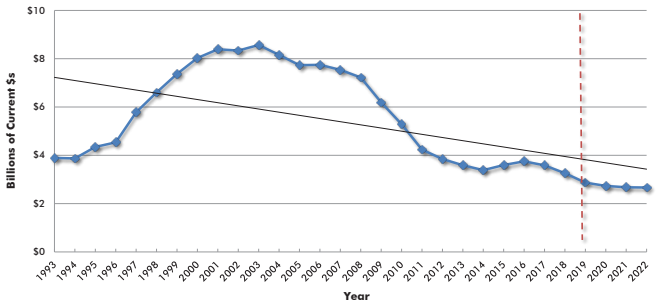
GRAPH 9: U.S. CONSTRUCTION SPENDING: HEALTH CARE PUT-IN-PLACE (PIP) INVESTMENT



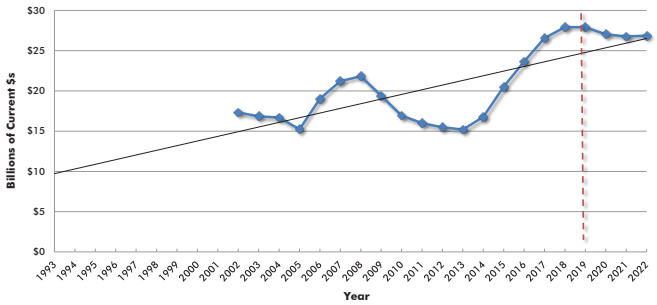
GRAPH 10: U.S. CONSTRUCTION SPENDING: EDUCATIONAL PUT-IN-PLACE (PIP) INVESTMENT



GRAPH 11: U.S. CONSTRUCTION SPENDING: RELIGIOUS PUT-IN-PLACE (PIP) INVESTMENT



GRAPH 12: U.S. CONSTRUCTION SPENDING: AMUSEMENT AND RECREATION PUT-IN-PLACE (PIP) INVESTMENT



Graphs include a 'best fit' linear trend line. For Graphs 9, 10 and 12: *Numbers for this series prior to 2002 are no longer consistent with more current data.*

Source of actuals: U.S. Census Bureau/Forecasts: ConstructConnect/Charts: ConstructConnect.

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Total Engineering PIP Construction Forecast

- Total heavy engineering PIP construction spending in the U.S. has its occasional ups and downs, but as indicated by an R^2 value of 0.9198, it stays relatively close to its long-term upwards-pointing trend line;
- New infrastructure will always be needed to accommodate demographic influences such as population growth – although the latest annual population increase scaled back to only +0.6% y/y;
- There's also a bullish market for repairs to and replacement of existing infrastructure.

Transportation PIP Construction Forecast

- With an R^2 value of 0.95, 'transportation' construction spending closely aligns with its upward-sloping trend path;
- This category of work is set to do even better than its trend line out to 2022 and beyond due to a vast inventory of upcoming railroad (e.g., high-speed trains in Florida and Texas) and rapid transit projects (e.g., with colorful names like 'Green', 'Purple' and 'Orange' Lines);
- Nearly every international airport in America has a huge capital spending program either proceeding or in planning stages.

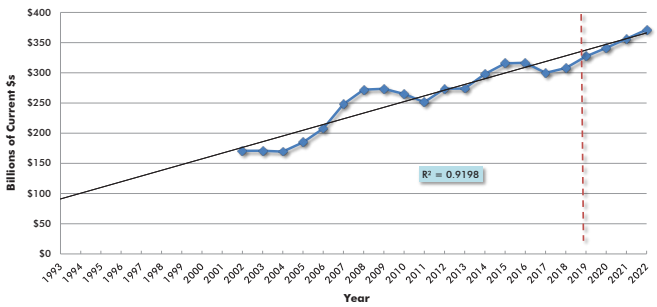
Communications PIP Construction Forecast

- Communication PIP construction spending has bounced back from a mini-trough from 2012-14;
- An era of 'big data' for business and data streaming for personal entertainment has already arrived and is only likely to take firmer hold in the years ahead;
- A concerted push towards 5G transmission of data is already occurring and will intensify over the forecast period.

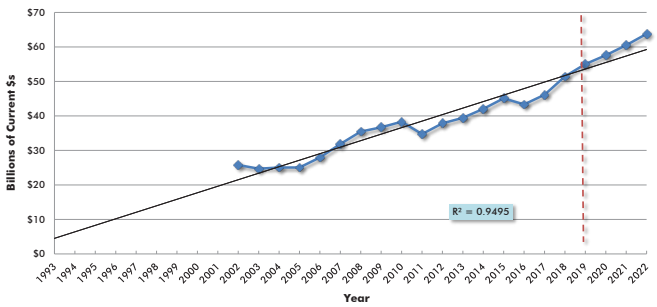
Power PIP Construction Forecast

- Contrary to earlier expectations, demand for electricity has not been on a continual climb over the past many years;
- Rather, conservation efforts have proven extraordinarily effective;
- Nevertheless, the decline in 'power' construction spending that occurred in 2017 and 2018 has run its course and 2019 saw an improvement back towards a long-term upward trend;
- Conversions of coal-fired plants to natural gas are continuing;
- Big solar and wind projects are dotting the landscape;
- 'Power' also encompasses oil and gas pipelines and it's a coin toss whether they proceed or are sidelined by environmental and native-land-claim court challenges.

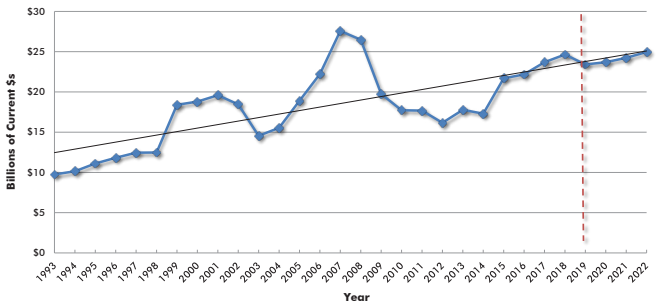
GRAPH 13: U.S. CONSTRUCTION SPENDING: TOTAL ENGINEERING PUT-IN-PLACE (PIP) INVESTMENT



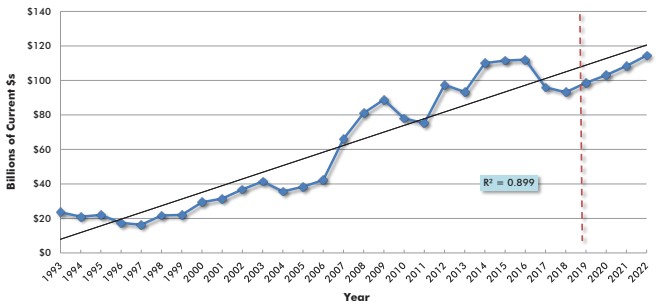
GRAPH 14: U.S. CONSTRUCTION SPENDING: TRANSPORTATION PUT-IN-PLACE (PIP) INVESTMENT



GRAPH 15: U.S. CONSTRUCTION SPENDING: COMMUNICATIONS PUT-IN-PLACE (PIP) INVESTMENT



GRAPH 16: U.S. CONSTRUCTION SPENDING: POWER PUT-IN-PLACE (PIP) INVESTMENT



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Source of actuals: U.S. Census Bureau/Forecasts: ConstructConnect/Charts: ConstructConnect.

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Highway and Street PIP Construction Forecast

- Seemingly, each year, there's considerable angst over where the public money will be found to finance highway and street projects;
- Nevertheless, going back over almost two decades, PIP spending on roadwork has increased by between +2.0% and +3.0% either as an annual average or as an exponential growth rate;
- The R^2 value for the correlation of 'highway and street' construction with its trend line is a high 0.9258;
- A surge in bridge and tunnel work, which is a subset of this category, is projected to lift the annual forecast numbers above trend line for several years to come.

Water Supply & Sewage Treatment PIP Construction Forecast

- 'Water supply and sewage treatment' PIP construction spending has followed a fairly predictable and gently upward-sloping path over the past decade;
- This is a category of construction work influenced heavily by housing starts, demographics and a public health imperatives.

Conservation PIP Construction Forecast

- The trend line for 'conservation and development' construction spending has increased at an annual rate over +5.0% for as long as the data has been available;
- In each of the past two years, the annual bump has been close to +11.0%;
- Conservation spending is the first line of defense in the effort to ward off the nasty effects of climate change (e.g., more pervasive hurricanes, tornadoes and wild fires);
- It includes shoring up of marine defenses along coastlines to protect property from rising water levels.

Manufacturing PIP Construction Forecast

- Capacity utilization rates in traditional production-line manufacturing have been low and falling of late;
- But countervailing strength in industrial construction will come from large energy projects (refineries and chemical plants);
- Plus, there is carry-over work from undertakings of $5 billion or more each recently launched (e.g., LNG projects in Texas and Louisiana).

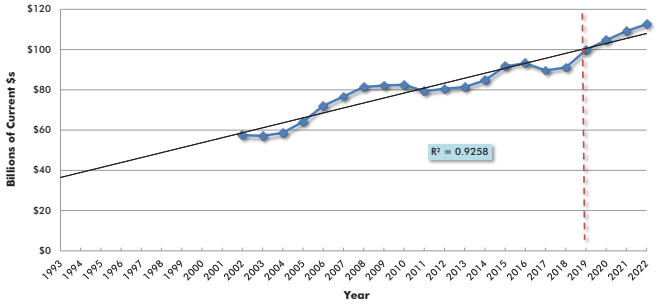
TABLE 1: U.S. CONSTRUCTION SPENDING (PUT-IN-PLACE INVESTMENT) (BILLIONS OF "CURRENT" $s)

	Actuals		Forecasts		
Type of Construction:	**2018**	**2019**	**2020**	**2021**	**2022**
Grand Total	1307.2	1286.1	1,310.8	1,341.3	1,383.3
(year vs previous year)	3.3%	-1.6%	1.9%	2.3%	3.1%
Total Residential	546.1	507.9	521.1	534.1	551.2
	2.7%	-7.0%	2.6%	2.5%	3.2%
Total Non-residential	761.1	778.2	789.7	807.2	832.0
	3.7%	2.2%	1.5%	2.2%	3.1%
Total Commercial/for Lease	201.4	196.2	192.8	192.3	194.7
	8.9%	-2.6%	-1.7%	-0.3%	1.3%
Lodging	31.5	34.0	32.2	30.7	30.3
	9.9%	8.0%	-5.2%	-4.9%	-1.1%
Office	74.5	79.1	80.6	81.6	82.9
	8.4%	6.3%	1.9%	1.2%	1.6%
Commercial (retail/warehouse)	95.4	83.0	79.9	80.0	81.5
	8.9%	-13.0%	-3.7%	0.1%	1.8%
Total Institutional	181.1	182.2	180.2	180.1	183.9
	1.4%	0.6%	-1.1%	0.0%	2.1%
Health Care	42.6	44.1	45.1	46.2	47.6
	-1.1%	3.5%	2.1%	2.5%	3.0%
Educational	97.8	97.1	94.9	93.7	95.8
	1.1%	-0.7%	-2.3%	-1.2%	2.2%
Religious	3.3	2.9	2.7	2.7	2.7
	-9.0%	-12.0%	-4.7%	-2.1%	-0.4%
Public Safety	9.5	10.1	10.5	10.8	11.0
	10.9%	7.0%	3.4%	2.7%	2.3%
Amusement and Recreation	27.9	27.9	27.0	26.8	26.9
	5.1%	0.0%	-3.2%	-1.0%	0.4%
Total Engineering/Civil	307.9	327.3	341.3	356.3	371.6
(year vs previous year)	2.7%	6.3%	4.3%	4.4%	4.3%
Transportation	51.4	55.0	57.6	60.5	63.8
	11.5%	7.0%	4.6%	5.1%	5.4%
Communication	24.6	23.4	23.7	24.2	25.0
	4.0%	-5.0%	1.2%	2.3%	3.0%
Power	93.2	98.6	103.1	108.4	114.4
	-2.9%	5.8%	4.6%	5.1%	5.6%
Highway and Street	91.1	99.8	104.7	109.2	112.7
	1.7%	9.5%	4.9%	4.3%	3.2%
Sewage and Waste Disposal	23.9	25.6	26.5	27.4	28.2
	4.5%	7.0%	3.4%	3.3%	3.0%
Water Supply	15.3	15.7	16.0	16.4	16.8
	8.1%	2.5%	2.0%	2.2%	2.4%
Conservation and Development	8.3	9.2	9.8	10.3	10.8
	10.6%	10.9%	6.7%	5.4%	5.0%
Total Industrial/Manufacturing	70.8	72.6	75.4	78.5	81.8
	0.1%	2.5%	3.9%	4.1%	4.3%

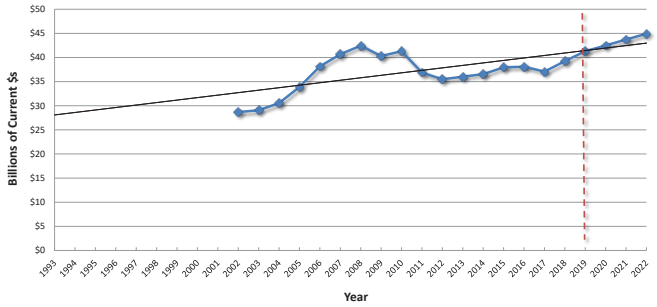
"Current" means not adjusted for inflation.

Source of actuals: U.S. Census Bureau/Forecasts: ConstructConnect/Table: ConstructConnect.

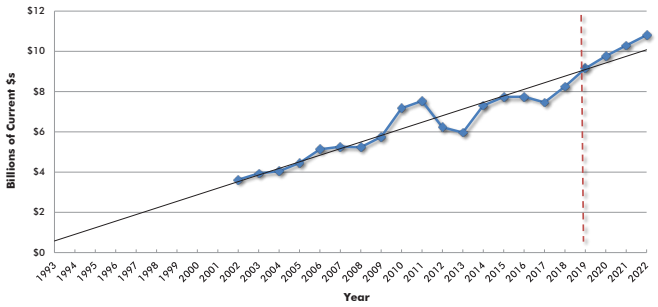
GRAPH 17: U.S. CONSTRUCTION SPENDING: HIGHWAYS AND STREETS PUT-IN-PLACE (PIP) INVESTMENT



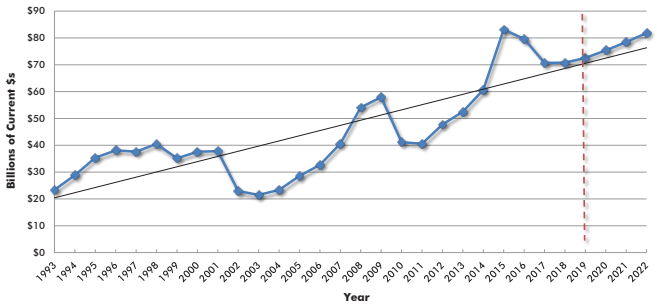
GRAPH 18: U.S. CONSTRUCTION SPENDING: WATER SUPPLY PLUS SEWAGE & WASTE DISPOSAL PUT-IN-PLACE (PIP) INVESTMENT



GRAPH 19: U.S. CONSTRUCTION SPENDING: CONSERVATION & DEVELOPMENT PUT-IN-PLACE (PIP) INVESTMENT



GRAPH 20: U.S. CONSTRUCTION SPENDING: MANUFACTURING PUT-IN-PLACE (PIP) INVESTMENT



Graphs include a 'best fit' linear trend line. For Graphs 17, 18 and 19: *Numbers for this series prior to 2002 are no longer consistent with more current data.*

Source of actuals: U.S. Census Bureau/Forecasts: ConstructConnect/Charts: ConstructConnect.