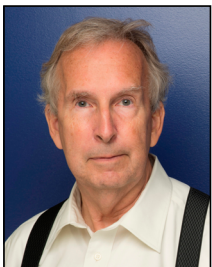


Spring 2022 (Published: March 2022)

U.S. Put-in-Place Construction Forecasts

Prepared by Alex Carrick, ConstructConnect® Chief Economist



Alex Carrick

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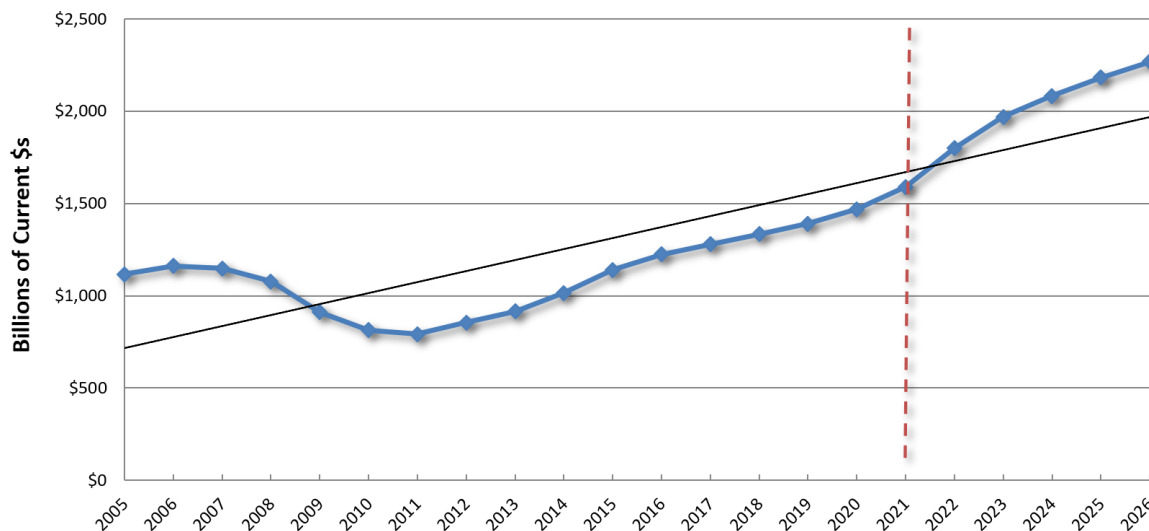
Quarterly U.S. Put-in-Place Forecast Report, Spring 2022

In the first coronavirus pandemic year of 2020, U.S. price-adjusted gross domestic product (GDP) fell by -3.4%. GDP made a rousing recovery in 2021, however, rising by +5.7%. Consumer spending as a share of GDP attained an all-time high last year of 70.2%.

Entering the year 2022, there were known factors that put a slight damper on GDP growth expectations, including an inordinately high inflation rate and imminent interest rate hikes. What was not foreseen, however, was Russia's invasion of Ukraine. The fighting is already having far-reaching humanitarian and economic consequences. If matters aren't resolved quickly, the nations of western Europe and the Americas will be challenged to accept refugee inflows in numbers that will likely exceed any previous waves.

Cont'd on page 2

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: Oxford Economics and ConstructConnect. Chart: ConstructConnect.

'Starts' versus Put-in-place (PIP) Statistics

'Starts' compile the total estimated dollar value of all projects on which ground is broken in any given month. By way of contrast, put-in-place capital spending statistics are analogous to work-in-progress payments as the building of structures proceeds to completion.

Consider a \$60 million office tower for which ground is broken in June 2022. For the 'starts' series, the entire estimated value (\$60 million) will be entered in June 2022. In PIP numbers, it will be captured as spending of approximately \$15 million in 2022; \$25 million in 2023; and the final \$20 million in 2024.

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The fillip delivered to commodity prices is being most evidently seen in the cost of gasoline. With world oil now selling for well over \$100 USD per barrel, the U.S. price at the pump per gallon has shot above \$4.00 for the first time since 2008. The impact of a big increase in the price of petrol is, in many ways, like a large tax hike. It drains money from other uses.

Central banks have been on the cusp of raising interest rates for a while. The Bank of Canada has already acted, upping its overnight rate to 0.50%. The Fed appears set to be more hawkish as well, but an extra note of caution has crept into the deliberation. The Fed will be wary as to how far it goes with rate increases until there's a more complete understanding of the negative impacts on the domestic and world economies

of sanctions on Russian banks and commodity exports. Consumers and firms in Europe especially are about to be hit with substantial surcharges on top of already high energy bills, that will have deleterious effects on world trade.

U.S. residential put-in-place construction sailed through the past two years in good shape. The weakness was in nonresidential construction. Presently, there are strong underpinnings for U.S. nonresidential PIP construction. Job openings are plentiful, wages are climbing, retail sales are booming and profits to fuel capital investment are abundant. Unfortunately, though, enthusiasm shouldn't be allowed to run unchecked, given the heightened array of uncertainties around input costs and the international geopolitical environment.

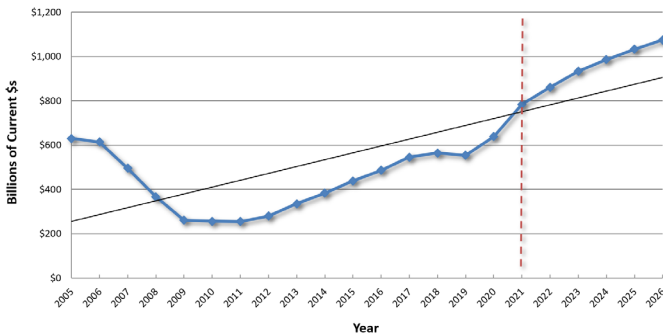
Table 1: U.S. Construction Spending (put-in-place investment)
 (billions of "current" \$s)

Type of Construction:	Actuals		Forecasts				
	2020	2021	2022	2023	2024	2025	2026
Grand Total	1,469.2	1,589.0	1,798.3	1,969.7	2,083.0	2,181.7	2,267.3
(year vs previous year)	5.6%	8.2%	13.2%	9.5%	5.8%	4.7%	3.9%
Total Residential	638.1	784.0	860.2	933.1	985.2	1,032.2	1,074.6
	15.3%	22.9%	9.7%	8.5%	5.6%	4.8%	4.1%
Total Non-residential	831.1	805.1	938.0	1,036.6	1,097.9	1,149.5	1,192.7
	-0.8%	-3.1%	16.5%	10.5%	5.9%	4.7%	3.8%
Total Commercial/for Lease	203.3	192.1	213.9	234.1	248.1	258.2	268.2
	-1.6%	-5.5%	11.3%	9.5%	6.0%	4.1%	3.9%
Lodging	29.1	19.8	20.5	26.7	29.7	32.1	34.7
	-13.2%	-32.0%	3.7%	30.4%	11.4%	7.8%	8.2%
Office	87.4	82.0	87.8	92.3	95.6	97.9	100.0
	-1.5%	-6.2%	7.1%	5.1%	3.6%	2.4%	2.2%
Commercial (retail/warehouse)	86.8	90.4	105.5	115.2	122.7	128.3	133.5
	2.9%	4.1%	16.8%	9.1%	6.6%	4.5%	4.1%
Total Institutional	204.5	187.2	203.1	216.7	224.9	233.0	240.4
	1.5%	-8.5%	8.5%	6.7%	3.8%	3.6%	3.2%
Health Care	48.1	48.9	52.4	56.6	59.2	61.5	63.9
	4.0%	1.6%	7.3%	8.0%	4.7%	3.8%	3.9%
Educational	107.4	98.1	104.8	111.9	115.8	119.9	123.4
	-1.4%	-8.7%	6.8%	6.8%	3.4%	3.5%	3.0%
Religious	3.5	3.1	3.1	3.2	3.3	3.4	3.5
	-6.2%	-12.5%	2.4%	2.7%	2.3%	2.7%	3.0%
Public Safety	17.9	12.0	12.1	13.0	13.6	13.8	13.9
	48.8%	-33.0%	1.2%	7.6%	4.2%	1.3%	0.7%
Amusement and Recreation	27.6	25.2	30.6	31.9	33.0	34.5	35.7
	-9.4%	-8.6%	21.5%	4.2%	3.6%	4.4%	3.6%
Total Engineering/Civil	351.2	347.5	418.6	463.1	492.5	518.8	537.7
(year vs previous year)	0.7%	-1.1%	20.5%	10.6%	6.4%	5.3%	3.6%
Transportation	59.7	56.3	69.3	74.5	77.5	80.9	82.4
	3.9%	-5.6%	23.0%	7.5%	4.1%	4.4%	1.7%
Communication	22.5	21.8	24.7	26.8	28.6	30.5	32.6
	1.5%	-3.0%	13.1%	8.7%	6.7%	6.5%	6.8%
Power	115.0	115.0	138.8	155.8	167.2	178.0	188.7
	-2.5%	-0.1%	20.7%	12.2%	7.3%	6.5%	6.0%
Highway and Street	99.9	100.2	122.5	135.2	144.4	153.6	157.5
	0.5%	0.3%	22.3%	10.4%	6.8%	6.4%	2.5%
Water Supply & Waste Disposal	45.1	46.5	54.0	59.9	62.8	63.2	63.7
	6.1%	3.2%	16.0%	10.9%	4.9%	0.6%	0.8%
Conservation and Development	9.0	7.6	9.3	10.9	12.0	12.6	12.8
	-2.8%	-14.8%	22.2%	16.5%	10.1%	5.1%	1.8%
Total Industrial/Manufacturing	72.1	78.3	102.5	122.7	132.3	139.5	146.5
	-10.9%	8.5%	30.9%	19.7%	7.9%	5.4%	5.0%

"Current" means not adjusted for inflation.

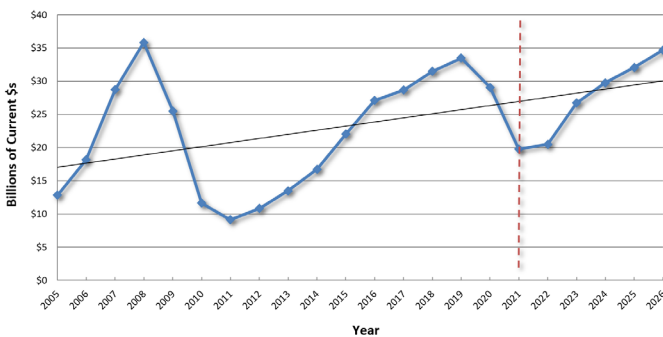
Source of actuals: U.S. Census Bureau/Forecasts: Oxford Economics and ConstructConnect/Table: ConstructConnect.

Graph 2: U.S. Construction Spending: Residential Put-in-place (PIP) Investment



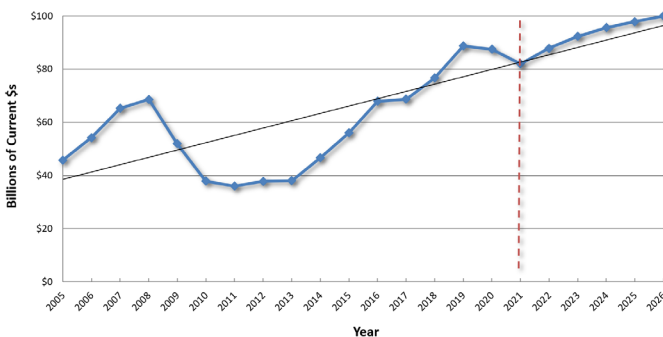
The exceptional strength in residential PIP construction of the past couple of years (i.e., +15.3% y/y in 2020 and +22.9% y/y in 2021) will begin to moderate in 2022 (+9.7%). Working to restrain homebuilding activity will be higher mortgage rates, worsening affordability, and slowing population growth. Nevertheless, an earlier decade of homebuilding below trend will see counterbalancing momentum for some time. Residential PIP will first exceed \$1 trillion in 2025.

Graph 3: U.S. Construction Spending: Lodging Put-in-place (PIP) Investment



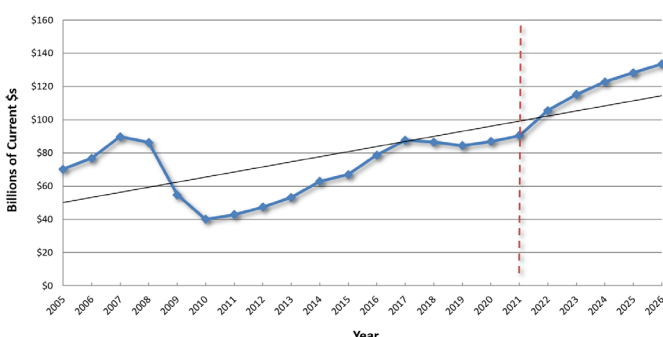
The PIP figures don't normally show huge swings, but between 2019 and 2021, accommodation capital spending nosedived by -41.0%. Recently, business and tourism travel has been making a comeback. Air fares are still at inexpensive levels, although the price of jet fuel will soon take off. Owners of major hotel/motel chains are super competitive. They'll do what it takes to entice old and new clientele, explaining the substantial list of contemplated projects in this sector.

Graph 4: U.S. Construction Spending: Office Buildings Put-in-place (PIP) Investment



E-mails are increasingly going out to workers encouraging them to return to their former office workplaces. Not every company is insisting, but there's a drumbeat underway, nonetheless. A lot of workers will be ambivalent. There's the stay-at-home convenience factor to be weighed against the desire to mix with other people once again. For those with long commutes, the near doubling in the price of gasoline will be a shock. Stubbornly high office vacancy rates will also promote buying a property as a cheaper investment strategy versus building new for some time.

Graph 5: U.S. Construction Spending: Retail, Warehouse, Restaurant Put-in-place (PIP) Investment

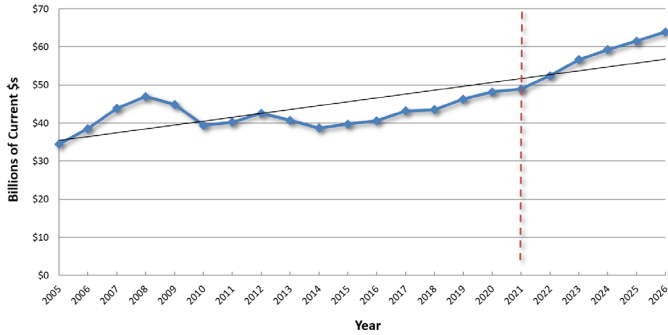


In 2021, retail construction groundbreakings, for the first time in several years, stopped falling and registered a mild uptick. 'Bricks and mortar' retail, after taking a pummeling from online sales, appears to have found its baseline footing. Shoppers will be returning to malls. For many individuals, browsing physical store shelves is a preferred form of entertainment. Meanwhile, the expansion of fulfillment and distribution space will proceed unabated. Also, at plant sites, due to supply chain hiccups, there's plenty of incentive to jack up crucial inventory storage capacity.

Graphs include a 'best fit' linear trend line.

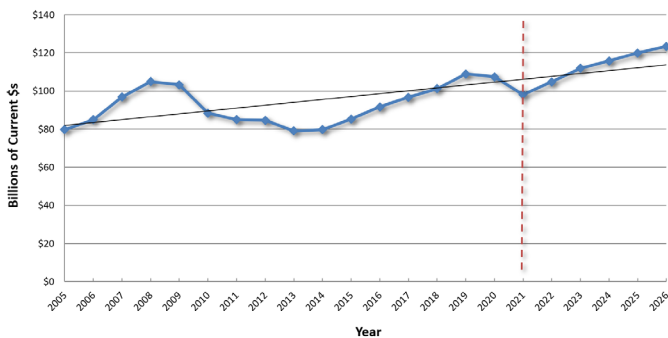
Source of actuals: U.S. Census Bureau/Forecasts: Oxford Economics and ConstructConnect/Charts: ConstructConnect.

Graph 6: U.S. Construction Spending: Health Care Put-in-place (PIP) Investment



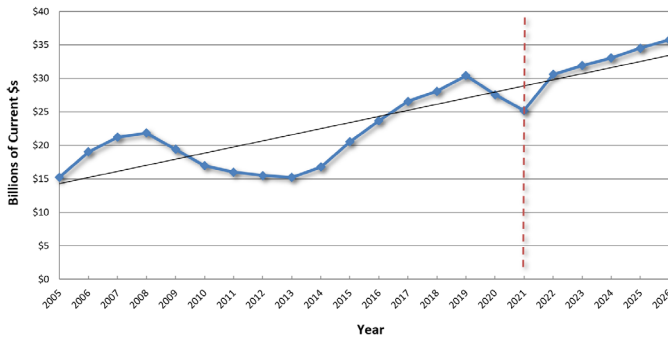
The two-year anniversary of COVID's initial harmful impact on the health of Americans is at hand. While public policy concerning vaccinations has proven controversial, extensive coverage has played a role in shifting the contagion closer to endemic status (i.e., always there, but in the background). Hospitals are returning to business as usual, and that means a preponderance of attention paid to the elderly. Every 'baby boomer' still alive is now aged 55 or older, amplifying the demands they'll be placing on the system for cardiac and a host of other procedures.

Graph 7: U.S. Construction Spending: Educational Put-in-place (PIP) Investment



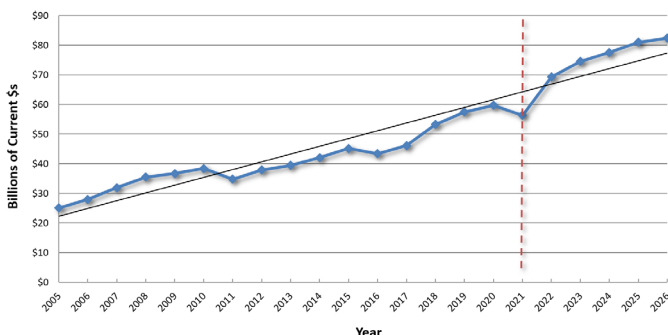
Strikes against the prospects for educational facility construction include a prolonged drop-off in annual births (which lowers the feeder stream into K-12), a vast array of courses and diploma opportunities offered over the Internet, and foreign student enrolments that are a pale shadow of what they once were. On the plus side, though, hot trends include mechanical and other upgrades at existing locations, new structures in burgeoning suburban areas, teaching hospitals on university campuses and the establishment of joint venture academic-business research sites.

Graph 8: U.S. Construction Spending: Amusement and Recreation Put-in-place (PIP) Investment



For much of the past two years, the desire to attend a concert, go to a movie, see a live sporting event, or risk some 'dinero' at a casino has been thwarted. On the flip side, the forced frugality has enabled the stockpiling of bundles of cash that are chomping at the bit to be released. When the pandemic is vanquished, degrees of restraint will be peeled away. Prior to spring 2020, professional sports teams were on a tear to build new stadiums. Plans for new 'palaces' that didn't come to fruition then, are being brought forward again (e.g., a new Buffalo Bills stadium).

Graph 9: U.S. Construction Spending: Transportation Put-in-place (PIP) Investment

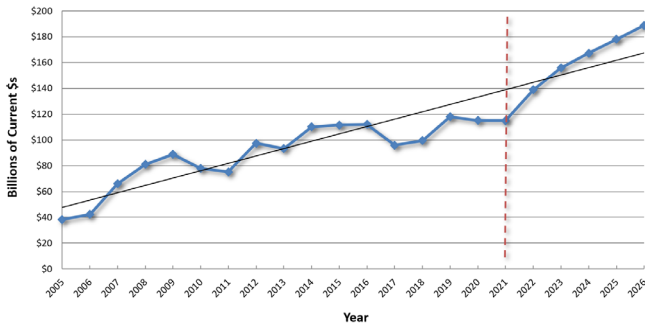


Nearly every major city in America has plans for rapid transit expansion, by means of light rail systems or subways. Ridership shrinkage during the work-from-home era will soon be reversed. Portions of the billions of dollars of contemplated transit expenditures may have been shifted further out in time rather than taken off the table. The same goes for airport expansions. Also, everyone knows how favorably President Biden views railroad connections. Plus, in the not-too-distant future, at least one of several hyperloop proposals will transition from the pilot stage.

Graphs include a 'best fit' linear trend line.

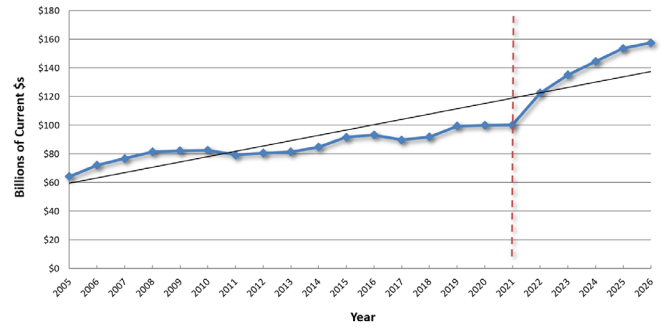
Source of actuals: U.S. Census Bureau/Forecasts: Oxford Economics and ConstructConnect/Charts: ConstructConnect.

Graph 10: U.S. Construction Spending: Power Put-in-place (PIP) Investment



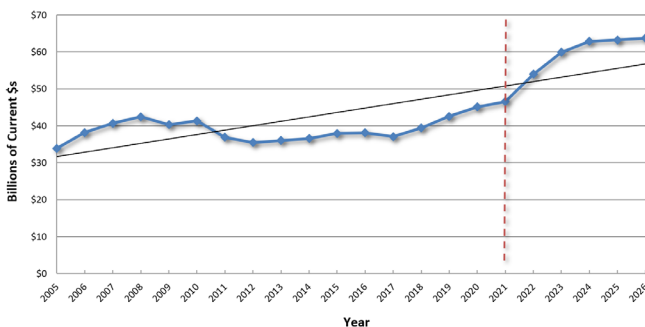
Russia's aggression against Ukraine has taken the world by surprise. Caught in a bind have been European customers dependent on Russian oil and natural gas. Suddenly, greater energy autonomy has become a top goal for many nations. Quick fixes for the new energy shortage problem, such as greater utilization of fossil fuels or coal, will meet stiff opposition from those who revel in the progress made so far in reducing carbon emissions. Particularly welcome will be efforts to speed adoption of solar, wind and other forms of sustainable electric power generation.

Graph 11: U.S. Construction Spending: Highways and Streets Put-in-place (PIP) Investment



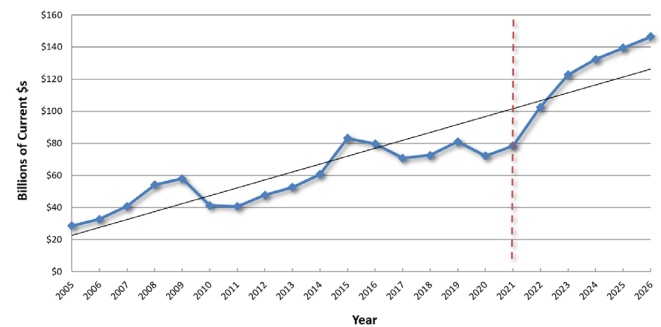
The main 'drivers' of highway and street construction are the outward spread of new residential communities, the need for access routes to potential resource development sites, repairs to and widenings of existing roadway ribbons and, of course, available financing from government or by means of PPP arrangements. Funding has become less of an issue at the federal, state, and local levels thanks to the billions of dollars being set aside for roadway in the Infrastructure Investment and Jobs Act (IIJA). Another major beneficiary of IIJA money will be bridge work.

Graph 12: U.S. Construction Spending: Water Supply, plus Sewage & Waste Disposal Put-in-place (PIP) Investment



A decade of barely sustained interest in delivering quality water to homeowners and in properly carrying away and cleaning up effluent is now being put into better order, with help from the infrastructure spending initiatives launched by Washington. An improving trend of spending began in 2018 and is projected to continue through 2024. Another spur to spending will come from the push towards 'resiliency' with respect to the handling of precipitation damage tied to climate change. Faster run-off systems along city streets, and in tunnels and subways, are badly wanted.

Graph 13: U.S. Construction Spending: Manufacturing Put-in-place (PIP) Investment



The route to stronger manufacturing construction in America is about to proceed along some old and new paths. Major domestic and foreign car manufacturers have announced plans to massively ramp up electric vehicle and battery production in Michigan, Tennessee, Kentucky, and other locations not yet disclosed. To rectify an enormous shortfall in available computer chips, Intel and Samsung are striving to build huge new facilities in Arizona, Ohio, and Texas. Finally, for North American fertilizer, petrochemical, and LNG producers, there are tremendous opportunities to be seized based on the more advantageous cost of energy here than overseas.

CURRENT VS CONSTANT DOLLARS

During most of the past decade, there wasn't much concern with simply talking about construction volumes in 'nominal' or 'actual' or 'current-dollar' terms. The role being played by price increases was relatively minor.

With the big current increases in material input costs, and wages too for that matter, and the flow-through impacts on project pricing, the difference between 'current' dollars and 'constant' dollars has become significant once again.

'Constant' dollars remove the impact of inflation. For example, it's important to know

that if a dollar volume increases by 10%, but prices have also gone up by 10%, then the 'real' change has been zero.

A price index or deflator is used to convert current dollars to constant dollars. A base period is chosen for a certain price level and it is assigned the value of 100.0. Then if prices increase by +5% over the next year, the index in year two moves to $1.05 \times 100.0 = 105.0$.

If prices rise by +4% in the third year, the index will shift up to $1.04 \times 105.0 = 109.2$.

Or, if prices change by -4% instead, the index value in the third year will become $0.96 \times 105.0 = 100.8$.

Market volumes divided by an appropriate price index or deflator will yield dollars that are termed 'constant' (i.e., in the sense that they've had inflation removed) relative to the

chosen base period.

The PIP construction dollar volumes set out in this report, as calculated by Oxford Economics and ConstructConnect, are in 'current' dollars. The estimates of the year-over-previous-year pricing impacts, as provided by Oxford Economics, are +2.9% in 2020; +3.0% in 2021; and +10.1% in 2022. From 2023 onward, costs and pricing settle back down again into an annual +2.0% to +3.0% range.

What this means is that in 'real' or 'constant' dollar terms, grand total PIP construction of +13.2% y/y in 2022 will yield a 'real' or 'constant' dollar increase of only about +3.0%. The year 2022, by physical activity, will be less robust than both the year prior, 2021 (+5.0%), and the year to follow, 2023 (approximately +7.5%).