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THE MAGAZINE OF THE MASTER BUILDERS' ASSOCIATION OF WESTERN PENNSYLVANIA

JANUARY/FEBRUARY 2018



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Shell's Franklin Cracker



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# PUBLISHER'S NOTE

I'm paid to tell the forest from the trees. The readers of this magazine, my emails and blog expect that I'll see something that they don't; or, at least, that I'm not tied up looking at the trees that they are. So what happens when you're so busy looking at the forest that you don't notice the elevation has changed?

Ever since the announcements by the Airport Authority, Allegheny Health Network and UPMC of their billion dollar investments, that's how I've felt about my role as the futurist of the construction industry – a title that doesn't sit very well with me anyway. None of the projects that were announced were necessarily surprises to me – they had all been talked or whispered about for a while by people who knew of their plans – and those projects don't represent a sea change in Pittsburgh's economy. But for some reason seeing all those projects in front of my eyes made me realize I may have missed that we had changed elevation or, at least, direction.

If I'm going to be any good at forecasting what's coming down the pike, I have to pay attention for micro-trends and macro-trends in the regional or national economy. The hospital work is part of a micro-trend, a shift in the need for space because of some singular or short-term change in the way one slice of the market operates. Similar micro-trends at work in our market right now would be the technology research (like robotics or AI) or the revitalization of East Liberty. Macro-trends are bigger, more influential changes that are affecting the way the economy works for the long-term, like Pittsburgh's demographics or the exploration of the shale gas. It's the latter macro-trend that I'm talking about.

There are a handful of times in your life when you can see that things are changing in a big way. Over the past decade there has been that sense about things changing in Pittsburgh. I guess because there have been so many significant changes in so many micro-trends (Downtown living, reservations for a restaurant on a Tuesday?, self-driving cars, etc.) that it seemed like everything was changing. But while I was trying to process how all these big projects were going to get built and how that would affect the construction landscape, I saw a much bigger macro change on the horizon.

As a content provider I am expected to pay attention and look for trends in the industry. For that reason I really shouldn't be all that surprised by changes. But when I processed what is going on in the regional construction industry and the regional economy I thought I saw a sea change, one I did not expect. During all of that processing, it dawned on me that the basic nature of Pittsburgh's economy was changing again. And ironically, that change is

something of a "Back to the Future" phenomenon.


I decided to turn that revelation into an article. If you are intrigued by this introduction you can find the article in our Trend to Watch column on page 52. If you're not sure that you're willing to invest the time just yet, let me give you the Cliffs Notes version.

Shell's new ethane cracker under construction in Monaca will be the beginning of a decades-long build up of a new industry in Western Pennsylvania. While I was doing the research for this edition of BreakingGround, I talked to a couple of chemical industry experts who were very comfortable predicting that this industry would bring 100,000 new jobs to Western Pennsylvania by 2030. That staggered my imagination. When I pressed them on that forecast both men pointed out that they were talking about job growth across several sectors and that the manufacturing economy in Western PA would get the biggest boost. Shale gas gives Western Pennsylvania an abundant supply of cheap energy and that is extremely attractive for people who make things. More important than the jobs that would come, a revitalization of manufacturing would shift the foundation of the economy from one built on services to one built upon assets and services.

Having a diverse economy means that Pittsburgh won't be vulnerable to the kind of industry exodus that occurred when domestic steel imploded in the 1980s. Reintroducing an asset-based industry into that diverse economic mix is a good thing and has a bigger impact than just the jobs. Let's face it: because of workforce pressures or competition, companies will always be looking to do more with less people so the jobs are somewhat temporary anyway. But an economy built upon assets has some permanence. For that reason, decisions have a longer horizon and more patience built in.

For construction, that's good news. People fix things they expect to hold onto for a long time and they are willing to spend more to have things fixed properly. And building out an industry means a lot of construction for a long time.

As of 2018, this vision of mine is unrealized. It may turn out to be a hallucination, but the petrochemical industry seems determined that the Tri-state area will look like a reduced version of the Gulf Coast by 2030. The economic elevation may be shifting higher.



Jeff Burd



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# REGIONAL MARKET UPDATE



**J**ob growth in metropolitan Pittsburgh remained solid, if not spectacular, into the fourth quarter. The Bureau of Labor Statistics reported on November 22 that employers in Pittsburgh added 12,100 jobs in October 2017 compared to October 2016. That marked the fifth consecutive month with at least 10,000 more jobs than the previous year. That's a trend that suggests that the seven-county region will get back on a path of job growth of one percent or more, although similar fourth quarter trends over the past three years were revised downward at year's end. Absent the steep declines in manufacturing and energy sector jobs that occurred in 2014-2016, however, economists are more confident that the gains in 2017 will stick.

Pittsburgh's unemployment rate plunged 1.4 points year-over-year to 4.7 percent in October. The number of unemployed fell by 18,200 but the decline was due to a decline in workforce of 27,400 workers due to accelerating rates of retirement among Baby Boomers. Unfilled job openings in Western PA remained high, with more than 28,000 openings December 1. The number of unfilled openings, in fact, represented half of the total unemployed in the region.

Two recent commercial real estate research reports highlighted the impact of the technology sector on Pittsburgh's job market and drove home the influence that tech's growth has had on the demand for real estate, specifically office space.

CBRE Research's Tech-30 report ranks North American tech markets based on high-tech job growth and rent increases. Pittsburgh moved from eleventh in 2016 to third overall in 2017. Pittsburgh's high-tech workforce grew 31.4 percent from 2015 to 2016, well above the national average of 11.1 percent. The impact on office demand from the tech sector was apparent, as 95.1 percent of office jobs added from 2015 to 2016 were created by the tech industry. As would be expected, the demand for tech space created upward pressure on rents. The weighted average rental rate of the top tech leases signed since 2010 was roughly \$31.95 per square foot, 23 percent higher than Pittsburgh's average Class A asking rate.

A Pittsburgh market report presented recently by JLL looked at the impact of three hot tech businesses on the

city's office and industrial markets. The report showed that jobs in the autonomous vehicle (AV) industry grew 324 percent from 2016 to 2017 in Pittsburgh. That growth rate was 50 percent higher than San Francisco's – which placed second – and dwarfed the third-place city, San Jose (home to Silicon Valley). The average salary of those AV jobs is \$81,682.

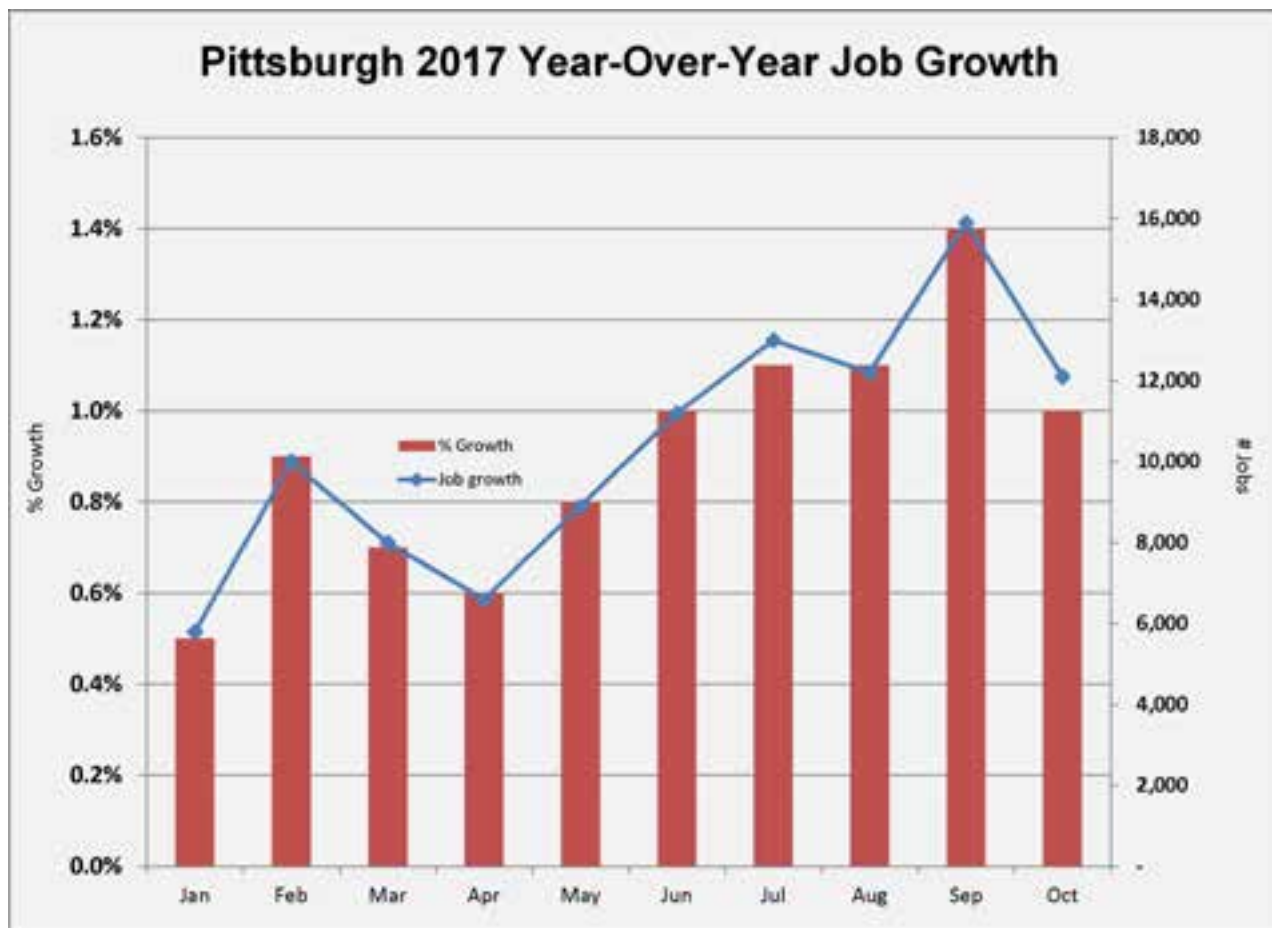
Pittsburgh also had the highest growth rate for additive manufacturing jobs, 128 percent year-over-year versus 9 percent nationwide. In robotics, the year-over-year growth rate was 59 percent, beating New York at 54 percent and Detroit at 27 percent. The average salary for a robotics worker in Pittsburgh is \$72,437, compared to the U.S. average salary of \$64,766.

Companies in these sectors have been among the most-publicized deals in the market over the past couple of years. After numerous deals – including the recent agreement to lease 80,000 square feet in the former Wilson McGinley warehouse – Uber has gone from no footprint in Pittsburgh in 2014 to 300,000 square feet two years later. One of its competitors, Argo AI, signed a deal this fall to become the anchor tenant in the Riverfront West Building at Oxford's 3 Crossings. The 65,000 square foot space will become starter space if the company grows at the rate it plans to. Another AV company, Delphi, has leased 20,000 square feet in RIDC O'Hara. The Advanced Robotics Manufacturing Institute is the 90,000 square foot lead tenant at Mill 19, the first building being developed by RIDC at the Hazelwood Green complex. With \$250 million in grants for robotics research, the Mill 19 facility will be the kind of magnet that could draw hundreds of thousands of square feet of corporate partners to the park.

According to JLL, there are known users of about 200,000 square feet from these sectors looking for space in the Pittsburgh market at the moment. That kind of user activity must be music to the ears of the developers looking to fill up new space in Oakland. The neighborhood has long been Pittsburgh's hottest for space and rent growth, offering access to Pittsburgh's universities just ten minutes east of Downtown.

Walnut Capital has recently closed on properties and disclosed its plans for Oakland. The developers will spend





*After four years of job growth stagnation, Pittsburgh appears to be seeing growth again in 2017. Source: Pittsburgh Today, U.S. Bureaus of Labor Statistics.*

\$6 million to renovate and add parking to the 43,000 square foot former Cadillac dealership at Craft Place and the Boulevard of the Allies. At the former Pittsburgh Athletic Association building on Fifth Avenue, Walnut Capital will renovate the PAA to re-purpose it for office or research use. The University of Pittsburgh is rumored to be the building's major tenant. The most ambitious of the trio of projects Walnut Capital is advancing is a new 11-story office building it will develop at 242-244 McKee Place. All three of the projects are being built by the PJ Dick/Strada Architecture team.

At the firm's signature development, Walnut Capital is reported to be nearing a deal that would trigger the construction of Bakery Square 3.0, the final office building at the tech-centered complex on Penn Avenue.

Two other developments will be vying for tenants in Oakland. Murland Associates LP is developing a 97,000 square foot office building in the 3400 block of Forbes Avenue, currently being built by Mascaro Construction. Sterling Properties is also exploring options for its Sterling Plaza II, a 105,000 square foot office (as previously entitled) on Craig Street. Sterling's Dave McSorley reported receiving inquiries about the project this past summer.

Among the users reported to be in the market in Oakland is Microsoft, looking for a beachhead of 50,000 to 70,000 square feet.

Two projects in the Central Business District fringe moved forward as 2017 wound down. Burns & Scalo Real Estate received approval from the Urban Redevelopment Authority for the sale of the land to develop the 150,000 square foot Riviera at Pittsburgh Technology Center. Burns & Scalo released NEXT Architecture to design the building. More quietly, Oxford Development has been working to get out of the ground in 2018 with the first building of three at what has been called 3 Crossings 2.0.

After announcing multi-billion dollar capital programs in October/November, Allegheny Health Network (AHN) and UPMC moved forward with several of the projects in December. AHN selected Turner Construction to build its 160-bed new hospital in Wexford and announced the that first of its "micro-hospitals" will be built in 2018 in Hempfield Township, outside Greensburg. UPMC issued a request for proposal to five international architectural practices for the design of its \$600 million Heart and Transplant Hospital at Presbyterian and the UPMC Hillman Cancer Center at Shadyside Hospital.

Assuming that most of the major projects planned for start in 2018 move ahead on schedule, the region's construction market should top \$5 billion for the first time. As has been the case for much of the decade, the surging construction market will be led by the private sector. Commercial real estate will be a stronger construction segment in 2018, but the resurgence of Pittsburgh's institutional sector will grab a significantly larger share. Pennsylvania's budget for the coming years does not offer much in the way of hope for resurgence in publicly-funded construction outside of heavy/highway work.

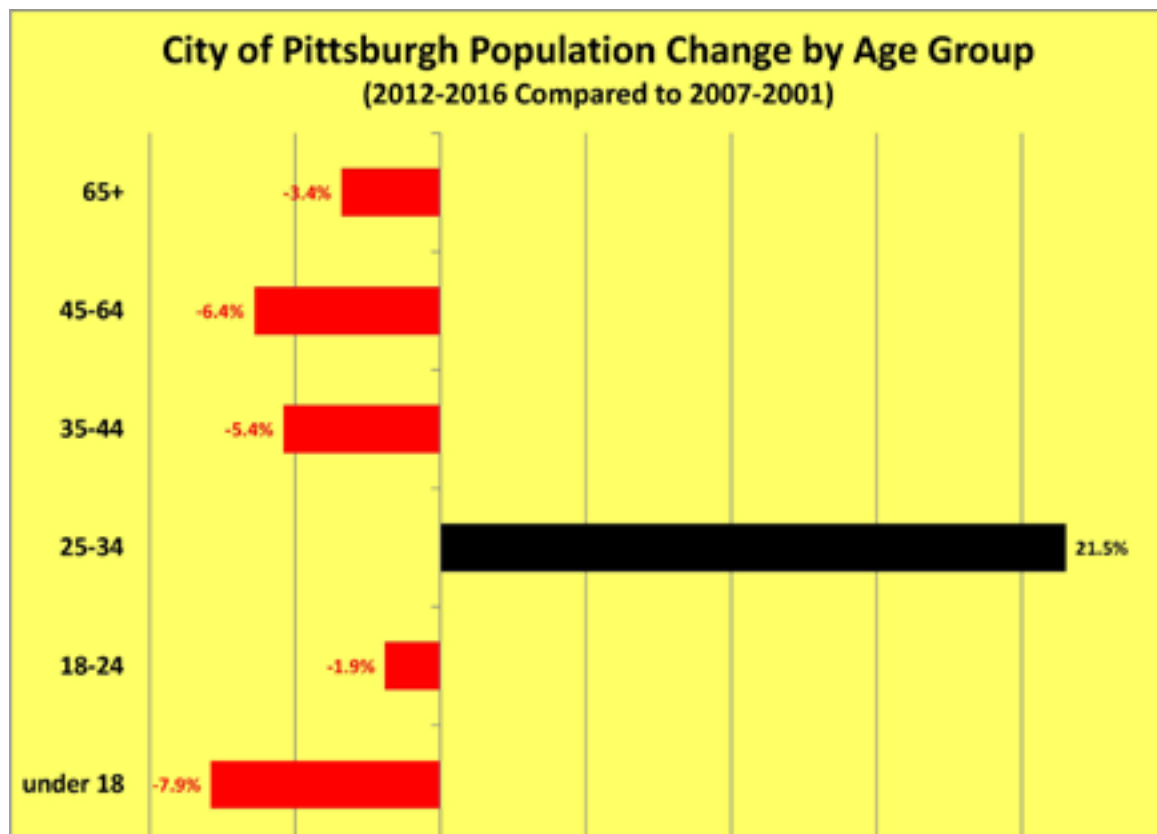
The delay in the budget was due to an ongoing dispute about revenue to support the Commonwealth's spending. This is a dispute that will, unfortunately, be revisited in coming years too, assuring that the belt tightening in the 2017-2018 budget will continue into 2019. As passed, Pennsylvania's capital spending for the next 24-36 months will remain depressed.

Spending for the Department of General Services, the agency that is the landlord for PA's government, will be between \$30 and \$40 million annually in 2018 and 2019. Capital budgets for the PA State System of Higher Education have fallen to \$45 million from \$65 million. Projects at state universities that have offsetting fees or are funded by university foundations may proceed

beyond what is budgeted, but there are few of those projects in the pipeline.

The news is equally gloomy for K-12 construction. Funding for PlanCon will be \$234 million in 2018, a level that is supporting projects already approved or under construction and is \$70 million below the 2014-2015 budget. Under Act 25 of 2016, the current moratorium on PlanCon processing of new projects was to expire on May 15, 2017, when a new program for reviewing and reimbursing school district projects was supposed to be implemented. No such program has been approved (or put forward) by the end of 2017, leaving the K-12 market in limbo for the time being.

Pennsylvania's largest line item for supporting construction and development is the Department of Community and Economic Development's (DCED) budget. Scheduled to shrink from \$397 million to \$300 million over the next three years, DCED's budget nonetheless looks appealing and supportive for construction. The DCED budget includes Redevelopment Assistance Capital Program (RACP) grants, which help to bridge gaps in funding for private development. Setting RACP grants aside, the budget for DCED is \$58 million in 2018, meaning DCED will not be able to contribute significantly to the growing backlog of deferred public projects. BG



*Unlike most U.S. cities, Pittsburgh has seen strongest population growth in the 25-34 year-old cohort.*



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# NATIONAL MARKET UPDATE

Observers of the economy looking for signals of a significant change in trends will be disappointed going into 2018, as far as most major forecasters are concerned. History has taught us that economic inertia is usually short-lived but there is little evidence of a shift in the economy's current trajectory.

Although the political environment has been particularly volatile and uncertain in 2017, businesses view the Trump Administration's policies towards business to be quite consistent and have responded positively throughout the year. With the expectation that some form of tax legislation will pass that will allow corporations and individuals to keep more income, business activity accelerated during the fourth quarter. While most corporations gave little or no indication that a tax reform windfall would be used to boost hiring, job creation nonetheless outperformed expectations. November's addition of 226,000 jobs to U.S. payrolls pushed the average monthly hiring above 165,000 per month for the first 11 months of 2017. That's a pace that is 15,000-20,000 jobs higher than expected, and one that is unusual for a recovery in its ninth year. Looking forward, it appears that hiring growth in 2018 will be limited more by tight labor supply than by the perceived demand for business growth.

In terms of the construction economy's most widely-accepted measures of health – gross domestic product (GDP), unemployment, occupancy rates and the ten-year Treasury note – economists are anticipating that 2018 will look like 2017 (and 2015-2016) for that matter. Final data on the 2017 economy won't be wrapped up until well into the first quarter of 2018, but the third quarter data and early fourth quarter results indicate that the U.S. economy will continue to grow modestly, with modest upward pressures on both prices and interest rates and a labor market that is near full employment.

One forecast that is expecting better growth in 2018 is that of the Conference Board. Its chief economist and chief strategy officer, Bart van Ark, wrote of a stronger trajectory for the economy going into 2018. Van Ark sees GDP growth hitting 2.8 percent in the fourth quarter of 2017 and predicts 2.5 percent growth in 2018. The Conference Board expects that the pent-up demand from business investment will continue to boost the economy in 2018 as consumer investment levels out. In his November 8 letter explaining the Conference Board's forecast, van Ark wrote:

"Business investment has awakened from the doldrums this year, rising by more than 4 percent after falling into negative territory in 2016. Confidence in the manufacturing sector has been especially strong. The composition of growth supports a long-term improvement in productivity. Capital equipment has risen at an 8.7 percent annual rate during the past two quarters, while investment in warehouse structures is up more than 20 percent since the end of last year. These investments demonstrate a renewed firm commitment to increased efficiency."

The increased investment in manufacturing over the past couple of quarters has given the economy a lift and some insight into the psyche of the private business owner. Although the ratio of operating income/interest expense has fallen in 2017, it's clear that manufacturers are confident in the outlook to increase capital spending on manufacturing facilities and plant equipment, even as capacity remains below the 80 percent bellwether level. Wells Fargo Securities, in its December 6 Interest Weekly newsletter remarked:

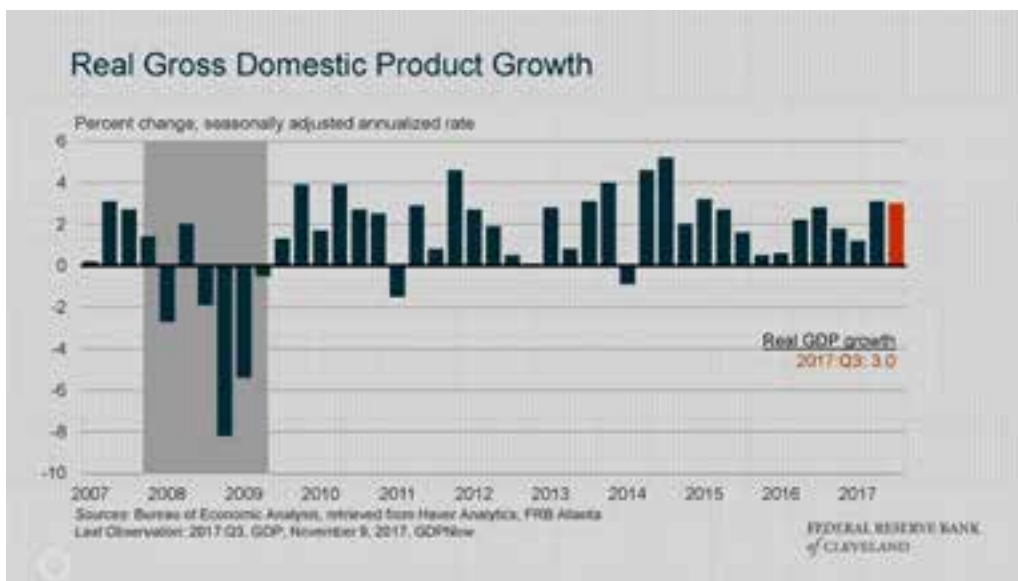
"The continued rise in capital expenditures has some positive implications, as it may provide a lift to the historically weak pace of productivity growth we have seen in this cycle. Moreover, it also implies that these companies have enough

THE CONFERENCE BOARD ECONOMIC OUTLOOK, 2017-2018  
Percentage change, seasonally adjusted annual rates

	2017				2018		2016	2017	2018
	I Q*	II Q*	III Q*	IV Q	first half	second half	ANNUAL	ANNUAL	ANNUAL
Real GDP	1.2	3.1	3.0	2.8	2.4	2.2	1.5	2.2	2.5
Real Consumer Spending	1.9	3.3	2.4	2.7	2.3	2.4	2.7	2.7	2.5
Residential Investment	11.1	-7.3	-6.0	3.0	2.5	2.2	5.5	1.0	0.8
Real Capital Spending	7.1	6.7	3.9	5.4	4.5	4.2	-0.6	4.5	4.7
Exports	7.3	3.5	2.3	4.0	3.9	3.8	-0.3	3.2	3.7

\* Actual data





of the markers pointing toward that performance is the surprising jump in productivity that was registered in the second half of the year.

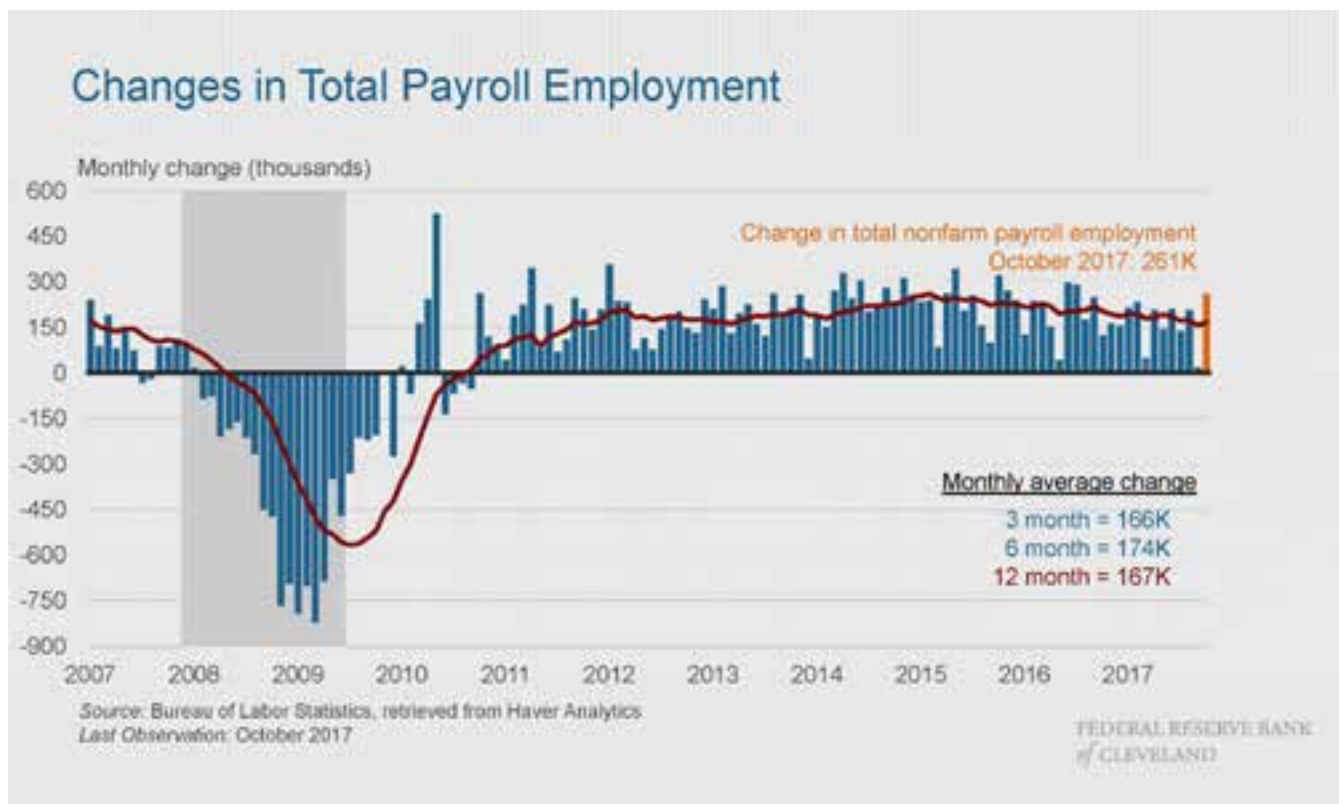
Workers produced 4.1 percent more in the third quarter of 2017, while working an additional 1.1 percent more hours. The resulting 3.0 percent jump in productivity was double the gain in the third quarter of 2016, according to the Labor Department's December 6 report. Last quarter's performance broke a decade-long trend of weak productivity gains

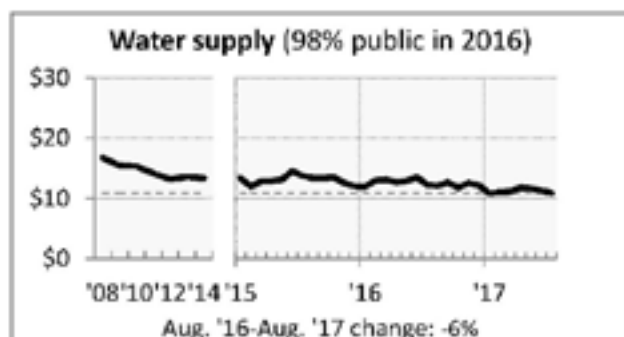
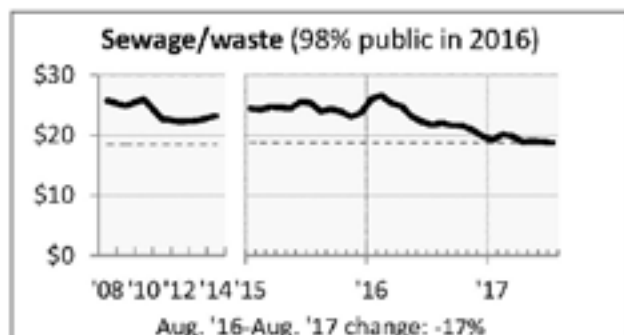
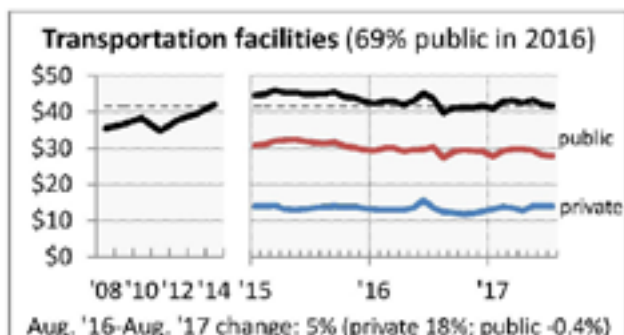
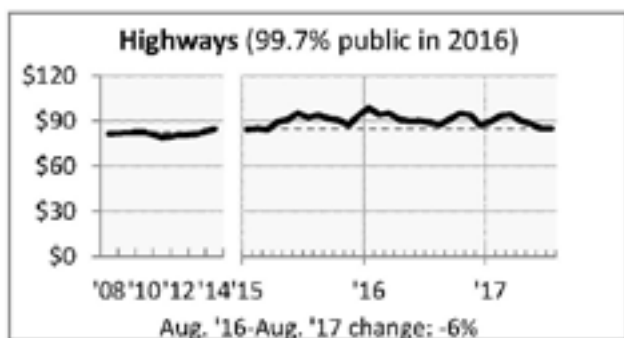
confidence in future sales prospects to justify ramping up new investments in their business."

Both economic output and productivity have rebounded since the slow start of 2017. The Commerce Department's December 1 report on GDP showed a strong first reading of third quarter GDP, registering 3.2 percent growth after the final revision of second quarter growth came in at 3.1 percent. Should the final estimates of third quarter growth remain above three percent, it will mark the first time GDP growth topped that level in consecutive quarters since 2014. One

that followed the Great Recession and the integration of computers and Internet into the workplace in the 2000s. The spike in productivity also sets the stage for higher wage growth, another metric that had lagged profits since the recovery began in 2010.

The measure of manufacturing activity rebounded in October and November after the shocks of the hurricane season in the South. Increased investment by U.S. manufacturers has been met by rising demand from overseas markets to create





Source: U.S. Census Bureau Construction Spending Report

Investment in public works is generally flat or declining compared to the 2008-2015 trend. Source: AGC of America.

better conditions for U.S. producers. Double-digit gains in core capital goods orders, including mining and construction equipment, bode especially well for the manufacturing sector. If the Trump Administration can move an infrastructure spending plan forward in early 2018, demand for heavy equipment should rise that much more.

Looking towards 2018, three of the construction industry's leading economists anticipate growth in most sectors of the industry in the coming year, but anticipate that increases will slow down further from the ranges seen in 2017.

Ken Simonson, chief economist for the Associated General Contractors, has forecast a 2 percent to 7 percent increase in construction spending for 2018. Private residential construction will continue to be constrained by limited lot supply but will see the most growth at 6 percent to 9 percent. Private nonresidential construction should see more headwinds, as commercial construction begins to plateau and institutional construction wrestles with long-term funding solutions. The AGC forecasts an increase between 1 percent and 5 percent for nonresidential construction.

American Institute of Architects' (AIA) chief economist, Dr. Kermit Baker from Harvard University, presented the forecast of AIA's Consensus Construction Forecast Panel. The panel estimates that construction spending on nonresidential buildings will increase 3.8 percent year-over-year in 2017 and forecasts 3.6 percent growth in 2018. Commercial construction drove the market with an 8.8 percent increase in 2017 but the AIA panel sees spending on commercial projects growing by only four percent in 2018. Other highlights in Baker's forecast were a strong increase in industrial construction spending of 6.6 percent in 2017 and 5.8 percent next year. The AIA expects institutional construction to grow by only 1.1 percent in 2018.

ConstructConnect's Economist Alex Carrick noted that the synchronization of economic expansion across the globe is creating positive conditions that will be hard to derail in 2018. Carrick highlighted the pent-up demand in the housing market, which drove his forecast of higher-than-normal growth in residential construction.

"If Millennials decide they want to have single-family housing like their parents and grandparents, it will help to drive residential starts," said Carrick. "We've had 10 years when housing starts have been less than the 1.4 million benchmark that represents equilibrium. So, if housing ever really gets going, it's going to drive the economy for years to come."


Simonson's forecast for nonresidential spending is held down by concerns over the vitality of the public construction market, which he estimates could swing between a three percent increase or decline. In both of the largest segments of public construction – education and infrastructure – funding solutions for capital spending remain unsettled, although expenditures by states increased more briskly in fiscal year 2017.

In its November 16 State Expenditure Report for fiscal year 2017, the National Association of State Budget Officers




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estimated that capital spending by states will increase 5.7 percent over 2016, the largest increase since 2006. Following spending growth of 3.1 percent in 2016 and 4.2 percent in 2015, the higher rate of growth in 2017 is being attributed to heightened recognition of the need for infrastructure maintenance and acceptance that an increase in federal assistance may not be forthcoming.

The most recent readings on total U.S. construction showed that the industry is reaching record high levels. The Census Department reported on December 1 that annualized construction spending in October topped \$1.241 trillion, a 1.4 percent increase over September and a 3.9 percent increase compared to October 2016.

Contractors are showing exceptional confidence in the market and the business conditions for the coming year. The U.S. Chamber of Commerce and USG Corporation, in conjunction with Dodge Data + Analytics, issued its Commercial Contractors Index on December 11. The report showed continued optimism about the industry, with an overall rating of 74. Among the key findings were:

- Nearly all (98 percent) of contractors expect revenue to stay the same or increase in the next 12 months, a slight increase from the 95 percent reported in Q3.
- Nearly all (99 percent) of respondents report high or moderate confidence that the market will provide sufficient new business opportunities.
- Contractors report an average backlog of 9.4 months in Q4, which is 75 percent of the average ideal backlog of 12.5 months.

U.S. contractors are reflecting confidence in the industry that is almost universal heading into 2018. There are, of course, potential bumps in the road. The mid-term election cycle is likely to be rougher than in past. Concerns about global conflicts, terrorism and the investigations into the Trump Administration linger as incidents that could spark fear and cool confidence in the economy. In counter balance, the strong employment picture, rising wages, lower taxes and the expectation for some form of infrastructure provide strong support for construction growth in 2018. 



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# WHAT'S IT COST?

All indications are that the steady pace of increasing construction costs will continue, and likely accelerate, into 2018. Upward pressure from growing global demand, coupled with continued growth in U.S. construction demand in 2018 will give the supply chain and specialty contractors the market support to raise prices.

The report by consultants IHS Markit and the Procurement Executives Group (PEG) indicated that price increases are becoming more widespread and consistent. Moreover, increases in finished goods and equipment are showing that raw material cost increases are being passed on through the supply chain. The IHS Markit/PEG Index was at 60.2 in November, supported by higher prices in both the materials/equipment and labor. A reading over 50 indicates rising prices. October's headline index was 58.9.

The November index saw only two categories with lower readings than October's.

Of special note in the November survey was the accelerating increase in subcontractor pricing, owing to higher activity from a fully-employed labor supply. Emily Crowley, principal economist pricing and purchasing for IHS Markit, noted, "Subcontractor rates continued to accelerate over November and expectations for future increases reached a five-year high. Tightening labor market conditions combined with an uptick in activity are driving expectations of future rate increases. Currently the U.S. South and West are having the most trouble finding workers leading to stronger wage escalation."

Thompson Research Group (TRG) reported on December 6 that announcements of future price increases for building materials are getting more numerous. In its monthly survey of building products suppliers, TRG reported that wallboard is on partial allocation in a number of U.S. markets and that all respondents expected that the 15-18 percent increase in January will be accepted, at least in part. Other major building components with 2018 price increases in the market include steel studs (15 percent), flooring (5-6 percent), insulations (8-12 percent) and concrete (\$8 per yard). Respondents expected that virtually all value-added goods will see price increases in January, with little or no market pressures to push back against the increases.

November's report on consumer and producer prices from the Bureau of Labor Statistics confirmed these surveys again. Softness in energy prices helped keep consumer prices just above the two percent target for inflation but the producer price index (PPI) for final demand rose 3.1 percent compared to November 2016 and the PPI for final demand construction jumped 3.0 percent. Inflation for completed buildings and nonresidential subcontracting remained consistent in their steady climb, with year-over-year increases ranging from 2.6 percent to 4.2 percent.

Within the categories of processed goods important to construction, the year-over-year trends for products that had spiked earlier this year have moderated while those that saw pushback against price increases have been rising more briskly. In the former category are diesel, asphalt, copper, and steel (although pricing for steel appears to be heading higher again). In the latter category, plastics and lumber have benefitted from the strength in housing demand. BG

PERCENTAGE CHANGES IN COSTS		Nov 2017 compared to		
		1 mo.	3 mo.	1 yr.
<b>Consumer, Producer &amp; Construction Prices</b>				
Consumer price index (CPI-U)		0.0	0.5	2.2
Producer price index (PPI) for final demand		0.1	1.0	3.1
PPI for final demand construction		(0.2)	0.5	3.1
<b>Costs by Construction Types/Subcontractors</b>				
New warehouse construction		(0.3)	(0.1)	3.1
New school construction		(0.4)	0.0	3.1
New office construction		(0.1)	0.6	2.6
New industrial building construction		(0.2)	0.7	4.2
New health care building construction		0.0	0.8	3.0
Concrete contractors, nonresidential		(0.2)	0.7	2.8
Roofing contractors, nonresidential		0.0	0.0	1.8
Electrical contractors, nonresidential		0.0	0.8	3.6
Plumbing contractors, nonresidential		0.0	0.5	3.7
Construction wages and benefits		N/A	0.9	3.0
Architectural services		0.0	(0.1)	2.5
<b>Costs for Specific Construction Inputs</b>				
#2 diesel fuel		2.5	15.3	42.7
Asphalt paving mixtures and blocks		0.8	0.2	0.3
Cement		0.2	(0.2)	4.7
Concrete products		0.3	0.4	3.0
Brick and structural clay tile		0.2	0.7	1.6
Plastic construction products		2.6	3.9	7.2
Flat glass		0.1	0.9	0.8
Gypsum products		0.0	0.3	8.5
Lumber and plywood		1.6	2.8	11.8
Architectural coatings		0.3	0.6	1.9
Steel mill products		(1.4)	(0.9)	8.8
Copper and brass mill shapes		2.5	7.6	17.4
Aluminum mill shapes		0.7	5.2	13.2
Fabricated structural metal		0.3	(0.1)	5.3
Iron and steel scrap		(3.0)	(8.6)	25.2
Source: Bureau of Labor Statistics, Updated December 13, 2017				
Compiled by Ken Simonson, AGC Chief Economist				





# THE BIG PICTURE: BUILDING THE BOOM

f e a t u r e

**B**e careful what you wish for. That adage should be running through every architect's, engineer's and contractor's mind as 2018 unfolds. The vague outline of this wave of construction has been visible on the horizon for a couple of years. Shell's Franklin project and the ALCOSAN Wet Weather solution were two mega-projects that loomed as major labor demand sources when the 2010s ended. Now that the decade's end is approaching, those projects have become almost secondary considerations.



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Shell's project will still be the largest mobilization of construction labor in more than a generation but the energy giant and its engineering/procurement/construction (EPC) firm, Bechtel Energy, have been working with the local and national crafts to ensure adequate workforce for several years. ALCOSAN may or may not be ready to get its major project underway by 2019 or 2020 but the largest chunk of the wet weather solution appears that it will be a specialized solution, with the traditional treatment plant work "only" being in the hundreds of millions.

What has changed the landscape has been a series of announcements since Labor Day that have surprised the construction industry in Western PA. These new projects, which include two more billion-dollar jobs, have given indigestion to an industry that was already pretty full. Most trades were already operating at full employment, with several utilizing travelers to meet the regional demand for skilled labor. With a chemical complex, a new airport terminal, \$3 billion in new hospitals and, perhaps, a massive regional wastewater treatment plant all under construction at the same time, there is the real possibility that there will be a workforce crisis that roils schedules and budgets. Contractors and labor leaders are justifiably concerned.

With this potential crisis looming, however, there isn't a sense of panic. First, the natural tendency for Pittsburghers to look for the other shoe to drop is still alive. Construction veterans are still waiting to see everything develop before they believe it. But the more prevalent attitude seems to be that professionals on all sides of the problem will figure it out. History has shown that projects get built if the demand is there. While this boom is a bigger spike than the one that occurred in the late 1990s, the dynamics are similar. The work will get done.

## The Problem: Supply and Demand

"There's no doubt it's on our radar screen," says Ray Gajski, president of Ruthfrauff Sauer, one of Pittsburgh's largest mechanical contractors. "I'm not sure people are thinking enough about it and that's surprising."

Concerns about adequate workforce originated with concerns about the demographics and the cultural shift away from construction careers. More specifically in Western PA, the workforce concerns became elevated when Royal Dutch Shell came calling. During the three years that Shell studied the feasibility of its Franklin project, regional leaders were asked repeatedly to provide information that verified that there was an adequate construction labor force to handle the construction. Savvy construction owners looked at the Shell project's demands on workforce as a concern about the timing of their own projects. Few observers of the industry saw the convergence of so many major capital projects at the same time, especially considering the boom in commercial real estate work that is coinciding with the major projects.

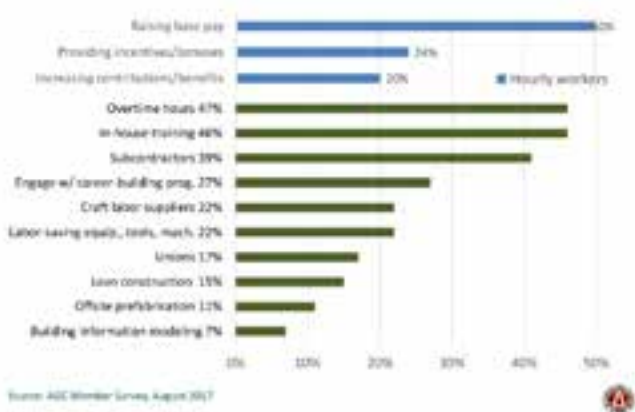
When 2017 ended, most of the trades were at or near full employment and those that were not were expecting the workers on the bench to be assigned before spring. The trade unions in Western PA have not let the problem sneak up on them. Most of the unions have invested millions of dollars in new or updated training centers. Apprenticeship classes have been expanded and the frequency of recruiting apprentices has increased. But big gaps remain going into 2018.

Part of the gap is demographic. Unions have been investing in training centers knowing that a disproportionate number of journeymen would be retiring over the coming years. Another limitation on expansion is that the working nature of the apprenticeship programs means that jobs had to be available for apprentices to take, which meant there had to be projects. While construction is now booming, that wasn't true as recently as 2014. Moreover, the size of the boom that is coming is much larger than can be solved by apprenticeship growth alone. Attracting workers from other parts of the country is part of the solution but few, if any, regions of the U.S. are experiencing unusual construction unemployment. Pittsburgh's problem may be exaggerated by comparison; but short supply is an industry-wide problem.

"The problem is that the shortage is nationwide," reminds Jeff Nobers, executive director of the Builders Guild of Western PA. "It's not like you can go to Detroit or Cleveland to get workers to come here for a few years to get us through the crunch. There aren't available workers in Detroit or Cleveland either."

The Commercial Contractors Index, issued on December 11 by the U.S. Chamber of Commerce and USG Corporation, echoed Nobers' concerns. The Index showed that 92 percent of contractors are at least moderately concerned about

### How Contractors Are Responding to Hiring Problems



Contractors experiencing difficulty in filling positions have relied mainly upon increasing pay/bonuses, working overtime, increasing training, and subcontracting to execute work. Source: AGC of America.



workforce skills and availability. Contractors surveyed said that they do not consider jobsites to be very efficient, providing an opportunity for productivity gains. Other responses that revealed concerns about contractors' ability to produce the work in the pipeline included:

- 44 percent of contractors identified labor productivity as the key means to achieve jobsite efficiency.
- 40 percent of contractors reported the use of prefabricated building components to be the top means of improving labor productivity.
- 57 percent of contractors expect to hire workers in the next six months.

The Associated General Contractors of America (AGC) regularly surveys its members on the business conditions and special issues facing the construction industry. In an August 2017 survey the AGC found that 70 percent of its members expressed difficulty filling hourly labor positions, with carpenters, brick layers, electricians, plumbers and concrete workers listed as the most difficult. Nearly half of the contractors said that they were having difficulty hiring project managers and field supervision staff. One-third listed estimating help as difficult to find.

Those results resonate with the Pittsburgh market as well. Even as the trades expand their base of trained workers, the bench is nearly empty for the carpenters, and electricians. That the latter group is the highest-paid workers in the industry suggests that pay isn't the issue. During 2017, there were 1,300 apprentices taken into classes across all 16 trades in Western PA. Next year the Builders Guild estimates that the number will be around 1,500. That helps with the current supply problem but, at the same time, roughly 18,000 of the 50,000-plus craft workers will retire by 2022.

However uncertain the labor supply situation may be, the pipeline of project demand is very certain and very full.

Shell's project moved from its "early works" phase to the vertical construction phase just this past year. Although still in the buildup phase, the Franklin project is employing 1,100 workers as 2017 ended. By the end of 2018, the labor demand from Shell's project will have peaked and will remain at peak through 2019. As peak construction approaches, there are some truths emerging about how Shell's demand for workers will impact the Pittsburgh market.

Most salient is the reality that the demand for skilled workers was probably overblown. Bear in mind that there may be the need for 1,000 fewer workers at peak, meaning that the Shell project will still need 5,000 workers for the next two years, a workforce that is many times the available local supply. The project is still the largest in two generations, but the demand may be less of a burden than originally thought.



*Robotics have had limited application in the U.S. construction industry thus far but the potential for significant automation in the trades is strong.*

Another hopeful sign for the workforce challenge is the fact that the local labor force has shown less interest in the cracker plant than was feared. With premium wage opportunities, local contractors and owners were concerned that the chance to make 15 or 20 percent more per hour, and accumulate lots of overtime, would draw the best of the tradespeople to Monaca. Thus far, however, the unique conditions of the Monaca site have proven to be less attractive. Workers spend a disproportionate amount of time accessing the site. They aren't permitted to use their own tools. Movement throughout the site is strictly controlled. More workers have been inclined to return or stay with their "steady Eddie" employers and absenteeism at the site has been about 15 percent.

Scott Harris, vice president of Harris Masonry, says that the absenteeism rate at the Shell site may not be unique to the project. He has seen a change in work habits among his younger crews.

"It's not that unusual," Harris says. "In the past when I had to turn in hours worked, I just counted the number of guys we had on the job and multiplied by 40. Everyone worked a full week. Now it's advanced calculus."

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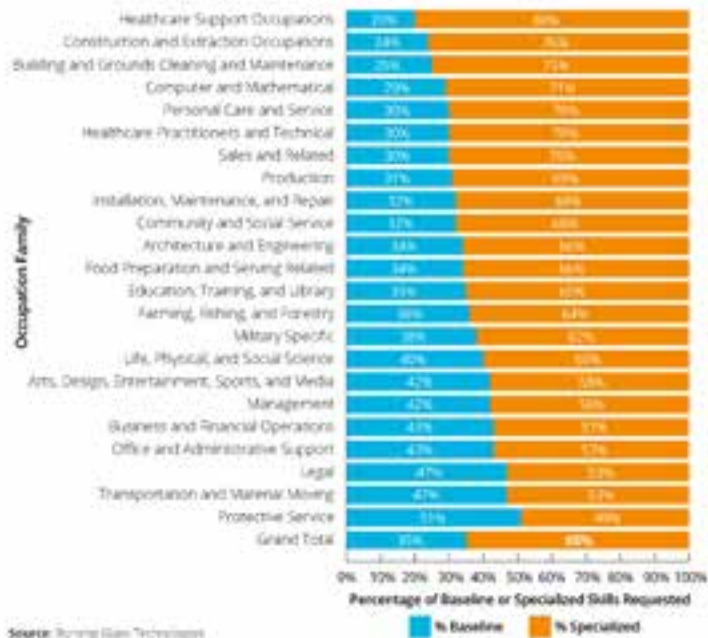
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Table S: Baseline Skills vs. Specialized Skills Requested by Occupation Family



The Inflection Point study from the Allegheny Conference on Economic Development found that construction and maintenance workers were among the professions with the most on-the-job training for needed skills.

going to demand that the younger workers become more willing to change those habits over the next five years. Including the Shell Franklin project, there are three projects that will top the \$1 billion mark. The new landside terminal building is estimated to cost \$1.1 billion and the ALCOSAN wet weather project at the Preble Avenue plant is budgeted at \$1.5 billion. Perhaps another dozen will be between \$100 and \$400 million. Beyond those big known projects, which will carry on into the early 2020s, there will be a second and third ethane cracker in the Tri-state region, as well as an unknowable amount of downstream industrial development related to the buildout of the petrochemical industry.

What seemed to really get the attention of the industry was the dueling late fall announcements of new major capital projects by the two main hospital systems. Allegheny Health Network is on the fast track to get a new \$220 million hospital in Wexford started by the end of 2018. UPMC announced a new Eye Institute at Mercy, an expansion of the Hillman Cancer Center in Shadyside and a new patient tower in Oakland, the Cardiac and Transplant Hospital at Presbyterian. That was in addition to a previously-announced new \$125 million facility in Jefferson Hills area and a \$150 million-plus expansion of Children's Hospital.

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Add in a new \$100 million computer science building at Pitt and new dormitory and science buildings at Carnegie Mellon, and you have a crescendo of the kinds of institutional projects that are the bread-and-butter of Pittsburgh contractors. The challenge is maintaining the bench strength until the work heats up next year.

"We have purposely stepped outside of our area to keep people busy waiting for the Pittsburgh market to come around," admits Todd Mikec, CEO of Lighthouse Electric. "Don't get me wrong; we've learned to travel pretty well, but I'd be lying if I didn't say we had our sights set on some of this attractive work that's coming up at Allegheny Health Network and UPMC."

For contractors, the effect of this unusual demand is a welcome shift in the market trend that has existed for about eight years. Following the 2008-2009 recession, buyers held the upper hand in the market. Bid lists swelled and margins shrunk. As the economy recovered, construction returned in fits and starts. Several mainstay sectors of the market – like K-12 schools and hospitals – remained depressed. The result was an extended period of highly competitive bidding, which left contractors' coffers drained. That has begun to change and contractors are beginning to see the indications of a seller's market emerging. The result will be more selective bidding and fees that are more in line with the risks of construction.

"Contractors are just going to start saying 'no' more often," says Anthony Martini, president of A. Martini & Company. "It's going to be the first time in my memory where it will truly be a seller's market."

"It means that I won't go capture work just because it's there and overload myself to the point where I can't perform," predicts Joe Burchick, president of Burchick Construction. "All contractors have to be cognizant of that. Bid lists are going to drop from ten to six to three. You are going to be more selective, look at the type of work that you want to do and the bid list. It also means fees will go up."

"Whoever has the manpower will get the work," predicts Gajski. "For mechanical contractors, the core group of mechanics is who will build it."

Ruthrauff Sauer has a field workforce of about 200 workers in the pipefitting and sheet metal trades. Gajski expects that those workers will be the ones he counts on to produce the extra work, although it won't come without a cost.

"When we're bidding, we're estimating from known productivity factors. If we have to reach out, we get workers we're not familiar with and that productivity factor changes and it will cost more," he explains. "I'm building premium time into our estimates. Instead of having 20 workers on a job for six months to complete it, we may have 15 working

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*Steamfitters Local 449 invested more than \$20 million in the construction of a new 75,000 square foot training center in Jackson Township to enhance their apprenticeship and journeyman training. Photo by Ed Massery Photography.*

six days a week. The job will still take six months, but it will cost more."

One cautionary note about this boom in the making is that it is more of a 2019 reality. That means that 2018 will see many of the same labor supply issues without as many opportunities to land work as the years that will follow. John Mascaro Jr., CEO of Mascaro Construction, thinks his company may have to approach the market as though the boom is underway next year.

"From our perspective, we can never over-promise and under-deliver," he explains. "There might be some opportunities that we say no to even though we may need work. It becomes a metric that we monitor on our business development side. I do not want us to ever under-deliver on project execution. You have to stretch but you can't create problems for your clients because you can't perform."

### **The Solution: Attract and Train**

While the full extent of the coming boom in construction wasn't realized until recently, the construction trades leadership has been aware of the need for increased recruitment and training for most of the decade. During that time most of the crafts have improved their training capacity or capabilities, or both. Among the trades that have upgraded their training programs, a number have invested millions in building new or expanded facilities, including the Keystone Mountain + Lakes Council of Carpenters, (KML), Ironworkers, Operating Engineers, Plumbers and Steamfitters, which spent more than \$20 million on a new



center just north of Zelienople. That facility was built just a few years after the Steamfitters had invested millions in their existing training center on Saw Mill Run, primarily because of the extraordinary demand by the gas industry and the Shell cracker project.

Building new facilities was only part of the solution to the demographic problem. The crafts also had to attract more people to the industry. The coming wave of construction projects now exacerbates that challenge.

"We're not doing something different now, but we have elevated the effort," says Bill Waterkotte, executive secretary-treasurer for the KML Carpenters. "We always had the problem of retirees going out the other end faster than young carpenters were joining. It helps now that we don't have the early retirement wave we had when we offered it after 2008, so that pace has slowed down."

Perhaps no trade has felt the pressure to respond to the wave of construction as much as the steamfitters. Sparked by the demand from the Shell plant – which will require 1,400 or 1,500 fitters at its construction peak – Steamfitters Local 449 built its 75,000 square foot, state-of-the-art training center in Lancaster Township to expand its training and apprentice attraction. Ken Broadbent, business manager for Local 449, explains that their attraction efforts are both targeted and grass roots-based.

"We communicate with the tech schools and community colleges in all 15 counties in our region because we want people that are already interested in heating and air conditioning or welding to take our test," he says.

"We are bringing in three times more apprentices than we have in the past, foreseeing the number of apprentices we're going to need on the cracker plant, the New Castle generating plant and the upcoming hospital work," continues Broadbent. "I think Pittsburgh is going to attract more tech companies. I think the plastics industry will follow the cracker. We have to be prepared and look to the future to make sure we can man this type of work."

Broadbent explains that the Steamfitters took in 117 apprentices in early December, adding that number to the 450 apprentices currently in Local 449. At the new facility, equipment suppliers rent space within the building to use for specific training on their equipment. The Steamfitters provide 18 weeks of welding training prior to the apprentices going on the job site. Apprentices have multiple welding certifications, plus their OSHA 10 card. Before going to work they have completed drug tests and training in basic hand tools. Broadbent says the Steamfitters feel that their apprentices have to offer more when they hit the ground on the job.

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manufacturers and vendors in the industry,” he says.

“We’ve doubled our apprenticeship classes. We brought in more than 200 carpenters in the last six months,” Waterkotte notes. “We’ve been advertising and promoting ourselves on social media. We have signs that say, ‘carpenters needed’ at the big box hardware stores and lumber yards. The Carpenters are not sitting back, that’s for sure.”

This spike in demand for construction workers helps build the workforce for the long term as well. One of the Catch-22 realities for apprenticeship training is that there must be jobs for the apprentices to work. The trades were somewhat hamstrung in their efforts to build a bench of workers by the slow recovery. It does no good to recruit 100 apprentices if the market will only support employing half of them during training. There may be temptation to exploit the boom to raise labor rates unusually higher, but the heightened demand might be better used to build the next generation of construction workers.

“I hope and expect that the other trades will follow the Carpenters example: be happy for the work and focus on employing as many skilled workers as possible,” says Burchick. “The work gives the trades the chance to get more workers trained the right way.”

“The trades are well-positioned with state-of-the-art facilities to train as many workers as needed. It has fallen on us, the Builders Guild and the trades to attract people into the construction industry as a career,” admits Jack Ramage, executive director of the Master Builders’ Association of Western PA.

“We’ve got to continue to recruit young kids out of high school and even out of college that this is a great industry to work in,” agrees Justin Bruce, executive vice president of Bruce & Merrilees Electric. “You go through the apprenticeship program and you come out with an associate’s degree, and you’ve been paid the entire way through it. You have no debt; you’ve been making money; and you have a great job with a strong future ahead of you. Some of our best project managers are the ones who came out of the field. They understand what it takes to do the work and now they’re managing it.”

Ramage explains that marketing the industry has changed as the habits of the next generation have changed. Gamification is being used to attract high school students to think about the industry differently. Events are being held to bring the industry to underserved communities. Pre-apprenticeship programs are being held to prepare minority applicants for the demands of the industry. Programs like Breaking Chains of Poverty at the Energy Innovation Center present careers in construction as avenues to move from poverty to middle class. Nobers points out that holding Builders Guild job fairs isn’t an effective method for reaching a broader audience.

“We really need to execute a years-long marketing campaign. There has to be the constant drumbeat of awareness and frequency to draw people to the region and the industry,” suggests Nobers. “When we promote the industry to the high school students we have to bring in the influencers – parents, counselors, teachers – not just the students themselves.”

The problem of too few workers in construction is integrated with similar shortages in other industries, and the problem aligns with the challenge of the shrinking population of both greater Pittsburgh and Pennsylvania. The Allegheny Conference on Economic Development recently updated its landmark Inflection Point study on the potential regional workforce shortage and the issue of attracting more people to Western PA remains one of the top problems. The Conference is engaged in attracting talent through a number of initiatives, but construction was not one of the industries that was a focus of the efforts. That may be changing.

“The Allegheny Conference’s focus on attraction is through the Imagine Pittsburgh website, primarily for engineering and IT talent, where there is high demand and short supply,” says Linda Topoleski, vice president for workforce operations and programs. “Those workers tend to be more mobile and construction tends to be more relationship-oriented and union-oriented. We’re in a consideration mode about construction in that it’s a workforce need, and requests have been made by conference members. I will say that we have had a number of companies interested in growing the pipeline for construction here and we’ve been approached to encourage interest in construction.”

One of the areas of opportunity that exists is for growing the interest in construction as a career within the existing working population. There is a significant gap between the number of apprenticeship applicants who pass the basic skills and drug tests, and those that pass through the interview process. Nobers reports that 693 out of 750 applicants passed through the testing in a recent round of apprentice classes in multiple trades. Only 51 percent of those interviewed were taken into apprenticeship.

Chad Jones, executive director of the National Electrical Contractors Association of Western PA, defends the interview process as a protection against wasting the time and resources of the contractors, and the applicants.

“You try to decipher if the person is committed or looking at construction as a bridge job,” Jones explains. “The amount of money invested in these people is enough – upwards of \$150,000 – that we want to be sure they are serious about construction as a career.”

Ramage is convinced that some of the gap is caused by applicants who aren’t prepared for the process when they pursued the apprenticeship opportunity.

TOM TURNER, P.L.S. Project Manager

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"I think there's more of an issue of not knowing how to interview, how to dress, how to answer questions," he says. "I think a lot of kids get rejected because they don't know how and we can help them. There is actually a game – an app – that helps kids have better interviews."

Over the coming decade, there will likely be breakthroughs in technology that will offset some of the demographic and attraction issues. Robotics, machine learning and additive manufacturing are all fields that will have an impact on the future of construction. There are examples of structures and components all over the world that were the result of additive manufacturing, or 3-D printing. Autonomous heavy equipment runs on job sites today, with the prospect of widespread use of autonomous vehicles replacing some portion of the operators. Robots perform repetitive and predictable motion tasks in many industries, including construction. A brick-laying robot would reduce demand for masons in a hard-to-recruit trade.

Leaders in most industries are rightly concerned that advances in these kinds of technologies will lead to wholesale displacement of workers and massive unemployment. History has shown that adopting new technologies moves human capital further up the value chain, producing higher wages and better conditions for workers. Those better conditions require a period of adjustment that can be painful for the workforce but, in the case of the construction industry, technology may end up being the bridge that closes the gap between supply and demand. For the current demand cycle, however, that bridge isn't quite ready.

"We're on our second phase of robotics experiment. We had one demonstration with it and are having another," says Harris. "The problem is that the robots are very limited. If you have a square building with no obstacles it will be a breeze, but that's not our trade."

A survey of its members by the AGC found that contractors were mainly employing time-honored and incentive-based solutions to the problem of hiring and retaining workforce. Some 60 percent of the respondents said they were raising base pay and 24 percent were adding bonuses or incentives to attract hourly workers. Forty-seven percent of the contractors were increasing overtime hours and almost 40 percent replied that they were increasing the use of subcontracting to plug the gaps in their ability to self-perform work. Those solutions merely push the problem down the chain of command.

Where the AGC survey found the greatest opportunity was in technology and systems designed to increase efficiency. Only 15 percent of the contractors were using lean construction techniques and just 11 percent were utilizing offsite prefabrication to reduce the reliance on field labor. Only

seven percent cited building information modeling (BIM) as a solution, even though the use of BIM to drive prefabrication and reduce wasted field hours is a proven solution.

It's clear that use of improved technology and updated techniques represent opportunities for the construction workforce to get more work done per worker, as has been the case in most other industries. There are factors that impact a construction jobsite that aren't an issue on a factory floor, like safety considerations and weather, but the low usage rate of innovation in construction suggests that there are productivity gains being left on the table.

"We're comfortable using the units we use but there is so much waste built into them. We accept them as our productivity but 35 percent of the time in the field is recoverable lost time," asserts Joseph Massaro III, president and CEO of Massaro Construction Group. "About 40 percent of that is direct production and 25 percent is indirect, like prep and clean up. The recoverable lost time is a result of our failure to plan. Workers are in the middle of a task and discover they don't have enough material. We have six masons coming to the site, but we don't have the job ready for them when they show up."

Ray Gajski looks at workforce planning as one of the keys to Ruthrauff Sauer's ability to build major projects in a tight labor market. He looks to the companies leading the project for help.

"We're always doing manpower projections. You're hitting a moving target, of course, but our workers are our most valuable assets, so we plan every day," Gajski says. "If owners produce an accurate schedule and communicate it through the construction manager, we can make the labor work. If we can spend time up front with the construction manager and create a realistic schedule, then the crafts can plan their needs. That also means putting teams together early."

Massaro acknowledges that the fragmented nature of a job site means that it's easy for there to be interference between trades people and small confusions or miscommunication between parties on the site each day. The elevated risk of a construction site is also an incentive to build in time and money on an estimate to protect against overruns.

"It's tougher to be lean in our industry because it's not linear but there are so many places where we could do better," Massaro says.

In addition to looking at what is being wasted at the job site, contractors should also do some soul-searching about their internal human resource development culture. The renaissance in construction has a parallel in the post-World War II era, when a vast rebuilding boom had to be managed by a workforce decimated by war service. Those dynamics



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***“We communicate with the tech schools and community colleges in all 15 counties in our region because we want people that are already interested in heating and air conditioning or welding to take our test,”***

created opportunities for ambitious young men. John Mascaro thinks he and his peers will need to look for those qualities in today's workforce.

“You might have to take a risk on a less experienced employee. You might have to make a hard-working fourth year apprentice a foreman and coach them up. You might have to hire a kid out of college and teach them how to estimate,” he suggests. “We have to add to the talent pool. The people you have in house are going to have to buy into that. We stink at that in our industry, at coaching. Our people must spend time on people development not just building their project.”

“It was two or three years ago, when we noticed our workforce was aging, that we started doing mentoring,” notes Martini. “We put young guys side-by-side with older workers to learn how to manage projects. We took three journeymen and they became exceptional superintendents. There is a shortage of qualified superintendents. It costs us more money, but if these people are as good as we think they are, they will make us more money in the long run.”


Chad Jones also sees the market conditions creating more earning potential for workers, with the heightened demand easing fears of layoffs. Skilled workers in construction are among the best-paid trades, a situation that is only likely to improve. Jones also sees the seriousness of the workforce supply issue as solving what he says is one of construction's worst characteristics: inertia.

“We have a unique market right now in an industry with archaic habits. We have to start changing some of those archaic habits,” he says.

Adopting new technology, redefining productivity, and attracting and training more workers will all be elements of the solution to how the construction of \$15-20 billion worth of projects will be accomplished over the next three or four years. Perhaps, as Joe Burchick suggests, this boom will present the industry with the opportunity it needed to create a new generation of skilled workers. In the near term, the question remains: how will all of these projects get built?

“Are all the projects going to get done? Yes,” answers Ramage. “Will some get pushed back? Sure. But that seems to always be the case.”

“We're working in Ohio right now in a small market where there are jobs 30 minutes away that pay \$10 an hour more, but we were able to work with our union partners and get people on the job site,” relates Todd Mikec. “I have 100 workers on the job today. It's not easy but we've been able to staff the job with that help. I think the same thing can happen here in Pittsburgh. I'm pretty involved with our labor partner here and they are committed to getting us the resources we need.”

“We will be able to meet the needs,” assures Waterkotte. “We're on the offensive, doing constant recruitment. I've told our people that if they aren't doing something to find more people, they are wasting their time. We can leave no stone unturned.” 





# ROBERT MORRIS UNIVERSITY

## STUDENT RECREATION AND FITNESS CENTER

**C**ompleted in just over seven months, the Student Recreation and Fitness Center at Robert Morris University (RMU) in Moon Township is a 45,000 square foot multi-purpose building that was the first piece of a multi-part athletics solution. For the next couple of years, the Student Recreation Center will serve the needs of RMU's indoor varsity athletics teams while the new UPMC Events Center is being built on the site of the former Sewell Events Center. But its facilities are intended to serve the larger student body currently and permanently.

"The driver for the project was that on-campus fitness facilities were inadequate for our students' needs," explains Jonathan Potts, vice president of marketing and public relations for Robert Morris. "We have a very physically-active student body, even among non-athletes, and we had just outgrown the facilities."

RMU's students made use of three facilities for their extracurricular athletics and fitness needs. Each had drawbacks and the combination of the facilities was still not a satisfactory student amenity. The Jefferson Center was the university's original student activity center. It was dated and sized for the original student population size. John Jay Gymnasium was RMU's original field house. While it was still useful as

a gym, John Jay Hall is in the process of being completely re-purposed as a science and math building. There were new facilities in the Yorktown Hall student housing complex but that facility was developed off campus. A shuttle transports students to Yorktown Hall but, obviously, there are capacity limitations to that and the proximity isn't the same as having a student recreation center in the heart of campus.

"We certainly had the need for our traditional students on campus for their intramural sports and general athletic activities," explains Tim Kirsch, senior director of capital projects and safety for RMU, and the manager for the project. "The other factor is the UPMC Events Center that is underway. Until construction of the events center is complete, for our

Division 1 men's and women's basketball and women's volleyball teams, practices are being held in the student recreation center; and both women's teams are playing their games there."

It's the relationship with the UPMC Events Center project that presented the biggest challenges for the Student Recreation Center project. In part the challenge was the compressed schedule for the design and construction; but, in the context of the larger program, the real challenge was the coordination that was necessary between the two athletic building projects, both in terms of schedule and budget. The full impact of that challenge fell first on the architect for both buildings, Ross Bianco of RBA International.

"The Student Rec project had three immovable forces," Bianco explains. "One was that we had an immovable date for the start of the Events Center in October 2017. That meant the Student Rec center had to be done by mid-September. The other force was that both the Events Center and the Student Recreation Center were part of the same approved budget."

Bianco had designed multiple projects at Robert Morris by the time these projects developed and he had a long-time working relationship with Perry Roofner, vice president of facilities at the university. He knew that the problems that would arise from the interconnected projects would be resolved, but even he had to concede that the timeline created some extraordinary circumstances. With RBA given the notice to proceed on design in July 2016, Bianco had about 90 days before several critical decisions had to be made about the whole program.

"UPMC Events Center had to be budgeted by October 2016 for Robert Morris to know that it could raise the money to build it and then go ahead with the rec center," Bianco recalls.

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"The rec center also had to be on budget at the same time. We only had design development documents completed by mid-October when the student rec center went out to bids."

The timeline is even muddier than Bianco describes. Working with little more than schematic design, the decision-making during design development was going to have to be sufficiently final on some critical long lead time items – like structural steel and athletic equipment – that accurate details and shop drawings could be done. Design decisions on the structure made in October were going to be fabricated in time to deliver steel four months later. To ensure that this unorthodox delivery succeeded, Robert Morris brought contractors onto the jobs early. PJ Dick was selected as the construction manager for the Events Center and in July 2016, Robert Morris selected TEDCO Construction as the general contractor for the Student Recreation and Fitness Center.

"We looked at a couple of contractors and chose TEDCO. We like to open up opportunities to different contractors in Pittsburgh. TEDCO had done other projects on campus and we had a comfort level about working with them," recall Kirsch.

That comfort level would be critical, as TEDCO would be providing input on the project prior to the start of design development.

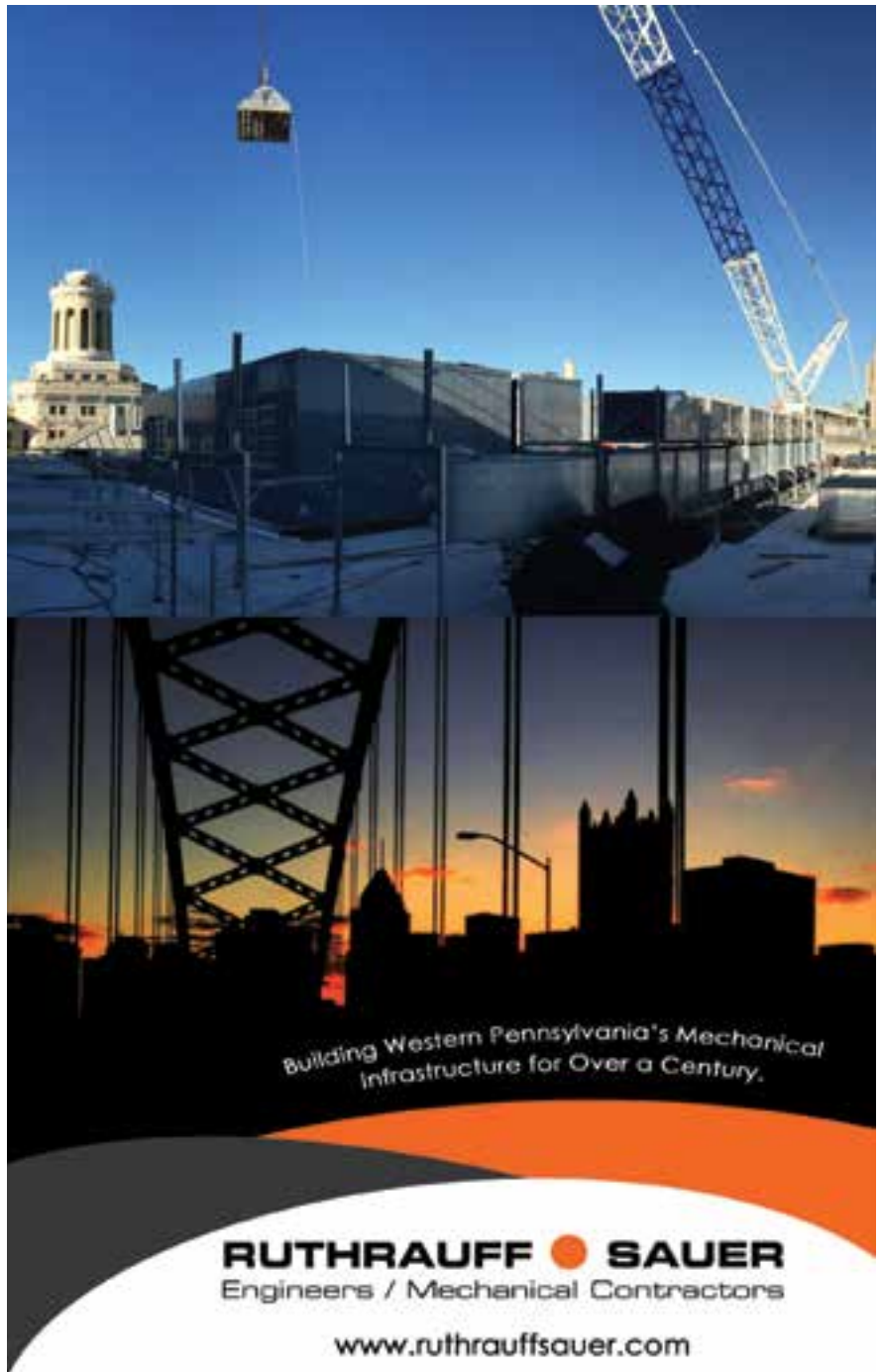
"It was key to be experienced with those folks. To understand where they're coming from and have them understand where we were coming from was important," observes Dan Bell, TEDCO's project manager. "It helped that [Superintendent] Don Jones and I were involved in the pre-construction to the extent that we were because we got a feel for working with everyone."

With the assurances that the Events Center and Student Recreation Center would both be built within the total budget, there was something of a mad dash to get programmatic decisions made prior to the start of construction on the recreation center in February 2017. Here again, the decisions about one project impacted the other.

RBA's building design was driven by the need to streamline the process and the certainty that they would need flexibility while the design was being completed. The building structure is composed of two distinct construction types. The gymnasium, fitness center and mezzanine offices are housed in a pre-engineered steel structure of 27,000 square feet. The balance of the

building, comprising 18,000 square feet, is a conventional light steel structure that was designed to be intentionally different. Bianco says that experience taught him that he would need this separate structure to accommodate the changing program of his client. That flexibility would be tested early and often.

"When it went out to bid it was 38,400 square feet. During design in January we found out that we had to provide temporary homes for more departments, so we needed more square feet," Bianco says. "We knew we had to build a full gym. We designed a center hall with a fitness center on one side and the gymnasium on the other. That way I



knew that any additional square footage could be added like saddlebags on the gym side. If we made those saddlebags stick-built structures, we could re-arrange them as needed.”

There was a catch that came with the decision to add more space: the budget could not grow. That meant some frenetic value engineering in very few months. RBA received the design development contract for the Events Center on December 15, 2016 and would deliver 25 percent design development documents on February 3, 2017. That date was just four days ahead of when steel was to arrive for the Student Recreation Center. That gave the design and construction team less than seven weeks (including the holidays) to figure out how to add 7,000 square feet for the same price, while receiving program changes from the owner, like changing the gym from a practice facility to a competition gym. That choice created a cascade of other revisions.

“A competition gym has different requirements,” explains Kirsch. “The number of basketball hoops, the shot clocks needed, are all different.”

“During that time, we figured out what interim athletic uses would be necessary as part of the Student Rec Center

program,” says Bianco.

“The pre-engineered building was chosen because of budget and schedule. With a pre-engineered building, once it’s released the design is on the manufacturer and delivery is their responsibility,” explains Bell. “We had essentially hammered out the pre-engineered building in advance but when I came on to the project they were still trying to figure out the conventional construction portion of the building. There were still questions about size and the locations of the usage areas. It was always morphing and manifesting itself into something different in terms of finishes to make sure that the budget worked.”

“At the same time, you have to comply with the NCAA regulations for basketball and volleyball so working within the budget constraints and providing what the NCAA requires was another challenge,” he continues.

Bell says that the value engineering process was among the most complicated he has encountered. The speed with which the project developed meant that sometimes there were ideas for savings that had been rendered moot because construction had proceeded too far to change.





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*Robert Morris University Student Recreation and Fitness Center  
Photo by RBA International*



New plumbing codes regarding cleanable surfaces limited what finishes could be changed in locker and shower rooms and bathrooms. The process could be frustrating, because decisions sought each day weren't always made. Bianco, Kirsch and Bell all expressed admiration for the fact that the team tried to move the project forward every day, even when progress wasn't what the parties had hoped.

"With Ross and TEDCO, there was just a constant interface between them to deal with the questions and issues," notes Kirsch.

"There was a very good synergy between TEDCO, the subcontractors, RBA and ownership, so that if there was an issue that was brought up no one was pointing fingers," says Bell. "It did get frustrating at times but there were still real synergies among all four entities to make sure that it got done."

"The magic was having an owner, architect and contractor decide that this was going to work," asserts Bianco.

The "can do" attitude had its tests. Often, when a project is delivered with much of the team in place during design, the hassles are in preconstruction and the construction flows smoothly as a result. But in the case of the Student Recreation and Fitness Center, there were going to be challenges at almost every turn because of the speed of the delivery.

As Murphy's Law might dictate, there were soils problems. Most of the site for the Student Recreation Center was on rock but, in one corner, the site had insufficient fill. Bianco's split structure design gave the program the flexibility it needed but tying the segments together created a challenge for the exterior contractor.

"Getting the building structure up and the siding on were keys to the critical path," Bell explains. "What was unique was that the conventional part of the building was clad by the metal building company. We erected the conventional

structures against the metal building and as the siding company completed the pre-engineered structure, it put the siding on the conventional structure as well. Getting the building covered up was a key to being able to move on to the finishes when we did."

TEDCO and its team of subs got in and out of the ground in February 2017. Bell recalls bringing his daughter to the site in April, when the exterior was being installed and the floors were bare concrete, and wondering how the September completion was going to happen. Four months later, she saw the exercise equipment up and running. Above and beyond all the other challenges, the seven-month schedule was the most daunting.

"The timing of the project was a challenge, getting into it in the winter when weather is always a challenge," says Kirsch. "Obviously, coming out of the ground in February and opening in September made for a very tight schedule. It was also a challenge ensuring that we had the right scope to meet all of the needs of the many users. And budget is, of course, always a concern for a university. I think we got a lot of facility for the money."

The main participants in the project agree about the finished product. Like soldiers reflecting upon basic training, there is a sense that each one knew that the journey was going to be difficult and rewarding in the end.

"We talked about the ground rules going in," recalls Bianco. "We knew there were going to be days when it would be messy, days when you weren't going to get the decision you wanted. You had to have a short memory and start fresh again the next day."


"There was a lot of communication. Dan Bell and Don Jones did a great job of keeping up with me, telling me what details or decisions they needed so that we didn't have problems later. I could call Don any time to talk about what problems



could be coming and how to avoid them. Was it hard? Of course it was, but it was worth it.”

The users of the facility at Robert Morris seem to agree.

“It’s the recreation center for all students. That’s why we’re all here, to provide great facilities, whether it’s a rec center or a residence hall,” asserts Kirsch. “We want to make sure Robert Morris students get a great education, of course, and have great places to live. We also want them to have great amenity spaces where they want to spend their spare time. All three of those aspects of student life are important.”

“What was neat about the whole project was that it was clear to me that Robert Morris really cared about the students,” concludes Bell. “Every time they would refer to the building they said ‘we promised this to the students’. It was always student-focused and it made you feel good. When you build an office, or renovate an office space, 75 percent of the people coming to that space don’t really want to be there. But if you do a place like this, people want to come. When you can tell that the owner really cares about the student body and the student-athletes, it makes it that much better. You could tell Robert Morris really cared that they had a Class A facility for their students.” 

PROJECT TEAM

TEDCO Construction Co.....	General Contractor
Robert Morris University .....	Owner
Ross Bianco/RBA International.....	Architect
Ruthrauff I Sauer LLC .....	HVAC/Plumbing
A-Positive Electric .....	Electrical
Easley & Rivers Inc. ....	Interiors
Carl Taylor & Sons .....	Concrete
Tom Brown Contracting Inc. ....	Waterproofing
Sample Development .....	Site Work
C. Tucker Cope.....	Pre-engineered Building
Harris Masonry .....	Masonry
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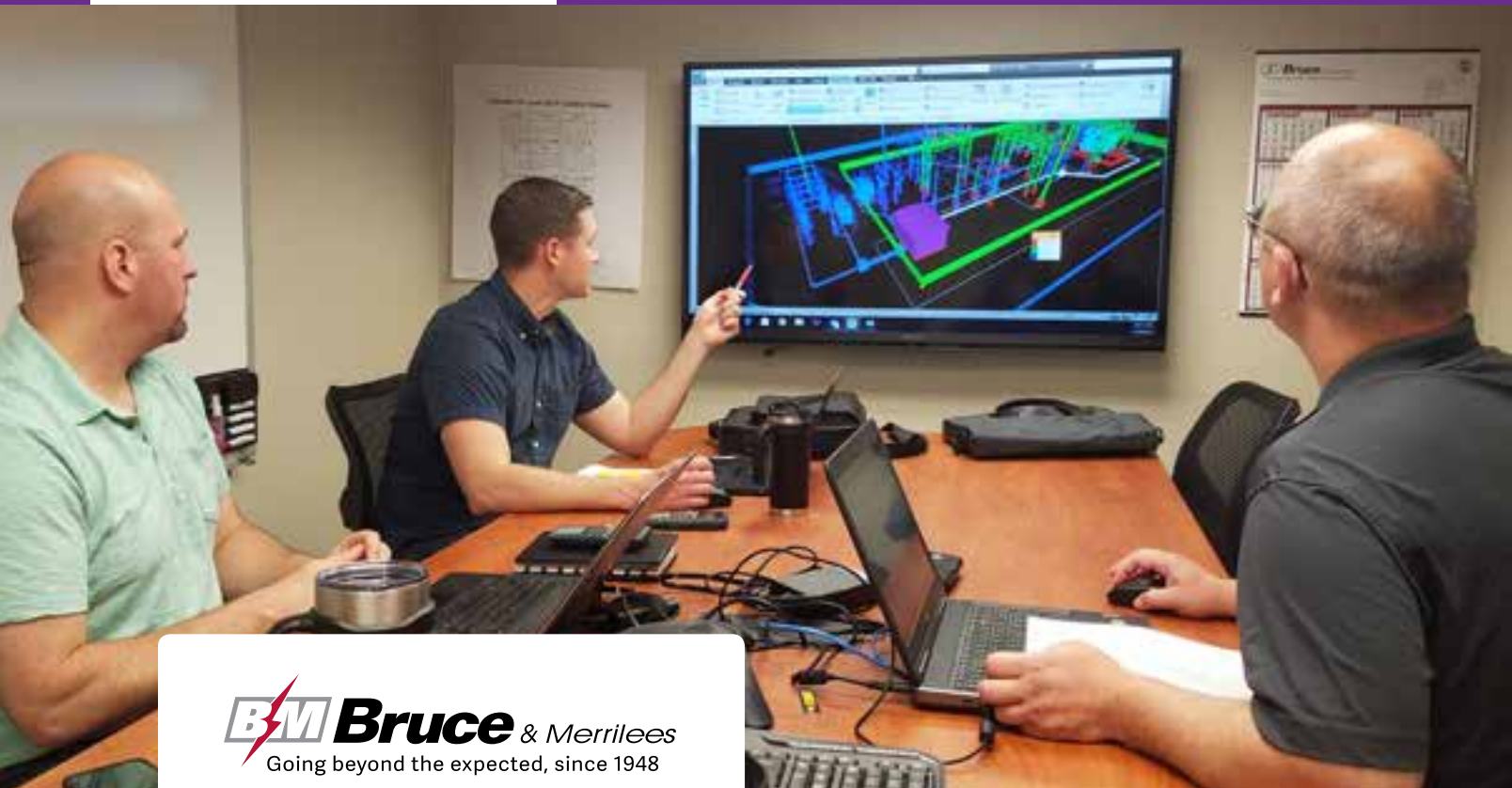
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*Whenever possible, Bruce & Merrilees uses BIM to plan, coordinate and prefabricate its work. The model is displayed on large monitors in job site trailers to help the field supervision review the day's work with the electricians to plan for safe work conditions.*

**B**ruce & Merrilees is a full-service electrical contractor, headquartered in New Castle, PA, and one of the region's largest specialty contractors. Recently ranked #285 in Engineering News Record's Top 600 Specialty Contractors list, Bruce & Merrilees maintains a field crew of between 300 and 350. The surprising size and range of Bruce & Merrilees isn't the biggest mystery surrounding the company. That would be: where are the Merrilees's?

Justin Bruce, executive vice president and secretary of the corporation, recounts the history of the firm that Howard Bruce founded and the mystery of the missing Merrilees's.

"My grandfather was an electrician at Pearl Harbor during World War II. When he returned to the states he decided he wanted to have his own electrical company," Bruce explains. "He met J. P. Merrilees, who had a small appliance repair shop in New Castle. He made a deal with Merrilees to operate out of his office and shop. When Mr. Merrilees passed away, my grandfather agreed to keep the name with the business and, in fact, the company still repaired appliances into the 1980s."

The agreement with Merrilees gave the fledgling business a home. More importantly, the fact that Merrilees already had established credit allowed Bruce to serve the market without being cash-strapped in the tight credit environment that followed World War II.

In its 70th year, Bruce & Merrilees has been managed by its third generation for more than 15 years. Brothers Jay, Jonathan and

Justin Bruce take the challenge of protecting what their father and grandfather built very seriously. Jay leads the business as chief executive. Jonathan runs the operations for all the business except the transportation sector. Justin is responsible for business development and estimating.

None of the current generation began his working career with Bruce & Merrilees, even though all three worked in the business growing up. Bob insisted that his sons find work for themselves and the three brothers scattered to New Jersey, Washington DC and Colorado. Jay was the first to return, joining Bruce & Merrilees when he started a sister company in the cell tower construction sector in 1996. In 2000, he coaxed Justin back to help with the transition and both of them convinced Jonathan to return in 2005.

"We're very lucky to have the relationship we do. We all work so close together and have complete trust. I think the best thing for all of us is that we all went out and did different things and worked for different people after college. It opened our eyes," observes Justin. "We are great business partners. We challenge each other but at the same time we compromise and agree on the direction. Not very often do we have a disagreement about the direction of the company."

Their approach to the electrical contracting business differs from their father's in the same way that the market differs from that of the early 1970s, when Bob Bruce took the reins from Howard.

While his brother Gary became a professional engineer, Bob grew up in the business, starting in estimating, learning the trades, and working his way up. Bob was the public face of the company, becoming very active in National Electrical Contractors Association and working with the the IBEW leadership. Bob led the company into the transportation and electric utility markets. He had the vision to take Bruce & Merrilees into markets that it hadn't been, markets that required that the company do things differently from everyone else in the market.

Howard Bruce focused on service and quality when he founded the company in 1948, figuring that if he kept his customers happy they would be repeat business and he wouldn't have to spend as much time chasing new customers. His sons maintained that focus, but Bob Bruce also looked to grow the company. What he passed along to his sons was that same sense of customer service and the sense that they would have to manage the business differently if they wanted to evolve with the market.

One of the big differences in this generation of leadership is that Jay, Justin and Jonathan recognized the need for more strategic planning. They decided to approach the business with a long-term plan for finding a more diverse group of repeat customers. Bruce & Merrilees has a strategic planning team that regularly evaluates the markets and where Bruce & Merrilees stands in them. This generation also more closely manages the risks associated with construction, both in terms of safety and finances. They extended their strategic thinking to include training the field staff to pay attention to the kinds of things that created repeat business and made a safer, smarter workplace.

The environment that the younger Bruce's create for their employees is one that Bob Bruce would find familiar.

"Our mindset is that if we don't train and innovate in the way we go about our work, we don't survive" asserts Justin. "The one thing that is consistent is that we want people to grow and develop within our business, to feel like they're part of the family. It's what we strive for because if everyone feels that they're part of the family, they're going to come up with innovative ways to train or to reduce cost. It's a very open environment we're trying to create. We try to be transparent as owners and managers. We have open meetings so that the employees can understand what's good and what's bad and what's ugly. In this business there's always some of each. When transparency is truly in place, you get people all pulling the rope in the same direction."

At Bruce & Merrilees, creating the environment begins with safety and training.

"One of the biggest things we teach - and it's hard to teach initially - is if you see something, say something. If you don't understand what you are to do, ask; don't just think that you'll figure it out along the way," Justin explains. "Our foremen know that before they do anything else each day, they go through the job site assessment. It doesn't matter who is going on the job site. We identify the issues that we're dealing with that day. Educate and inform. If you were working in a ditch in the morning and then move to a bucket in the air in the

afternoon you have a new JSA. What are the risks? What are the challenges we're facing working up in the air today? And it's identifying what the critical steps are. The critical step is the point of no return, the step that once taken, you can't take back."

Bruce insists that the emphasis on safety, training and improvement have to become part of the culture. For Bruce & Merrilees as owners, that means providing high quality tools, vehicles, places to work and the technology its workers need to do the job right. It also means being willing to let go of workers who don't buy into the culture, regardless of their productivity. This commitment to culture led them to create a program they call the Human Performance Handbook in 2013. The program provides human performance tools for all functions that Bruce & Merrilees performs, from the office to the job site.

"It's about human performance and the fact that we all make mistakes. We're fallible as humans and there's a way that we can recognize those mistakes before they happen," Justin explains. "We have a human performance team that continues to work on that and develop that and educate people on that. It is the single biggest tool that has changed the attitude of our field staff and how they look at safety and quality, ensuring that we do things the right way.

"The program started because one of utility customers insisted upon it. As we learned about it, we saw the logic of it and adapted it to our own needs. Every new employee goes through an on-boarding and orientation program that teaches them how Bruce & Merrilees works, not the way the local or other contractors do. If we don't have an on-boarding and orientation program for every person we hire then we are rolling the dice about what they have learned in the past."

For Bruce & Merrilees management, this emphasis on human performance training creates a workforce for the future. With the uncertainty about the ability to find adequate workforce in the future, the Bruces figured that maintaining and improving their current workforce was the best solution. Turnover is low at Bruce & Merrilees. The employees feel their positions are secure. They are empowered to challenge unsafe or poor quality conditions in the field, even challenging owners. It's ingrained in them that safety trumps schedule and the result has been that doing things the right way doesn't impede productivity. Bruce & Merrilees believes this approach has given them a workforce that is prepared for the future, and believes its customers have noticed.

"The reputation that I hear most is that we don't need to babysit you. We know if you're here we can worry about other trades or other work because we don't have to worry about what Bruce & Merrilees said they're going to do," notes Justin. "The three of us are very sincere about that aspect of dealing with customers."

For the future, the market has turned in Bruce & Merrilees's favor. The company continues to have a strong share in intelligent transportation systems work across a handful of state transportation departments. Its industrial resume has led Bruce & Merrilees to work for the oil and gas companies. Bruce &





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Merrilees is working on the \$863 million Hickory Run combined cycle power plant near New Castle, and it expects to land a contract on a second major plant in 2018. The company has been active with the major hospital projects and commercial work in Pittsburgh, landing the Point Park Playhouse and the UPMC Events Center at Robert Morris University.

The success in Pittsburgh was aided by the decision to open an office in Green Tree, even though the main office is just 45 minutes north of the city. Bruce & Merrilees felt that there needed to be more face-to-face interaction with its customers than it was having from New Castle. The Pittsburgh office is the fourth branch office, joining Columbus, Bethlehem and Baltimore. There are about 75 office employees in the five locations.

Looking ahead to the wave of new construction and the decade beyond, the three Bruce brothers see their company strengthening their niches and are focusing on how emerging technologies are going to create new opportunities for Bruce & Merrilees to serve its customers. They are particularly enthused about the energy markets and the technologies that are impacting them, whether it is energy storage, micro-grids, or the next generation of power plants. They see Bruce & Merrilees being able to bring their expertise and technology to their existing customer niches.

"It will be more how technology touches our various niches. What are our customers in those niches going to do new and different, and how are we going to support them? What are we going to help that customer do better, faster, and with more quality?" Bruce asks. "We have to be the ones that adapt and are flexible. We can't expect our customers to be flexible. We see ourselves helping to take on larger projects where we can add a lot of value, not just by putting electricians on the job. We have to do more than that." **BC**



Jonathan Bruce



Justin Bruce



Jay Bruce

### Bruce & Merrilees Electric Company

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## Pennsylvania's Crumbling Underground Infrastructure – Out of Sight, Out of Mind?

BY EDWARD B. GENTILCORE, ESQ. AND BRANDON T. URAM, ESQ.

**A**nyone who has opened a newspaper or turned on a television recently has likely seen a feature detailing the precarious state of America's aged, and rapidly deteriorating, infrastructure. While Pittsburgh has been featured on many "best of" lists, it has also received the unflattering distinction of having arguably some of the more troubling infrastructure conditions in the nation.

Most of this negative publicity regarding Pittsburgh's deteriorating infrastructure centers on the mind-boggling number of structurally-deficient bridges in the metropolitan area (e.g., 60 Minutes' November 2014 piece entitled "Falling Apart: America's Neglected Infrastructure"). While these bridges certainly require attention and increased funding to repair, replace, or upgrade them, they are not the only infrastructure concern affecting Pittsburgh, or, for that matter, Pennsylvania.

Staying with the bridges for a moment, seeing a need to respond to these important (and visible) pieces of our surrounding infrastructure, an effort to expedite the efficient repair, replacement, and, significantly, the long-term maintenance of hundreds of these bridges was undertaken. To accomplish this, the Pennsylvania Department of Transportation ("PennDOT") turned to the relatively new Public-Private Transportation Partnerships Act. See 74 Pa. C.S.A. §§ 9101, et seq. (the "P3 Act").

By way of background, the Pennsylvania General Assembly passed the P3 Act in 2012. The P3 Act is a significant departure from the typical procurement process (e.g., sealed bids) and delivery systems (e.g., design-bid-build, design-build, etc.) required for most, if not all typical, Pennsylvania public construction projects. The P3 Act instead allows PennDOT and other state transportation agencies and authorities to transfer the responsibility for the engineering, construction, operation, and maintenance of new or existing "transportation facilities" to a private-sector entity for a defined time.

There is no "standard" public-private partnership arrangement, as the facts, issues, and circumstances of each potential project differ; this allows for much greater flexibility, and, in turn, much greater innovation. As the Design-Build Institute of America has noted:

"The definition of a P3 varies and can encompass a broad range of approaches that involve a contractual relationship

between the public owner and one or more private sector entities. . . . [g]enerally speaking, a P3 is a project delivery model that involves an agreement between a public owner and a private sector partner for the design, construction, financing, and often long-term operations and maintenance of one or more infrastructure assets by the private sector partner over a specified term. Under the P3 delivery model, the public owner transfers to the private sector partner risks that are typically retained by the public owner under a traditional delivery model such as design-bid-build."

*Public-Private Partnerships: A Design-Build Done Right Primer*, Design-Build Institute of America, [https://www.dbia.org/resource-center/p3-resources/Documents/dbia\\_primer\\_p3.pdf](https://www.dbia.org/resource-center/p3-resources/Documents/dbia_primer_p3.pdf) (October 2016).

Consistent with an adaptive approach, the P3 Act was enacted to promote this type of innovative and efficient construction, rehabilitation, and maintenance of such transportation facilities (particularly Pennsylvania's many structurally-deficient bridges) by tapping into the private sector's ingenuity and economies of scale. As the Commonwealth Court of Pennsylvania has recently noted, "[t]ypically, in a P3 contract, . . . the private sector partner finance[s] the upfront capital costs and then recover[s] its investment over the term of the P3 agreement." *Clearwater Constr., Inc. v. Northampton County Gen. Purp. Auth.*, 166 A.3d 513, 515 (Pa. Commonwealth Court 2017). The P3 Act allows for both solicited and unsolicited private sector submissions.

To date, the most significant project implemented under the P3 Act has been the Rapid Bridge Replacement Project (the "RBRP"), which PennDOT awarded to the consortium of Plenary Walsh Keystone Partners ("Plenary Walsh") in October 2014—it is one of the largest (not to mention most ambitious) P3 projects in the country. Under the RBRP, Plenary Walsh is required to finance, design, construct, and maintain 558 structurally-deficient bridges located throughout the Commonwealth for a 28-year term. In exchange, Plenary Walsh will receive in the neighborhood of \$900 million.

While that might seem to be a big price tag from one perspective, when the numbers are broken down, they reveal a significant savings to PennDOT, and thus the Commonwealth's taxpayers. The RBRP kicked off in the summer 2015 and is expected to wrap up in early 2018;

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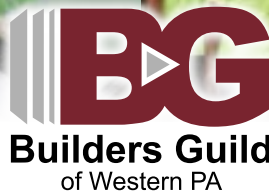
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under ordinary delivery systems, these bridges would have taken five to 10 years to replace.

Based on the RBRP's success, civic leaders and lawmakers should now turn their attention to another type of infrastructure, one not as visually apparent, but still one that can no longer afford to be left unaddressed: underground infrastructure. Regardless of whether policymakers and their constituents can observe the decrepit nature of their communities' underground infrastructure, they need only look to places like Flint, Michigan to see that turning a blind eye is not a solution—it can be negligence, or worse.

According to the U.S. Conference of Mayors, maintaining, operating, replacing, and upgrading the nation's water infrastructure could cost between \$2.8 trillion to \$4.8 trillion through 2028. At the same time, however, according to the Congressional Budget Office, capital spending on new construction and major rehabilitation projects for water utilities is falling at an alarming pace. See Mindy Fetterman, *As Water Infrastructure Crumbles, Many Cities Seek Private Help*, Pew Charitable Trusts, <http://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2016/03/30/as-water-infrastructure-crumbles-many-cities-seek-private-help> (March 30, 2016).

Perhaps not so surprising, the American Society for Civil Engineers gave the country's water infrastructure an abysmal "D" grade in its 2017 Infrastructure Report Card. In a similar vein, the Rand Corporation recently noted that, while certain aspects of infrastructure were improving, "problems [regarding water infrastructure] persist that defy easy solutions. . . and [that] many of the state funds for drinking water and wastewater plants have not been operating on a sustainable basis for some time now, and communities with declining tax bases struggle to maintain their . . . water systems and repay their debts to bond holders." Debra Knopman, et al., *Not Everything Is Broken: The Future of U.S. Transportation & Water Infrastructure Funding & Finance*, RAND Corporation, [https://www.rand.org/pubs/research\\_reports/RR1739.html](https://www.rand.org/pubs/research_reports/RR1739.html) (December 5, 2017).

By way of example, local officials in Flint, Michigan decided to switch water providers in an effort to cut costs, which required the city to temporarily use water from the Flint River. However, city officials did not immediately treat the new water, and instead took a wait-and-see approach that only exacerbated corrosion of the city's old pipes. Eventually, this corrosion caused lead to leach into the drinking supply, thus causing a public health emergency. See Merrit Kennedy, *Lead-Laced Water in Flint: A Step-by-Step Look at the Makings of a Crisis*, N.P.R., <https://www.npr.org/sections/thetwo-way/2016/04/20/465545378/lead-laced-water-in-flint-a-step-by-step-look-at-the-makings-of-a-crisis> (April 20, 2016).

Because these old systems were left in place, countless people have been put in harm's way. The cost to remedy the situation in Flint will cost millions, if not billions, of dollars. That pales in comparison, however, to the physical and mental harm that have been inflicted upon the surrounding community. Several public officials have been criminally charged in connection with Flint's water crisis.

In line with the above, in November 2017 Pennsylvania's Auditor General, Eugene DePasquale, issued a scathing 55-page report ("Report") that outlined the deficiencies plaguing the Pittsburgh Water & Sewer Authority ("PSWA"). (The Report can be found at <http://www.paauditor.gov/Media/Default/Reports/PWSAAudit%20Report%2011-01-17.pdf>). Ominously, DePasquale expressly noted "that PSWA's aging and deteriorating infrastructure issues and financial and operational long-term viability issues result from years of mismanagement and conflicted leadership causing a crisis in the authority's governance."

The Report offered numerous alarming details, including: (i) the PSWA system, which includes, approximately 1,200 miles of pipes, is in "deplorable" condition; (ii) PSWA's average annual capital improvement investment is \$31.4 million; and (iii) that PSWA's average annual capital improvement investment should be \$200 million.

The Report's very first recommendation to the PSWA is to "[d]evelop a short-term and long-term executable action plan to address necessary improvements to operations and to preclude further potential risks of not providing safe, reliable drinking water to its customers." The second recommendation is to "stabilize the deteriorating infrastructure and eliminate current health hazards and request support from the City [of Pittsburgh] where necessary to make improvements."

Because of the breadth of issues tormenting the PSWA, including concerns regarding financial viability, one potential mechanism to achieve the infrastructure-related goals outlined in the Report could use the P3 Act. However, as noted above, the P3 Act applies to "transportation facilities," which is broadly defined as "a proposed or existing road, bridge, tunnel, overpass, ferry, busway, guideway, public transportation facility, vehicle parking facility, port facility, multimodal transportation facility, airport, station, hub, terminal or similar facility used or to be used for the transportation of persons, animals or goods, together with any buildings, structures, parking areas, appurtenances, intelligent transportation systems and other property needed to operate or related to the operation of the transportation facility. The term includes any improvements or substantial enhancements or modifications to an existing transportation facility." [P3 Act at § 9102].

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Still, based on this definition (and particularly the emphasized text above), the P3 Act would appear to be broad enough to include underground infrastructure within "transportation facilities." Therefore, municipal and water authorities could at least have the discussion over consideration of adding the P3 Act to their respective arsenals in an effort to properly, and efficiently, remedy the "deplorable" underground infrastructure plaguing our communities. If this discussion does not yield using the P3 Act in the same manner as the RBRP, it may result in a legislative dialogue expressly expanding the P3 Act to include the words, "underground infrastructure" components and features.

As many more than not have reported, underground infrastructure issues need to be addressed in the near-term. While more shockingly demonstrated by the events in Flint, Michigan, these issues can no longer be tucked into a not seen and, therefore, not heard category. In order to provide safe, clean drinking water, and reliable wastewater disposal systems, the PWSA, and other entities throughout the Commonwealth, should seriously consider utilizing the P3 Act to replace these ticking time bombs before this issue of concern becomes one of crisis in Pennsylvania. BG

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# FINANCIAL PERSPECTIVE

## The Professionals Weigh In on 2018

It's hard to look ahead at 2018 as a "business as usual" year if you're a construction financial professional. There are significant accounting changes looming, a tax bill that could change the game on what is deductible and how profits are taxed, and a market that has enormous revenue growth potential. CPAs and CFOs around the industry have more on their plates than at the end of most years. Some of the most experienced construction pros offered their ideas on how to prepare for 2018 and beyond.

Mark Bronder, partner with Clifton Larsen Allen, admitted that it might sound self-serving when he made his recommendations but explained his advice in the context of uncertain conditions.

"I think it's important that business owners make sure they are surrounded by strong professional talent," Bronder asserts.

If you have strong professional talent that knows your industry you're going to talk to them regularly. Like with the current tax environment, for 2018 you certainly want to know what's going on in that environment," he continues. "I am spending a ton of time tax planning for clients right now and my goal, in light of what's happening in Congress, is to defer profit from 2017 into 2018 to take advantage of the potential reduction in tax rates. We want to defer income into 2018 and accelerate any personal deductions into 2017."

As the tax year ended, the final tax reform bill was still a work

in progress. Most of the professionals felt a level of comfort that the result was going to be pro-business and create an environment where future profits would be taxed less.

"With the tax proposal looming, Congress has gone far enough that you have to believe that there will be a compromise," predicts Mark Ulishney, partner with Case Sabatini. "The similarities between the bills show that deductions are going to be more limited. With that said, you should accelerate payments that are deductible in 2017. If you can defer income into 2018, you may be in a better situation."

"This tax law is going to pass and it's going to be advantageous to defer income," agrees Bronder. "We don't know what the final bill is going to be yet. It's going to change because the House and Senate bills are different in many aspects, but the compromise and committee will bring it together and no matter how you look at it, it's going to be advantageous to defer income."

"With the change in corporate rate, businesses need to reevaluate their corporate structure to see whether it makes sense to convert to an 'S' corporation or to convert from an 'S' to a 'C' corporation," suggests Dick Spence, principal and chair of Hill Barth King's Construction Industry Practice. "If you're not distributing a lot of cash, you may want to consider converting to a 'C' corporation to take advantage of the 21 percent rate versus the effective 30 percent rate of







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a flow-through entity. You may want to consider if that's an appropriate structure for your business. That's a discussion that should be happening in the next month or two."

Tom Menk, assurance partner with BDO, also focused on the potential impacts on small businesses, like the kinds that populate the regional construction industry.

"Bonus depreciation moved up from 50 percent to 100 percent in both bills," Menk notes. "Both plans also eliminate lifetime exchanges to defer taxes. The rate changes will obviously help with the pass throughs."

While Menk was keeping an eye on what tax legislation might ultimately pass through Congress, he was equally concerned about revised accounting standards from the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board. Part of a lengthy review of international accounting standards that has been ongoing since the financial crisis, the Generally Accepted Accounting Practices (GAAP) standards for recognizing business revenue include changes that affect companies using percentage of completion accounting.

"For privately-held companies, the new revenue recognition standards will impact contractors. Contractors are not necessarily focused on the changes, either for how they will recognize revenue or also for their accounting systems, how they report and determine what is recognized," Menk notes. "The standards go into effect in 2019. I'm working with contractors during 2018 to prepare them to handle progress payments, incentive clauses, claims and liquidated damages. They will have to get more in line with what the standard says and figure out what they need to do to be in line with the standards."



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Ted Pettko, shareholder at Schneider Downs & Co., says he is focused on three operational concerns as he advises clients on their approach to 2018. Like most professionals, Pettko assumes several very strong years are ahead for construction and knows that better markets pose different challenges for the industry.

"Companies need to look at what projects are out there. What projects should they chase? Should they chase all of them or be selective and choose the ones that have the best return for the risk? How do they deploy the resources in the right way?" Pettko asks. "Second is the hiring of skilled labor and, especially, management."

In his analysis of contractors' management teams, Pettko sees one aspect as particularly critical and possibly overlooked.

"The last concern is estimating. Do you have the right infrastructure to pursue the project opportunities? Estimating resources have become thinner and it will be a critical function and factor in taking advantage of the opportunities."

The abundance of opportunities that appear to be on the horizon is a source of concern for Jim Bly, managing director of Alliant Construction Services Group in Pittsburgh.

"When we're going to have unprecedented growth here, it's the risks of growth that we talk about," Bly says. "Whether that's with a general contractor, making sure that subs are qualified, that there is subcontractor default protection and that they aren't awarding too much work to the same subs, or with the specialty contractor making sure they don't load up beyond their capacity. Contractors die from overeating not starvation."

Bly's point is often misunderstood by casual industry observers. Going into a period when there is the opportunity to take on projects that will raise



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a company's volume – especially with large projects – caution is often thrown to the wind. That's a risk that must be managed by planning and communicating with banks and insurers.

"For specialty contractors, availability of labor is important but the ability to finance labor is also a key," Bly warns. "When you see rapid growth you often see negative cash flow because there is weekly payroll expense but progress payments are 45 or 60 days behind. Contractors need to be sure of their lines of credit and their banking covenants.

"Going into a period of growth, set covenants with some head room for when the growth occurs. For the surety company, lay out what projects are coming and when they are coming so the surety can consider the backlog and better understand the real impact of the backlog on finances."

Dick Spence is also emphasizing discipline, especially in the context of the overall economy.

"We're on an eight-year run now. Interest rates are starting to go up again," he cautions. "Watch your debt. Watch your ratios. Remember the lessons you learned from 2008 and 2009."

"The conditions are very good for our industry. I think people are more optimistic about 2018," predicts Ulishney. "You see that in the stock market. You see that in the forecasts of how much more consumers are spending at Christmas. Different people are looking at the changes differently through their own eyes but it's all positive." **BG**



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## Re-Industrialization: A Different Kind of Asset-Based Economy

**T**he culmination of Pittsburgh's many "Renaissances" is a region that is resilient, with a diversified economy, clean environment, the reversal of a demographic death spiral, and a burgeoning reputation as a place to be. It's somewhat ironic then that post-industrial Pittsburgh is on the verge of a re-industrialization because of abundance of natural gas that lies beneath its ground.

One school of thinking that intended to explain the post-industrial economy of the Western world saw appreciating assets – like stocks or real estate – as the drivers of growth, rather than manufacturing or even services. The assets described in this school of thinking were soft assets, like work ethic, geography or other cultural assets, which could be leveraged to create growth without harming the assets. This economic development approach is especially effective in major urban areas, where scarcity of land and concentration of human capital simplifies the process of adding value to the economy.

Civic leaders in Western PA have tried to steer the Pittsburgh economy in that direction as they struggled to create new economic anchors to replace heavy industry over the past 35 years. The focus on multiple, diverse economic drivers yielded a more resilient – if unspectacular – economy in Pittsburgh, one that may be poised to benefit from an unexpected re-industrialization.

Re-industrialization brings with it jobs and pitfalls. Pittsburgh's smoky and polluted past was mostly due to the careless way people operated the process of making things but there is also truth to the fact that manufacturing is inherently polluting. New plants are friendlier to the environment and regulations protect the air and waterways but vigilance will still be necessary to maintain the environmental gains made over the past 30 years. Manufacturing is also inherently cyclical so there will be an element of the boom-and-bust cycle back in Pittsburgh's economy. There will also be the element of hard assets, which will have an impact on the way we think about our economy again.

The industrial revolution depended upon hard assets like natural resources and physical plants. Unlike the modern asset-based economy, industrial assets were finite, even if American business underestimated just how finite. The primary decision-making metric was the return on asset, rather than return on investment. As manufacturing grows in Western PA, decision-making will become focused again on optimizing the sustainable return on assets, a mindset that is very good for construction.

This isn't a difference of semantics. Assets like manufacturing plants, gas reserves or production equipment produce returns by what they produce. Assets like real estate or financial products are valued subjectively by the perception of their price, as well as an internal rate of return. A company's stock can have a dividend

but the vast majority of stocks are owned with the intention of gain through appreciation. Likewise, a bond has a yield from its interest rate but often the motive behind the ownership of bonds is to sell the bond well before it matures, when the market for selling the bond is higher. These kinds of assets – including real estate – often benefit from leverage, giving owners the opportunity to magnify incremental gains in perceived value into bigger returns on the investment. The return on these kinds of assets tends to shorten the horizon on decision-making.

Pittsburgh's commercial real estate market is a good example of how short-horizon decisions differ from those with a longer payback. Developers in Pittsburgh are primarily not transactional developers so their decision-making process is more like that of a manufacturer. Transactional or merchant developers don't expect to own assets they are building or buying for more than a few years. Their business model is built on fees and appreciation of the asset by selling after stabilization. Pittsburgh's stable of home-grown developers tend to hold the buildings they build or buy, turning a profit from rental income that exceeds the debt service. There is the expectation that the property will appreciate too but, in a market where appreciation has historically been small and steady, property owners learned not to build their businesses on the five-year capital gain.

Think how that mindset influences decisions about how the building will be maintained and improved. An owner that expects to sell a property in three or four years doesn't choose long life-cycle products that cost more. Long-term quality is less important than first impression. Keeping costs down is more important than a long-lasting improvement.

Assets used for production are viewed in the opposite way. The supply chain for the oil and gas industry have seen how this dynamic has influenced decisions in the Marcellus shale play. The output from a well produces profits that dwarf the savings from penny-pinching during construction, so schedule and performance become more important than price. (Of course, price does matter when the price of the commodity falls by 50 percent, as we have seen.) The same is true for the cost of repairing a production line in a manufacturing plant. When a million dollars an hour is flowing through that line, taking extra time to shave five points off a contractor's price is counterproductive.

Suppliers and contractors to the steel industry saw this at work when the mills were pumping out steel. The answer to the question of when was more influential than the answer to how much.

Shell's ethane cracker could serve as a prototype for how the industrial asset-based sector will make decisions. The \$6 billion investment was based upon the feedstock abundance and its proximity to 70 percent of its customers. Part of the decision was also based upon the fact that polyethylene made from natural

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gas is cheaper to make than polyethylene made from oil. When oil was \$100 per barrel, that difference saved Shell \$750 million annually. That's a pretty quick return for a 75-year asset. When oil fell to \$30 per barrel, the advantage fell too, to \$250 annually. That changed the decision-making. As the investment decision dragged on, many feared Shell would abandon the project, even after sinking \$1 billion into the Monaca site. Had the decision to shelve the project been made, it would not have been because \$1 billion doesn't mean much to Shell, but rather because Shell could not see the return on the asset justifying the capital investment in comparison to its other opportunities.

Even under construction, Shell's asset-driven decision making is apparent. Bechtel Energy is engaged on a cost-plus basis, rather than a lump sum or guaranteed maximum price. The

performance metrics are schedule benchmarks that are focused on getting product out of the plant on time. That doesn't mean Shell doesn't care how much the asset costs, but it shows that how much money Bechtel is making is less important than how much money Shell can make.

It is the nature of the shale gas boom, with cheap and abundant energy produced, that will drive some of the re-industrialization of the Appalachian region. Making things is an energy-intensive process in most cases. When the cost of energy is cheap, the through-put in those manufacturing assets goes up in value. And the abundant supply of that natural gas will drive development of the major industries for which gas is the feedstock.

When the petrochemical and plastics industrial infrastructure is built out, as experts predict it will be, a portion of the Pittsburgh economy will again be based upon assets that are fixed and here because of particular advantages of the location. The gas reserves are here. The markets being served are nearby. The infrastructure will be here.

Economic assets that rely upon a location that has long-term advantages are more reliable assets than those based upon human or financial capital. The reason that Pittsburgh is one of the centers of high technology is the research done at Carnegie Mellon University. That hasn't changed in three decades but the economic benefits that have arisen from big trends in tech have not been as permanent (remember Fore Systems? Lykos?). Even today, as Pittsburgh becomes the center of the automation/robotics universe, the long-term benefits of the technology will go elsewhere if Pittsburgh doesn't become home to some of the manufacturing that will result.

For the construction industry, a Pittsburgh economy that has 15 or 20 percent of its output tied to manufacturing will produce more opportunities. Manufacturing assets require constant maintenance and improvement to optimize the return on the assets. That will mean a steady source of construction demand.

Of course, at this point, the fully re-industrialized Pittsburgh economy is still the promise of an industry in its infancy in Western PA. But when manufacturing does make its return, there is comfort in knowing that it will be but one of many healthy economic sectors. That fact will help buffer the business cycles that will inevitably occur. But, as a consumer of construction services, manufacturing will comprise a large and steady share of the construction market. That will add depth and breadth to the market. It will also bring decision-making that favors value, safety, performance and quality over price. **BG**

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# BEST PRACTICE

## Pittsburgh International Airport Sheds Myths and Finds Sustainable Growth



*The proposed new \$1.1 billion landside terminal will be under construction in 2019. Rendering courtesy Allegheny County Airport Authority..*

It was an article of faith in the economic development community: high seat fees drove airline costs up at Pittsburgh International Airport (PIT), making the airport tough to sell. As Christina Cassotis made the speaking rounds early in her tenure as CEO, she took pains to shatter that assumption. The problem, she said, was that airline executives weren't being sold on Pittsburgh.

"The myth of the high cost was just that. This is a good market and Pittsburgh had turned around as a region long before the airport caught up," she insists. "Commercial aviation is a fascinating industry in that it can bring supply to demand like no other. If you have a market I can be there the next day with a plane. Southwest Airlines and other airlines were starting to figure out they could do some things in Pittsburgh now that US Airways didn't dominate. But there was no urgency. Our job was to create that urgency, to tell the story behind the numbers that airlines like to look at."

From the perspective of the most basic metric – the number of cities with direct flights in and out of Pittsburgh – the effort has been remarkably successful. When Cassotis arrived, there were 37 direct flights out of PIT. With the addition of the Alaska Airlines Seattle flight to the market in mid-November and One Jet's decision in December, there are now 73 cities with direct flights. As the flight count began to climb, the Airport Authority

also invested in making the airport experience a better one, upgrading baggage claim and investing in the shopping and dining options. The result was a trickle of recognition that turned into a deluge of awards in 2017.

Air Transport World magazine named PIT the Airport of the Year in January 2017. CAPA Center for Aviation recognized PIT as Regional Airport of the Year. Travel & Leisure ranked PIT sixth in its top ten domestic airports, as did J. D. Power & Associates. Airport Revenue News named Cassotis Airport Director of the Year in August 2017. The Airports Council International–North America gave Cassotis the ACI-NA Excellence in Visionary Leadership Award during its 2017 Annual Conference in September.

One of the risks of focusing on all the accolades being showered on Cassotis, PIT and the Allegheny County Airport Authority of late is that you'd be listening to the sizzle while the steak is being served. There are accomplishments worthy of praise for the airport but there is also a playbook for revitalization being developed that is serving the region well, one that both exploits Pittsburgh's good news and creates good news of its own.

"The board was looking for a CEO who could answer the question of whether or not more flights were possible with a different approach or was that all we had to live with," Cassotis



recalls. "Did they have to adjust to this new normal or was something more possible? My guess was that this airport had not been positioning itself assertively and proactively in a way that the airlines understand. That was my approach."

Because Pittsburgh was a hub, the airport didn't have to compete for flights and lost some of the muscles needed to attract airlines. Cassotis believes that losing US Airways gradually made it harder to compete than if the airline had

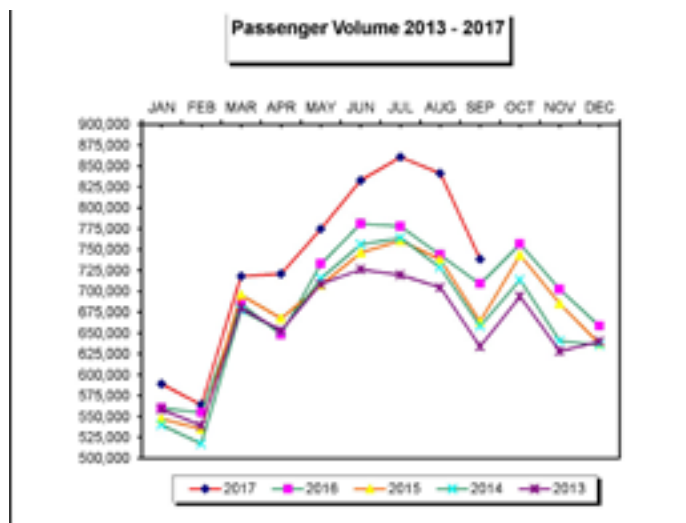
simply pulled the plug on PIT.

"Because people were so focused on the hub coming back, on filling the gates, they were missing the opportunity to build a really strong origin and destination airport. The opposite of a hub is not 'not a hub'," Cassotis jokes. "The opposite of a hub is an origin and destination (O & D) market. San Diego is an O & D Market. Boston is. Tampa is. You can have a really strong market and not be a hub."

Origin and destination (O & D) traffic numbers are one of the leading metrics of an airport's vitality. Since US Airways' decision to move its hub operations from Pittsburgh in 2004, that metric hasn't necessarily been kind to PIT. Rather than hiding from O & D numbers that are less than exciting, Cassotis chooses to place the focus of her pitch to airline executives on the economic excitement of Pittsburgh. That's where the future activity will be.

"We also had to position ourselves in the community as another entry point for the world to discover Pittsburgh's Renaissance. One of the ways that people understand Pittsburgh is that Uber is driving its driverless cars there. People see Uber investing in Pittsburgh and wonder what else is there," Cassotis observes. "To position ourselves in the commercial aviation industry in the exact same way so we have to understand the community. We meet regularly with corporations, foundations, nonprofits, the tourism industry, and universities to ask what they are doing, how they are looking at the world and who they are going after. We can start telling a story around momentum."

In the span of three years, PIT has become an integral part of



Passenger traffic at Pittsburgh International Airport is on pace to grow for the fifth consecutive year in 2017. Source: Allegheny County Airport Authority September 2017 Traffic Analysis.

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the Pittsburgh region's economic success recipe. Busy airports are supposed to be that, as a reflection of the vibrancy of the local economy. But in the case of PIT, in which so many economic hopes were misplaced in the 1990s, the airport and its leadership play different supporting roles than just connecting people to places. With 3,800 acres of developable land, and a fortuitous location in the midst of the shale gas footprint, PIT has the potential to be one of Western PA's physical magnets. That opportunity isn't lost on Cassotis or the Airport Authority's leadership.

"Christina's charge was to get the flight count up because it was holding back business," says Robert Hurley, director of Allegheny County Economic Development department and treasurer of the Allegheny County Airport Authority. "I see [what she's done] as a holistic solution. The airport supports the business community and the diversity of our economy supports the growth of more flights."

"Airlines are interested in growth and how sustainable that growth is. They want to know what happens if one part of the economy declines. Pittsburgh's story is one of a diversified economy," Cassotis says. "When we talk about the fabric of this community, what we talk about is that it was a community that was dependent upon one industry and one airline. That community has reinvented itself. So, we are talking about growth among a diversified set of industries and we talked about it very differently depending upon what airline we're talking to."

There is a symbiosis developing from this role as both servant

and driver of the economy, one that can create a virtuous cycle of more flights and more jobs. To leverage that symbiosis more fully, the Airport Authority is planning to build a new terminal that will make PIT a more effective regional asset.

"This is a financial decision. This is not aesthetic. We're not doing this in order to make the place look better," Cassotis explains. "We're doing this because it's going to cost the airlines less money and that's a good thing for everybody. We can operate more efficiently. As an intended consequence we get to be the first place visitors come and we want to wow them. It's why this facility is so critical and why this physical manifestation of the brand has to show up in a facility that looks like you've arrived."

Passenger traffic topped 20 million per year by the end of the 1990s but declined after the September 11, 2001 terrorist attacks and plummeted as US Airways pulled out of Pittsburgh. There were 7.8 million passengers who traveled through PIT in 2013. Just three years later the number had grown to 8.3 million passengers. Activity for 2017 should surpass 8.5 million passengers.

The increased activity is but one reason for the construction of the new terminal. Lauded as the "airport of the future" when it opened in 1991, PIT was designed for a future that changed dramatically in its second decade. Airport security became a different animal after the September 11 attacks, making the access and egress of pre-9/11 airports obsolete. That's an obvious game-changer but the pace of technological change had an equally disruptive effect on airports. Cell phone service

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***"I know what makes a successful market and I could see all of the elements here in Pittsburgh in ways that people who have been here for a long time couldn't,"***

was virtually nonexistent in 1991. WiFi didn't exist. Personal computing devices weren't around so no one needed to use or charge their tablet in 1991. Airlines consolidated and the technological improvements within the airline industry radically altered how the airlines used terminals. The number of airplane turnarounds went from four per gate per day to ten.

Even before Cassotis was hired, the Airport Authority had been mulling plans for change. The perspective of an outsider, with the successes that followed, accelerated those plans.

"Christina noticed when she moved to Pittsburgh that everyone in town called it the 'new airport' but in reality, it's old," chuckles Hurley. "It doesn't work anymore. The lesson is that it took someone from outside to take us to task for that."

"I know what makes a successful market and I could see all of the elements here in Pittsburgh in ways that people who have been here for a long time couldn't," Cassotis says.

Construction of the new terminal will be but one of a handful of billion-dollar projects to be built during the next five years. The project will employ more than 1,000 workers during construction, but the airport's leadership looks to the terminal to be just one piece of a larger economic development puzzle. Located almost equidistant from Shell's cracker site, Downtown Pittsburgh, PTT's proposed cracker site and Southpointe – to which PIT will link via the Southern Beltway in 2019 – Pittsburgh International's 3,800 acres becomes much more than a source of potential revenue for the county. The airport's land has the potential to be an economic hub, with spokes leading to some of the region's future economic drivers. Bobby Hurley says the Airport Authority is seeing that potential already.

"What's happening at the airport now mirrors what is going on in this market. It used to be that we were begging people to consider leasing land at the airport and now we have clients asking us what they can lease," he observes. "We have a consultant looking at land use, looking at not only what land to lease but what uses would be best for the property. One of the focuses of the landside terminal project is to bring development closer to the airport."

"We are as interested in land development as we are in the terminal development. We are just about to wrap up a highest and best use land study that looks at all of our parcels," Cassotis notes. "The days are over when you had to beg people to come out here and get the bottom of the fair market value. Now we get to say we have the cracker plant up the road; we have additive manufacturing going on and all this technology. What should be here? We want highest and best use, and by that, I mean for the community. How can we be as targeted for that development as we are with the airlines? We're very focused on that. It's a very big part of our strategy. We're excited about where we're going." **EG**

# INDUSTRY & COMMUNITY NEWS



Jendoco's Dan Then (left) and Michael Kuhn (right) flank Verizon's Dave Salicce at the Cystic Fibrosis Passion for Wine event, co-sponsored by Jendoco Construction.



Jeff Wetzel from AE7 (left) with Nello's Gene Boyer and Cherri Silak at the AIA Design Gala.



Desmone's Travis Kreidler (left) with Jacki Tully and Dave Meuschke from Burchick Construction.



Jendoco's Chris Klehm, AIA Executive Director Michelle Fanzo and Marc Mondor from Evolve EA (right).



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Members of the A. Martini & Company Cares team helped Light of Life Ministry pack more than 1,000 Thanksgiving dinners on November 20. Pictured from left are: Donna Lynch, Katie Stern, Lois Bowman, Mike Larson-Edwards, Emily Landerman, Fred Swearingen, Angelo Martini Jr., and Bonnie Reganick.



Cohen Seglias' Pittsburgh office helped with a Habitat for Humanity build day at one of its renovation sites in Duquesne. Pictured (clockwise from lower left) are: Lisa Wampler, Jim McGraw, Emily Lane, Lori Wisniewski Azzara, James McNally, and Brian Lawton (center).



Mascaro Trucking for a Cure was held on October 26 to support Breast Cancer Awareness. McClymonds Supply & Transit brought its 2017 Peterbilt Breast Cancer Awareness truck. Team Mascaro raised a total of \$3,000 for the American Cancer Society.



Mascaro held its 10th annual Guest Bartender event on November 9. Due to the generosity of our guests and employees, Cystic Fibrosis received over \$11,100 in donations. Mascaro CEO John Mascaro with Sophia Martin, daughter of Mascaro's Nate Martin and the inspiration for the Guest Bartender event.



Joe Burchick (center) was honored with the Tink Bryan Award for service to the construction industry at the PA Builders Exchange's Annual Cocktail Party on November 11. Pictured with Burchick at Lee Harris (left) from Harris Masonry and PBX Executive Director Del Walker.



Representing Easley & Rivers at the PBX Cocktail Party were (left-to-right) Laura Burkett, Marissa Miller and Inbal Fox.



(From left) Eric Pascucci from PJ Dick, John Paul Busse and Specified Systems' Bill Wilson.



(From left) Babst Calland's Matt Jameson, Ashley Gill, JD Mazzocco, Esther Mignanelli and Danelle Jameson.

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Landau's Mike Nehnevajsa (left) and Bill Waterkotte from the KML Carpenters.



The MBA's Jack Ramage (left) with Lee Mages from the KML Carpenters.



PBX's Del Walker with Don Lampus Jr. (right).



Celebrating the holidays with NAIOP Pittsburgh were (from left) Maureen Sweeney from Blumling & Gusk, Pennoni's John Skorupan, and Turner Construction's Jodi Rennie and Joe Milicia.





The MBA's Young Constructors collected toys and raised money for Toys for Tots and the Mario Lemieux Foundation Austin's Room again at their annual Holiday Party. The MBA's Eric Starkowicz, MBA YC chair Adam Ramsey from Wyatt (center) and incoming chair Brian Budny (right) pose with representatives of the Penguins and the Marine Corps.



Landau's Bethany Sidun and Bryant Garvin from Gateway Engineers.



(From left) Robert Hippert and Norah O'Neil from Henderson Brothers with Willis' Seth Young.



(From left) Brittany Coscia, Jessie Johnson and Laura Albert from Dick Building Co., with Hatzel & Buehler's Brandon Rupert.



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(From left) Iliya Jordanoff from Fisher ARCHitecture, Babst Calland's Jim Miller, and Burchick's Dave Meuschke and Jacqi Tully.



(From left) Rycon's Stephany DelSignore, Cody Scagline and Eric Danko with Naley McKamish.



Zach Huth from Huth Technologies (left) with PJ Dick's Jeff Turconi



The MBA's Eric Starkowicz (left) and MBA YC Chair Adam Ramsey from Wyatt (right) present a \$5,000 donation to Austin's Playroom to Drew Parish from the Mario Lemieux Foundation.



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# AWARDS & CONTRACTS

**AIM Construction** was awarded a contract by the University of Pittsburgh to do \$3.5 million in renovations to the Cathedral of Learning 22nd and 23rd floors. The architect is Pieper O'Brian Herr Architects.

UPMC awarded a contract to **AIM Construction** for the Magee-Women's Hospital of UPMC Radiology Oncology. Image Associates is the architect for the \$1.85 million renovation.

The Veterans Administration awarded a \$653,963 contract to **Spartan Construction Services Inc.** for canteen renovations at the VA Medical Center in Erie, PA. AE Works is the architect.

West Virginia University Healthcare awarded a contract to **Mosites Construction** for the fit-out of the eighth floor of the Ruby Hospital tower in Morgantown, WV. The architect for the \$6 million project is IKM Inc.

**Volpatt Construction** was selected to build the tenant improvements for the Arias Agency, a \$582,000 fit-out in Pine Township. The architect is LGA Partners.

University of Pittsburgh awarded a contract to **Volpatt Construction** for the renovations to the Philippine Room in the Cathedral of Learning's nationality rooms. WTW Architects designed the project.

UPMC selected **A. Martini & Co.** to renovate pharmacies at two suburban facilities in West Mifflin and Washington, PA. The architect is IKM Inc.

**A. Martini & Co.** was selected by Penn Cove Group Capital as construction manager for the renovation of the 140,000 square foot Oxford Athletic Club at the Village of Pine in Wexford. The architect is H. Chambers & Company.

Fourth River Development awarded a contract to **Burchick Construction** for renovations to the 225 Boulevard of Allies office building. Pieper O'Brien & Herr Architects designed the \$2.5 million project.

Westmoreland County Commissioners awarded a contract to **Yarborough Development Inc.** for the general construction portion of the \$1 million Mammoth Park Maintenance Facility in Mount Pleasant Township. The architect is Design 3 Architecture.

**Massaro Corporation** was selected as construction manager for the renovations and additions to First Presbyterian Church of Washington, PA, which was founded in 1793. Margittai Architects is the architect for the \$2 million project.

The First Tee of Pittsburgh selected **Massaro Corporation** as the contractor for the construction of its new facility at Schenley Park. The new \$3.7 million facility will replace the clubhouse at the Bob O'Connor Golf Course.

Frick Environmental Center, built by **PJ Dick**, was recently awarded Leadership in Energy and Environmental Design Platinum Certification. The Environmental Center was also recognized by the Green Building Alliance, receiving their

inaugural Leadership Award for its role in a decade-long vision of incorporating the world's highest sustainability standards into a free and public, municipally owned building.

**PJ Dick** is performing concrete services for the University of Pittsburgh's High Bay Storage Addition.

**Mascaro** is providing preconstruction services for the relocation of the UPMC Shadyside Pharmacy.

**Mascaro** received a construction manager at risk contract from the University of Pittsburgh for upgrades to Litchfield Tower C.

**Nicholson Construction Company** has returned to Baltimore for phase two of the nearly \$145 million M&T Bank Stadium upgrade. Nicholson completed phase one in April 2017 and finishing the foundation work for two new escalators and elevators to improve accessibility to upper level suite seats. Nicholson is installing 7-inch diameter micropiles to support the vertical structure's new and existing footings, and concrete columns and pilasters to reinforce the existing structural basement wall. The micropiles will extend up to 78 feet below grade and have a center bar inserted in the column for added support.

**Landau Building Company** was awarded the WVU Medicine Fifth Floor North OR Expansion at Ruby Memorial Hospital in Morgantown, WV. The work, which is anticipated to be complete in less than 4 months, includes four operating rooms, accompanying scrub rooms and corridors. IKM is the architect.

**Landau Building Company** recently signed a contract for the 1,024 square foot Outpatient Center Renovations at Uniontown Hospital. The anticipated five-week construction period will begin in February. Image Associates is the architect.

**Landau Building Company** starts renovations to the UPMC Magee Cancer Center Pharmacy in January 2018 and is scheduled to be completed in ten weeks. GBBN Architects is the designer.

**Landau Building Company** was the construction manager for the 4,350 square foot Pharmacy Renovation at Magee-Women's Hospital in Pittsburgh, PA. Other spaces included in the project were IV Clean Room, USP 800 Room, Stat Room, Drug Processing Room, Offices and staff lounges. GBBN was the architect.

**Landau Building Company** recently finished several projects for WVU Medicine at Ruby Memorial Hospital in Morgantown, WV. The "Magic Room" renovations, a month-long project, were roughly 1,000 square feet of office space on the first floor of the hospital. As the Construction Manager, Landau completed the four-phased renovation of the Servedy renovation in less than six months. Work included five platforms, a beverage area, check-out area, and a reconfigured soda and utility room. Also included were new flooring, finishes, ceilings, service equipment, casework, fire suppression system, and ductwork. IKM was the architect for all of these projects.

**Landau Building Company** was the construction manager for the recently converted space on the first floor of Hillman Cancer





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Center located in Pittsburgh, PA into Magee Women's Health Clinic. The work was completed in 100 days. The architect was Radelet McCarthy Polletta.

**Landau Building Company** finished the kitchen expansion/renovations to UPMC Cranberry Place, a UPMC Senior Community Center located in Cranberry Township, PA. The architect was Radelet McCarthy Polletta.

**Rycon Construction** is building High Street Residential's (a wholly-owned subsidiary of Trammell Crow Company) new \$80 million Glasshouse, a Class A residential mixed-use building featuring 319 apartments and 335 indoor parking spaces. The five-story facility, located in Station Square, was designed by Hord Coplan Macht and will be ready for occupancy in summer 2019.

In New Castle, **Rycon** is beginning phase two of improvements at UPMC Jameson Hospital. Work includes infrastructure upgrades to the chiller water plant and hospital emergency power as well as interior renovations to the lobby, ICU, and orthopedic departments.

Allegheny Health Network selected **Rycon** as construction manager on their new \$19 million, 63,000 square foot Community Cancer and Imaging Center at Forbes Hospital in Monroeville. Work will break ground early February 2018 and will continue until February 2019.

Office improvements to the 36th and 37th floors within the USS Tower are underway by **Rycon's Special Projects Group**. The Design Alliance is the architect on the 65,400 square foot project for UPMC.

**Rycon's Special Projects Group** is midway through a \$1.1 million office renovation for investment service company Incline Equity Partners. The 13,300 square foot space is located on the 23rd floor of the EQT Tower.

CBL Properties awarded **Rycon's Special Projects Group** a \$5.5 million construction management contract to demo a JCPenney at Eastland Mall in Bloomington, IL and add new shell space for future retail tenants. The 47,000 square foot project will continue until June 2018.

**Rycon** is underway with an eight-week interior fit-out at Heinz 57 Center for UPMC on the 11th floor. The project also includes remodeling a café on the 6th floor. All work will end by mid-February 2018.

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**Rycon's Special Projects Group** is responsible for a 2,300 square foot fit-out of a PNC Bank branch in DuBois. Work includes new finishes, carpet, restrooms, and casework and is expected to wrap up March 2018.

Two office renovations by **Rycon Special Projects** totaling \$880,000 on the 11th floor within Liberty Center began in early December and will continue until mid-February for CBRE and law firm Lovett Bookman Harmon Marks (LBHM). Desmone is the architect.

In October, DDR Corp. selected **Rycon's Special Projects Group** as their construction manager for a \$940,000 retail build-out in Cincinnati to an existing 27,000 square foot Michaels store in Kenwood Square shopping plaza. Construction is underway and will wrap up August 2018.

**Rycon** is renovating four Love's Travel Shops & Country Stops convenience store locations throughout Georgia, Alabama, and South Carolina. The locations range in size from 1,000 to 2,500 square feet and total nearly \$1 million dollars.

Grady Health Systems chose **Rycon** to complete a \$650,000 medical renovation at Grady Hospital in Atlanta. Work is set to commence shortly after the new year and continue until late April 2018.

**Rycon** was awarded a construction management contract to build a new 4,600 square foot Speedway gas station/convenience store outside of Atlanta. The \$2 million project has a 16-week schedule.

PREIT awarded **Rycon** two construction manager contracts to build new retail stores, HomeGoods and Five Below, at Magnolia Mall in Florence, SC. Both projects are slated for a February 2018 completion.

**Rycon** and ArquitectonicaGEO are the design-builders responsible for the estimated \$4.5 million initial phase of work at Miami Children's Museum. The 8,000 square foot addition includes a new entryway and pavilion. The design phase starts mid-January 2017.

**Dick Building Company** completed the Volvo Retail Experience (VRE) conversion of the Bobby Rahal Volvo dealership in Wexford, Pine Township. The project was complete in 4.5 months, the fastest VRE project in the United States. Graves Design Group is the architect.

**Dick Building Company** was awarded a contract to renovate the Association for Iron and Steel Technology's offices at the RIDC Thorn Hill Park in Marshall Township. Design 3 Architecture designed the space.



# FACES & NEW PLACES

**Bob Sawyer** has joined **PJ Dick** as a project manager assigned to the VA Wilkes Barre Kitchen Project. Mr. Sawyer graduated from Penn State University with a BS in Administration of Justice. He has over 30 years of experience in the field of construction management.

**Turner Construction Co.** promoted **Jodi Rennie** to vice president and general manager of its Pittsburgh office. Rennie joined Turner's New Jersey office in 1987 and was most recently vice president and manager of business development for Pennsylvania and New Jersey.

**Joe Milicia** was promoted to vice president and operations manager for Turner Engineering Group. Milicia was vice president and general manager of the Pittsburgh office since 2002. He joined **Turner Construction** in 1989. Milicia earned a mechanical engineering degree from the College of New Jersey.

**Rycon** hired **Shannon Gray** as an administrative assistant within the Special Projects Group. She is a graduate of Temple University with a degree in advertising and strategic communications.

**Phil Marraway**, graduate of Penn State, has been hired as a senior project manager in **Rycon's Building Group**. He brings over 16 years' relevant experience to the company.

Duquesne University and Robert Morris University alumnus, **Cody Matchett**, is **Rycon's** Casework & Millwork Division's newest project manager to join the team. He holds two management degrees and has over 19 years' relevant experience.

With 15 years' experience, senior project manager, **Roger Pahoresky**, has been added to the **Rycon** Cleveland team. He is a graduate of Cleveland State University.

Project engineer **Cody Scagline** joined **Rycon's** Building Group. He is a Penn State graduate, holds a degree in mechanical engineering, and has over two years' construction industry experience.

**Kevin Shaffer** has transitioned from project manager to preconstruction manager & BIM coordinator within **Rycon's Building Group**.

**Jendoco Construction Corporation** announced the promotion of **Pierre Brun** to director of marketing and information technology. Pierre, along with his other duties, has been involved in all marketing and I.T. aspects of the business since joining Jendoco in 2003. Jendoco also announced that **Robert Lloyd** had been promoted from vice president to president of Jendoco Real Estate.



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# CLOSING OUT

## How Severe are Workforce Shortages and How to Fix Them

BY STEPHEN E. SANDHERR

**T**he construction industry has been steadily adding jobs in many parts of the country for much of the current decade. As a result, many firms now report that their greatest single challenge is finding qualified workers to hire. That is why the Associated General Contractors of America and our partner Autodesk conducted a nationwide survey to gauge the extent of current worker shortages during the summer.

We received over 1,600 responses to the survey, including 23 from Pennsylvania, and it is clear from those answers that the industry's workforce challenges remain significant, particularly when it comes to recruiting hourly craft professionals that represent the bulk of the construction workforce and include positions such as carpenters, electricians, laborers and painters.

Nationwide, 70 percent of firms report they are having a hard time filling hourly craft positions. Similarly, 74 percent of Pennsylvania firms report that it is hard to find enough qualified craft workers to hire.

The five toughest craft positions to fill in the Keystone State are equipment operators, carpenters, laborers, supervisors and truck drivers. Meanwhile, the five toughest-to-fill salaried jobs are project managers, estimating personnel, safety personnel, tax/accounting/finance positions and training personnel.

It also appears that labor shortages are not going away anytime soon. Seventy-two percent of Pennsylvania firms report it will continue to be hard, or get even harder, to find hourly craft personnel over the coming 12 months. The same percentage of the state's firms report it will continue to be hard, or get even harder, to find salaried field and office personnel this year.

Contractors also have a low opinion of the quality of the pipeline for recruiting and preparing new craft workers. Sixty-five percent of responding firms from the commonwealth rated the new craft worker pipeline as poor or fair while only 26 percent said it was good or excellent.

Tight labor market conditions are prompting many firms to change the way they compensate employees. Many Pennsylvania construction firms report they have increased base pay rates for craft workers because of the difficulty in filling positions. And 38 percent report they are providing incentives and bonuses to attract craft workers.

Many firms report they are doing more training and changing the way they operate to cope with workforce shortages. Nationwide, 46 percent report they are doing more in-house training while 47 percent report they are

increasing overtime hours and 41 percent are increasing their use of subcontractors.

In addition, 27 percent report getting involved with career-building programs in local schools. And 22 percent report they are increasing their use of labor-saving equipment, 11 percent are using offsite prefabrication and 7 percent are using virtual construction methods like BIM to cope with workforce shortages.

The bottom line is that construction workforce shortages remain a significant problem for most firms. It should hardly be surprising that, after years of government disinvestment in career and technical education programs, relatively few new workers are being attracted into the industry.

We need federal, state and local officials to act on the measures outlined in the association's workforce development plan and Agenda to Rebuild Our Aging Infrastructure and Construction Workforce. In particular, we are pushing federal officials to increase investments in high-school career and technical education programs to help attract more young adults into the industry. Doing so will lead to an increase in construction employment that will help boost overall economic growth as new workers invest their earnings throughout local communities. **BG**

*Stephen E. Sandherr is the chief executive officer of the Associated General Contractors of America.*



*Stephen E. Sandherr*

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