CONSTRUCTION MARKET OUTLOOK
Philadelphia, Pennsylvania

July 2018

DHARAM CONSULTING

Urban redevelopment efforts, business expansion and population growth have led to an increase in development activity in Philadelphia, in particular in the Center City area. We expect construction activity to remain firm near term, before the pace of growth moderates due to a maturing business cycle. Input cost pressures from higher wages and salaries, as well as material prices will increasingly put pressure on the supply chain. Cost escalation is expected to peak over the next 12 months, before trailing off slowly from the second half of 2019, due to slower construction pipeline growth.

This report examines the current state of the local industry, drivers and barriers to growth, and the outlook for pipeline work, in order to assess the impact on construction cost and bid submission prices.

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PHILADELPHIA ECONOMIC BACKDROP

Like many urban areas, Philadelphia has undergone a major transition in recent decades, with service and knowledge-based industries now driving economic performance. The area has a strong base of skilled workers and educational institutions, and is a hub for key sectors such as public health, life sciences, chemicals, and higher education. The City Center, including University City and the Navy Yard are a focal point of development and job creation.

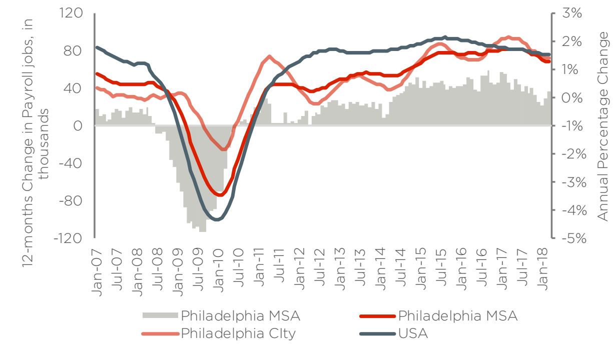
Philadelphia is enjoying a period of sustained economic growth, with the city adding 39,000 jobs between the start of 2016 and May 2018 (fig. 1). The expansion has been driven by the private and institutional sectors. Construction, leisure & hospitality, and transportation added the most jobs over the past five years. A significant number of jobs were also created in the education and health services, by far the largest employers in the area (fig. 2).

Reflecting an expanding corporate and private sector, employment and income growth, and an influx of people into the urban core, there has been an increase in the delivery of large-scale mixed-used developments, in particular in the City Center area.

Unemployment stood at 5.2% in April 2018, which is the lowest in two decades (fig. 3), but still is above the national average. Indeed, whilst the recent economic performance has been good by regional standards, Philadelphia has lagged the national average in terms of population growth, job creation and economic expansion.

FIG. 1: EMPLOYMENT TRENDS

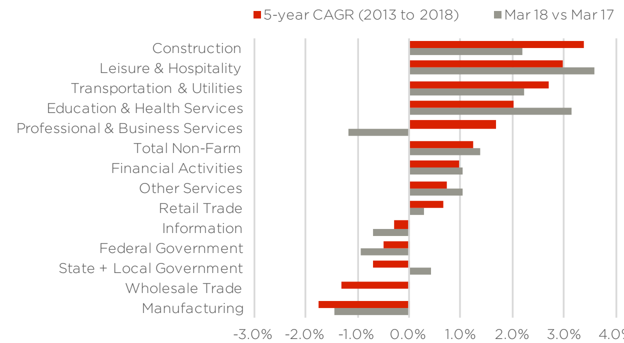
Philadelphia MSA: Philadelphia-Camden-Wilmington



Source: BEA, Dharam Consulting

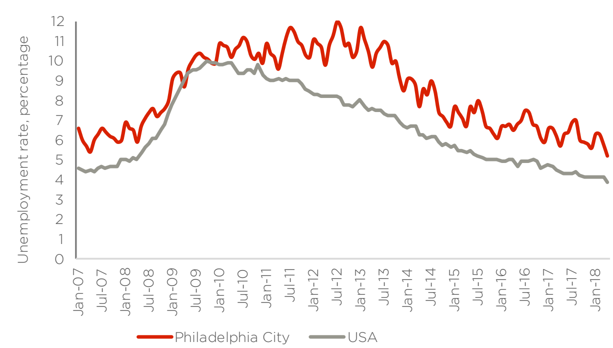
FIG. 2: EMPLOYMENT BY SECTOR

Jobs by Sector: Philadelphia, PA Metropolitan Division



Source: BLS

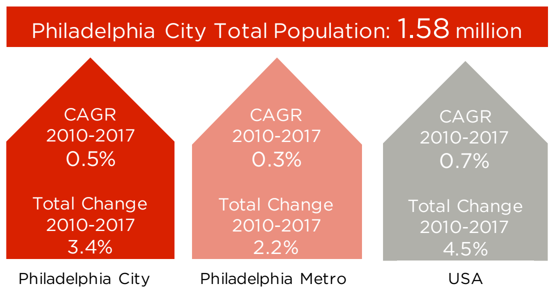
FIG. 3: L.A. JOBS BY SECTOR



Source: BEA, Dharam Consulting

The Philadelphia population rose since its low in 2000/01, up 3.4% between 2010-2017, which is below the national average (fig. 4). Center City, has seen a quicker pace of population growth.

FIG. 4: POPULATION TRENDS



As with other regions, the outlook for Philadelphia depends on national economic developments, where we see a number of challenges, such as the future path of federal monetary and fiscal policy, global commodity prices, and further developments in international trade policy that is impacting trade relations.

By mid-2018, the US economy will have expanded for nine years. That the current cycle has lasted as long has a number of reasons, including a relatively contained pace of economic and wage growth, the stimulus from the Tax Cuts and Jobs Act of 2017, as well as the $300+ billion in new federal spending through 2019.

The IHS's US forecast sees growth of 2.6% in 2018, up from 2.3% in 2017. On the business side, capital investments should remain solid, as cash flows are strong. The corporate sector is receiving a boost from the tax reform, in the form of a cut in the statutory corporate income tax rate from 35% to 21%, and the 100% expensing provision for investments.

Whilst the US economic fundamentals look firm, providing confidence to businesses, consumers and investors alike, there are some factors that cast a shadow over the outlook. Since the start of the year, concerns over a maturing economic cycle, inflation, higher interest rates, and US trade policy have caused an increase in market volatility.

Whilst still relatively contained, low unemployment rates have firmed up salary and wage trends, adding to inflation. Consumer price inflation in the Philadelphia area stood at 1.4% in April 2018. This is lower than the US average of 2.2% in April 2018. The Fed has already raised its target range for the federal funds rate twice this year to 1.75-2%. As the economy continues to run near to capacity, the Fed could press harder on the brakes by increasing rates further. This will strengthen the Dollar against other currencies, lowering import costs, but hurting exports.

The US' stand on International trade policy has shifted notably over the past year. Most prominent has been the implementation of increased tariffs on China, as well as the introduction of a 25% import tariff on steel and 10% on aluminum imposed on the US' major trading partners, including Canada, Mexico and the European Union. In addition to increased cost to US businesses and consumers, affected countries are already implementing retaliatory policies, increasing fears of an escalating trade war, which could create enough uncertainty to affect business and consumer behavior, putting a break on growth.

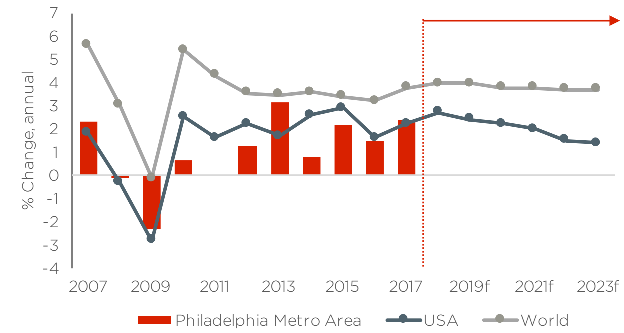
Further on the domestic policy side, the Philadelphia area looks particularly vulnerable to major changes in the health care policy, though the likelihood of these major changes is not clear to date.

In 2017, the Philadelphia economy expanded by 2.4% and whilst the pace of expansion is forecast to slow, overall growth is expected to be sustained over the years to 2021 (fig 5).

The Office of the City Controller for Philadelphia predicts payroll employment to increase moderately over the next three years. Education & healthcare, professional services, construction as well as leisure & hospitality are expected to drive job creation (fig. 6).

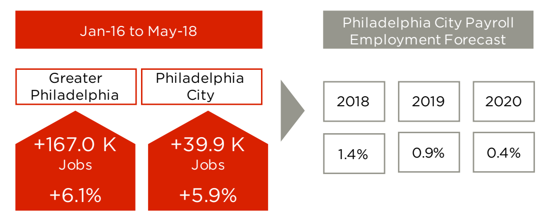
FIG. 5: ECONOMIC PERFORMANCE

Philadelphia MSA: Philadelphia-Camden-Wilmington



Source: BEA, IMF, IHS Markit,

FIG. 6: ECONOMIC PERFORMANCE



Source: BLS, IHS

Our view: Philadelphia is enjoying a period of economic expansion, but the pace of growth has been slower than in many other urban areas in the US, a trend which is expected to continue. Nevertheless, the combined effect of residential population growth, job creation and increased visitor numbers has spurred developments, which are focusing on a redevelopment of the urban core via a number of large master-plan projects.

CONSTRUCTION MARKET INDICATORS

The analysis of the state of the Philadelphia construction market is based on official statistics and our industry survey, which has been conducted with architects, engineering consultants, developers, and construction managers active in the market. Their views give a unique insight into the outlook for the industry, drivers and barriers currently at play, potential changes in pipeline work and cost, as well as concerns and opportunities.

State of play

Nationally, construction spending in value terms expanded by 7.7% in 2017 and 6.5% in the year to April 2018. Spending growth continues to be led by residential and private non-residential sectors, such as commercial work. A solid outlook for the US economy should support further growth in the construction industry.

The consensus forecast predicts an increase in construction spending in 2018 in the range of 4-5%. Similar growth is expected for 2019, before forecasters expect a slowdown in the expansion.

Views diverge amongst forecasters, however. Trade associations, such as the FMI and the ABC, are generally more upbeat about industry prospects than others such as IHS Economics, who predict marginal growth over the next two years. Forecasters who paint a more cautious picture point to the slower pace of expansion in commercial work over the past year, a trend which they see continuing over the next years as investors and developers may become more cautious in light of rising interest rates and a turn in the business cycle. In addition, increased project costs from key inputs such as structural steel could slow the pace of activity, in particular in the high-rise commercial, as well as industrial sectors.

Forecasters who are more optimistic cite the following reasons for stronger construction spending in the 18 months to 2 years ahead:

- Buoyant consumer and business confidence levels;
- Post- natural disaster rebuilding efforts, especially associated with hurricane damages sustained in 2017;
- A boost for construction from the tax reform; and
- The implementation of a national infrastructure package.

The signed tax bill entails substantial changes to the existing US tax regime, impacting multiple sectors, including the real estate and construction industry. The new legislation lowers tax rates on corporations, pass-through entities, individuals, and estates. The corporate tax rate has been cut from a maximum rate of 35% to a flat rate of 21%. For individuals, the top tax rate was reduced from 39.6% to 37%, although this reduction expires at the end of 2025. Ernst & Young (EY) highlights the following tax measures specific to the engineering and construction industry:

• Alternative Minimum Tax (AMT): Eliminated for Corporations; Exemption Increased for Individuals

• All categories of tax-exempt private activity bonds (PABs) are retained, which include bonds issued for projects owned by section 501(c)(3) organizations, low-income multifamily housing developments, single-family mortgage bonds, airports; docks and ports; sewage and solid waste facilities, mass commuting facilities and facilities for the furnishing of water.

• Continuation of ability to issue tax-exempt bonds for facilities used as professional stadiums or arenas. Changes to the pass-through rate on certain net income.

• Limitation on interest expense deduction.

• Elimination of qualified tax credit bonds, including qualified school construction bonds, qualified zone academy bonds, and qualified energy conservation bonds, among others.

• No change to low-income Housing Tax Credit and Mortgage Credit Certificates, which allow qualifying homebuyers to claim a tax credit for a portion of the mortgage interest paid during a tax year

• Increased expensing/ additional depreciation of qualified property.

• Addition of an excise tax on certain payments to foreign affiliates and of a new anti-base erosion provision.

• Elimination of business deductions for transportation fringe benefits.

Overall, the tax reform makes a number of changes significant to the construction industry. However, the final provisions are not yet set in stone and it will be important for the industry to monitor clarifications and potential technical corrections during implementation.

The national infrastructure package, promised by the current administration remains an uncertainty for the construction industry. As yet there are no clarifications to the current iteration of the proposed infrastructure plan which sets out a $200-billion federal investment over the coming decade, aimed at leveraging an additional $800 billion in state, local, and private investment.

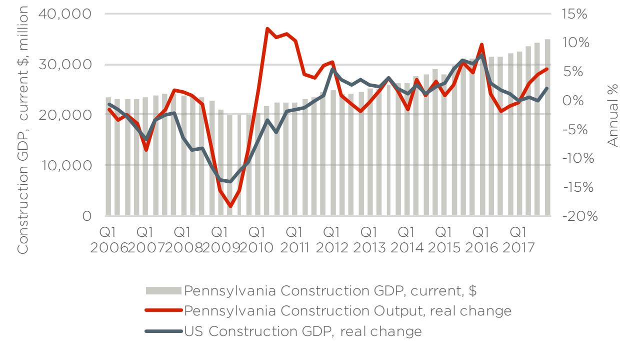
Adding to uncertainty for the construction sector are the changes to federal policies, which directly affect the cost and the supply chain of labor (by limiting immigration) and construction materials (through the introduction of steel and aluminum import tariffs), which could potentially put a brake on construction spending.

Construction activity in Greater Philadelphia has been firm in recent years, pushed on by strong demand for residential space, tax abatements on new construction and a recognition of Philadelphia's economic renaissance.

Construction output in Pennsylvania (measured in construction GDP terms) rose from 2010 to 2012 and stood at $135.1 billion in 2017. Stripping out construction inflation, real construction output has also increased over the same period, though construction volumes growth (as opposed to values) has been considerably slower (fig. 8).

Construction starts in Philadelphia jumped in 2017, increasing by more than 50% on those seen in 2016 and doubling between 2012 and 2017. In 2017, the value of construction starts stood at $12.2 billion, a record high for the metro area. For 2018, starts are currently forecast to total some $9.8 billion (fig. 8). Whilst this is considerably lower than last year, it is still a high amount for the city. Between 2012 and 2016, the value of starts averaged $7.4 billion per annum. Infrastructure, residential and institutional work were the largest sectors over the past five years. The best performing sectors over the past five years have been the healthcare sector, as well as the commercial and multi-unit residential sectors (fig. 9).

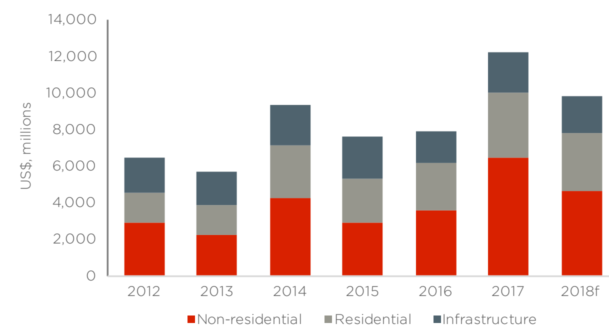
FIG. 7: CONSTRUCTION OUTPUT



Source: BEA

FIG.8: REGIONAL CONSTRUCTION STARTS

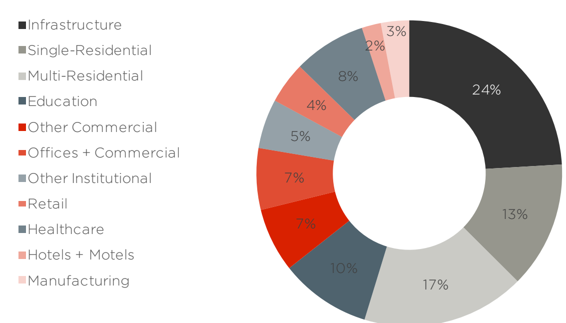
Greater Philadelphia: Philadelphia-Camden-Wilmington



Source: ENR, Dodge Data

FIG. 9: CONSTRUCTION STARTS BY SECTOR

Greater Philadelphia: Philadelphia-Camden-Wilmington
Construction starts by sector: 5-year average (2012-2017)



Source: ENR, Dodge Data

Industry expectations

Two-thirds of the respondents to our Philadelphia construction survey report that their workload rose over the past 12 months. Whilst positive, this is a smaller share than the official statistics would suggest. In terms of the pace of growth, a third saw their workload rise by a strong 6-10% over the past 12 months (fig. 10). Those who report an increase in their workload cite projects progressing as part of master plans, firm demand for residential space and availability of capital as the main drivers for growth. In contrast, a more volatile political environment, uncertainty over national policy changes, labor shortages and increasing construction costs appear to have slowed the expansion of other supply chain participants.

Respondents are more cautious about future growth prospects. Two-fifths expect the industry to expand over the next five years, of which just over 20% expect firm growth of 6-10% per annum. A fifth expect workload to remain steady at current levels, while a third expects a drop in their workload. The industry generally expects stronger market conditions over the next two years, as more projects move into design and construction, but sees work trailing off from 2020.

Those who expect an increase in workload cite demand fundamentals in the regional market and a steady roll-out of planned building work. They generally expect growth to last over the next two years, before a turn in the business cycle will stall growth. Those with a more tempered near-term outlook cite a growing uncertainty over US economic stability, higher interest rates signs of saturation and an expected period of correction in some market segments after a long period of expansion, as well as the increasing cost of construction as constraints on the market.

Reflecting the mixed outlook, more than half of survey respondents see the chances of their growth expectations materializing as 50:50, while more than two-fifths are uncertain or very uncertain about the outlook over the next years.

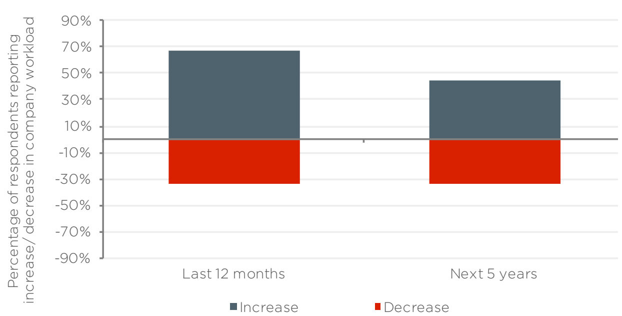
There are a number of large-scale projects currently under construction and in the near-term pipeline, which is expected to keep the market fairly busy overall. However, the pace of growth may slow beyond 2020 in line with the national picture, as the business cycle matures and the market becomes saturated in some asset types.

Cited downside risks to growth are resource constraints, changes in government spending plans, the economic backdrop, including US finances, and regulatory changes (fig. 11).

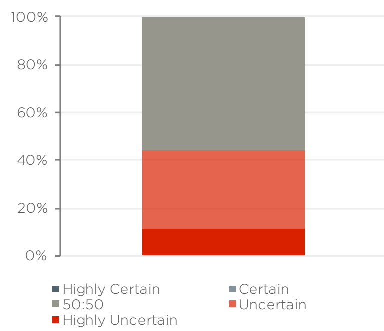
On the upside, the new tax structure could lead to increases in private sector investment, while a solid infrastructure investment plan with clear implementation policies could lead to stronger medium-term outlook for the industry.

FIG. 10: WORKLOAD EXPECTATIONS AND RISKS TO OUTLOOK

Construction industry current workload and expectations



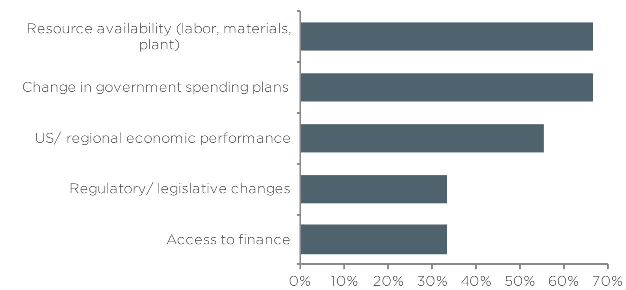
Degree of certainty over future workload
Industry Opinion - % of respondents



Source: Q2 2018 Dharam Consulting Philadelphia Construction Survey

FIG. 11: KEY RISKS TO INDUSTRY GROWTH

The majority of respondents view potential changes in government spending plans, as well as resource availability as the key risks to industry growth over the next 5 years.



Source: Q2 2018 Dharam Consulting Philadelphia Construction Survey

Our view: Current market conditions support stronger workflow in 2018 and 2019, with official indicators, as well as industry expert opinion pointing to continued growth. The industry expects a continued flow of work as master plan developments proceed. However medium term, political and economic uncertainty, some concern regarding overbuilding, and the rise in construction costs, is likely to slow the construction pipeline from 2020/21 and the subsequent years.

PHILADELPHIA CONSTRUCTION PIPELINE

2017 saw a high number of residential and non-residential projects being completed in the Philadelphia market. At the same time the construction pipeline expanded as projects progressed, broke ground on site and were proposed for the future. Demand for space driven by demographic trends, such as an influx of millennials into the city core, as well as an expansion or relocation of Fortune 500 companies with HQ's in Center City. The local construction pipeline of currently known projects firmed up last year, which is expected to last until 2019/20. Unless currently proposed and speculative schemes do actually enter the pipeline and turn into active projects, the level of work delivered is set to trail off from 2020.

To assess the state of the construction procurement market, the impact on trade resources and cost inflation, we have analyzed the currently known project pipeline in the Philadelphia market.

On the public-sector side, the City of Philadelphia FY 2019-2024 Capital Program sets out spending of $10.11 billion (fig. 12). The majority of funds over this period, some $3.2 billion is earmarked for the Philadelphia International Airport (fig. 13).

Other priority areas are water and transit related projects, with funding allocations totaling $2.7 billion and $1.4 billion, respectively

FIG. 12: 2019-2024 CAPITAL PROGRAM

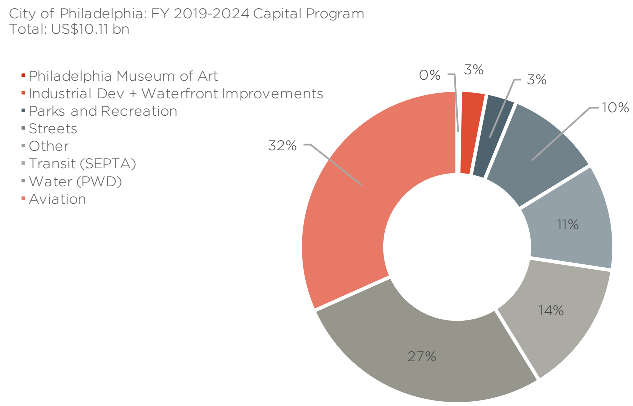
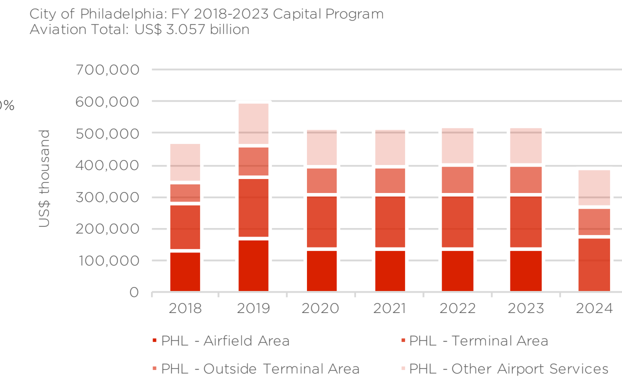


FIG.13: AIRPORT CAPITAL PROGRAM



The major projects in the currently known private construction pipeline are listed in Table 1. The list is by no means exclusive and takes only those projects into consideration for which the construction cost and timeframes have been announced.

According to the Central Philadelphia Development Corporation (CPDC), 13 major development projects, worth $1.2bn, as well as 35 other projects, were completed in 2017 in the Central District. Another 35 projects are currently under construction.

The major private projects in the current pipeline, have an estimated combined value of $17.2bn. The majority of these are planned to be delivered within the 2018/19 period, which has caused capacity constraints on the market, in particular for labor resources. However, the impact is contained as, a large number of projects were recently completed or are about to be completed, which should free up resources to move onto the next commencing projects. The single largest development in Philadelphia's history is Liberty Property Trust's $1.5 billion Comcast Technology Center, which is close to completion. There are major master plan developments, which are being rolled out over a long timeframe, most notably the University City/ uCity Square campus and Schuylkill Yard. These two, together with Pennovation are the three focal points of developments in Philadelphia over the next decade.

According to our industry survey the main source of funding for projects in Greater Philadelphia are through private fund raising (capital markets), academic institutional budgets and philanthropic funds/ donations. Survey respondents also report that developments are being increasingly supported by Tax Increment Financing (TIF) funding. Within TIF districts a portion of certain taxes generated by new developments can be used to support debt service of the targeted developments.

TABLE 1: PHILADELPHIA LARGE-PROJECT PIPELINE OF CURRENTLY KNOWN PROJECTS

PROJECT	Sector	US$, million	Start	Completion	Developer/ Owner
LARGE-SCALE PROJECTS UNDERWAY					
Comcast Technology Center	Mixed-use	1,500	Q3 2014	Q2 2018	Liberty Property Trust
University City/ uCity Square campus		6,500			
Penn Medicine Center for Healthcare Technology Phase 1	Healthcare	170	Q1 2017	Q2 2019	Penn Medicine
Penn Medicine Pavillion	Healthcare	1,500	Q1 2017	Q1 2021	Penn Medicine
Philadelphia Ronald McDonald House Expansion	Healthcare	50	Q2 2018	Q1 2019	Philadelphia Ronald McDonald House
3675 Market	Mixed-use	190	Q1 2017	Q4 2018	JV University City Science Center, Ventas, Wexford S+T
Perelman Center for Political Science & Economics	Education	77.6	Q4 2015	Q2 2018	University of Pennsylvania
Campus Commerce Center Phase 2	Mixed-use	80	Q1 2018	2020	Campus Apartments
3700 Lancaster	Residential	80	Q4 2018	Q2 2020	JV University City Science Center, Ventas, Wexford S+T
Hamilton Court	Residential	100	Q4 2016	Q2 2018	Post Brothers
Uscience Residence Hall	Residential	50	Q3 2017	Q1 2019	University of Sciences
New College House West	Residential	163	2018	2021	University of Pennsylvania
Penn Museum Renovation	Hospitality/ Leisure	N/A	Q4 2017	Q3 2019	University of Pennsylvania
Evans Building Main Dental Clinic	Healthcare	21	Q4 2015	Q3 2018	University of Pennsylvania
Richards Medical Research Labs Towers A&B	Education	28.5	2015	Q3 2019	University of Pennsylvania
Stemmler Hall	Education	119.3	2015	Q4 2018	University of Pennsylvania
3.0 University Place	Mixed-use	N/A	Q4 2018	Q4 2019	University Place Associates, LLC
Schuylkill Yard	Mixed-use	3,500	Q4 2017	2035	Drexel University, Brandywine Realty Trust
East Market (6 towers)	Mixed-use	600	Q4 2014	Q4 2018	National Real Estate Development
W Hotel and Element by Westin	Hospitality/ Leisure	359	Q1 2015	Q2 2018	Chestlen Development
1301 Market Street	Mixed-use	350	2018	2020	Oliver Tyrone Pulver Corp
Fashion District of Philadelphia (Gallery Mall Redevelopment)	Mixed-use	325	Q4 2015	Q4 2018	PREIT and Macerich
The Laurel (1911 Walnut)	Residential	300	Q2 2019	Q4 2021	Southern Land Company
River Walk	Mixed-use	300	Q1 2018	Q4 2020	PMC Property Group
SLS Philadelphia Hotel & Residences	Mixed-use	240	Q3 2018	Q4 2020	Dranoff Properties, SBE Entertainment Group
2400 Market Street (Aramark HQ)	Mixed-use	230	Q1 2016	Q4 2018	PMC Property, Lubert-Adler
Penn's Landing	Public Space	225	2021	2023	Delaware River Waterfront Corporation
1401 Spruce Street	Mixed-use	210	Q4 2014	Q4 2018	Post Brothers
Park Towne Place	Residential	200	2013	2018	Aimco
Museum of Arts "Core Project"	Hospitality/ Leisure	196	Q1 2017	Q3 2020	Philadelphia Museum of Art
The View (Phase 2)	Mixed-use	199	Q3 2017	Q3 2019	Temple University, Goldenberg Group
Temple Library and Classroom Facility	Education	170	Q1 2017	Q4 2018	Temple University
The Hamilton	Mixed-use	156	Q3 2017	Q3 2020	P3s Community College of Philadelphia, Radnor Property Group
Lincoln Square	Mixed-use	155	Q4 2016	Q4 2018	Alterra Property Group, KIMCO & MIS Capital
One Franklin Tower	Mixed-use	140	Q4 2016	Q2 2018	PMC Property, Lubert-Adler
800-830 Vine Street Master Development	Mixed-use	130	Q4 2018	Q4 2021	Pennrose Properties, EZ Park, Inc., and United Developmen
Hyatt Centric	Hospitality/ Leisure	125	Q1 2017	Q2 2019	Hyatt Corporation
1213 Walnut	Mixed-use	125	Q4 2015	Q4 2017	The Goldenberg Group/ Hines
The Alexander	Mixed-use	120	Q4 2017	Q1 2018	Property Reserve Inc
The Harper	Mixed-use	120	2015	Q2 2019	Pearl Properties
2110 Walnut St	Residential	100	Q2 2017	Q3 2018	Astoban Investments
Broad + Pine	Mixed-use	100	2019	2022	Dranoff Properties
Kimpton Hotel	Hospitality/ Leisure	90	Q4 2016	Q3 2018	Peebles Corp, P&A Associates
2012 Chesnut	Residential	80	2019	2020	Alterra Property Group, Rheal Capital Management LLC
Eastern Tower Community Center	Mixed-use	76	Q2 107	Q2 2019	PCDC, JNA Capital, Inc.
The National	Residential	70	Q2 2016	Q3 2018	The Buccini/ Pollin Group
218 Arch Street	Mixed-use	58	Q2 2016	W4 2018	PMC Property Group
1600 Callowhill	Residential	50	Q4 2017	Q4 2018	Ivy Realty
Independence Collection	Commercial Offices	40	Q2 2016	Q2 2018	MRP Realty
The Free Library of Philadelphia Parkway Central Renovation	Hospitality/ Leisure	35	Q4 2016	Q4 2018	The Free Library of Philadelphia
Marriott AC	Hospitality/ Leisure	35	TBC	TBC	Baywood Hotels
SoNo	Mixed-use	30	2016	2019	Alliance Partners HSP
The Curtis	Mixed-use	25	Q3 2015	Q2 2018	Keystone Property Group
401 Race Street	Residential	N/A	Q1 2017	Q1 2019	Priderock Capital Partners
Pod Philly	Hospitality/ Leisure	N/A	Q2 2018	Q3 2019	Parkway Corporation and Modus Hotels
1001 S. Broad Street	Mixed-use	400	Proposed		Tower Investments (Bart Blatstein)
510 North Broad	Mixed-use	300	Proposed		Parkway Corporation and Nightingale Group
1300 Fairmount	Mixed-use	200	Proposed		RAL Development Services LLC
Mellon Independence Center Tower	Mixed-use	N/A	Proposed		Brickstone Realty
702 Sansom	Mixed-use	100	Proposed		Toll Brothers
Pier 34/35 South	Mixed-use	N/A	Proposed		Ensemble Investments LLC

Source: Center City Philadelphia, ENR, Dharam Consulting

Figure 14 shows our estimation of cash flow over the next few years. Based on the current pipeline, estimated construction times, and the assumption that most projects proceed as planned, we expect an increase in workload over the near term 2019, after a dip in 2018. The drop off in 2018 can be explained with the completion of major projects this year, such as the $1.5 billion Comcast Center or East Market. At the same time, we do not expect the pipeline to peak before 2020 as further projects are likely to enter the existing pipeline. A number of large projects are long-term phased projects, which should sustain a steady level of construction work over the medium term.

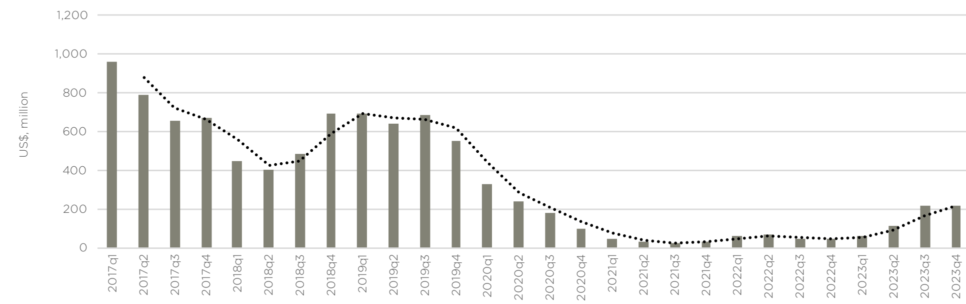
Our detailed analysis of the flow of trade resources within the current pipeline is summarized in figure 15. Whilst some mega-projects, such as the Comcast Center are completed this year, the roll-out of major masterplans, most notably University City and Schuylkill Yard, will keep contractors and sub-contractors busy. Figure 16 shows the revenue trend of general contractors in the Mid-Atlantic market. Combined revenues of construction contractors totaled $22 billion in 2016 (2017 figures were not available at the time of publication). This is 16% higher compared to the preceding year. The top 10 contractors accounted for just over half (54%) of the market, with The Whiting-Turner Contracting Co accounting for 11% of the market in 2016.

The share of revenues of the Top 10 designers fell from 52% in 2015 to 40% in 2017. Total designer revenues stood at $5.3 billion in 2017. Reflecting the pipeline growth, annual revenues increased by 11% in 2017 and 19% in 2016.

Based on the pipeline, we see the pressure on resources subside moderately, as major projects complete. Whilst there are a number of large master plan developments, these are long-term in nature, giving the market time to adjust to this level of work.

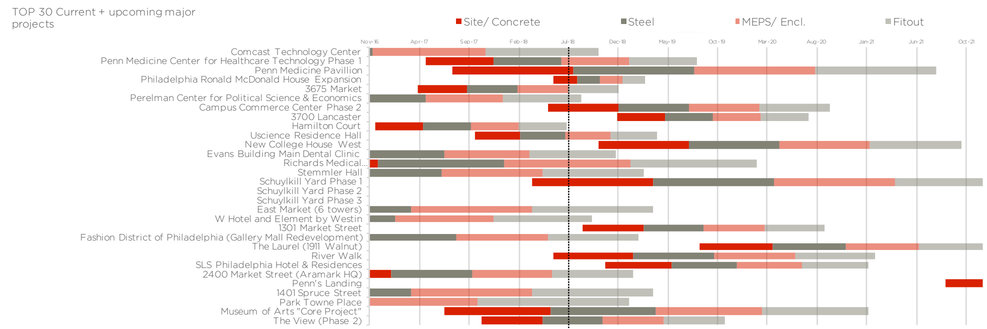
FIG. 14: PHILADELPHIA PROJECTS CASHFLOW

(CALCULATION BASED ON 50 MAJOR PRIVATE PROJECTS IN THE PIPELINE FOR WHICH THE CONSTRUCTION VALUE IS KNOWN AND WHICH ARE NOT YET COMPLETED)



Source: Dharam Consulting

FIG. 15: ESTIMATED TRADE RESOURCE OUTLOOK 2017 – JANUARY 2023



Source: Dharam Consulting

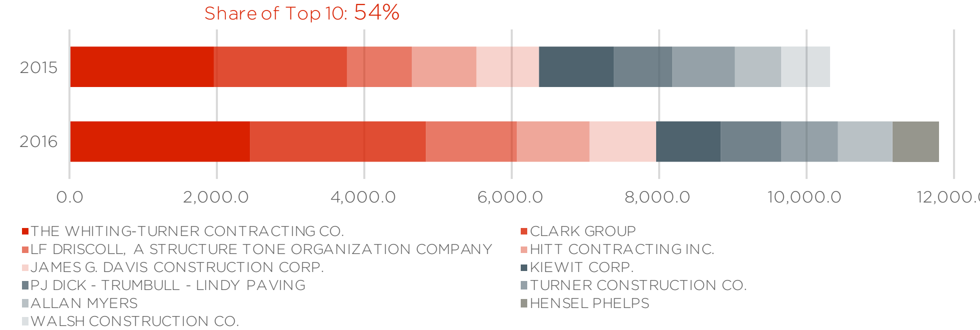
TRADE RESOURCES	PEAK DEMAND MAJOR PROJETCS PIPELINE
Peak Site Concrete	Q1 2018
Peak Steel	Q3 2018
Peak MEPS/Enclosure	Q1 2019
Peak FITOUT	Q4 2019

Dharam Consulting

FIG. 16: MID-ATLANTIC CONTRACTOR REVENUE

By Revenue, per year

Total 2016 Contractor Revenues $22.0 billion
Share of Top 10: 54%



Source: ENR

CONSTRUCTION MARKET PRICING

Construction activity in the Philadelphia area has been strong in recent years, which has caused constraints on contractor and trades resources. Together with rising material prices, this has caused bid submission prices to increase. Adding the introduction of import tariffs on key construction materials, including steel, aluminum and lumber, as well as immigration policies that may impact labor supply, and the industry is set to continue to see increased levels of price escalation near term.

Current construction costs

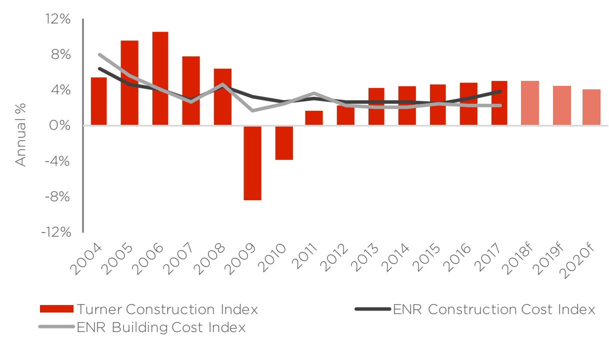
Building cost indices

Nationally, the ENR building cost (BCI) and construction cost indices (CCI), show that construction cost increases in recent years were mainly driven by labor cost. The CCI, which contains a higher labor component, increased by an average of 2.9% p.a. between 2012-17, with cost increases accelerating to 3% and 3.9% in 2016 and 2017, respectively. The BCI recorded increases of 2.3% and 3.3% in 2016 and 2017, respectively (fig. 17). In June 2018, the CCI and the BCI were up 3.4% and 3.1%, respectively year-on-year.

The Turner Cost Index shows that bid submission prices rose faster than input costs in recent years. Bid prices rose 5% last year. In Q1 2018, bid submission prices were up 5.1%. Nationally, Turner expects outturn costs to rise by an average of 4% p.a. between 2018-20. Unless there is a major slowdown of work, we see prices submitted by contractors to turn out higher this year, as suppliers of key materials push through price increases.

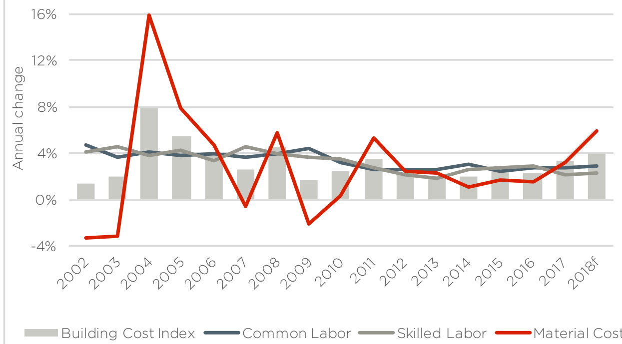
Construction costs in Philadelphia are amongst the highest in the nation. The composite index, which includes material and installations is 15% higher than the national average (Fig. 18). Notably, the index for labor (installation) is 35%

FIG. 17: U.S. CONSTRUCTION COST INDICATORS



Source: Turner, ENR

FIG. 18: LOCATION COMPARISON



Source: ENR

Local market capacity

Our survey shows a mixed picture of resource availability within the local construction supply chain. According to respondents, the industry currently experiences material capacity constraints when it comes to labor, in particular on the sub-contractors/ trade and also main contractors side. Just under two-thirds of respondents report strained capacity of main contractors, and all of our survey respondents indicate capacity constraints on subcontractors and at the trades level. All of a balanced supply of materials. There are some constraints on the supply of plant + equipment, but generally these are not as pronounced as on the labor side. Generally, these constraints are not seen as severe (fig. 19).

The industry expects labor supply capacity to improve only slightly over the next five years, in particular from 2020/21. The majority expects material supply to remain balanced, but some of our survey respondents see some material supply constraints on the horizon.

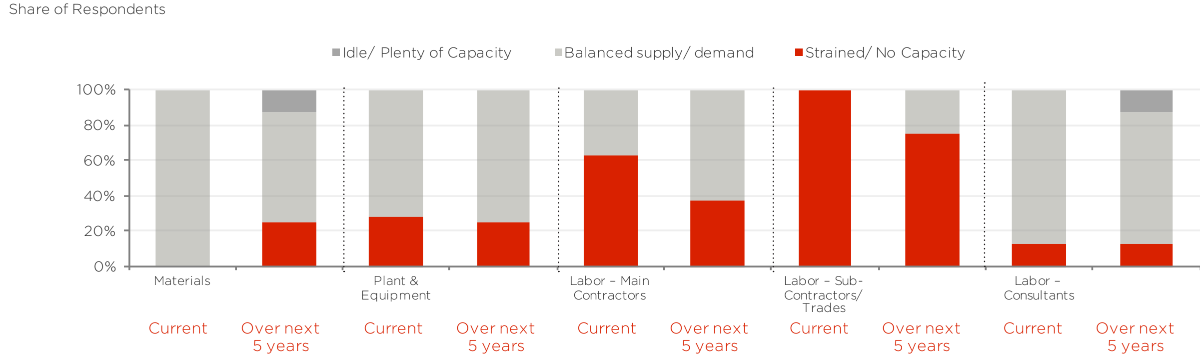
Input costs trends

Survey respondents report that fuel and energy costs, as well as material prices exerted the most upward pressure on input costs over the past year (fig. 20). Three-quarters indicated that wages & salaries rose by 5%. Higher input costs are impacting the supply chain. Whilst half of respondents saw their profit margins unchanged over the last year, the other half saw their margins decrease (on average 1-5%).

Looking ahead, the industry expects input cost pressures to increase over the next five years (Fig. 21). All expect material and fuel costs to increase. In addition, wages and salaries are expected to rise significantly. Despite the Tax Reform, our survey respondents expect a rise in tax burden to increase their business costs. Nearly two-thirds of survey respondents are confident that their profit margins will remain stable over the next five years. A quarter expect their profit margins to fall.

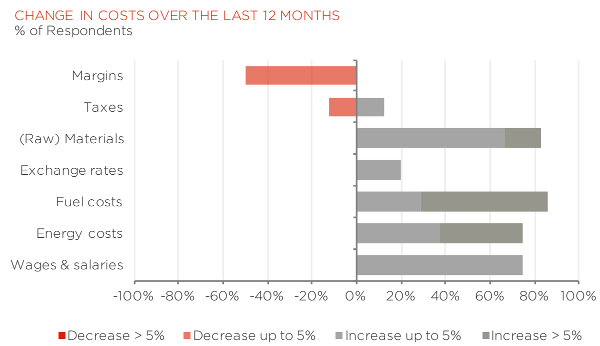
The building cost index for Philadelphia recorded a 3.8% rise in 2017, while the construction cost index was up by 3.3 %, in line with the national average (fig. 21). In June 2018, building and construction cost indices were up 3.5% and 3.4%, respectively year-on-year.

FIG. 19: CAPACITY IN THE PHILADELPHIA BUILDING INDUSTRY

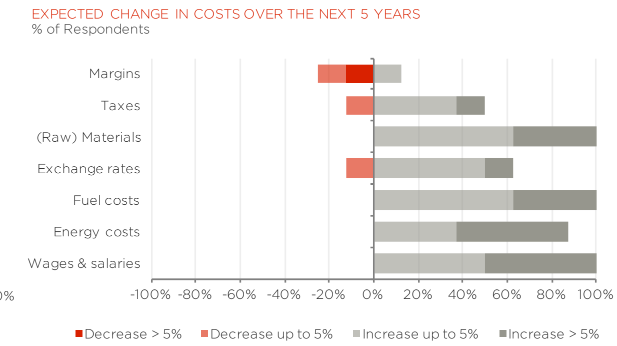


Source: Q2 2018 Dharam Consulting Philadelphia Construction Survey

FIG. 20: INPUT COST TRENDS

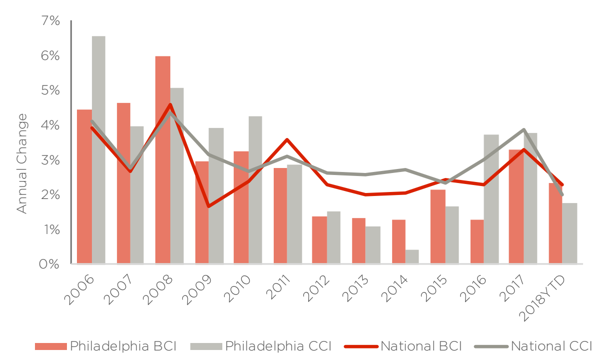


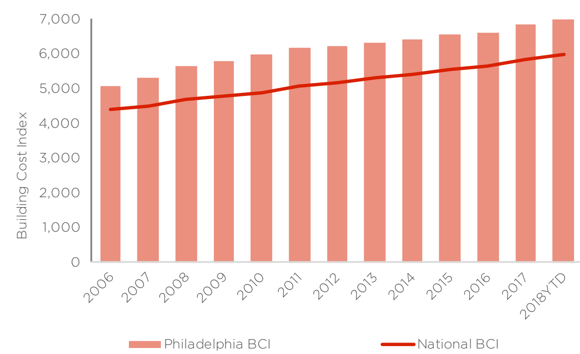
Source: Q2 2018 Dharam Consulting Philadelphia Construction Survey



Source: Q2 2018 Dharam Consulting Philadelphia Construction Survey

FIG. 21: INPUT COST TRENDS





Labor Costs

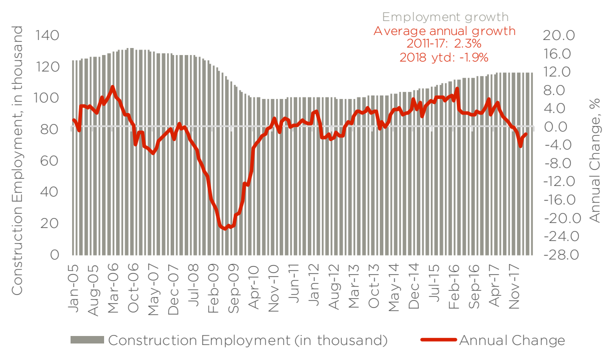
Our survey shows that due to firm workload levels, the local industry currently experiences a lack of capacity when it comes to labor across main contractors and trades. These constraints appear a direct consequence from the recession which had hit the sector hard and had led to downsizings, consolidations, and a decrease in the regional labor pool.

Construction employment has increased since the Great Recession of 2009/10, but remains markedly below pre-recession levels (fig. 22).

The skilled labor index increased by 3.1% in 2017, while the common labor cost index rose by 3.8%. In June 2018, the skilled and common labor indices were up 3.5% and 3.3%, respectively year-on-year.

FIG 22. : CONSTRUCTION EMPLOYMENT

Philadelphia MSA: 12-months moving average



Source: BLS, Dharam Consulting

Material Prices

Material prices increased significantly over the course of 2017. We expect material prices to fluctuate in the near term, as international demand and domestic policy changes with regards to the introduction of tariffs on key inputs impact the market.

On average, material prices in the Philadelphia area increased by 3.3% in 2017 (Fig. x), in line with the national average. In the first six months of this year, material prices in Philadelphia, according to the ENR figures were up 3.45% year-on-year.

Oil prices have risen over the past two years, but remain below historic highs. We expect moderate upward pressure on energy and fuel costs over the medium term. Copper prices have risen significantly since the beginning of 2016 and were 27% higher in 2017 than in 2016. Copper prices continued to rise from the start of the year, exceeding $7,200 per ton. Copper price changes are typically reflected in the cost of MEP related materials, which are expected to increase as a result.

The US administration, in March 2018, imposed a 25% tariff on steel and 10% on aluminum imports. Temporary exemption granted to key importers were retracted on June 1, 2018. This means that import tariffs now apply to the majority of steel and aluminum imports. The value of steel products currently impacted by tariffs is $23.4 billion, or 80% (figure 19). The most significant steel imports under tariffs are flat and long products from Canada, the EU and Mexico, as well as steel sections from the EU.

The steel tariffs introduce uncertainty into the market at a time when the construction industry is enjoying years of sustained growth, but also capacity constraints, rising cost pressures from both labor and building materials and concerns over a cyclical slowdown in activity.

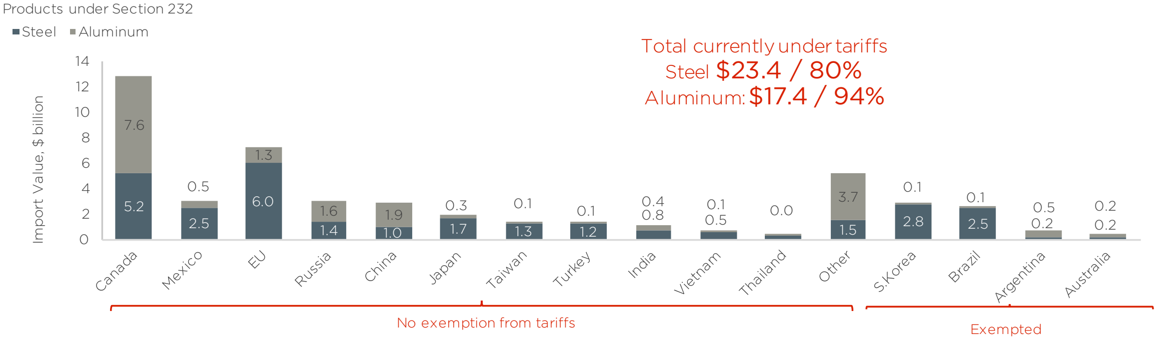
Steel prices have already increased since the latter half of 2017, partly due to global demand factors and anticipation of the tariffs. From December 2017, steel prices spiked. Average prices for steel plate increased 24% in 2017 and rose a further 50% between the end of 2017 and April 2018. Similarly, hot-rolled coils prices jumped 41% in 2017 to $679/ ton in December 2017 and have since risen to $890/ ton in April 2018. Rebar prices rose from $560/ ton at the end of 2017, to $698/ ton in April 2018, an increase of 25% (fig. 23).

Market demand and capacity will determine further material price increases. We see steel demand to be sustained, and manufacturers and suppliers will seek to pass through the full cost impact of the tariffs on their products. Some manufacturers are taking advantage of tight market conditions, increasing prices beyond 25%. We see this as opportunity pricing from fabricators/ installers who are already busy and therefore able to increase their profit margins under the blanket of 'the tariff effects'. At the same time, US production is likely to be ramped up under the new policies, which should over time level out prices.

Our analysis shows that construction projects costs could rise in the range of 0.4% to 1.3% overall due to the steel tariffs. For a full analysis of the impact of the US steel and aluminum tariffs on US construction costs see our Special Note **"The impact of the US steel and aluminum tariffs on US construction costs".**

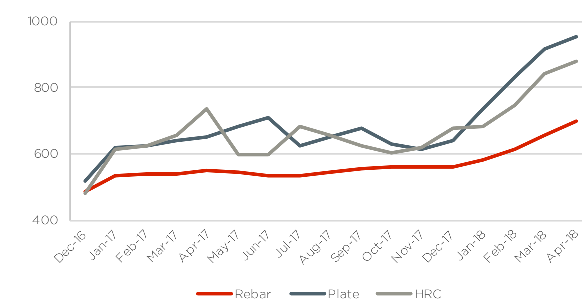
FIG 22: US STEEL AND ALUMINUM TARIFFS

Products under Section 232



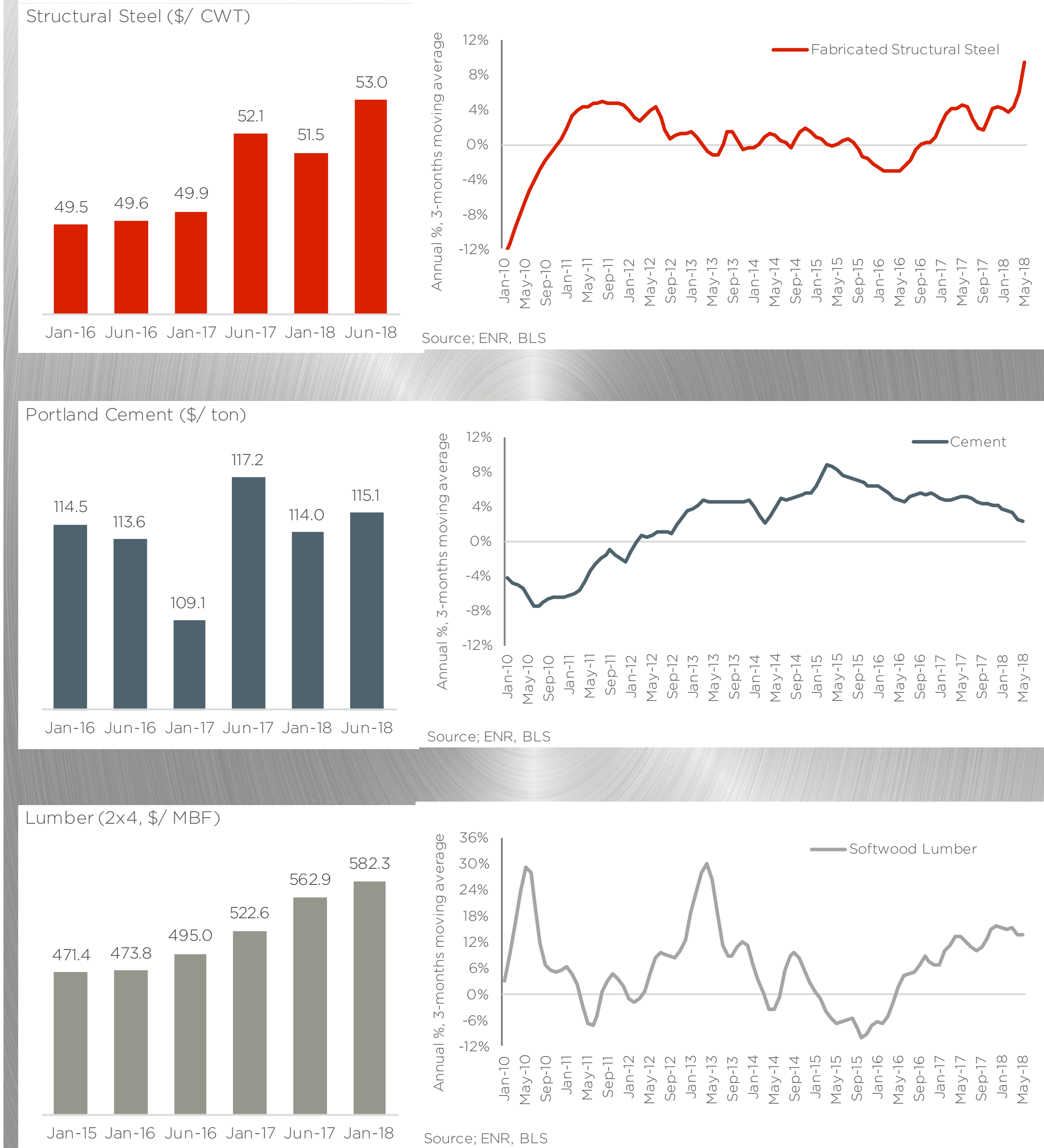
Sources: US Census Bureau, Dharam Consulting calculations of imports (based on HTS product costs in Section 232 reports. Tariffs and exemptions as of June 2018 announcements.

FIG 23: US STEEL PRICES



Source; Platts, ENR
Rebar Southern US, Plate US SouthEast Average, HRC Indiana Prices

FIG. 24: PRICE MOVEMENTS OF MAJOR MATERIALS



Cement prices have maintained a consistent increase in recent years, rising by 5% in 2017 compared to a year earlier, and increasing another 3% in the year to date (fig. 23). The price increases closely mirror the construction spending growth, and the health of the industry will determine price levels in the years ahead. Should any national infrastructure package commence, prices of cement are likely to spike, until then, price increases are likely to remain steady.

Lumber costs jumped in 2017 due to an up to 24% new tariff on imported Canadian lumber, which in turn allowed US mills to raise quotes. This has caused the price of framing lumber to spike (fig. 23). Prices continued to rise in 2018, up 17% in the year to May. Adding to price pressures are strong residential demand and the higher demand from hurricane damage.

After a drop in early 2016, gypsum prices rose substantially in 2017, up 9% compared to a year earlier. Prices in May 2018, were up 5% on the 2017 average. The latest price announcements from the National Gypsum Price Bulletin ar shown in table 2.

TABLE 2: PRICE ANNOUNCEMENTS

Material/ Price change	January 2018	June 2018
Gypsum Wallboard	+15%	+15%
Interior Finishing	+7%	
Cement Board	+10%	
Plaster	+7%	

Source: National Gypsum Price Bulletin

Outlook for construction prices

We expect material prices to continue to fluctuate on the back of global demand and domestic policy changes with regards to the aluminum and steel tariffs and potentially other import restrictions. Steel and aluminum tariffs went into effect on March 23, and exemptions on major trading partners were retracted from June 1, 2018. Depending on the quantitative changes to imports, the impact on steel prices is sizeable. At the same time, US production is likely to be ramped up under any new policies, which should level out prices. While the impact on cost of specific projects will need to be looked at individually, we estimate that the steel tariffs add 0.4% to 1.3% on project costs.

Major master plan developments are being rolled out in Philadelphia, which are transforming the urban core. Consequently, we do not foresee a slack in capacity utilization in the next two years and bid submission prices will reflect the tightness in the market.

In the Philadelphia area, half of our survey respondents report an increase in their bid submission prices over the past year, seeing increases of above 5%. The other half reports no change in their bid submission prices. On average, we saw bid submission prices in 2017 increase by 4.5%.

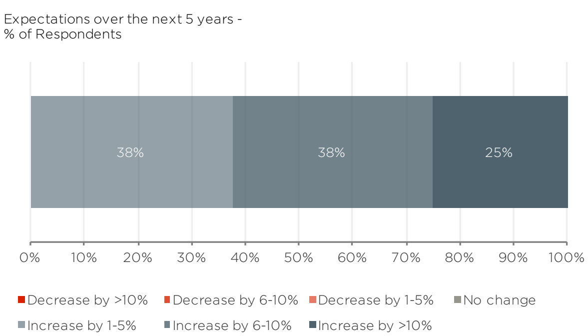
Our survey suggests that experienced contractors able to deliver large-scale, complex projects benefit from residential and commercial projects being awarded to established contractors with a delivery track record. These have been able to pick and choose projects and the pricing of project components such as overheads and profits has increased.

Looking ahead, survey respondents, and our analysis of prices, indicate that construction input and bid submission prices in Philadelphia are set to continue to rise over the next five years. The majority of the increases expected in 2018 and 2019 (fig. 25).

Schemes currently underway and planned in the city are expected to keep the supply chain busy over the next few years. Our analysis of the current large project pipeline indicates that work is likely to peak in 2019/20. We currently expect the peak construction output (bid submission) inflation to fall into 2019 as a number of large projects and packages will be tendered over the next 18 months (fig. 26).

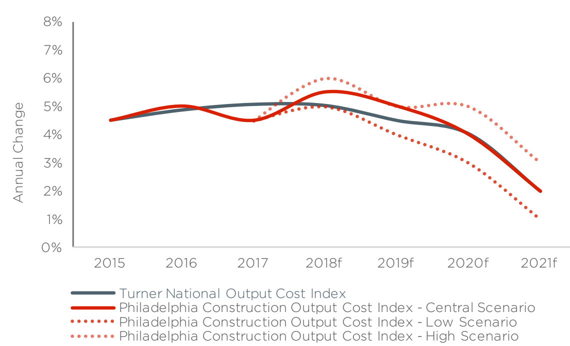
Our current forecast ranges for bid submission prices is shown in table 3.

FIG. 25: BID SUBMISSION PRICE EXPECTATIONS



Source: Q2 2018 Dharam Consulting Philadelphia Construction Survey

FIG. 26: PHILADELPHIA BID SUBMISSION PRICES



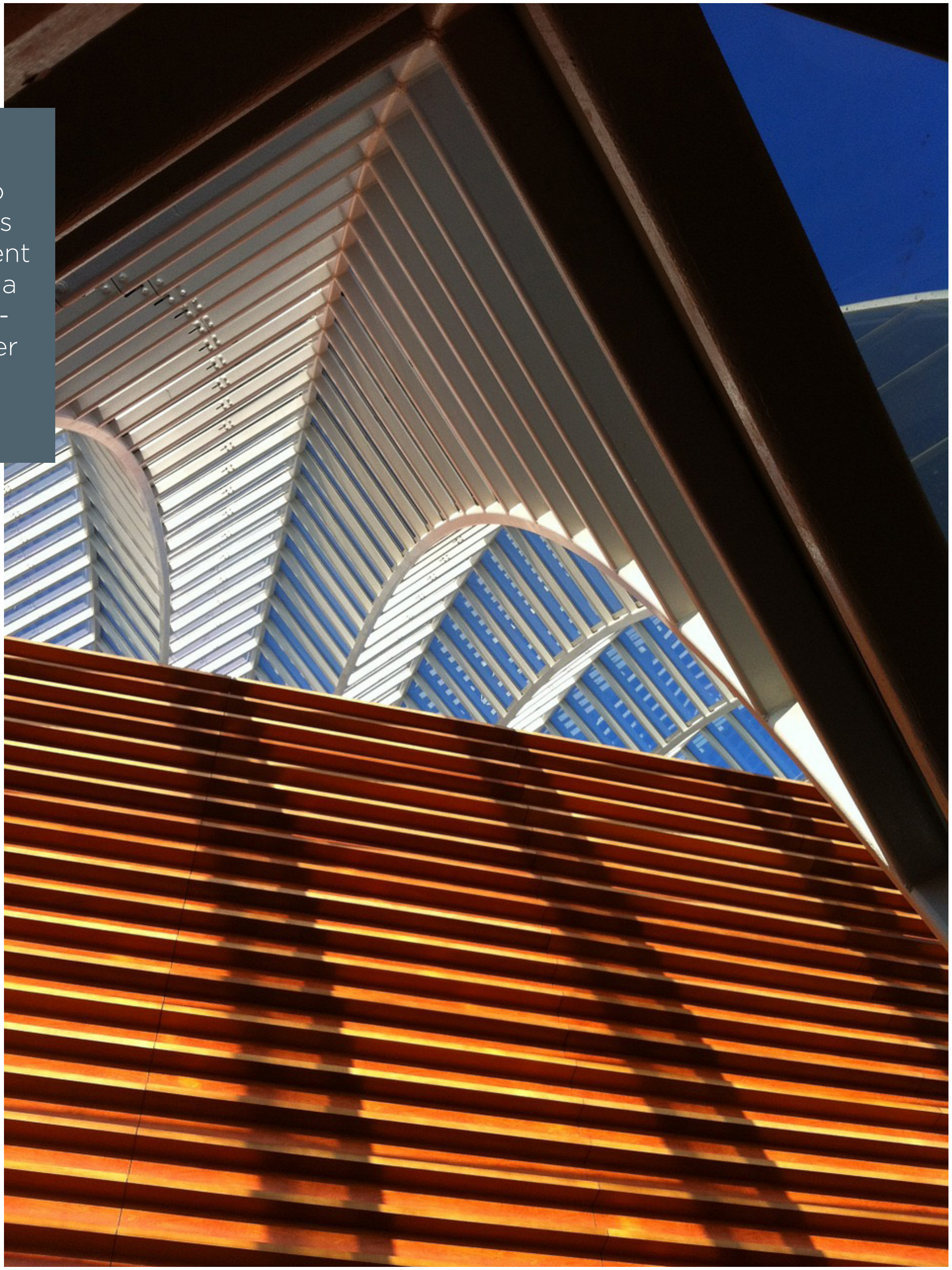
Source: Turner, Dharam Consulting

TABLE 3: DHARAM CONSULTING BID SUBMISSION PRICE FORECAST FOR PHILADELPHIA

Annual Change	2017	2018f	2019f	2020f	2021f
Bid Submission Prices	4.5%	5-6%	4-5%	3-4%	1-3%

Source: Dharam Consulting

Our view: On the back of firm construction volumes, we expect competition for contracting and labor resources to be maintained in the local market. At the same time, prices for many building materials are also rising. Given the current pipeline, where we see increased work levels in 2019 after a brief hiatus in 2018 (as many projects are finishing), we expect tender activity to be strong this year, moderating over the course of 2019. Cost escalation is expected to peak in 2018 and trail off modestly from 2019.



KEY POINTS AND IMPLICATIONS

Construction work in Philadelphia is currently at a high level. There are resource constraints experienced in the market, most notably on the sub-contractor side, but the market expects these to moderate in the medium term as the industry adjusts to work levels. The main risk to the industry – apart from a stronger than expected turn in the business cycle – are current cost pressures, which could impact the flow of private sector developments.

Achieving cost certainty

Our central cost forecast scenario foresees bid submission price escalation in Philadelphia to be in line with the national average in 2018 at a relatively high rate of 5.5%. We expect price escalation to slow moderately over the next few years, as large-scale projects complete and master plan projects within University City and Schuylkill Yards being rolled out over a longer time frame, which allows the market to adjust to the levels of work. Nevertheless, there are significant upside and downside risks to the construction outlook, which creates opportunities, but also poses challenges to project cost estimation and profit margins within the supply chain.

An earlier than expected turn in the current business cycle and the recent spike in input costs could cause project owners to re-evaluate the delivery timeframe of their projects. Significant increases in wages, as the US economy reaches capacity, and a subsequent upward shift in inflation expectations, is causing major investor nervousness and has led to stock market fluctuations. The market is now pricing in swifter increases in interest rates. This could lead to slower capital investment.

Price pressure is coming from rising material costs, due to global factors, a significant uplift in demand from post-natural disaster rebuilding efforts, as well as the introduction of import tariffs on steel, aluminum and lumber products. In addition, there are a large number of significantly sized projects in the local development pipeline.

The current uncertainty over material prices, most notably steel, increases the level of risk that contractors and subcontractors need to address when bidding for projects, as they are vulnerable to price fluctuations between pre-construction advice, bid-submission, and contract award. The likely response is an increase in bid prices to cover the risk of fluctuation, or the addition of a clause that limits the time-period a price can be held.

We recommend that project owners and contractors with projects in the earlier construction stages (planning and design) review their cost assumptions for structural, reinforcing, and other steel components, and consider price adjustments to mitigate the upward price risk. Also, project contingencies should be assessed considering recent market events.

For projects in bidding phase, project owners and contractors should review their procurement and contractual obligations for sourcing steel products for the project. In addition, bids should be evaluated with regards to the duration of price guarantees and price fluctuation clauses specific to steel products cost in to limit budget risks. Buyers could also consider options for early procurement of steel components to lock in prices.

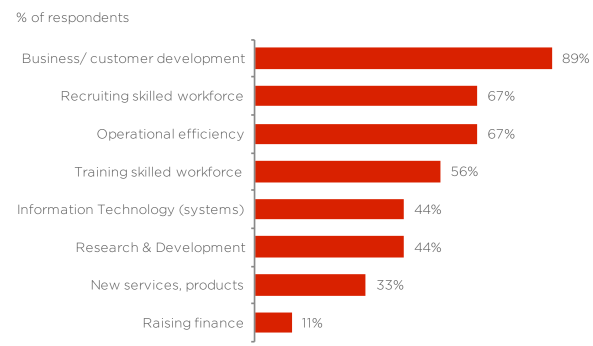
• Including early trades to secure some element of fixed price in the first stage.

• Undertake scenario planning as uncertainty and volatility in markets require greater attention to the assessment and modelling of the financial viability of developments.

Investment priorities

The industry believes that there are plenty of opportunities in the region and across sectors but, perhaps reflecting uncertainty over the growth outlook, the industry is focusing on business and customer development to achieve their business growth targets, both to retain existing and acquire new clients (fig. 27). Recruiting a skilled workforce and providing training to increase workforce skills is another key area, a direct consequence of the labor constraints experienced in the market. Two-thirds of our respondents also focus on operational efficiency in order to retain and grow margins in times of rising business and input costs.

FIG. 27: COMPANY INVESTMENT PRIORITIES TO ACHIEVE GROWTH



Source: Q2 2018 Dharam Consulting Philadelphia Construction Survey

Project performance and risk mitigation

Less than half of the respondents to our industry survey expect their workload to increase over the next five years. What will be necessary to sustain growth in a potentially slower market?

Unsurprisingly, efficient project execution ranks high on the agenda of the industry. Our survey shows the regional construction industry is somewhat divided over the efficient delivery of projects. Half of survey respondents indicate that they do not have underperforming projects, the other half do.Half of respondents report that less than 50% of their projects are delivered on time and on budget, while most see their project come in over budget.

The main reasons cited for underperformance are changes in project scope or design, inaccurate estimation of project budgets, as well as unexpected price escalations. We have seen that optimism bias relating to setting project targets, assumptions and forecasts around cost and time estimation are common in our industry. These uncertainties can be reduced via high-level risk assessment, starting at the initial planning phase of the project. We typically see an increase in performance when risk management is implemented as an integral part of project planning and the decision-making process, as opposed to a process that follows after the plan is developed and decisions are made.

The potential for project underperformance could be decreased significantly by better risk management and removing sources of uncertainty. Key factors include:

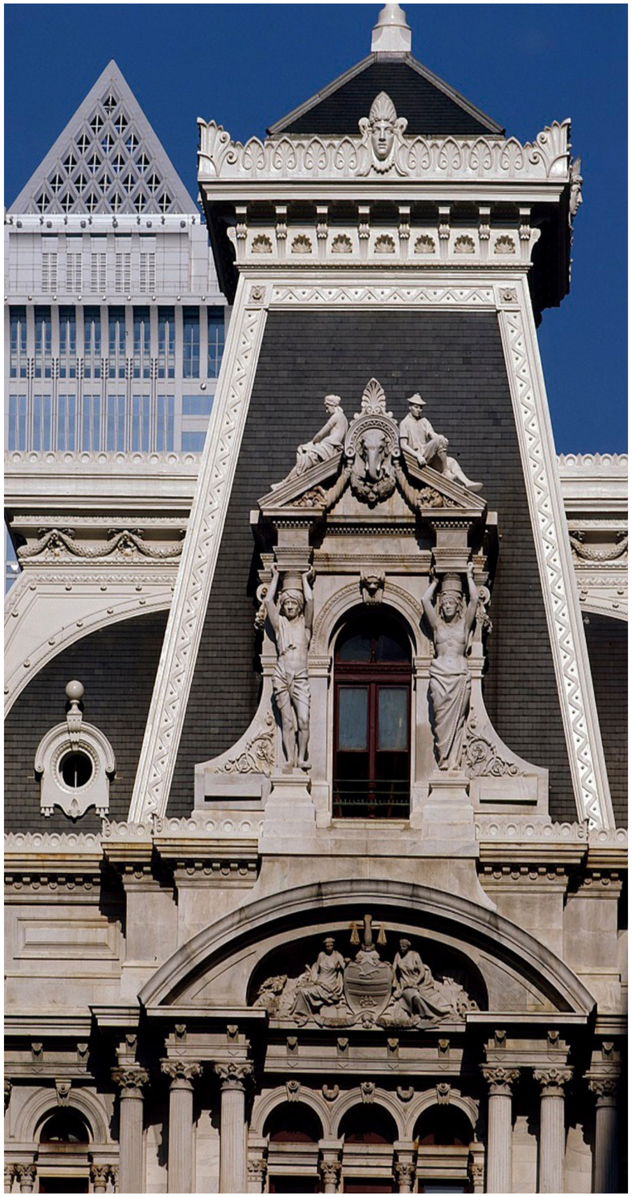
- Design completion,
- Efficient project supervision
- Finding and investing in the right people
- Considering different procurement options
- Managing interface risks.

Managing procurement complexity

Uncertain market conditions around workload and input costs mean that maintaining profit margins is a challenge for the industry. Whilst organizations manage challenges ranging from operational efficiency, organizational structuring, and skills retention to win work, they will have to maintain capacity and staff levels to remain competitive and able to deliver projects. Efficient procurement will help clients achieve their project goals and the supply chain to deliver their business targets.

Bar any major shocks, the current master-plan developments should proceed as planned, which means that procurement complexity will remain high. Client organizations and consultants should therefore invest greater effort into ensuring that their scheme attracts the best possible interest. Successful delivery requires clear thought and good planning to foster and maintain industry collaboration and to avoid adversarial relationships during project execution. Some key factors:

- Allocating a sensible timeframe for pre-qualifications and the bid period, and ensure contractors are notified in advance to enable allocation of bid resource;
- Providing clear bid information – quality documentation is emphasized, with precisely defined specifications and interfaces for example, as opposed to quantity;
- Offering equitable contract conditions, along with contract mechanisms that have positive impacts on bid price and the overall commercial offer; Appropriate use of single-sourcing or two-stage bid process according to project specifics with incentives and risk sharing; and
- Including early trades to secure some element of fixed price in the first stage.
- Undertake scenario planning as uncertainty and volatility in markets require greater attention to the assessment and modelling of the financial viability of developments.



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Dharam Consulting is an Independent Construction Consultancy specializing in providing proactive and value adding Cost and Risk Services that contribute towards successful outcomes for our clients and their projects.
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