

A woman in profile, wearing a white hard hat with "SAFETY" written on the side, clear safety glasses, and an orange high-visibility vest over a white shirt. She is holding a tablet computer. In the background, another worker in a white hard hat and orange vest is visible, slightly out of focus. The setting appears to be a construction or industrial site.

Investing for a sustainable recovery

**INTERNATIONAL CONSTRUCTION
COSTS 2021**

Foreword

The Arcadis International Construction Costs 2021 is published while COVID-19 still continues to afflict the world. Vaccination programs will make a huge difference as they are rolled out in many countries, but it is clear that the road back to business as usual will be long and hard.



Our research for ICC 2021 was completed during the second, much stronger wave of the pandemic. Encouragingly, we have found that most construction markets have remained stable during the year, showing high levels of resilience in the face of extreme market disruption. This year's index varies from last year's iteration with European cities led by Geneva taking the top five spots due to currency fluctuations in 2020 as well as a recovery in prices of commodities. With modest levels of inflation and some spare capacity, construction industries in most countries are well positioned to make their contribution to recovery. This is important, because as world economies slowed because of the pandemic and associated lock downs, many governments have opted to investing in infrastructure as part of their recovery to create jobs, stimulate the economy, and to accelerate a sustainability transition.

With large capital investment programs being proposed in many countries, it is critical to focus the recovery on creating long term value from the investments by choosing the right programs and by delivering them as productively and with as much certainty as is possible. These investments must also make their contribution to Net Zero Carbon targets. While this past year has focused so much attention onto the public health crisis, climate change and the urgent need for carbon reduction is rightfully our greatest challenge and number one priority.

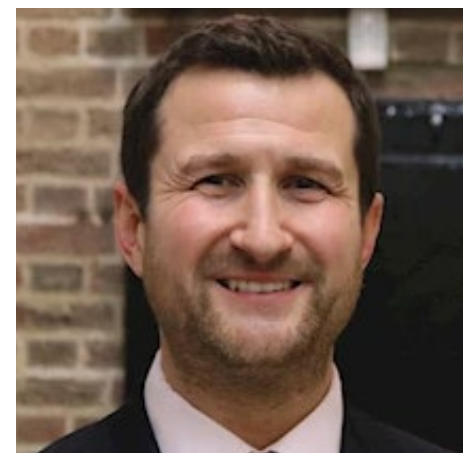
Successful investment relies on well-informed choices and decisive action. A sense of urgency is needed not only due to climate change but also to capitalize on the positive investment environment (cash rich) we have currently. With the capital cost of projects likely to increase once the true extent of measures towards carbon neutrality and future proofing are factored in, greater scrutiny needs to be place on efficiency, productivity and delivery routes to enable projects to continue to be investible against conventional means.

Arcadis has created a five-point plan to guide clients and their project teams to define and deliver their project requirements in the context of a broader assessment of value. It is important that in this recovery, the right projects are taken forward to deliver maximum benefit. This requires a more disciplined way of looking at value, selecting projects on the basis of their benefits and affordability. It is also important to ensure that projects are set up to deliver on client and stakeholder expectations which includes sustainability, social value, as well as return on investment.

The pandemic has had a huge impact on our markets. Recovery will be slow and uncertain, but the construction sector has a critical role in supporting it. Bold and pioneering decisions that demonstrate leadership are needed to make the step change towards sustainability and a shift toward whole life cycle things as well as sustainable metrics in its broadest

interpretation. We will excel by delivering the right investments to plan, program and budget. Being clear about requirements and making the right choices are the first crucial step to delivering these outcomes.

At Arcadis our mission is to improve quality of life by helping clients design, create, operate, and future proof their assets. We help our clients create value from their investments for both the short and the long term amid various risks and uncertainty of events.



Andrew Beard

Global Head of Cost & Commercial Management

The Arcadis International Construction Costs Index 2021



Our 2020 International Construction Cost Index was published at the outset of the COVID-19 pandemic. One year later, we see a full spectrum of the economic consequences, and while circumstances remain challenging, we can also say that the construction industry has proven incredibly resilient in the face of multiple national lockdowns, public health restrictions, and temporary supply chain breakdowns. Where possible, new ways of working have been introduced, with interventions ranging from staggered shifts to wider adoption of digital tools – not only for communication, but also for example for surveying and safety checks. Both clients and contractors came together and collaborated closely during this challenging time. As a result, no major deflationary episode was reported, and prices held steady, signaling that the sector is in relatively good shape. However, challenges are emerging and the path to full recovery will be bumpy.

Throughout 2020 we saw governments taking unprecedented steps to protect their economies. As attention shifts from managing the crisis towards stimulating the recovery, capital investment will be used in many locations to create jobs and increase productivity. This is likely to be reflected in increased demand for economic infrastructure, as well as healthcare and education. Construction will both be a big beneficiary and contributor to this process. By contrast, the private sector, except for the residential, will lag. Whilst some new commercial investments will require reappraisal in the view of trends that emerged during pandemic, such as working from home or shopping online, it is likely that other opportunities will come from the updating and repurposing of existing assets.

Despite the disruption caused by COVID-19 including the delay to COP26, there are positive signs that progress towards Net Zero Carbon priorities has accelerated during the year. The circumstances are encouraging too, with the U.S. re-joining the Paris Agreement and China committing to be net-zero by 2060. Given the large post-COVID-19 investment programs proposed by many governments, the public sector will have a key role in driving transition to a more sustainable built environment. This will include the design and specification of new assets as well as targets, including the Nationally Declared Commitments, regulatory tools (such as nZEB in the EU or Future Homes Standard in the UK) and financial incentives such as carbon pricing.

The positive outlook for construction in 2021 is underpinned by a wide range of public investment. Governments recognize the wider contribution that construction makes to national economies through the creation of jobs and support to domestic industry. During lockdown construction work was allowed for continue in many countries. Because of this, capacity of the supply chain was largely retained, although there are some challenges ahead. In locations that depend on migrant labor, particularly in Asia, some pressure around workforce availability can be anticipated as many workers will have returned to their homeland. Furthermore, those that return will face border closures and other precautions when returning to work. There are also risks arising around the commodities and materials availability. Finally, even as vaccinations are rolled out in some countries, social distancing on sites will be required for some time and will continue denting productivity – albeit to a smaller extent than in the first half of 2020.



Watch out for materials

During 2020 we witnessed a spectacular recovery in prices of commodities. After an initial shock caused by suspended demand, metal prices were quick to climb back, especially iron ore which gained 75% over the space of few months. By the end of 2020 higher commodity prices had passed through to manufactured goods, with the price of steel sections increasing in Europe by around 25%. This increase is the result of a combination of factors – the slow restart of the steel manufacturing capacity coincided with lower output of iron ore in Brazil and, larger than usual demand both from China and Europe. Prices of timber and other products associated with housebuilding have also increased in many markets too. While the depreciation of the dollar by an average of 7% during 2020 has shielded many markets from the full effect of these increases, they are likely to feed through to an increase in building costs during 2021.

In short-term, prices are likely to increase, until the capacity of supply chains is fully restored. The resulting temporary material shortages might also cause delays to ongoing projects. However, in the mid-term, prices are likely to stabilize – although the scale of demand created by the economic recovery programs and infrastructure projects will need to be monitored. In the long-term, we do not expect a major inflationary drive from commodities. However, the production of many construction materials is carbon intensive and NZC targets are likely to be inflationary. Carbon prices have increased by 60% over the past year and manufacturers will increasingly need to invest in low-carbon manufacturing processes. The transition to a net-zero manufacturing practices will take time and will come at a cost. However, it should begin sooner rather than later.



2021 will be a year of re-construction and re-invention. Governments throughout the world need to channel worthwhile investment into affected communities quickly, and the construction sector has a crucial role to play. COVID-19 proved that our sector can be collaborative, it can adapt to change and go digital if needed. This year will be about embedding these practices for good.

Our *International Construction Cost Index for 2021* covers 100 cities and this year we have included new locations from Europe – Vienna, Oslo, Lyon and Nice.

Geneva is the most expensive location, followed by London and Copenhagen. In general, the top 10 is dominated by the European locations. New York, Hong Kong, and San Francisco are also in the top 10, albeit in lower positions. This trend has been driven by significant currency movements, which this year have had more impact on the rankings than construction price movements.

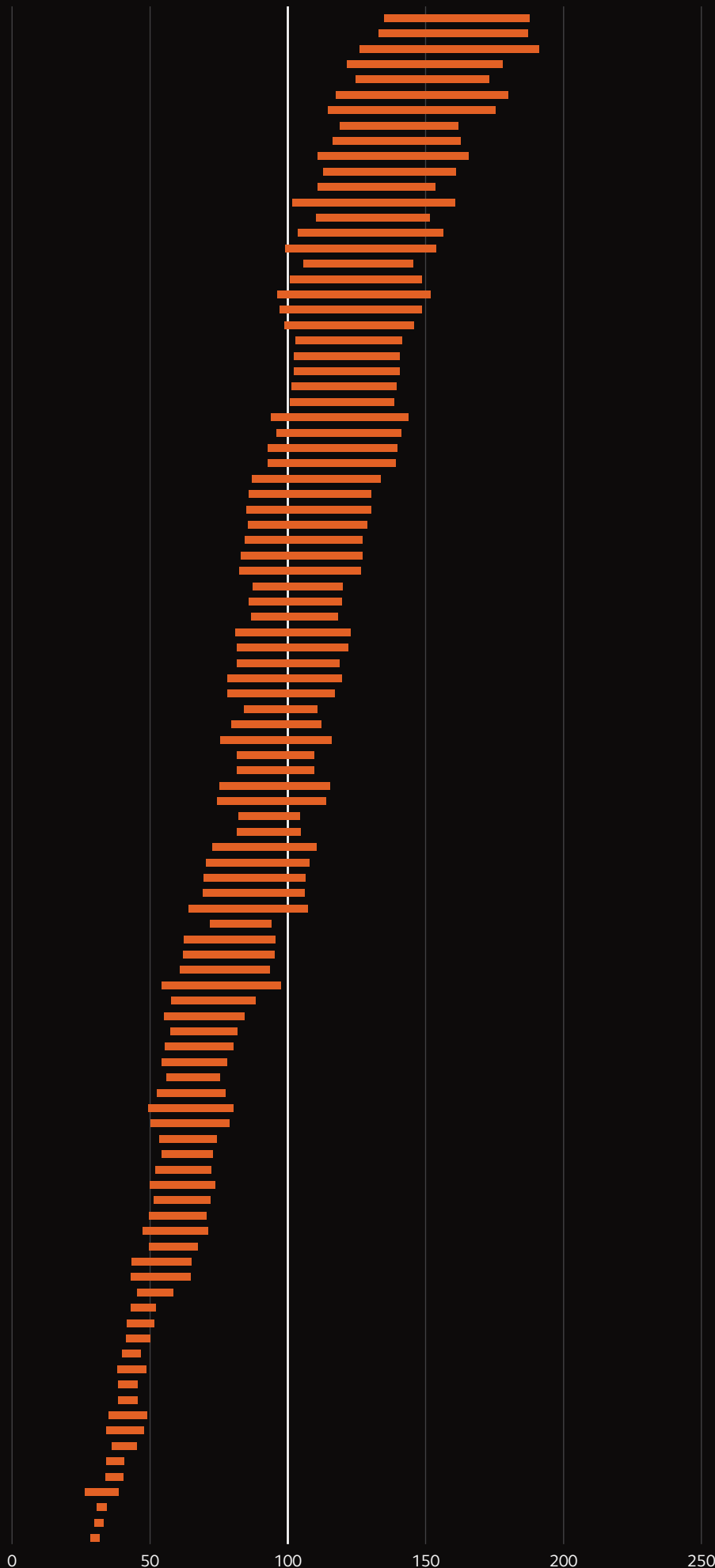
The U.S. dollar has been relatively strong for several years, and in the early stages of the pandemic, it rose on the back of safe haven status. However, since April 2020, there has been a marked depreciation, reflecting to a degree the impact of the U.S. Fed's ultra-low interest rate guidance. As a result of a cheaper dollar, construction costs in the U.S. have fallen relative to other locations, and U.S. cities have shifted down the index. The depreciation of the dollar also affected the positions of cities in countries with a dollar peg, including the Middle East and Singapore. The Euro and other European currencies are up by 10%, with Sterling and the Australian Dollar also seeing material gains.

A further striking aspect of the 2021 ICC is price stability. In the past, when demand for construction has fallen, construction prices have fallen sharply. Even after the huge disruption in markets last year, this has not happened. This is a very positive outcome, leaving markets in a healthier state than might have been the case. Prices are largely flat, with some adjustments for quality and performance enhancements in some markets such as the Near Zero-Energy Buildings directive in the EU.

On the back of a weaker dollar, there are fewer opportunity locations for the dollar-denominated investors in 2021. Nevertheless, 2021 is a good time to enter the market before public-sector infrastructure programs soak up capacity and start to crowd-out other investments. On top of the inflationary effects of increasing demand, investors should also bear in mind emerging evidence of the premium costs associated with new near-zero carbon regulations.

International Construction Cost Index 2021

Annualized TPI Q1 2021



Geneva	1%
London	0%
Copenhagen	1%
Oslo	1%
Zurich	1%
New York City	2%-3%
San Francisco	4%-5%
Hong Kong	-3%
Dublin	1%-3%
Macau	-2%
Tokyo	0%
Stockholm	0%
Auckland	0%
Bristol	1%-2%
Munich	1%
Boston	3%-4%
Manchester	1%-2%
Nice	1%
Christchurch	0%
Philadelphia	3%-4%
Paris	1%
Birmingham	1%-2%
Liverpool	1%-2%
Edinburgh	1%-2%
Cardiff	1%-2%
Glasgow	1%-2%
Seattle	5%-6%
Lyon	1%
Sydney	-1%
Vienna	3%
Chicago	1%-2%
Brussels	0%
Los Angeles	1%-2%
Frankfurt	1%
Berlin	1%
Washington DC	2%-3%
Las Vegas	2%-3%
Belfast	1%-2%
Moscow	4%
Riyadh	2%
Melbourne	-1%
Brisbane	-3%
Amsterdam	-4%
Ottawa	2%-3%
Perth	-2%
Singapore	10%
Seoul	1%
Toronto	2%-3%
Rome	1%
Milan	1%
Detroit	1%-2%
Denver	1%-2%
Abu Dhabi	0%
Dubai	0%
Adelaide	-1%
Phoenix	1%-2%
Miami	2%-3%
Montreal	2%-3%
Santiago	3%
Doha	0%
Memphis	1%-2%
Dallas	2%-3%
Houston	1%-2%
Zagreb	0%
Bucharest	3%
Sofia	0%
Prague	0%
Sao Paulo	5%
Rio de Janeiro	5%
Warsaw	3%
Lisbon	2%
Belgrade	1%
Istanbul	10%
Barcelona	2%
Krakow	3%
Madrid	2%
Porto	2%
Malaga	2%
Kiev	8%
Buenos Aires	40%
Manila	5%-7%
Bogota	1%
Mexico City	2%
Athens	0%
Beijing	5%
Shanghai	5%
Bangkok	0%
Jakarta	0%
Hangzhou	5%
Shenzhen	5%
Guangzhou	5%
Johannesburg	3%
Nairobi	3%
Chengdu	5%
Wuhan	5%
Ho Chi Minh City	2%
Kuala Lumpur	0%
Mumbai	3%-5%
New Delhi	3%-5%
Bengaluru	3%-5%

Investing for a sustainable recovery



The past year has been one of disruptions in numerous areas of life and particularly economic as countries locked down to prevent the spread of the COVID-19 pandemic. Millions shifted to working from home and across many industries, businesses were forced to adapt in unexpected and unprecedented ways. Construction is one industry that, in most countries, was able to continue functioning on-site after implementing safe ways of working. In fact, our sector was key to maintaining continuity of economic activity in many countries. Moreover, the construction industry has played a critical role in making many of the adjustments and shifts that the world had to undertake to function amid the “new normal” which included prioritizing the build of health care facilities, growth in data centers and logistics, among others.

Inevitably, the national debt of most countries has soared with the enormous costs of lockdown and the wider health response to the pandemic. For many economies, the leveraging will continue to facilitate an economic recovery. This will include investment in infrastructure and energy transition, as well as other priorities that were the focus before the pandemic such as sustainability and reducing inequality in their societies.

Recent estimates, for example by the World Bank, show that global GDP contracted by around 4% in 2020. However, there is evidence that the construction markets across the globe have remained stable and resilient despite the unprecedented disruption to economic activity resulting from COVID-19. Moreover, construction has played a key role in the short-term economic recovery efforts launched by many governments, supporting jobs and businesses at a local level. It has remained a positive lever to spur economic activity and investment into cities and communities for priorities such as the shift to active travel during the pandemic.

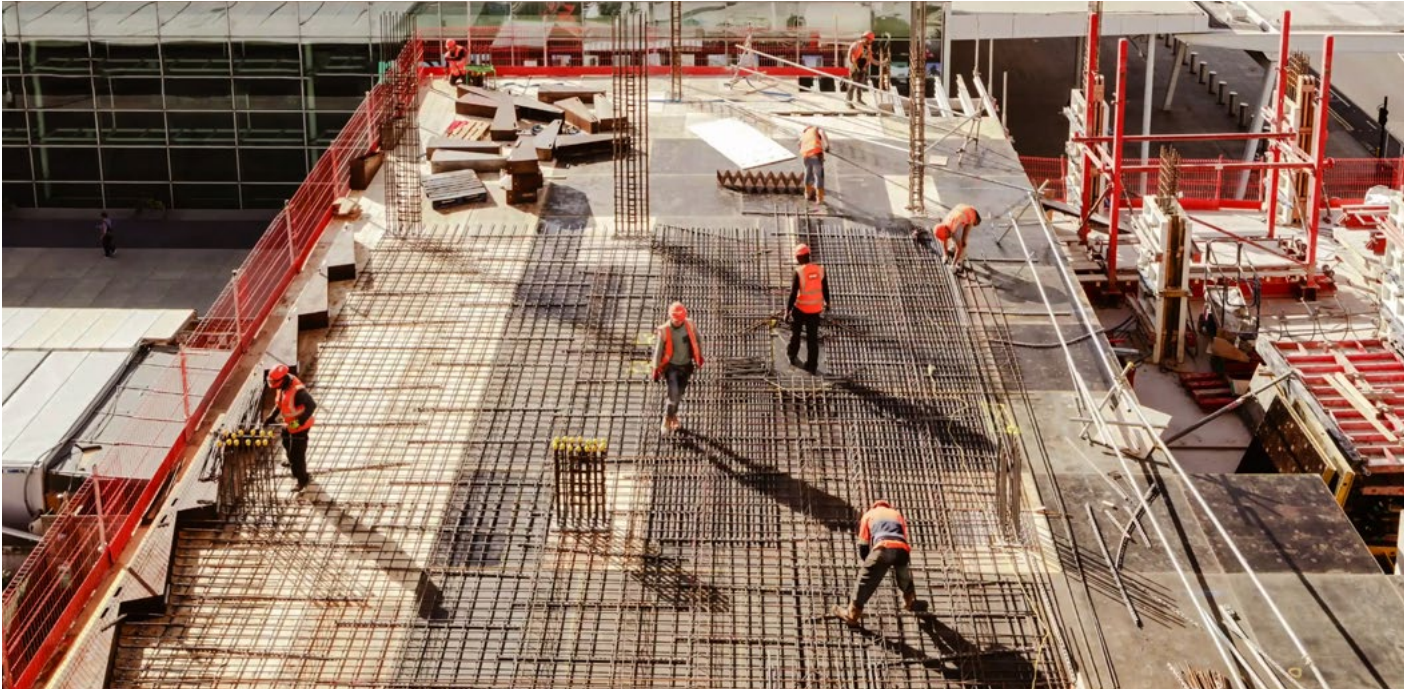
As we start to plan for the recovery phase, many governments including the U.S. and the UK are planning “Build back better” recovery plans focusing to a large degree on infrastructure projects to create jobs, spur economic growth, and focus on sustainability efforts. The flow of private and public funding in this industry has kept millions of people in work, delivering significant projects such as continuing investment in the ten transport network across Europe. Many details of the new programs, such as the \$2 trillion U.S. infrastructure program, are still being determined. Given their scale, there is a unique opportunity to delivery an optimized balance of economic, social and environmental value through these initiatives. However, this needs to be planned in from the outset.

This discipline of planning is a vital step, particularly because of the long-term challenge of climate change. The health crisis has of course been at the forefront of attention in the last year, but our greatest challenge remains the net zero challenge. According to the [IEA](#), 39% of the world’s greenhouse gas emissions are associated with the creation and use of new and existing buildings and infrastructure. We are less than ten years away from the EU 2030 climate target plan that aims to substantially reduce carbon emissions, and yet we are still delivering assets that will require retrofit before 2050 to make them NZC compliant.



The transformation will require many steps including the adoption of industrialized construction to minimize waste, the substitution in all markets of carbon-intensive materials like cement and the adoption of low-carbon electrical and hydrogen-powered plant as part of the construction process. This is a shared challenge across many markets but will be particularly difficult to implement in emerging markets where access to low-carbon resources, products and machinery is so much more limited. Perhaps as we emerge from the emergency conditions of the pandemic, the industry can truly wake up and act so the transformation now can carry us forward to a “construction in a net zero carbon economy” after 2030.

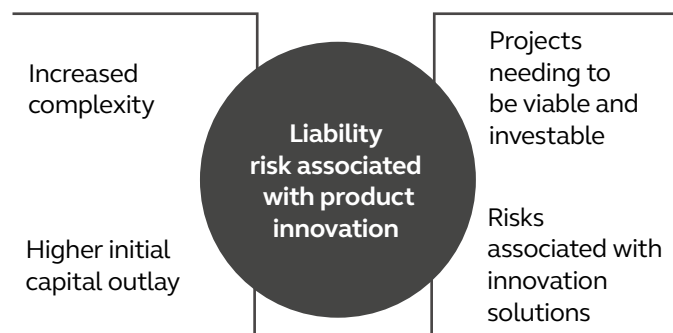
Consequently, it is imperative that our sector plays its part by reducing its own greenhouse gases and by supporting the green and carbon neutral policies that are being promoted by many governments. This is important for our long-term resilience and license to trade. Societal expectations are shifting, and there is a growing expectation that sustainability should be an integral part of how industries and businesses function. This includes the vital aspect of social value for all citizens. The pandemic has heightened awareness of engrained social divides, resulting in a renewed urgency for action to be taken to address long-standing inequalities. The recovery should strive to be as all-encompassing and beneficial as possible.



This current opportunity to leverage planned levels of investment to transform the construction industry into a sustainable one is crucial. With government deficits in some countries at record levels, it is uncertain for how long large-scale infrastructure investment programs can be maintained. Therefore, it is imperative to maximize the value of the investments now and create lasting change in the industry that enables a more productive, inclusive, and sustainable future. This will equip the industry to be better positioned for tougher economic times, should they emerge.

Building back in a way that ensures longer term benefits will hinge crucially on the adoption of a broadly based and evidenced value framework to optimize the investments that are being made. This entails maximizing existing forms of productivity and innovation so that investment programs are viable and affordable as well as incorporating new technologies that contribute to solving the climate change crisis. Creating a blueprint that places a high priority on increased productivity and optimal value creation will help to ensure that the industry is well equipped to continue to deliver future benefits, even as the scale of investment is reduced, and tougher choices on project priorities need to be made.

That said, it has been recognized that the additional investment associated with sustainable construction will remain somewhat commercially challenging until solutions are delivered at scale. This has been illustrated by the rapidly falling costs of wind and electric power and will be repeated across other sectors. Moreover, the long-term benefits of low-impact development are substantial, and the tide is turning to where stakeholders including investors and voters are rewarding the low carbon pioneers with their support including lower-cost capital. However, clients are at different points in their “net-zero journeys” and some of the shared issues which they face include:



Nonetheless progress should continue. To help guide the optimization of projects and to increase the certainty of their delivery, Arcadis has developed a five-point project delivery plan combining well established practice with digital tools and value-based thinking. The five-points of the plan equip clients and their project teams to define and deliver their project requirements in the context of the broader assessment of value set out in this paper:

5 Point Plan



Understand the context: prioritizing the objectives and defining value.

- Build a 360-degree view of the value that your investment could deliver informed by data.
- Record the main objectives and consider what the trade-offs are in delivering your objectives including, sustainability, productivity, and innovation.
- Prioritize the objectives and select the value drivers that support them.

Detail the requirement: bridge deliverables with the outcomes.

- Build a holistic view of how all the parts of the project contribute to the objectives and identify functional requirements and constraints.
- Develop a detailed understanding of the requirements and the direct relationship to the expected benefits and CAPEX/OPEX implications.
- Develop a business case based on value drivers and create a value framework.
- Prioritize the requirements understanding interdependencies.

Optimize the solution: balance nice-to-have with must-have.

- Design a solution that addresses all anticipated outcomes, identifying technologies and innovative approaches that can best meet the requirements.
- Use cost and value drivers to fine tune the design, including the prioritization of investment as well as the efficiency of construction and operation.
- Define optimal solution and update value framework in accordance with it. Identify the metrics you will use to monitor the progress.

Choose the most appropriate delivery route.

- Review supply chain capability and get the understanding of the available delivery routes.
- Align procurement route and commercial and contract strategy to incentivize the value chain to leverage technology, manufacturing principles and innovation.
- Ensure assembled team has all required skills – not only technical but also soft skills needed to facilitate and coordinate the delivery.

Measure performance and success.

- Monitor progress in real time against the expected benefits, correct any divergence as soon as it arises.
- Review and sign off performance requirements confirming outputs have been delivered and long-term performance is assured.
- Continue the evaluation of benefits delivery during and post-occupancy.

Adoption of the five-point plan will help to increase the certainty of delivering best value from an investment, ensuring that objectives are met.

Construction's contribution to the global recovery from the COVID-19 pandemic cannot be understated. The ability of the industry to ramp-up employment and to channel expenditure through local economies is a vital asset in an economic downturn. With big plans for an investment-led recovery across the global, we can be certain that our sector will be in the spotlight and will be expected to meet raised expectations with respect to quality, safety, and the impacts of our work on the environment. Irrespective of where the work is located, whether it is new build or retrofit, or whether the project is a humble home or a high-speed rail network, there is a responsibility to stakeholders and to society as a whole to ensure that the work is done in a sustainable and efficient manner with long term performance and benefits in mind.

Construction around the world

A deep dive into a select group of markets which have shown noteworthy changes and initiatives during the last year.



John Batten III
Global Cities Director

Cities continue to be on the front-line of the COVID-19 crisis as it unfolds. Cities have seen the most severe economic impacts, as lockdown and social distancing has emptied commercial districts and severed global commercial ties. But cities are likely to be the focus of recovery efforts too when the crisis comes under control. City center assets may need repurposing and big efforts will need to be made to ensure that transport systems and other critical infrastructure are safe and ready for when demand returns. We asked City Executives in some cities to highlight some of the critical developments in their city.

Asia- Pacific



Australia

A strong fourth quarter of 2020 aided by the return of demand for commodities and an increase in consumer spending helped lift Australia from its first recession in 30 years. GDP is anticipated to increase by between 3% and 4% in 2021 and 2022. The construction sector has emerged from the pandemic relatively unscathed, with an overall decrease in activity of approximately 1.6%. While the property sector declined, the value of engineering and infrastructure works increased in 2020, driven by projects mainly in New South Wales and Victoria, the economic powerhouses of the country.

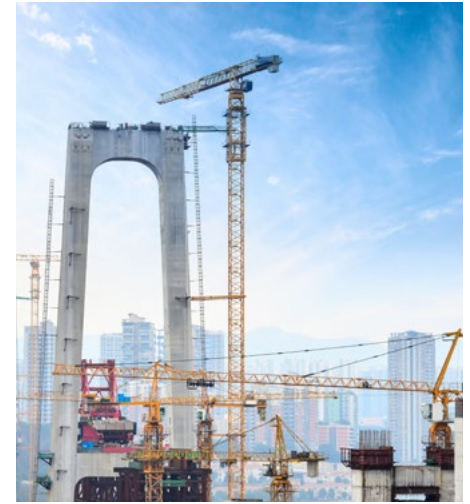
Yet, the outlook for 2021 remains uncertain, particularly as public investment in infrastructure and social housing is only likely to materialize in the second half of 2021. In the short term, we anticipate that the market will remain relatively competitive, and that slight deflation of around -1% is quite plausible. However, the distribution of the vaccine will also underpin consumer and market confidence and, as the pledged investment in Australia's economic recovery gathers pace, we anticipate strong growth within both property and infrastructure, with the construction sector approaching pre-pandemic levels towards the end of 2021.



“Continuing investment in mobility is the post-pandemic priority for Sydney.”

— Stephen Taylor, Sydney

Australian cities have successfully managed COVID-19 outbreaks through a policy of strict lockdown supported by restrictions on movement in and out of the country. Sydney has seen one major lockdown and some temporary restrictions which has meant that economic activity has not been too badly disrupted. As in many cities, commercial development slowed whereas the public sector was able to maintain pace, aided by extended working hours and accelerated planning consents. Sydney already had a large public infrastructure program in place, including major metro and urban highway developments, and this will continue to support employment and activity in the sector as Australia's recovery accelerates.



China

First to be hit by COVID-19 pandemic, China was also the first to enter the path to recovery – which started in Q2 2020. After an initial fall of 6.8%, the GDP grew overall by 2.3%, an enviable outcome in current circumstances.

Construction industry performed exceptionally and managed to achieve an increase in output of 6%, driven mainly by the investment in infrastructure and housing. There is also a strong push for creation of digital infrastructure, especially data centers and 5G networks. Following the lockdown, operating construction sites are required to include epidemic prevention practices as part of regular site management.

The outlook for 2021 is strong for the construction sector, which will continue to benefit from significant public investment. The increased demand is likely to create some inflationary pressures, especially regarding the accessibility of labor and materials. This is anticipated to translate into 5% cost increase over the coming year.

Hong Kong

The Hong Kong economy suffered from recession in 2020 and contracted by 6.1%, the sharpest annual decline on record. The economy is expected to pick up throughout 2021, although this is a subject to high uncertainty associated with both pandemic and geopolitical developments. A growth between 3.5-5.5% is anticipated, with low underlying consumer price inflation of 1%.



“The contrasting performance of cities across the Greater Bay Area highlights just how much impact COVID-19 has had on Hong Kong.”

– Francis Au, Hong Kong (SAR) and the Greater Bay Area

Citizens in the Greater Bay Area have experience to manage SARS-like pandemics such as COVID-19. Initial lockdowns lasting three weeks in most cities in Guangdong Province of Mainland China were very strict, but measures were lifted earlier than other economies. Whilst development responded quickly in Mainland China, Hong Kong saw a quite significant reversal in activity and future demand as a result of the effect of the pandemic on the wider business and commercial economy. Whilst commercial development is proceeding at a healthy pace in most of the Greater Bay Area, recovery in Hong Kong is benefiting from public sector stimulus though the construction industry is begging for more.

There has been contraction in the private sector output, and pipeline of new work remains subdued because of both lower demand and extended periods required to obtain permissions to commence construction work. Despite increased investment from public sector, lag from the private investors is likely to create, at least temporarily, a deflationary landscape for construction in Hong Kong in 2021.

Overall, construction activity fell by 4.5% during 2020 with the full impact of the contraction being cushioned by a 13% increase in the value of public sector contracts. The housing market remained active, with total stock growing by about 1.8% during the year. However, delays caused by COVID-19 are delaying projects, as highlighted by a recent extension to building covenant deadlines. Despite the very significant growth in public sector investors, the lag from private investors is likely to create, at least temporarily, a deflationary landscape for construction in Hong Kong in 2021.



India

Prior to the pandemic, India was one of the fastest growing economies in the world. COVID-19 brought a decline in GDP of 5.7% - this is similar to values reported by some of the most developed countries and a proof of resilience. In 2021 strong growth of approximately 10% is anticipated.

Construction output declined by 30% because of COVID related restrictions, but government’s commitment to continue with significant investment in infrastructure (\$15 billion in 2021) creates a positive outlook for recovery. Another source of workload will come from investment in the healthcare sector. There is a confidence that as consumer demand returns, so will the private investment, especially in residential and industrial sectors.

The construction sector, especially in big cities, depends heavily on the migrant workers, many of whom returned home during pandemic. As such, there is an expectation of a slight inflationary pressure from labor. However, in combination with elevated demand, it is still likely to result in 3-5% inflation in 2021.

Philippines

The economy of Philippines experienced a substantial contraction of 9.5% which was caused mainly by slowdown in construction, real estate and manufacturing. The recovery is expected to be achieved by the end of 2021, when the services sector regains its capacity and demand comes back to manufacturing and construction. The latter decreased by almost 40% with many new projects put on hold, and the ones in procurement and design are significantly delayed. Further, site closures as a results of lockdown also contributed significantly to the decrease.

Growth in the construction sector in 2021 will come mainly through public sector spending within the programs focusing on increasing resilience in the “new normal.” The areas of focus would be education and healthcare facilities, as well as increasing regional connectivity and expansion of digital infrastructure. While there are no major inflationary factors on the horizon, prices are still expected to increase by average 6% this year, caused by additional project site safety procedures and reduced productivity on site.

Singapore

As a global trading nation, Singapore was hit particularly hard by COVID-19, with the economy shrinking by 5.4% in the year, a record contraction and the first downturn since 2001. Manufacturing expanded by 7.3% in the year, but both services and construction shrank. The economy recovery is expected to be gradual in 2021, GDP is expected to grow by 4% to 6%.

Construction was the hardest hit sector, the total construction demand contracted 37% to \$21 billion in 2020. Both the public sector and private sector were hard-hit, partly as a result of the ‘circuit-breaker’ lockdown introduced in April 2020 to manage the impact of the pandemic. The Singapore government has been very proactive in its response to the crisis. Close to \$100 billion budget has been committed on various aspects of support to households and businesses in 2020. Furthermore, the government was very quick in introducing legislation to suspend the operation of penalty clauses in contracts, sharing the burden of disruption more fairly between clients, contractors, and their supply chain.

At the height of the pandemic, Singapore saw significant inflationary pressure due to the absence of migrant workers as well as the loss of productivity arising from complying with safe management measures. With a gradual recovery forecast for 2021, Singapore will not return to levels of activity seen in 2019 until at least 2022. As a result, construction cost is expected to be on the upward trend in 2021.



Vietnam

Vietnam was one of few countries which managed to expand its economy in 2020, with GDP increasing by 2.9% and projected to further grow by 9.3% in 2021. This exceptional outcome can be attributed mainly to strong performance of manufacturing and infrastructure investment.

Construction activity decreased by 5% and is poised for a sustained growth of 7.7% on average between 2021-24. This forecast is supported with significant public investment aimed at improving regional connectivity through expansion of transport network, especially rail. Government is also proactively encouraging public private partnerships, especially in the housing sector, in response to accelerating urbanization. Vietnam has sufficient construction labor available, however some pressure is likely to come from the commodity markets and result in a cost increase of approximately 2% in 2021.



Europe

The European Union

COVID-19 had varied impact on the economies of the EU countries, where GDP was hit most in France, Spain, and Greece, but to a much lesser extent in Poland and the Netherlands. On average, the economies contracted by 6.3% in 2020. Ireland was the only outlier with an increase of 3% recorded. Following the approval of \$808 billion recovery fund, hopes are increasing for a recovery this year, with the forecast of 3.7% average growth in 2021.

The EU remains committed to a green transition, and 37% of the post COVID-19 stimulus has been ringfenced for projects that support climate change mitigation objectives. In the context of construction industry, the regulations regarding Near-Zero Energy Buildings became effective for all new buildings from January 2021 (they were in place for public buildings since 2019). Even though each member state is left to define exactly its criteria for the energy performance of new buildings, these new requirements create a cost premium and have been accounted for in this year's index.

The EU Construction sector performed in varied ways in 2020, depending on the extent and duration of lockdown restrictions in particular countries. France and Italy were among the ones with the deepest contraction and monthly construction output fell by 50% at the peak of pandemic. By contrast, Romania noted an overall 9% increase in construction output. Across the EU construction activity has fallen by approximately 8% and it is not likely to recover before the end of 2022, even in the hotspots like Ireland or the Netherlands. Infrastructure and residential sectors are expected to bounce back first, while non-residential buildings, especially outside public sector, will lag.





“Investments in the reduction of carbon emissions will play a big part in the COVID-19 recovery – \$8 billion are devoted to the energy renovation of buildings including \$553 million that has been pledged for social housing retrofit alone.”

– Nicolas Boffi, Paris

Paris

Construction did face a significant slowdown in Paris as a very deep lockdown was enacted in Spring 2020. Since then, normal working has largely resumed and much of the backlog has been recovered. Similar to the UK, construction is seen as an integral part of the recovery. In particular in French cities like Paris, there is a particular focus on the promotion of skills and capacity required to renovate and reduce the carbon footprint of existing buildings.

Paris will continue to benefit from investment programs ahead of the 2024 Olympics including housing programs to address a growing need. The uncertainties around the future of offices are multiplying with the development of teleworking. Initiatives to transform offices into housing are supported and were notably the theme of Réinventer Paris 3. The transformation of offices into housing is a lever to meet the growing demand for housing but also a way to boost innovation and economic dynamism.



“In addition to the problems of COVID, project teams also had to deal with uncertainty associated with nitrogen emissions, which has delayed many projects.”

– Carolien Gehrels, Amsterdam

The handling of COVID-19 in Dutch cities like Amsterdam was very similar to that in Germany, with risks being managed on a project-by-project basis, which in some cases did result in extended program times. Activity volumes had already fallen in late 2019 as a result of a court decision that prevented the issue to contractors of permits for nitrogen emissions. This led to delays affecting projects across all sectors including housing and transport. These same sectors will be a big priority for recovery, supported by the \$24 billion ‘Grow Fund’ alongside investment in the conversion of commercial buildings into mixed-use residential.



“Berlin has access to a wide range of financial resources that will support the City’s Energy and Climate Protection Program.”

– Birgit Detig, Berlin

Germany’s response to the first wave of pandemic was very successful, and this could be seen in the performance of the construction sector, which was barely affected by the COVID-19 crisis. Contractors developed their own safety solutions and were able to maintain progress, contrasting with other European cities in France, Italy, and Spain where shutdowns were more widespread. Berlin already had long-term infrastructure investment plans in place, mostly focused on mobility. These will continue and will of course make a significant contribution to the future operation of the city. In common with the rest of the EU, Berlin will have seen the introduction of tighter regulations associated with near-zero energy standards (nZEB). In addition to regulatory requirements, clients in Germany can access low-cost funding to support investments in low-carbon construction – particularly that associated with retrofit.



“London’s recovery from COVID-19 will be driven by the encouragement of inward investment rather than by increases to the local tax base.”

– Peter Hogg, London

London will be a beneficiary of the UK’s rapid vaccine roll-out, but at time of writing, the city is only just emerging from a national lockdown. Construction activity in the city was sustained through most of the COVID restrictions once sites opened after a precautionary lockdown. Effective safety measures have enabled productivity levels to recover, and the construction sector has been singled out as a major contributor to the ‘Build back better’ initiative. The residential market has been buoyant through the year, supported by government intervention and global investment into mid-market build-to-rent. By contrast, the focus for investment in public transport is likely to shift away from London to other UK cities in line with the Government’s post-Brexit ‘leveling-up’ agenda.



United Kingdom

The British economy was hit most significantly among the G7 group in 2020 and recorded a contraction of almost 10%. This was due to high dependence of GDP on the hospitality and leisure services sector and equally high level of urbanization – both factors vulnerable to public health issues. The prognosis is for a 7.3% bounce back in 2021, which – similarly to other countries – will be underpinned with strong investment from the public sector.

Construction decreased by approximately 13% and it is forecasted to recover to pre-COVID levels only in 2022, supported by a dynamic growth in infrastructure, housing, and industrial sectors. While trade deal between the EU and UK removed a significant portion of uncertainty, the private sector will still need some time to regain confidence, especially in the view of trends accelerated by COVID. In the short-term the construction market in the UK will remain competitive, with subdued inflation of 1-2% predicted for 2021, mainly driven by the limited availability of materials. Current circumstances favor investment as supply chains look to secure workload and are not yet busy with public sector projects.

North America



“The impact of COVID-19 will go beyond immediate impacts on construction to a wider reappraisal of drivers behind residential and commercial development.”

– Peter Glus, New York

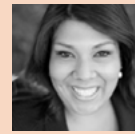
New York City saw a significant reversal in private construction markets as the wider impact of the lockdown coincided with a post-peak slowdown in commercial markets. Public funding in the early stage of the pandemic was scarce and as a result, there was less opportunity to pump-prime the recovery through capital programmes. However, with a large slice of the \$1.9 trillion Federal Stimulus program being targeted at large cities like NYC, prospects are much brighter in 2021.

United States

Despite the dramatic course of the COVID pandemic, the U.S. economy recorded a relatively mild contraction in the range of 2.4%. It has now entered the recovery path, supported with a record \$1.9 trillion stimulus package and a very rapid vaccine roll-out. The Federal Reserve committee is predicting a growth of 4.2% in 2021, but the expansion pace will slow down after 2021 to around 3%.

The construction sector entered 2020 in a strong position, with output in real terms at the highest levels since 2008 and employment on equally record high levels. The second quarter of 2020 saw the pandemic taking its toll, but the volume of the construction market still managed to increase by 1% compared to 2019, driven by the strong demand from the residential sector supported by low mortgage rates.

The outlook for 2021 is to an extent uncertain – while the residential sector is expected to continue to blossom, there will be some contraction in commercial areas. Whether part of the stimulus will be used by the local governments to invest in health, education and infrastructure remains to be seen. The returning demand will be met with challenges – costs of materials and access to skilled labor can make for a bumpy ride.



“In LA, it is clear that programs associated with the 2028 Olympics, resiliency and active travel have got the golden ticket so far as post-COVID prioritization”

– Macaria Flores, Los Angeles

California cities including Los Angeles and San Francisco have been emerging from a second wave lockdown introduced in December 2020. However by March 2021, many indoor facilities including dining, gyms and offices have reopened. Construction sites closed for one week at the start of the first lockdown to provide a breathing space to introduce safety measures and social distancing. Some projects have been delayed in the private sector due to issues associated with funding and shifting demand, but it has also been possible to bring forward some infrastructure projects. Looking forward to the recovery, stimulus provided at all levels from city, through state to federal funds, will play a major role. However, it is too early for the allocation of funds to have been finalised. One thing that is certain is that the recovery in California's cities will have a very strong net zero component, with the State Legislature keen to use its powers to jump start sustainable construction.



United Arab Emirates

GDP contracted in the United Arab Emirates (UAE) by 6.6% in 2020 - the first time since 2009. The construction industry is expected to rebound in 2021, with expected growth of between 2-3 % following the declines of 2020. The UAE will continue to benefit from Government measures to strengthen the economy, with the construction sector receiving a boost due to the initiatives associated with Energy Strategy 2050, the Sheikh Zayed Housing Program and the Emirates wide Tourism Strategy. The historic normalization of relations with Israel will also open up opportunities for investment and the countries have agreed a joint strategy to boost co-operation in the energy sector.

Saudi Arabia

Despite its exposure to volatile commodity markets, the Saudi Arabia economy has emerged from 2020 in reasonable shape. Overall, GDP fell just over 4%, with most impact being felt in domestic markets rather than in overseas revenues from energy exports. Many measures were introduced to safeguard public spending programs, including an increase in sales tax from 5% to 15%. Overall, public spending has been cut by 7% in 2021. After growing by around 4% in 2019, construction output fell by around 1% in 2020. The scale of public sector programs being delivered in the Kingdom acted as a shock absorber, with progress on many of the mega projects associated with Vision 2030 being sustained during the year.

Looking forward, with the long-term development of new cities and resorts on the Red Sea coast, the mega project trend will be a significant influence on construction markets in the kingdom. Similarly, the drive to diversify the economy will see more private sector investment highlighted by the recent SAR 27tn Shareek Plan. Housing Saudi Arabia's rapidly growing population will also sustain steady demand for development in all parts of the country.



“Construction has a vital role in the Vision 2030 program and investments have accelerated to counter the effects of a global slowdown.”

– Abdallah Al Garawi, Riyadh

A quick response to COVID-19 risks on construction projects in Saudi Arabia meant that there was very little impact on progress during 2020. Measures taken in addition to the rapid implementation of site safety measures included the creation of COVID-19 safe bubbles in labor accommodation to ensure the safety of the workforce. The construction sector has probably seen a net gain as a result of post-pandemic investment with a particular focus on healthcare as well as the long-running challenge of housing a fast-growing population.



Methodology

Arcadis developed its comparative cost index for 100 cities, covering 20 building functions, based on a survey of construction costs, review of market conditions and the professional judgement from its global team of experts. Ranges of indicative prices for each building function are collected for each city. Low and high range costs are converted into U.S. Dollars (USD), normalized and indexed against the price range for each building type for Amsterdam, where Amsterdam = 100. Average low and high index ranges are calculated for each city based on the 20 building types.

The data was collected in the first quarter of 2021.

Costs used to calculate the index are based on buildings delivered to local specification standards, meeting both functional requirements and quality expectations. As a result, while the index compares the relative costs of delivering the same building functions in a city, it also reflects the different levels of quality expectation reflected in a specification.

The index does not take into account purchasing power parity. The construction cost data used in this index is current as the February 1, 2021. The exchange rates used to calculate the index were current on the February 1, 2021.

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Arcadis is the leading global Design & Consultancy firm for natural and built assets. Applying our deep market sector insights and collective design, consultancy, engineering, project and management services we work in partnership with our clients to deliver exceptional and sustainable outcomes throughout the lifecycle of their natural and built assets. We are 27,000 people, active in over 70 countries that generate €3.3 billion in revenues. We support UN-Habitat with knowledge and expertise to improve the quality of life in rapidly growing cities around the world.

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