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Introduction

Welcome to the June edition of *Voices*, a collection of insights on resetting amid COVID-19. The COVID-19 pandemic is a deep humanitarian crisis—one that is also causing unprecedented disruption across the global economy, and the impacts are likely to be felt for years. Leaders from across the infrastructure value chain are scrambling to keep their employees safe while ascertaining how their organization's finances, workforce, projects, supply chains, and operations may be disrupted.



Tony Hansen
Director of the Global
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To navigate this disruption, we need to respond promptly and rethink the meaning of "business as usual". Investing in infrastructure will likely be critical to economic revitalization, enabling a sustainable recovery for countries and the global economy. The goal of this edition and the 2020 GII Virtual Summit is to provide industry leaders with an opportunity to share insights on how organizations can best navigate the crisis, protect their core businesses, and reset for a comeback.

Over the past three months, we have continuously curated well-researched perspectives on the fluctuating situation, lessons and potential solutions from industry leaders, and sector-specific insights on next steps. These insights have been shared through a series of GII webinars, articles and interviews with industry leaders, and a virtual global summit. The best ideas are shared in this collection of Voices, which includes a recap of the sixth GII Summit, held on June 10 and 11.

We hope you find these perspectives helpful and wish you, your families, and your colleagues' resilience over the coming months. •



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A new paradigm for project planning

Owners and contractors can protect both workers and project economics by embracing a more efficient approach to project execution.



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As our society overcomes the initial shock of mandated lockdowns, physical distancing, and other measures to slow the spread of COVID-19, it's becoming clear that these precautions will not end abruptly—even when shelter-in-place orders are lifted around the world. While safety has always been a priority on the construction site, its gravity is taking on new meaning as the industry learns to navigate the immediate and long-term effects of one of the most significant global health crises in memory.

Indeed, construction laborers are watching the job site morph in front of their eyes—and those whose projects have stalled will find a very different experience from the one they left a few months prior. Personal protective equipment (PPE), on-site testing, staggered shifts, increased sanitary requirements, and a partially remote team will transform the construction industry—not only in the near term but potentially for years to come. Given that many are operating with single-digit margins, this next normal threatens project budgets, schedules, and delivery if owners and contractors fail to adapt.

Successful adaptation will require more than setting out hand sanitizer or limiting the number of workers on a buck hoist at once. It will need a fundamental change. The industry has long struggled to implement productivity improvements or fully embrace digital tools; doing so will soon become table stakes. Furthermore, owners can offset the stress on budgets and timelines by embracing a more efficient approach to project execution—that is, shifting the construction component of the engineering, procurement, and construction (EPC) curve. Most owners and contractors launch construction as soon as possible. But in many cases, they can eliminate laborer downtime and ramp up to peak productivity quicker by delaying the start until more of the commodity materials are available. This approach was advisable even before the global pandemic. but the coronavirus-fueled crisis has created a new urgency for the industry to finally change its behavior and accept a new paradigm.

The impact of COVID-19 on the construction site

The realities of COVID-19's effect on construction sites are stark. Physical-distancing requirements will significantly alter the entire on-site experience, including camp-accommodation design, bussing, canteen layouts, and line management at site entry and exit. Heightened personal safety and hygiene protocols will necessitate on-site temperature screens (and potentially random COVID-19 testing), PPE requirements, and temporary facilities such as washing stations, clean rooms, and stockrooms for masks, gloves, face shields, and so forth. Labordensity restrictions could force contractors to stagger work shifts; increase supervision of physical distancing, safety, and hygiene protocols; and extend the overall duration of construction.

All of these changes will lead to an increase in indirect costs (those not directly associated with materials and installation such as supervision, scaffolding and major equipment, temporary facilities, quality control, safety, and construction management). Typically, these indirect costs account for 35 to 50 percent of overall construction costs; we anticipate it will increase by another 15 to 30 percent. Exact costs will vary depending on project location (including whether it's urban or requires a worker camp), quality of craft, and construction methodology. It will be driven by a reduction in productivity, increased procurement (for example, of PPE), and—critically—lengthened project timelines. These costs will be built into the overall capital price for construction that owners will now bear. To ensure that projects continue to be viable for owners to develop, initiatives in other areas will be needed to counter these increases: rapidly improving in productivity, working remotely, and digitizing project delivery.

Mitigating the increase in indirect costs and schedule overruns

We see two imperatives to mitigating the additional costs and schedule overruns caused by the next normal of construction: getting serious about improving productivity using digital tools—

Successful adaptation will require more than setting out hand sanitizer or limiting the number of workers on a buck hoist at once.

particularly those that enable remote work—and embracing a more efficient approach to project execution.

Get serious about improving productivity using digital tools

While introducing initiatives to improve productivity is not new, now more than ever improving productivity will be one of the most significant elements to countering the rise in indirect costs. Many of the productivity initiatives entertained in the past have focused on time and motion studies, tool time, crane time, pipe fit up for welds, craft incentives, and daily planning.

A key component of improving productivity is more broadly embracing digital tools. Indeed, construction remains one of the least digitized industries in the world.² But digital use cases can directly address the most common challenges in construction—now exacerbated by COVID-19. Disparate working teams, less site presence, and constrained physical movement amplify the need for even better collaboration, more transparency, and more remote work. Digital twins, for example, provide a virtual replication of the site hosted in the cloud and easily accessible from any location. Drones can scan the site and update progress in the virtual reality in near real time, creating transparency on performance as well as quality issues are surfaced early, known to all, and can be swiftly addressed. The list of opportunities goes on. And if there is one thing we've learned over these past months of lockdown, it's that many jobs can continue to be performed remotely and productively. Today's technology will allow us to transfer roles that have traditionally been performed at site, such as contracts, cost control, finance, and procurement, to the home office—and there are clear cost advantages to doing so. For one, all of the site indirect costs such as camp/accommodation, food, site transportation, PPE, and rotational business travel can all be avoided. Depending on the job location in relation to the home office (such as whether that's in the same country or camp, around the world, or across the city), this cost could represent anywhere from 15 to 50 percent more than the cost of the equivalent home-office position. On the direct cost side, jobsite positions typically attract uplifts and additional paid work hours, which, again, depending on the jobsite, could cost an additional 20 to 50 percent more than a similar position based in the home office. While roles associated with construction, quality, and safety will always need to be on-site, the opportunity for substantial savings by having nonmanual employees work remotely is clear.

Embrace a more efficient approach to project execution

Often the most significant losses of productivity are a result of poor availability of work fronts—that is, the tasks that can be completed with the materials on hand at the site. Small deviations in design, for example, can have huge impacts on the availability

¹ For more, see "Reinventing construction through a productivity revolution," McKinsey Global Institute, February 27, 2017, on McKinsey.com.

² For more, see Jan Koeleman, Maria João Ribeirinho, David Rockhill, Erik Sjödin, and Gernot Strube, "Decoding digital transformation in construction," August 20, 2019, McKinsey.com.

of materials and construction work fronts, leading to craft idle time and construction delays. Time and time again, construction mobilizes too early and quickly chews up all the work fronts available—only to end up waiting on design and material deliverables to continue.

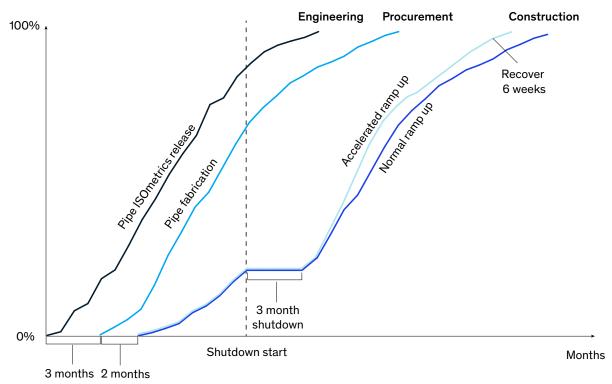
One strategic change that owners and contractors can apply almost immediately is to delay the start of construction until a far greater percentage of engineering and procurement deliverables are available. The trick is not to extend the overall duration of the project but to steepen the construction S-curve so construction starts later but still completes at the same time. By having more work fronts available when construction commences, the commodity curves can ramp up and reach peak productivity much quicker, potentially saving months in the construction duration (Exhibit 1). That can translate into millions

of dollars in indirect cost savings. Owners and contractors that master this approach could codify the efficiency changes, improve on budgeted productivity, and even accelerate projects beyond what has been possible in the past.

Consider a hypothetical gas facility to be built in the Middle East, budgeted at \$2 billion. The owner asks the EPC contractor to incorporate COVID-19 sanitation requirements and enforce physical distancing. Due to labor-density restrictions, the contractor proposes splitting the 6,000 craft workers into two shifts but warns the owner that there will be a productivity impact for the night shift and resulting delay of the construction schedule. Introducing a night shift also entails increasing the number of field nonmanual staff. The overall impact is estimated to be roughly \$105 million (5 percent of the project budget) and a loss of four months.

Exhibit 1

Contractors can mitigate the productivity loss during shutdown by adopting a more efficient approach.



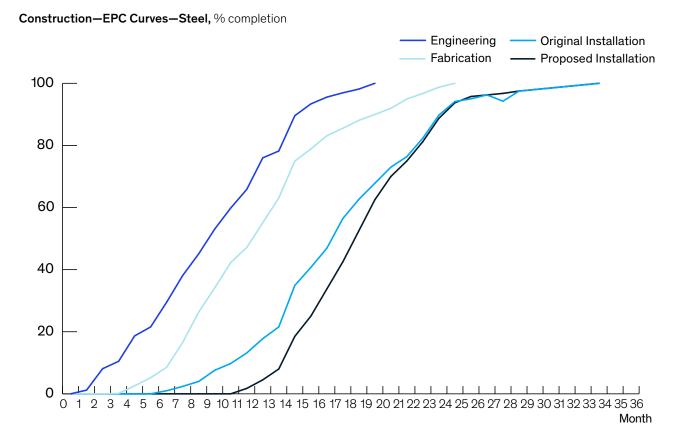
Piping release, fabrication, and installation curves

Embracing a more efficient approach to project execution can mitigate both the cost and schedule overruns. In this example, steel installation can start in month five when 50 percent of the steel is on-site, rather than in month one when just 10 percent is on-site. This allows the contractor to attack 20 work fronts at once rather than just five, steepening the construction S-curve by cutting idle time and countering the effect of the reduced productivity (Exhibit 2). Replicating this approach across all major commodities—concrete, pipe, cable, instruments, and so forth—scales the impact.

The contractor is also successful in identifying 22 percent of field positions that can be transferred to the home office, which results in additional savings.³ Positions such as contracts administration, resident engineering, the majority of procurement, finance, and cost control are all transferred. In addition, the contractor can eliminate 17 percent of his field positions by employing digital tools for measuring field progress, surveying, and performing quality control on-site and in the fabrication yards.

By taking these actions, the owner in this hypothetical example would be able to mitigate the four months of schedule delay and recover 89

Exhibit 2 Intentionally delaying the start of construction until more work fronts are available can accelerate productivity ramp up.



³ This example is calculated using an actual staffing plan for a recent major project, including the positions that could be transferred to remote or adjusted to incorporate digital tools to improve productivity.

percent of the impacted cost while maintaining a safe and clean jobsite.

It's worth noting that this more-efficient approach to construction has always been an option. But owners and contractors tend to stick to the status quo, which prioritizes a series of cosmetic milestones, such as pouring first concrete or erecting first steel, that stand in as an indicator of progress but that don't have a material effect on the overall timeline. This status quo is ingrained because of a widely held mindset that once you can start construction, you should—even if the optimal course of action would be to wait until enough materials and work fronts are available to support a sustained ramp up. As such, one of the biggest hurdles owners and contractors will need to overcome is their own hesitation to abandon the status quo and embrace a new model. In the era of COVID-19, they may not have much of a choice.

In mere months, the COVID-19 pandemic has already permanently changed the way we do business. It would be naive to assume the current lockdowns and safety precautions are a one-time event. As such, owners and contractors need to prepare for the next normal and embrace permanent, routine safeguards for their jobsites to protect the health and safety of their workers while making project economics work. There is no other option.

Physical distancing, an increasingly remote workforce, expanded use of digital tools—these are the characteristics of the next normal in construction. Those who transition quickly and prepare before construction ramps back up will come out ahead.

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Preserving project continuity in the face of COVID-19

Advancing infrastructure projects means owners must protect people, projects, and performance. This will require adopting an agile posture, continually assessing risks, and adjusting operations.



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The COVID-19 pandemic is a health crisis that has leaders across the world grappling with the well-being and livelihoods of their communities. The economic challenges wrought by the pandemic continue to mount—and with them comes much uncertainty about the future. Capital projects have been hit particularly hard, with worker absences, supply-chain disruptions, and deteriorating investor confidence taking a toll.

Although many projects will continue—in fact, our analysis suggests that despite economic headwinds, \$8 trillion in capital delivery is expected to continue throughout 2020—three primary challenges have emerged, all requiring new levels of agility from project owners:

- Fluctuating guidance and restrictions. Policies put in place to flatten the coronavirus curve have already disrupted the availability of labor, materials, and equipment, and are likely to continue doing so even as they ease. Further waves of the virus, and global variations in severity and timing, will make it difficult to for project owners to predict the impact as governments balance healthcare outcomes with reopening the economy.
- Market conditions. Supply chains and contractors will be strained, and project owners must be prepared for the possibility of insolvency or bankruptcy alongside cash flow shortages.
- Cash and working capital. Resources will be increasingly scarce as the markets and economy falter and then recover, and a challenge that may be compounded by low cash reserves.

Yet, irrespective of the pandemic, projects still face a performance bar—and owners face an uphill battle. Although they will likely look to governments and corporate stakeholders for initial guidance, the burden of leadership at the work site falls squarely on their shoulders. The COVID-19 crisis will test even the most sophisticated project owners, and passing that test will take a focus on three core priorities: protecting people, the project, and performance.

Protect people

Numerous people working in close quarters and using common facilities means construction sites carry elevated COVID-19 risks—an outbreak could affect an entire workforce. Project owners need to develop new working norms, adopt a more flexible working system, and address broader concerns associated with the pandemic to protect one of the most valuable resources: people.

Defend against on-site transmission—without shortchanging safety

Project owners must first defend against on-site transmission by intensifying existing safety measures to account for COVID-19, such as by changing operating practices to ensure physical distancing and proper sanitation.

The range of interventions does not stop there. Fewer on-site leaders may mean supervision suffers, or fewer spot inspectors will be available to check for health, safety, and environmental (HSE) issues. Smaller crew sizes may engender a "make do" attitude that leads to fatigue, strains, and sprains. Longer wait times for proper safety equipment could inadvertently lead to more frequent shortcuts, such as skipping fall-protection steps or cutting corners on required personal protective equipment (PPE) such as steel-toed boots. Balancing both COVID-19 precautions and safety measures will require HSE professionals to uncover and manage the extent of the risks.

Develop a flexible contingency system

Owners expect a set of variables over the course of their projects—seasonal changes in particular. Many have dealt with surprises, such as temporary shutdowns of supply chains due to severe weather events or unexpected subsurface conditions. However, even the most experienced owners lack a response plan for more profoundly disruptive events, something that the COVID-19 crisis desperately calls for. Acting swiftly in the face of changing policies requires project owners to develop a strategy that stratifies risks, defines triggers for action, and provides guidance on what to do. Having this system in place means they can more quickly identify threat levels and advise their workers.

Address workers' underlying concerns directly

Project owners should take care to monitor morale, stress, and mental health while communicating regularly. Livelihoods are at stake, and record numbers of unemployment claims are processed every week. As such, many workers—particularly those who can't work remotely—have justifiable concerns over being able to provide for their families through this crisis while minimizing exposure to the virus. Owners may therefore seek alternative, flexible benefits for workers, such as enhanced paid sick leave and government relief for payroll. Ultimately, directly addressing workers' concerns can help them feel more engaged and safer on the job.

Protect the project

Projects are now facing unforeseen market conditions, contracting challenges (including potential bankruptcies or invocations of forcemajeure clauses), supply-chain bottlenecks, and cash-flow shortages. Owners will likely want full visibility into potential risks, and can help safeguard the project's overall business case by taking four steps. These will likely be new for project owners, so we provide an overview here to help them get started.

Launch a value-improvement exercise

For most projects, the assumptions and conditions that underpinned previous execution-strategy decisions have changed, jeopardizing the business case. For example, project owners may not be able to justify expensive public-transit projects when the pandemic has drastically reduced ridership. Launching a value-improvement exercise could identify risks on continuing projects and opportunities that take on new relevance in the face of COVID-19. The exercise comprises a set of actions to help project owners keep the business case and execution strategy viable (Exhibit 1).

Conduct a contractor analysis

Contractors may not be financially positioned to complete the project, and owners could see change orders and claims as a result of COVID-19. For "critical" contractors—high-value or specialized—the risks are heightened. A thorough,

regular analysis throughout the project life cycle promotes productivity and labor continuity. This analysis should include a pre-pandemic snapshot of progress, delays, and expected contractor claims to establish a baseline, followed by an assessment to measure contractors' financial strength and how critical they are to the project. Owners should also analyze contracts to prepare for change orders and claims. Potential mitigation will focus on bolstering critical contractors and sourcing alternatives for noncritical contractors.

Map the end-to-end supply chain

Complex global supply chains that move materials through different jurisdictions with varying COVID-19 effects are prone to weak links that could jeopardize the overall project; loss or unavailability of even a single critical part can lead to a total halt. Project owners should map out their entire supply chain to take more proactive measures during COVID-19, including identifying alternatives, considering where to stockpile, and reviewing contingency budgets to source and expedite critical materials.

Strategically preserve resources

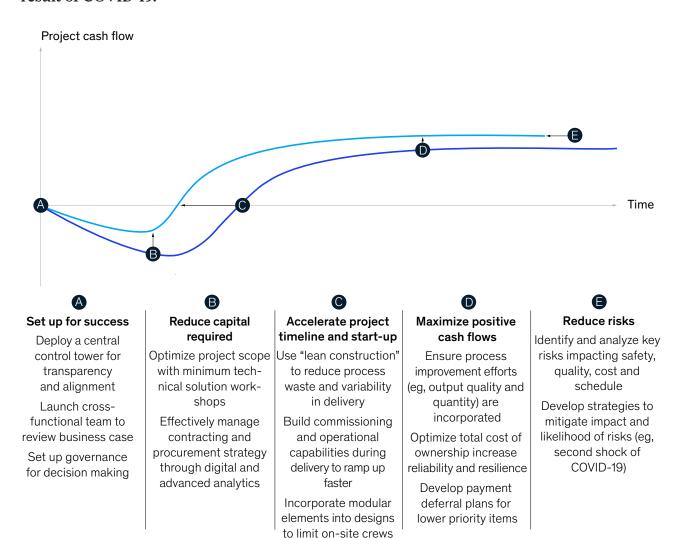
Capital projects consume immense amounts of cash, which—in the current environment—can be even more critical than earnings. Methodical approaches including greater collaboration with functions such as procurement, labor, or finance, can help project owners conserve cash. Potential actions include negotiating with vendors on discounts and payment-deferral plans, aggregating demand for commoditized materials across multiple projects to take advantage of bulk discounts, or identifying and applying for appropriate stimulus or relief funds, when available.

Protect performance

The bar for capital-project performance will not change, leading owners to explore how best to adjust their operating models across engineering, procurement, and construction so that performance can be maintained in the face of COVID-19. Digital technology will underpin many of these changes; digital solutions that

Exhibit 1

Project-improvement exercises could identify opportunitites that are now relevant as a result of COVID-19.



Source: McKinsey Capital Projects and Infrastructure Practice

can be deployed rapidly will help preserve project continuity, while more advanced, transformative technologies (such as digital twins and artificial intelligence—enabled processes) can help position project owners more advantageously after the first wave of COVID-19 subsides.

Modernize engineering processes

Traditionally siloed engineering teams now find it even more difficult to access critical data or interact with one other and stakeholders; modernizing

processes and adopting digital solutions can help. Detailed mapping of the engineering process provides greater visibility across stakeholders, and information modeling and digital twins establish a single source of truth across teams, aiding remote sign-offs and handoffs. Designing with greater agility, such incorporating more prefab and modular components into a project plan, can help engineers iterate more easily on a remote basis—and respond to supply chains and workforces that are more prone to disruption.

Create a supply-chain nerve center

Procurement can go beyond traditional functions and even go on the offensive. In the face of disruption, a supply-chain nerve center—

an agile, coordinated, cross-functional team—can help manage and optimize procurement processes (Exhibit 2).

Exhibit 2

Set up a minimal viable and flexible supply chain nerve center for end-to-end visibility, agility, and resilience.





Four essential elements to build a supply-chain nerve center

1. Nerve-center organization

Staff the team quickly, with clear individual roles, responsibilities, and accountabilities

Allow flexibility to accommodate rapidly changing situations Empower nerve-center leaders to make timely decisions

2. Operating cadence

Limit meetings to vital deliberations and decision making while fostering collaboration

Ensure team members can seek input and support from the leader

Test potential solutions

3. Issue identification

Identify critical issues across all areas first Map out issues as immediate, addressable, or unforeseen/arising

4. Response plan

Craft realistic goals with necessary trade-offs Assign milestones and key performance indicators to track progress



The supply-chain nerve center will manage four work streams

- Ensure risk transparency across tier-one, -two, and -three suppliers; support supplier restarts; manage orders; gain higher-priority status from suppliers; and ensure the qualifications of new suppliers
- 2. Manage ports, pre-book logistics capacity (shipping, rail, and airfreight), and optimize routes
- 3. Identify critical parts, ration parts as needed, and optimize locations
- **4.** Develop scenario-based demand requirement for construction scope of work, and manage the planning for manufacturing and sourcing

The nerve center's objectives will be diversifying the supply chain, managing demand more efficiently, enabling agility, and managing use of off-site assembly and modular approaches. Together, the nerve center should manage five workstreams:

- Suppliers—focusing on risk transparency, restarts, orders, priorities, and qualification
- Scenario-based demand requirement for construction scopes of work and planning for manufacturing and sourcing
- Logistics, ports, capacity (shipping, rail, and air freight), and optimized routes
- Clean-sheet pricing and contract negotiation to optimize cost effectiveness and deliverability
- Dedicated, continuous improvement of procurement processes, including by examining opportunities for technology and digitization (such as e-sourcing)

Tackle construction challenges with a new working model

Four key jobsite challenges will need to be addressed: increased wrench time due to new health and safety measures, difficulty sharing information, and lack of on-site field engineers. We recommend reviewing the entire worker journey to identify areas of improvement, adopting a Takt planning model— a planning and scheduling method that structures work into timed blocks—and setting up new lines of digital communication to help information flow among all involved in the project.

Assess increased wrench time due to new procedures. Project owners need to understand in detail the journey for each member of the workforce so they can address all changes to wrench time. For example, taking temperatures and distributing PPE will take time, so owners can increase the number of temperature sensors and set up more PPE stations. Physical distancing requirements will also change the typical journey, so owners need to assess how that affects wrench time and respond accordingly.

Use Takt planning for synchronized logistics and to manage disruption due to spacing requirements. In Takt planning, construction plans are categorized by work areas, and workstreams are reduced into standardized, synchronized work activities across the project to ensure continuous workflow and productivity. Simple but effective tools, such as constraint logs and area maps, identify issues, reallocate work across project areas, and efficiently track progress without resorting to high-level statistics.

Applying Takt to shift schedules can help break down bottlenecks, particularly as workers cycle in and out due to health precautions (Exhibit 3). Materials and equipment required by workers can be placed at strategic locations based on data-driven forecasts and field input. Onsite logistics will include time for deep cleaning and sanitation, and daily plans for logistics operations will be determined the day prior.

Develop new processes to mitigate lack of support and communication on-site. Communication among stakeholders is critical to keeping these schedules tight and optimized. Project owners should deploy dynamic dispatching and remote progress monitoring using digital tools that replace in-person communication. In the new Takt-driven operating model, everyone will have a role in ongoing communication, particularly during handoffs. Owners should consider investing in a workflow tool that everyone can access and update, which can serve as a repository of notes and information.

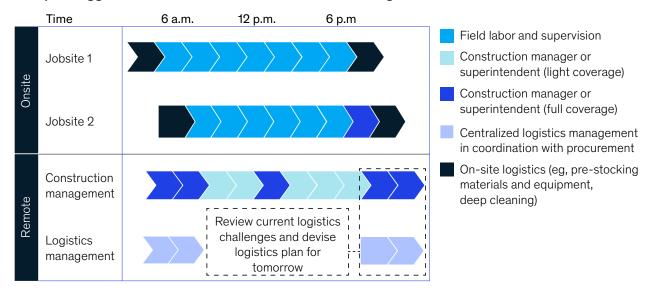
Identify digital solutions for immediate and long-term needs

Although precious few investment dollars for technology may be available, digital solutions will help project owners with continuity as they attempt to work remotely, manage workflows and data accessibility, and monitor sites and progress. Project owners should honestly assess their requirements and current capabilities to prioritize those investments. Many solutions can be rapidly implemented or scaled. For example, a European

Exhibit 3

Takt planning enables more efficient and dynamic use of time with a betterdistributed workforce.

Example staggered schedule with clear on- and off-site assignment of duties



commercial real estate developer is using webbased workflow tool that helps remote workers provide input on planning cycles, update crew sizes, and manage supply-chain disruptions due to COVID-19 in real time. These types of innovations can help project owners not only preserve project continuity but deliver faster, better results for all.

Project owners should also consider how to emerge from the crisis better positioned and more resilient. Larger investments in more advanced digital technology can help. Certain technologies—digital twins, Internet of Things-connected assets and worker monitoring, augmented reality, and labor and process automation—are all on the rise in the industry. One multinational engineering and construction firm is already using a digital twin of an in-progress site for rapid design iterations and constant remote monitoring of physical assets.

The path forward involves addressing the immediate concern of stopping the virus' spread, whether on a jobsite or within the community. As projects continue, owners will have to protect their projects against existential threats from labor, supply, or capital shock. The next few months will prove critical as new ways of working are discovered and new operating models designed. Project owners that proactively deal with those consequences will be best positioned to succeed in the recovery.

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Restarting after COVID-19: A Q&A with Clifford Chance's David Metzger

Standby agreements for major capital projects can help preserve relationships as well as shore up suppliers' and contractors' solvency during construction standstills.



David Metzger

Head of Global Construction Group and Coronavirus Advisory Group Clifford Chance Since the start of the year, major infrastructure project leaders have been grappling with COVID-19 issues that jeopardize many of their most basic strategic, operational, and financial project assumptions. Sponsors, contractors, lenders, and governments may be tempted to make short-term decisions—such as dismissing claims for extra time summarily and withholding payment for partial milestone completion—that could compound the issues in the long term rather than solve them.

In this interview, David Metzger, head of Clifford Chance's Global Construction Group and Coronavirus Advisory Group, discusses how negotiation and collaboration among stakeholders can help mitigate (or even preempt) disputes that otherwise could impair or prevent project recovery once the crisis eases.

McKinsey: What challenges has the COVID-19 crisis created for project stakeholders and eventual project restart?

David Metzger: Even the most sophisticated contracts are not designed to ensure the sort of stakeholder alignment that will be required when we emerge from the COVID-19 crisis. Conventional contract language and claims management are not well suited to the uncertainty we are seeing, since project owners and financiers can't accurately revise programs and models. When construction and the global supply chain come to a halt, it puts many contractors and suppliers at risk of not just missing milestones and delivery targets but going out of business entirely. Every stakeholder faces risks from revenue delays, time and cost overruns, reduced cash flow, and default and termination.

Precipitous action by any stakeholder could result in not just project defaults but long-term disputes and relationship issues. The more complicated the project, the more difficult it is to have open conversations with the full breadth of stakeholders to ensure that all parties are ready to restart the project smoothly when COVID-19 restrictions end. And in many cases, it is clear that the impact will stretch far beyond any formal site or facility shutdown because of supply bottlenecks for key

equipment and plant, missed weather windows, and ongoing distancing and health restrictions—meaning few projects will pick up right where they left off without additional complications.

McKinsey: How can project stakeholders mitigate such risks?

David Metzger: Project stakeholders must recognize that it is in everyone's best interest to work together, with the primary goal of ensuring the project can continue with minimal additional delay as restrictions related to COVID-19 are progressively lifted. This may seem counterintuitive to those accustomed to defending their own interests first. However, the wider picture is that what often starts as a protective notice of possible force majeure can broaden into alternative concurrent claims for force majeure, variations, owner default (such as due to delays on other contracts), change in law, or project suspension.

Parties can redefine this narrative by creating standby arrangements designed to take the worst-case scenario—that is, contract terminations—out of the equation and enable a framework for speedy recovery. These arrangements will require everyone to recognize they have skin in the game and to be willing to put something in or, at the least, to minimize incentive to collapse a structure.

The heart of most standby arrangements is a fixed period during which a mutually agreed set of activities are understood to have been suspended and not subject to further claims. For example, the agreement may acknowledge a standstill of on-site construction but a continuation of design development, which can be performed remotely. Such agreements create the necessary certainty for structuring reliefs and remodeling the project while allowing for earlier restarts when possible. They can also avoid delay and suspension periods accruing to termination rights, enable collaborative planning for efficient remobilization, and shift some of the financial risk away from contractors and suppliers. One international project developer has implemented standby agreements across several renewable energy projects to avoid disputes affecting the second half of 2020.

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McKinsey: Why might project owners and lenders consider taking on financial risks currently allocated to contractors and suppliers?

David Metzger: The pandemic is blind to whom it affects and, as mentioned, force majeure—type claims can quickly turn into broader disputes. Moreover, if a supplier or contractor becomes insolvent or a contact must be terminated, the added cost, delay, and risk to a project will likely be costlier than the concessions to extend time or to help them stay afloat and be ready for project restart. For example, parties can discuss partial payment of milestones while work is halted as well as who should bear which remobilization costs.

McKinsey: What are the obstacles to implementing a standby agreement?

David Metzger: The biggest obstacle is that a standby agreement requires all parties to sign on. This may be not just a question of lender approvals; it may also, for example, require recognition of relief from a power offtaker, concessional authority, or equivalent settlements with subcontractors. If the project is public or due to a public—private partnership (PPP), the complications are generally greater. The reliefs available in PPP structures—for example, changes in law—are usually much more

limited than in private-sector contracts. And some public authorities may be too constrained to show the necessary flexibility for these agreements to happen (whether due to financial limitations, procurement law, or audit controls, for example).

We have seen some governments act as helpful promoters for such arrangements, showing flexibility and helping mitigate project risks. But we have also seen some governments unconsciously delaying resolutions, whether because resources are prioritized elsewhere or because of a desire to extract some benefit for the government or the taxpayer (especially in countries badly impacted by the fall in oil prices). Development finance institutions and export credit agencies may assist as interlocutors in such situations, though the political dynamics can vary; for example, multilaterals may feel obligated to assist not just the project but the country.

The dynamics of who should be managing standby agreement discussions for very highly leveraged projects can also be particularly challenging, as the consequences may be particularly severe for equity. This is where the "partnerships" component of PPPs should be at the fore, and a combined debt and equity approach is justified—but can again be lost by isolationist or defensive thinking.

David Metzger is the head of Clifford Chance's Global Construction Group and Coronavirus Advisory Group.

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Resetting capital spending in the wake of COVID-19

Amid the pandemic, many CFOs are struggling to stabilize cash flows. A quick reset of capital spending—which can usually be achieved in about four weeks—can help them reach their goals.



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The COVID-19 pandemic will have an enormous impact on people's lives and livelihoods—that much is clear. The path to recovery is far less so, though it is evident that the crisis has significantly impeded many organizations' ability to execute capital projects, and may continue to do so for some time.¹

The availability of labor and materials has decreased worldwide, while more and more balance sheets and cashflows are becoming capital-distressed. Physical distancing and travel restrictions have

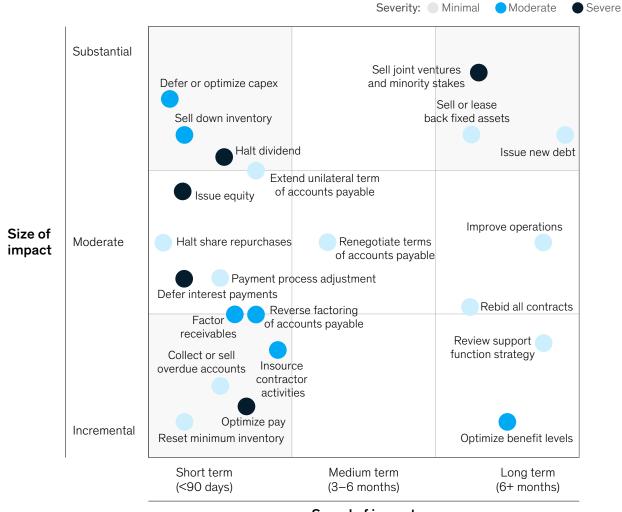
made it difficult for sectors and countries to get workers safely into plants and construction sites, and vital supplies into global production networks. Government-enforced public-health measures, for example, have disrupted the operations of fabrication yards and construction sites across Asia and Europe.

Freeing up cash by deferring capital expenditures is one of the fastest and most substantial ways to mitigate these ill effects (Exhibit 1). As such,

Exhibit 1

Deferring capex rapidly frees up significant amounts of cash.

An illustrative example of priority areas for high impact and quick implementation



Speed of impact

¹ For more on potential recovery scenarios, see "COVID-19: Implications for business," updated June 18, 2020, McKinsey.com.com.

companies across sectors and the globe have announced capital-expenditure cuts ranging from 10 to 80 percent (Exhibit 2). To gain insight on the extent to which specific industries have been affected, we analyzed publicly available notices from some of the largest companies in the world: 98 had announced capital reductions. Although many have announced top-line cuts to capital budgets, however, finance leaders often don't know which projects to cut or where best to reallocate their capital.

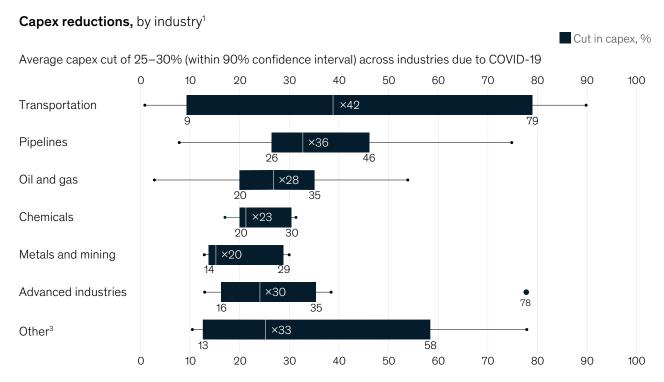
As the pandemic-fueled crisis has illustrated, CFOs and company leaders will need to quickly reset their capital-project portfolios. To do so, companies should follow a four-step process: triaging their portfolio, prioritizing options, optimizing individual projects, and finalizing the portfolio plan. This approach sets up a blueprint for companies for long-term, effective portfolio optimization in the next normal.

A reset is difficult but worth the effort

In our experience, successfully executing this approach not only maintains delivery of business objectives and results—they also reduce capital spending by 15 to 30 percent, and boost ROIC by 2 to 4 percent. Furthermore, our analysis shows that the reward will likely be worth the effort. In studying 1,500 companies based in the United States over a 20-year period, our colleagues found that those that dynamically reallocated

Exhibit 2

Oil and gas and transportation have announced the largest capital reductions.



¹ Research targeted top 500 global companies and revised capital-expenditure guidance given the COVID-19 environment.

²Capex-reduction percentage is calculated as percentage reduction in planned capex for the same period starting FY 2020. ³ Includes companies in advanced industries, automobile, telecommunications, and utilities.

Source: Publicly available investor materials; press search

their capital outperformed those that did not²—their median compound annual growth rate for total shareholder returns was 10 percent, compared with 6 percent for companies that did not. This evidence suggests that companies' response to this crisis is critical for not just short-term liquidity but also long-term success once the coronavirus crisis has passed.

Attaining these results is more easily said than done, however. Crisis situations require leaders to be well-equipped with facts to act quickly. Given the uncertainty surrounding the pandemic, however, fact-finding and knowing how much is necessary to cut to sufficiently improve cash flow can be difficult. Indeed, our April 2020 survey of 43 capital-projects leaders found that determining how deep to cut and a lacking fact base were their biggest challenges (Exhibit 3).

Regardless of whether business has grown, slowed, experienced closures, or prepared for a return to something approaching normalcy, all companies and

their capital projects are undoubtedly affected by the COVID-19 crisis. Understanding the implications of the crisis and recovery on 2020 and 2021 project portfolios is critical. Until now, most leaders have been focused on the immediate response to the crisis, and many have been forced to make rapid cuts early. But as the crisis effects linger, CFOs and capital project leaders would be wise to revisit and refine their capital portfolios.

A better approach to resetting a capital portfolio

Once an enterprise has determined the level of capital expenditure it can afford, we recommend four steps toward a fast reset of its capital portfolio.

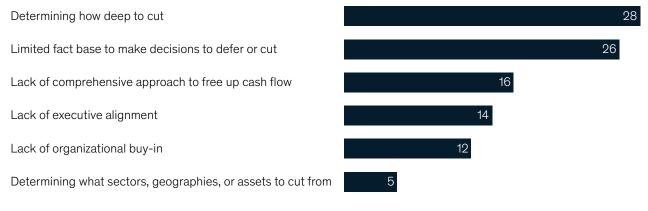
1. Triage the capital portfolio

The first step is to rapidly assess where to reduce or defer capital spending while minimizing liabilities. In some cases, physical threats to continued project execution, such as restricted site access, may cause more harm than financial ones do. In March 2020,

Exhibit 3

Capital-project leaders and executives face numerous challenges in resetting their portfolios.

Responses to "What is the biggest challenge your company is facing?," %



Source: Webinar conducted April 28, 2020 (n = 43)

² Stephen Hall, Dan Lovallo, and Reinier Musters, "How to put your money where your strategy is," McKinsey Quarterly, March 1, 2012, McKinsey.

for example, facing the rapid spread of COVID-19, many North American operators with strong finances closed sites to contractors and sent nonessential personnel home because of health and safety concerns.

Some existing projects may no longer be viable in the current environment. Work restrictions affecting suppliers and contractors, limited availability of materials and equipment, and changing market conditions could all eliminate a project's need or ability to execute. In addition to assessing the existing portfolio, capital project leaders must also identify the largest potential opportunities for projects that have not started or are not essential to core operations.

2. Assess each project and prioritize

The second step begins with analyzing each project to develop a fact base to support informed decision making. These facts might include, for example, spending to date, committed spending, stoppage costs, as well as a measurement of expected benefits, stakeholder impact, and risk trade-offs.

Criteria used for this type of assessment differs by industry. Chemicals companies typically assess a project's production impact—for example, if a project is not completed, is it likely to result in a shutdown? Upstream oil and gas operators consider several criteria, such as lease obligations, the cost of supply, and the cost of development, to make decisions regarding which reservoirs to drill or let expire. And utilities might measure specific risks to assess each project; for example, utilities in California would prioritize completing wildfire-prevention work before the start of the summer fire season, and these important, risk-mitigating projects must continue.

In our experience, utilities that focus on projects that add the most value—that is, using a risk-adjusted economic metric to replace or sustain projects rather than performing maintenance on a calendar schedule—can reduce their capital spending by 20 to 35 percent.

3. Optimize selected projects

Once the priority projects are clear, the third step involves maximizing each one's value by refining its business case and scope, enhancing design, striving toward contracting excellence, and improving construction execution.

For projects that continue, this step provides an additional opportunity to save on capital expenditure by pressure testing a minimum technical solution and identifying market opportunities. As such, companies should select the largest and most complex projects to upgrade, moving onto additional projects if time permits.

One North American chemicals company that was able to improve its sustained projects negotiated significant reductions in its engineering and construction contracts and other portions of the scope. In total, the savings on capital spending for those projects were nearly 25 percent.

4. Reset the portfolio

Finally, operators need to combine what they've learned in the first three steps to create a robust trade-off analysis. Portfolio decisions must be finalized—changes implemented across the organization. A reinforcing fact base will help not only make adjustments in the near term but also adapt to changing conditions over time. In addition, principles applied during a rapid resetting may also yield substantial benefits when applied to existing capital-planning processes that may affect future allocation cycles.

CFOs and other business leaders often have capital decision-making processes already in place, but working in crisis mode introduces new urgency and competing priorities for their time. It is therefore crucial for leaders to have an impartial foundation and forum to inform debiased decision making.³

³ For more on eliminating bias in decision making, see Tim Koller and Dan Lovallo, "How to take the 'outside view," March 5, 2019, McKinsey.com.

Rapidly setting their capital portfolio will allow companies to quickly free up capital spending according to their needs; various scenarios will prescribe which projects should be cut, reduced, optimized, deferred, or continued as planned. Using this four-step approach, one North American real-estate developer achieved a cost reduction of more than 60 percent by standardizing a set of priorities across investments for the most critical asset needs. Furthermore, the optimized investment portfolio that resulted still met program requirements and constraints—including, for example, acceptable living standards.

As operators get to work on resetting their capital portfolios, they should keep a few things in mind. First and foremost, they should implement a morenimble process for capital allocation: companies will need to respond to the rapidly changing environment and focus more on projects that are "shovel worthy" rather than "shovel ready." This requires investors to be strategic as they watch the world unfold—to save worthy projects that are affected by the crisis and weed out projects that were on shaky ground from the start.

One head of a Canadian public-infrastructure agency described his approach to prioritizing projects by thinking about different time horizons in parallel: keeping immediate assets and projects running while also considering the long term. The organization isolated a few indicators deemed important for recovery and manages its pipeline based on those elements. It is also working closely with its government partners to set a new post-coronavirus baseline for infrastructure priorities—in which sustainability in all forms will play a significant role.

In service of nimbler capital allocation, operators must also consider these realities:

- Having the right fact base is crucial. Difficult trade-off portfolio decisions will rely on foundational information to minimize impact or risk to the company.
- Investing in new types of capital is imperative.
 Reallocate capital to new areas of investment or growth (such as operational improvements in the next normal, including digital efforts).
- Speed matters, and portfolio choices will have a lasting impact. Companies will need to react quickly and competently to stabilize cashflows while balancing effects on future growth and operations.
- Collaboration is more critical than ever.
 Conditions are progressing more rapidly and in ways we haven't experienced. Operators, stakeholders, and suppliers will therefore need to think differently about partnerships going forward.

Uncertainty surrounding the pandemic and economic recovery will persist. It will become increasingly important for operators to rapidly reprioritize their capital portfolios. Doing so will operationally and financially benefit both them and—once they can continue their projects—the broader economy.

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The authors wish to thank Sam Linder and Michael Gootman for their contributions to this article.

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How construction can emerge stronger after coronavirus

Engineering, construction, and building materials have a vital role to play in a post-pandemic recovery of our communities and economies. Seven actions can help companies prepare for the next normal.

This article was written collaboratively by the global leaders of the McKinsey Engineering, Construction and Building Materials Practice, a group that spans different regions and segments and includes: Jonas Biörck, Jose Luis Blanco, Jan Mischke, Maria João Ribeirinho, David Rockhill, Erik Sjödin, and Gernot Strube.

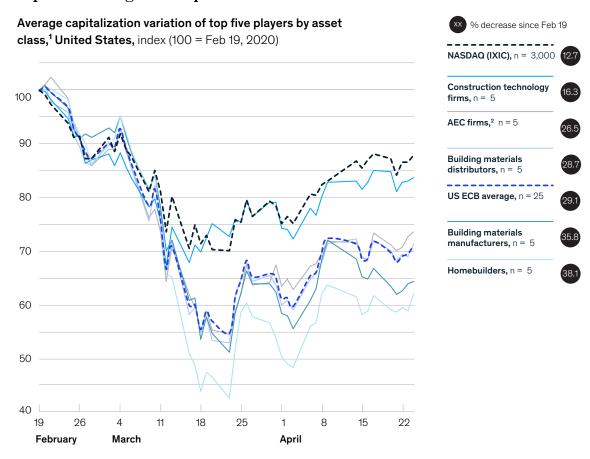
COVID-19 has affected communities globally, with more than 2.5 million reported cases as of April 30—a number that is still rising. And while governments and companies globally are responding fast, much remains to be done.

In this difficult time, construction matters more than ever. From building hospitals in just a few days to donating lifesaving equipment, the industry has played a critical role in responding to the crisis and in the recovery. The industry represents 13 percent of global GDP, and unlocking currently constrained labor availability could help drive recovery while addressing our most pressing construction-related needs.

But the industry has also suffered: construction sites in many countries have shut down. And most sites that are open have faced disrupted supply chains and operational restrictions. Such disruption has been reflected in financial indexes: since February, public engineering, construction, and building materials (ECB) companies have dropped significantly more than average (Exhibit 1).

Companies that came out ahead after the financial crisis of 2008 typically moved fast and hard on productivity (including cost reduction), rapidly reallocated resources, and made bold moves (including early divestitures and acquisitions

Engineering, construction, and building materials (ECB) companies have experienced larger stock price declines than the reference index.



¹ Subsegmentation includes aggregate daily averages for closing prices for top five companies from each subsegment.

Source: S&P Capital IQ

² Architecture, engineering, and construction.

in recovery) to prepare for the future. Leaders also invested heavily in digital technologies, differentiated their portfolios and offerings, and cleaned up their balance sheets¹ (Exhibit 2).

Yet the COVID-19 crisis is likely to change the dynamics of the ECB industry on an even more fundamental level than the previous financial crisis, highlighting potentially stark divergences between organizations that adapt to and thrive in the next normal—and those that do not.

Organizations must think through the moves they can make today to come out ahead later. A fast return to business as usual seems unlikely for the industry: leaders must first define and prepare for

what the construction industry will look like after the crisis. Seven actions can help them anticipate and adapt to the next normal.

COVID-19's effects on supply, demand, and industry dynamics

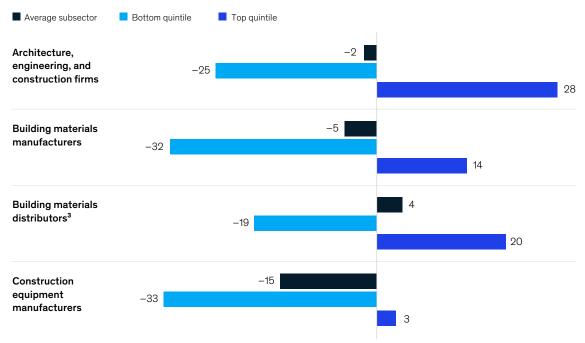
Beyond the short-term impact of an economic downturn on construction demand, the crisis is also expected to hit long-term supply and demand, resulting in lasting shifts in investment patterns.

Although a high level of economic uncertainty persists, research from the McKinsey Global Institute suggests that economic activity could be back on track by early 2021—if the virus is contained within the next few months and the right economic policies

Exhibit 2

Similarly to the years following the global financial crisis, players will diverge greatly in their response.

Performance of ECB subsector¹ into and out of the global financial crisis, measured by 2007–11 TSR², %



¹ Includes players with more than \$500 million in revenues in 2018.

¹ Chris Bradley, Martin Hirt, and Sven Smit, "Strategy to beat the odds," McKinsey Quarterly, February 2018, McKinsey.com.

² Total shareholder returns.

³ Includes equipment rental companies.

are enacted. However, longer-term lockdowns or other severe restrictions, even intermittent ones, could result in a severe and sustained economic downturn, with economic activity returning to 2019 levels by 2023 at the earliest.²

Construction is typically much more volatile than the overall economy. Reduced economic activity results in less demand for new commercial or industrial facilities, and ambiguity further dampens investment. Loss of income and lack of consumer confidence negatively affect demand for housing construction or refurbishment. And as the value of buildings and infrastructure closely tracks GDP, the need for new construction activity is highly sensitive to GDP growth, even in longer-term models. A four-year slump, for example, could substantially reduce construction's share of GDP above and beyond the initial contraction—even though the current crisis is not primarily related to real estate, as it was in 2008.

On the upside, unprecedented public-relief packages could not only support a rapid recovery but also be followed by public-investment programs.

The pandemic also represents a shock to supply. Both migrant and domestic construction workers may be unable to reach jobsites and will need to adhere to new on-site protocols that will reduce productivity for the foreseeable future. Some building-materials supply chains have also been interrupted, suspending production and distribution.

Signs of disruption

Even before COVID-19, ECB's performance had been subpar compared with other industries. Stagnant productivity, low levels of digitization, and low profitability have dogged the industry for years—as have its highly bespoke building approach, fragmented ecosystem, and high share of on-site manual labor.

Indeed, recent years have signaled impending disruption. A combination of increasingly stringent sustainability requirements, rising cost pressure, labor scarcity, and new available materials, production approaches, and digital tools are forcing

the industry to innovate. For example, the market share of permanent modular construction in North American real estate has grown by 50 percent from 2015 to 2018, albeit from a still-modest basis, and R&D spending among the top 2,500 construction companies has risen globally by approximately 77 percent since 2013.

A forthcoming analysis, which includes an in-depth economic evaluation and a survey of more than 400 ECB executives, also indicates that this disruption will fundamentally shift the size and distribution of industry value pools. Incumbents will need to adapt their strategies and business models to survive and thrive in the ECB industry.

Short- and long-term trends

Preliminary indications are that many of the characteristics of the COVID-19 pandemic are inducing or increasing some disruptions. In addition to immediate trends, we expect longer-term ones to accelerate as new ways of living and working become standard:

- Short term: Increased digitization.
 - Organizations across the industry are shifting to remote ways of working. For instance, designers and engineers are relying even more heavily on digital collaboration tools such as building-information modeling (BIM). Leading engineers and contractors are using 4D and 5D simulation to replan projects and reoptimize schedules. Integrated digital-twin solutions are being developed to be used end to end, from project concept to commissioning. And contractors are looking to online channels for monitoring their employees' well-being through apps, ordering construction materials, managing scarce resources more accurately, and maintaining cash flow.
- Short term: Rebalanced supply chains toward resilience (versus efficiency).
 Contractors are building inventory, securing critical materials and long-lead items, and identifying alternative suppliers.

² Sven Smit, Martin Hirt, Kevin Buehler, Susan Lund, Ezra Greenberg, and Arvind Govindarajan, "Safeguarding our lives and our livelihoods: The imperative of our time," March 2020, McKinsey.com.

ECB companies are already taking steps to move beyond the current crisis. Leaders must proactively reshape their agendas to improve their odds of future success.

- Long term: Augmented consolidation. Players are looking to consolidate to establish economies of scale and support investment in IT, talent, R&D, and technology. Furthermore, companies and investors will increasingly look to consolidation for much-needed resilience in their balance sheets.
- Long term: Vertical integration. Industry players are already starting to vertically integrate to increase efficiency and as a route to standardization and control of design and execution. In a post-crisis world, vertical integration (which may include a return to greater reliance on direct labor) is a potential route to greater resilience. This is the case in industrial asset classes, where equipment manufacturers are experimenting with integrating forward in the value chain and often moving from building to assembling industrial plants. And in real estate, many vertically integrated players are emerging with new business models.
- Long term: Further investments in technology or digitization and innovation of building systems. The industry faced a shortage of skilled labor before the crisis. With the prospect of rolling physical-distancing measures and restrictions on cross-border movement of labor, skilled labor shortages will become even more acute. The case for digital tools that are proven to increase productivity, such as 4D simulation, digital workflow management, real-time progress tracking, and advanced schedule

- optimization, will become even stronger. For similar reasons, we see an increase in R&D spending to develop new standardized building systems to speed up and automate elements of design and construction. We also expect to see more players investing in automation of on-site and back-office processes.
- Long term: Increase in off-site construction.
 Building in controlled environments makes
 even more sense in a world that requires close
 management of the movement and interaction of
 workforces. Such rationale further strengthens
 the case for off-site construction, beyond the
 existing quality and speed benefits. In fact,
 we expect to see contractors gradually push
 fabrication off-site and manufacturers expand
 their range of prefabricated subassemblies.
- Long term: Acceleration toward sustainability, including designs for healthier living.
 Governments may stimulate the economy by encouraging measures to meet carbon reduction targets—for example, by retrofitting housing stock to improve energy efficiency.
 Such incentives might come in the shape of a combination of policy changes and direct public investments. We expect to see a parallel shift in demand toward more sustainable buildings and communities that promote healthier lifestyles (such as access to local amenities and outdoor space, higher standards on air quality, and recycled and sustainable materials).

Reimagining for the next normal

Across all types of business, it is becoming clear that the world will look different as we move beyond the COVID-19 crisis to the next normal. As industry leaders consider navigating this crisis and surviving and thriving in the next normal, we propose a call to action across five stages: resolve, resilience, return, reimagination, and reform (Exhibit 3).³ In particular, reimagination can help ECB leaders look beyond the immediate crisis and start to plan for the next normal.

In the first weeks of the crisis, ECB companies focused on the first two steps: resolving the immediate issues and building resilience for the coming months. In some regions, sites are now starting to open again, and ECB players are restarting operations (see sidebar, "Considerations for restarting operations in construction: A checklist"). This process demands a delicate balance: protecting the health of workers, demonstrating compliance with local regulations, and managing client and supplier relationships and contracts—all while trying to achieve some level of productivity and financial stability.

The majority of ECB companies are by no means out of danger—and won't be for some months—but now is the time to start reimagining our industry and how organizations can emerge in the next normal from a position of strength.

Seven actions for success

ECB companies are already taking steps to move beyond the current crisis. Many executive teams are reshaping their strategies and operating procedures, launching ambitious initiatives to come out stronger and spur positive change on the heels of the pandemic. Leaders must proactively reshape their agendas to improve their odds of future success.

The following seven actions can help leaders prepare for the next normal:

Accelerate rollout and adoption of digitization.
 There is no time to experiment with the perfect road map. Organizations must instead enable well-proven remote use cases. For contractors,

Exhibit 3

Engineering, construction, and building materials leaders are now focusing on reimagining the next normal.

The five horizons



Resolve

Address the immediate challenges that COVID-19 represents to institution's workforce, customers, technology, and business partners



Resilience

Address near-term cash-management challenges and broader resiliency issues during virus-related shutdowns and economic knock-on effects



Return

Create detailed plan to return business to scale quickly as COVID-19 situation evolves and knock-on effects become clearer



Reimagination

Reimagine the next normal: what a discontinuous shift looks like and implications for how institutions should reinvent



Reform

Be clear about how regulatory and competitive environments in industry may shift

³ Kevin Sneader and Shubham Singhal, "Beyond coronavirus: The path to the next normal," March 2020, McKinsey.com.

 $^{^{4}\ \ \}text{Mihir Mysore and Ophelia Usher, "Responding to coronavirus: The minimum viable nerve center," March 2020, McKinsey.com.}$

Considerations for restarting operations in construction: A checklist

As engineering, construction, and building materials players return to work, they should plan across four dimensions.

Protecting on-site employees

- Establish physical-distancing and isolation policies, based on government and industry guidance
- Maintain physical distance and health (for example, through selfcontained crews, changes to shift patterns, temperature checks, self-reporting health checkup apps, reconfigured cafeterias, more personal protective equipment and greater sanitation, and alternative transportation arrangements)

Reorganizing

 Identify work that can easily be taken off-site into controlled environments (such as rebar prefabrication and riser preassembly)

- Establish support and guidance for remote interaction and home office based work (such as administrative functions and design)
- Reforecast schedules to account for disruption to the workforce and delivery; reallocate resources as needed

Restoring supply chains

- Agree on new ways of working (including procedures for accepting deliveries and payment terms)
- Implement contingency measures for key deliveries (such as third-party logistics providers and alternative distributors)

Reassuring customers

 Make the implications of lower productivity on customers and contracts clear

- Agree on start dates and revised schedules
- Agree on ways of working (such as any contractual disputes that are on hold until sites are back up and running)
- Prepare to renegotiate annual bonus contracts with adjusted endof-year targets and to adapt the pricing strategy

this may mean scaling up remote collaboration at the production stages using a digital model or urging for minimal manning at site offices. Distributors may need to rethink their entire fulfillment model with minimal physical interactions, especially with e-commerce models for which sales teams could work and handle customer contracts, sales, or ordering remotely with digital tools. Engineering consultants might strengthen their BIM capability and other collaboration tools. Finally, building materials manufacturers may need to ensure updated BIM, market access through e-commerce, as well as effective, digitally enabled remote sales.

 Invest in the culture and skills needed to operate in the next normal. Balancing performance and health is critical at any point in time—and it's that much more important in these turbulent times. Industry players must invest proportionately in culture to erode not only risks related to remote work but also apprehension across the workforce regarding job security and productivity. Moreover, there is no better time to upskill the entire workforce and require training on new tools and technologies (such as BIM) and operating procedures. Many of these activities can benefit employees by encouraging greater engagement among one another.

 Build a control tower across the portfolio. In a world in which construction prices may come under pressure, companies should use their total size to avoid getting squeezed. Resource allocation will pose a significant challenge for construction in the coming months. It will involve making trade-offs between projects and assets and will rely on accurate progress data across the portfolio. Therefore, companies should establish a central monitoring function that can rapidly identify and respond to resource-allocation needs across the portfolio. In addition to systematic assessment of the parts of the portfolio that may be affected by COVID-19, these capabilities can include realtime transparency on project process, material inventory, subcontractors, services, and costs. Players that have increased transparency across portfolios are much better equipped to optimize sourcing, among other needs.

- Bolster supply-chain resilience. Most ECB players have already reviewed their supply chains for vulnerabilities due to the pandemic; they must now look at options for fortification—such as building inventory, identifying back-up distribution channels, and recruiting direct labor to replace subcontractors. These could lead to greater consolidation and vertical integration of the value chain not only to minimize risk but also drive future productivity. Indeed, today's fragmented and multilevel contracting practices often hinder large-scale changes in ways of working, rollout of digital tools, general investments, and R&D.
- Redeploy capital and resources. To sustain a post-crisis revival, ECB players must strategize their business priorities. In many cases, responding to COVID-19 could present opportunities to make long-overdue moves. And while aspects will differ across the value chain, they will also likely each contain choices of where to deploy capital, resources, and capabilities (and where not to) in the most economical manner. Examples include

- reinforcing future high-growth segments by increasing funding and reallocating competencies or sharpening core business focuses by selectively exiting business areas. Given the breadth of such options, an effective execution should consider both organic and inorganic levers.
- Identify opportunities to shift work offsite. Suppliers and subcontractors should identify elements and subsystems that can be preassembled in a controlled environment. Longer term, players can look for more significant elements of construction to modularize or build off-site (for example, frames and volumetric modules). Such shifts could help building-materials manufacturers collaborate on designing new product features that could facilitate building-site activities. Furthermore, off-site construction could contribute to sustainability goals by reducing materials waste, noise, and air dust as well as enabling circular building systems.
- Get closer to customers. Customer preferences are undergoing a step change—toward online retail, remote working, and more sustainable communities, to name just a few examples. It is not yet clear what other shifts might emerge, but we can assume many of those will likely become engrained and normalized in customer preferences, permanently. Therefore, it's more important than ever to stay close to current (and future) customers.

A healthy and productive ECB industry is vital for an immediate crisis response—and to overall economic recovery. However, that industry will look far different from the current setup. Now is the time for ECB companies to prepare for their role in a more productive and resilient industry.

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Meeting E&C needs in and after coronavirus: A Q&A with WSP's Paul Dollin

A global engineering consultancy is planning for recovery by rethinking how its people work, as it safeguards its engineering and construction operations.



Paul Dollin
Chief Operating Officer
WSP

Throughout the COVID-19 pandemic,

engineering and construction leaders have been faced with the challenges of meeting infrastructure needs. Like all leaders, they are also rethinking how they support and engage with their employees.

In this interview, Paul Dollin, chief operating officer of engineering professional-services consultancy WSP, shares how the firm has adapted to the current working environment, and what the future might look like.

McKinsey: What steps have WSP's global leadership team taken to address the complex challenges that are continually unfolding under COVID-19?

Paul Dollin: We have approached COVID-19 with a "plan for the worst, strive for the best" mentality, with an aim toward decisive, rapid actions to protect the safety of our people, the programs of our clients—and the longevity of our business.

Our primary and immediate challenge was continuing to meet each client's unique needs while anticipating how those needs might change in the current environment. We began drawing on what we see as a crucial strength of our operating model, which is to empower the local leadership teams who are closest to our clients. These leaders have adapted their operating approaches to overseeing construction activities, using videoconferencing to review designs and make presentations. We've also enhanced our efforts to identify, process, and communicate important information to clients.

What we have found is that client interaction is not only possible in the context of a lockdown but often more extensive, more relaxed, and more frequent. In many instances, our clients are willing to chat on a video call for more time than they were willing to spend in a meeting at their offices. We are also emphasizing global collaboration to refine our thinking. Webinars, which are open to all employees and the general

public, have allowed us to share timely information, analyses, and best practices from our thought leaders.

McKinsey: What sorts of results have you seen from these efforts?

Paul Dollin: To date, the results are encouraging. In April, business performance and related key metrics were strong despite some effect on revenues from COVID-19. Of course, we do recognize there must be a transition from the current shorter-term response period to one of longer-term vision. This strategic shift requires us to consider how to extend these positive outcomes into lasting practices for our clients and employees.

We are paying particular attention to our employees' mental health and well-being as they work from home. Our efforts include awareness training to help managers recognize situations that might require further attention and a mental-health self-assessment for employees as they work from home. Employees can also participate in numerous company-sponsored counseling sessions, both for themselves and their families. Over the longer term, we plan to continue supporting our people with ongoing virtual support groups, educational webinars, and mindfulness sessions, all designed to help people feel connected to each other even when they aren't physically in the same space.

Local offices supplement these activities by hosting virtual game nights, contests, and social gatherings. As part of our regular communications with employees, we highlight all of these offerings—our central concern continues to be how employees are adjusting to the stress and strains of isolation.

McKinsey: How has WSP adapted to a remoteworking model in the context of projects and clients that are located around the world?

Paul Dollin: One the critical roles WSP plays is in leading a wide range of planning-stage projects, where stakeholder and public participation is vital to determining the best outcome for the community. Traditionally, this engagement

has been accomplished through face-to-face public workshops and meetings. But we have demonstrated to clients in Australia, Canada, New Zealand, Sweden, the United Kingdom, and the United States that virtual yet interactive workshops can bring together diverse groups to advance the planning process. These workshops have also been helpful in defining the parameters of projects that should move forward to design and construction. We have also advanced essential construction projects by utilizing video-capture technology to inspect sites and remote-sensing techniques instead of on-the-ground surveys.

And throughout the crisis, we have found that maintaining and increasing client engagement has been key to confidence building and effective decision making. An integral part of this effort is keeping everyone abreast of COVID-19 latest developments through calls and virtual meetings.

McKinsey: What lessons learned from the 2008 global financial crisis can be applied today to meet society's infrastructure needs in the recovery phase?

Paul Dollin: We think one of the important lessons from that time is the role that infrastructure investment can play in boosting economic development. Dollars invested in critical transportation infrastructure, for example, could provide an essential economic stimulus.¹

However, in 2009, the focus in the United States was on "shovel ready" projects rather than planning-stage projects. The result, in our experience, was a gap in permitted projects in the construction pipeline 18 to 24 months later.² This experience suggests that earmarking funds for planning-stage projects could help support construction activity on a more sustained basis. Consequently, we are currently working on proposals in several countries to encourage funding for planning-stage projects.

McKinsey: Emerging from COVID-19, what steps can we take to make the industry more sustainable and collaborative, and to future-proof infrastructure assets?

Paul Dollin: As an industry, we should view the planning, design, construction, and maintenance of infrastructure through a wider lens, considering the universal impacts of our decisions. Deep and continuous collaboration—among the public sector, the private sector, academia, and professional associations—will inform and shape the best decisions.

The crisis has revealed how agile we can be and where we can perform even better. Digital tools have enabled us to apply our advisory and multidisciplinary technical capabilities in new ways to foster interaction and coalesce diverse ideas from around the world to benefit projects in progress as well as those envisioned. As we consider the longer-term implications of working remotely and virtually for the foreseeable future, it is clear that we must continuously adapt. We will closely monitor conditions for our people, projects, and clients while maintaining established practices that continue to produce positive outcomes.

Paul Dollin is chief operating officer of engineering professional-services consultancy WSP.

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¹ For more, see Shoshana Lew and John D. Porcari, "Eight years later: What the Recovery Act taught us about investing in transportation," Brookings Institution, February 22, 2017, brookings.edu.

² Shovel worthy: The lasting impacts of the American Recovery and Reinvestment Act on America's transportation infrastructure, US Department of Transportation, 2018, transportation.gov.



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Commercial real estate must do more than merely adapt to coronavirus

COVID-19 is a humanitarian challenge that will have lasting effects on how people live, work, and play. By acting today, real estate leaders can best serve end users and ensure their own viability.



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In a matter of weeks, the lives of so many have changed in ways they had never imagined. People can no longer meet, work, eat, shop, and socialize as they used to. The working world moved rapidly from business as usual to cautious travel, office closures, and work-from-home mandates. Instead of traveling and going out to eat at restaurants, consumers across the world are tightening their purse strings to spend only on essentials—primarily food, medicine, and home supplies—and getting these delivered much more often.

Physical distancing has directly changed the way people inhabit and interact with physical space, and the knock-on effects of the virus outbreak have made the demand for many types of space go down, perhaps for the first time in modern memory. This has created an unprecedented crisis for the real estate industry. Beyond the immediate challenge, the longer this crisis persists, the more likely we are to see transformative and lasting changes in behavior.

To respond to the current and urgent threat of COVID-19, and to lay the groundwork to deal with what may be permanent changes for the industry after the crisis, real estate leaders must take action now. Many will centralize cash management to focus on efficiency and change how they make portfolio and capital expenditure decisions. Some players will feel an even greater sense of urgency than before to digitize and provide a better—and more distinctive—tenant and customer experience. And, as the crisis affects commercial tenants' ability to make lease payments, many operators will need to make thousands of decisions for specific situations rather than making just a few, broad-based portfolio-wide decisions.

Most real estate players have been smart to begin with decisions that protect the safety and health of all employees, tenants, and other end users of space. The smartest will now also think about how the real estate landscape may be permanently changed in the future, and will alter their strategy. Those that succeed in strengthening their position through this crisis will go beyond just adapting: they will have taken bold actions that deepen relationships with their employees, investors, end users, and other stakeholders.

The immediate challenge

Over the past several years, real estate investments have generated steady cash flow and returns significantly above traditional sources of yieldsuch as corporate debt—with only slightly more risk. Since the virus outbreak, however, this reality has changed, and real estate players have been hit hard across the value chain. Service providers are struggling to mitigate health risks for their employees and customers. Many developers can't obtain permits and they face construction delays, stoppages, and potentially shrinking rates of return. Meanwhile, many asset owners and operators face drastically reduced operating income, and almost all are nervous about how many tenants will struggle to make their lease payments. "Concession" and "abatement" are the words of the day, and players are working rapidly to figure out for whom they apply and how much.

Not all real estate assets are performing the same way during the crisis. The market seems to have pivoted mostly on the inherent degree of physical proximity among an asset class's users—even more so than on its lease length. Assets that have greater human density seem to have been the hardest hit: healthcare facilities, regional malls, lodging, and student housing have sold off considerably. By contrast, self-storage facilities, industrial facilities, and data centers have faced less-significant declines. As of April 3, by one estimate, the unlevered enterprise value of real estate assets had fallen 25 percent or more in most sectors and as much as 37 percent for lodging (the most extreme example). 1 It's no surprise that—when shoppers avoid crowds, universities send students home, and retailers, restaurants, and hotels close their doors—owning and operating those properties is a less valuable proposition. As such, liquidity and balance-sheet resilience have become paramount.

Behavioral changes that may outlive the crisis

Real estate owners and operators across almost every asset class are considering several potential longer-term effects of the coronavirus outbreak and the required changes that these shifts are likely to bring.

¹ REITs amid a pandemic, Green Street Advisors, April 3, 2020, greenstreetadvisors.com.

For example, within commercial office space, the multiyear trend toward densification and open-plan layouts may reverse sharply. Public-health officials may increasingly amend building codes to limit the risk of future pandemics, potentially affecting standards for HVAC, square footage per person, and amount of enclosed space. At the same time, just as baby boomers age into the sweet spot for independent and assisted living, fear of viral outbreaks like COVID-19 may prompt them to stay in their current homes longer. It is possible that demand for senior living assets could dampen, or the product could change altogether to meet new preferences for more physical space and more-intensive operational requirements. It is also possible that senior-living facilities could prove they are best able to handle viral outbreaks, accelerating demand.

The COVID-19 experience could also permanently change habits that may affect demand for other real estate assets, such as hospitality properties and short-term leases. Even a short moratorium on business travel could have lasting impact when alternatives such as video conferences prove sufficient or even preferrable. Near-shoring of supply chains may further reduce demand for cross-border business travel, and consumers who are afraid of traveling overseas may shift leisure travel to local destinations.

Consumers forced to shop online because of closed malls and shopping centers may permanently adjust their buying habits for certain categories toward e-commerce. Before the pandemic, consumers were already shifting their spending away from physical stores. This long-term trend may accelerate even faster after the crisis—especially as many previously struggling brands are tipped over the edge into bankruptcy or forced to radically reduce their footprint. Early evidence from China shows some staying power in the coronavirus-driven shift to e-commerce. Within certain product categories where supermarkets or mainstream retailers competed with online retailers, substantial market share could transfer to online players.

The shift to e-commerce may also further boost already high demands for industrial space. Relatively niche asset classes (such as self-storage and cloud kitchens) could see an improvement in their unit

economics, as demand density goes up when more people work from home, while other asset classes (such as coliving) may suffer. And universities forced to educate remotely for entire semesters could convince students and other stakeholders that existing tools are sufficient to provide a high-quality education at a lower cost, and a new type of hybrid (online—offline) education could become even more widely embraced.

The depth and breadth of economic impact on the real estate sector is uncertain, just as the scale of human catastrophe from the pandemic is yet to be seen. However, behavioral changes that will lead to significant space becoming obsolete in a post-coronavirus environment seem imminent. Given the potential for transformative changes, real estate players will be well served to take immediate action to improve their businesses but also keep one eye on a future that could be meaningfully different.

How leading real estate owners and operators are navigating the crisis

While the longer-term consequences are difficult to predict, the immediate market consequences of the coronavirus crisis have been made clear—the public market sell-off in certain real estate types has been nothing short of dramatic. All companies, public and private, are working hard to navigate the immediate crisis with respect to staff, tenants, and end users of space, while also facing tough business tradeoffs. Most industry leaders seek to strike the right balance between capital preservation and further strengthening their competitive differentiation.

Over the past several years, industry leaders have been diversifying sources of revenue, pursuing digital strategies, and focusing on tenant experience. The COVID-19 crisis has accelerated the need for those strategic changes—and highlighted that those that haven't yet made such investments will probably need to catch up quickly. For example, while relatively few real estate companies were actively developing or pursuing digital and advanced analytics strategies before the pandemic, such strategies can help with tenant attraction and churn, commercial lease negotiations, asset valuation, and improved tenant experience and operations. Other direct results of the outbreak include the need to meaningfully engage with customers and employees on health and safety in physical spaces.

In the wake of the coronavirus outbreak, real estate industry leaders are taking on a set of common imperatives.

Earning the respect, trust, and loyalty of customers and employees

Above all, owners and operators have an obligation to protect the safety and health of people by all reasonable means. For leading operators, the need to overcommunicate—to both make sure they fully understand tenants' needs in this moment and help protect everyone in their ecosystem—is leading to some changes in behavior. This may make the practice of communicating as a company-level brand (rather than property-level brand) more common, speeding up an existing market trend. In B2B environments, such as offices and retail stores, CEOs and management teams may join asset managers and property managers and engage directly with tenants. They should follow up quickly on the actions they have discussed with tenants. Not only are such changes the right thing to do—they're also good business: tenants and users of space will remember the effort, and the trust built throughout the crisis will go a long way toward protecting relationships and value.

Centralizing cash management

Real estate has always been highly decentralized: many important decisions that impact cash flow have been made at the property level. But given the uncertainty around the duration and depth of this crisis, top management is now providing more centralized direction on property-level cash management in addition to company-level balance-sheet decisions and credit lines. All levels of management—including those at the property level and company level—are beginning to identify efficiency levers and when to pull them based on the underlying performance of properties and the business as a whole. In the past, few properties and companies took a lean-enterprise mentality toward capital and operating expenses. Those that do adopt lean practices and eliminate inefficiencies, however, can buy themselves a little more time to work through uncertainty. But creativity can also be employed more often, as not all cash-creating activities need to involve cutting costs. For example, some developers engaged in residential sales are looking into innovative ways to liquidate new inventory, such as lease-to-own programs and financing partnerships.

Making tailored, informed decisions—particularly in commercial lease concessions

While it may be tempting to make reductive assumptions about the coronavirus outbreak's economic impact, the corresponding policy responses at city, state, and federal levels will not be uniform across real estate portfolios. Even within a single asset, needs will vary among tenants. Thanks to the richness of available behavioral data, select real estate leaders will use analytics to generate fact-based insights on local epidemiological and economic scenarios, what is happening to competitive assets around a property, and the impact of the crisis on individual tenants. These perspectives can inform highly targeted decisions, rather than a one-action-fits-all-tenants approach.

Nearly every landlord is preparing for the effects of the downturn, when scores of tenants across asset classes will ask for lease concessions or abatement. While a single policy across all tenants and properties may be easier to implement, decisions must be made for each situation, starting with a consideration of tenants' safety and well-being. In the office sector, factors such as price point in the market, tenant-renewal probability, tenant-default probability, local regulations, building appearance due to vacant spaces, and potential reputational risks should inform individual decisions. Few real estate players have information about these on hand, and even fewer have the right tools, processes, and governance to make decisions. For instance, they rarely have detailed protocols in place for what can be decided at a property level versus what should be decided centrally, as well as what tools can be used for leasing or which asset-management professionals must make these tough decisions daily. Properly implemented, a set of clear protocols along with structured, fact-based decisioning will ensure fairness and procedural justice for tenants and help operators communicate their actions with key stakeholders, including tenants, investors, and lenders.

Taking the digital leap

Before the crisis, the real estate industry had been moving toward digitizing processes and creating digitally enabled services for tenants and users. Practically overnight, physical distancing and the lockdown of physical spaces have magnified the importance of digitization, particularly by measures such as tenant and customer experience. Within

residential real estate, players that have invested in digital sales and leasing processes—using virtual open houses and showings; augmented and virtual reality; and omnichannel, targeted, and personalized sales—will more quickly allow their residents to find the right space for themselves.

When an operator may have to keep its amenity spaces closed for months, creating a differentiated experience will necessarily involve a suite of digital-first products and experiences: telehealth, on-demand delivery and concierge services, virtual communities, contactless access for residents, guests, and maintenance staff, and much more. As more users adopt these digital-first products and services, users' expectations will be raised, and players that provide a differentiated post-crisis experience will stay ahead of the curve. These digital offerings will pay dividends in the form of superior loyalty and the ability to create brand new revenue streams while better meeting the needs of tenants and end-users.

Acquiring operating companies, not just single assets

In the context of a post-coronavirus world, most investors and operators are reconsidering all capital decisions. Extreme uncertainty surrounding the duration of cash-flow depression and exit capitalization rates make it exceedingly challenging to underwrite acquisitions and discretionary capital expenditure with confidence. And private market players that are not facing near-term financial distress intend to hold assets through the downturn-some view the current environment as a valuation issue, not a value issue. Still, record-high dry powder is influencing investor attitudes. Many have already shifted their mindsets toward finding single assets at bargain prices, though the current difficulty in accessing capital markets has delayed action, and supply may remain constrained as potential sellers wait for valuations to return. These

combined complications have caused many real estate leaders to focus on acquisitions of operating companies, large asset portfolios, and public real estate investment trusts.

Rethinking the future of real estate, now

Some landlords are now starting the process of thinking ahead to when the crisis is over. Strategic review processes aim to understand how real estate usage might change going forward. However, rather than relying on traditional economic or customersurvey-driven approaches, real estate leaders are looking to psychologists, sociologists, futurists, and technologists for answers. Will employees demand larger and more enclosed workspaces? Will people decide not to live in condominiums for fear of having to ride elevators? While uncertainty currently reigns, by employing a range of creative personnel and using new methodologies—such as deep design interviews—business leaders may find new and more predictive insights.

As during the period following the global financial crisis of 2008, while some real estate players go beyond just adapting and flourishing, others fade. Individual firms' abilities to weather the storm will depend on how they respond to immediate challenges to the industry—particularly the current declines in short-term cash flow and demand for space, as well as the uncertainty surrounding commercial tenants' ability to pay their bills. In the medium to long term, the changed behaviors forced upon the industry will have likely altered the way consumers and businesses use and interact with real estate. The critical question is which of these changes will stick. Throughout, acting quickly and smartly will help determine the fate of players not only in these challenging times but also as the industry emerges from the current crisis and inevitably reinvents itself.

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