

Capital Projects & Infrastructure

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 force-majeure 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.

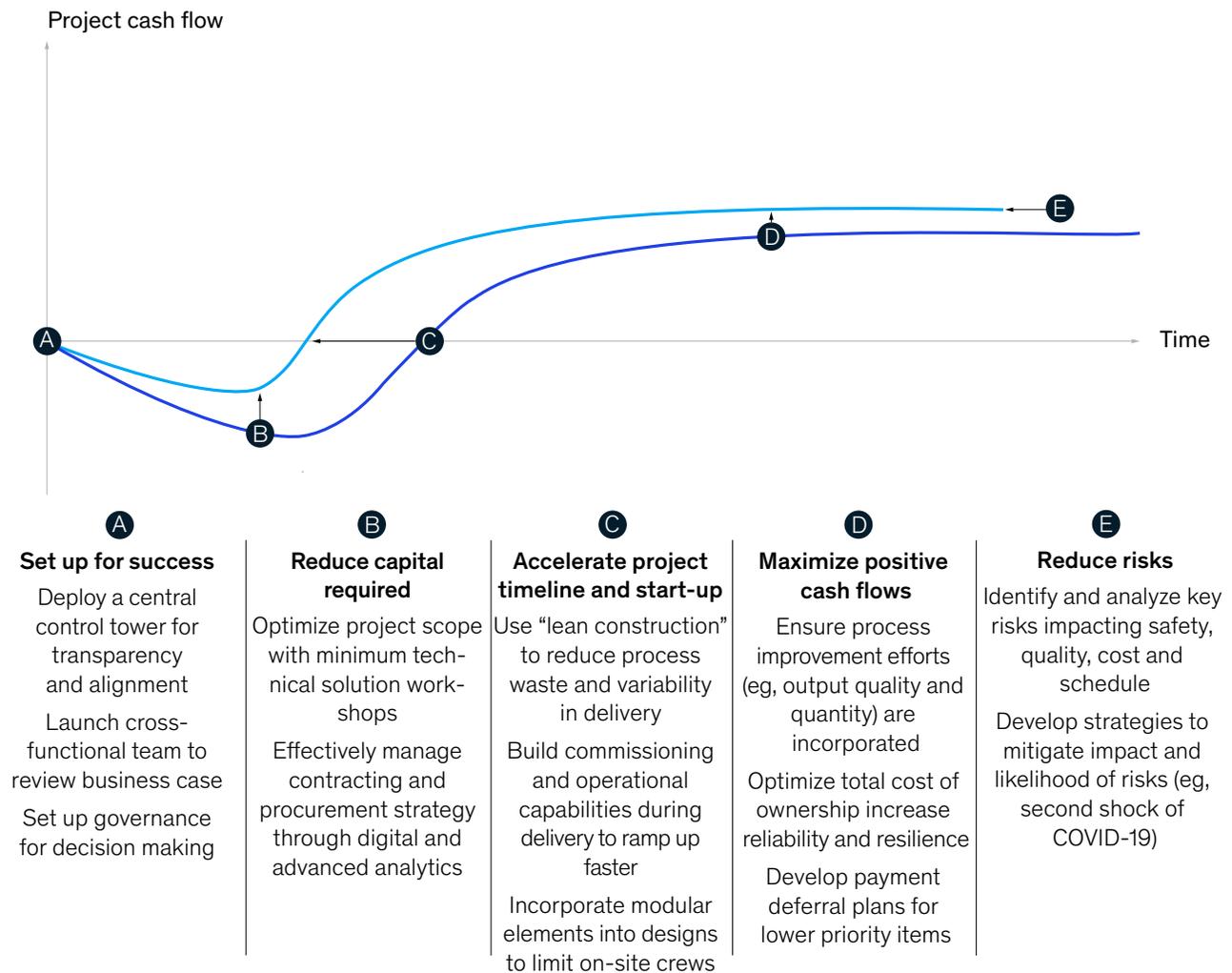
Strategically preserve resources

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

Project-improvement exercises could identify opportunities 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 as 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	 The supply-chain nerve center will manage four work streams
<p>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</p> <p>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</p> <p>3. Issue identification Identify critical issues across all areas first Map out issues as immediate, addressable, or unforeseen/arising</p> <p>4. Response plan Craft realistic goals with necessary trade-offs Assign milestones and key performance indicators to track progress</p>	<p>1. 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</p> <p>2. Manage ports, pre-book logistics capacity (shipping, rail, and airfreight), and optimize routes</p> <p>3. Identify critical parts, ration parts as needed, and optimize locations</p> <p>4. Develop scenario-based demand requirement for construction scope of work, and manage the planning for manufacturing and sourcing</p>

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.

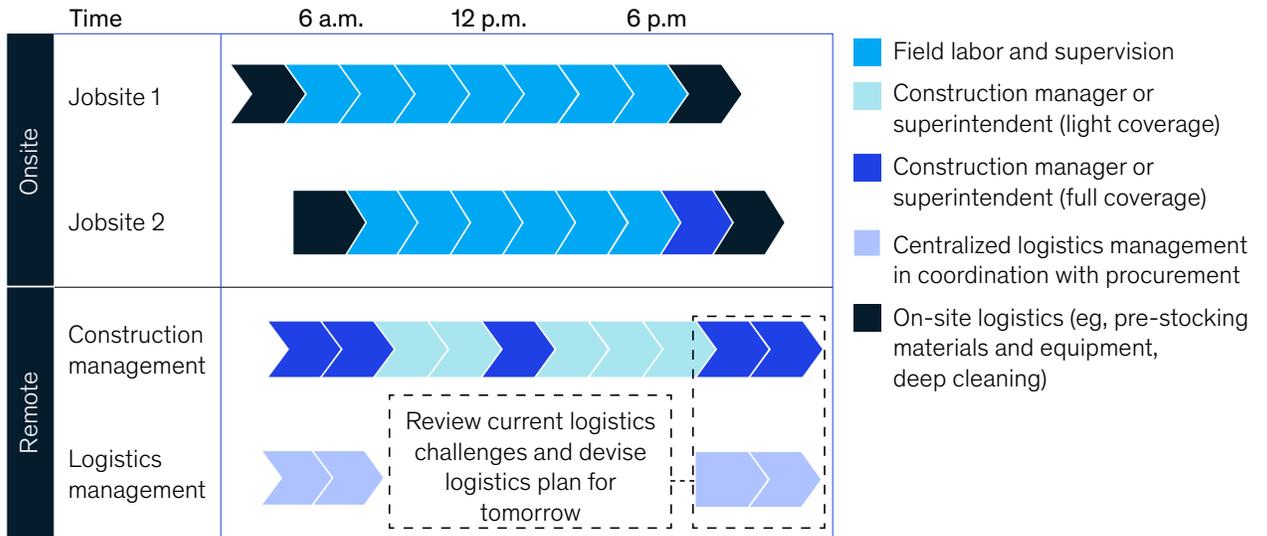
Identify digital solutions for immediate and long-term needs

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 better-distributed workforce.

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



commercial real estate developer is using web-based 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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