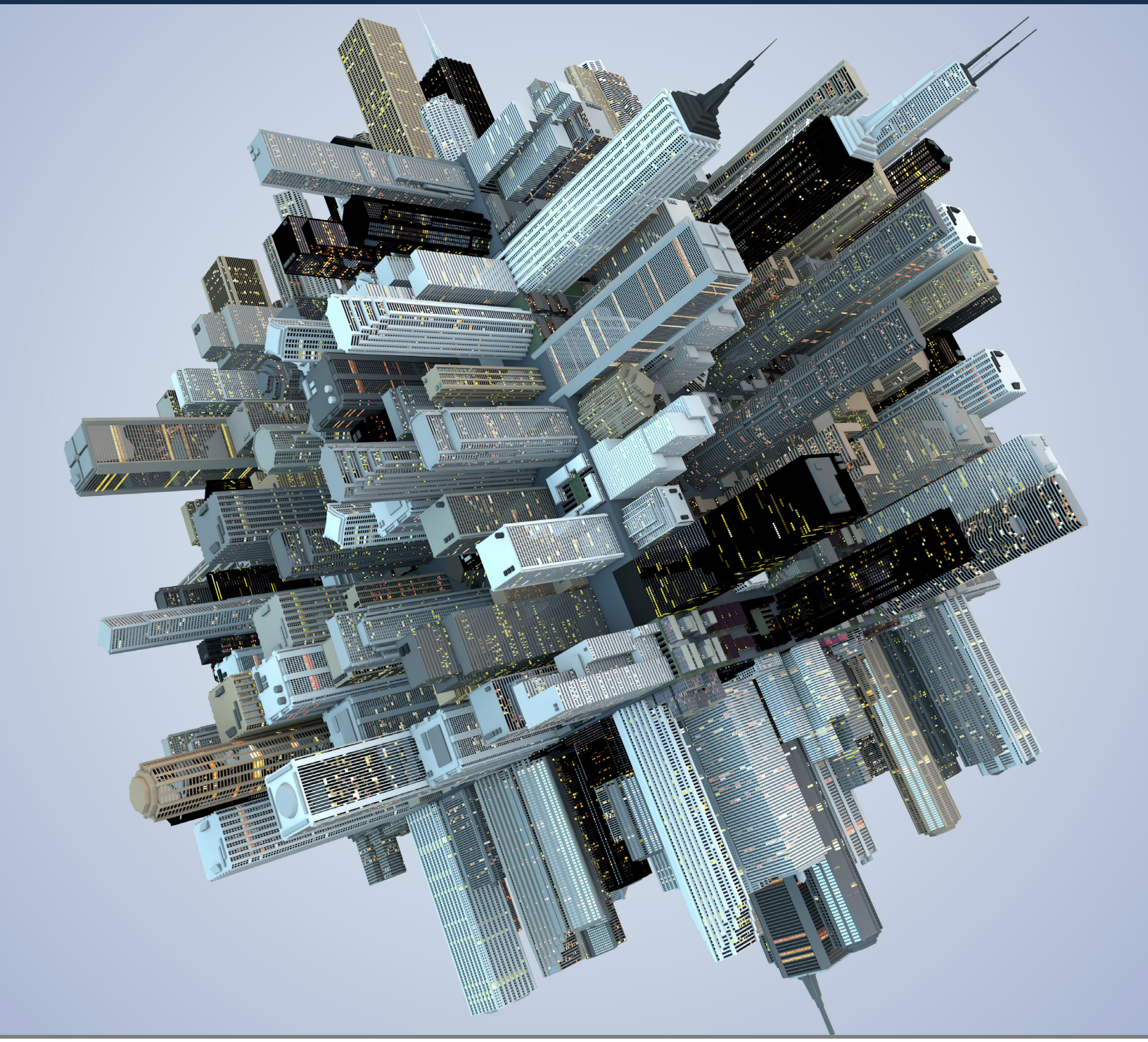
FMI for the Built Environment

Construction Industry Round Table



MEGAPROJECTS:

Changing the Conversation

By Sabine Hoover

FMI

THE BIG FACTS ABOUT MEGAPROJECTS

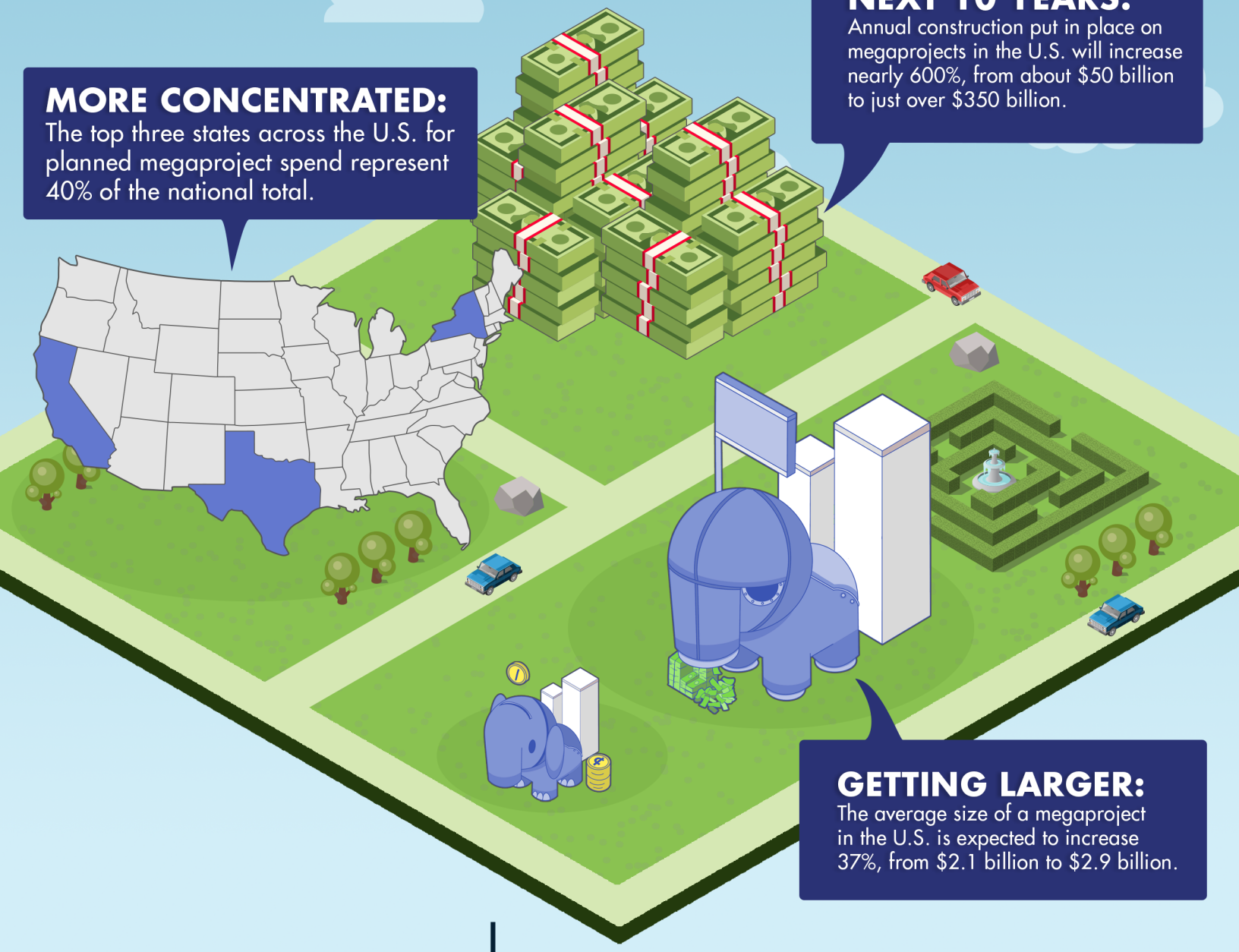
Megaprojects are getting bigger and more frequent.

NEXT 10 YEARS:

Annual construction put in place on megaprojects in the U.S. will increase nearly 600%, from about $50 billion to just over $350 billion.

MORE CONCENTRATED:

The top three states across the U.S. for planned megaproject spend represent 40% of the national total.



GETTING LARGER:

The average size of a megaproject in the U.S. is expected to increase 37%, from $2.1 billion to $2.9 billion.

How owners and project stakeholders are changing the way they work together to deliver successful megaprojects.

The widespread shortcomings and low success rate of megaprojects have been so pervasive that those involved have begun to question the very model. The recent exits of prominent engineering[1] and construction (E&C) players in certain types of megaproject markets indicate the situation may be coming to a head.[2] Yet, at the same time, megaprojects are constantly growing larger and increasing in number and complexity. Consider this: Between 2013 and 2018, the annual value of U.S. megaproject starts increased from 3% to approximately 33% of all U.S. construction project starts. Similarly, FMI predicts that ***over the next decade, annual construction put in place (CPiP) on megaprojects in the U.S. will increase nearly 600%,*** from about $50 billion to just over $350 billion ***(Exhibits 1 and 2).***

These are big numbers. So what does this mean for the future of the E&C industry? Will we continue tormenting ourselves with project delays, cost overruns, lawsuits and political debacles until the end of time? Or has the industry finally reached a point where we can say "no more."

The answers are unclear, but we are starting to see signs of a cultural shift in how owners, contractors and designers collaborate and interact with one another on megaprojects. Though success stories are anecdotal and limited, one of the key topics that keeps bubbling to the surface is trust. It is this basic emotional state, a central theme of all human relationships, that can make or break entire project teams and associated outcomes.

In this paper, we present FMI's latest market forecast on megaprojects, share insights from industry leaders on five key ingredients that drive successful megaprojects, and offer questions and recommendations around how to change the name of the game.

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1 In the context of this paper, "engineering" includes all design professionals. Also, in the context of our research, we use Flyvbjerg's definition of megaprojects, which are large-scale, complex ventures that typically cost $1 billion or more and may take years to develop and build, involve multiple public and private stakeholders, are transformational and impact millions of people (Flyvbjerg, 2014).

2 Debra K. Rubin and Mary B. Powers. "After Bottom-Line Hits, More Firms Exit Fixed-Price Work." ENR. August 7, 2019.

Looking Ahead: More and Bigger Projects

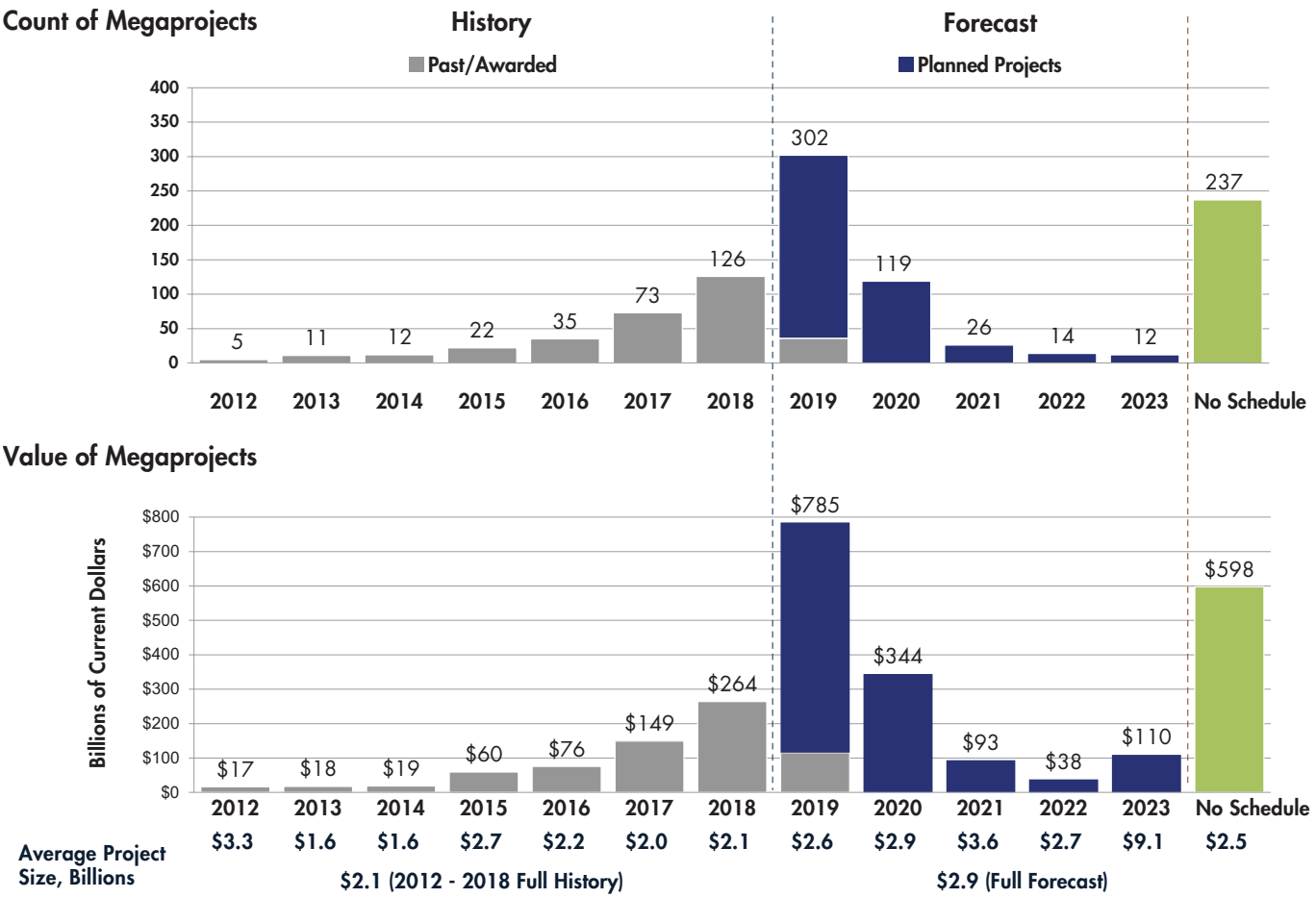
Our research indicates that at least 320 megaprojects have been awarded in the U.S. since 2012—a staggering investment valued at over $700 billion. Additionally, another 670-plus megaprojects are being planned, representing a future investment opportunity likely to reach $2 trillion ***(Exhibit 1)***. Most of these planned megaprojects are expected to be built in the South and West, with three states accounting for 40% of the total starts value (New York, 15%; California, 15%; and Texas, 10%).

Measured differently (as seen in ***Exhibit 2***), between 2012 and 2018, historical megaproject CPiP represented only 1.8% of ***total*** CPiP, or just over 4% of 2018 CPiP. ***However, within the next decade—and likely within the next five or six years—we expect annual megaproject spending to near or exceed 20% of total CPiP—a dramatic shift for the E&C industry.***

Historically, megaproject activity has been driven by the industrial and infrastructure segments. In fact, megaproject industrial and infrastructure starts (on a current dollar basis) represented 61% of all industrial and infrastructure starts in 2018, up from 42% in 2017.

Looking at the same data for other large projects ranging from $500 million to $1 billion, we found comparable trends in the historical starts. ***These smaller, albeit still very large, projects highlighted that even commercial and residential starts (e.g., mixed use) have been consistently and more frequently increasing in size and complexity.***

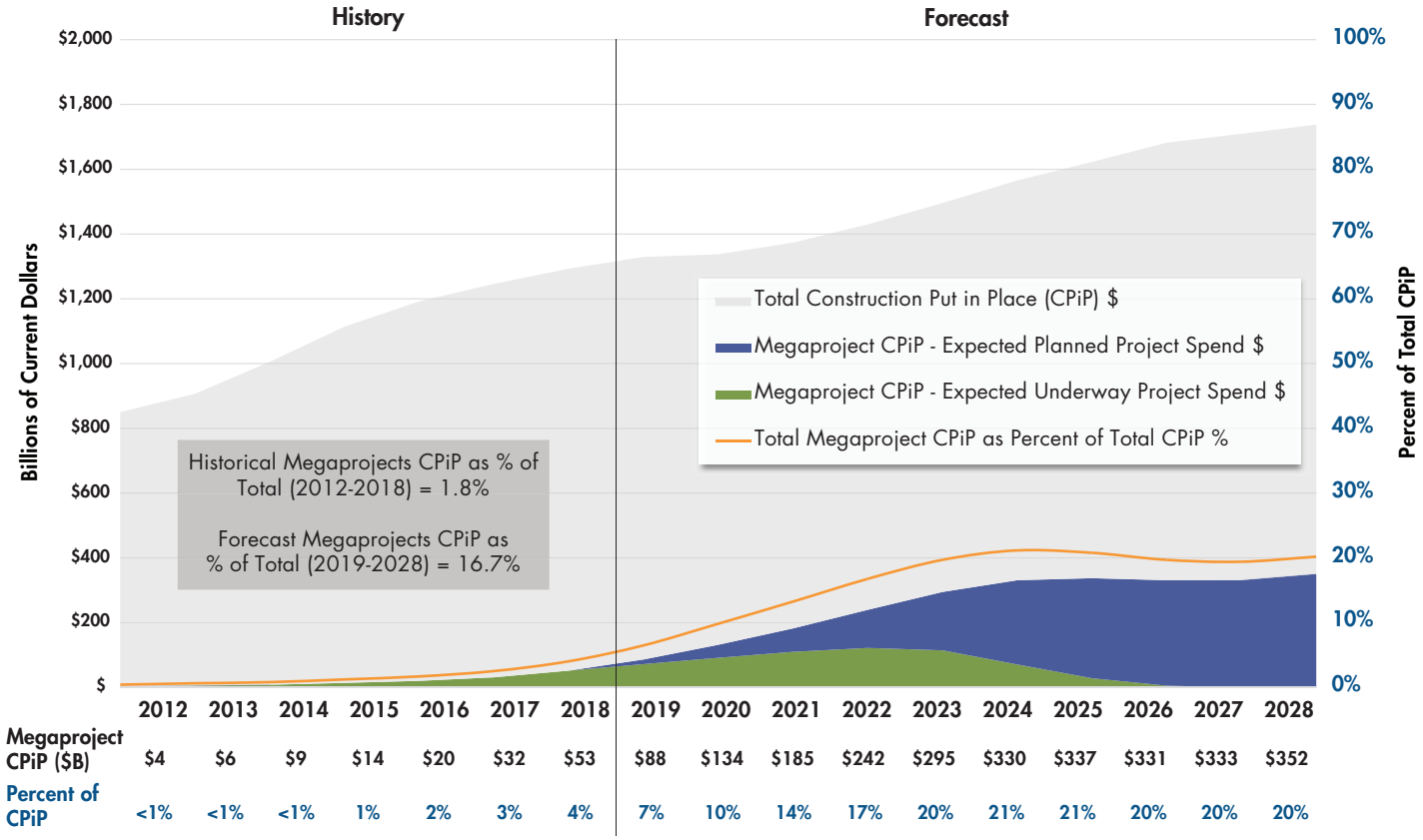
Exhibit 1. U.S. Megaprojects, Historical and Planned Activity Construction Starts/Awards, as Reported



Sources: FMI, building permits, ConstructConnect, Dodge

Exhibit 2. U.S. Megaprojects, Historical and Planned Activity

Construction Put in Place Forecast, 2012-2028



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Megaproject CPiP ($B)	$4	$6	$9	$14	$20	$32	$53	$88	$134	$185	$242	$295	$330	$337	$331	$333	$352
Percent of CPiP	<1%	<1%	<1%	1%	2%	3%	4%	7%	10%	14%	17%	20%	21%	21%	20%	20%	20%

Sources: FMI, building permits, ConstructConnect, Dodge

Ron Magnus, founding principal with FMI, explained this growing trend as follows: "Part of the reason why owners have decided to package smaller and multiple commercial and private projects into large, single megaprojects is because the market is so hot. Speed to market has become critical for owners. In addition, construction companies are getting larger, making it more feasible for them to handle bigger projects."

Bill Spragins, a former principal with FMI and an expert in the project team alignment/partnering arena, added, "One reason public agencies packaged smaller projects into single, large megaprojects in an alternative delivery system was to take advantage of economies of scale and reduce the overall timeline to complete them. This in turn produced cost savings. One successful example of this is the T-REX project in Denver, which was completed in roughly five years instead of a much longer time frame had it been built under traditional contracting and project delivery methods. Alternative project delivery methods such as public-private partnerships provided public owners with additional financial and operational options to get critical infrastructure built."

With owners and E&C firms embarking on ever-larger projects, industry stakeholders are being challenged to take a completely new look at how to tackle the next generation of complex megaprojects. As the authors of one recent study stated, "There is an emerging view that not only is the nature of projects changing, but also the social environment in which these projects occur. Accordingly, these megaprojects require a completely different perspective, level of stakeholder engagement, cultural environment and project leadership than that practiced at the moment, which is based on up-scaled large project management disciplines."

Bent Flyvbjerg, a research authority in the realm of megaprojects at Oxford University's Saïd Business School, UK, confirmed, "Megaprojects are a completely different breed of project in terms of their level of aspiration, lead times, complexity and stakeholder involvement.

Consequently, they are also a very different type of project to manage. A colleague of mine likes to say that if managers of conventional projects need the equivalent of a driver's license to do what they do, then managers of megaprojects need the equivalent of a pilot's jumbo jet license.[3] And, just like you wouldn't want someone with just a driver's license to fly a jumbo jet, you wouldn't want conventional project managers to manage megaprojects."[4]

Looking ahead, owners and project stakeholders across a wide range of construction segments must prepare and adapt to this changing business landscape. These new-age megaprojects require changing mindsets and new business models that encompass broader stakeholder involvement and new, collaborative cultures—beyond the traditional engineering mindset.

Wanted: A New Mindset

Much has been written and researched about the very low success rates (measured by achieving budget, schedule and economic business case) of complex megaprojects. ***In fact, globally, less than 1 in 1,000 megaprojects achieve their promised business outcomes.***[5]

On the flip side, there is very little known about what makes megaprojects successful because success is so rare. This was the impetus for the Construction Industry Round Table (CIRT) to partner with FMI to investigate leadership best practices associated with megaprojects.

In this first research phase, the FMI team interviewed 22 industry stakeholders, including owners, contractors, designers and academics who have been involved in both successful and unsuccessful megaprojects during the past decades. Findings are based on these qualitative interviews and are synthesized into five themes that interviewees consistently brought up as key ingredients to delivering successful megaprojects.

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3 The colleague is Dr. Patrick O'Connell, practitioner director of Major Programme Management at Oxford University's Saïd Business School.

4 Bent Flyvbjerg. "What You Should Know About Megaprojects and Why: An Overview." Project Management Journal. April/May 2014.

5 "Changing the game. How Australia can achieve success in the new world of Mega-projects." Australian Constructors Association. 2015.

1) The Trust Factor. Study participants talked about the issue of trust in almost all conversations and discussed its importance as a key ingredient for project success. Stakeholders on successful megaprojects invest a lot of time upfront in building trust through off-site meetings, getting to know each other on a personal basis. While trust is essential to any healthy relationship, it's one of those things that doesn't happen right away. You must build it, develop it and then continue to work at it. This takes time, and successful owners and project stakeholders are very deliberate in the way they build trust and communicate with one another—long before the project has even begun. In a study published earlier this year, its authors argued that "trust is ***the*** key factor in driving the rules and framework of megaprojects."

Jim Whitaker, principal and senior vice president at HKS Inc., adds, "No project delivery tool nor process improvement can replace basic human trust. Trust is the cornerstone, the basic building block. If you don't or can't trust someone, then you can't work with him or her effectively and efficiently; you'll hedge. You're probably not going to like them, you're certainly not going to give them the benefit of the doubt, and ultimately, they're not or you're not going to honor your end of the bargain, etc. So the unraveling begins with: How much do core team members trust one another? In my experience that is the secret sauce, and it's the first and worst bond to be broken, and it's usually irreparable when it is."

"You can invent and invest in as many processes, procedures, risk registers and technology tools as you like. The foundational principle we fail on most often is just the human interaction of basic trust. And trust begins and ends with telling the truth. Just tell the truth. We know no design or construction contract can legislate good behavior; yet successful project outcomes are predicated on key team members trusting one another."

Jim Whitaker, FAIA and FDBIA, Principal and Senior Vice President, HKS Inc.

2) A Culture of Cohesion and Collaboration. Keith Molenaar, associate dean for research at the University of Colorado Boulder, in collaboration with the Pankow Foundation, studied more than 200 different building projects and found that cohesion and collaboration were the keys to success. In fact, ***their research uncovered that the contract type or project delivery method did not determine project success.*** Instead, early involvement of team members—and owners creating a collaborative environment—was more influential in driving success rather than the contract type itself. Furthermore, the research uncovered that qualifications-based selections generated positive project outcomes, whereas price-based selections resulted in less positive project performance.

"Psychology is prime and will override any business model."

Australian Constructors Association

Molenaar explains, "Everything that I've found over the years is the earlier you can get the team integrated, the better the chances of success. Not that it will guarantee success, but it does increase your odds."

Interviewees confirmed the importance of getting all project teams aligned ***early*** in the process and working as ***one*** team. Part of this process includes joint goal setting upfront so that individual team members can work toward common project outcomes.

George Pfeffer, management committee member at DPR, states, "On one project, we spent the first two weeks with all three organizations (owner, architect and DPR) sitting in an office with butcher paper on the walls, and we charted out how we were going to act as one organization—one team for the best of the project—as opposed to three independent entities. We worked intentionally and closely together through these first two weeks, which led to that same dynamic throughout the project. We all felt this was the right thing to do, but the owner's leadership was pivotal. The organizational structure we set up treated all three organizations' resources as a common pool and placed the best person into a position to lead a particular function or scope, regardless of which organization signed the paycheck. For a large ground-up hospital in California, we knew we needed processes and results that reduced latency and were value-add to the project. By expanding this philosophy to the rest of the project stakeholders, and operating together in a big room, we were able to reduce the budget by $200 million without giving up functionality, square footage or quality. We tracked the response time to the several thousand RFIs and kept the average response time to less than four days. We did this by implementing the 'get up and go talk through the question first with your teammate' method before creating an RFI."

3) Transparent and Authentic Leadership. Good leadership plays a crucial role in the success or failure of megaprojects. Interviewees all pointed out that megaproject teams require a different type of leadership culture—one that is flexible, open and transparent. Developing such a culture takes time and requires trust and authenticity from all participants. Effective megaproject leaders are experts in developing a team environment that fosters emotional engagement, shared purpose and accountability, and is safe for constructive feedback and open discussions (versus blaming). This type of leadership culture ideally exists across all project levels and across all organizations involved in a megaproject.

UC San Diego Associate Vice Chancellor Eric Smith, who serves on a leadership team for Capital Program Management, explains, "Successful megaproject teams must have a strong project culture, strong project leadership and excellent execution." Regardless of the project in question, he says good leadership starts with a willingness to be authentic, transparent and vulnerable. "People respond to those types of leaders because there's a natural empathy between human beings that kicks in," says Smith, "and that creates a desire to help solve the problem and to make everyone successful."

Other researchers confirm, "The challenge is for us to move beyond platitudes and to consciously develop a nurturing environment by the way we conduct ourselves in the many transactions and interfaces we have on a daily basis. Culture is emergent, not proclaimed. We need to focus much more on the creation of sustainable project environments where we have a clear sense of 'why' and aligned teams across boundaries."

4) Nimble and Autonomous Teams. Megaproject stakeholders often centralize decision-making to minimize project complexity and quell anxieties. This, in turn, can lead to bureaucratic gridlocks and cost project stakeholders millions of dollars daily. Successful megaproject teams are breaking out of this mold and setting up smaller, more nimble project teams that can move quickly. Like the platoon model for marines, these teams enjoy a certain degree of autonomy and are empowered to make decisions without approval from the top, and at each decision point.

Some companies use this team structure to help grow and develop individuals into new roles. Charlie Holm, senior project manager with Fortis Construction, explains, "With this nimble decision-making model, people who work on megaprojects for years can see the opportunity for growth. For example, someone who's on the quality team might strive to be the quality team lead. And if he or she achieves that, then there's the opportunity to become the project team lead further down the road. We've been very successful with this concept."

Interviewees confirmed that these complex megaprojects require a different leadership model and new types of leaders. The top-down, hierarchical leadership structure, where one centralized project leader is a single point of responsibility, is no longer viable on these complex megaprojects. There are simply too many variables and interests in play. Instead, those leadership roles must focus on ***enabling*** leadership, and remaining agile and adaptable at all times.

Leadership agility is closely aligned with what it takes to be a Peak Leader—a concept FMI has researched for more than a decade in the engineering and construction industry. At a leadership level, agility is a mindset that facilitates rapid growth and the adoption of key business strategies—key competencies when leading megaproject teams (for more information, see "Eight Characteristics of Agile Leaders").

5) Educated and Experienced Owner. All interviewees agreed that owners make or break projects; this is not news. But having skilled and experienced owner-employees is even more critical on megaprojects. Several interviewees from owner organizations had worked in construction or design (or both) before taking on roles on the owner side. As a result, they had intricate knowledge of how contractors and designers approach risk allocation, cost estimating, scheduling and so forth, and brought more of a partnering approach to the table (rather than an adversarial attitude).

Darin Daskarolis, senior director, Global Construction - Data Centers at Facebook, stated, "The underlying philosophy behind our successful megaprojects program started with a vision of forming effective, respectful and trusted partnerships with our general contractors. Having worked as a general contractor, I'd call it being the model owner. Since commercial construction is largely a relationship-based business, we knew we had to form strong bonds with our contractors to develop a common and realistic view of the challenges ahead. This common view informed sensible budgets and guided strategic staffing decisions. As we prepared to ramp up and build megaprojects at an unprecedented pace, this approach became our scaling mechanism as well. These strong partnerships were leveraged globally to share best practices and accelerate learning in new regions. In return for all these program contributions our general contractors earn repeat business and both parties reap the benefits."

One fundamental piece of an owner's approach is the selection and implementation of an appropriate project delivery system that will be a win for all participants. The recent exits of prominent E&C players from certain alternative delivery systems indicate a misallocation of risk on these types of projects, combined with a lack of education throughout the owner organization on the speed of decision-making and other nuances required for success with the new delivery approach. If this does not change, additional E&C firms may follow suit and exit as well, which will only drive up the costs on future infrastructure projects.

Spragins added, "In the end, all parties contribute to the success or failure of any given project. However, owners ultimately must lead and establish an environment for success on how business will be conducted. So, while a proactive contractor can certainly help resolve any given difficult issues that arise, it is nearly ***always*** the owner who must be the guiding light in these situations."

In our research on "What to Do When Projects Go Bad," we found that 50% of the projects studied contained elements of at least one of the following owner factors:

- Inexperience with the use of a new project delivery system
- Inexperienced project staff
- Poor or slow decision-making processes that cannot keep pace with the project schedule
- Unbalanced application of the contract requirements versus collaborative problem resolution by the owner's representative/CM for fee/program manager

The perfect storm is created when an inexperienced owner organization with poor or slow decision-making is matched with an inexperienced contractor who is not fully organized or staffed at project initiation. Spragins added, "This often leads to each party defaulting to its interpretation of the contract to resolve every inevitable issue that arises on the project. Executives only intervene in a 'reactive' manner, when things have reached a crisis mode and changes/financial outlays have reached an unsustainable level."

Paving the Way for The Future

According to global strategist Parag Khanna, the world is becoming more networked as a result of the buildings and structures that we build. Worldwide, all defense budgets and military spending total about $2 trillion per year, yet global infrastructure spending is expected to increase from $3 trillion to $9 trillion annually by 2030.[6]

In the U.S. alone, FMI expects total construction put in place on megaprojects to exceed $2.5 trillion, reaching more than $300 billion per year (or roughly 20% of annual spend) over the next decade. In addition, FMI forecasts nearly 50% of construction to occur in just 20 metropolitan markets over the next three to five years, and just five of these metropolitan markets will make up one-fifth of total construction in the U.S. These include New York, Los Angeles, Dallas, Houston and Washington.

"Google plans to spend $13 billion on data centers and offices across the U.S. in 2019, saying the investment will create thousands of new construction jobs in states outside its traditional base of California."

Bloomberg

With this power shift toward urban areas or "megacities," we also expect to see growing demand for major infrastructure improvements—a trend that will create winners and losers in E&C: Industry players will face increasing complexities and higher demand for new building and delivery systems, and will also be challenged with better resource utilization and cost associated with urban growth and development.

In a similar vein, key changes are taking place from a social-demographic viewpoint and pushing new changes in value systems and world philosophies. From an economic value proposition standpoint, for example, stewardship of the environment, resources and sustainability are all becoming deeply embedded in the social contracts of the North American population. This directly impacts design

6 "Megaprojects Set to Explode to 24% of Global GDP Within a Decade." Future of Construction. Feb 18, 2018.

and construction expectations, including where structures are built; how buildings are operated; and their impacts on the physical, human and social environments. Such factors will ultimately impact public policy and subsequently translate into governmental regulation.

This is both a daunting and encouraging future picture of the built environment. However, given that most megaprojects have historically been plagued by cost and time overruns, profit shortfalls, environmental damage and negative social impacts,[7] the industry must re-evaluate the way companies establish project teams, contracts and delivery methods from the onset because the risk/reward ratio associated with certain models has gotten out of balance.

Furthermore, this prognosis also forces industry players to ask themselves questions such as:

- Can I compete in this new megaproject landscape? And if so, where?
- What type of project risk assessments are now required, and what are the risk profiles I am willing to play in and not willing to play in?
- What are the implications for my business? For example, what operational structure and processes are required? What leadership competencies and team structures are needed? How can communication be improved for different project sizes?
- What partners should I team up with? Which owners should I target?
- How do I invest in building my company with top-tier talent? And a pipeline of such talent that appeals to younger generations and can sustain a high level of teamwork for longer durations on megaprojects? How do I source and/or evaluate such talent?
- What can my company do differently to plan and deliver larger and more complex projects?

Our initial research confirms that a small group of E&C players and owners are deploying a fresh approach to collaboration and teamwork on these large projects, taking on a "one-unit" mindset—unified by a shared sense of purpose and a fair business model—rather than working as separate entities against each other. While this seems simple to do, it's surprisingly difficult to get right.

However, if we as a global society do increase our infrastructure spending to $9 trillion per year, as Parag Khanna suggests, we have no choice but to completely change our mindsets. As society continues to move toward more megacity cultures, lifestyles and global economies, megacities as a whole may become more vital than the countries in which they're located. Should megaprojects continue to fail just as their spending is expected to reach new heights, the impacts could be devastating to the framework of the E&C industry.

Additionally, any major city, region or nation not working on its own megaprojects will risk being left behind. The choice is yours. How will you participate, and what will you bring to help shape or change the conversation today?

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7 Bent Flyvberg. "What You Should Know About Megaprojects and Why: An Overview." Saïd Business School, Oxford University, Oxford, United Kingdom. Project Management Journal. April/May 2014.

SUCCESS INGREDIENTS

Success Ingredient	How It Contributes to Better Outcomes	What Happens When It's Missing	How to Make It Work
Trust Factor	• Teams are more effective, more efficient and more productive when members trust each other. • People freely share information, collaborate and leverage one another's skills and abilities productively. • People know what is expected of them and what they can expect in return.	• People become withdrawn and disengaged. • Self-confidence and confidence in others erode. • Engagement and commitment to work dwindle. • Collaboration and productivity suffer.	• Invest a lot of time upfront in selecting the right team members (matchmaking) and building trust through meetings and gatherings. • Settle and align contractual expectations among organizations. • Educate each other on project delivery mechanisms and clarify requirements. • Educate each other on how each organization functions, including an honest assessment of strengths and weaknesses, given the project at hand. • Establish challenging but easily attainable goals early on and meet them. Under promise and over deliver.
Culture of Cohesion and Collaboration	• Builds shared accountability and leads to mutual achievement and deep synergy. • Results in increased productivity and participation, greater commitment to the project and a clear sense of purpose. • Leads to clear alignment of roles and team behaviors.	• Can lead to run-for-cover shifting of blame or contracts when things go wrong. • Creates contention and disputes rather than an aligned problem-solving approach to novel issues.	• Set and manage clear team expectations (common vision and team alignment). • Define clear and concise project goals and roles for team members. • Form the glue that holds the team together (establish rules around communication, honesty, transparency). • Build a one-unit mindset! Answer the question: What would we all have to believe about this team to behave as *one unit*?
Transparent and Authentic Leadership	• Is the foundation for driving a culture of trust among project stakeholders. • Creates a team culture of shared accountability and drives emotional engagement. • Empowers team members with the facts, enabling them with the power to help solve problems and make everyone successful.	• Saps the enthusiasm of project teams and results in poor performance. • Leads to disengagement and unhappy team members who assume the worst.	• Start with a willingness to be transparent and vulnerable. • Encourage collaboration among teams and across their organizations. • Share relevant project updates to team members and empower others to do the same where appropriate. • Cultivate synergies across teams and create strong team dynamics.

Success Ingredient	How It Contributes to Better Outcomes	What Happens When It's Missing	How to Make It Work
Nimble and Autonomous Teams	• Small teams can move quickly and be more nimble. • Team leaders take ownership and have greater ability to make an impact.	• An absense of these teams can lead to bureaucratic gridlocks and cost project stakeholders millions of dollars daily. • Issues get stuck at lower levels of management until they have an irretrievable impact on schedule and cost.	• Keep leadership roles agile and adaptable. • Set expectations and establish purpose with team leaders and establish ground rules for how teams will function (includes levels of decision-making authority). • Identify decisions where teams are empowered to act autonomously and encourage them to do so. • Define consistent problem-solving process and exit path (from team) for issues that become deadlocked.
Educated and Experienced Owner	• Promotes better collaboration and risk allocation. • Establishes credibility with A/Es, contractors and the rest of the supply chain. • Gives team confidence that they can work through any of the inevitable issues that will arise. • Promotes a culture of innovation and idea generation.	• Project can get derailed from the beginning if owner does not have experience with delivery system. • Lack of experienced owner and staff as well as poor decision-making lead to poor execution. • An unbalanced focus on application of the contract requirements versus achieving overall intent of the contract.	• Choose alternative delivery systems only when the organization is aligned internally on the speed of decision-making that will be required to support the project schedule. • Set joint goals and expectations with all project stakeholders early in the process. • Apply easily understood metrics to goals and monitor on a continuous basis. • Clarify decision-making path and authority across all organizations.

About the Research Team

Sabine Hoover is FMI's content director and is responsible for leading content and research initiatives across the organization to drive thought leadership and promote industry engagement. She is also the chief editor for FMI's flagship publication, the "FMI Quarterly." She can be reached via email at shoover@fminet.com.

Ron Magnus is founder of FMI's Leadership and Organizational Development practice. This practice has focused on developing the strategic capability of leaders worldwide. Many of the largest engineer and construction firms in the world are clients and friends. Ron also serves on several boards as a director and trusted advisor. He can be reached via email at rmagnus@fminet.com.

Mark Casso represents CIRT as its president, responsible for both leadership and management aspects of the business trade association. As such, Mark directs the resources and programs of the Round Table to achieve its goals to influence public policy to free the creativity and capabilities of the construction industry to competitively provide efficient and valuable services; improve the industry's image; and to provide a forum for networking and education of its members. He can be reached via email at mcasso@cirt.org.

Brian Strawberry is a senior economist with FMI. Brian's expertise is in economic and statistical modeling. He leads FMI's efforts in market sizing, forecasting and building product/construction material pricing and consumption trends. Brian's combination of analytical skills and creative problem solving abilities have proven valuable for many contractors, owners, and private equity groups, as well as industry associations and internal research initiatives. He can be reached via email at bstrawberry@fminet.com.

Alyssa Menard is a market research associate with FMI. Alyssa is responsible for conducting primary and secondary research around market trends within the AEC industry and built environment. Her primary objective is to ensure best practices in the collection, management, analysis and interpretation of data for content development within the organization. She can be reached via email at amenard@fminet.com.

About The Construction Industry Round Table (CIRT)

The Construction Industry Round Table (CIRT) is composed exclusively of approximately 120 CEOs from the leading architectural, engineering and construction firms doing business in the United States. CIRT is the only organization that is uniquely situated as a single voice representing the richly diverse and dynamic design/ construction community. First organized in 1987 as the Construction Industry Presidents' Forum, the Forum has since been incorporated as a not-for-profit association with the mission "to be a leading force for positive change in the design/construction industry while helping members improve the overall performance of their individual companies." The Round Table strives to create one voice to meet the interests and needs of the design/construction community. CIRT supports its members by actively representing the industry on public policy issues, by improving the image and presence of its leading members, and by providing a forum for enhancing and developing strong management approaches through networking and peer interaction. The Round Table's member CEOs serve as prime sources of information, news and background on the design/construction industry and its activities. If you are interested in obtaining more information about the Construction Industry Round Table, please call 202-466-6777 or contact us by email at *cirt@cirt.org*.

Exclusively Focused on the Built Environment

Who We Are

FMI is the leading consulting and investment banking firm dedicated exclusively to the Built Environment.

We serve the industry as a trusted advisor. More than six decades of context, connections and insights lead to transformational outcomes for our clients and the industry.

FMI Consulting

FMI has more relationships in the industry than any other consulting firm. We leverage decades of focused experience and expertise to advise on strategy, leadership and organizational development, performance, technology and innovation.

PRACTICE AREAS

Strategy

- Market Research
- Market Strategy
- Business Development
- Strategic Planning

Leadership & Organizational Development

- Leadership & Talent Development
- Succession Management
- High-performing Teams
- Corporate Governance
- Executive Coaching

Performance

- Operations
- Risk Management
- Compensation
- Peer Groups

Technology & Innovation

- Tech Market Accelerator
- Tech Partner Program
- Tech Readiness Assessment
- Tech Sourcing & Adoption
- Integrated Business Intelligence

FMI Capital Advisors

We are the leading investment banking firm exclusive to the built environment. Our dedicated team of more than 35 experienced M&A finance professionals has completed hundreds of transactions in the industry. FMI offers the broadest and deepest M&A coverage of the Built Environment.

SECTOR EXPERTISE

- Architecture, Engineering & Environmental
- Building Products
- Chemicals
- Construction Materials
- Contractors
- Energy Service & Equipment
- Energy Solutions & Cleantech
- Utility Transmission & Distribution

SERVICES

- M&A Advisory
- ESOP Advisory
- Valuations
- Ownership Transfer

EXECUTIVE EDUCATION

- Acquisitions in the Construction Industry
- Ownership Transfer & Management Succession

FMI

for the Built Environment

TRAINING PROGRAMS

Over 10,000 industry leaders have completed FMI training programs, which span the entire management spectrum, from new managers to senior executives.

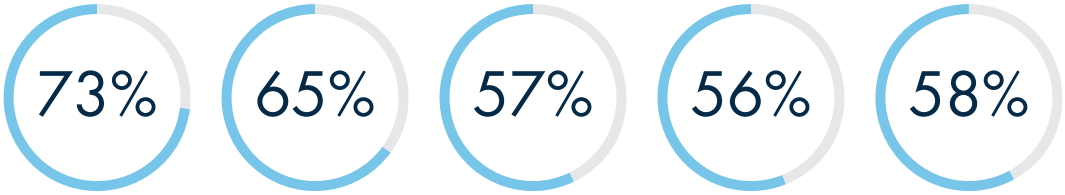
- Emerging Managers Institute
- Field Leader Institute
- Project Manager Academy
- Construction Executive Program
- Leadership Institute
- Leading Operational Excellence
- Construction Selling Skills
- Market & Selling Strategies
- Ownership Transfer & Management Succession
- Acquisitions in the Construction Industry

FMI PEER GROUPS

FMI manages nearly 50 individual peer groups across the industry. Connecting businesses through networking, expanding visions and providing feedback.

- Organizational Structure and Development
- Human Resources
- Business Development
- Information Technology
- Operations Management
- Financial Management

FMI CLIENT HIGHLIGHTS



ENR Top 400 **LARGEST CONTRACTORS**

ENR Top 200 **SPECIALTY CONTRACTORS**

ENR Top 100 **DESIGN FIRMS**

ENR Top 200 **ENVIRONMENTAL FIRMS**

ENR Top 100 **CM FOR FEE FIRMS**

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