How to Plan and Deliver a Better Engineering Project

Practical Tips, Key Steps & Industry Trends



SEH

Building a Better World for All of Us®

INTRODUCTION

Better Projects Change The World

Each architecture and engineering (A/E) project brings its own set of challenges. Your ability to overcome these challenges and achieve successful projects hinges on the choices you make – from before the request for proposal (RFP) to your decisions around project manager (and team), project delivery and everything in between.

We want you to have the information you need to make the right project decisions. We have filled the following pages with key industry trends, practical project tips and steps, technological advances and direct insight from project managers, senior engineers, community engagement specialists and former public works officials, among other seasoned experts.

Take your first-best step toward a better engineering project.

Cover Photo: In partnership with the City of Boulder, an SEH team designed the Baseline Pedestrian Underpass near the University of Colorado Boulder campus. Bringing to life the City's commitment to multimodal transportation, this unique underpass will provide greater connectivity as well as safe crossing for bicyclists, pedestrians and drivers for decades to come.

Sources:
https://www.enr.com/articles/45067-public-private-partnerships-when-will-reality-meet-the-promise | https://www.abc.org/News-Media/News-Releases/entryid/15959/price-of-construction-materials-declines-in-november-abc-predicts-moderate-increases-in-early-2019 | https://datausa.io/profile/soc/332011/#demographics | http://go.psmj.com/blog/70-of-your-clients-are-judging-you-on | https://www.enr.com/blogs/22-marketropolis/post/44808-ten-trends-in-aec-business-development | https://store.psmj.com/a-e-c-project-management-bootcamp-psmj | https://www.epa.gov/ejscreen | https://cdn.ymaws.com/www.iap2.org/resource/resmgr/pillars/Spectrum_8.5x11_Print.pdf | https://www.entrepreneur.com/article/310062

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INTRODUCTION

10 A/E Industry Trends Re-Shaping the Public & Private Sectors

It's no secret that knowledge is key to a better project.

As you plan and act on new initiatives in the months ahead, we've gathered key A/E trends – with the hope they will provide you with actionable knowledge. In addition to key trends, we explore how these changes, challenges and innovations will impact your current and future projects.

1

GREATER FOCUS ON PROJECTS PROMOTING CLIMATE RESILIENCE

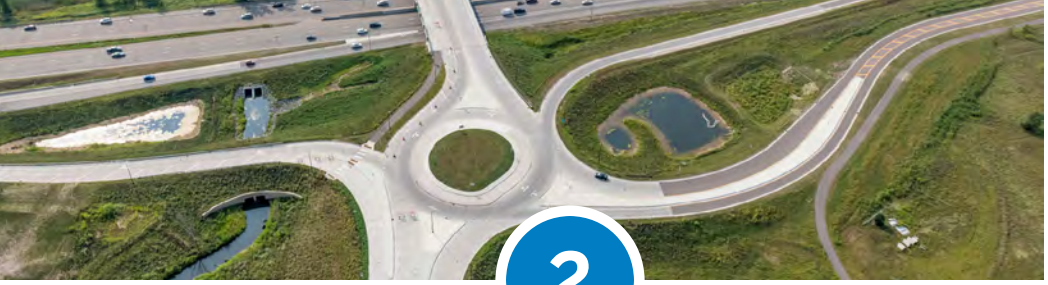
There is consensus among those within architecture and engineering that we must protect our communities from storms and other natural acts. But we must also design, plan and build in a way that goes beyond protection and, instead, creates resiliency. Enter the growth of climate resilience.

Scientists' long-predicted effects of climate change, like sea ice loss, rising sea levels, and more intense heat waves, are now happening. Some impacts, such as droughts, wildfires, and extreme rainfall, are occurring faster than expected. These combined effects further exacerbate the need for sustainable projects.

Climate resilience can be generally defined as 1) the capacity to absorb stresses and maintain function in the face of external pressures like drought, wildfire, flooding and heat waves, in addition to more steady changes in temperature, precipitation and sea level. And, 2) the ability to adapt, reorganize and evolve our assets into more desirable configurations to improve their sustainability.

How will this affect my projects?

As you seek new ways to complete various types of projects, evaluate whether your project partner is considering climate resilient methods. Have you received a vulnerability assessment or lifecycle analysis for your treatment facility, bridge, building or trail? Have you gleaned insight into how long-term performance and maintenance might be impacted by the climate?



2

CLIENT EXPERIENCE DRIVING A/E DECISIONS

In the decade ahead, A/E organizations will invest even more in the client experience. Why? According to Engineering News Record, 80 percent of an A/E company's business is driven by the client experience. Rightly so, municipalities are becoming more selective when hiring A/E consultants; choosing firms that offer the best experience (in addition to the best value).

How will this affect my projects?

In many ways: timely and transparent communication, trust, efficiency, more attention paid to your budget and a project team that truly listens to your stakeholders. Value will always be the primary driver of buyer decisions. But if your experience is also a top priority, ask yourself the following questions when evaluating consultant partners:

- Do we feel listened to by the project manager and team as a whole?
- Does the project team understand our needs and drivers of the project?
- Do we trust them with our finances, land and future?
- How has our partner engaged stakeholders; have they dismissed or invested in our people?
- What are our partner's ultimate motives?



3

DRIVERLESS TECHNOLOGY CHANGING ROADWAY DESIGN

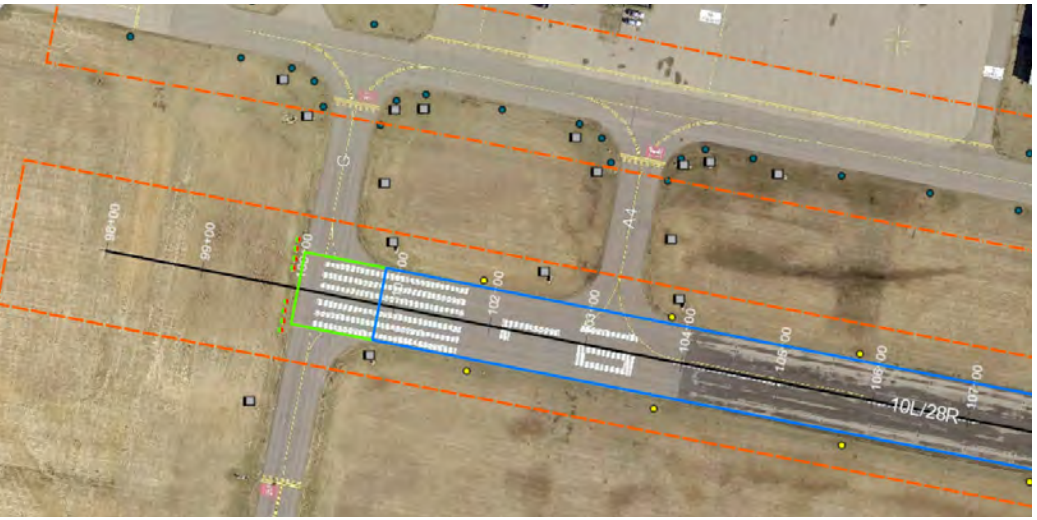
By the end of 2024, less than 5% of global traffic is expected to be self-driving vehicles, as the technology is still in early adoption. However, experts predict rapid growth, with autonomous vehicles potentially making up a larger portion of traffic by 2030. The key development in passenger cars is the expected expansion of Level 3 driver assistance, offering hands-off, eyes-off driving, pending regulatory approval, with more automakers likely to adopt it. The self-driving vehicle business is forecasted to grow into a $285 billion annual market over the next 10 years, and those spearheading this industry realize achieving such growth starts now.

How will this affect my projects?

Self-driving vehicles will dramatically impact roadway, intersection and pedestrian-crossing design:

- With fleets of driverless cars operating as a 24-hour transit system, parking lots may shrink in size or become obsolete – making land available for any number of uses.
- Pedestrians and bicyclists will play a larger role in corridor design, as pedestrian-oriented roadways (as we see in Europe) prompt more mixed-use, walkable development.
- Driverless cars are going to impact how businesses like grocery stores receive and deliver their products. Some businesses are already testing driverless delivery services.
- Designing for driverless cars may lead to narrower roads with fewer signs, less pavement and potentially require less maintenance.







4

DRONES, WEBCAMS AND VIRTUAL REALITY: ACCELERATING PROJECTS, REDUCING COSTS

Technology is moving the A/E industry forward in rapid fashion. With better video capabilities than airplanes, drones provide an unlimited means of capturing video, photography and important data at a project site.

Real-time, 360-degree, high-definition webcams allow project managers to monitor progress without traveling to a site. Virtual tours allow viewers another means to "walk" around project sites, traverse and view the smallest details without visiting in person.

How will this affect my projects?

These technologies are reducing unnecessary expenses and creating newfound transparency and timeliness. A/E partners should be using these tools to improve how they serve your needs and to help stakeholders visualize upcoming and ongoing projects.



5

3D ANIMATION AND MODELING BECOMES A TRUSTED ASSET

Further expanding on the increasing role of technology, 3D animation has created a new milestone in the evolution of architecture. Architectural 3D animation is providing the full picture around planned infrastructure's look and impact.

Further, the use of 3D modeling for facility design allows owners to envision their project, its results and impact in real-time. Changes can also be made in real-time, allowing design teams and owners to make faster and more informed decisions. And when it's time for renovations, owners can use 3D animations to envision how changes are going to fit.

How will this affect my projects?

SEH Project Manager Toby Muse offers insight into this growing trend: "Rely on 3D renderings when trying to decide on a project solution or gain buy-in within your community. This helps decision makers envision the final product rather than relying on their imagination at field tours before construction or with words in meetings. Seek these tools when making a decision on a partner!"



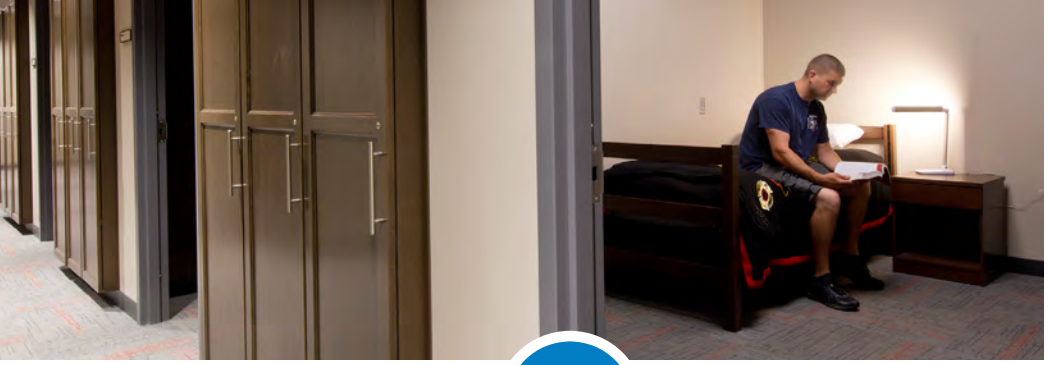
6

THE NEW GENERATION OF MASTER AND COMPREHENSIVE PLANNING

Today, good planning factors in budget, finances and practical steps – on the front end. This saves communities on the back end and makes sure the right projects are getting completed at the right time. In short, comprehensive and master planning have become a dynamic asset management model.

How will this affect my projects?

Comprehensive, master and facility plans, for example, need to have a financial plan in place. They also need to carefully weigh the impact one project will have on the surrounding area, future projects, growth plans and changes in law. Make certain your plans shift from theoretical to practical, include the above components, and that you're not waiting until "shovel in the ground day" to consider them.



7

INFRASTRUCTURE DESIGNS INCLUSIVE OF ALL IDENTITIES AND BACKGROUNDS

Looking at a specific industry for this trend (though relevant to many industries), firefighting has always been a male dominated field. According to recent data, women currently make up around 6% of the professional firefighting workforce in the U.S., with over 6,500 female career firefighters. Additionally, there are about 35,000 female volunteer firefighters, contributing to a total of roughly 9% of the U.S. firefighting community when both career and volunteer positions are considered. This reflects a gradual increase, but the gender imbalance in the field remains significant.

How will this affect my projects?

Communities are striving to make this industry more inclusive and inviting to everyone. One important and intentional effort that we're seeing is the rise of "gender neutral" fire station designs. Traditionally, fire stations have featured a single large dormitory. Today, many are being designed with private sleeping quarters (as shown above) and bathrooms while still featuring collaborative public spaces.

As more cities, counties and towns seek greater diversity, one way to embolden inclusion is making fire stations inviting to all demographics.



8

THE RISE OF PUBLIC-PRIVATE PARTNERSHIPS (P3)

The American Society of Civil Engineers (ASCE) has estimated that the U.S. will need to invest $4.59 trillion by 2025 to restore its infrastructure, with approximately $2 trillion still unfunded as of recent assessments. As a result, more private companies are partnering with public entities; seeing potential return on investment and taking on the role of updating infrastructure rather than waiting for governmental support. Private sector involvement in public-private partnerships (P3s) has grown, though fewer large-scale deals have materialized than initially expected. The U.S. is now a more attractive destination for private infrastructure investments, especially in sectors like digital infrastructure and renewable energy.

However, challenges such as ambiguous funding models and slow permitting processes continue to limit more rapid private-sector participation.

How will this affect my projects?

P3s may offer new infrastructure or better services without raising taxes or creating other charges. As the back and forth at the federal level rages on – regarding the growth of P3s – keep an eye on the various P3s coming together within your community.



9

INVESTMENTS IN TALENT ARE RISING

The "war for talent" is intensifying competition among A/E firms. This is because A/E service providers have come to understand their success hinges on the experience, diversity and capabilities of their workforces. They recognize the need to recruit and nurture the best people. And more than ever before, so do their clients (you). In response, many A/E firms are increasing their investments in learning and development, engagement, retirement options and other growth initiatives.

How will this affect my projects?

As you evaluate submitted proposals or make decisions during the interview process, pay close attention to the credentials of the proposed team. Don't hesitate to dig into their capabilities (resumes, LinkedIn profiles, among other avenues), specialty areas, years of experience and tenure. Especially if you feel important insight is being withheld. The better understanding you have of the proposed team, the more informed your decision making.



10

STEADY RISE IN COST OF CONSTRUCTION MATERIALS

Construction material costs have surged significantly in recent years due to post-pandemic supply chain disruptions, inflation, and labor shortages. Material prices rose by over 20% in 2021, and price volatility continued through 2023, affecting key materials like lumber, steel, and concrete. Inflation and supply chain issues are expected to keep costs unpredictable into 2024, with contractors facing higher and fluctuating prices compared to the moderate increases anticipated pre-pandemic.

How will this affect my projects?

As the costs of steel, iron, lumber, concrete, wire and cable, among other products, vary month over month and year over year – seek clarity from your A/E consultants. Every project is specific and different, and should be treated as such.

TRENDS

About the Expert



BENITA CROW, PE*

Benita is an SEH vice president and leads the company's operations in Iowa, Minnesota, Nebraska, North Dakota, South Dakota, and Texas. Over the course of her nearly 25 years in the industry, Benita has served in the roles of project manager, engineer and regional practice center lead for SEH's Airports Planning and Design Group. Contact Benita at **bcrow@sehinc.com** for additional insight into A/E trends and their impact.

**Registered Professional Engineer in MN, WI, TX*

Hiring a Consultant

From creating an effective RFP to proposal warning signs and "musts" for the interview stage – your how-to for hiring the right A/E consultant.

In this section:

- 4 Insider Tips for Better RFPs
- 5 Warning Signs
- 3 Ways to Optimize Proposal Review
- 9 Key Evaluators During the Interview Stage

HIRING

4 Insider Tips For Better RFPs

Communication is paramount to achieving better projects, and the RFP is often your project's first official communication with potential consultants.

Throughout this section, an expert and former public officials directly involved with creating and responding to RFPs share practical steps, lessons learned and keys to evaluating firms throughout the proposal process.



1 Scope clarity prevents inconsistencies

Make sure your project objectives and goals are clearly stated in the RFP. For example, the number of design options you are seeking, your timeline, and the traits of your preferred project partner. These parameters give you an objective tool to measure firms against, and create consistency and ease in the review process. If you ask for something specific and it's not showcased, you know which consultants to count out. In addition, scope clarity lowers project costs.

> Consultants are often prone to add scope if the RFP doesn't make clear what you're seeking; this can increase proposed costs and cost variance, and lead to wide-ranging proposal responses.

John Rodeberg, former public works director/ city engineer, SEH project manager

2 Structure and limits make things easier for all

Never shy away from communicating the exact order you want details and descriptions to be responded in – the same goes for setting a page limit. In this way you can quickly pull and review the most essential information, and know exactly where to find it without getting lost in extraneous, often "fluffy" information. Consultants appreciate limits, too! It's not uncommon, without a page limit, to see proposals reach 100 pages when just 10 would do.

> From the proposal responder point of view, page and scope limits go a long way in helping to prioritize what information should be provided and what should be left out. As a proposal reviewer, your time is valuable; limits make sure you only receive the information you need.

Jodi Winberg, SEH director of marketing

3 Never hesitate to pick up the phone

It's okay to be unsure about your project scope and/or how to communicate it within an RFP. In such instances, be encouraged to reach out to your most trusted consultant(s) for insight. Trusted partners should be willing to leverage their experience to help bring clarity to your RFP. If you're unsure of the best solution for your project, don't be afraid to state this outright within the RFP by asking respondents for explorative ideas and solutions based on their experience.

> Consultants should be willing to provide insight and clarity around your scope before the RFP is release/published. If they're not, you might have one decision already made for you.

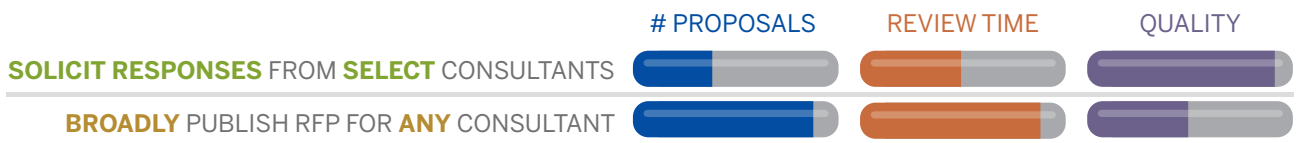
John Rodeberg, former public works director/ city engineer, SEH project manager

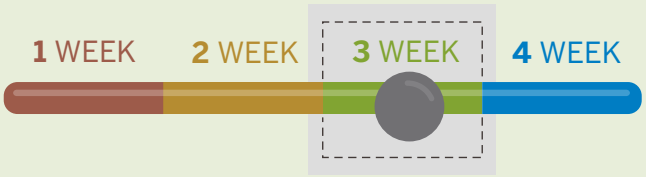
4 Less is more

It's not uncommon for issuers to broadly publish their RFPs, hoping to receive more options and ultimately drive down proposed costs. However, due to the cost and effort required to develop a strong proposal, some qualified and preferred consultants might choose not to propose at all. In addition to burying you in a sea of proposals to review, this can also lead to inaccurate and even deceptive cost proposals.

> We strongly encourage project sponsors to spend an hour pairing down their list of qualified, trusted consultants. For instance, moving from 12 to as few as five strongly vetted firms will streamline and reduce the time required to review your proposals. It will also elicit the strongest proposal responses.

John Rodeberg, former public works director/ city engineer, SEH project manager





The Timing Sweet Spot

Responding firms will bend over backwards to meet your deadlines. But it's also important to keep in mind that you will likely receive higher quality proposals when proper time is allotted for responses, and when notifications of an impending RFP are released.

How much time do consultants need?

Two weeks is the industry norm, though this depends on project-specific circumstances. Three weeks is ideal. Especially if it's a complex project where the consultant needs to assemble a team of internal experts and external partners, strike agreements and fully analyze your project.

A full month is unnecessary in most cases though, again, this largely depends on the project.



HIRING

5 Warning Signs

Key warning signs to consider as you seek the highest proposal and partner quality.

1 Generic cover letters

Great cover letters and executive summaries clearly communicate how the proposal as a whole plans to address your RFP. Unnecessarily long cover letters (and proposals) can be an indicator that the consultant doesn't fully understand what you're asking for, didn't take the time to gain understanding, or may be compensating by providing "everything under the sun." Conversely, this is an opportunity for you to make sure important context and clarity is provided in the RFP.

2 Imprecise language

Proposal language can serve as a clear indicator of a lack of alignment with your project's goals. For example, if the goal of your street reconstruction project is to accommodate a more diverse mix of users (multimodal), frequent use of the phrase "traffic volumes" might suggest the consultant didn't pay attention to your RFP or is bent toward vehicular traffic. Another example, if "value add" is used throughout a proposal but not made clear what this means to your project, the responder might just be working in a common buzzword.

3 Brochure-like content

Proposal responses, from the cover letter to the appendix, should primarily focus on your challenges and what solutions will be employed to meet your unique needs. Make note of proposal responses that apply or at least strive to meet the 70-30 rule. If the ratio of a responder's proposal is 30-70 – that is, 70 percent focused on the firm itself and just 30 percent on your needs – you might have received a rushed, canned or copy/paste response. Although this ratio isn't always possible, it is possible to sense the effort.

> As a former public works director, during the proposal review process we always looked for consultants that brought experience and innovation, but also understood the limits of the project scope and budget.

John Rodeberg, former public works director/city engineer, SEH project manager

4 Copy and paste, copy and paste

Strong proposals and partners clearly address the needs you've laid out in the RFP – and not just through a word-for-word retread. Proposals that contain large sections of your RFP copied word for word may indicate your project is not getting the attention desired or required. It may also highlight the consultant's priorities.

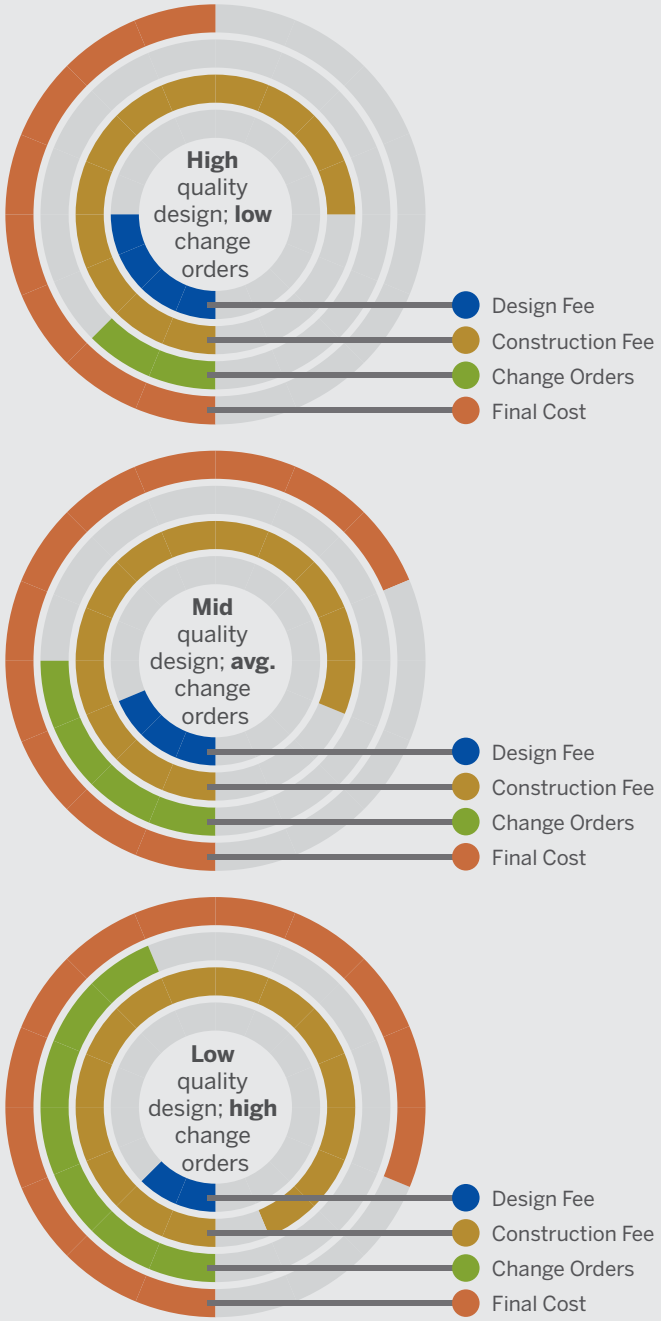
5 Cost and quality mismatch

The design choices made by a consultant not only impact construction, but also long-term operations and maintenance costs. Cost does and should play an important role in your hiring decisions. However, it's important to make sure you're balancing cost with quality; making certain cost proposal offers are realistic and have your long-term interests in mind.

> Consider the designer's influence on the cost of the project as a whole. Design fees often range between 5-15 percent of a total project's cost, with construction taking up the rest. Better designers and better project managers deliver fewer change orders and decreased lifecycle costs. Hire the best, most qualified team – your return on investment will be tenfold.

John Rodeberg, former public works director/city engineer, SEH project manager

How change orders can impact project cost:



HIRING

3 Ways to Optimize Proposal Review; 3 Ways to Ask for More

In addition to streamlining the proposal review process, it's time to start asking for more.



1 EXECUTIVE SUMMARY

Ask respondents to include a cover letter or executive summary; one that's concise, to the point and preferably 1-2 pages. With answers and solutions to key items addressed upfront, you more quickly gain a sense of how consultants understand your project needs and what to expect throughout the proposal.

2 ENSURE OBJECTIVITY

If you've organized your RFP in a way that makes for an easier, more seamless review process, consider creating a checklist for each section and have reviewers assign a number rating as to how each respondent met your expectations. This can turn subjective experiences into objective, data-driven evaluating. For example, the project scope:

1 – Unsatisfactory

2 – Meets Requirements

3 – Exceeds Requirements

3 TRUST YOUR NETWORK

Rely on your personal network – community leaders, private developers and other trusted peers – to explore who they've partnered with and their experiences. Rightly so, trust often serves as a key indicator in firm hiring decisions. Gaining direct insight from parties you trust (and who they trust their projects with) can substantiate quality proposals and differentiate similar ones.



4

FIND THE PROJECT TEAM ONLINE

Currently, around 75% of buyers of A/E services use social media as part of their decision-making process, with LinkedIn standing out as the preferred platform. About 79% of buyers of A/E services marketers report LinkedIn as their most effective tool for generating leads, and 82% find the greatest success on LinkedIn compared to other social media channels. This highlights LinkedIn's importance for buyers in evaluating A/E service providers, making it the dominant platform for professional and business interactions in this sector.

This platform provides you with a resource to ensure resume consistency, explore mutual connections/references, and gain deeper insight into what drives your consultants in a way that proposal resumes cannot.

> Thorough, engaging LinkedIn profiles, and how users interact with their online networks, showcase innovative teaming partners. We've seen a dramatic shift in which A/E professionals are becoming proficient online to supplement traditional relationship-building efforts – and to make sure RFP issuers can learn as much information as they need through a few clicks of the mouse.

Jodi Winberg, SEH director of marketing

5

DO CLAIMS OF AUTHORITY HAVE MERIT?

Today, business development hinges on active listening and objective insight; advertisements, high-pressure sales tactics and upselling have very little place. Enter the rise of educational content – articles, case studies, presentations, infographics, video storytelling and beyond. As you evaluate your firms, explore whether they back up claims of expertise with objective analysis and freely accessible content on their website rather than "about us" advertisements.

6

ASK FOR VISUALIZATIONS

In today's digital age, printed proposals have become less common, with digital submissions now being the standard. Don't hesitate to request visuals! Digital proposals enable consultants to include interactive elements like 3D visualizations, virtual tours, and augmented reality (AR) views of project designs.

These proposals can also feature video testimonials, detailed project walkthroughs, and even immersive simulations of engineering solutions, providing a richer and more dynamic experience for understanding the team's capabilities. Direct links to team profiles, such as LinkedIn, further enhance accessibility and transparency.

HIRING

Key Evaluators During the Interview Stage

Understanding the role interviews play in your decisions, what traits to value and nine questions you should always ask.

In the Trends section, we introduced how the client experience is increasingly driving A/E buying decisions. Specifically, communities, private developers and other project sponsors are becoming more selective when hiring A/E consultants – choosing firms that offer the best experience and the best value.

80 percent of an A/E company's business is driven by the client experience.

Engineering News Record, Ten Trends in A/E/C Business Development

Though not always necessary, the interview stage serves as an important opportunity to reaffirm beliefs on one firm; further get to know a consultant you haven't worked with; gain clarity into the wealth of technical information presented in a proposal; and ultimately decide which firm can provide the right combination of experience and value.

Coming out of the interview process, you should be able to confidently answer each of these questions (originally presented in the Trends section):

- Do we feel listened to by the project manager and team as a whole?
- Does the project team understand our needs and drivers of the project?
- Do we trust them with our finances, land and future?
- How does our partner plan to engage stakeholders; will they dismiss or invest in our people?
- What are our partner's ultimate motives?
- Will this partnership set us up for long-term success?

9 key questions to ask during an interview

If you're considering new partners or have a particularly complex or sensitive project, it may be wise to move shortlisted consultants to the interview stage. If you opt for in-person presentations, interviews or Q&A, it's important you get the information you need to make a final decision.

There are endless questions you can ask – all depending on the project, proposal, your goals/needs and more. Above all, it's important to uncover: Can the firm provide the solution/project result we are seeking? Can we successfully work with them? Simple questions, but often at the core of final decisions. To get to the heart of these inquires, consider asking your shortlisted consultants the following nine questions.

CRITERIA	RANKING
Unique Viewpoint	●●●○○
Project Experience	●●●●●
Longevity	●●●●○
Project Management Style	●●●●○
Communication Style	●●●●●
Delivery Style	●●○○○
Value-added Services	●●●○○
Flexibility	●●●●○
Tools and Technologies	●●●○○
TOTAL	**33 PTS**

Using a numerical ranking matrix can help keep results impartial.

1 What do you bring to the table that other consultants don't?

Hiring is hiring, whether you're hiring a consultant or an intern for a summer role. Uncovering key differentiators – beyond clichéd, canned responses – helps you uncover the best fit for your staff, community and project. Ask what makes them different.

2 Has your team successfully worked on similar projects?

Success completing a number of similar projects (since all projects are unique) provides insight into whether the consultant has the experience and expertise you require. Not just to complete the project, but to complete it within your timeline, budget and to the highest level of quality. Find out what specifically makes their referenced projects similar and relevant to you.

3 What do your years of experience tell us?

Experience and expertise are key indicators of future success. You need to know they have the expertise required. But when engineering firms proclaim *xx years* of experience, really dig into why they believe this matters to you, and best positions them as your partner for this particular project.

4 What makes you a "better" project manager?

Whether your project is completed on time and within budget with no surprises comes down to project management. But is that enough to consider it a success? As explored in the Project Management section ahead, there are good project managers and better project managers. It's important to uncover which category your proposed project managers fall under.

5 Explain your communication process. Will you be available when we need you?

Consultants should understand and appreciate your communication expectations and showcase how they plan to meet them. Gain clarity around the point of contact, the tools available to reach them and what the overall formal communication process will entail (daily, weekly, etc.).

6 How do you articulate findings to your clients?

There are many reasons to partner with a consultant. Chief among them: you're seeking time, expertise and resources you don't have or would like to supplement. But how do they communicate findings and happenings? Is the partnership hand-in-hand throughout? First, ask interviewees if they feel it's important to keep you in the know from start to finish, and beyond. Then find out how.

7 What "value-added services" will you bring to our project, and what does it mean to you?

Valued-added services (or value add) is an oft-used term in the A/E world. Unfortunately, too often it's used as a buzzword rather than a strategy and impact that will be used throughout your project. Many firms promise value add; make sure it's a promise that can be communicated, quantified and delivered. Is it a free service? Is the value in price? Do your competitors offer it? Ask for specifics.

8 How will you accommodate changes in scope?

Your partner needs to seamlessly shift with changes in project scope. Learning about how they plan to document and communicate scope changes and how they handle sudden shifts of any kind can help you make more informed decisions about fit. Will extra approvals be required? How does this impact budget?

9 What types of tools and technologies do you use for this type of project?

Many A/E projects are being delivered – accelerated, communicated, made more precise and flexible – by technological innovations. Expect your shortlist to showcase what they have to offer and how their tools will distinctly benefit your project. The Technology section ahead examines both newly arrived and tried-and-true innovations.

Interpreting the answers

Selecting the right consultant takes time and resources. The decisions you make often result in years-long partnerships. When you know what you're looking for and how to find it, you better position your project as a whole for the success you desire.

> Oftentimes you will discover new ideas for your project while reviewing proposals, which may change the scope. To obtain the best value proposal, we recommend confirming your original ranking for a proposal with your decision makers, then negotiate a contract with the highest ranked firm to include the modified scope. The new work plan and contract should concisely identify the changes and should firmly establish budget hours.

John Rodeberg, former public works director/city engineer, SEH project manager

HIRING

About the Experts



JOHN RODEBERG, PE*

John is an SEH principal and former city engineer and public works director. Contact John at **jrodeberg@sehinc.com** for additional insight into hiring a consultant.

**Registered Professional Engineer in MN*



JODI WINBERG

Jodi is SEH's director of marketing. She leads a team to elevate the SEH brand through an integrated, multi-channel marketing approach, drive growth in new and existing markets, and lead the company's competitive pursuit strategy. Contact Jodi at **jwinberg@sehinc.com** for additional insight.

Quality Management Plans

The role of quality management specific to your projects, the components of a quality management plan, and how to evaluate whether what's promised is being delivered.

In this section:

- Why You Need a *Quality* Quality Management Plan
- Key Components of a Quality QMP
- Quality Practices Must Begin Before Your Project Begins

QUALITY MANAGEMENT PLANS

Why You Need a *Quality* Quality Management Plan

Quality is a degree of excellence. As you evaluate past projects and seek to improve your next, make sure the quality you seek is more than just a buzzword.



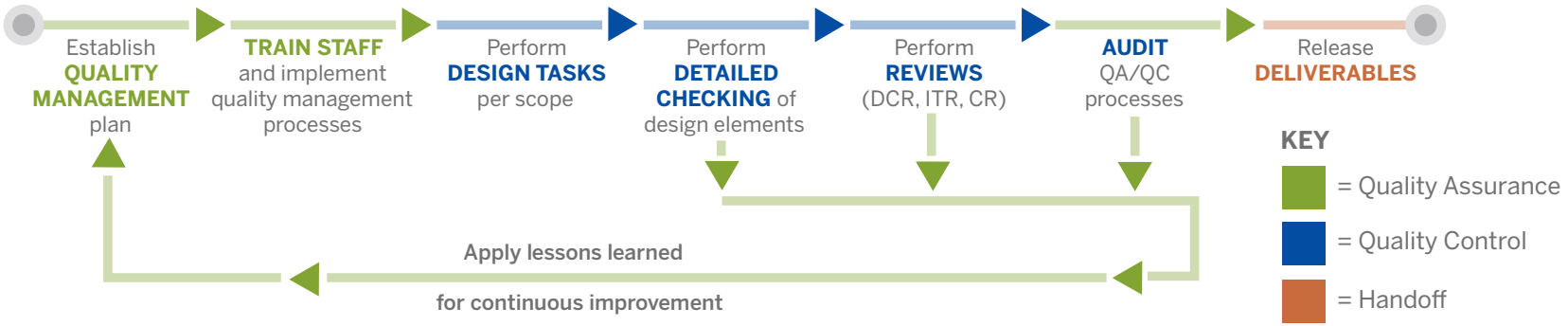
Quality management plays a pivotal role in the success of each project – making sure each phase of your project meets quality expectations, and that other specific goals are met along the way.

Often prepared by your partnering consultants, quality management plans (QMP) are project-specific documents that define the acceptable level of quality. They also outline and hold accountable how your project teaming partner(s) will deliver your desired level of quality.

When preparing an RFP for an upcoming project, best practice is to require your responders to submit a description of their quality management policies and procedures. Each firm's submission should outline how they intend to manage quality while also defining the processes they'll follow to produce a successful project.

Review each QMP before selecting a consulting partner to ensure there is consistency when it comes to planning, budgeting and scheduling the quality review of your project – and don't be afraid to ask for proof of their QMP practices on other projects.

Example Quality Management Process



QUALITY MANAGEMENT PLANS

Key Components of a Quality QMP

The PSMJ Project Manager Bootcamp Handbook defines four key components of quality management, as well as important components of the QMPs being prepared for your projects.



1

QUALITY MANAGEMENT (QM)

QM is the practice of coordinated activities relied on to direct and control a project team with regard to quality. QM involves your project manager finalizing the QMP and sharing it with the project team to ensure there is a common understanding of your project's goals and quality expectations before the project begins. As the project moves along, your project manager is responsible for making certain the project team uses the tools and processes defined in the QMP to deliver a successful project.

2

QUALITY CONTROL (QC)

QC is the part of quality management that focuses on fulfilling quality requirements. These are specific actions taken to carefully evaluate project deliverables, such as the use of a QC checklist when preparing construction drawings. Such checklists provide the design team with a list of specific tasks to review in order to ensure the appropriate design data is included in drawings or renderings, and verified to minimize plan errors or omissions.

3

QUALITY ASSURANCE (QA)

Done right, this is where your project manager inspires confidence in your staff that quality requirements will be fulfilled. QA involves specific actions being taken, not just handshakes and a nod! For example, key QA actions include your project manager assigning a designated independent technical staff member to 1) review draft bidding documents to ensure project goals are being met and 2) identify any potential constructability issues before the project is finalized.

4

QUALITY IMPROVEMENT (QI)

QI is the piece of quality management focused on increasing the project team's ability to fulfill their quality commitments. QI includes continuously examining a project throughout the development process; documenting and sharing this information at a project debrief meeting at the conclusion of a project can lead to better QI on future projects.



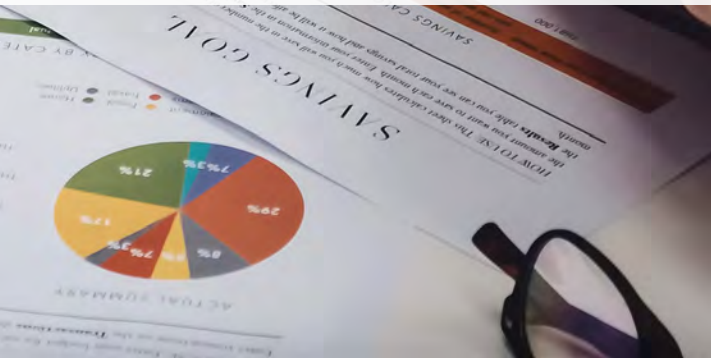
"It's important to note that standard QMPs are not practical for every project, though your partnering team should have and communicate a formal QMP process. When QMPs are part of the RFP process, make sure they are tailored to your unique project – you deserve more than a cookie cutter approach.

Scott Haupt, SEH project manager



Quality Practices Must Begin Before Your Project Begins

The cost of beginning formal quality practices after a project is underway will far exceed the expense of making sure your engineering consultant creates and implements a QMP before the project begins.



These costs include re-work, having to extend project timelines and infrastructure, and/or end results that fail to meet your standards.

To minimize costs, re-work and keep your projects on schedule – here are additional qualities of a quality QMP:

1. There should be a clear definition of your expectations and how you define quality.
2. Specific elements or actions that will ensure quality (e.g., QC checklist) should be illustrated.
3. The person(s) responsible for each QMP action should be listed and their roles made clear.
4. Target dates and completion dates for each QMP action should be listed and made clear.
5. The budget for each QMP action should be carefully provided.

How much should you pay for a QMP?

QMPs typically range between 5-10 percent of a project's overall design budget. However, this largely depends on whether the project is public or private, the project size, the type of project, risks involved and complexity. It's important to have this conversation with your teaming partner(s) to better understand cost factors, QMP components and to make sure you're receiving what's being promised.

Beyond cost, there is potentially more at stake without a QMP.

Projects without a QMP or formal quality process put public trust and your reputation on the line should time delays and budget overruns creep in.

As you weigh your consulting partner's QMP (or those proposing on your project), it's important to evaluate the components explored to the left and on the previous pages – in addition to proposed cost, specificity of the QMP, transparency, precision, accountability measures and whether the project manager inspires trust in your team.

QUALITY MANAGEMENT PLANS

About the Expert



SCOTT HAUPT, PE*

Scott is a senior professional engineer and project manager who knows the quest for quality starts at the beginning, with a well developed plan. Contact Scott at **shaupt@sehinc.com** for additional insight into QMPs and their components.

**Registered Professional Engineer in MN, WI*

Community Outreach and Public Engagement

Introducing the rise and need for equitable community and public engagement, including your first step and five proven techniques.

In this section:

- What is Equitable Engagement?
- 5 Techniques to Inspire Equitable Engagement
- The Time For Equitable Engagement is Now

ENGAGEMENT

What is Equitable Engagement?

Public engagement is a two-way process undertaken by community and/or project leaders to better understand stakeholder needs, values and goals.

The process includes engaging community stakeholders to incite feedback and buy-in, inform and provide project transparency, generate excitement and ultimately improve your projects.

Today, transparency is no longer an add-on; it's a demand and expectation.

As a result, traditional community engagement practices often fall short. Equitable engagement recognizes the limits of traditional engagement practices, supplements tried-and-true practices, and features strategies to engage those who have historically been or felt left out of the process.

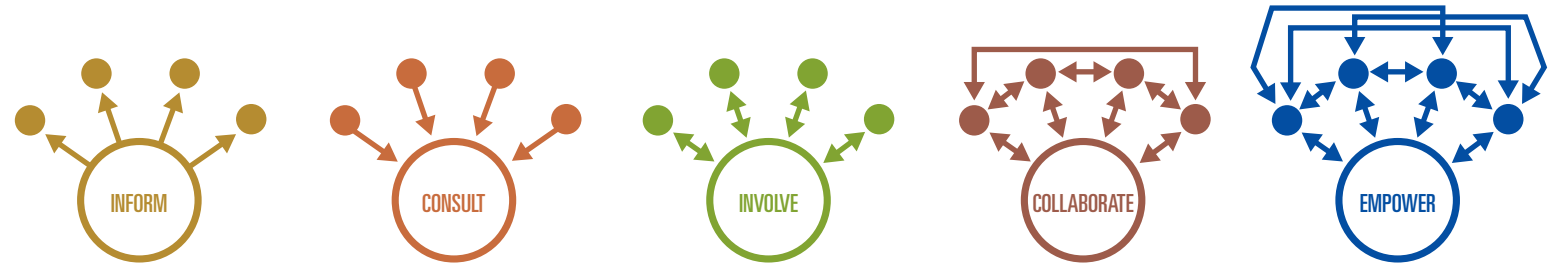
For engagement to be equitable, it must achieve participation that reflects a community's entire geography, race/ethnicity, age, gender and/or other demographic characteristics. It should also place specific emphasis on those who will be most impacted by the project, as well as those who are most often diminished in these conversations.

Equitable Engagement: Fair and impartial; dealing equally with all concerned and impacted.

Assessing your need for equitable engagement

Seek to understand the impact of a given project in order to precisely determine the needed level of community engagement. This helps to clarify the "why" of engagement, as well as your objectives.

Not all projects require the same level of outreach. It's important to figure out the entire spectrum of impact your project will have; this will determine the appropriate level of community engagement. As noted previously, the first step toward equitable engagement is to gain an understanding of the populations impacted and their specific barriers to engagement. There are a few ways you can do this.



Low level of public engagement

Mid level of public engagement

High level of public engagement

Source: https://www.iap2.org/page/pillars

EJscreen: identify stakeholders, need

One solution is the Environmental Protection Agency's (EPA) environmental justice (EJ) mapping and screening tool called the EJscreen. This tool is available to the public on the EPA's website.

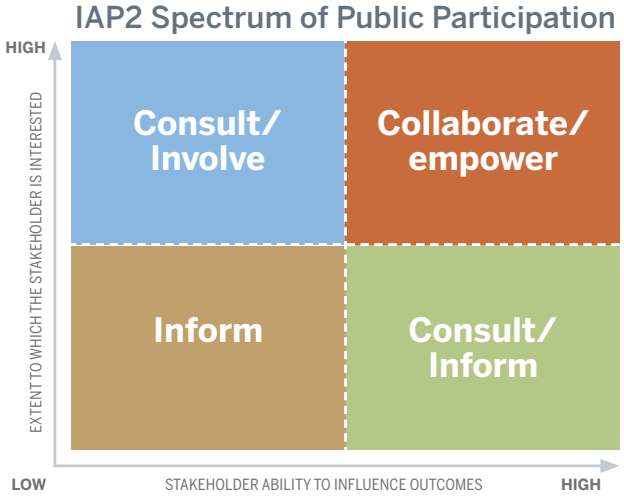
The EJscreen is a web-based mapping tool used to access high-resolution environmental and demographic information for selected locations of your population. It is based on nationally consistent data and an approach that combines environmental and demographic indicators in maps and reports. This tool empowers users to identify areas with:

- Minority and/or low-income populations
- Potential environmental quality issues
- A combination of environmental/ demographic indicators that are greater than usual
- Other relevant factors or ones that may be of interest

In general, the greater impact a project has on at-risk or underrepresented populations, the higher level of engagement necessary to help ensure that it is implemented in a fair and equitable manner. The EJscreen can help you glean this information.

IAP2 spectrum: collaboration and empowerment

Once level of engagement needs have been determined for each impacted community, the International Association for Public Participation's (IAP2) Spectrum of Public Participation can help determine what this particular level of engagement means for a project.



The IAP2 Spectrum clarifies the role of the public in planning and decision making. Stakeholders should feel collaborated with and empowered, and this requires project teams to commit to maximizing stakeholder interest (vertical line in graphic above) and influence (horizontal line).

> For engagement to be equitable, it must achieve participation that reflects a community's entire geography, race/ethnicity, age, gender and other demographic characteristics. It should also place specific emphasis on those who will be most impacted by the project, as well as those who are most often diminished in these conversations.
>
> *Chelsea Moore-Ritchie, senior planner*

ENGAGEMENT

Techniques to Inspire Equitable Engagement

It takes careful planning and acknowledgment to fully understand a community and its particular needs.

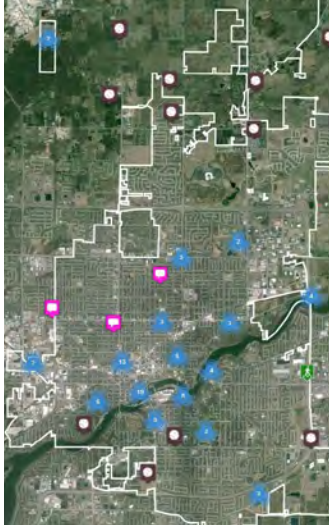
There are a variety of techniques that can be used to bring a deeper level of engagement to a project. As you move forward on a new project or self-assess previous efforts, the following five techniques will help you achieve equitable engagement.











1 Build personal relationships

Attend important gatherings and connect with key leaders within the community. This technique is ongoing and requires genuine commitment.

2 Increase accessibility

Consider the issues/barriers to creating accessibility, such as: language, location, time, transportation, childcare, food, incentives and appeal. Take your engagement efforts to places where community members are already gathering – social media platforms included!

3 Create a welcoming environment

Engage and partner with resources within the community in order to find and select a location that is comfortable and conducive to achieving the interactions needed and for all voices to be heard.

4 Develop other engagement alternatives

Provide additional opportunities for social interaction and relationship building. Also provide accessible communication tools, including: visuals, language (printed and in-person translation), incentives and technology.

5 Partner with diverse organizations and agencies

Connect with organizations and networks who are already well connected and/or provide services within the community. The more diverse partners you collaborate with, the more diverse audiences you are going to attract and engage.

ENGAGEMENT

The Time for Equitable Engagement is Now

Equitable engagement doesn't have to be complex – it just has to be intentional.



Thriving communities come from public engagement that fosters collaboration, shared problem solving, supportive partnerships, inclusion and transparency. Each project you undertake presents the opportunity to engage people of varying cultures, languages and socioeconomic demographics.

When you showcase appreciation for these diversities, seek to understand their concerns, provide opportunities for meaningful feedback and ultimately bring people to a common, respected and valued ground – you've achieved equitable engagement.

Whether undertaking engagement efforts internally or with a project partner, evaluate your practices and approaches against the characteristics explored in this section. And hold true to the principles. Truly equitable engagement can require greater investment in time and resources, but the investments often lead to better projects.

> Thriving communities come from public engagement that fosters collaboration, shared problem solving, supportive partnerships, inclusion and transparency.

Kristin Petersen, SEH senior planner and lead engagement specialist

Important components of a community engagement strategy:

1. **PURPOSE** of activity
2. **WHEN/WHERE** it will take place
3. **INTENDED** stakeholders
4. **FORMAT** of activity to engage/include
5. **ROLES** and responsibilities
6. **SCHEDULE**
7. **EVALUATE** outcomes

ENGAGEMENT

About the Experts



CHELSEA MOORE-RITCHIE

Chelsea is a senior planner with experience in community and transportation planning. Contact Chelsea at **critchie@sehinc.com** for additional insight into equitable engagement strategies.



ADRIAN DIAZ

Adrian is an urban planner who is passionate about working with diverse communities. Contact Adrian at **adiaz@sehinc.com** for additional insight.



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Kristin is a senior planner, project manager and engagement specialist. Contact Kristin at **kpetersen@sehinc.com** for additional insight.

Project Delivery

Which project delivery method is right for your next project? Exploring the options, considerations and delivery trends.

In this section:

- Deconstructing Your Project Delivery Options
- FAQ: The Rise of Public-Private Partnerships



PROJECT DELIVERY

Deconstructing Your Project Delivery Options

You have a project in the works, with many plans already developed.

But what delivery method is best, and how can you be sure you're selecting the right approach? For example, if your project is in the public sector, you may be required by law to use the traditional design-bid-build method. But for those who fall outside this realm, there are several options to choose from – each with their own unique qualities. Here, we examine the primary options and what they entail.



1

DESIGN-BID-BUILD (DBB)

DBB is the traditional method for delivering projects. Through this method, the project owner contracts with separate entities for the design and construction of a project. DBB ensures that project owners are compliant with regulations and helps to level the playing field in terms of contractors and consultants (as they are required to submit their proposals based on a set of RFP requirements).

Typically, the project owner knows what they want and has funding, and has the resources to oversee every step of the project. DBB places responsibility on each participating entity.

> Nuances like demands, timeline, risk and budget should determine the best project delivery system. Let the demands of your project sort it out for you.
>
> *Steve Peterson, SEH Design|Build President*

2

DESIGN-BUILD (DB)

With DB, the design and construction phases are undertaken by a single entity – often referred to as the design-build contractor. DB projects are often completed in a timelier manner than DBB as the design and construction phases regularly overlap.

Design-build also minimizes risks for the project owner because there is only a single point of responsibility, rather than two or more. Having a single point of contact also helps reduce overall project costs.

3

CONSTRUCTION MANAGER AT RISK (CMAR)

CMAR provides project owners with the most control over costs. A guaranteed maximum price (GMP) is determined at the beginning of the project; anything above the GMP is not considered. Or, a change order is the responsibility of the construction manager. The construction manager acts on behalf of the project owner when putting a given project out for bids, being careful the project does not exceed the agreed upon GMP.

4

PUBLIC-PRIVATE PARTNERSHIP (P3)

P3s are a commonly used project delivery method that involve partnering with a private company or developer to deliver a public facility or infrastructure. P3s are structured to provide public sector project owners with more flexible terms, as well as less risk than more traditional project delivery methods.

The public sector owner often leases back the use of the completed infrastructure but maintains operational control. Other times, the project owner leases back the use of the infrastructure, but puts financing and operational control in the hands of the private company/developer.

Choosing the right delivery method



Understanding the different delivery types creates important understanding, but choosing the right project delivery system varies greatly and largely depends on the specific goals of your project. Which method has the lowest or highest risk? The best chance for success? What about the highest return on investment potential? Don't hesitate to connect with skilled, trusted consultants/contractors to help uncover which method is best for you.

With P3s gaining popularity throughout the U.S., the following couple pages takes a closer look at some of the common questions surrounding this project delivery method.



PROJECT DELIVERY

FAQ: Public-Private Partnerships (P3s)

As explored in the Trends section, the ASCE believes the U.S. needs to spend around $4.5 trillion on at-risk infrastructure by 2025.

As a result, more private companies are partnering with public entities; seeing potential return on investment and therefore taking on the role of updating infrastructure rather than waiting on government support.

Enter the rise of P3s.

The following FAQ uncovers answers to the most common questions surrounding P3s.

How would a P3 impact my project?

P3s can provide communities with new infrastructure and, potentially, better services without raising taxes or creating unseen charges. If you're short on budget, staff and/or time, depending on the project size and complexity, and whether they're legal within your state, a P3 delivery may be worth exploring for your next project.

What types of projects can be developed under a P3?

P3s are used to deliver a wide range of public facilities, public buildings and public infrastructure projects. Examples include:

- Municipal – fire and police stations, city halls, libraries, convention centers
- Educational buildings
- Transportation infrastructure
- Recreational infrastructure
- Public utilities
- Wastewater treatment
- Redevelopment of neighborhoods and riverfronts
- Public housing
- Energy savings programs
- Defense infrastructure
- Telecommunications
- Public healthcare projects

P3s are legal, right?

Yes, though it depends on your location. About three quarters of all U.S. states have enacted laws enabling and supporting P3s. These partnerships are generally considered a real estate transaction and must be established properly. Thus, it is not subject to the same selection requirements often used for design services or construction procurement.

Should we consider a P3 for our next project?

As presented in the Trends section, the funds gathered by private entities for such purposes have risen from $7 billion as of 2000 to $450 billion as of 2018. And yet, there haven't been as many large P3 deals as most expected. Private entities are being careful to make sure their investments provide the return they anticipate.

However, we are seeing significant growth in P3s on a smaller scale. Businesses in need of renovations, for example, are turning to private investors if the terms suit both sides.

There are many additional potential benefits of a P3, and this type of partnership is worth exploring if you feel it may be a fit. A few of these benefits include:

- There are **NO BOND ISSUANCE** costs.
- Capital costs **DO NOT GO AGAINST** a municipality's bond debt capacity.
- Initial capital costs are **TRANSFERRED** to the private sector partner.
- Facility maintenance and **OPERATING COSTS** may be **INCLUDED** in the contract terms.
- **SINGLE POINT OF CONTACT** and accountability.
- Provides **ACCESS TO PRIVATE FUNDING** sources.
- **PROJECT RISK IS TRANSFERRED** to the private partner, including schedule, design, construction, operations and maintenance, and economic performance.
- **ACCELERATED PROJECT DELIVERY,** with payments deferred until the improvements are delivered.
- **MONETIZES** underperforming publicly owned assets in need of capital.
- Completed projects can **DRIVE ECONOMIC DEVELOPMENT.**

How can I find out if my project is eligible for a P3?

P3 project delivery is a valuable development tool that may be considered by state and local municipalities, non-profits, economic development boards, alumni boards, transportation boards, port authorities, school districts, public housing, military branches and federal agencies, among others. Examine the statutes of your state, and consider reaching out to current or past consultant partners for insight and clarity.

How is a P3 different from DB or CMAR deliveries?

Design-build and construction manager at risk are creative project delivery methods used primarily for the design and construction of capital improvements. A P3 is a contractual arrangement between a public agency and a private sector entity or developer that often includes the design, construction and financing of public infrastructure. Many times, the maintenance and operations of this infrastructure are included in the P3 project contract.

Bottom line

If you're not sure which project delivery method is best for your next project, be encouraged to connect with your trusted consultant. They should have the knowledge and resources you need to determine the best delivery method for each project.

PROJECT DELIVERY

About the Expert



STEVE PETERSON

Steve is the president of SEH Design | Build Inc., a company dedicated to connecting clients to alternative project delivery solutions that work. Contact Steve at **speterson@sehinc.com** for additional insight into project delivery methods.

**Registered Professional Engineer in KY, WI*

The Foundation and Framework of a Better Project Manager

Good project managers are hard to find. Better ones are even scarcer. Here, we examine the anatomy of a better project manager – and how you can identify yours.

In this section:

- Traits of a Better Project Manager [INFOGRAPHIC]
- Characteristics Explained – How to Uncover Your Ideal Fit

PROJECT MANAGER

Traits of a Better Project Manager

Great projects require a collective effort from countless skilled workers and stakeholders.

But there is often just one person who leads the effort, who undertakes accountability throughout a project's lifecycle, and who drives your experience. The project manager.

Whether seeking to develop your own team or on the hunt for the right A/E consultant, there are definitive traits of good project managers – and of better project managers.

Make sure you recognize the differentiators.



PROJECT MANAGER

Characteristics Explained – How to Uncover Your Ideal Fit



1 ACCOUNTABLE

True accountability increases success rates by 95 percent, says the American Society of Training and Development. Responsibility can be given, but accountability must be embraced, owned and cultivated. Better project managers accept responsibility for completing a project and its tasks – and embrace being answerable for every activity and every decision. When projects thrive, they pass credit to the team. When challenges arise, they own mistakes.

> How can you be sure you're receiving the level of project management your project deserves? During the interview or any other stage, ask away: 'What makes you a better project manager?'
>
> *Jenna Obernolte, SEH project manager*

2

FOREST THROUGH TREES

As projects progress, especially complex projects with multiple phases, locations and/or stakeholder groups, it's not uncommon for project managers to migrate their focus toward daily tasks and the minutiae.

Better project managers see the forest through the trees. They recognize that every decision will impact your present and long-term future; this trait is reflected in every interaction, action and quality of the final product.

> Better project managers take a step back and help you make decisions that impact more than just your project. They uncover solutions and help you make decisions that will benefit the future of your community.

Jenna Obernolte, SEH project manager

3

ACTIVE LISTENER

Listening doesn't just happen. That's hearing. It's an active process in which a conscious decision is made to truly receive, reflect and understand the messages of the speaker. How can you spot an actively listening project manager? Look no further than the contents of the proposal they submitted (were your concerns heard and responded to?), the impression you were left with after an in-person meeting, or their change management strategy following an adjustment in scope.

> The 'Better Project Manager' approach isn't born in a day. Make sure your project manager runs the marathon, not the sprint; constantly assesses the big picture; proactively listens; gains your trust; and has the right kind of experience to properly lead your project where you want it to go.

Toby Muse, regional civil and construction sector lead

4

PROACTIVE

Reactive project managers solve matters as they arise, respond after you've engaged and work hard to keep projects on track. Proactive project managers also work hard for this. But with a "forest through the trees" approach, they are often able to anticipate needs, are the first to engage, and are always on the hunt for project efficiencies, streamlines and other value-added services.

> When a project manager develops a sound scope that is clear and understandable, provides their client and team with a clear roadmap to the expected outcomes of a project, and is intentional about open, two-way communication through the project development process – project success becomes more inherent and predictable.

Jeremy Tomesh, regional sales practice center lead

5 PULLS

A good project manager "pushes" the team forward – telling, directing and delegating. They undertake more of a chain of command approach, which can be and often is effective. However, strict hierarchies can also disrupt the flow of information, which prevents effective and swift decision making – leading to project disruption. Better project managers empower, collaborate and coach. They have a clear mission and "pull" their team (you included) into this mission – creating a collaborative, motivated and successful partnership.

"There's a level of trust involved in working with any A/E consultant, but you should always expect and demand transparency – and your partners should openly embrace this expectation.

Jenna Obernolte, SEH project manager

6 INTUITIVE

Earned value management, logic, reasoning, mental capacity and data-driven decision making are important qualities in a project manager – both good and better. Better project managers integrate intuition. They trust the numbers to an extent, but also rely on their multidisciplinary experience and expertise, and emotional intelligence, to make the right decisions on your behalf.

"We become better project managers when we have empathy for the communities we serve. It's always nice when a project goes well, but better project managers look beyond the numbers and understand how a project impacts the community as a whole.

Erin Jordan, SEH project manager

7 QUALITY EXPERIENCE

Many consultants boast years if not decades of experience; experience is vital, but it's important to understand how you benefit from this experience. Whether your project manager showcases three years or three decades of experience, find out whether it's the right experience. That is, why it's relevant to you and your staff, project and community as a whole.

"Any good project manager can provide necessary updates regarding schedule and budget. Better project managers provide the 'why' behind recommendations, decisions and actions. This creates a 'no surprises' environment, avoids reverse decision making and prevents delays in project delivery.

Toby Muse, regional civil and construction sector lead

8

MARATHONER

The saying goes, “done is better than perfect.” True, sometimes. Consultants often promise projects that are “on time and within budget.” This is important! But done lacking the quality you deserve can set your project, users and stakeholders back for years. Better project managers endlessly strive to meet your deadlines but never at the cost of quality.

9

“WHY” COMMUNICATOR

Good communicators will send emails every so often and provide thorough updates at periodic team-client meetings. Better communicators are transparent; they proactively, frequently and openly provide you with the “why” behind recommendations, decisions and actions. This approach creates an environment without surprises; one where you understand all decisions along the way without having to seek out this information. As opposed to at the end of a project, which can cause delays in delivery.

> What makes a project manager ‘better’ is the ability to recognize the strengths and weaknesses of each team member – and providing opportunities to maximize identified strengths. This empowering approach sets each team member up for success, and leads to better products overall.

Kaci Nowicki, enterprise aviation market lead



A glimpse of the Nine Mile Regional Creek Trail in Edina, Minnesota, led by Project Manager Toby Muse. Toby helped the team transform a line on the page of a master plan into 6.1 miles of ADA-accessible trail and boardwalk through the heart of a first-ring suburb, now serving 100,000+ users.



PROJECT MANAGER

About the Experts



JENNA OBERNOLTE

Jenna is SEH's Rochester office civil engineering practice center leader. Her passion rests in helping others find success – colleagues and clients alike. Contact Jenna at **jobernolte@sehinc.com** for additional insight into the traits of better project managers.

**Registered Professional Engineer in MN, IA*



TOBY MUSE

Toby is a regional civil and construction sector lead who works with public clients to design efficient, safe and useable trail, roadway, utility and municipal transportation system assets. Contact Toby at **tmuse@sehinc.com** for additional insight.

**Registered Professional Engineer in MN*

Technology's Rising Role in Your Project

From project kick-off to completion, technology plays a key role in how your projects progress. Here are a few ways.

In this section:

- Technology's Rising Role in Key Project Phases

TECHNOLOGY

Technology's Rising Role in Key Project Phases

From project kick-off to completion, technology plays a valuable role in how your project progresses.

Cloud platforms, digital twins, and AI-powered 3D modeling give stakeholders the ability to explore a project, make real-time changes, and visualize what's ahead. Drones, mobile applications, and collaboration software create fast, efficient, and transparent teamwork. Data-driven planning, combined with tech-savvy teams, enables strategic asset management and long-term maintenance strategies.



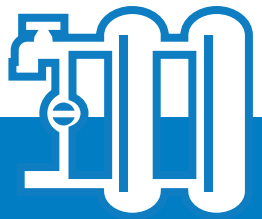
REAL-TIME COLLABORATION

Drones and mobile applications, among other tools, create real-time, efficient and effective collaboration.



STAKEHOLDER BUY-IN

3D modeling, 3D digital models and 3D printing gives stakeholders the ability to get a "feel" for a project, make real-time changes and visualize what's in store.

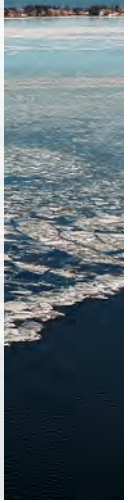


ASSET MANAGEMENT

Technology and tech-savvy teams enable strategic asset management, long-term maintenance planning.



Phase 1: Real-Time Collaboration



Seamless, digital collaboration in action

Collaboration ensures open communication with stakeholders and keeps teams aligned on progress. With today's tools, collaboration is faster, smarter, and accessible anywhere.

Consider drones, which save time and money while creating immersive project visuals. They capture millions of data points, feeding into 3D models and dashboards that reduce risk and allow issues to be spotted early. Instead of telling stakeholders about a challenge, project managers can show them with real-time imagery.

Mobile data collection has transformed field work. Instead of waiting days for paper logs to circulate, staff now use tablets and mobile GIS apps to capture GPS locations, notes, and videos directly on site. Information uploads instantly to the cloud, fueling live dashboards that owners can access in real time. When issues surface, teams make informed decisions on the spot, minimizing delays and avoiding costly rework.

Actionable Tip

For real-time collaboration, adopt digital data collection tools. Pair mobile devices with GPS receivers to increase accuracy, and use intelligent forms to minimize errors. A/E consultants can then deliver field data directly to your team and stakeholders in minutes.

> Mobile applications like Esri ArcGIS have transformed how construction data is captured and shared. Teams can upload directly from the field, making collaboration truly real-time.

Bryan Tolcser, drone & GIS specialist

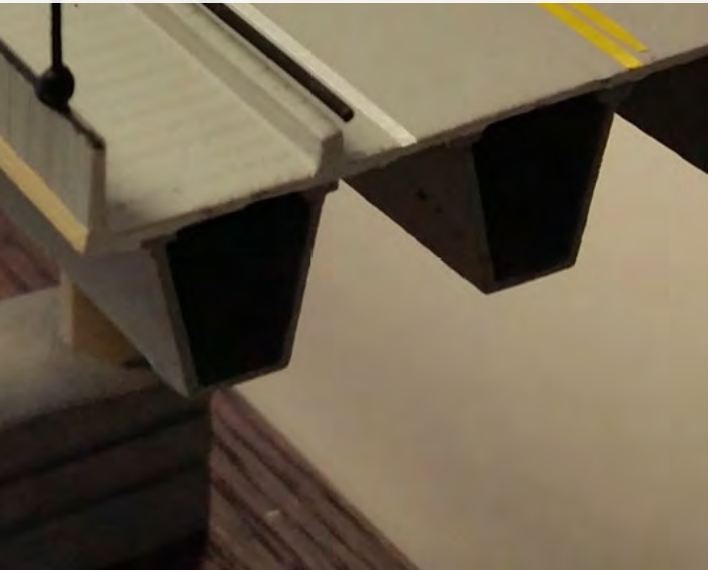




Phase 2: Making Projects Come Alive

> The days of visualizing projects on paper alone are gone. Multi-dimensional modeling gives everyone a chance to see, interact, and make decisions with confidence.

Andrew Niederhauser
SEH Design Technology Manager



Making Projects Come Alive

Stakeholders now expect more than static 2D drawings. With advanced modeling, scanning, and immersive design tools, consultants create interactive project experiences that are both engaging and dynamic.

Architects and engineers use 3D models not only for design, but also to bring communities into the process. These tools allow the public and sponsors to clearly see a project's impact before construction begins, building stronger trust and accelerating approvals. Unlike traditional CAD drawings, today's models deliver precision, speed, and lifelike realism.

Think of the difference between paper maps and Google Maps. The latter lets you zoom to street level and explore as if you are there. 3D modeling does the same for your projects, enabling precise scenarios, more informed decisions, and greater trust in the design process.



Actionable Tip

Use drones and scanners to create 3D replicas of project sites. Present multiple design options side by side to give stakeholders clear comparisons and more confidence in their decisions.



Phase 3: Asset Management

> Effective asset management turns project data into actionable insights. By tracking condition, cost, and performance, communities can make smarter decisions that reduce risk and extend the life of critical infrastructure.

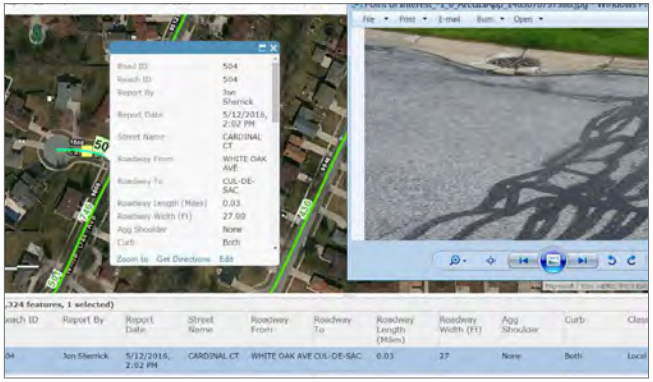
Andrew Niederhauser
SEH Design Technology Manager



Strategic management: building lasting value

Projects do not end at ribbon cutting. The data collected during design and construction – such as utility inventories, pavement condition ratings, or water system inspections – can provide long-term value if it is organized and used strategically. Asset management ensures that your investment continues to pay off, guiding operations, maintenance, and capital planning.

Modern asset management does more than track infrastructure. By combining field data with digital tools, you gain insight into what assets exist, their condition, when maintenance is needed, and the costs involved. This approach helps prioritize improvements, extend asset life, and maximize limited resources. While some owners harness advanced platforms like digital twins, many achieve major gains through practical strategies such as GIS-based inventories, mobile inspections, and predictive analytics.



It's important to note that CIP, O&M and the creation of a digital twin model are only as good as the data collected. From day one of a project through ongoing strategic asset management, it's important you have the right team and technology in place – drones, high-definition webcams and laser scanning capabilities, among other tools – to precisely capture and report the data you need.

Actionable Tip

Begin asset management discussions early in the project. Ask your consultant how inspection data, construction records, and maintenance activities can be captured in formats that align with your existing systems. Even if you start with a simple GIS-based inventory, you will create a foundation for smarter budgeting, better lifecycle planning, and more resilient infrastructure.

TECHNOLOGY

About the Experts



ANDREW NIEDERHAUSER, GISP

ASSOCIATE | IT DIRECTOR - DESIGN & INFORMATION

Andrew is SEH's design technology manager who helps colleagues and clients leverage and maximize data collection, design and visualization solutions. Contact Andrew at **aniederhauser@sehinc.com** for additional insight into the role of technology in improving today's projects.



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