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U.S. High-Speed Rail: Looking Beyond Groundbreaking

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Momentum is building for high-speed rail across the U.S., and it looks a lot like the early days of our interstate highway system. From the 1930s through the 1950s, states throughout the country were building their own highways and turnpikes, one corridor at a time. Despite its disjointed beginnings and often controversial history, the interstate highway system has become integral to our society. High-speed rail is following a similar path today. California High-Speed Rail is under construction, and Brightline West between Southern California and Las Vegas has broken ground. Cascadia in the Pacific Northwest and Dallas to Houston in Texas are in planning and development. Meanwhile, Amtrak's new Acela trains in the Northeast and faster service on corridors out of Chicago are raising expectations for intercity rail.

That momentum is a good thing. On trips of roughly 100 to 500 miles, high-speed rail can compete with flying on door-to-door travel time. It can also relieve crowded highways and airports, offer a comfortable and sustainable way to travel, and anchor economic growth around its stations for generations. Even though some of the ongoing programs are still years from construction, now is the time for transportation leaders and their partners to prepare for the challenges that come later in delivery.

LATE-PROGRAM CHALLENGES

Most of the early work on a high-speed rail program is civil: grading, viaducts, tunnels, and stations — all very well understood disciplines within our industry. Much more complex than the civil scope is the systems scope. For a rail system meant to continuously operate above 200 miles per hour across hundreds of miles, program teams must design and install trackwork, traction power, signaling and train control, communications, and rolling stock with extremely strict tolerances and certify that all of the installed systems function together as one. Just as importantly, some of our transportation agencies, program teams, utility companies, and permitting authorities lack direct experience with high-speed rail. Because of the high complexity of systems work and because the industry lacks experience, there is a risk of delays and cost increases late in the lifecycle of a high-speed rail program.



Three specific late-program challenge areas stand out: the

civil-to-systems handoff, traction power and utilities, and testing and commissioning.

» **Civil-to-systems handoff.** Civil contractors own their scope, and systems contractors own their scope, but who owns the interfaces between civil work and systems work? This is not a rhetorical question. Especially on large, complex programs, interface ownership may be unclear, which can lead to clashes, prolonged decision-making processes, and the need for costly rework.

» **Traction power and utilities.** A high-speed corridor requires a long chain of traction power substations fed by the regional grid, and securing that capacity can take years. Without sufficient planning, this issue can become the critical path late in a program.

» **Testing and commissioning.** A program team must prove that each component within a high-speed rail system works with all of the other components at speed before a new line can carry passengers. However, by the time the testing and commissioning phase has commenced, the ribbon-cutting date has usually been announced. This can create immense political pressure to meet a deadline that may not be realistic. The crunch can also stress a program team's quality control approach and lead to problems with long-term system reliability and maintenance.

SOLUTIONS AND OWNERS' REPRESENTATIVE SUPPORT

The solution to the civil-to-systems handoff challenge is a systems integration approach that starts on day one. Systems integration makes sure every part of the corridor works together as planned. It covers civil works, trackwork, traction power, signaling and train control, communications, and rolling stock. It also accounts for the people who will deliver the system — owner, designers, and contractors — and the people who will run and ride it — operators, maintenance crews, and passengers. With a formal systems integration approach, a program team defines a single point of accountability for interfaces and specific processes to track open items related to those interfaces.

To manage the challenges related to traction power and utilities and testing and commissioning, high-speed rail program teams have to partner early with utility providers and operators. Partnerships with utility providers early in design can facilitate agreements on grid interconnection and substation sites, reducing the chance of delays when traction power and utility construction begins. Integrating the operator into the team as an active participant during final design can help shape testing plans, procedures, and readiness criteria early. This leads to a faster commissioning phase and a smoother transition to operations.

A formal systems integration approach, established on day one, and early partnering with utility providers and operators can improve safety and reliability of a high-speed rail system while saving time and money. Owners' representatives who have delivered rail megaprojects, including high-speed systems overseas, are ideally suited to manage systems integration and partnering by coordinating planning, design, construction, and stakeholder work across a program organization. More specifically, owners' representatives can help define interfaces and assign owners to each and phase programs so civil and systems works stay in step. Owners' representatives can also manage communications and coordinate with utility providers and operators, soliciting and documenting inputs at the right time during the program lifecycle. Additionally, they can establish and oversee program controls to track performance and follow-through on action items related to systems integration, partnering, and other program functions. This can help a program team flag and avoid potential issues.

THE FUTURE OF U.S. HIGH-SPEED RAIL

In the coming years, California High-Speed Rail and Brightline West will produce valuable lessons for every program that follows. But teams in the Pacific Northwest, Texas, and elsewhere don't need to wait for those lessons to start shaping the success of their high-speed rail systems today. The earliest stages of planning are when a program team has the most influence over how their program finishes. Decisions made today about civil and systems interfaces, utility partnerships, and operator involvement will shape cost, schedule, quality, and safety results years from now. In a broader sense, decisions made today about individual programs will help determine whether, like the interstate highway system, high-speed rail becomes integral to U.S. society decades from now.



About the Author

CMAA Member, Mohammad Saleem is a transportation and program management leader with 30 years of experience. He is vice president of rail and transit at Hill International, Inc., where he is responsible for delivering major infrastructure projects on time and within budget. To speak with Mohammad about high-speed rail, contact him at MohammadSaleem@hillintl.com.

On December 9, 2026, alongside leaders from the California High Speed Rail Authority, Mohammad will be moderating a panel on California High Speed Rail presented by CMAA's Southern California Chapter. The discussion will cover the program updates and upcoming opportunities. For more information visit here.

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