

# Building Bridges beyond Structures: Fostering Support and Encouragement within Our Industry

by Nyssa Beach, Colorado Department of Transportation

As an engineer in the transportation and structural engineering industry, I have traveled through many challenging and exciting projects on my career journey. When this path led to the first cast-in-place concrete segmental bridge for the state of New Mexico (see the Project article about U.S. Route 54 over the Canadian River in the Winter 2021 issue of *ASPIRE*®), I eagerly joined the design team and soaked up the opportunity to learn all I could about concrete segmental bridge design.

In 2016, I attended my first American Segmental Bridge Institute (ASBI) conference and immersed myself into this specialized world of structural design and construction. The first morning of the conference, I headed toward the convention center and asked for directions to ASBI. I was directed toward some signs, which led me to a meeting room. I stepped into the room and was momentarily amazed at the incredible representation of women at the ASBI conference—until I realized that I had been directed to the ASBI spouses’ breakfast. I felt embarrassed and flustered, but a group of extremely kind women turned me around and pointed me in the right direction. I squared my shoulders and joined the other conference attendees with the thought that perhaps my involvement at ASBI could make a difference.

Like many others, I’ve had my moments of wondering if I belonged in engineering. Ultimately, I’ve been fortunate throughout my career to have wonderful mentors and supporters who have solidified my belief that I do belong, and that our industry excels at supporting people. Through the work we do and the teams that make this

work happen, our inherently people-driven industry leaves a legacy beyond the structures we build, passing on collective knowledge to the next generation. I’ve found that mentorship is critical; it shapes the individuals who currently lead our engineering industry forward and those who will one day become leaders.

“In order to be a mentor, and an effective one, one must care. You must care,” Maya Angelou states in one of my favorite quotes. “Know what you know and care about the person, care about what you know and care about the person you’re sharing it with.”

My mentors and supporters include the engineer just a year ahead of me at my first job who took me under her wing and pointed out which socks to wear during cold-weather bridge inspections, the supervisor who helped me identify and align key skills in myself that I couldn’t see on my own, and even the coworker who kindly sympathized when I came to work as a new mom

with baby spit-up dripping down my back. As we progress, it becomes our responsibility to ensure the success of future generations in this industry.

This responsibility felt more personal for me as I made a recent career shift from the private to the public sector. I got to immerse myself in not just the “what” but the “why” of projects by stepping into a role with the Colorado Department of Transportation as a resident engineer. My job now involves leading a team and orchestrating the development of diverse infrastructure projects in the Denver metro area. I represent my community from an owner’s mentality on projects from the conceptual stage through design and construction, and with long-term asset management. For me, the best part of this role is connecting the collective knowledge and skills of our industry to solve problems and help communities.

Making this career leap required stepping outside of my comfort zone of structural technical design and



U.S. Route 54 over the Canadian River Bridge. Oil painting on canvas by Nyssa Beach.



Nyssa Beach and her daughters, Hannah and Maddie Beach, during the Women's Transportation Seminar Colorado Girl Scout Mobility Day Tour 2023. Photo: Women's Transportation Seminar Colorado.

taking a leadership role within project teams. The job involves managing all facets of infrastructure—coordinating technical issues, stakeholders, and community members—as well as working with our maintenance teams, construction staff, and the Federal Highway Administration. At this stage in my career, I felt confident in making this leap not only because of my own skills and experience but also from the solid foundation of support that I have within our industry. I hear time and time again, “This is a small industry.” I have benefited from my involvement in professional organizations and the relationships I have formed working on projects, being part of teams, and sitting on committees. While I may not always know the answer, I know who to call, where to find training, and where to look to seek out different perspectives that can challenge my viewpoint. I'm well positioned to support others in this industry.


Each year in the fall, I help with a Women's Transportation Seminar

Girl Scout Mobility Day in downtown Denver, Colo. The event is a wonderful, chaotic, giggly, walking tour of urban engineering, with civil engineers and planners serving as the girls' guides at each stop. The scouts learn to read a train schedule and ride the Denver Regional Transportation District light-rail trains, and we visit a transit-oriented development. They walk through blocks of the Denver Union Station in pairs for a blindfolded Americans with Disabilities Act activity, learn bike safety right next to the green-painted bike lanes, and scramble up to the platform of the Denver Millennium Bridge to “think like a bridge engineer!”

With my many years of experience designing, constructing, load-rating, and maintaining bridges, I'm their guide to all things bridges. I've done my “bridge talk” for more than 12 years now: while pregnant, with a baby strapped to my back, pregnant *and* with a toddler strapped on my back, with my kids toddling around between my legs, and, most recently, with my own two Girl Scouts as part of the tour group.

Before talking with the scouts about how many bridges there are in the United States (they're always shocked that it's more than 100), discussing

how bridges are designed for loads (I've gotten the question: “So, would a bear attack be a ‘load?’”), and challenging them to “think like a bridge engineer,” I always share the following message: I think that being a good engineer doesn't necessarily require figuring things out easily, but it does involve not giving up on things that are hard and loving that feeling of solving the problem. And if you look different, think differently, and have a different background than others around you—great! Engineers can design and construct solutions to uplift our diverse world. We only do that truly well when our teams are as diverse as the communities we serve.

To me, it's important to pass along this message. I've shared it while working on STEM activities with the Girl Scouts, in school classrooms, college classrooms, with LGBTQ youth, and with minority and underrepresented organizations. I try to take this message with me to work every day and often tell it to my inner voice that pushes back each time I take a step forward in my career path. I belong in engineering, and I want to do my part to both improve the community around me and help this industry become an encouraging and supportive field. 

Women's Transportation Seminar Colorado Girl Scout Mobility Day Tour 2023 at the Millennium Bridge in Denver. Photo: Women's Transportation Seminar Colorado.

