

NEXT STEP

Advice from Young Engineers Moving Forward in Their Careers

Choose an Inspiring Mentor And a Job That Fits Your Values

KATIE BOWMAN, P.E., M.ASCE, held two jobs in consulting—with Stantec in Santa Barbara, California, and Kimley-Horn in Memphis, Tennessee—before returning to the University of Memphis, where she is pursuing her master's degree in civil engineering and working as a graduate research assistant under the direction of Stephanie Ivey, Ph.D., A.M.ASCE, the associate dean for research at the Herff College of Engineering and the director of the West Tennessee STEM (science, technology, engineering, and mathematics) Hub and the Southeast Transportation Workforce Center at the University of Memphis. Bowman is assisting Ivey on three transportation projects that align with her personal dedication to helping students of all ages and backgrounds and making a long-lasting difference in the world.

How and why did you make the transition from practicing engineer to student and researcher?

I have an amazing adviser, Professor Ivey. I started grad school in spring 2019 while I was working full time at Kimley-Horn. Professor Ivey invited me to come on board in December 2019. My last day with Kimley-Horn was January 3, 2020, and I started at the university on January 6. It was a fast and hard transition from being a consultant to becoming a student again. But I was ecstatic to come to work for a mentor like her who is so positive and supportive. She really wants to make a difference in community livability through transportation planning. It's only one-quarter of what my monthly pay was, but it was an opportunity to have school paid for and to get to work with her, so the choice was very easy.

What does your position as a graduate research assistant entail?

There are three main focuses to my work. One is to run the West Tennessee STEM Hub, which has a lending library of STEM activity kits for kids. I supervise thirty undergraduate students who go to the schools and teach STEM activities using these kits. They are meant for teachers who lack STEM knowledge themselves. We take over their class for a couple of hours, bringing our own lesson plans and supplies. The kids have fun while they learn.

I also am responsible for the Girls Experiencing Engi-

neering camps; this is Ivey's seventeenth year of running the camps. There are different curricula for middle schoolers and high schoolers, all geared toward transportation. This summer, of course, we went virtual. Our high schoolers worked on a project that identifies safe biking and walking routes for students to their schools, and the middle schoolers built and tested virtual bridges using Autodesk's Tinkercad, which is geared toward kids.

And I just started working on a new camp that's a free, AutoZone-funded STEM camp run through the Memphis public libraries. We use Zoom, and the complication there

is getting all the students into their virtual breakout rooms. It takes forever! I want to do more research about engaging kids in virtual learning because it is a challenge and so many kids around here are already behind.

The third thing I am doing is a TDOT [Tennessee Department of Transportation] research project. The University of Memphis, Vanderbilt University, and Tennessee State University have partnered to examine diversity and inclusion within TDOT. I was brought in to examine how other state DOTs address these issues, and I am working on a paper on that right now. I am very supportive of the Black Lives Matter movement, but I don't support just talking and not doing anything concrete about it. So I appreciate getting to look at how we can change things as transportation engineers.

In my research, I found that there is no real framework for diversity and inclusion for all DOTs to follow.

We asked for recommendations from the state DOTs, and one of the states said, "The first thing we need is a uniform language to use when talking about these issues." It's like a lost conversation. The state DOTs need support so that they don't feel like they are all alone in addressing these issues.

What are your goals for your education and your career?

My next project is a partnership between the civil and electrical engineering departments of the University of Memphis and Southwest Tennessee Community College. The goal is to find a way to teach TSMO [transportation systems maintenance and operations] in a way that acknowledges that transportation and information technology are converging. We want to create a curriculum for students heading into smart-transportation jobs.



Katie Bowman, P.E., M.ASCE

CURRENT POSITION
Graduate Research Assistant,
University of Memphis

PREVIOUS POSITION
Analyst, Kimley-Horn,
Memphis

Meanwhile, I really care about kids, so I am working to understand the K–12 STEM curriculum and what the needs of kids are. We need to get kids ready for their future education and not remove curriculum that they will need. I grew up in a low-income part of town where a lot of kids were immigrants, and there wasn't much talk of going to college. My high school had problems with the curricula and the students being able to learn what they really should learn. I want kids like that to know they have support and can consider college. I want them to know that people do care and that no matter their backgrounds, they can turn their lives around.

And ultimately, I want to teach civil engineering at the university level.

What are the differences between learning engineering to practice it and learning it to teach it?

To teach it, you have to stay on top of technology and all the programs that graduates will need in practice, like HydroFLOW and StormCAD. Typically, graduates don't have that knowledge. So teachers have to stay ahead of what the real-world needs are.

Which organizations or activities helped you on your path so far?

ASCE is amazing! When I worked for Stantec in Santa Barbara, one of my coworkers was the president of the ASCE Younger Member Forum there. I got involved and learned that this is a group of like-minded people who just want to make a positive impact on the world. They were people I wanted to surround myself with.

When I got to Memphis, I met two other members who were studying for the P.E. exam at the same time I was, so we studied together and got to be friends. But there was no Younger Member Forum here, so we founded one. We had to write the bylaws, so I reached out to National for help. Now the West Tennessee Younger Member Forum is on the national list of active chapters.

Recently Robert L. Cagle III [P.E., F.ASCE], the Region 4 member of the

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ASCE Board of Direction, created a Region 4 Younger Member Council, and he asked me to be its representative. I was thrilled.

What concerns do you have about your path as you move forward?

I don't have health insurance right now. I can't afford it. That's scary.

I was advised after I got my bachelor's degree in civil engineering to go work in the profession and then come back if I wanted a higher degree. And that was good advice; the real world is way different than school. I think ev-

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erybody needs to go out and experience that.

But now I am back at school and I want to get a Ph.D., and that's three to five more years of school. So do I take a loan out for health insurance for that time? It's especially concerning for me because I struggle with depression. Right now, I'm doing on-campus counseling, and it's helping.

What do you do to relieve stress and maintain balance?

I run. If I don't run, I feel anxious and uneasy. It's so important to get out of the house for thirty minutes a day and let your body and mind recharge. It lets me focus on my mental health and stay aware of how I'm feeling.

Also, I'm a very social person, and I have learned how to talk to anyone. That is a quality I like to use because people want a relationship. And to do that, it's important to be able to have in-depth conversations.

What advice do you have for younger engineers entering the field right now?

I think it is so important to work for a mentor. You are spending so much time with this person; if you can't see yourself in that person, it's hard to grow.

I also encourage people to move out of state and try new environments. I grew so much by moving to a new state where I didn't have any friends and had to grow into a new role.

And finally, if you are unhappy, talk about it. Engineering is stressful, and if you are not talking to someone, a small problem can turn into a bigger concern. Engineers don't generally talk about feelings, but I think it is something we should encourage.

—LAURIE A. SHUSTER

Are you a younger member who has recently taken the next step in your career? We'd like to hear from you. Email cemag@asce.org using the subject line "Next Step."