Transcend

Educating the next generation of water & wastewater engineers

Transcend software is used by the world's largest engineering firms, utilities, and equipment suppliers to streamline preliminary design practices and focus on value-added work.

But something you may not know is that many of the world's leading universities also use Transcend tools, including the Transcend Design Generator, to teach the next generation of infrastructure engineers. We believe that training the next generation of professionals how to use cutting edge generative design tools leads to more sustainable, innovative infrastructure and 'future proofs' their careers by learning how to work with, not against, software.

The University of Michigan – Using TDG Since 2021

Dr. Glen Daigger, a renowned wastewater treatment expert and Professor of Environmental Biotechnology at the University of Michigan, has implemented TDG as part of his curriculum for a senior design course that includes biological wastewater treatment . Dr. Daigger's students are provided a 'hands on' experience acting in a 'real world' setting to complete a wastewater treatment project. Pete Cavagnaro, PE, BCEE, is the Director of Water Resources Recovery Solutions and one of Dr. Daigger's course advisors.

A 50-year veteran in the wastewater industry, Cavagnaro was interviewed about his role advising students in the course, as well as the experience using TDG as a training tool for students.

"There's a class of maybe 80 students, and they're divided into groups and working teams. And the goal is to simulate work experience. So, before they get out and go off into their careers, they have a sense of what it would be like to work in the real world," Cavagnaro says.

The students are in the roles of consulting engineers reporting to an "owner" represented by a real-world developer. Some students serve on building teams made up of structural engineers, project managers, & geotechnical experts. Each

building team works together on the development of a building site that meets criteria that have been established by the owner.

“There’s also a team looking at the overall site, which is maybe 400 acres of land and looking at the environmental needs for that area. Then there's another group of people that form a team looking at water supply, water distribution, wastewater collection, and wastewater treatment. We're all together collaborating and talking about the approach to estimating wastewater flows and process design and selection.”

Creating preliminary designs as the course deliverable

Cavagnaro works with students to come up with viable options for what a wastewater treatment plant might look like given the specific project requirements.

“Their deliverable would probably be considered preliminary design level of detail. They have a scope of work from the owner, owner instructions, and then their own resources and thoughts and ideas on how to approach the project. We talk about all sorts of topics during weekly meetings. We may talk about odor control, hydraulic profiles, process design, process modeling… Why the process model we're using not giving the desired outcomes? Are the results confusing? What can we do to clarify?

Towards the end, we start looking at the layout and how the equipment is going to be arranged, how much space is needed, is it indoors, outdoors, and what will the site look like, and what type of provisions are needed. It's really all over the board in terms of what we're doing and looking at and trying to provide and share insights as to what we're doing and why, not just saying, do it this way.”

Introducing Transcend Design Generator as part of the process

Cavagnaro was introduced to Transcend a few years ago by Dr. Daigger, and says it has made a meaningful impact on the student’s education experience as part of the course.

“It's obvious a lot of thought and effort has gone into developing this product. I can't tell you how much we appreciate Transcend making this available to this group and how meaningful it is.”

Interestingly, TDG is not a required tool to use as part of the curriculum, just like in the real world. It's up to the students whether they choose to use it. “Students are tasked with developing a design concept idea and doing that in the most efficient way possible. They have a limited amount of time, and they have other classes and things going on in their life,” Cavagnaro says.

This year, two teams assigned one or two people to look at using the software. They quickly realized the benefits that TDG could bring to their preliminary design work after trying to develop calculations and designs the ‘traditional,’ manual way.

“It's not until they start to realize, ‘oh we have some deliverables to provide in terms of a hydraulic profile and process flow diagram and, and.’” Cavagnaro then introduces TDG – “There's this program that you might want to look at. It can help you with these deliverables.”

Cavagnaro sees a big difference in the success of the teams who use TDG and those who don’t. “There was one person on each team that went through the whole problem-solving process with Transcend. One of them got a lot of information about the building related spaces, the office space, restrooms, conference rooms. They were able to take editable Excel files to do analysis and compare process models between Transcend and SUMO.

They did great. They shared information together. So, the team that got the information was able to share it with the team that didn’t have it.”

The future of wastewater engineering training

Given Cavagnaro’s fifty years in the sector, we were curious to get his opinion on software like TDG and its applications in the ‘real world.’ Engineers are often hesitant to utilize tools like Transcend as part of their day to day, given their own spreadsheets they’ve developed and the expertise that resides in their head.

“We're in a different world today. It's not a matter of if, it's a matter of when. Just

the economics of design and from what I've seen, your product can do in terms of the initial output. Why wouldn't you want access to this as a tool in developing your initial work plans and concept designs?

A person needs to be involved in asking the questions, does this make sense? Are we meeting the project goals? Is there a fatal flaw in what we have here? But in terms of just doing the basic mechanics, programs should be able to go through and provide some initial workings."

Cavagnaro also says that today's engineers are different – they've learned differently and have been exposed to different ways of working.

"It's a new world. It's a different world. I graduated 50 years ago this year, which is great, and I get to see this new crop of engineers who think differently – they're more articulate, they're more open minded. They're going to be using products like TDG as part of their day-to-day efforts."

Using TDG as part of your curriculum – either at a university, utility, or engineering firm

Ultimately, the Transcend Design Generator provides a range of design options that can help engineers identify the most appropriate solutions for a given project. It also allows users to experiment with different design parameters to explore the effects of different design choices.

The software automatically generates a variety of interactive engineering outputs that can help budding engineers visualize the effect of their design decisions, like process flow diagrams and full 3D BIM models. The software also includes a library of vetted calculations and components that speed up the design process and allows users to generate complete conceptual designs in hours, rather than days or weeks.

If you're interested in the benefits TDG can provide to your organization, we'd love to hear from you. Contact us by filling out the form on our Academic page or e-mailing us at **info@transcendinfra.com.**