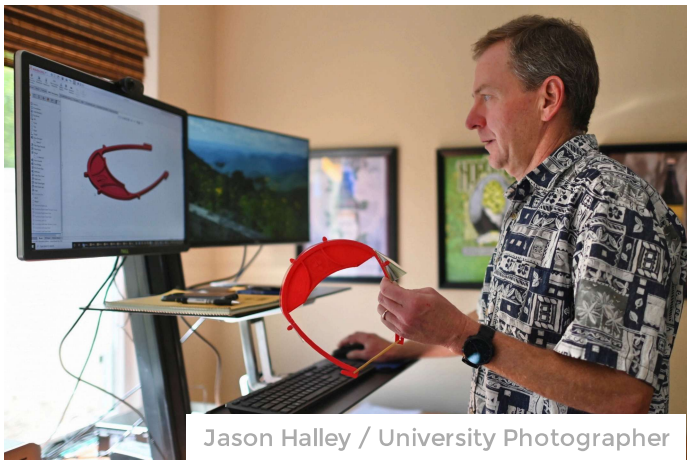
Chico State Joins Community Push for Personal Protective Equipment

Sean Murphy April 14, 2020



Jason Halley / University Photographer

Editor's Note (May 14, 2020): This story has been updated to reflect an additional partnership to create PPE.

Addressing the community's urgent need for additional personal protective equipment (PPE), Chico State is working to bridge that gap amid the COVID-19 pandemic.

Through consultation with Enloe Medical Center and a partnership with tech startup Idea Fab Labs, the University is supporting the production of thousands of PPEs for healthcare workers using campus community members' personal 3D printers and University machinery for plastic injection molding. The goal is to produce and distribute 20,000 face shields by mid-July in Butte, Glenn, Tehama, and Colusa Counties.

Together, the partnership is striving to prevent a sizeable PPE shortfall as the healthcare community braces for an expected surge in patients diagnosed with COVID-19. The first set of face shields was delivered to Enloe in mid-April, with deliveries ongoing in recent weeks.

"This is a community effort, it's not just the University," said Greg Watkins, chair of CSU, Chico's Department of Mechanical and Mechatronic Engineering and Sustainable Manufacturing. "Everybody wants to do their part to help."

The four county Public Health Departments conducted surveys to identify how many each county needs. Completed shields will be trucked to each county's public health office, then distributed by the county. The shields will be given to hospitals, doctor's offices, urgent care clinics, dental offices, veterans clinics, student health centers, and more.

Modifying a face shield frame template initially made publicly available by Georgia Tech, faculty from CSU, Chico's College of Engineering, Computer Science and Construction Management and the College of Natural Sciences, as well as colleagues from Meriam Library, worked closely with Enloe representatives to finalize a design the hospital approved as effective and safe. Idea Fab Labs is producing the plastic face shields that snap onto the frames.

Student Perry Cheney helped develop a metal mold that could be used with the campus plastic injection machines to create visor frames for face shields.

The project's first phase was to make 3,000 face shields –with the possibility of making significantly more if there was demand, Watkins said. As the University follows the state's Stay At Home order, with only essential personnel on campus, he and colleagues looked to the wider Chico community to help.

More than a dozen faculty, students, and community members stepped up to volunteer their own 3D printers to produce face shield frames to help protect healthcare employees working the front lines. Each piece takes approximately an hour to print, and the community volunteers began printing parts in mid-April, using the design template provided by the University.

With the success of the project's first phase, and a continued demand for PPE, the University moved into the project's second phase–manufacturing up to an additional 7,000 frames, using the department's plastic injection machines. In early May, students developed a

metal molding to be used for plastic injection and significantly increase frame production.

They are now producing about 600 frames per day – and may be able to double that.

“Everybody came together and put in a lot of hours to make this happen,” Watkins said. “It’s gratifying to see our students apply their design and manufacturing education and utilize our campus facilities to help out the local medical community.”

Brandon Burdick (left), Marshall Ellis (right), and other students are able to produce more than 600 frames each day with the injection mold machines.

Idea Fab Labs, a fabrication lab, makerspace, and tech-art gallery located just blocks away from the University, is cutting transparent plastic shields that snap onto the frames produced at Chico State. The shields and the frames can be cleaned and reused.

Idea Fab Labs director Erin Banwell initially contacted Enloe representatives to discuss how the startup could help with PPE production and began producing prototype frames and shields from models posted online.

When Watkins learned of the lab’s efforts, he initiated the subsequent partnership offered to leverage the University’s design and manufacturing expertise and, if needed, its 3D printers and plastic injection molding machines to help with the project. He said that despite the circumstances, he’s grateful to be able to help by putting his engineering training to good use.

“It’s satisfying to apply engineering skills to a community project and see the incredible interest of those who are willing to help,” he said. “They’re not concerned at all with getting reimbursed, they just want to help.”

North Valley Community Foundation (NVCF) and Feather River Health Foundation split the cost of the plastic material and the labor so the shields could be donated. NVCF and Feather River Health Foundation both have coronavirus relief funds and this month formed a partnership to combine resources.

“It has been incredible to watch this come together,” said David Little, executive vice president of NVCF. “Everybody recognized a need for personal protective equipment for all health care workers, from doctors in emergency rooms to hygienists in dental offices. Then everyone worked
to figure out how to make it happen.”

In addition to Watkins, other individuals at Chico State who have been instrumental in moving this project forward are Eric Ayars, chair of the Department of Physics; Sinan Bank, assistant professor from the Department of Mechanical and Mechatronic Engineering and Sustainable Manufacturing; Jaydie Lee,