

## **JANUARY 11, 2025: EIGHT YEAR**

Dear customers and friends,

Today marks the end of the eighth year of my business, Forecast LLC, and it has been a busy and transformative year. It started with spending a lot of time at the machine shop preparing a big machine for installation, had a major career change in the middle, and there were many success stories by the end.

Once [DMS Machining and Fabrication](#) in Barre, VT finished fabrication of upgraded components that I helped design for accelerated testing of pavement for research, the machine was shipped to the [University of Illinois](#). I spent about a month in Rantoul, IL, setting the machine up, writing control software for the Delta Motion controller that translates motion commands into hydraulic valve signals and reads sensor data, and writing/testing the LabVIEW program that the user interacts with to tell the machine what to do and saves test data. After returning to Vermont, I collaborated remotely with the on-site team to finish getting the machine operational. The graduate student who is relying on the machine for his [research](#) is very happy to be collecting data for his Pd.D. thesis. The machine has completed over 120,000 44-foot-long cycles at 5 miles per hour, pressing two large (40.1" diameter) truck tires, one behind the other, into the pavement, each with 10,000 pounds to 14,000 pounds of force. This [dual-inline](#) mode is one of many modes that the machine will be capable of when fully commissioned. During the commissioning of this project that I have worked on for nearly four years, I learned a lot about tuning large and powerful hydraulic systems, and I am proud to be part of designing and building a machine with so much capability.

I had the pleasure of working with a local cardiologist at the University of Vermont Medical Center to design and fabricate a low-cost test rig for his research. He needed a way to replicate a cardiac ablation on tissue in a temperature-controlled saline bath, using his novel electrodes and applying a consistent force. After our initial prototype demonstrated proof of concept, we revised the design to fix some deficiencies and allow his research team to generate useful data.

I continued my partnership with the local business accelerator [LaunchVT](#) by providing design/engineering as a prize, and supported Burlington makerspace [Generator's JumpStart](#) program, a business bootcamp for product-based startups by sharing my time and expertise. One of my customers, a local inventor, won a spot in the JumpStart program after we iterated and improved his product design before he applied. Also through Generator, I continued to teach an introduction to 3D CAD modeling class using [Fusion 360](#). In this 2.5-hour workshop that I taught several times and will continue to teach, participants learn the basics of 3D computer modeling so they can realize their design concepts.

My recent experiences mentoring engineering students and teaching the CAD modeling workshop motivated me to make a career change this year. I am now running the capstone design program for 4<sup>th</sup>-year mechanical and electrical engineering students at the University of Vermont, called [Senior Experience for Engineering Design](#) (SEED). The first semester of this two-semester course just ended, and I enjoyed it and learned a lot. It is so much fun guiding 100 students through the engineering design process as they work in multidisciplinary teams on 25 real industry-sponsored projects. This successful program has been running since 2007, and I am honored to have been chosen to continue improving it and teaching passionate and motivated students. The students are actively learning about teamwork, communication, leadership, how real engineering projects go from concept to completion, and are

developing lasting relationships with industry professionals. Industry partners gain access to senior engineering students, a creative look at company challenges, and the opportunity to mentor young engineers who may become future employees. I will soon be looking for student projects to start in August 2025, so please let me know if you are interested in learning more.

While teaching, I am continuing to work on other projects as time allows, including one with existing customer [Resonant Link](#), a Vermont-based wireless power company. I recently designed a new, customized system for demonstrating their wireless power technology to a major medical device manufacturer.

I hope you are well, and if we haven't spoken in a while, please write back. I would love to reconnect. If you are interested in learning more about the history of Forecast LLC, you can find the previous seven anniversary notes on my [website](#).

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