Trek, one of the world’s best-known bicycle manufacturers, was founded in 1976 with the mission to build the best bikes on the planet. Over the years, Trek’s mission has expanded to use bikes to address contemporary problems such as climate change, urban congestion, and human fitness. In that vein, Trek constantly works on developing greener bikes—and greener business practices. Trek provides green bike packaging and recyclable bike parts, while also focusing on low-impact manufacturing and renewable power at its Wisconsin headquarters. For more green—and more flexible—design work-flows, Trek recently consolidated its engineering stations to be all mobile, relying on Dell M4700 mobile workstations equipped with NVIDIA’s Quadro K2000M mobile GPUs for reliable performance throughout the design process and beyond, with a smaller energy footprint.

CHALLENGE
Trek is constantly expanding and innovating, introducing new road, mountain and town bikes every year while simultaneously working to streamline manufacturing processes to be more efficient and sustainable. Trek has long relied on NVIDIA Quadro GPUs in its desktop workstations for powerful and efficient engineering and design across its bike lines and its accessories division, Bontrager. But a mobile work-flow promised greater flexibility for engineers dealing with vendors across the globe, and reduced power consumption overall for the forward-thinking company. However Trek needed to ensure that its industrial designers and engineers—who use SOLIDWORKS, MODO, CATIA, and various FEA and fluid dynamic software solutions throughout the design and development process—would experience the same top-notch GPU performance they were used to getting at their desks.

SOLUTION
Trek has been rolling out Dell M4700 mobile workstations across its headquarters, turning to NVIDIA Quadro K2000M mobile GPUs to leverage unparalleled performance. NVIDIA’s GPU architecture offers double the performance and number of NVIDIA CUDA cores over the previous generation, at the same power budget—reducing energy consumption while enabling a better, faster GPU. This is critical for Trek, which has about 150 projects in development each year. Recent projects developed on the new mobile workstations include the Madone and Domane high performance road bikes and the Fuel EX full suspension mountain bike.

“There are a lot of intricate parts that go into bicycle design, and we require a lot of hi-res modeling in MODO and visualization in SOLIDWORKS with RealView” explained Mike Hammond, Design Manager, Trek. “Individual parts can get up to 200-300 MB; there’s a lot of
surfacing and detail that needs to be included and you need to be able to spin each component around and change the dimensions and have it update quickly. Speed and stability are critical. If each change takes a minute to render and you’re doing that 30 times each day, it really starts to add up—not to mention ten minutes wasted every time your system crashes. With NVIDIA GPUs I have zero render time and zero crashes; I can export images straight from the RealView screen and everything is always smooth and interactive, even large assemblies. We push these mobile workstations as hard as we can, and thanks to NVIDIA’s GPUs, they always keep up.”

Another major benefit for Trek engineers is the flexibility to tap this GPU power in any location.

“We push these mobile workstations as hard as we can, and thanks to NVIDIA’s GPUs, they always keep up.”

“The mobile work-flow is great for us because we travel a lot on research trips, test trips, and to meet with vendors overseas to make sure that everything is going well in production and hitting our cost targets,” said Hammond. “With NVIDIA’s mobile GPUs under the hood, we have a reliable system in place to make design changes out in the field in real time, instead of waiting until we’re back in the office.”

IMPACT

Thanks to Dell and NVIDIA, every group at Trek experiences performance benefits and increased productivity—with a clean, green conscience. In addition to delivering critical power to the engineering and design teams, NVIDIA GPUs also increase efficiency for everyone at Trek—for instance, the marketing team, which relies on 3D animation and video in Adobe Creative Cloud for sales and promotional tools.

“The great thing about NVIDIA cards is that they just work,” concluded Hammond. “Your graphics card should be invisible—it’s when it fails that you notice it. You don’t want to be running a large assembly and moving things around and start to see glitches. You don’t want to notice it, you just want it to perform, and that’s exactly what NVIDIA does.”