

A beautiful shot of
the road winding
among the massive
granite spires.
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Driving THROUGH STONE

South Dakota's Needles Highway

BY AMY GRISAK

The Needles Highway sticks close to the landscape as it descends through the forest growing among the rocks. Visit Rapid City



Maneuvering a car through the gigantic granite formations of the twisting, turning Needles Highway is a must-experience for any geology lover. The 14-mile-long Needles Highway (SD 87) ventures from Sylvan Lake in Custer State Park to U.S. Highway 16A, a few miles from the town of Custer, yet the short drive can easily take an hour or more when you stop to take in the remarkable surroundings.

The road itself is an anomaly. Instead of being created to move traffic quickly and efficiently, it was designed to slow people down by its primary vision and route planner, Peter S. Norbeck, who was then the governor of South Dakota. Norbeck held a deep love for the Black Hills and was instrumental in the creation of Custer State Park in 1919.

With automobiles gaining in popularity, he wanted to create an immersive experience for visitors to drive alongside the otherworldly-looking formations. Norbeck reportedly marked each mile by either walking or riding a horse and worked with civil engineer Scovel Johnson to create a route many deemed impractical, with grades of up to 22%, plus no shoulders or guardrails in some areas to preserve the view. The public loved it.

ALMOST MONUMENTS

In a desire to promote the region, South Dakota state historian Doane Robinson envisioned carving figures of Western icons, such as Lakota leader Red Cloud and Buffalo Bill Cody, into the granite spires. But upon closer inspection by sculptor Gutzon Borglum, the granite was found to be too narrow and structurally fragile to support the project. Borglum believed nationally prominent figures, namely four presidents, would be better suited to draw visitors, and he proposed what is now Mount Rushmore.

THE NEEDLES ORIGIN STORY

Rising from the prairie and badlands of South Dakota, the Black Hills were uplifted roughly 60 to 70 million years ago during the Laramide orogeny. This same mountain-building event created the Rocky Mountains. Deep faulting caused the area to dome upwards. Younger sedimentary rock that covered the area was also forced up, but erosion gradually removed those layers, leaving the ancient Precambrian core exposed. This includes some of the oldest surface rock in North America.

The Needles are in a unique position of what geologists call Harney Peak granite

(now typically associated with the Black Elk area). It is a light-colored granite that is exceptionally hard and is prone to weathering along fractures rather than breaking apart unevenly.

It's the same type of granite found on Mount Rushmore, but the jointing and natural fracture patterns are more vertical than horizontal. After millions of years, water seeps into these seams and freeze-thaw cycles, called frost wedging, widen some of them. This creates the series of spires, the "needles," we see today.

What's truly fascinating is the precision of some of the weathering processes. A perfect example of the combination of frost wedging, along with chemical erosion, is the "Eye of the Needle." This distinctive feature above the tunnel of the same name resembles an eye in a needle. In this case, the frost wedging was more refined, expanding in small pockets rather than flowing through the rock seams.

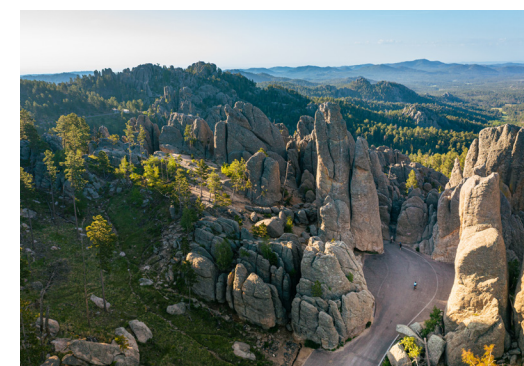
Chemical erosion has also shaped the formation. This occurs when water holds a weak carbonic acid, which can form by capturing carbon dioxide in the atmosphere or by percolating through mineral-laden rocks. The acidity reacts with the potassium

feldspar or sodium feldspar within the granite. The hydrogen ions from carbonic acid change some of the feldspar minerals into clay minerals, specifically kaolin, which are softer and more easily eroded. This is one reason the hole in the "Eye of the Needle" wore through without breaking.

DRIVING THE HIGHWAY

From 1919 to 1922, workers drilled and blasted through the granite, including the iconic tunnels that were designed to be narrow — just eight feet wide. It wasn't a matter of making a hole; it meant careful placement of the charges to create Norbeck's vision of choreographing the nature of the drive. This was no place for large vehicles, especially commercial trucks. Plus, he wanted to keep as much of the landscape intact as possible.

Beginning at Sylvan Lake, a beautiful man-made lake ringed with granite boulders, with some emerging from the middle of the lake, the drive begins in a lodgepole forest at 6200 feet. Within a half mile, Hood Tunnel introduces visitors to the tight features that make this trek unique. Keep in mind that there is two-way traffic on the road, so it's important to take turns passing through the tunnels.



Above, left: A couple of bull bison along the Needles Highway.
Amy Grisak

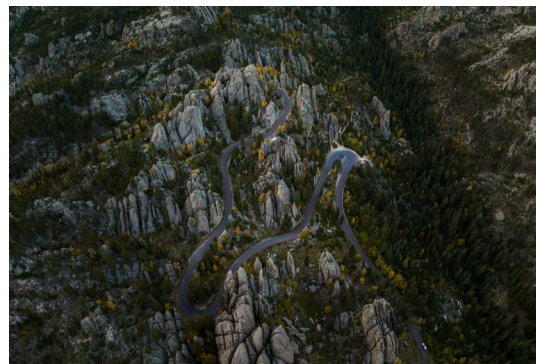
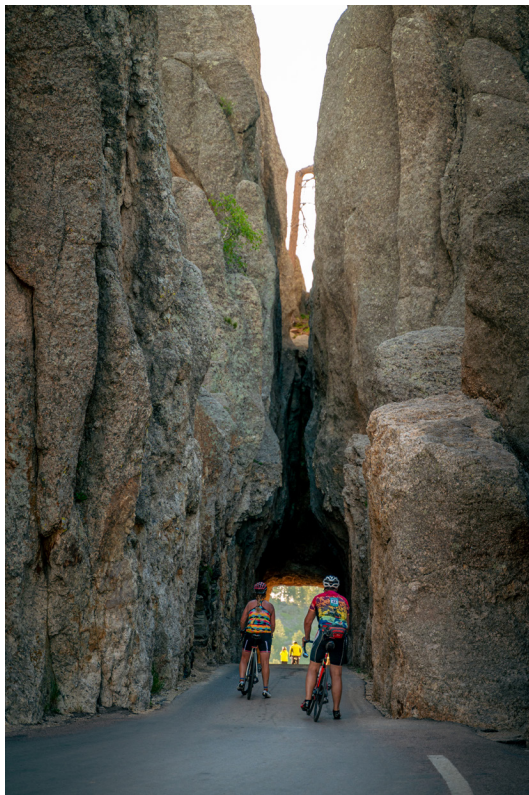
Below, left: A bird's eye view of how the road was designed to wind around the granite spires.
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Right: Motorcyclists weave through the tight spaces of the Needles Highway.
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Left: Bicyclists ride through the eight-foot-wide Eye of the Needle tunnel.
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Above, right: A bicyclist has the road to themselves as they travel along the Needles Highway with the massive rock formations lining either side.
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Below, right: Looking down on the Needles Highway as it winds through the granite and forest.
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If you prefer minimal crowds, opt for early in the year or into the fall, around October and beyond. It's a magical time in these shoulder seasons when it's sometimes possible to drive it almost alone."

Between one and two miles, it's the heart of the spires with stacks of these pinnacles standing precariously along the road. At the 2.5-mile mark, a sharp curve takes you through the Cathedral Spires trailhead. The parking area is notoriously packed because this short hike brings you deep within these dramatic granite formations.

The Cathedral Spires Trail is relatively short, roughly a three-mile round-trip. It requires some easy rock scrambling as the path leads through a maze of granite giants, gaining over 500 feet in elevation over the rocky terrain. It's a challenging hike for less experienced hikers, and warrants preparation, particularly because the weather in the Black Hills can change in an instant. Wear sturdy shoes and good socks, pack an extra layer of clothes, and bring water (at least a

liter per person), especially on warm days. Hiking poles are also handy for maintaining balance on uneven paths. There are terrific views along the way, and at about the 1.5-mile point, the area opens up into a natural amphitheater surrounded by glittering, towering granite.

Beyond the Cathedral Spires area, the road remains very curvy, exposing the view along the way. There are occasional pullouts to stop and take in the scenery. At 4.5 miles, the Eye of the Needle Tunnel and geological feature take center stage in a large, round area with parking along one edge. It's hard to know which way to look because it's all stunning. The area is often crowded because visitors want to take photos of the unique formation.

Once again, the tunnel requires cooperation for each car to pass through, and

onlookers often gasp at how close the walls are to the vehicle. From miles five to seven, there are multiple pull-outs to experience the clusters of spires. The Iron Creek Tunnel welcomes visitors shortly after. The granite walls around the Iron Creek Tunnel are known to be particularly colorful during sunset.

After this tunnel, the descent leads into ponderosa pine forests and more meadows. Look for deer, turkey and bison. By mile 10, there are expansive views of the Black Elk Wilderness. At 14 miles, riders can choose to continue to the Wildlife Loop in Custer State Park, head to the Iron Mountain Road, or turn back north toward Rapid City.

WHAT TO EXPECT

Located within Custer State Park, there is a fee to drive the Needles Highway. At the time of writing, a weeklong pass is \$25, or it is \$60 for the year for non-residents (\$40 for South Dakota residents). It is well worth it, considering the natural wonders within this park and the ample wildlife viewing opportunities. Of note are the "begging burros" along the Wildlife Loop. They are descendants of the burrows used as pack animals that used to take guests to the Black Elk Peak Lookout.

The Needles Highway is often closed

in the winter during inclement weather. Timing, whether the day or the season, is equally important to consider. If you prefer minimal crowds, opt for early in the year or into the fall, around October and beyond. It's a magical time in these shoulder seasons when it's sometimes possible to drive it almost alone.

During the summer, visitation builds after Memorial Day with a noticeable influx during the Sturgis Motorcycle Rally in August. Not surprisingly, midday is the busiest time on the Needles Highway, but for those looking to ditch the crowds, it is distinctly quieter in the early morning and after dinner.

Norbeck set out to slow down people so they could appreciate this otherworldly landscape. He certainly accomplished his dream. Driving the Needles Highway offers a chance to wander among these granite giants, marveling at their spectacle, all while keeping an eye on the winding road. 💎

Amy Grisak calls the "Treasure State" of Montana home, the ideal location for her fascination with rocks, gems and fossils. She is the author of the Nature Guide to Glacier and Waterton Lakes National Parks and Found Photos of Yellowstone, and readers can follow her adventures at amygrisak.



The Needles Highway winds its way through the rocky landscape, allowing visitors to experience the landscape at a leisurely pace.
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