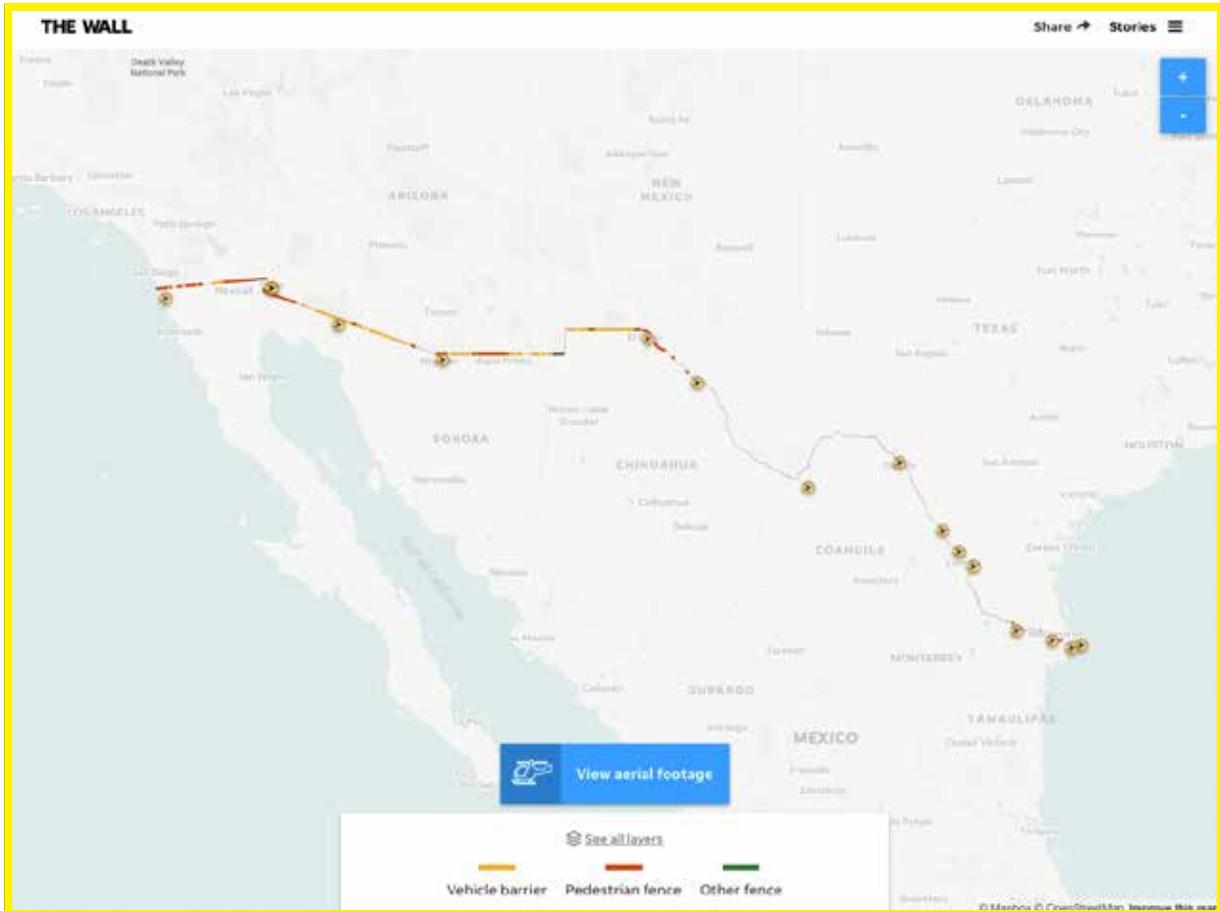


Sept. 20, 2017



THIS ITEM IS AN INTERACTIVE

[Map: https://usat.ly/2yqqqJN](https://usat.ly/2yqqqJN)

We looked at every mile of the U.S.-Mexico border. Now you can, too – right here.

The USA TODAY NETWORK has produced the most current and comprehensive public map of current fencing along the U.S.-Mexico border by flying and driving the entire 2,000-mile border and then verifying its findings with public records, digital property maps, on-the-ground reporting and satellite imagery.

An interactive digital map, based on this extensive reporting, allows users to pick any spot on the border and cue up aerial video taken from a helicopter at that exact location, as well as see the type of fencing used along the border.

As President Donald Trump pushes forward with his commitment to build a border wall, the map shows huge swaths of the border that are not fenced. About 650 miles of the 2,000 mile border is fenced, leaving 1,350 miles open. Of that 650 miles of fencing, about half is designed to stop only vehicles, not people.

Huge stretches of the border are not fenced.

Despite years of construction, and more than 2 billion dollars spent, much of the border is not fenced, including most of Texas. There are wide open spaces in between stretches of steel fencing along the lower Rio Grande. **Continues on next page**

The Texas fencing is full of gaps.

The border fence begins in Texas, but it's miles inland from the border's edge at the Gulf of Mexico. Elsewhere, fences start and stop with huge gaps in between. This is all pedestrian fencing, pictured in red on the map, designed to stop people from crossing.



Pedestrian fencing begins in Brownsville, Texas. Fencing in Texas has huge gaps between segments and often sits far back from the border. (Laura Gomez/USA TODAY NETWORK)

Fencing starts and stops, seemingly at random when viewed from the air.

Much of the fence was built on federally owned land or through private-property seizures. Fencing often appears in confounding locations because of this and also because the border is in a floodplain, limiting where fencing can go.

Much of Texas' fencing sits far from the border.

The Rio Grande snakes back and forth. Because of this, sometimes border fencing is close to the river, and sometimes more than a mile away. Big chunks of property in the U.S. sit on the "other" side of a border fence. These fence segments sometimes leave residents and property on the "outside" of the fence. People use gates or gaps to get back and forth.

Even where there's a lot of fencing, it might not really stop crossers.

The map plots all the fencing the team could see from the air, plus fencing that journalists verified on the ground. It identifies three types of fences: vehicle barriers, pedestrian barriers, and others.

Long sections of the border west of El Paso have pedestrian fencing, usually steel posts up to 18 feet tall. But much more common is vehicle barrier, either X-shaped crossbars or short steel posts.

The 300-plus miles of vehicle barriers are effective at stopping cars. But anybody on foot can easily cross over, under or through. These fences often sit in harsh deserts that make crossing deadly on its own.

That means that only about 350 miles of the 2,000-mile border has fencing designed to stop people.

In many cases, fence labeled as "other" on the map may not be security fence maintained by federal officials, but may be other barriers such as ranch fencing, which generally is designed to stop vehicles and livestock.

Hundreds of miles of fencing was built, so a wall could be built, too. But it would be hard and costly to do so.

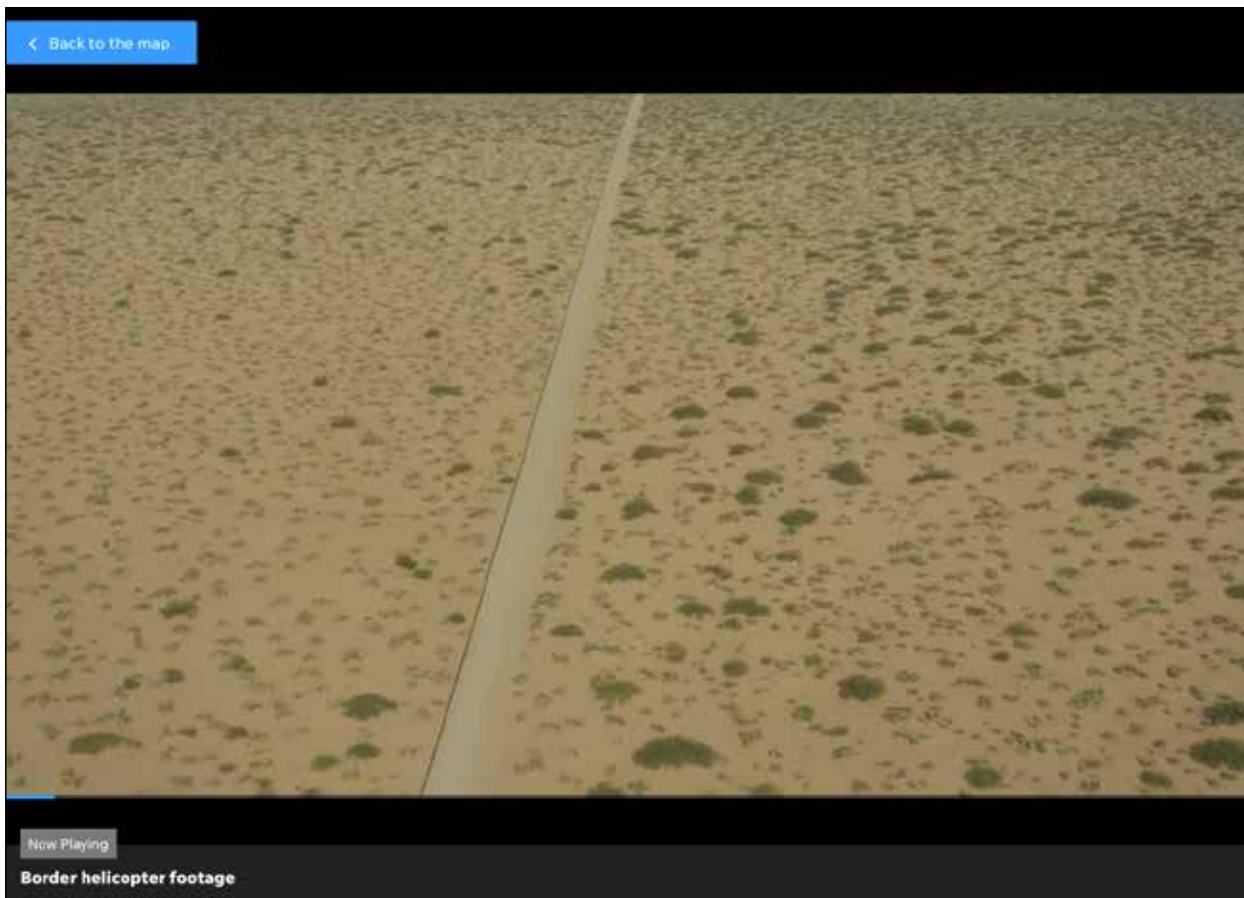
Steel fencing has already been cut into steep hillsides and built deep into the harsh desert. It can be done. But much discussion about the idea of a wall has centered on how much it looks like a wall. If the wall is built of concrete, as Trump repeatedly said during his campaign, it will be far heavier and require different construction techniques.

In August, Homeland Security officials announced they had chosen initial bidders to build prototypes. They said the prototypes would be made of reinforced concrete, 30 feet long and up to 30 feet tall, and incorporate see-through features. The actual designs have not been publicly released.

Much of the border sits hundreds of miles from the nearest big city, as reporters for "The Wall" observed. Building walls would require constructing roads to get there.

How the map project was done:

The USA TODAY NETWORK team started with about 40 hours of aerial footage of the



border flight itself. The helicopter camera system tracked not just the GPS coordinates of the helicopter, but also angles and positions of the camera.

The mapping team converted that data into a system that showed the precise location of what the camera was seeing. With the position data and mapping software, a three-person team from Arizona State University began synchronizing a digital map to the video, a process that took weeks.

The video was edited to remove flight portions that pulled away for refueling or overnight stops, resulting in one continuous stretch of video about 20 hours long.

Using the video, the team logged the map locations of every visible piece of fence. After multiple reviews, team members refined the map by checking it against other sources of information, primarily satellite imagery and federal maps from 2013 released under the Freedom of Information Act by the Department of Homeland Security to the University of Texas.

To use the Department of Homeland Security maps, the network worked with Shea Lemar, a geographic information system project manager at ASU. She and ASU students turned these traditional flat maps into interactive, digital maps that allowed the students and reporters to analyze the border and its fencing — and check their data against it.

Some fencing sits far from the border, typically in south Texas where the twisting Rio Grande conforms to no straight line. The helicopter flew and mapped the borderline, and these fences often were so far back they do not appear in the frame.

In these cases, a network photographer in Texas traveled the fence segments and checked the GPS coordinates of each segment's start and end points. A data reporter used mapping software to check those fence lines against satellite imagery.

Ultimately, the team refined all the fence location lines, and digital developers began the work of syncing the map and the video.

As a result, users can pick a point on the interactive map, zoom in and see video of every foot of the border — and any fencing that is there.

"It's not just a flat map," ASU's Lemar said. "It starts to have meaning."

The interactive map also highlights points of interest along the border. Users can see short documentaries and 360-degree videos taken from the ground.

The result is a powerful digital map that provides an unprecedented look at the U.S.-Mexico border.

"You can actually put yourself in that place now," Lemar said.