



The 3,777-foot Cajon Pass is the low point between the San Bernardino and San Gabriel mountain ranges and is one of two natural entryways into the Los Angeles Basin (the other being San Geronimo Pass). In the geologic past, these two ranges were one, formed by the San Andreas fault and later separated by the fault to form the pass. The Serrano and other Indians used the pass for thousands of years as a corridor between the coast and desert. The Spanish named the pass and began using it in the 1770's; the pass was to become a key point on the Old Spanish Trail between Los Angeles and Santa Fe. In 1847, Mormons initiated wagon travel over Cajon Pass while traveling between Salt Lake City and Los Angeles.

The first railroad to seriously eye Cajon Pass was the Southern Pacific. When the SP had crossed Tehachapi Pass in the mid-1870's, the most direct route to El Paso was southeast across the desert to Cajon and San Geronimo passes, bypassing Los Angeles. However, LA businesses lured the SP over Soledad Pass, through LA and then over San Geronimo Pass to El Paso, thus bypassing Cajon Pass. The first railroad across Cajon Pass was the California Southern Railroad, a subsidiary of the Atchison, Topeka and Santa Fe Railway, which built north from San Diego, California, to meet the AT&SF at Barstow, California, in 1885 (on the SP Needles Branch, which became AT&SF track). The San Pedro, Los Angeles & Salt Lake Railroad began using the AT&SF (former CS) tracks over Cajon Pass in 1905. Finally, in 1967, nearly 100 years after the SP turned toward LA instead of toward Cajon Pass, the SP completed its "Palmdale Cutoff" to circumvent Los Angeles.

This northeast view of the Cajon Pass area is from the top of 10,000-foot Mount San Antonio ("Old Baldy"). Strands of the San Andreas fault run through the foreground valley and the parallel ridges farther back. The two prominent grades left of center are the two directions of Interstate 15, which does not traverse Cajon Pass, but rather the nearby Cajon "Summit" at 4,190 feet. The railroad grades and old U.S. Route 66 (now California 138) use the actual pass, in the hazy center of the image, at 3,777 feet.



An eastbound BNSF consist hauls a container train up the valley of Cajon Creek, which is also followed from the LA Basin to Cajon Pass by an Indian trail, the Old Spanish Trail, the Mormon wagon road, and the AT&SF/CS, UP/SPLA&SL, and SP railroads, as well as by Route 66 and Interstate 15. This southward photograph is 10 miles southwest of Cajon Pass. Subsequent photos will explore the three railroad grades from this point up to the pass, which is complicated by the fact that the grades do not correspond to the three railroads that have used the pass. The three grades are, from oldest to newest and from east of west, as follows:

- The 1885 CS/AT&SF grade: This is a single track and compared to the other grades follows the creek farther up the grade then has the steepest approach to the pass. Since 1905, this route has been used by SPLA&SL and successor UP. The 1885 grade is out of the photo to the left, down by Cajon Creek.
- The 1913 AT&SF double tracking: The AT&SF double tracked its route over Cajon Pass in 1913. In the process, the AT&SF built a new grade that followed a longer, shallower grade upslope (northwest) of the 5 steepest miles of the original route southwest of Cajon Pass. This second grade was 2 miles longer than the CS grade and reduced the maximum grade from 3.0 to 2.2 percent. The new route leaves the CS grade a mile south of this location (behind the train). In 2008, the BNSF Railway added a third track that follows the 1913 route, so the 5 miles of 1913-vintage grade is now double track (being used by the train in the photo). The 1913 route ran through two short tunnels, the two Alray Tunnels, which were “daylighted,” i.e. converted from tunnels to a deep cut, in 2008 when the third track was added. The third track enables 150 trains per day on the BNSF lines.
- The 1967 SP Palmdale Cutoff: North of Cajon Pass, the Palmdale Cutoff approaches the pass from the northwest and curves to the southwest, and remains west of the BNSF tracks all the way into the LA Basin. The SP (now UP) Palmdale Cutoff is the farther of the two grades in the photo and is west of and upslope of the AT&SF 1913 grade.



The 1913 AT&SF route passes through the Mormon Rocks, which are Miocene-aged (18-20 million years) gravelly sandstone that has been folded and tilted during movement of the nearby San Andreas fault. The second track was added in 2008.



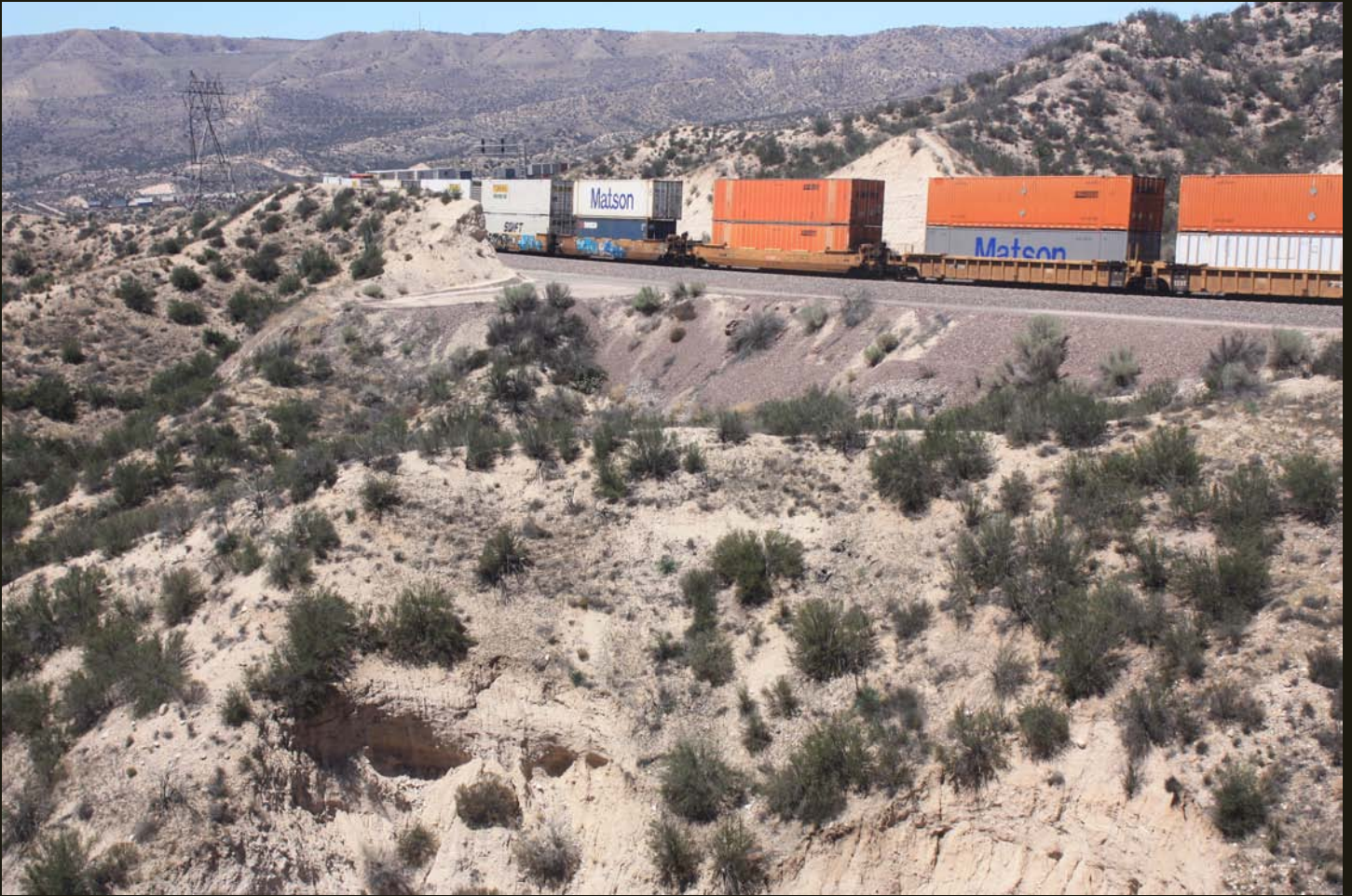
The SP Palmdale Cutoff cuts through the Mormon Rocks. The holes are “tafoni,” formed as the cement holding the rock together is dissolved. The small caves and openings offer nesting spots for raptors and other large birds.



In this eastward view 8 miles southwest of the Cajon Pass at Mormon Rocks, the 1967 SP Palmdale Cutoff is in the foreground and the AT&SF mainline (1913 grade) is plied by a BNSF container train. The 1885 CS grade is out of site a half mile farther east and lower on the slope.



Southward view 3 miles southwest of Cajon Pass. The closest track is the SP (now UP) Palmdale Cutoff. The center grade is the 1913 AT&SF (now BNSF) double track. The farthest track, visible through the underpass, is the original CS (now BNSF) grade. Altogether four modern, concrete-tied tracks!



One mile southwest of the pass, the 1913 grade is again merged with the 1885 CS grade and is triple tracked, representing the 1885 CS track, the 1913 AT&SF track, and the 2008 BNSF track (probably all upgraded in 2008). The CS grade leaves the 1913 grade near the front of the train in this southwestward view. The former Alray Tunnels, since 2008 the Alray Cut, is a mile down the line from here.



West entrance to Cajon Pass area, just east of the previous photo. Only the upper containers of a stacked container train (same as previous photo) peek above a deep cut in the soft alluvium. Cajon pass formed by movement on the San Andreas fault, which literally cut off the head of an alluvial fan that slopes northward into the desert north of the Pacific Crest. The bedrock mountain that a million years ago was south of the fault and shed sediment onto the alluvial fan has since been displaced to the northwest and in its place is a valley, now the valley of Cajon Creek, whose headwaters are at the top of the decapitated fan. The gap was use by Indians, Spaniards, Mormons, railroads, and highways.





Southwestward view one mile northeast of the previous photo. An eastbound BNSF container consist exists the cuts of the previous photo and has arrived at Summit Valley. Note the gentle topography that is abruptly cut off just beyond the rear of the train; that is where the head of the alluvial fan, which slopes toward us, was cut off by the San Andreas fault. The rear of the train is on Cajon Pass and the Pacific Crest. Note the desert vegetation on the dry side of the pass, compared to the chaparral in the first few photos and on the distant hills.



Closer view of the BNSF triple track, at about the same location as the previous photo. The CS first built through here in 1885, the AT&SF added a second track in 1913, and BNSF added a third track in 2008. The SP Palmdale Cutoff is upslope and out of view on the right (north) in this southwestward view in Summit Valley.



Same location as previous, showing detail of fasteners on concrete ties. No spikes here, golden or otherwise.



Another BNSF train in the triple-tracked BNSF route over Cajon Pass. Historic U.S. Highway 66, now California 138, is visible to the right.



Southwestward view of same area as the previous few photos, with the BNSF triple train in Summit Valley and, in the right (northwest) foreground, the 1967 SP Palmdale Cutoff comes in at a higher elevation than Cajon Pass, located at the rear of the train. Note that the 1967 SP cut is in soft alluvium.



Eastward view of a BNSF train at the northeast end of Summit Valley, with 11,000-foot Mount San Gorgonio in the distance. During the Pleistocene (ice ages), Mount San Gorgonio was capped with glaciers. From right to left within this field of view, BNSF triple track telescopes down to double track that continues all the way to New Mexico and beyond.



A BNSF train at the northeast end of Summit Valley, where the line returns from triple track over the pass to the normal double track of the BNSF's Southern Transcon.



Northward view of the 1967 SP Palmdale Cutoff, where it curves left (northwest) toward Palmdale. Note the Joshua Tree at the southwestern limit of its desert range.