Skykomish – A Great Northern Town
and How the Railroad Built it -Twice
by
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Rev. 2
Skykomish and Great Northern Railway 1889 – 1955

Background - Railroad Terms

To understand the history of Skykomish one first has to understand the biggest problem facing a railroad engineer, which is track grade. A one percent grade rises or falls one foot in 100 foot traveled. This appears flat to most people, but for a railroad the 1% grade means a loss of 74% of the traction from a perfectly flat track. This means that if an engine can pull 100 cars on a flat track, at a 1% grade it can only pull 26 cars. With a 2% grade the same engine could only pull 13 cars. The maximum grade is called the “ruling grade” as it determines the maximum load an engine can haul. So herein lies the value of Skykomish for the railroad engineer. The ruling grade from Seattle to Skykomish is 1%, and the ruling grade from Skykomish to Leavenworth is 2.2% (1929-present). So Skykomish served as a location to add helper engines to push the load east over the Cascade Mountain pass. The other major factor in track design is the radius of the curves. The larger the radius the less the wheel friction and higher potential speed. These laws of physics apply whether it is a full size railroad or a scale model track. This is mentioned so when one looks at the scale model track of the Great Northern and Cascade Railway one can see why the curves are sweeping and the grade is less than 2.2 percent.
The First Beginning of Skykomish - 1890's

It all began in 1889 when Railroad tycoon James J. Hill reorganized his railroads and named it the Great Northern Railway. He decided to extend his railroad from St. Paul, Minnesota to Seattle, WA. Hill wanted to create a direct route from the upper mid-west to the growing trade markets in the Orient. Mr. Hill hired E. H. Becker as chief engineer of the Pacific Extension, and Becker hired John Stevens to work as chief locating engineer to determine the route of the railroad. Using his experience and the recently discovered Marias Pass in Montana, Mr. Stevens continued west to Spokane and the Columbia River. Here he began the exploration of the Cascades to determine the best route to the coast. This lead to the discovery of the pass bearing his name, seventeen miles west of what was to become the town of Skykomish.

Mr. Stevens employed John Maloney as a packer to help his engineers with the survey and construction of the railroad. Some say he advised Mr. Maloney to develop a homestead at the flat spot at the foot of the 2.2 percent grade. Stevens felt that it would become an important point in the operation of the railroad, as it was at 1,000 foot elevation and the last flat area before heading up the 4,400 foot Cascade Range.

During the construction of the railroad in 1892 there was not much there but a boxcar sidetracked for a depot. After completion of the railroad in 1893 a post office was established and the town became known as Skykomish. After the first community store burned, Mr. Maloney built the present store in 1902. The town was platted in 1899 and it was incorporated by Maloney and his wife, on June 5, 1909. Frank Wandschneider built a 3 story hotel to accommodate the men. The hotel burned in 1904. Today’s impressive 4 story Skykomish Hotel and Restaurant was built in 1905 by D.J. Manning. It had three saloons and a restaurant with 50 rooms with 2 bath and shower rooms each floor. The restaurant and card rooms were open twenty-four hours a day to accommodate the railroad crews. Card games consisting of poker and panguingue (pan) were the favorites of railroad men to pass the time between calls to work. The first scheduled train went through Skykomish on June 18, 1893. The engineer on this first train was Patrick McEvoy. Mr. McEvoy later settled here and in 1897 opened a saloon that became a gathering place for railroad men he knew during his railroad days. Originally known as the Olympia it still prosperes as the Whistling Post Tavern. Just down the road there was a boarding house and was replaced by the 3 story Hatley Hotel in 1922. The top 2 floors burned in 1937 and after extensive remodeling it was opened as the Cascadia, which is still an active hotel today.
Great Northern Railway 1893-1925

The first route over the pass was a series of switchbacks, with grades of up to 4% on the West side and 3.5% on East side, was completed on January 6, 1893 (see photos below). To traverse a switchback the train has to travel to the end of the dead end spur, then the switch is thrown and engine reverses direction to go into next spur. This is repeated at each spur. The spurs were only 1000 feet long so the maximum train length was 2 engines and 23 cars. With a heavy load and snow that could be reduced to as little as 5 cars. The trip from Cascade Tunnel to Wellington could take from 5 to 15 hours. The trip from Wellington to Cascade Station could take 90 minutes on a good day, to up 36 hours on a trip with snow falling 8 to 12 inches an hour. Soon after completion of the switchbacks John Stevens started survey work on a 2.6 mile tunnel between Wellington and Cascade Tunnel Station to eliminate the switchbacks.

Switchbacks                               Original Track 1893-1900 and new Tunnel

The tunnel boring began on August 20, 1897 and tunnel was completed on December 20, 1900. The surveying was so accurate the alignment was off 1/4 inch in 2.6 miles. The new tunnel was a huge advance from the original route as it could handle heavier freight and passenger loads but the tunnel introduced some new problems.

Wellington Early 1900's                     Cascade Tunnel Station 1910
With the long tunnel and a 1.7 percent grade, steam engines had to run near full power eastbound, and the smoke, flames, heat, and cinders coming out of the stack made working conditions through the tunnel almost impossible. The heat in the cab was often approaching 200 degrees. Due to condensing steam the rails often became wet causing drive wheels to slip. Smoke and cinders from the steam engines became a near-death problems for the engineers and passengers. Engineers used a wet rag around their face to combat the heat and smoke. By 1908 traffic had increased and the loads had increased from 600 to 1600 tons. Two 2-6-6-2's were used for these loads. The tunnel was hardly ever clear of smoke. To solve this smoke problem a dam was constructed in Tumwater Canyon, near Leavenworth, to generate power, and the tunnel was electrified in 1909. Electric engines pulled the steam engines through the tunnel to solve the heat and smoke problems and were switched in and out at Wellington and Cascade Tunnel Station. Only the 4.7 mile tunnel from Cascade Tunnel Station to Wellington was electrified.

The new route on the West side of the 2.6 mile tunnel was in steep country and heavy snows created avalanche dangers, causing constant winter problems. Several rotatory plows and steam engines were
stationed at Wellington to try to keep the track clear. Many miles of snow sheds were constructed to help with avalanche control. Construction and maintenance of them was a major expense.

Scenes similar for Wellington Conditions

On March 1, 1910 it snowed heavily in the hills above Skykomish. Rotatory plows were put on each end of a work train, but could not keep the track open. The snow trapped two Great Northern trains at the Wellington Depot. Snowfall turned to rain and a thunder clap sent a 11 foot wall of snow down onto the trains sweeping them 150 feet down the hillside. Some 96 people died.

Other Events of the Era

With the tunnels in place the need for the original route with the switchbacks was no longer needed. This GN railroad grade was easily converted to a road, which is now the Stevens Pass Highway, although the road today is not same as the first highway.

Logging was in full swing around Skykomish. Below is a picture of a steam donkey tethered on the Skykomish River. Built on huge skids they literally winched themselves to their location in the woods. A steam donkey was the motive power to drag logs out of the woods to either a river, or landing to load
log onto rail cars or trucks. In the second picture the spar pole cables were attached to a donkey and the logs pulled to the loading area. It appears that the cart has flanged wheels to run on logs “rails” to haul out the trees.

Steam Donkey on Skykomish

Donkey set up with Spar Pole

Bloedel Donovan Lumber Mill

Mill Pond Up Close
With the Wellington disaster, and interrupted winter service from avalanches, GN surveyors began to look for an alternate route. In addition, the train load had increased to 2500 tons, and with the more efficient operation of the trains, a lot of equipment and crews were sitting idle for hours waiting for the next train. Stevens was particularly interested in the ideas of Hiram Chittenden, who was the primary engineer for the Ballard Locks. In late 1916 he published a detailed proposal for a 30 mile tunnel from Leavenworth to almost Skykomish. Great Northern engineers began surveys, but they were shelved because of WW1, and resumed in 1921. By 1925 there were four routes on the short list. After a short study by management, a decision was made on November 19, 1925 to extend the electrification west to Skykomish and east of Wenatchee and to build a new tunnel to eliminate avalanche danger in the Wellington area. Due to the deteriorating conditions of the snow sheds the tunnel had to be completed before the winter of 1928-1929 as show sheds were a huge cost. Since surveying work had been completed a contract was awarded one week later. A month later on December 28, 1925 drilling started on the west end. (author's sarcastic note: What are the odds a decision would happen this quickly today?) Three years was an unprecedented short time for drilling a tunnel. Drilling from many points would be needed as to complete the tunnel on time. Tunneling would have to be done twice as fast as current rates. Crews drilled from both ends, sunk a shaft 622 feet deep at Mill Creek, giving 2 more attack points to drill from, and bored a Pioneer tunnel to add more digging points. (Added note: the contract was for 25 million dollars. In today's dollar that would be worth 1.4 billion, not counting costs for permits and environmental mitigation.)

When the new Cascade tunnel was under construction it became a boon for Skykomish. It was the nearest “big town”, a staging center and a supply point for various contractors.

Tunneling of 8 feet per day was considered good. Using the best machines and 1800 men working underground, working three shifts 7 days a week, they achieved rates of up to 33 feet per day. And this through solid granite. World records for tunneling were broken constantly.

To speed up tunneling a pioneer tunnel was started at Scenic, 66 feet south of the main tunnel and 7 feet above its sub-grade, and ran 5.6 miles to Mill Creek Shaft. Every 1500 feet a cross shaft was
bored through to the main tunnel, thus providing additional points to drill from. As the pioneer tunnel was only 8 x 9 feet its progress went a lot faster than the main tunnel. The pioneer tunnel was used to move supplies and equipment in and debris out. Later when water became a serious problem the pioneer tunnel's floor was dropped so it could serve to drain the main tunnel.

Drilling through granite is a difficult task requiring lots of drill rod and dynamite. In fact to keep the drills at peak efficiency at each site there was a large blacksmith crew to reshape and temper them.
Amazingly enough the tunnel was completed on January 12, 1929, with 3 days grace period. The survey work was so accurate that the tunnel was off by 9 inches horizontally and 3 inches vertically in a tunnel that was 7.79 miles long. An amazing feat with what would now be primitive surveying methods. (authors comment – I would doubt modern engineers would have been within 20 feet of alignment judging by what I read in the papers). The electrification of the route was completed from Wenatchee to Skykomish, which eliminated steam trains between these points. This made Skykomish and even more important town because the electric and steam engines were switched in and out, and large crews were needed to staff and maintain the equipment. Wellington and Cascade Tunnel Station were no longer needed and soon faded out.
At one time eight passenger trains a day stopped in Skykomish. During the passenger train era some of the finest passenger trains in America stopped in Skykomish – the Great Northern Flyer, the Oriental Limited, the Cascadian, the Western Star and the Empire Builder. Also there was a train affectionately known as the “Dinky” that went to Seattle in the morning and returned to Skykomish in the evening. The last passenger service ended in May 1971.

By 1947 diesels had been assigned to the hot-shot mail and passenger trains. These trains were light and fast and had no problem going through the tunnel under diesel power. By 1952 the entire Cascade Division was converted to diesel engines. The last scheduled steam run was in March of 1953. One problem remained with diesels and the tunnel. Slow moving eastbound freight moving up the grade had problems with overheated engines from exhaust gases. The train acted as a piston driving the cool air in the tunnel ahead of the engine leaving 1200 degree exhaust gases for the trailing engines.
The solution was a high capacity ventilation system at the East Portal. The East Portal was fitted with a steel door and 6 foot fans. When an east bound train enters the West portal the doors close and one fan forces 220,000 cubic feet of fresh air per minute into the tunnel blowing cold air to the train. With the door shut the train can not act as a piston, and plenty of cool air reaches the entire train. When the train approaches within 3200 feet of the East Portal, the door opens. Once the train has left the tunnel the door closes and the second fan cuts in to purge the tunnel in about 28 minutes.

Once the ventilation system was installed and put in service on July 31, 1956, diesels took over the compete operation through the tunnel. The overhead wires were taken down and the Electrics we taken out of service and sold. This was a huge blow for Skykomish as the large crews needed to operate and maintain the electrics, and switch in an out the engines, were not needed. The decline of Skykomish was beginning.

Stay tuned for Part 2 – The Fall and Rise of Skykomish

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