

# Hair Pin Bend Roads

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**Abstract:** As far as we move on a straight road it will be a long journey that will decrease focus and will to drive. So, if there are any turns or bends keeps the driver focused and keeps up his driving skills to operate his vehicle. In this paper we discuss about the HAIR PINN BENDS around the world. The Xinjiang hairpin bend road which is located on Chiragsaldi Pass has large number of hair pin bends. It is a high mountain pass at an elevation of 4980m (16,338ft) above the sea level. It has over 600 hair pin turn roads. It has the large number of turns, which is recorded as the road having world largest number of hair pin turns on a highway. This paper also presented about different countries having hair pin bend roads. Some of the cautionary signs are mentioned which help while we move on a hair pin will bend. Information on the location of hair pin bends in India. Purpose of hair pin bends are also mentioned

**KEYWORDS:** Hairpin bend, mountains, steep terrains.



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## INTRODUCTION

In the modern world with modern vehicles, it has been easy to travel a long distance at ease. Increase in modern vehicles also increased the need for a place for their moment. So, the roads are laid out for their moment and depending on the type of land, they are built in different shapes and at different angles. One of the easiest ways to climb up or down the hills is by using Hairpin turns or bends that are built on a steep slope.

A Hairpin bend is a turn with an inner acute angle making it necessary for the user to turn almost 180° to continue or climb on the road. These are having a sharp bends on a steep slope or steep incline. This curve is so called because it goes along to the shape of a hair-pin.

Highways with repeating hairpin turns allow easier, safer ascents and descents of mountainous terrain than a direct, steep climb and descent, at the price of greater distances of travel and usually lower speed limits, due to the sharpness of the turn. Highways with repeating hairpin turns allow easier, safer ascents and descents of mountainous terrain than a direct, steep climb and descent, at the price of greater distances of travel and usually lower speed limits, due to the sharpness of the turn.

There are number of hair pin bend roads in the world which are having minimum bends of 10 to maximum bends of 600 that are built till present. Xinxiang high way over a mountain have the maximum of 600 hair pin bends till present over a 75 kms road and 4980m above sea level. These roads are used for bicycle racing, raids up and down the hill or slope with many U-turns which is hard and requires more focus and attention.



Xinjiang hair pin turn road

It is the world's largest hairpin bend road present in the western region of Xinjiang which is a desert area. It has a very close hair pin bends over a steep slope. Such turns in ramps and trails may be called switchbacks in American English, by comparison with switchback railways. In British English "switchback" is more likely

to refer to a heavily moving (in a wavy pattern) road--a use extended from the rollercoaster and the other type of switchback railways.

## ABOUT XINJIANG HIGHWAY

- Chiragsaldi Pass is a high mountain pass at an elevation of 4980m (16,338ft) above the sea level, located in the Kunlun Mountains, in the Xinjiang Autonomous Region of the People's Republic of China.
- The road to the summit is called 219 national highways, also known as Tibet-Xinjiang Highway.
- Construction of this road started in 1951. It was completed in 1957 and fully paved with asphalt in 2013.
- This road is also known as the "Sky Road" in Chinese, you're firmly on altitudes over 5,000m.
- The breath-taking scenery ranks as some of the most inhospitable terrain on the planet.
- The road is terrible, with a notorious lack of oxygen that tests the organisms and a high degree of steepness.
- Expect many stretches with no water or food for tens or hundreds of kilometers, dozens of high passes, no shower or even a wash for weeks and night time temperatures of -25 degrees C or lower.
- This road passes through remote areas, so you need to be prepared.
- Despite its reputation for running through terrain that is by and large uninhabited, the G219 does pass through a number of important historical and religious sites.

## COUTRIES HAVING HAIR PIN BENDS

1. The UK, in particular Scotland has many mountains with hair pin bends. Especially 'Bealach na BA' in Scotland has many such turns.

The mountain pass was built in 1822. It has the steepest ascent of any road climb in the UK, rising from sea level at Applecross to 626 meters (2,054 ft), and is the Scotland. The name is Scottish Gaelic for Pass of the Cattle, as it was historically used as a drovers' road.



UK 'Bealach na BA' hair pin bend

- Zig zag in Dorset, England, part of the B3081, is known for being one of the bandiest roads in the country.

Zig Zag hill is one of the best driving roads in Great Britain. It's part of the B3081 road and is located near Shaftesbury, a town and civil parish in Dorset, England. It's said to be the windiest one mile stretch of road in Great Britain.



Zig zag in Dorset

- Alped'huez in the French alps, famous for its 21-hairpin bends.

Alpe d'Huez is a cycling legend. It's the most famous mountain climb in the Tour de France. Located in south eastern France, in the Isère department in the Rhône-Alpes region, the ski resort sits at an elevation of 1.860m (6,100ft) above the sea level.



Alped'huez in French

- Stelvio pass, Germany:

Stilfserjoch, with its 48 hair pin bends on the northern ramp is one of the most famous mountain passes. The Stelvio Pass is a high mountain pass at an elevation of 2.757m (9,045ft) above the sea level, located in the Ortler Alps in Italy between Stilfs in South Tyrol and Bormio in the province of Sondrio.

The road over the pass, known as StilfserJoch in German, connects the Valtellina with the upper Adige valley and Merano and is particularly challenging to

drive due to the presence of 48 hairpin bends, with the road becoming exceedingly narrow at some points, and some very steep inclines.



Stelvio pass, Germany

- The road from Frangokastello to kallikratis in crete has 27 tight bends.

The drive from Kallikratis to Kapsodasos is a sharply winding and precipitous ascent in a steep and narrow zig-zag road in southwest Crete, Greece. The road includes a challenging section (2.1km) with 7 hairpin turns and pretty steep (8.95%).



Cretes 27 tight bends

- The road between Lysefjord and the mountain has 27 hair pin bends.

The popular tourist road Lysevegen in Forsand in Ryfylke (FV500) is a curvy mountainous road going from Lysebotn innermost in the Lysefjord to Sirdal, with a length of 29 km (18 mi.) This is an impressive road in the high mountains of Rogaland and Vest Agder some of it single carriageway with passing places - with impressive scenery and weather. It is located at an elevation of 932m (3,057ft) above the sea level.



Lysefjord hair pin bends

7. The trollstigen road in rauma, Norway, from Andalsene to valladal has 11 bends.

The Trollstigen Road is one of our most popular National Tourist Routes and is a spectacular drive up or down the serpentine road between Åndalsnes and Valldal. The road is not particularly long, but twists through 11 hairpin bends up to Stigrøra, 858 meters above sea level. At the top of the Trollstigen there is a platform offering spectacular views and there are also two viewpoints along the road. All are designed to blend into the natural surroundings by the Norwegian architect firm Reiulf Ramstad Architects.



Trollstigen road in rauma, Norway



Left bend



Left Z bend



Right Z bend

8. In India, the Ghat road from Namakkal to Kolli Hills has 70 hairpin bends to reach the top of the hills,
9. Ponmudi Hills in Kerala has 22 hairpin bends to reach the hill top,
10. The Gata Loops, a part of the route from Manali to Leh, the Agumbe Ghat road from Udupi to Teerthahalli in Karnataka have 13 hairpin turns.

**CAUTIONARY SIGNS OF THE HAIR PIN BEND ROADS**

Hair pin bends are sharp turns especially on a hilly road. The sign cautions you about the direction in which the turn is. It gives the time to reduce the speed to manage the turn and also eyes of the driver to turn. Without any signs near turns can lead to sudden crashes or any bad events that can lead to accidents.



Right bend

**IN WHAT PLACES HAIR PIN BENDS ARE BUILT IN INDIA**

Most of the access routes into the eastern and Western ghats are ghat roads for the mountainous ranges of Indian subcontinent. These roads are amazing and interesting feats of engineering and most were built during the British raj. Ghat roads were built to connect to the famous hill stations established in the mountain for residents to avoid summer heat. They generally served to connect coastal areas with the upper deccan area of the Indian subcontinent. Most of the holiday spots and



OOTY GHAT ROAD WITH 36 HAIR PIN BENDS IN EASTERN GHATS



KOLLI HILL ROAD WITH 72 HAIR PIN BENDS

## HOW HAIR PIN BENDS COMFORTS TRAVELLERS

Hair pin bends are easier to climb uphill or downhill. Without them, it would be very hard and dangerous for a vehicle to make it to the top as road starts to become steepish on the way up unless you have a powerful four-wheel drive with a good power to weight ratio and a highly trained driver behind the wheel.

The very hard part is for your vehicle – the engine will struggle more and more as you rise the slope, especially in higher gears. An engine power is commanded by its torque, the amount of turning power put into action by the engine. The bigger the torque number at a given RPM the easier would be the climb.

## ADVANTAGE OF HAIR PIN ROAD

- High ways with repeating hairpin turn allow easier, safer than a direct, steep climb at the price of greater distances of travel and usually lower speed limits, due to the sharpness of the turn.
- It makes easier to travel up and down of a hill or mountain.

## CONCLUSION

Xinjiang hair pin bends are the largest turns up to now which makes it a unique road with large number of turns/bends. These bends are present on the national high way which passes through Chiragsaldi Pass in China. We need to be cautious while driving through hair pin bends, if we lose the sight on the road leads to any bad events.

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