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QINGHAI-TIBET RAILWAY

A MAN-MADE ENGINEERING MIRACLE



Extending 1,956 kilometers on the Qinghai-Tibet Plateau, the Qinghai-Tibet Railway connects, Xining, capital of Qinghai Province, and Lhasa, capital of Tibet. It ends Tibet's history without railway, and sets a new record for the world's highest railway.



As 960 kilometers of it sits at 4,000 meters above sea level, the designers and engineers of this railway had to solve various difficulties in its construction. The three major challenges faced were the fragile ecosystem, the lack of oxygen, and permafrost. Many foreign experts had thought that it was impossible for the Chinese to conquer these difficulties. However, a few years later, they were shocked at this man-made world wonder, and reputed it as a miracle in engineering.

Since its operation, the Qinghai-Tibet Railway has become one of the busiest railways in Asia. Millions of travelers flock to the Qinghai-Tibet Plateau to experience this great work on the snowfields. In order to help travelers know more about it, Tibettravel.org has collected abundant information about the highest railway in the world, including how the engineers overcame the challenges of its construction, where travelers can take a train to Lhasa, how to book train tickets to Tibet, what travelers can experience along the railroad, and the impacts of the railway, etc.

1. Why was the Qinghai-Tibet Railway built?

Why was the Qinghai-Tibet Railway built? The answer is quite simple, that is, to improve the transportation on the Qinghai-Tibet Plateau, and to boost development of this region. In China, there is a proverb saying that "If people want to be rich, they must first build roads."

Before 2006, most people could only get into or out of Tibet by road. It usually took a few days. Though they could also travel by air, most people were not able to afford the one-way air ticket of over RMB 1,500. Thus, this region needed other means of transportation badly to solve these problems.

Before the construction of the railway, people coming to Tibet were amazed at the majesty of Tibet's snowfield scenery. Cut off from the outside world, everything on the plateau - its snow-capped mountains, grassland, lamas, prayer banners, the Potala Palace, and the Tibetan people living 4,000 meters or more above sea level, had an aura of mystery.

The scenery in Tibet was so beautiful, but it lagged behind other areas of the world. Located at a remote area in south-west China with a harsh climate and geographic environment, Tibet's inadequate transportation facilities with restricted its economic development, and communication the world. It was obvious that if Tibet was to develop and catch up with the world, there must be a railway. To build a railway in Tibet would definitely benefit its local development in many aspects.



Hence, a plan to build a railway to Tibet was made. In fact, four possible railway routes were designed. These were the Qinghai-Tibet Railway, Sichuan-Tibet Railway, Yunnan-Tibet Railway and Xinjiang-Tibet Railway. After careful study and discussing the feasibility of constructing the railways, the scientists settled on the Qinghai-Tibet Railway. Because, aside from the frozen earth problem, it was by far the best choice of the four, as it avoided avalanches, desert, and marshland. It is nevertheless a project up to now unequalled in engineering cost, project duration, and transportation capacity. On June 29, 2001, construction of the Qinghai-Tibet Railway started at Golmud, Qinghai Province.

2. Why is the Qinghai-Tibet Railway a man-made world wonder?

After reading the following key facts of Qinghai-Tibet Railway, nobody will be unconvinced that this railway is worthy of its name as a man-made world wonder.



✘. The **FIRST** railway to Tibet. The Qinghai-Tibet Railway is the first railroad to Tibet, linking Tibet with mainland China and ending Tibet's history without rail.



✘. The world's **HIGHEST** railway. 960 kilometers of this railway lie at 4,000 meters above sea level, and its highest point is 5,072 meters, at least 200 meters higher than the former world's highest railway, the Peruvian railway in the Andes.



✘. The world's **LONGEST** plateau railroad. The total length of the Qinghai-Tibet Railway is 1,956 kilometers from Xining to Lhasa. The Golmud-Lhasa section zigzags 1,142 kilometers across the Kunlun and Tanggula mountain ranges.



✘. The world's **LONGEST** track on frozen earth. 550 kilometers of the railway is built on frozen earth, the longest in any of the plateau railways on Earth.



✘. The world's **HIGHEST** railway station. Tanggula Railway Station located at 5,068 meters above sea level is noted as the highest train station on Earth.



✘. The world's **HIGHEST** railway tunnel. The Fenghuoshan Tunnel of Qinghai-Tibet Railway built at 4,905 meters above sea level, is the most elevated on frozen earth in the world.



✘. The world's **LONGEST** plateau tunnel. the Kunlun Mountain Tunnel with a total length of 1,686 meters is the world's longest plateau tunnel built on frozen earth.



✘. The world's **LONGEST** plateau railway bridge. With a total length of 11.7 kilometers, the Qingshui River Bridge, at an altitude of 4500 meters in the Hoh Xil unpopulated area, is noted as the longest plateau railway bridge in the world.



✘. The world's **FASTEST** train on frozen earth. Upon its completion, the train's maximum speed is designed to reach 100 kilometers per hour in frozen earth areas, and 120 kilometers per hour on non-frozen earth.



✘. **NO worker died of altitude sickness. Around 100,000 engineers and construction workers were involved in the construction of this railway, and 10% of them were from local ethnic groups. None of the workers died of altitude sickness during the construction.**

3. Why is the Qinghai-Tibet Railway an Engineering Miracle?

International experts simply stated that the Qinghai-Tibet Railway could not be built when China announced the plan of building the track on the Tibetan plateau. With its extremely harsh climate and geographic conditions, it was no doubt, an arduous task.

Both economic and geographic difficulties were encountered in the construction of this most elevated railroad. As is well known, such a feat of engineering must require huge investment, which was a big challenge for China at the time. But, the biggest challenges lay in the harsh geographic conditions on the high plateau. The fragile ecosystem on the Qinghai-Tibet Plateau, and also the lack of oxygen at the high-altitude, and the permafrost were major problems.

1. Solution to lack of oxygen

About 85 percent of the Qinghai-Tibet Railway was built over 4,000 meters, which means that the oxygen level along the railway is only 50-60 percent of that at sea level and that the annual average temperature is below freezing point. It is a big threat for travelers with light luggage, let alone for the construction workers, who had to do heavy labour when carrying out the project.

To ensure the health of the builders, a medical insurance system was put in place. A total of 115 medical facilities were set up along the railway, staffed with more than 600 medical professionals. 17 oxygen-making stations were constructed. There was one clinic every 10 kilometers along the line, allowing sick workers access to rapid and effective medical treatment, as well as regular health checks. Sometimes, the workers had to shoulder oxygen bottles to get to work. They also enjoyed regular breaks from work to rest in low-altitude areas.

With these efforts and facilities, none of the workers died of altitude sickness during the construction.



2. Protection of the fragile ecological environment

The Qinghai-Tibetan Plateau with its primeval, peculiar and fragile ecosystem is home to many rare animals and plants, and the source of many rivers. Protection of the ecological environment was an essential concern in the design of the Qinghai-Tibet Railway. Some RMB1.54 billion was invested in the project, for environmental protection.



✘. All waste water from construction and camp sites was processed to meet the corresponding sewage treatment standard before discharge. Solid waste from construction sites and trash from the campsites was sorted out and recycled whenever possible. Waste that could not be degraded was moved to appropriate places for batch treatment.



✘. The route was selected to keep away from the major habitats of wild animals as much as possible. For example, the original route was abandoned because it passed through the reserves of black-necked cranes. If avoidance was impossible, such as the section cutting through the Hohxil, Qumar and Soga nature reserves, measures were taken to minimize disturbance to endangered animals like the Tibetan antelope and wild ass.



✘. 25 passageways were built for wild animals, based on their migration habit, and fences were installed on both sides of the railway to prevent wild animals and livestock wandering onto the railway.



✘. In order to avoid disturbance to the Tibetan antelope mating season each June and July, the builders stopped work for a period, withdrew equipment from the construction site, and also removed the colored flags, which would alert and frighten the Tibetan antelope.



✘. Construction sites were selected and designed to ensure that vegetation was not destroyed. To prevent damage to permafrost, wetlands and grasslands, 675 bridges with a total length of about 160km were built between Golmud and Lhasa. It is around one seventh of this section.



✘. To minimize the loss of ground vegetation, grass seeds suitable for plateau areas were carefully selected and planted with appropriate means of cultivation. In places difficult for plants to grow, the turf was preserved and replanted in other places, section by section, to be moved back to cover the slopes of the roadbeds and construction sites.



✘. All the units involved in building this railway took measures to minimize the pollution during construction. To achieve this goal, high-efficiency, low-noise and low-pollution equipment were used.



✂. Since the operation of the Qinghai-Tibet Railway in 2006, all the stations use environment-friendly energy sources such as electricity, solar energy and wind energy for heating. Garbage at the stations is collected for batch treatment. Domestic sewage, after being treated to meet the State's discharge standard, is used, whenever possible, to water green spaces.



✂. All the train cars were installed with environment-friendly toilets, wastewater deposit tanks, and garbage treatment facilities to protect the environment along the railroad.

Adverse impact of the railway construction on the ecological environment was kept to a minimum. Investigations by SEPA, and other authorities, show that frozen soil, vegetation, wetlands, and the water quality in rivers along the railway, have been effectively protected and the plateau ecosystem was not markedly affected.



3. Solution to Permafrost (perennially frozen ground)

Around 550km of the railway had to pass through the places with permafrost, which features soft and wet soil in summer and hard and stretching soil in winter. It troubled engineers over the world, but the Chinese successfully figured out ways to solve the problem, and ensure roadbed stability in permafrost regions by gravelling embankments. and vent-pipe roadbed techniques.



✓ Permafrost areas were avoided as possible, by building bridges instead of railroad. Building a bridge over the permafrost, though expensive, has the least impact on the area. The 11.7km Qingshuihe Bridge is the world-longest bridge built on permafrost.



The most important solution to permafrost are stone embankments - a layer of loosely piled chunks of granite about the size of baseballs, that allow enough space between the rocks for air to circulate freely.



In some places, the engineers buried ventilation pipes in the ground. The pipes simply allow the cold air to circulate underneath the rail-bed. In other spots, though, a pipe called a thermosiphon was sunk 5 meters (15 feet) into the ground and filled at the bottom with ammonia. A monitoring system has been established to check the temperature change along the railroad.

4. Where can travelers take a train to Tibet?

Currently, seven cities in mainland China offer direct trains to Lhasa. They are Beijing, Shanghai, Guangzhou, Chengdu, Chongqing, Xining and Lanzhou. But it does not indicate that you can board a train to Tibet only in these cities. Trains to Tibet pass through many important cities in China, like Nanjing, Zhengzhou, Xian, Changsha and Taiyuan. Whichever city you board, all trains pass through the Qinghai-Tibet Railway, from Xining to Lhasa.

Schedule of Trains to Lhasa

Train Code	Dep. Time	Arr. Time	Distance	Duration	Frequency
T27 (Beijing to Lhasa)	20:00	15:40 (the 3 rd day)	3761km	43hr.40min.	Every Day
T164/T165 (Shanghai to Lhasa)	19:36	20:15 (the 3 rd day)	4373km	48hr.39min.	Every Day
T22/T23 (Chengdu to Lhasa)	20:55	16:35 (the 3 rd day)	3360km	43hr.40min.	Every Two Days
T222/T223 (Chongqing to Lhasa)	19:37	16:35 (the 3 rd day)	3641km	44hr.58min.	Every Two Days
T264/T265 (Guangzhou to Lhasa)	12:19	19:20 (the 3 rd day)	4980km	51hr.1min.	Every Two Days
K917 (Lanzhou to Lhasa)	12:05	14:35 (the 2 nd day)	2188km	26hr.30min.	Every Two Days
K9811 (Xining to Lhasa)	22:00	21:40 (the 2 nd day)	1960km	23hr.40min.	Every Day
K9801 (Xining to Lhasa)	15:05	14:35 (the 2 nd day)	1960km	23hr.30min.	Every Two Days

Note: The above schedule is just for your reference, as it may sometimes be adjusted, so please contact 'China Tibet Train' for up-to-date information.



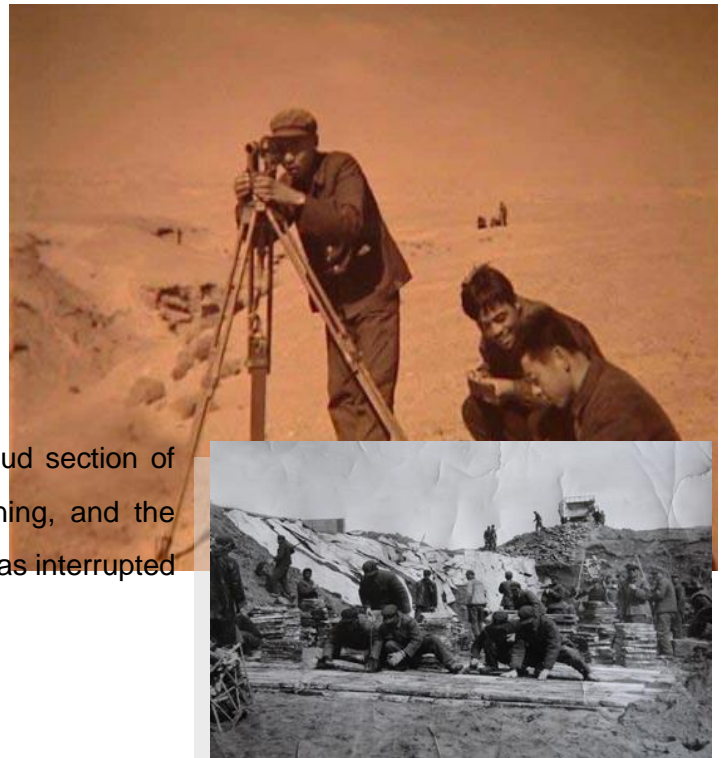
5. History of Qinghai-Tibet Railway

✓ In October 1955, the great Chinese leader Mao Zedong sent a team to the Tibetan plateau to investigate the feasibility of constructing the railway.



✓ In September 1958, construction of the Xining-Golmud section of the Qinghai-Tibet Railway was secretly launched in Xining, and the Guanjiao Tunnel at the same time. However, the project was interrupted many times due to economic difficulties.

✓ In 1956, the Ministry of Railways officially launched the primary planning of the project. In the summer of 1957, a 13-person team was dispatched to start the survey.



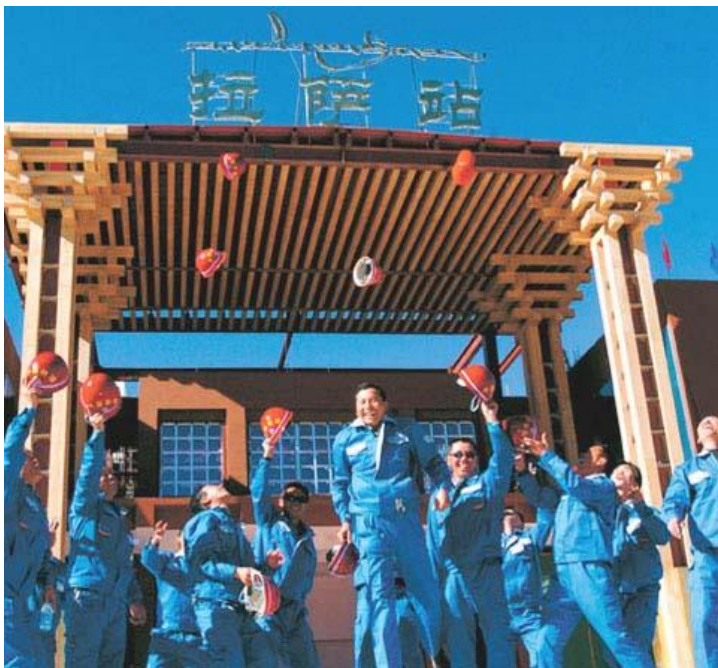
✓ In 1974, the construction of the Xining-Golmud section was resumed. At the same time, the scientific research, survey and design work of the Golmud-Lhasa Section was also restarted again.



✓ On June 29th, 2001, construction of the Qinghai-Tibet Railway officially started at Golmud, Qinghai Province.



✓ On October 12th, 2005, Lhasa-Golmud Railway was completed with rails reaching the Lhasa Railway Station. But, there was still a lot of work to do, like track testing and signaling work.



✓ In September 1979, the first phase of the Qinghai-Tibet Railway from Xining to Golmud was completed. And it was opened for civil use in 1984. Due to the limited technological and economic capabilities of China at that time, the construction of the railway from Golmud to Lhasa was not



continued.

✓ On August 24th, 2005, track was laid at the railway's highest point, the Tanggula Pass, 5,072 m (16,640 feet) above sea level.



✓ On July 1st, 2006, the world famous Qinghai-Tibet Railway was put into operation. At the beginning, only three train routes ran: daily trains running from Beijing to Lhasa and on alternate days between Chengdu-Lhasa and Chongqing-Lhasa, and between Xining-Lhasa and Lanzhou-Lhasa.



✓ As of Oct 1st, 2006, two more trains, from Shanghai and Guangzhou, were officially set for operation on alternate days, and both of the two trains ran every other day.



✓ In July 2010 the Shanghai–Lhasa service became daily, and a daily service between Xining and Lhasa was added, but the service was then suspended for the winter low season.



✓ On September 26th, 2010, the construction of Lhasa-Shigatse Railway, the first extension of the Qinghai-Tibet Railway, was started. It will be finished in 2014.



✓ The number of passengers taking the train has increased from 6.4 million in 2006, to 10 million in 2011 and 10.76 million in 2012.



6. What to see along the Qinghai-Tibet Railway?

If you are not in a hurry, do not miss the great experiences that lay on the route of the Qinghai-Tibet Railway. Firstly however, the railway itself is a great wonder, reputed as “the sky road”. But of course, the breathtaking scenery gives additional attraction to this charming rail-track. Traversing three Mountain ranges: the Kunlun, Tanggula and Nyainqentanglha; and numerous rivers and lakes, the railway will show you the fabulous landscape of the Qinghai-Tibet Plateau.

Qinghai Lake and Bird Island

Do not rush to board the train to Lhasa. Try to spare at least half a day to visit the stunning Qinghai Lake, around 100km from Xining City. The ellipse-shaped lake looks like a huge poplar leaf sitting on the alpine prairie, and possesses the most beautiful scenery during summer and autumn.

Abundant in fish, the Qinghai Lake attracts flocks of birds in turn. This forms the charming Bird Island on the western shore of the lake. Bird Island is a paradise for many varieties of birds, including migrating birds.



Ta'er Monastery



About 25 kilometers away from Xining, the Ta'er Monastery is one of Tibetan Buddhism's six largest Gelugpa monasteries, and deserves a visit. It is said to be the birth place of the founder of Gelugpa, Tsong Khapa.

In the Tibetan language, Ta'er Monastery is called 'gongben', which means '10,000 figures of Buddha'. During its 400 year history, it has gradually become a place of interest and was recognized as a cultural relic site under state-level protection for its distinct ethnic color and native style.

If you are already on the train to Lhasa, do not fall asleep, as a surprise awaits you. Chaerhan Salt Lake, 750 kilometers away from Xining, may be the first majestic sight you encounter. 32 kilometers of the Qinghai Tibet Railway runs over the salt lake, which was originally part of the ocean in primordial times and formed during intense tectonic activity resulting in the formation of the largest plateau in the world, the Qinghai-Tibet Plateau.

You can see clouds running in the water, and then disappearing, for this lake has a reflective surface. This lake is also protected and surrounded by mountains, and the tents of nomads and their herds.

Chaerhan Salt Lake



Kunlun Mountains

The Kunlun Mountains are the first mountain range that the Qinghai-Tibet Railway traverses. It is where the world's longest plateau tunnel, the Kunlun Mountain Tunnel, with a total length of 1,686 meters is built.



As the largest mountain system in China, the mountains extend a distance of 2,500 kilometers at an altitude between 5,500 and 6,000 meters above sea level. Their peaks are perennially snow-covered, and are a pure and beautiful sight.

Kunlun Mountain Pass

Situated around 160 kilometers away from Golmud, you will overcome the first mountain pass, the Kunlun Mountain Pass. From here, the altitude rises abruptly from 2,800 meters to 4,700 meters and the temperature and air pressure drop accordingly.



Imagine that you are transferred from hot summer to severe winter suddenly, with magnificent snow scenery surrounding you. North-west of the pass is Yuxu Peak at 6138m and east of the pass is Yuzhu Peak at 6179m.

Hoh Xil Depopulated Area

This is the harshest area along the railway, the unmanned Hoh Xil, which is the last paradise for wildlife in China, and one of the most primitive and well-preserved natural environments in the world.

It is at an average elevation of above 4,000 meters, so it is extremely cold and the oxygen level is extremely low, which makes it an uninhabitable area for humans. However, it is a haven for over 230 species of wild



animals including Tibetan antelopes, Tibetan wild donkeys, wild yaks, white-lip deer, snow leopards, Tibetan snow pheasants, etc. To protect the wildlife, the railway was built on a 3- 4 meter high bridge, while special passages for the animals were channeled under the bridge according to their migration habits.



Tuotuo River

The Tuotuo River sources from the main peak of Tanggula Range, which is where China's longest river, the Yangtze, begins. The natural scenery around the river is unique and amazing, with bamboo-shaped ice bars, ice-bridges, icy lakes and so on. Moreover, you may see yaks drinking water beside the river, or trying their best to fill their stomachs.

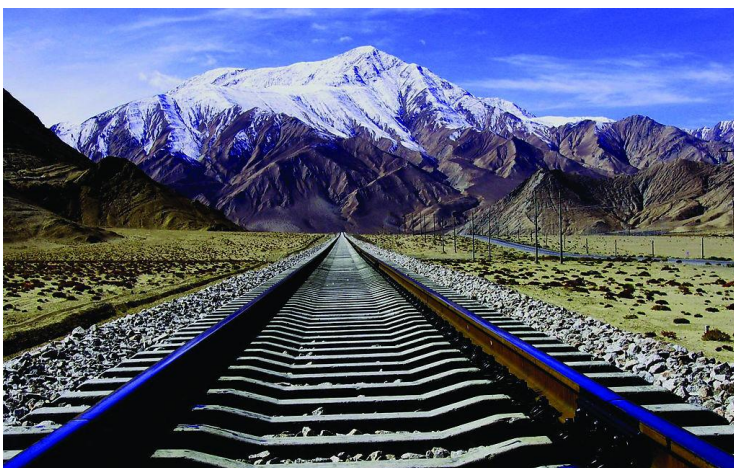
Here, you can also see the first railway bridge of Yangtze River – the Railroad Bridge of the Tuotuo River, which is 1,389.6 meters in length, and has 42-holed bridge piers arranged in a straight array. It resembles a huge winding dragon across the glittering wide river.



Tanggula Mountain Pass

About 203 km away from the Tuotuo River, the train will arrive at the highest point of the Qinghai-Tibet Railway, the Tanggula Mountain Pass at 5072 meters above sea level. The Tanggula Mountain Pass is also the natural boundary between Qinghai and Tibet.

The Tanggula Railway Station must be mentioned here. It is the highest railway station in the world. A through



train may stop at the station to wait for another train coming from the opposite direction to pass, however passengers are required to remain on the train. You can see the charismatic scenery of the Tanggula Mountain, covered with snow, all year round. Also, you can see the vast plains, highland lakes, and the Tanggula River and glacier.

Changtang Grassland

After passing the Tanggula pass, the train will descend to the Changtang Grasslands, which is one of the five biggest pastures in China. Surrounded by the Kunlun, Tanggula, Kangdise and Nyainqentanglha mountains, it is a rich land for plants, and a paradise for wild animals.

Yaks, sheep and nomad's camps can be seen everywhere on the vast grassland in the summertime. The spacious grassland always evokes an ambience of relaxation and refreshment. If you take a train to Tibet in early August, you may glimpse the grand annual horse-racing festival held on this grassland.

Cuona Lake

Lying at 800 meters above sea level, the Cuona Lake is the highest fresh water lake in the world, and the nearest lake to the Qinghai-Tibet Railway, with a distance of less than 100m at the closest point. The rivers and streams on the south side of the Tanggula Mountains will flow into the Nujiang River through this lake.



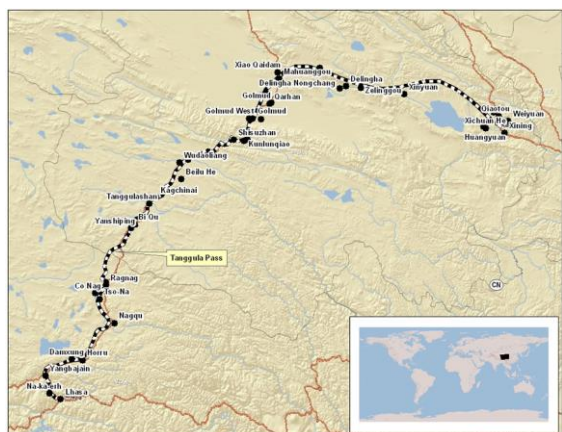
You can clearly see this beautiful lake from the train. Like a glittering blue pearl among the vast grasslands, it reflects the blue sky and the fluffy white clouds. Flocks of cranes, mandarin ducks, swans, and other wild animals can be seen in, and near, the lake. It is also revered as a holy lake in Tibet, attracting many believers.

Yampachen Hot Springs

When the train approaches Lhasa, it will pass by the world famous Yangpachen Hot Springs. These hot springs boast the highest-temperature hot springs, boiling springs, geysers and common hot springs. The water bubbles up at a temperature of 30 degrees °C which at this altitude is above boiling point. It is a spectacular phenomenon - hot springs boiling on the cold plateau.



7. Major Train Stations and Sightseeing Platforms on Qinghai-Tibet Railway



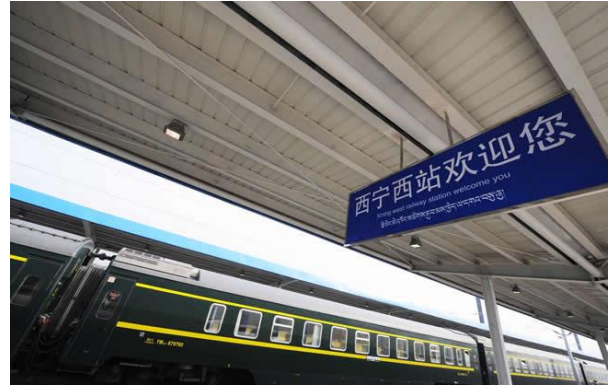
On the Qinghai-Tibet Railway, there are 90 stations from Xining to Lhasa and every station has unique scenery. However, the trains to Lhasa do not stop at every station. To provide travelers better opportunity to enjoy the stunningly beautiful scenery along the way, scenery-viewing platforms have been erected at nine stations: Yuzhu Peak Station, Chumaer River, Tuotuo River, Buqiangge, Tanggula Mountain, Lake Namtso, Nagqu,

Damshung, Yambajan. During the daytime, visitors can enjoy the fantastic views around these areas and take photos on the platforms. The following are the famous railway stations and sightseeing platforms on the Qinghai-Tibet Railway.

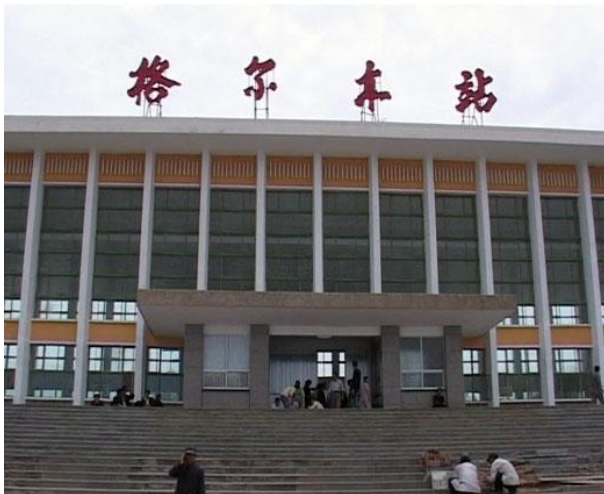
The Major Train Stations on Qinghai-Tibet Railway

✓ Xining West Railway Station, the starting point of Qinghai-Tibet Railway

The Qinghai-Tibet Railway starts from Xining West Railway Station, and ends at Lhasa Railway Station. All the trains to Tibet stop at this station for around ten minutes, so passengers can get off the train to breathe some fresh air, or buy snacks.



✓ Golmud Railway Station where the real high altitudes in train journey start.



Located at 2829m above sea level, the Golmud train station is one of the major stations on the railway to Tibet. From Golmud, the altitude increases rapidly and oxygen supply systems begin to work to guarantee passengers' comfort. Onward 100km from Golmud, the altitude is already more than 4,000m above sea level, with the highest points at Wudaoliang and the Tanggula Mountain Pass.

✓ Tanggula Railway Station, the world's highest train station

Located at 5,068m above sea level, surpassing Ticlio (Peru), at 4,829 meters, Cónдор station, at 4,786 meters, on the Rio Mulatos-Potosí line, in Bolivia, and La Galera station at 4,781 meters in Peru, the Tanggula Railway Station is renowned as the world's highest railway station. The railway station has three tracks, one of them served by a platform, and another one served by a very short sub-platform.





Amdo Railway Station, the biggest cargo-passenger train station in Tibet

Situated at 4,702 meters above sea level, the Amdo Railway Station is one of the world's highest train stations. Covering an area of 140,000 square meters, it is the biggest cargo-passenger train station in Tibet, along with the rest of the Qinghai-Tibet Railway. The design of the main building of the station is based on a Tibetan tent and yurt. The creasing and symmetrically up-rising wings on the top of the building are just like the Eagles that can be seen everywhere on the Changtang grassland. The design also indicates that Amdo (and Tibet) is developing rapidly.



Nagchu Railway Station, the second most important train station in Tibet

Built at 4513 meters above sea level, and close to Qinghai-Tibet Highway, the Nagchu Railway Station on the Qinghai-Tibet Railway is the second most important train station in Tibet. It is an important station for transferring and replenishment along the railway. It is 8km south of Nagchu town, 322km from Lhasa railway station and 820km away from Golmud train station. As a major railway station in Tibet, this station is furnished with unique Tibetan decoration. The appearance of the rain cover at the entrance of this train station symbolizes the snow-capped mountains and yurts on the Qiangtang Grassland in northern Tibet.



Lhasa Railway Station, the terminal of Qinghai-Tibet Railway

Only 5 kilometers south-west of the Potala Palace, Lhasa Railway Station is located on the southern bank of the Lhasa River, at an altitude of 3,641 meters. It is the terminal station of the Qinghai-Tibet Railway, and also the largest railway station on the Qinghai-Tibet Railway, with 7 platforms and 10 station tracks, 8 arrival and departure tracks and 2 freight tracks.



It has a five-storey main building of combination style with Tibetan and modern elements. There are 4 kinds of waiting rooms, ordinary waiting rooms, soft seat waiting rooms, VIP waiting rooms and Tibetan style VIP waiting rooms.

The 9 Stations with Sightseeing Platforms on the Railway to Tibet

At present, there are 9 sightseeing stations on the Qinghai-Tibet Railway. However, ordinary trains to Tibet usually do not stop at these stations. Only the tourist train from Xining to Lhasa would stay for around 15 minutes in each station.



Mt. Yuzhu Station (4,159 m, 955 km from Xining)

Located 4159 meters above sea level, Mt. Yuzhu Station is the first sightseeing station on the Qinghai-Tibet Railway. Yuzhu Peak with an altitude of 6,178 above the sea level is the main peak of the Kunlun Mountains. Standing on the sightseeing platform, travelers can admire the snow-covered Mt. Yuzhu and the glacier in the east of the sight-viewing platform, even in summer. Yuzhu Peak is one of the highest peaks in the Kunlun Mountains, the biggest mountain system in China.



Then looking towards the south-west, travelers will be amazed by the Hoh Xil unpopulated area, where over 100 rivers and rare wild animals such as Tibetan antelope, yak and wild donkey can be seen. Other scenes such as jokuls (mountains covered with ice and snow), gorges, stone forests, and salt flats can be enjoyed.



Chumaer River Station (4,495 m, 1,056 km from Xining)

The Chumaer River station is the second sightseeing station on the railway to Tibet. It is situated at a vital point on the route of the Tibetan antelope migration path. To avoid disturbing their migration, the 2,565 meter long Chumaer River Bridge, with 78 bridge holes, was constructed for wild animals to pass below. Flocks of pregnant antelopes trek from the east part of the Kunlun Mountains via this area and head further west to the hinterland of Kekexili to give birth to their offspring during summer.



Looking north, travelers may get a glimpse the Qingshuihe Bridge and the Wubei Bridge. The 11.7 kilometer long Qingshuihe Bridge is the world's longest railway bridge. Both the two bridges were built with passage arches for animals.

✓ Tuotuo River Station (4,547 m, 1,239 km from Xining)

The Tuotuo River is known as the source of Yangtze River, the longest river in China. Standing on the sightseeing platform, travelers can see this glittering, wide river and the 273 meter long bridge of the famous Qinghai-Tibet Highway. The first railway bridge of the Yangtze River, the Tuotuo River Bridge is easily seen and worth a visit too.



The natural scenery around the Tuotuo River in winter is unique and amazing, with bamboo-shaped ice bars, ice-bridges, icy lakes and so on. Moreover, you may be lucky enough to see yaks drinking water beside the river or trying their best to fill their stomachs in summer.

✓ Buqiangge Station (4,823 m, 1,380 km from Xining)

Standing on the sight-viewing platform at Buqiangge railway station, travelers can enjoy charismatic scenery of vast plateau meadows, grasslands, and grand snow-capped mountains. The natural features are well presented in this area, as designers of the Qinghai-Tibet Railway gave full consideration to environment protection.



✓ Tanggula Station (5,068 m, 1,421 km from Xining)

The Tanggula Station is famous as the highest railway station in the world. Standing on the sightseeing platform, travelers will be amazed by the charismatic scenery of the Tanggula Mountain covered with snow all the year around, the vast plains, the highland lakes, the Tanggula River and glacier.



✓ Cuona Lake Station (4,594 m, 1,553 km from Xining)

Cuona Lake is the nearest lake to Qinghai-Tibet Railway, with a distance of less than 100 m at the closest point, so travelers can get a fantastic view of this majestic alpine lake when standing on the sightseeing platform.

The lake, like a glittering blue pearl among the vast grasslands, reflects the blue sky and the fluffy white clouds. Around the lake is the famous Qiangtang Nature Reserve where the Tibetan yak, donkey, snow leopard and others live. Flocks of cranes, mandarin ducks, swans and other wild animals can be seen in,



and near, the lake. The Cuona Lake is also a holy lake for the Tibetan people, just like the heavenly lake Namtso. Travelers may get a chance to see believers coming to worship at this revered sight.

✓ Nagchu Station (4,513m, 1,650 km from Xining)

Standing on the vast Qiangtang plain, the Nagchu railway station offers splendid sights of clear blue sky, crystal lakes, expansive plains, flocks of wild birds and the magnificent jokuls. If you travel to Tibet in early August, you can get off the train here and to enjoy the annual Nagchu Horse Racing Festival, which is held on the Qiangtang Grassland.



✓ Damxung Station (4,293 m, 1,808 km from Xining)

When you arrive at Damxung, which is known as the 'the north gate of Lhasa', you are almost at your destination. But do not miss the breathtaking grassland scenery stretching all the way from Nagqu to Damxung. It is easy to see grazing sheep and yaks on the grassland. In addition, the Damxung railway station itself is also a site worthy of your visit. It is regarded as the most characteristic Tibetan style architecture along the railroad.



✓ Yangpachen Station (4,293 m, 1,881 km from Xining)

This is the last sightseeing station on the railway to Tibet. Travelers will be surprised to see hot gases rise from the earth through natural outlets when arriving at

Yangpachen, which is just over 90 kilometers away from Lhasa. It is a place rich in geothermal energy and hot springs. The hottest namma hole (a natural well in a rock) in China, and the largest thermoelectric power plant in the country are situated here. As the hot spring contains hydrogen sulphide, the water has a beneficial effect on many chronic diseases; hence many tourists come here to enjoy its therapeutic and medicinal water.



Because it is comparatively cold in the morning, heated gases issue from the earth, creating a peculiar and spectacular scene. With jokuls and the glacier located to each side of Yangpachen, bathing in the hot spring is a special sensation, particularly in winter.

8. Experience a special train on a unique track

In order to ensure that the trains run on the high plateau safely, and that passengers travel on-board comfortably, all the trains to Tibet are well-designed taking into account the conditions faced - high elevation, low temperature, lack of oxygen, harsh climate, etc. In a word, the trains to Tibet are pressurized like aircraft, and are the best in China.

Air-conditioning

As the trains to Tibet run across areas with different altitudes, from less than 500m to over 5,000m, the temperature varies greatly all the way. Thus, a good air-conditioning system is necessary to keep the temperature in the train at a comfortable level, especially when the train arrives at a high altitude with extremely low temperature. With a pleasant temperature throughout the journey, travelers can enjoy the breathtaking scenery along the world's highest railway unhindered.



Oxygen supply

Air-conditioning alone is not sufficient to make a cozy environment on the train to Tibet. The Oxygen supply is the key element to ensure passengers' comfort and safety. There are two oxygen-supply systems on each train. One is used for increasing the oxygen level in the train, by temperature and air pressure controlling systems, when the train enters into the plateau zone. The other is directly used by passengers through an independent port. There are oxygen supply tubes and masks in each cabin for emergencies.



Private oxygen masks are provided to every passenger, whatever ticket they have. In sleeping berth cars, you can find outlets on the wall beside the windows, while in seat cars, you can find outlets under your seat.

Sightseeing Windows

Every Tibet train is installed with sealed sightseeing windows covered by anti-ultraviolet film, so as to protect passengers from the wind, sand and ultraviolet radiation. All the windows are provided with double-layered vacuum glass. The outer layer is covered by anti-ultraviolet film.



Aside from this, there are two layers of curtain in the cars for preventing ultraviolet radiation. The materials of the curtain, floor and berths on the train are all flame-resistant.

Electronic displays



There are two electronic displays in each car on the Tibet train. These are situated on the wall at the two ends of the car. They display the real-time altitude and temperature in the car, and also, on occasion, some useful tips for passengers. It is a considerate design, helping passengers to get a clear idea about the continuous change in elevation, and how the experience brings changes in their bodies.



Three Engines and thunder-prevention system

The trains are driven by 3 computerized engines at one time (made by US-based General Electric, or the home-based Dongfeng Locomotive Factory). The engines show great traction and brake power to guarantee reliability and comfort. An advanced thunder-prevention system was installed on each train to guarantee the safety of the trains running on the plateau.



Different cars

Each train to Tibet consists of two first-class sleeper cars, eight second-class sleeper cars, four seat cars, one dining car and one generator car.



First-class sleeper cars (soft sleeper cars): Each soft sleeper car is divided into 8 small compartments

with a door separating each of them. There are four berths (two upper and two lower) in each compartment. The ticket fare of a lower berth is slightly higher than that of an upper one.



The soft-berth sleeper car is the best on Tibet train. It provides independent LCD televisions, full-length mirrors; independent luggage storage space, a coat rack, and the door can be locked, unlike the open room of the second-class sleepers.

However, as there are only 64 berths in total on each train, it is relatively harder to get a soft-sleeper train ticket, especially in Tibet's peak tourism season from April to October.



Second-class sleeper cars (hard sleeper cars): Each hard sleeper car is further divided into 10 compartments, without a door. Each compartment provides 6 berths (two upper, two middle and two lower). The ticket fare of a lower berth is a little higher than that of a middle one, and the ticket fare of an upper berth is again slightly lower than the middle one.



Actually, the hard sleeper is not hard, it is also soft and comfortable. The major difference between soft sleeper and hard sleeper is the number of berths in each compartment. In addition, each soft sleeper compartment is provided with a door, while the hard sleeper compartment does not.



Hard sleeper is most travelers' choice as it is relatively economically priced, and is also comfortable for the long journey. There are 480 second-class berths on each Tibet train, so it is easier to get a hard sleeper ticket than a soft one.



Seat cars: Each seat car provides 98 soft and spacious seats, thus there are 392 seats available on each train. However, as travelers to Tibet by train have to spend at least one night onboard, it may be advisable to choose a sleeper berth.





Dining Car: The dining car is usually situated next to the soft-sleeper car, offers passengers 3 meals a day. It is decorated in a unique Tibetan folk style, which let travelers feel a strong Tibetan atmosphere before actually arriving in Tibet.



You can see the cooks busily preparing food for passengers in the cooks' house and enjoy delicious food at your table while appreciating the spectacular scenery outside. However, in non-meal service time, you are kindly required at least to buy a beer or a cup of tea to stay here; otherwise, you will be asked to return to your compartment.



For breakfast, passengers will be served pickles, eggs, bread and milk. A nutrient-balanced breakfast costs only RMB10, or so. For those passengers who would like to have noodles for breakfast, there are a wide variety of options: from Snow Vegetable Noodles to Beef Noodles, Steak Noodles, etc.



For lunch and dinner, there are both Chinese and Tibetan dishes. There are 55 cold dishes, 8 Tibetan dishes, 32 ordinary dishes and 8 soup dishes. Each dish is about RMB 25 and the average bill is about RMB 100 for two people.



There are also set meals available. They consist of three dishes, which are priced at around RMB 20 each. At meal times, the attendants always push the meal cart through the train to offer passengers such set meals, as the dining car is usually crowded at lunch and supper time.

Washrooms: Each car of the Tibet train is equipped with two toilets. On one side is an Asian toilet, and on the other side is a Western toilet. The toilets are kept clean, and toilet paper is available if required. Special lavatories offering easy access for wheelchair-bound people, have been installed. Inside the lavatory, there is a red button for the traveler to press in case of emergency, which will immediately alert the nearest attendant to the situation.



The attendants always keep the sink areas reasonably clean. Each sink area is equipped with three sinks, which have the push type water faucet. The sink areas are always busy in the morning because they are shared by at least 32 people.



In addition, every carriage is installed with a compressor for rubbish, a boiled water dispenser and oxygen-enrichment outlets.



Medical Service: Medical service is also available on the Tibet train, with professional doctors and trained nurses on-board. Passengers can get timely, but limited, first aid on the Tibet train. If you suffer breathlessness, you can ask an attendant for assistance. A trained attendant can come to assist with connecting the oxygen tube to the oxygen outlet, and can make sure the passenger obtains oxygen in the right way.

Be aware of your own health before making the trip to Tibet by train. A thorough examination is recommended. Each passenger is required to fill in a health declaration form before boarding to ensure a safe trip.

9. Tips on taking a train to Tibet

- ✘. Please take a thorough medical examination before you travel. Those who have heart problems, or high or low blood pressure are not recommended to take a train to Tibet, as medical service is limited.
- ✘. The life onboard is not as convenient as in a hotel. Therefore, it is best to prepare enough daily necessities, like napkins, towels, a toothbrush, a cup for drinking water, etc.
- ✘. Take light, high-carbohydrate meals for more energy, and avoid alcohol as it may increase the risk of dehydration.
- ✘. You may not like the food provided on the train, so prepare some of your favorite snacks to enjoy during the long journey. In the dining car on Tibet train, there is also a small bar selling all kinds of snacks and drinks, such as beer, wine, yogurt, instant noodles and ham sausages.
- ✘. You are required to show your Tibet permits when boarding the train to Tibet, so double check that you have it before heading to the train station.
- ✘. Prepare spare batteries for your camera. Sockets are only available in the first-class sleeper car and there are only two sockets per car. You can use it for charging mobile phones, etc. However, there will be many



people trying to use it during the trip. If you don't want to wait, you can bring an adaptor to use the bottom one, as there are usually few people using it.

✘. Generally, travelers need to store their luggage in their own compartment as there is no separate storage area. There is storage space underneath each of the bottom bunks, and an overhead storage area above the upper bunks. Soft bags are by far the easiest to store and access. Large, hard-framed bags may not fit under the seating and will need to be lifted into the overhead area.



✘. If you are a smoker, please be aware that no smoking is allowed in any of the cars when the oxygen supply systems are working on the section between Golmud and Lhasa

✘. If you are unsure of how to use the oxygen outlet when you feel breathless, ask for help from the steward. First-aid doctors are also available on Tibet trains.

✘. Be prepared for some strange occurrences that may happen when the train reaches an altitude of over 4,000m, for instance: ink pens leak; vacuum-sealed food packages explode; and some laptops and digital music players fail.



✘. The trains may stop at some high-altitude stations with charming views. Do not be too excited and run out of the train without any hesitation, as you may feel very uncomfortable afterwards due to the lack of oxygen. Please keep warm if getting off the train, since catching a cold may lead to disastrous consequences on the high plateau.

10. How to book Tibet train tickets

With the easy accessibility of internet in China, it is easy to book train tickets online in China. However, because Lhasa is an incredibly popular tourist site, tickets for the Qinghai-Tibet Railway sell fast. The sleeper tickets in particular, are usually sold out soon after the ticket offices begin to sell them. An efficient and secure way for foreign tourists to book and purchase the tickets is by using a reputable online travel agency, which will charge a service fee. However, please be aware that some travel agencies are not reliable enough to guarantee the tickets.

In order to manage the ticket reservation well, the ticket offices



ask for a train ticket reservation plan from travel agencies and groups. There are 3 kinds of plan: the annual plan to reserve the tickets for the coming year; the quarterly plan for the next 3 months, and the monthly plan for urgent reservation. If you book train tickets less than 30 days before the departure day, it is hard to guarantee tickets. It is obvious that with earlier booking, the better chance to guarantee tickets.

As a leading Tibet travel agency, Tibettravel.org has a considerable annual ticket reservation. Thus, we are one of the most qualified agencies to help you book your train tickets to Tibet.

A child of height less than 1.1m can enjoy a free ticket, while a child between 1.1m and 1.4m can enjoy a discounted train ticket. However, each child must be accompanied by at least one adult. If you ask us to purchase the tickets for you, please be aware however that this discounted price cannot be carried out, because of the difficulty of proving the height of passengers to the train ticket office without passenger stand aside. If you have children eligible for free or discounted tickets, please state this to us.



11. The impacts, and the future, of the Qinghai-Tibet Railway

The Qinghai-Tibet Railway has boosted Tibet's tourism and economy as well as its economic and cultural communication with the outside world. It has improved the life of the people on the plateau. However, the Qinghai-Tibet Railway also has its negative impacts on Tibet.



In recent years Tibet's tourism has expanded rapidly, especially after the completion of Qinghai-Tibet Railway in July 2006.

- ✘. In 2006, Tibet received 2.5 million tourists, including 150,000 foreign visitors.
- ✘. In 2007, Tibet received four million tourists from both home and abroad, up 60% from the previous year, generating an income of 4.86 billion RMB, 75 percent higher than in 2006, according to the Tibet Tourism Bureau.
- ✘. In 2008, Tibet received 2.25 million tourists with the total revenue standing at 2.26 billion RMB, down 44.2 percent and 53.4 percent respectively from the previous year, due to the effect of the March 14 riot in 2008.
- ✘. In 2009, Tibet's tourism rebounded. Tibet received 5.56 million tourists from both home and abroad, with revenue of 5.2 billion RMB, up 147 percent from 2008.

✘. In 2010, Tibet, in total, received 6.85 million tourists from home and abroad, 3.8 times more than in 2005. The total revenue was 7.14 billion RMB, 3.7 times as much as that of 2005.

✘. In 2011, Tibet received 8.7 million tourists from home and abroad, up 26.9 percent from the previous year. Its tourism revenue totaled 9.7 billion RMB in 2011, up 35.8 percent from 2010.

✘. In 2012, Tibet received 10.58 million tourists from home and abroad, up 21.7 percent from the previous year. The total revenue was 12.65 billion RMB, up 30.3 percent from 2011.

The above data certainly demonstrates that the Qinghai-Tibet Railway greatly promotes Tibet's tourism, which is a crucial factor in Tibet's economy. Many local Tibetans also benefit from the development of Tibet's tourism. Many farmers gave up farming to set up businesses catering for tourists, work as tour guides or drivers, run family hotels or restaurants, make handicrafts, etc.

With the operation of the railway, the overall transport infrastructure and investment environment in Tibet have been upgraded greatly. Many businesspeople and investors are also attracted to this land, with its great potential. Many modern machines are carried to Tibet via the railroad to build roads in Tibet. Nowadays, well-paved roads can be found in and between



major areas of Tibet. Traditionally horses were the only mode of transportation, but with the improvements made in infrastructure, people have switched to motorbikes or cars, which have made life much easier for the locals.

Tibet will also see more railtracks in near future. The Qinghai-Tibet Railway is being extended to Shigatse, Tibet's second largest city, then further to Kathmandu, the capital of Nepal. Construction of another extension of the Qinghai-Tibet Railway, the Lhasa-Nyingchi Railway will be started soon.

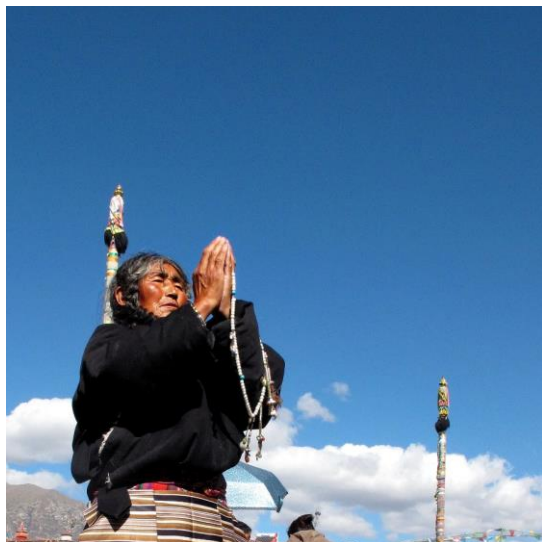
Besides, in the future, there will be more railways built to Tibet from mainland China. For instance, the 1,900 km long Sichuan-Tibet Railway, with investment of about 130 billion RMB will be constructed soon, and it will link the Lhasa-Nyingchi Railway after being completed. Also, construction of Yunnan-Tibet Railway and Xinjiang-Tibet Railway may also be on the



The railway provides a low-cost, 24-hour means of mass transportation; it accelerates the blending of Tibet's

economy and culture with that of mainland China, bringing considerable benefits to Tibet's mineral and material products, ethnic handicrafts and arts.

However, modernization may also be a great threat to the traditions. Critics say modernization is happening at a cost to the region's cultural heritage. The Qinghai-Tibet railway has opened the vast expanses of Tibet to the world and brought new concepts to the once isolated plateau.



Will the prayer wheels, buttered tea, and people lining up to kowtow disappear with the appearance of cups of coffee, pizza, ice-cream, and music bars? We do not know.

END

If you are going to plan a tour to Tibet by train, you may visit us at <http://tibettravel.org/tibet-train> , we offer a wide array of trips and Tibet train travel information.

*We are CITS, **China International Travel Service**, the top online China-based Tibet tour operator.*

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