

AN ANALYSIS OF THE INFRASTRUCTURE IN TIBET

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Figure 12.1(a): Views of an Expressway in China.




Figure 12.1(b): Views of an Expressway in China.

1. Tibet is a vast mountainous region. A poorly developed area for a very long time, it has benefitted from the tremendous infrastructure improvement China has carried out in all its provinces. What strategic imperatives will influence our thoughts when we discuss Tibet and its Areas of Influence? We will discuss the infrastructure available to China in the Tibet Autonomous Region (TAR) and its Adjacent Areas; let us call them the Areas of Interest, i.e., Xingjian, Xining, Gansu, Chengdu and Kunming. Of course, the paper restricts itself to only those in our areas of interest. Collection and Collation of Information on China are not accessible, especially in a remote area such as Tibet, which has remained ignored for a long time. However, of late, there has been an explosion in infrastructure improvement. In Apr 2021, the infrastructural improvements had just begun. Today, it is moving forward at a breath-taking pace. Any discussion on Tibet necessitates a proper understanding of its terrain and the improvements made by China.
2. Before we begin, we can peek into how China manages its vast Country administratively. As elucidated in Wikipedia, the Constitution of China provides for five levels of Administration: The Provincial (Province, autonomous region, municipality, and special administrative region), the prefectural (prefecture-level city (officially “city with district level divisions” and “city without district level divisions”, autonomous prefecture, prefecture [additional division] and league (the alternative name of prefecture used in Inner Mongolia, county (district, county, county-level city. (officially “city without district level divisions”, autonomous county, banner (the alternate name of the county used in Inner Mongolia), autonomous banner (the alternate name for county used in Inner Mongolia), special district (additional division), forestry area [additional division] and township. The fifth level, known as Village, is an administrative level. The Constitution of China designs the fourth level as “basic level autonomy”. (“Administrative divisions of China - Wikipedia”) China has, in 2017, 33 provincial-level regions, 334 prefecture-level divisions, 2862 county-level divisions, 41,034 township-level administration and 704, 382 basic-level autonomies. All Prefectures in China is the sub-province level of minority autonomous area. If the province is one autonomous

territory province level), only other minorities make an autonomous prefecture. Like Xinjiang is Uyghur Autonomous Territory. Within Xinjiang, there are six autonomous prefectures. They are Kizilsu Kyrgyz Autonomous Prefecture, Bortala Mongol Autonomous Prefecture, Changji Hui Autonomous, Bayingolin Mongol Autonomous Prefecture, and Ili Kazakh Autonomous Prefecture. Interestingly, Hongkong and Macau are Special Autonomous Regions which are not part of the Chinese administrative System. Taiwan is a claimed Province. For this paper, the Tibet Autonomous Region(Lhasa) is included in its entirety and all related provinces/areas adjacent to it partially, like the Uyghur (Xingjiang) Autonomous Region, the Qinghai (Xining) Province, the Gansu (Lanzhou) Province, the Sichuan (Chengdu) Province and the Yunnan (Kunming) Province. The table (from Wikipedia) below will make it easy to understand this five-level administrative setup, which will likely be reduced to three levels soon.

Administrative Divisions of the People's Republic of China (PRC)



 From Wikipedia, the free encyclopaedia

Level	Name	Types
1	Provincial -33 (1 claimed)	22 Provinces
		1 Claimed Province (Taiwan)
		5 Autonomous Regions
		4 Municipalities
		2 Special Administrative Regions (Hongkong and Macau)
2	Prefectural Level -333	293 Prefectural Level Cities
		7 Prefectures
		30 Autonomous Prefectures
		3 Leagues
3	County Level -2851	954 Districts
		366 County Level Cities
		1360 Counties
		117 Autonomous Counties
		49 Banners (Inner Mongolia)
		3 Autonomous Banners
		1 Special District (a special county-level division located in Guizhou province) ("Administrative divisions of China - Infogalactic: the planetary ...")
		1 Forestry District (in Hubei Province)
4	Township Level – 39864	8122 Sub Districts
		20942 Towns
		9660 Townships
		2 County Controlled Districts (Dist. Public Offices)
		985 Ethnic Townships
		152. Sums (Inner Mongolia)
		1 Ethnic Sum (Inner Mongolia)
5	Basic Level Authorities -662393	104083 Residential Communities
		558310 Village Committees/ Administrative Villages/Villages

12.1 Tibet: Administrative Prefectures



Figure 12.2: (From: World Atlas)

3. The Tibet Autonomous Region is divided into seven Prefecture level divisions: Six prefecture-level cities and one prefecture. These are further divided into 66 counties and eight districts. The TAR has an area of 12,28,400,000 sq. km and a population of 30,02,000. Lhasa City (population 5.6 Lakhs), Shigatse city seven lakhs, Chamdo city 6.6 lakhs, Nyingchi city 2 lakhs, Shannan/Lhoka city 3.3 lakhs, Nagqu City 4.6 lakhs and Ngari Prefecture 1 lakh are the prefectures in Tibet.
4. To cater for this massive administrative structure and population, China has, rightly, built/is building an extensive infrastructure of roads, railways, airports, hydroelectric dams and power stations and electronic communication systems. Most facilities have dual roles, i.e. for the armed forces and civilians. For example, the planned new nine-runway airport (five runways are ready), the Beijing Daxing International Airport, has one runway exclusively for military use.

5. In 2013, the Ministry of Transport(MOT) announced the “National Highway Network Planning (2013 - 2030)”, which planned to bring the total number of highways to 119, with 81 connecting highways between them. The total mileage will be increased to 265,000 km (165,000 mi), with an increased focus on the western and less developed regions. In 2022, the National Development and Reform Commission (NDRC) and MOT published a new National Highway Network Plan and added and reformed several expressways and national highways. All mentions of Expressways and Highways are as translated from these documents by Wikipedia.
6. All National Highways and Expressways denoted by the letter G (for Guo Dao) are managed by the Department of Transportation at the National Level. This is so even when many of these are planned and executed at the Provincial level. The Urban Rapid Roads belong to the local municipal administration. At the city level, the Municipal Transportation Bureau finances and administers the Highways belonging to DOT. The Municipal Urban and Rural Construction Bureau finances and administers the municipal urban and rural roads. Such roads have no coding. Provincial highways are denoted by the letter S for Shengdao. County Highways start with ‘X’, town level coded with Y and village level roads are coded with ‘C’, and dedicated roads are coded with ‘Z’. China has, in the updated NTHS (71118Network), as of Dec 2021, 170,000 km of expressways, 40,000 km of expressways under construction, 290,000 km of expressways in their Execution Plan and over 300,000 km of prefecture-level roads. Provincial Roads, according to “Lawdefender” of “Skyscraper City Blog” in China, business expressway projects are generally invested and constructed by domestic and foreign economic organisations or transferred to the Government to repay the expressway toll rights under the provisions of the Highway Law. From enterprise establishment, financing, project construction, operation and management all operate according to marketisation. Take Guangdong Province as an example. Guangdong Expressway, Shenzhen Expressway, and Dongguan Holdings, three expressway listed companies, from 2006 to 2014, the average net profit margin was 33.26%, 43.44%, and 50.92%, respectively. Elsewhere the same blogs mentioned that The G6 Expressway from Beijing to Lhasa needed help to raise funds for the completion of the construction. However, after the completion of the Highways and Expressways in Tibet, the mining traffic and tourism will help garner funds from the Road infrastructure in Tibet. Also, in many cases, the roads have been built for strategic purposes, and the Government is less interested in profits. Only expressways and highways related to Tibet and nearby are included unless these extend to other provinces from or into Tibet. In other cases, provinces find it challenging to repay the loans taken for construction. Despite this, it is very encouraging to see that China is managing to continue the construction of its road infrastructure with innovative and progressive methods.

12.2 Tibet

7. For ease of understanding, the entire area has been divided into the following sub-sectors to discuss the whole gamut of communication (Air, Rail and Road infrastructure available or planned for use in the Tibet Autonomous Region (TAR). (See the maps and tables on the Airports, Railway Lines and Roads at the end of this article):-
 - (a) The Eastern Sub Sector. The areas of Chengdu and Yunnan - the Eastern Gateway into Tibet.
 - (b) The Southern Sub Sector (Along G 318 Chengdu Lhasa Highway).
 - (c) The North Central Sub Sector (Along the G317 Highway from Chengdu to Lhasa).
 - (d) The South Western Sub Sector (G318 Highway Lhasa to Shigatse, Zhangmu and Kodari to Kathmandu).
 - (e) The Western Sub Sector (G 219 Highway from Shigatse to Yecheng(Kargilik))
 - (f) The North Western Sub Sector (Kashgar to Aksu along G3011 Highway, 475 km) and onwards by (G314 to Urumqui, 993 km).
 - (g) The Northern Sub Sector (Urumqui to Xining, (G 312 and G30, 1744 km).
 - (h) The Northern Approach to Lhasa Sub Sector. (From Xining, via Golmud to Lhasa along the G6 Highway and along the G 109 Highway to Lhasa).

12.2.1 The Eastern Sub Sector

8. Chengdu is Sichuan Province's capital and the centre of the Giant Panda. It is a prominent Financial City in China. Importantly, Chengdu is the take-off point for all Roads and Railway Lines into Tibet. In military operations against India, Chengdu will launch all military troops and logistics into Tibet. The areas of Chengdu and Yunnan are the Eastern Gateways into Tibet. Kunming is the entrance into Myanmar, Laos and Vietnam.
 - (a) **Chengdu.** Chengdu, the capital of Sichuan in SW China, located at an altitude of 500m (1600 ft), is the third most populated city in China. It is financially and industrially vital too. It is also a prominent city catering to tourists. The area is mountainous, with hills climbing up to 4500 m. The Great Panda Breeding Research Base and the Jinsha Site Museum are located here, besides the Wenshu Monastery. Chengdu controls the Tibet Autonomous Region. The Headquarters of the Western Theatre Command Region is also located here, along with the 13th Group Army. Chengdu has two International Airports and is a major Centre for roads and rail.
 - (b) **Kunming.** Kunming is the Capital of the Yunnan Province, located at an altitude of 1900m (6300 ft). Kunming is the Headquarters of the 14th Group Army of the PLA. During the Second World War, Kunming was the Headquarters of the Allied Struggle against Japan. 500 km to the West lies Mong Mao, the home of the first Ahom King, Sukhapha. He began his journey to Assam from Mong Mao. The Laos Kingdom also originated here. Myitkyina, Bhamo and Lashio, prominent cities in Myanmar with airports, are located only 560 km to the West and Southwest of Kunming.
 - (c) **Air.** The Chengdu and Yunnan regions are close to Myanmar and can access NE India easily by air. Most of these airports are built close to one another to cater for tourist traffic, but many cannot be used for military purposes, even though many are high-altitude airports with long runways. The important airports closest to India are enumerated below.

- (i) **Chengdu Tianfu International Airport.** Opened in Jun 2021, this airport is located at an elevation of 440m in Jianyang, 51 km to the SE of Chengdu Town. The airport has three operational concrete runways (six planned), 4000m, 3200m and 3800m long. It is only 960 km from Dibrugarh Airport. Except for Wikipedia, this airport does not appear on Social Media Platforms or Air Traffic websites.



Figure 12.3: (Attribution: FATIII Aviation)

- (ii) **Chengdu Shangliu International Airport.** This Airport is a large twin concrete runway (3600 m long) International Airport located 16 km West of Chengdu Town. It is at an elevation of 495m. It is about 930 km from Dibrugarh.
- (iii) **The Daocheng Yading Airport.** It is 400 km to the West Southwest of Chengdu. A high-altitude airport, it is at a height of 4411m with a concrete runway of 4200m. It is 424 km ENE from Tezu. The short distance to NE India enables the use of Fighter aircraft against Indian defensive positions and airports in a limited manner due to the elevation. The airport does not appear on maps or Social Media platforms.
- (iv) **Kunming International Airport.** Located 617 km South of Chengdu, this is a two-concrete runway airport, 4000m and 4500m long, built at an elevation of 2100m. Dibrugarh airport is 831 km to the West.

- (v) **Baoshan Yunrui Airport.** This airport is suited for offensive operations against NE India. Located 379 km SW of Kunming, it is built at an altitude of 1662 m. It has a 2400 m long runway. Tezu Airport is 447 km to the West.
 - (vi) **Dali Fengyi Airport.** The Dali City Airport, built at an elevation of 2149 m, is only 269 km from Kunming and 492 km from Dibrugarh. It has one concrete runway 2500 km long.
 - (vii) **Dehong Mangshi Airport (Near Ruili).** Earlier called the Mangshi Airport, this airport is the closest to Ruili on the Myanmar Border. It was built in 1940 as part of the series of airports to support the war against the Japanese. The airport was reconstructed in 1988 and reopened in 1990 with a 2200 m concrete runway. Dibrugarh is only 492 km away, while Jorhat and Dimapur are just 500 km away. Suitable for military operations against NE India.
 - (viii) **Tengchong Tuofeng Airport.** This airport was first opened on February 16 2009. After improvement, the airport reopened on September 09 2018. Tengchong is famous for its tea, Volcanic activity and Hot Springs. At an elevation of 1905 m, it has a 2350 m long runway. Kunming to the East and Dibrugarh to the West are equidistant at 440 km.
 - (ix) Airports in Myanmar. **Nogmung** at an elevation of 1325 ft, **Putao** at an elevation of 1407 ft, **Khamti** at an elevation of 676 ft, Myitkyina at an elevation of 482 ft, Lashio at an elevation of 2772 ft and **Bhamo** at an elevation of 377 ft are the closest airports in Myanmar to China. These low-altitude airports can be used for staging operations towards NE India and vice versa. However, these are all of short length, 1600m to 2000m, and so may not be suitable for sustained offensive operations.
- (b) **Rail.**
- (i) **Chengdu.** Chengdu is connected to Boaji, Beijing, Chongqing, Shanghai, Xian, Wuhan, Lanzhou and Dujiangyan. The High-Speed Railway Line from Chongqing to Urumqi passes through Chengdu and is operational, along with the upgraded conventional line to Urumqi and Xining. The Sichuan Tibet Railway Line to Lhasa is under construction, completed up to Ya'an in the West (94 km). The line from Lhasa to Nyingchi (Lizhi) (435 km) in the West was completed and opened for traffic on June 25 2021. The 1011 km long Ya'an - Nyingchi line is planned to be completed by 2030 but may be completed earlier.
 - (ii) **Kunming.** Kunming is the hub of Rail traffic in the Yunan Province, with railway lines converging on Kunming from Chengdu, Shanghai, Guangxi, Haiphong (Vietnam Railway reopened in 1996), Yuxi (second railway line to Vietnam under construction) and Dali. Any move into Tibet will have to be through Kunming or Chengdu. The 336 km single-track electrified railway line from Dali to Ruili on the Myanmar border has become the trunk line of the Sino-Myanmar Railway. Built with the support of Singapore, the new 2000 km railway line from Chongqing to Mandalay began operations on May 22 2022, giving China a short route to the Indian Ocean.
- (c) **Roads.**
- (i) **Chengdu.** China has built an extensive network of Roads from Chengdu. Ten expressways connect the city with its suburbs. Well-laid National Highways connect Chengdu with Kunming (G5 and the G108, Beijing to Kunming), Shanghai (G42), Xiamen (G76) and

Chongqing (G93). The G317 (Northern Tibet Highway) emanates from here to Lhasa. The G 318 (Southern Tibet Highway) from Shanghai to Lhasa also passes through Chengdu. The Ya'an Kanglik (Yecheng) Yakang G 4218 Expressway has been completed till Kangding (SE of Chamdo Airport). The construction of the G 4217 Expressway, which runs alongside the G 317 National Highway from Chengdu to Chamdo, planned to be extended to Nagqu, is also in progress.

- (ii) **Kunming.** Expressway G108 connects Kunming to Chengdu and Beijing. G 213, 2827 km long, from Ceke in Inner Mongolia to Mohan on the Laos Border, passes through Kunming, as does the G 320 from Shanghai to Ruili on the Myanmar Border (3695 km). On the G 320 from Kunming to Dali and onwards by G 214 to Mangkang (Markham County), we join the G318 to Lhasa. From Chengdu to Ya'an, the Highway runs 147 km and then 928 km by G 318 to Markham County, which is the Junction for the Road to Lhasa. The G219 National Highway, which runs from Kargilik through the Aksai Chin, has been extended from Shigatse through the Donshongla Tunnel, through Medok opposite Tuting, and runs through Zayu all through Yunan along the International Border with Myanmar, Thailand, Laos and Vietnam.

12.2.2 The Southern Sub Sector. Tibet Route to Lhasa (Along the G 318 highway)

9. This Sector adjacent to the Indian Border from Bhutan and Arunachal Pradesh is of the most interest to us. Any operation into India will be launched through this Sector. The G 318 Highway from Shanghai to Yining/Kargilik passes through Chengdu. It is believed to be one of the most picturesque routes in China. It crosses the Yangtze Kiang River near Ya'an as it flows Southwards before it doubles back, flows SW of Chengdu and turns East towards Shanghai. The terrain along the G318 is mountainous, with the road running through beautiful valleys. It meets the Yarlung Tsangpo (Brahmaputra R) just East of Nyingchi and North of Nanxin, where the massive River runs North and makes a wide bend to the South and South West, around the 7762 m (25531 ft) high Namcha Barwa Peak to Gelling and Tuting in India. It is interesting to observe that the dry desert-like terrain of Western Tibet changes to greenery with trees East of Lhasa Gonggar. Under construction is a massive Hydro Power Project on this River, below the Namcha Barwa Peak. There is a prophecy, possibly of the Great Buddhist sage Padmasambhava (Guru Rimpoche), that the massive mountain will collapse into the Yarlung Tsangpo, blocking the River. The blocked waters will flow over the Dongshong La Pass, under which the new (renamed G219) Nyingchi - Medok Highway passes. Will this Mega Hydro Power Project, three times the size of the Three Gorges Dam on the Yangtze Kiang, be the reason for the manifestation of this prophecy?

(a) **Air.**

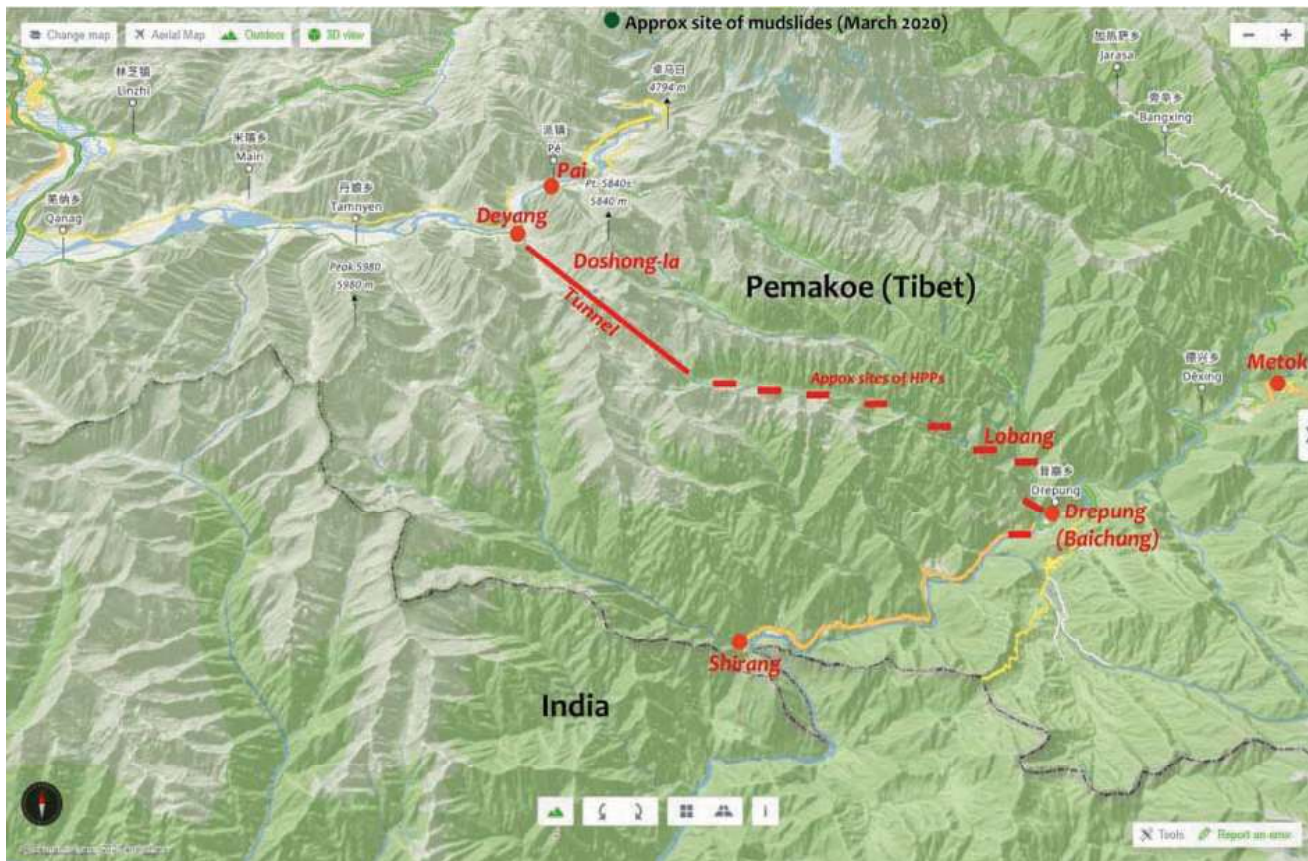
- (i) **Nyingchi Mainling Airport.** The Nyingchi (Lizhe) Mainling Airport, a greenfield "Hot and High" Airport, opened on the Southern Highway in 2006. Located at an elevation of 2949m, it has a 3000m long concrete runway. A parallel taxi track has been constructed, enabling it to be used as a runway. The closest airfields are Along, 133 km away, and Dibrugarh, 213 km away. In China, the Chamdo Airport, at an elevation of 4400 m, is 331 km away to the East. Missile Launchers also appear on the Northern side of the airport. Presently this airport is the

closest to our defences in Arunachal Pradesh. Nyingchi town also has an upgraded heliport with pads for eight Mi 17 helicopters.

- (ii) **Lhasa Gonggar Airport.** The airport, located 62 km South of Lhasa, is connected by an excellent expressway. 340 km to the East is the Nyingchi Mainling Airport. It is at an elevation of 3570 m. It has two 4000 m Runways. Prominent SAM Sites and UAV Hangars with UAVs are seen at Gonggar.
 - (iii) **The Kangding Airport.** The Kangding Garze Airport, located 40 km Northwest of Kangding (Garze County), is at an elevation of 4280 m (14041 ft), making it the third-highest Airport in China. It has a 4000 m long Runway, which opened in Apr 2009. The Ya'an Yecheng Expressway (G4218) is open till just short of Kangding. Few details about this airport appear on Social networks even though it appears clearly on Google Maps. It merits mention that the three High Altitude airports, the Kangding Airport, the Doacheng Yading Airport, discussed in the Eastern Sector above, and the Garze Gesar Airport, discussed in the Northern Central Sector below, are all in the Garze Prefecture, 300 km from each other. The Chamdo Bangda Airport is only 400 km west of the Garze Gesar Airport.
 - (iii) **Shannan Lhunze Airport.** China has, since April 2021, begun construction of the Shannan Lhunze (Longsi) Airport at Lhunze. This airport is in an area rich in cadmium, silver, and gold and will assist the mining in the area by the Chinese Government. The airport is a dual-use military and civilian airport. At an elevation of 3980 m, it has one 4500m long Class C Runway. It is only 50 km ahead of our forward defences in Sela. No further details are available. Interestingly the newly planned G695 National Highway from Mazha in Xingjiang, through the Aksai Chin, terminates at Lhunze. The construction of this airport needs close monitoring.
- (b) **Rail.** The 94 km Chengdu – Ya'an stretch of the 1629 km Sichuan – Tibet railway line opened for traffic on December 28 2018. The track for the 435 km Lhasa Nyingchi Line opened in Jun 2021. Construction work on the 1011 km Ya'an – Nyingchi line has commenced and is planned to be completed by March 2030, probably earlier. This line passes close to Chamdo Airport, located about 65 km south of Chamdo City on the G317 Highway. Thus Chamdo is a significant hub for Military Operations.
- (c) **Roads.**
- (i) **The G318 Southern Tibet Highway.** The Highway emanates from Shanghai and crosses Chengdu. It runs Westwards to Ya'an and onwards to Markham County, where it meets the G214 from Kunming and Dali at 928 km. While the G 214 moves Northwards to Xining, the G 318 runs onwards to the West, another 578 km to Bomi. It then drops down 216 km to Nyingchi. From Nyingchi, the G 318 climbs upwards to Lhasa (called the Lalin -Lhasa to, Linze-another name for the Nyingchi Highway). The G 318 Highway then proceeds to Shigatse and terminates at Zhangmu, a border town with Nepal. The G 318 is presently the longest Highway in China, but upon completion, when G219 National Highway will overtake it. This Highway will be an essential highway for the transportation of stores towards the IB.

- (ii) **The G4218, Expressway.** A new expressway called the Yakang (Ya'an to Kanglik) (or YaYe) Expressway, from Ya'an to Yecheng (also called Kangilik), runs from Ya'an to Luding. It runs parallel to the G318 Highway with a 13 km-long Erlangshan Tunnel. It is open till just short of Kangding town. 93% of this expressway will run through tunnels or bridges! Construction on the Lhasa Shigatse Stretch is complete..
- (iii) **G219 National Highway.** The G219 National Highway emanates from Yecheng near Kashgar in Xingjiang and runs through the Aksai Chin. It follows a route East of the Border with India and runs through Shigatse. From here, the Highway runs to Nyingchi. Then it runs through the 4.79 km long Donshongla Tunnel and the Louhozui Tunnel, 2.12 km long, to Medok (this portion opened in June 2021). It then climbs up towards Dagmo and turns Eastwards to Rima. It bends sharply Northwards and then runs East crossing a No of tunnels now under construction to Zayu. It then turns around the Myanmar Border to Baoshan and, after that, follows a route hugging the borders of Myanmar, Laos and Vietnam to reach Dongxing near the sea and the border with Vietnam (near Mong Cai). (Ref Mapcarta.com). It will be 10000 km long, the longest Highway in China. This Highway has full access to all forward defences of India, right from the Aksai Chin to Arunachal Pradesh.
- (iv) **Unnamed National Highway.** A new greenfield, called the ZhaMo Highway, opened in 2013 after constructing the 3.3 km Galong La Tunnel. It connects Bome Zhamu with Medog County, opposite Gelling along the Siang/ Yarlung Tsangpo River. It connects Medog to Bome County, 116 km away along the G 318 Highway. This Highway opened up the last county, which was unconnected by road. Today it runs for a portion with the G 219 Highway. Medog is only 40 km from Gelling, the Indian border town in Arunachal Pradesh.
- (v) **G 559 National Highway.** A new National Highway G559 will connect Zayu with Medog. The route is not known. It is likely to run South of G 318 to Zayu, following the present route of G219 National Highway (?).
- (vi) **G560 National Highway,** The G560 National Highway runs from Lhasa Gonggar to Shannan and Nyingchi, following the route of the erstwhile S201, S202 and S 306 Provincial Highways. It runs Southwards to Cona County for 217 km, about 23 km from the Border with India. It is asphalted and is a relatively straight road. The plan appears to connect with the greenfield airport under construction at Lhunze and the Indian Border at Sela.
- (vi) **G695 National Highway.** Another National Highway through Aksai Chin recently approved in 2022 is the 3500 km long G 695 National Highway from Mazha, 150 km West of Khorgas on the Khazakastan Border, along West/South of G219 in the Aksai Chin to Shannon Lhunze opposite the Sela Pass. This is discussed in detail in the Western Sub Sector later.
- (vii) **S 201 Provincial Highway.** 226 km long, it runs from Rawu on the G318 National Highway to Xiazayu opposite Kibithoo in India through Dela, Goyu and Zayu. A dangerous highway, it runs alongside the Sangyu River (Lohit R in India), with the highest point being Demo La at 4817 m.
- (viii) **S504 Provincial Highway.** The S 504 Provincial Highway runs from Bahezhen on the G318 National Highway, West of Nyingchi, to Basongtso Scenic Spot in the Mountains.

- (ix) Three new roads have been constructed Southwards from G318, towards the border with India, but these end inside the forest. These emanate from the G 318 Highway at Ciduo, Tongmucun and West of Debacun. However, none of these seems to extend towards the G 219 Highway. These roads need to be closely monitored.
- (d) **Miscellaneous Sites of Interest.** Google Satellite Maps shows two major military constructions just North of the junction of G318 and G214 at Bangdazhen. One is alongside Road G 214 and looks like a Logistics setup. The second, a little further North, is an ample concreted space which could be an adjunct of this Logistics space or, considering how large it is, could be a Missile Deployment Site.
- (e) **Power Project.** A 300 million Megawatt Hydro Power Project (HPP), three times the size of the Three Gorges Dam, is under construction on the Yarlung Tsangpo River around the ‘Great Bend of the River in Medog County North of Tuting. The plan appears to be to draw water by damming the River with a series of dams. They could then take the water through a tunnel SW of Pei across the Namcha Barwa Range into a series of turbines on a tributary, with the water flowing back into the Yarlung Tsangpo just before it enters India (See map below). This HPP in a highly seismically sensitive and landslide-prone area can have severe repercussions for India along the Brahmaputra River. The last mega landslide, West of the Great Bend of approximately 100 million tonnes, was on March 22 2021! The incursion with roadmaking equipment by the PLA at the end of Dec2017/ early 2018 near Bishing Village, near Geling, may have had connections with this massive project. The inadvertent crossing over of an Arunachali Youth at Bishing, who was arrested by the Chinese and later released, also could be because the youth’s curiosity got the better of him. There is a prophecy, possibly of the Great Buddhist sage Padmasambhava (Guru Rimpoche), that the massive mountain will collapse into the Yarlung Tsangpo, blocking the River, and the blocked waters will flow over the Doshong La Pass, under which the new Nyingchi - Medok Highway passes. Will this Mega Hydro Power Project, three times the size of the Three Gorges Dam on the Yangtze Kiang, be the reason for the manifestation of this prophecy? A map from Claude Arpi’s Blog on this HPP is appended below:-



12.2.3 The North Central Sub Sector

10. This area is around the G 317 Northern Tibet Highway from Chengdu to Nagqu (Nakcho). This area has seen tremendous improvement in infrastructure recently.

(a) **Air.**

- (i) **Chamdo Bamda Airport.** Chamdo has a High Altitude military cum domestic Airport constructed at an elevation of 4334 m. The Airport is approximately 65 km South of Chamdo City on the G 317 Highway. Adjacent to the G214 Highway running North to South, it is 300 km from Nyingchi and 391 km from Dibrugarh. Lhasa is 619 km to the West. The G 318 National Highway is a further 70 km to the South.
- (ii) **Garze Gesar Airport.** This greenfield airport, 4068 m above mean sea level, has one concrete runway 4000 m long. It is 446 km NW of Chengdu and 870 km North of Dibrugarh.
- (iii) **Yushu Batang Airport.** A reconstructed airport, Yushu Batang, is built at an elevation of 3890 m and has one 3800 m long runway. Chamdo Airport is 254 km to the SW, and Dibrugarh Airport is 626 km to the South. It became prominent as soon as it was opened in 2010 when it quickly helped deliver rescue personnel and relief supplies to the area after the 2010 Yushu Earthquake. An old runway, disused, is visible to the East of the present Runway. This Airport is only 300 km North of Chamdo Airport.

- (iv) **Nagqu Dagrang Airport.** Nagqu Dagrang Airport, at an elevation of 4436 m, will be China's highest Airport. It was to be completed by 2020, but construction delays have occurred. The Airport was part of a Chinese government development scheme to build 97 airports across China by 2020. The Government had intended that four-fifths of China's population would be within a 90-minute drive of an airport.
- (b) **Rail.** The Golmud (Gormo) Lhasa Railway Line meets the Highway at Amdo and moves on to Lhasa.
- (c) **Roads.**
 - (i) **G4217 Expressway.** A new 1200 km long six-lane Expressway G4217 (the Rongchang Expressway), is under construction from Chengdu to Chamdo. It will be extended to Nagqu later. Construction of 217 km from Chengdu to Ma'erkang has been completed. 86% of this road runs through tunnels.
 - (ii) **G317 National Highway.** A four-lane Highway, the G 317 emanates from Chengdu and passes through many places of Buddhist importance. It also rises into the Mountains to the North West, runs 1219 km to Chamdo and then continues 793 km to Nagqu. The G 214 National Highway crosses G 317 at Chamdo. From Nagqu, the G6 or the G109 Beijing Lhasa National Highways runs over 317 km to Lhasa.
 - (iii) **G345 National Highway.** A 3000 km long Highway from Jiangsu (Quidong) to Nagqu through Fuyang (S102), Henan, Shaanxi, Gansu (S305 and S307 relabelled), Qinghai (portions of S 309), crosses G214 and connects with G109 at Nagqu. Certain portions are still under construction.
 - (iv) **G349 National Highway.** A new Highway was planned in 2013 from Zhagyab to Saga; the starting point was extended to Markam on the G 318 National Highway. This road will follow the exact alignment for the S 303 Provincial road shown below but will extend to Saga, 590 km West of Nagqu, along the S 301 Provincial Highway. The exact route or distance is not known.
 - (iii) **S 303 Provincial Road.** The S 303 Provincial Road runs South of G317 from Baxoi County on the G 214 South of Chamdo to Bulong Town, 695 km to the West on the G317 National Highway. It runs almost entirely above 4200 m elevation. It is considered one of the most dangerous roads in Tibet. Possibly will be subsumed by the G349 above.

The South Western (Nepal) Sub Sector

- 11 The South Western Sub Sector includes all areas South of Lhasa to the borders of Nepal and North of Bhutan and Sikkim.
 - (a) **Air.**
 - (i) **Shigatse Peace Airport.** The Shigatse Peace Airport is a greenfield airport constructed in 1973 as a purely military airfield. It opened for civilian traffic in 2010. It is located at an elevation of 3782 m (12,408 ft) and is one of the highest airfields in the world. It has a concrete runway of 5000 m with an asphalt overrun of 60 m on either side. Construction of the new 3000 m runway at the West End of the existing runway happened post the Doklam Crisis The Lhasa

Gonggar airport is 155 km to the East, and the Ngari Gunsa Airport, at an elevation of 4274 m, is 936 km to the Northwest. Tribhuvan International Airport at Kathmandu is 427 km to the Southwest. Bagdogra Airport is 312 km to the Southeast.

(ii) **Lhatse/ Tingri Airport.** A new greenfield airport is under construction at the base of Mount Everest. It is at an elevation of 4300 m. Shigatse Airport is 200 km to the NE, and Bagdogra Airport is barely 150 km to the South.

(iii) **Ngari Burang Airport.** A new airport is under construction near the Sino-India-Nepal Tri Junction at Burang (Taklakot). Burang has been garnering the attention of the Chinese Government with roads, a Railway line and an airport planned here. The Airport was to be operational by 2021, but its completion has yet to be confirmed. It is at an elevation of 4250 m with one runway of 4500 m. Delhi will only be 400 km away from this Airport.

(b) **Rail.** The following lines are planned/under construction:-

(i) **Lhasa Shigatse Kyirong (Gyirong).** The Lhasa – Shigatse - Kyirong Railway Line will have a length of 761 km, close to the Nepal border. This line will extend to Kathmandu (another 40 km). The Lari (Lhasa - Rigatse) Line, 253 km long, opened for commercial operations in Aug 2014. The Lhasa-Shigatse Railway will be able to transport mineral ore from mines in Shetongmon County (Xietongmen) immediately West of Shigatse to processing plants in mainland China. Shetongmon County has one of the PRC's most significant copper and gold deposits. The line construction from Shigatse to Kyirong, expected to be completed by 2022, is not yet confirmed.

(ii) **Kyirong Kathmandu Railway Line.** A Chinese Construction Company has expressed an interest in constructing the 121 km Kathmandu – Rasuwagadhi Line to connect it to Kyirong. However, due to the massive Nepal earthquake of 2015, construction work on this Railway Line has been hampered. Plans exist to extend the Railway from Kyirong to Kathmandu, the Indian Border at Lumbini, and Pokhra. In Mar 2022, among the many agreements signed with Nepal was one for the commencement of a technical feasibility study for extending the line from Kyirong to Kathmandu.

(iii) **Shigatse Burang Railway Line.** Plans exist for an extension of the Lhasa Shigatse Line to Burang. Claude Arpi, in his article in the Indian Defence Review, mentioned this in 2016, but its level of progress is not known.

(iv) **Shigatse Yatung Railway Line.** 302 km long, through Gyantse, it will lead to the Strategic town of Yatung, just opposite Cho La and Natu La.

(v) **Shigatse Hotan Railway Line.** A Takshashila Institution Discussion Document by Suyash Desai, on Dec 2021, quotes Chinese Sources on their plans to construct a railway line from Shigatse to Hotan.

(c) **Roads.**

(i) **G4218 Expressway.** Construction of the 166 km long stretch of the G4218 Expressway from Lhasa Airport to Shigatse commenced in Dec 2018. The Expressway from Lhasa Gonggar to Shigatse was opened in June 2021.

- (ii) **G318 National Highway.** It continues 764 km Westwards from Lhasa to Zhangmu, or Kyirong, close to the Nepali border town of Kodari. The Chinese-built Highway runs to Kathmandu (40 km). Shigatse is 271 km from Lhasa. It is another 150 km to Lhatse and another 293 km to Nyalam County. Zhangmu (Kyirong) is 32 km from Lhatse and 2 km from Kodari.
- (iii) **S309 Provincial Highway.** This Provincial Highway turns South from the G 318 Highway at Dagaxiang and runs 190 km to Gyantse.
- (iv) **G219 National Highway.** This infamous Aksai Chin National Highway from Kargilik to Dongxing, 10000 km long, has been discussed in the Southern Sub Sector above.
- (v) **G 695 National Highway.** This new strategic Highway from Mazha to Lhunze has also been discussed in the Western Sub Sector later.
- (vi) **S304 Provincial Road.** The S 304 Provincial Road runs from Yangbajain to Dazhuka on the G318 short of Shigatse, 170 km in length. It is a shortcut bypassing Lhasa but is a dangerous road mainly running above 3800 m elevation.
- (vii) **G562 National Highway.** The G 562, earlier called the S203 and S204 Provincial roads, have been renamed the G562 National Highway, running between Baingoin and Yatung. This Highway is strategically significant. It is 2107 km long. Yatung Valley is just North of Natu La, Yak La and Cho La.
- (viii) **G216 National Highway.** This long Highway runs North to South from Altay on the Kazakhstan Border, North of Urumqi to Yatung (Yadong), running through Urumqi, Korla, Qiemo, Minfeng, Keriya, Lake Lighten (5800m above sea level), Jieze, Gerze (on the S 301 Provincial Highway) and Lhatse to Yatung, 2763 km long. Claude Arpi mentioned this route in his May 2020 article in his Blog. We had assessed it further to the East, but the terrain would not have permitted this route. This Highway has significant Strategic Implications as the transfer of troops and heavy equipment from the North to the South will be greatly facilitated.
- (ix) **S205 Provincial Highway.** A 440 km long road, militarily significant, connecting Sansangzhen on the G219 National Highway and the S 301 Provincial Highway runs East to West between Ngari and Nagqu at Nyima. The road runs above 4200 m and is unpaved at no places.
- (x) **S 206 Provincial Highway.** This fully paved Provincial Highway, running from Saga County, 401 km long, runs a few km West of the S 205 Provincial Highway, connecting Dangbo on the G219 National Highway and Dongcuo, just East of Gerze. It is another highway providing an alternate route for the transfer of troops and stores.
- (xi) **G563 National Highway.** The G563 National Highway is a short 35 km connecting road from the G 318 National Highway to Sa'gya town in the Shigatse Prefecture.
- (xii) **G564 National Highway.** The G 564 connecting road to Burang replaces the S 207 Provincial Road. It runs at over 4000m elevation and is 100km long.
- (xiii) **G565 National Highway.** This is a 135 km connecting road between G 219 Highway and Zanda (Tholing Monastery) just opposite Mana Pass.

(xiv) **Yatung Valley.** In the Yatung Valley, China has constructed an excellent network of asphalted/concrete Roads, climbing up from the BB Area to opposite Cho La, Yak La and the Red Ridge running back to Yatung, as visible on Sattelite maps. An excellent local Highway, a two-way road connects Yatung along the Western edge of the Valley Northwards with S 309 Highway. Another Road connects Yatung with Natu La. The G216 and the G562 National Highways will likely replace some of these roads. More minor roads extend towards the Indian Border to the Northern extreme of North Sikkim. Own forward defences cover most of these roads.

12.2.4 The Western Sub Sector Shigatse to Kashgar

12. This Sector is strategically a very important Sub Sector for India. This Sector includes the famous route G 219 National Highway from Altay in Xingjiang, through Kargilik and the Aksai Chin to Dongxing on the Vietnamese border next to the sea. The entire Highway in the West and South of Myanmar runs at a height of more than 3000 m. The route is also vital because Mt Kailash lies North of this Route, and Mansarover Lake is just to the South. The G 695 National Highway has been included in 2022 to run immediately to the West and South of the G 219 National Highway.

(a) **Air.**

(i) **Ngari Gunsa Airport.** The Ngari Gunsa (Kunsha) Airport, which opened in 2010, has an elevation of 4274 m and a 4500 m long runway. Located 45 km Northeast of Shiquanhe, the biggest town in the Ngari Prefecture, the Airport is only 207 km from Mt Kailash and the Manasarovar Lake over the G219 Highway. As the crow flies, it is 304 km East (ENE) of Shimla and 324 km SE of Leh, Chandigarh 349 km to the WSW and Delhi 484 km to the SW. It is 902 km SSE of Kashgar, the Gateway into the CPEC corridor and 548 km South of Hotan.

(ii) **Kashgar Airport.** The Kashgar or Kashi Air Port is located at the end of the G 219 Highway. It is located at an elevation of 1380 m and has one concrete runway that is 3200 m long. The closest Chinese Airports are Hotan, 436 km to the Southeast, and Aksu, 409 km to the Northeast. In Pakistan-Occupied Kashmir, Gilgit Airport is 429 km to the Southwest, Skardu Airport is 470 km to the South and Chilas Airport is 488 km to the Southwest. Srinagar Airport is 628 km to the South, and Leh Airport is 616 km SSE.

(iii) **Tashkurgan Airport.** The Tashkurgan airport is located on the Kashgar Khunjerab route of the CPEC and was opened on June 30 2022. It is constructed at 3258 m and has one concrete runway 3800 ms long. Kashgar airport is only 180 km to the NE, and Leh is 400 km to the SE. Many recent flights close to our no-fly Zone in Aksai Chin have taken off from this airport.

(b) **Rail.** Shigatse – Hotan Planned Railway Line. There is a plan to extend the railway line from Shigatse to Ngari and onward to Yecheng, Moyu (Karakash) or Hotan Railway Stations.

(c) **Roads.**

(i) **G4218 Expressway.** As mentioned above in earlier paras, the G 4218 Expressway from Ya'an to Yecheng is under construction.

- (ii) **G 219 National Highway.** It runs from Lhatse, 240 km West of Shigatse, to Yecheng or Kargilik. It was initially 2086 km long. Construction of this Road was started in 1951 and completed in 1957, though most of it was a gravel Highway. This Highway passes through Aksai Chin. The construction of this Highway surprised us and was one of the primary reasons for the 1962 Indo-China War. It was fully asphalted by 2013. The G 219 enters the Aksai Chin near the Hongshan Hu Lake, passes to the West of the Aksai Chin Lake and exits the incursion 40 km to the Northeast, where the International Border crosses the Karakash River. The G 219 runs about 150 km through the Aksai Chin Area. This Highway is in the cold desert with long distances without water, running at an average elevation of over 4000m, with the highest point at 5392 m. There are a No of passes at over 5000m and many above 4500 m. The average temperature along this Highway is -25 degrees Celsius. It has been expanded in the China National Highway Network Planning (2013–2030) both Northward and Eastward to span the entire Chinese western and southern border. The new route will measure over 10,000 kilometres (6,214 mi), making it, by far, the longest National Highway (Wikipedia), longer than G 319 National Highway. It will now run from Xinjiang to Dongxing on the Vietnamese border. The Highway is mentioned in the Eastern, Southern and Southwestern Sectors above.
- (iii) **G695 National Highway.** Another National Highway through Aksai Chin recently approved in 2022 is the 3500 km long G 695 National Highway. It runs from Mazha, 150 km East of Khorgas on the Khyrgistan Border, along West/South of G219 in the Aksai Chin and further through South of Shigatse and Lhasa Gonggar to Shannon Lhunze opposite the Sela Pass. Interestingly the Chinese plan to run this Highway through Depsang Plains, Galwan and Hot Springs! This Highway has been mentioned under the Southern and South Western Sectors also. This plan is an apparent attempt to irritate, even if they cannot build it as planned. It will be a new conflict point. Could the new bridge over the Pangong Tso built recently by the Chinese be a precursor to this road? A point to ponder.
- (iv) A military road, 25 km long, connects Rutog County on the G 219 National Highway with Spangur Tso. Another military road, about 80 km long, connects Anglacuo Lake on the G219 to Pangong Tso North through Wujiangkun.
- (v) Besides these major Highways, China has also constructed a No of Country Roads in the interior and towards the Indian, Bhutan and Nepal Borders.

12.2.5 The North Western Sub Sector: Kashgar to Urumqi

- 13 The North-Western Highway runs Eastwards from Kashgar. This Sector is an area in the news because of the alleged atrocities on the Uighur Muslims. This area may impact operations against India, especially for air warfare, logistics and missile deployment.
- (a) **Air.**
- (i) **Aksu Airport.** An asphalted airport, located 409 km NE of Kashgar, at an elevation of 1163 m with one runway 2400 m long. Nearby airports are the Kuqa Quici Airport, 230 km to the East; Urumqi Airport, 657 km to the Northeast; Yining Airport, 311 km to the North and Hotan Airport, 471 km to the Southeast. Leh Airport s 828 km to the SW.

- (ii) **Hotan Airport.** Hotan had one concreted runway, 3200 m long, with an elevation of only 1424 m. Construction of a parallel runway of equal length under construction can be seen on Google Maps and was reported by India Today in an article by Col Vinayak Bhat (retd) on December 09 2020. This runway is also likely to have been operationalised. Hotan Airport is 385 km East of Leh (385 km), with Kashgar Airport 436 km to the Northwest and Jammu Airport 666 km to the Southwest. It is the closest Airport to all North Indian Airports, with New Delhi only 976 km and Jammu 667 km away. In Satellite pictures, Hotan appears to be a major PLAAF Base.
- (iii) **Qiemo Yudu Airport.** Built at an altitude of 1252 m, this Airport has one concrete runway 2800 m long. It had an old airport closed in 2011 when the new Airport began operations. Hotan airport is 514 km to the WSW. Leh Airport is 844 km WSW of this Airport.
- (iv) **Kuqa Quisi Airport.** Constructed at an elevation of 1074 m, it has one concrete runway 2600 m long. Aksu airport is 230 km WSW, and Leh Airport is 1000 km to the West.
- (v) **Korla Licheng Airport.** The Korla Airport is at an elevation of 927 m and has one concrete runway 2780 ms long. Aksu airport is 480 km to the West, and Leh Airport is 900 km to the SW.
- (vi) **Ruoqiang Loulan Airport.** Built at 890 m elevation, it has one concrete runway 2800 m long. Qiemo airport is 200 km WSW, and Leh airport is 1000 km WSW.
- (vii) **Golmud Airport.** Golmud Airport, built at an elevation of 2845 m, has one runway, 4800 m long. Nyingchi Mailing Airport is 790 km to the South, and Dibrugarh airport is 992 km to the South.
- (viii) **Mangya Huatugou Airport.** The Huatugou airport to serve Mangya County has been under construction for some time. It is being constructed at an altitude of 2945 m and will have one runway 3600 m long. It is located 400 km to the NW of Golmud. It does not appear on any search engine except Nouahs Ark. An IATA No has not been allotted too. Hence this Airport has not been included in the map or table below.
- (ix) **Urumqi Airport.** This Airport, at an elevation of only 648 m, has one concrete runway, 3600m. Two 3600m and 3200 m long runways are under construction and will be ready in 2023. Urumqi airport can handle A380 and Boeing 747 aircraft after the completion of the new construction. Turpan, 163 km to the Southeast, is the nearest Airport. It is 1382 km from Leh Airport.
- (x) **Xining Caojiabao Airport.** Xining is the capital of the Qinghai Province. This Airport was built 30 km East of Xining and began operations in 2011. The old Airport at Lejiawan, 17 km to the West, is now a military base. At 2170 m, this Airport has one asphalt runway 3800 m long. Lanzhou is 145 km to the East, and Dibrugarh Airport is 1203 km to the SW. It is not included in the table below.
- (v) **Lanzhou Zhongchuan Airport.** “Lanzhou’s first airport, Gongxingdun Airport, was located just 2 kilometres (1.2 mi) from the city centre.” (“Lanzhou Zhongchuan International Airport - Wikipedia”). In 1957, a decision was taken to move the Airport to a better location. After 1976, the Airport was demolished and is now used as Staff Quarters of the PLAAF. A suitable

location for the new Airport was found 71 km to the North at Zhongchuan. It was opened in 1976 and has seen two expansions. This expansion began in 2019; the entirety of Zhongchuan town and several villages, totalling 10.7 square kilometres (4.1 sq mi), was demolished to make way for the expansion. The residents were relocated to Lanzhou and Lanzhou New Area. Presently the Airport, at an elevation of 1947 m, has one asphalt runway, 3600m long. One terminal and two runways, each 4000 m long, are under construction. Xining is 145 km to the West, and Dibrugarh is 1289 km to the SW. It is not included in the table below.

(b) **Rail.**

- (i) **The Southern Xinjiang Railway.** This Railway connects Urumqi with Aksu over a double line, 983 km from Turpan. A single line connects Aksu to Kashgar and from Kashgar to Hotan. It is 1445 km from Kashgar.
- (ii) **The Hotan Ruoqiang Railway Line.** The Hotan Ruoqiang Railway line, with a design speed of 120 kmph, was opened for traffic on June 16 2022. Further East, it connects with the Golmud Korla Urumqui Railway Line. It is 825 km from Ruoqiang to Hotan. Interestingly, the route includes five viaducts over the sand with a combined length of 49.7 km, designed to allow sandstorms to blow under them.
- (iii) **High-Speed Lanzhou Xinjiang Railway Line.** Urumqi falls on the High-Speed Lanzhou – Xinjiang Railway line, which is 1904 km long. The Lanxin railway has been extended from Ürümqi Westwards to Alashankou, on the Kazakhstan border. According to Wikipedia, the distance from Alashankou to Lanzhou is 2360 km. Beyond Alashankou, the Railway links up with the Turkestan–Siberia railway of Central Asia and eventually reaches Rotterdam. Last year a total of 9579 freight trains connected Chinese markets with Rotterdam.

(c) **Roads.**

- (i) **G30 Expressway.** The 4243 km long G30 Expressway runs from Lianyungang, Jiangsu, China, on the Yellow Sea, to Khorgas on the Khazakastan Border.
- (ii) **G3011 Expressway.** This expressway will connect Liuyuan in the Gansu Province with Golmud, 670 km away. Golmud has also been connected with Mangya, 452 km to the WNW.
- (iii) **G314 National Highway.** It runs from the Khunjerab Pass through Kashgar to Aksu to Urumqi, a distance of 1948 km.
- (iv) **G315 National Highway.** It begins at Turugart, on the Khyrgistan border and connects Kashgar through Hotan with Xining over a distance of 1903 km. At Turugart Pass, an inland port has been constructed to ease trade.
- (v) **G580 National Highway.** The G580 Highway from Aksu to Kangxiwar on the G219 Highway near Aksai Chin will open in 2022. The 190 km distance from Hotan to Kangxiwar is still under construction. The Hindutash mountains will be crossed by a tunnel which is under construction. This route could be the one that the G695 National Highway will follow from Mazha into the Aksai Chin.
- (vi) **G581 National Highway** 245 km long, it connects Kashgar with Erkeshtam in Khyrgistan, the second border crossing used for trade. Erkeshtam (Simuhana in China) is 165 km from Turugart. The European Route E60, originating from Brest, France, ends at Erkeshtam. (“Erkeshtam - Wikipedia”)

12.2.6 The Northern (Urumqi Xining) Sub Sector

14. Urumqi is connected with Xining by the High-Speed Lanzhou Xingjian High-Speed Railway Line. Xining Airport is at 2170 m elevation, 30 km to the East of Xining town. It has a single asphalt runway 3800 m long. The G 213 and G 214 National Highways connect Xining with Chengdu and onto the Laos Border at Mohan (11788 km) and Lancang (2023 km), respectively. Xining sits astride the G 109 Highway from Beijing to Lhasa.

12.2.7 The Northern Approach to Lhasa Sub Sector

15. Xining, the capital city of the Qinghai Province, has always been the Northern Entrance into Tibet. Xining falls on the major Highways from Kashgar and Dali and sits astride the Beijing Lhasa Highway. The Xining, Nagqu, Chamdo and Lhasa Airports have already been discussed.

(a) Rail.

- (i) **Xining Golmud Railway Line.** 814 km. Constructed as an extension of the Lanzhou Xiangjing Railway Line, it was completed in 1984. The 4,010 m New Guanjiao Tunnel is the longest tunnel between Xining and Golmud.
- (ii) **The Golmud (Gormo) Lhasa Railway Line.** 1142 km long, it was inaugurated on July 01 2006. The line passes through the Tanggula Pass (5072 m), with the Tanggula Railway Station (5068 m) being the highest railway station on this stretch. The 3,345 m Yangbajing tunnel is the longest tunnel between Golmud and Lhasa. More than 960 km, over 80% of the Golmud–Lhasa section, is at an elevation of more than 4,000 m (13,123 ft). There are 675 bridges, totalling 159.88 km. About 550 km of track is laid on Permafrost. Reports were received of cracks appearing on the pillars of the railway line. The melting of the Permafrost on which these pillars were built caused the cracks.
- (iii) **The Lhasa Zhangmu Railway Line** This line was extended to Shigatse in 2014. It will be further extended to Yatung, Zhangmu (Kodari) and Burang. These extensions have been mentioned above.
- (iv) **The Lhasa Chengdu Railway Line.** It is under construction. The stretch up to Nyingchi opened for traffic in Jun 2021. This operationalisation of traffic has been mentioned above
- (v) **The Golmud Chengdu Railway Line.** According to Chinese State media, a railway line is planned from Golmud to Chengdu through Kyegodu in Qinghai and Ngaba (Ngawa) in Northwestern Sichuan. A new railway line will connect Kyegudo with Chamdo. No information regarding these railway lines is available.

(b) Roads.

- (i) **G6 Beijing Lhasa Expressway.** 3710 km long, it passes through the major cities of Zhangjiakou, Jining District, Hohhot, Bayannur, Wuhai, Yichuan, Wuzhong, Baiyin, Lanzhou, Xining Golmud and Yangbajian. The expressway is fully open up to Golmud. The Nagqu- Yangbajian- Lhasa stretch has also opened. Portions of this Road between Golmud and Nagqu are yet to open. On August 21 2022, the Nagqu-Yangbajing section of the G6 Beijing-Tibet Expressway opened for trial operation. The total length of this section is about

226.937 kilometres (Naqu South Interchange to Yangbajing Interchange, Sambasa Village, Yangbajing Town, Dangxiong County (“[CHN] China | road infrastructure • 中国高速 | Page 224 | SkyscraperCity Forum”))

- (ii) **G109 National Highway.** This Highway from Beijing connects Xining and Lhasa over 1912 km.
 - (iii) **S202 Provincial Highway.** This 175 km road provides a parallel route to the G 109 from Shenquka through Danquiong, Quilong, and Lamu along the Lhasa River to Lhasa.
 - (iv) **S305 Provincial Highway.** An asphalted Provincial Highway, it bifurcates from the G 109 South of Nagqu to the East through the Lhari County and runs 413 km to connect up with the G318 Highway at Yigong. Its highest point is at Aba La, 5190 m.
 - (iv) **S303 Provincial Highway.** It runs from the G317 Highway Southeastwards from the East of Botuocun and joins the G214 Highway near Suonacun, a few km North of the Chamdo Airport. A 709 km long highway, it runs almost entirely at an elevation of 4200 m. Its highest point is at 5086 m. Partly asphalted, it is only a dirt road in many places. In two places near Lohrong County, prominent military complexes are seen.
 - (vi) **S301 Provincial Highway.** It emanates Westwards from the G109 National Highway from Northwest of Nagqu, through Nyima, Xungba township to Ngari joining the G219 Highway. 1374 km long, it runs at an average of 4500 m elevation, with the highest point at 5004 m.
 - (xi) **G216 National Highway.** It runs 857 km Southwards from Almaty (Hongshanzui Port) through Urumqi to Baluntai, where it joins the G 218 Highway. In the National Highway Network Planning (2013-2030), this Highway has been extended through Luntai County, Minfeng County and Gerze County (on the S301 Provincial Highway) to Kyirong (Kodari) on the Nepal Border. Its exact length is not yet known. This Highway, also mentioned above, will have significant strategic ramifications for India.
 - (xii) **G562 National Highway.** Another parallel road planned is believed to be the G 562, running from Baingoin County near Nagqu to Yatung from S 301 Provincial Highway (or from the G 126 Highway) parallel (?) to the S203 and S204 Provincial Highways. Mentioned earlier too.
- (d) **Logistics Centre.** A 900 m long covered railway siding exists near the Nagqu Railway Station, covered with a concrete roof. Similar to this, about a km to the South West are four concreted sidings, each approximately 800 m long, probably for storage.
- (e) **Gormo Lhasa Ppl.** The 1153 km long Gormo Lhasa Pipeline became commercial in 1990. The pipeline, transporting mainly diesel, motor and aviation fuels at ambient temperatures, is 159 mm in diameter, has a wall thickness of 6 mm and was buried in a trench at a nominal depth of between 1.2 and 1.4 m. It has a low oil flow (0.6 to 1) and is prone to frequent breakdowns. Internal and external corrosion has also affected the use of the pipeline. Oil transportation is stopped between November and April to avoid pipeline freezing. A large logistics Centre exists North of Nagqu, where we can see a prominent Petroleum Pipeline Complex.

12.2.8 Terrain Analysis

16. China is investing heavily in infrastructure, be it airports, rail and roads. To their credit, they have used innovation and invention extensively to overcome the extreme difficulties of terrain and altitude. From the details above, China has made significant progress in creating this infrastructure, even in the most difficult mountainous regions. Investment in Infrastructure in Tibet by the Chinese Government – railways, airfields and roads – has served the dual purpose of facilitating an unprecedented tourism boom, expanding mining of Tibet's resources and serving China's strategic and military objectives. The Gormo Lhasa pipeline and the planned mega hydroelectric power project on the Yarlung Tsangpo have or will further revitalise the fledgling economy of Tibet while simultaneously improving the strategic utilisation of its resources jointly by the civil Government and the PLA. This article attempts to enumerate these infrastructures in Tibet to benefit the ordinary reader and assist planners in tackling the seeming military might of China.
17. **Air.** All available airports show their elevation and runway length. China has built a No of Airfields close to our border. The Chinese Government aims to have an airport within 90 mins travelling time from home for every citizen. However, without a strategic aim, China will not construct airports at Burang opposite Mana Pass, Lhatse near Shigatse, or Lhunzhe near Nyingchi. All airports on the Tibetan Plateau are at heights close to 4000m, and even with extended runways of 5000 m, will not be of adequate efficacy for their operational use. For every 1000m increase in elevation, there will be a 20% reduction in the Maximum Take Off Weight (MTOW) and will need to increase the length of runways. Aircraft operating from airports at 4000 m will operate at 40% efficacy. Hotan airport, North of Tibet at 1424 m elevation with a 3200 m long runway, has another runway under construction. It is a major PLAAF Airbase with fighter aircraft, AEW aircraft, helicopters and drones seen on the tarmac. A large no of aircraft, helicopters and drones have also been seen at the Lhasa Gonggar Airport, but its elevation restricts usability. At Nyingchi Airport, a new taxiway built parallel to the present runway gives China two runways to operate on close to the Indian Border. A new runway has also been constructed to the West of the existing runway at Shigatse. These new constructions began after the Galwan Clash, indicating how much Galwan had rattled the Chinese. At 648 m elevation, Urumqi is being developed as a major Airport with three runways, which is approximately 1342 km from Leh Airport. A high-altitude airport recently opened at Tashkurgan on the CPEC Highway needs close observation. Any conventional air attack on Indian airfields from airfields further away, including Hotan, Xining and Urumqi, will necessitate air-to-air refuelling somewhere over Central Tibet. China has also developed secret landing grounds like the one East of Kongka Dzong and other regular unannounced Airports, but their use may not support sustained operations. Also, we cannot rule out the use of Airfields in Myanmar for the Eastern Sector and Skardu, Chilas and Gilgit in Pakistan for our Western Sector. Conversely, the airfields in Myanmar could be used by us too. Drones can be deployed at many of these forward airfields. Drone swarms can be employed from any good concreted areas along our International Border/LAC. However, it is not easy for him to employ his aircraft for conventional air warfare. The need for close, constant surveillance by every means possible is imperative. The tabulation below will provide a ready reckoner. The data of the Xining and Lanzhou airports have been included in the table though they are over 1200 km from Indian airports. It merits mention

that data on the airports is not easily obtainable. [A lot of the information was obtained through Aircalculator.com.]

18. **Rail.** An extensive railway network has begun taking shape in Tibet. Each train on the Golmud Lhasa Line with 20 coaches capable of transporting 60 tonnes carries 1200 tons. Ten such trains are required for the resupply of one Chinese Division for five days. Even if one Division moves in into Tibet in two days, sustenance is not easy logistically. Of course, once the Kashgar – Hotan – Ngari – Shigatse and the Ya’an – Nyingchi Railway Lines are ready, the capability of rail replenishment will double. This completion is unlikely before 2030. Accordingly, we need to work out the countermeasures to overcome this advantage that the Chinese will have. Another point that needs significant consideration is the Shigatse Burang Railway Line terminating opposite Pithoragarh, only 25 km from Mana Pass. Is the Chinese aim to create unrest, maybe with Nepal’s help over the Lipu Lekh Imbroglia? The tabulation below will provide a ready reckoner.
19. **Roads.** China is continuing to create an excellent road infrastructure Network in Tibet. These roads will increase his tactical and logistics capability opposite our forward areas. We have seen in Sikkim that he had surreptitiously built a No of Roads towards the International Border. Close surveillance is necessary on these roads. Interdiction Points on all roads must be preplanned when a sudden need arises. Passes and tunnels need particularly be known and covered. We may not be free to react in a future conflict if we do not collate the information today. The progress of the construction of the North-South G 216, G 562 and G695 Highways needs special attention. The tabulation below will provide a ready reckoner.
20. **Logistics Centres and Missile Bases.** China has created a No of Logistics Centres along the Highways. These need to be mapped and recorded. Monitoring these Logistics Centres will provide an Early Warning of his intentions. The DF 21, 31 and 31A Missiles can quickly be fired from trains or Vehicle trailers. However, their bases will again give us an early idea about his intentions if identified.
21. **The Gas Pipeline Project.** The Gormo Lhasa pipeline project has not been a total success. However, some amount of fuel is being pumped in. The pipeline can move fuel to Yangbajain and Lhasa to move it forward for use by the PLA. Its usage needs monitoring.
22. **The 300 Million Megawatt Hydro Power Project.** The project, projected to generate three times the electricity generated by the Three Gorges Dam on the Yangtze Kiang, opposite Tuting and Geling, has major strategic implications for India. If he uses it to release water to our disadvantage, we will need to control this water weapon by having a series of dams to control any such release. If the main dam creates a large water reservoir which could drown a large area through which new roads and railways are being constructed, China may have to reconsider its infrastructure projects in the Southern Sub Sector. The plan is to build smaller dams to avoid this possibility. A rethink on this by us may also be needed. We also need to cater for the eventuality of the Dams on the Yarlung Tsangpo failing and being forced to manage the sudden flooding. The large dam planned near Yinkiong for the Upper Siang Project and Pasighat for the Lower Siang Project needs to be sped up so that we can control the flooding of the lower reaches.

23. **Communication through OFC Cables.** It has also been learnt that China has laid Optical Fibre Cables (OFC) through its 'China's Advanced Info-Optical Network (CAINONET) project' to more than 90 per cent of its Villages. It may be helpful to monitor this network, particularly at the Junction Points. All border posts along the LAC/International Border have also been provided connectivity.

12.2.9 Conclusion

24. The Chinese have reacted with alacrity to the Galwan Clash, rapidly expanding their road, rail and air infrastructure. This paper seeks to provide a one-stop data solution on the entire gamut of infrastructure development in Tibet. It also records what needs to be done to prevent being surprised by the Chinese. The infrastructure development carried out by the Chinese is difficult to authenticate. However, the available details indicate a need for better management of our intelligence to monitor Chinese activity. The available details will help generate better discussion leading to the requisite planning required to counter the PLA and Chinese intentions. We also need to re-evolve our plans and preparations, which we are sure is happening.

12.3 Airports in West China Close to India

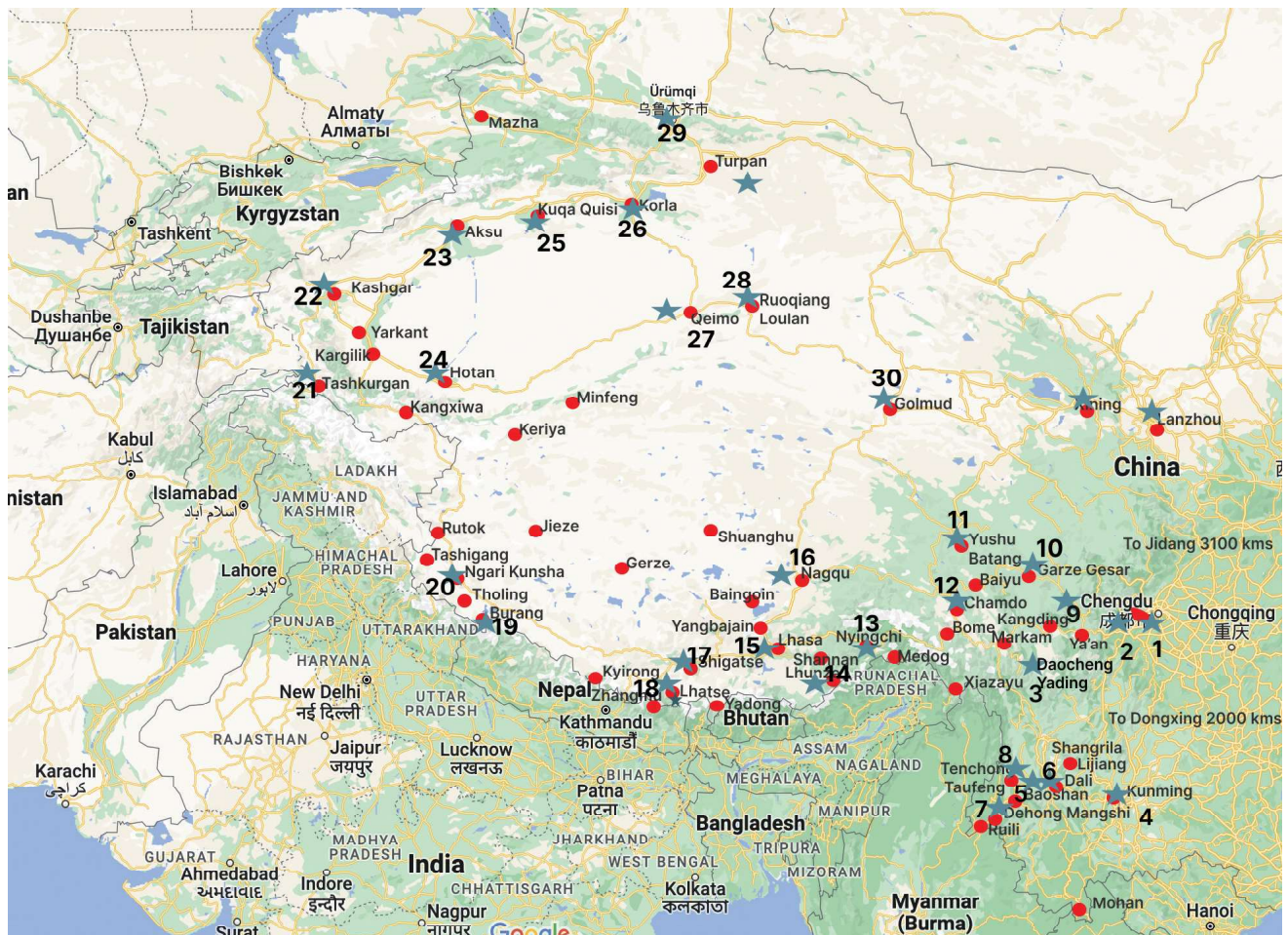


Table 12.1: AIRPORTS

Ser	Location	No of Runways	Elevation (m)	Length (m)	Airport in China	Nearest Airport in India	Remarks
1	Chengdu Shuangliu International Airport	2	495	3600 (both)	Chamdo, 654 km West	Dibrugarh 930 km	19 km West of Chengdu
2	Chengdu Tianfu International Airport	3 (2 North South and 1 East West) 6 runways planned	440	4000m 3200m And 3800m		Dibrugarh 960 km	70 km SE of Chengdu
3	Daocheng Yading Airport (DCY)	1	4411	4200	Chengdu 400 km	Tezu 424 km WSW	Not seen on Google Maps.
4	Kunming	2	2100	4000 and 4500	Chengdu 617 km	Dibrugarh 831 km	
5	Baoshan	1	1662	2400	Kunming 379 km	Tezu 447 km NW	
6	Dali	1	2149	2500	Kunming 269 km	Dibrugarh 564 km NW	
7	Dehong Mangshi (Near Ruili)	1	877	2600	Kunming 449 km	Dibrugarh 492 km	on Myanmar Border
8	Tengchong Tuofeng	1	1905	2350	Kunming 447 km	Dibrugarh 443km	
9	Kangding	1	4280	4000	Chengdu 300 km	Dibrugarh 719 km	
10	Garze Gesar (Sichuan)	1	4068	4000	Chengdu 446 km	Dibrugarh 870 km	Not seen on Google Maps
11	Yushu Batang	1	3890	3800	Chamdo, 254 km	Dibrugarh, 626 km	An old runway, disused, is visible to the East of the present Runway.
12	Chamdo Bamda	1	4334	4500 (old 5500 m runway is closed)	Nyingchi 301 km	Dibrugarh 397 km	
13	Nyingchi (Linzhi) Mainling Nyingchi Heliport	1	2949	3000	Lhasa Gonggar 331 km	Dibrugarh 213 km	New parallel taxiway can be used as a runway 7 Mi 17 Pads
14	Shannan Longsi Airport at Lhunze	1	3980	4500	Lhasa Gonggar 100 km	Dibrugarh 180 km	Class 4C airport Construction near completion
15	Lhasa Gonggar	2	3570	4000 (both)	Shigatse 155 km	Bagdogra 386 km	The 4500 m long Lhasa Damxung is now a PLAAF Base
16	Nagqu Dagrang	1	4436	4500	Lhasa Gonggar 40 km	Bagdogra 420 km	

Ser	Location	No of Runways	Elevation (m)	Length (m)	Airport in China	Nearest Airport in India	Remarks
17	Shigatse Peace	2	3782	5000 3000	Ngari Gunsu 936 km West	Bagdogra 312 km	The new 3000 m runway at the West End of the existing runway was constructed post the Doklam Crisis
18	Lhatse/ Tingri Near Mt Everest and Kodari in Nepal	1	4300		Shigatse, 200 km East		Construction near completion Near Mt Everest and Kodari in Nepal
19	Ngari Burang (Seen only on Mapcarta)	1	4250	4500		Delhi, 400 km	Construction was to be completed in end 2021(?). Near India Nepal China Tri Junction
20	Ngari Gunsu	1	4274	4500	Kashgar 902 km NNW	Leh 324 km.	
21	Tashkurgan	1	3258	3800	Kashgar 180 km	Leh 400 km	Opened on 30 Jun 2022
22	Kashgar	1	1380	3200	Hotan 436 km SE	Leh 616 km SSE	
23	Aksu	1	1163	2400	Kuqa Guici 230 km East	Leh 828 km West	
24	Hotan	1 1 under construction/ Completed	1424	3200	Kashgar 436 km NW	Leh 386 km West	Appears to be a maj PLAAF Base
25	Qiemo Yudu	1	1252	2800	Hotan 514 km WSW	Leh, 844 km WSW	Old Airport closed in 2011.
26	Kuqa Quisi	1	1074	2600	Aksu 230 km WSW	Leh 1000 km West	
27	Korla Licheng	1	927	2780	Aksu 480 km West	Leh, 900 km SW	
28	Ruoqiang Loulan	1	890 m	2800	Qiemo 200 km WSW	Leh, 1000 km WSW	
29	Urumqui	3	648	3600, 3600 and 3200	Turpan 163 km SE	Leh 1382 km SW	Maj PLAAF Base
30	Golmud	1	2845	4800	Nyingchi Mainling 790 km South	Dibrugarh 992 km South	
31	Xining Caojiabao	1	2170	3800	Lanzhou, 145 km East	Dibrugarh, 1203 km SW	Asphalt runway
32	Lanzhou Zhongchuan	1	1947	3600, 4000*, 4000*	Xining, 145 km West	Dibrugarh, 1289 km SSW	Asphalt runway, Two new runways 4000m each are under construction from 2019

12.4 Tibet: Railways

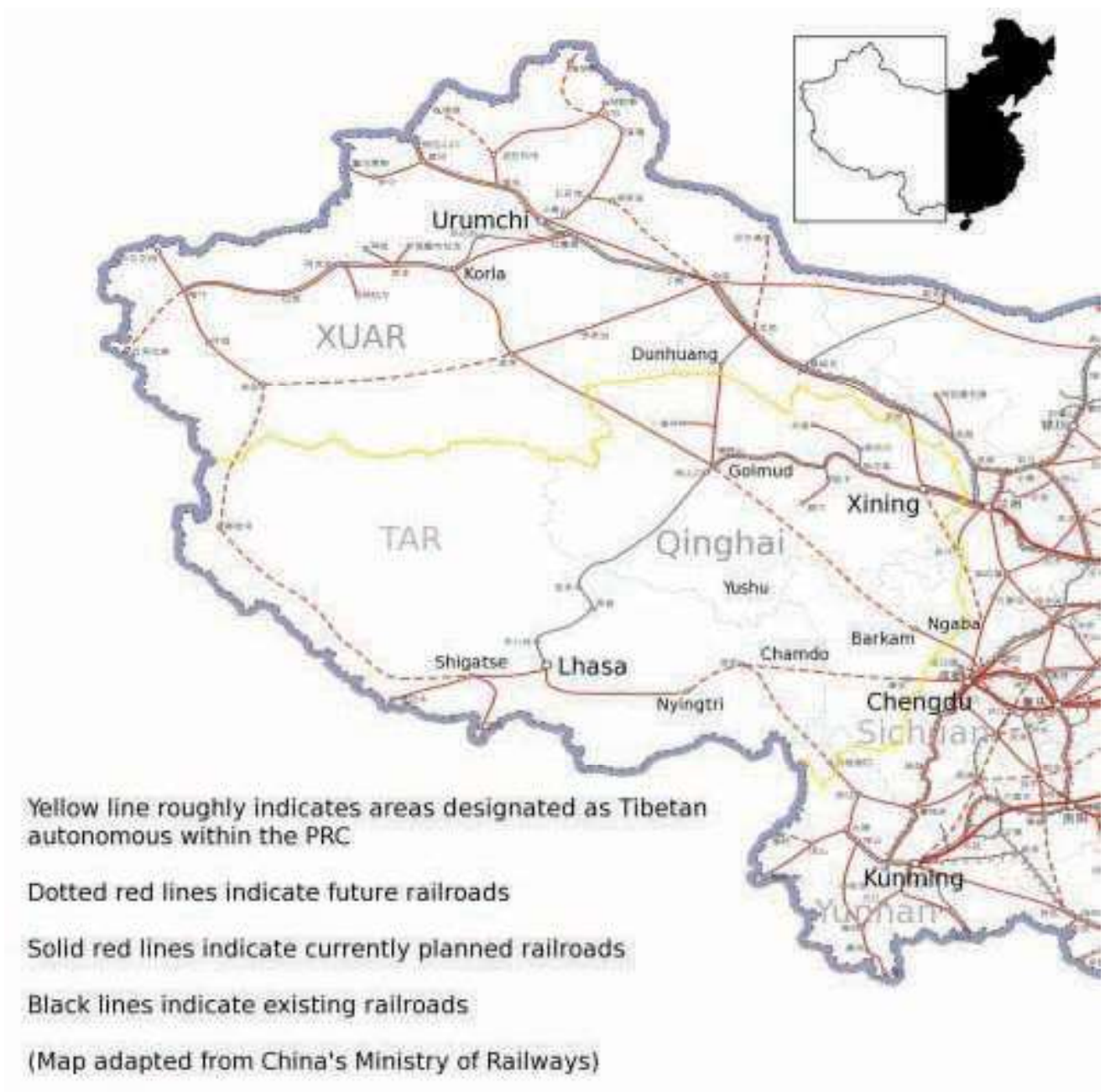


Figure 12.4: Courtesy: International Campaign for Tibet quoting (“During the 12th Five-Year Plan a strategic rail network to be built through Tibet, Xinjiang,” March 7, 2011, Xinhua [in Chinese].

Table 12.2: RAILWAY LINES TIBET

SER	FROM	TO	DISTANCE km	COMPLETED	
1	Xining	Golmud	814	Yes	
2	Golmud	Lhasa	1142	Yes	
3	Lhasa	Shigatse	253	Yes	
4	Shigatse	Kyirong	556	Planned	
5	Kyirong	Sankhu (Kathmandu)	72	Planned	
6	Chengdu	Ya'an	94	Yes	
7	Ya'an	Nyingchi	1011	No	
8	Nyingchi	Lhasa	435	Yes	
9	Shigatse	Yatung	302	Planned	
10	Shigatse	Burang	984	Planned	
11	Shigatse	Ngari	NK	Planned	
12	Ngari	Hotan	NK	Planned	
13	Urumqi	Aksu	984	Yes	Double Line.
14	Aksu	Kashgar	462	Yes	Single Line
15	Kashgar	Hotan	488		Single Line
16	Lanzhou	Urumqi/	2360	Yes	High Speed
		Alshankou			Connects to Rotterdam
17	Golmud	Chengdu		Planned	
18	Yushu	Chamdo		Planned	

12.5 Roads In Tibet

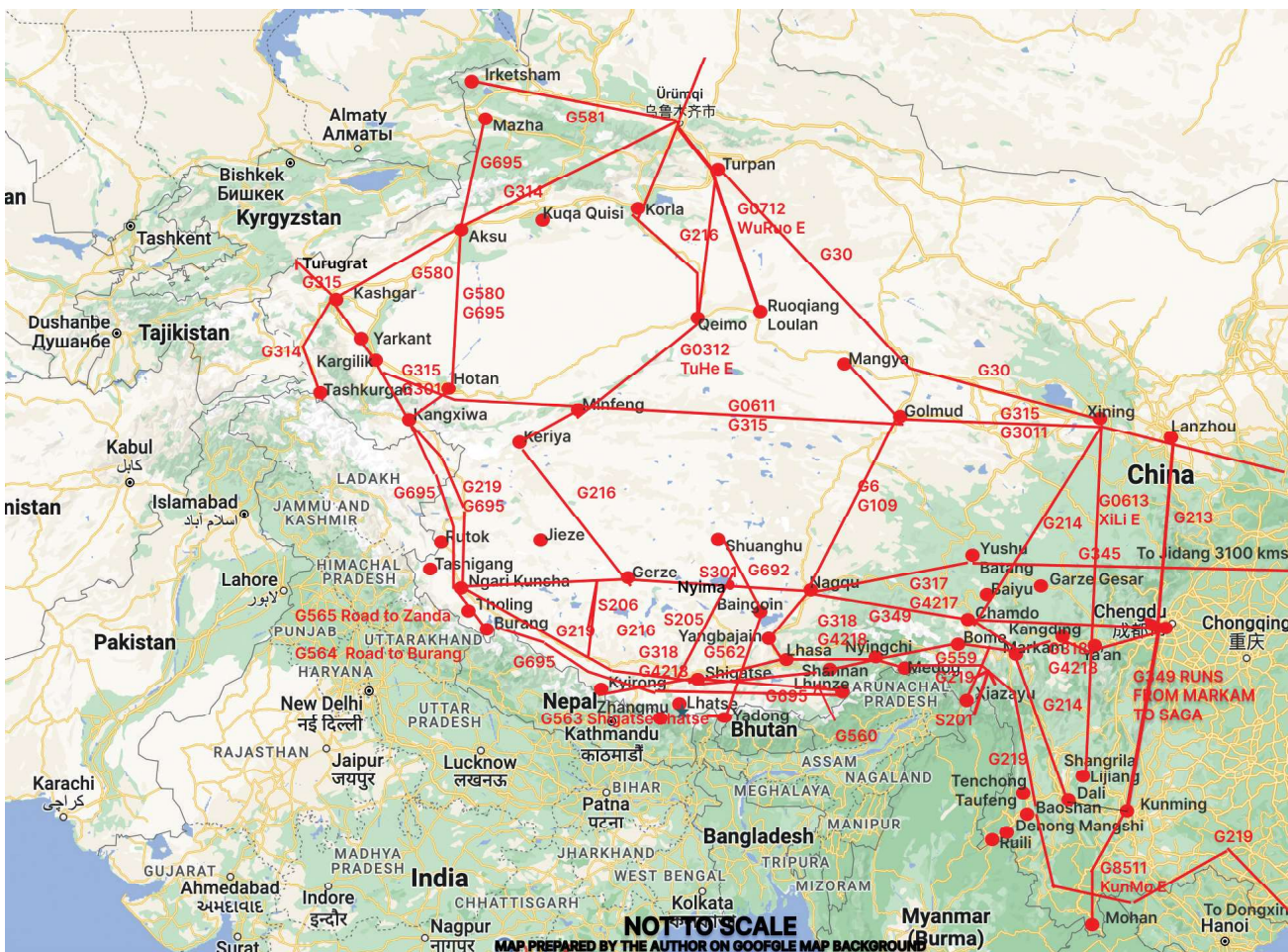


Table 12.3: EXPRESS WAYS

SER	ROAD NO	FROM	TO	DISTANCE km	COMMENTS
1	G6	Beijing	Lhasa	3710	Portions near Nagqu is yet incomplete
2	G4217	Chengdu	Chamdo	1200	Rongchang Expressway. 2x3Lane. 217 km to Ma'erkang completed. Will be extended to Lhasa
3	G4218	Ya'an	Yecheng	3500	Yakang or Yaye Expressway Completed from Ya'an to Kangding. Construction from Lhasa to Shigatse is in progress

Table 12.4: National and Provincial Highways (As related to Tibet)

SER	ROAD NO	FROM	TO	DISTANCE km	COMMENTS
4	G214	Dali	Mangkang (Markham)	724	Joins G318 at Markham and runs together till Bungdazhen South of Chamdo Airport
5	G318	Chengdu	Zhangmu	5476	Shanghai to Zhangmu
6	Unnamed Highway	Bome County	Medog		
7	G219	Yecheng	Dongxing	10000	Longest highway. First highway through Aksai Chin. Runs through Medog, opposite Gelling, Zayu and all along the SE and Southern border of China
8	G 559	Medog	Zayu	400	Unknown Route
9	G560	Lhasa Nyingchi	Lhunze	325	Near Sela Pass
10	G695	Mazha	Lhunze	3500	Introduced in 2022. Planned to run West of G219.
11	S201	Rawu	Xiazayu	226	Connects G318 with Area opposite Kibithu
12	G317	Chengdu	Nagqu	2012	Joins G6 and G 109 Highways at Nagqu.
13	G345	Jiangsu	Nagqu	3000	
14	G349	Markam	Saga	1899	Follows alignment of S303 and S 301
15	S309	Dagaxiang	Gyantse	190	Leaves from G318
16	S304	Yangbaijan	Dazhuka	170	Bypasses Lhasa. Not on map
17	G562	Bangoin	Yatung	709	S203 and S204 merged to form G562
18	G216	Hongshanzui port, <i>Fuhai, XJ</i>	Port of <i>Gyirong, XZ</i>	2763	Strategically an important Highway.
19	S205	Sansangzhen	Nyima	378	Connecting G219 and S 301
20	S206	Dangbo	Dongcuo	401	Connecting G219 and S 301
21	G563	Shigatse	Tingri	35	
22	G564	Manasarover	Burang	100	Opposite Mana Pass
23	G565	Manasarover	Zanda/ Tholing	135	Opposite Mana Pass
24	Connecting Military Roads	Yatung Valley	to IB		Many roads recently concreted.
25	Mil Rd	Rutog County	Spangur Tso	25	
26	Mil Rd	Anglacuo Lake	Pangong Tso North Bank	80	
27	G30	Lianyungang	Khorgas	4243	From Jiangsu on the Yellow Sea to Khazhakastan Border
28	G3011	Liuyaun	Golmud	670	Further connected to Mangya 452 km WNW
29	G314	Urumqi	Khunjerab Pass	1948	Through Aksu and Kashgar

SER	ROAD NO	FROM	TO	DISTANCE km	COMMENTS
30	G315	Turugart	Xining	1948	Through Kashgar and Hotan
31	G580	Aksu	Kangxiwar	787	Connecting road to G219 Highway near Aksai Chin
32	G581	Kashgar	Erkeshtam	245	Erkeshtam is called Simhuana in China. Connects with European Roue E60 originating from Brest in France.
33	G109	Beijing	Lhasa	3901	
34	S202	Shenquka	Lhasa	175	Runs Parallel to G109 Not on map
35	S305	Nagqu	Yigong	413	Connects G109 with G318 Runs through Lhari County. Not on map
36	S303	Botuocun (G317)	Suanocun (G214)	709	Partly asphalted. Near Lohrong County two prominent Military complexes are seen. Not on map
37	S301	Nagqu	Ngari	1374	Runs through Nyima and Xungba on the Central Highlands of Tibet.
38	S203	Shigatse	Namling		Connecting road between G219 and S301 crosses elevations of 4500m
39	S305	Nagqu	Yigong	413	Runs through Lhari County. Not on map
40	G109	Beijing	Lhasa	3700	Xining to Lhasa is 1912 km
41	G213	Xining	Mohan (Laos Border)	11788	Passes through Chengdu
42	G214	Xining	Lacang	2023	Passes through Chengdu

12.6 Photographs



Figure 12.5: The G 4218 YaYe (Ya'an Yecheng) Express Highway at Kangding with the G 318 passing below:-



Figure 12.6: A view of the G4218 near the Dadu River (Courtesy the Xinhua News Agency reporter Jiang Hongjing).



Figure 12.7: The World's highest tunnel, the Milashan Tunnel on the Lhasa Linzhi (Nyingchi) stretch of the G 4218 National Highway was opened for traffic on 26 Apr 2019. It is at an elevation of 4774 m. Each tube is 5727m and 5720m long.



Figure 12.8: A bridge over the Dadu River(Courtesy the Xinhua News Agency reporter Jiang Hongjing).



Figure 12.9: The Xingkang Jinsha River Bridge near Kangding on the G4218 YaYe Expressway



Figure 12.10: A view of the G4218 Yakang Expressway and the G318 Highway near Kangding.
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Figure 12.11: The Expressway to Lhasa Airport from Lhasa over the Yarlung Tsangpo River

Source: By Chlich - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=52372670>

WHO “DERAILED” PAKISTAN?

Col Nilesh Kunwar



13.1 Introduction

In its 75 years, Pakistan has been under military coups thrice under four different military rulers. Though constitutionally a democratic parliamentary republic with its political system based on an elected form of governance, Pakistan has, over the years, incessantly fallen under martial law or behind the scene manipulation by the Pakistan army.

It is essential to contemplate that no generation in Pakistan has seen a completely democratic government. The military has always been involved in governance. The people of Pakistan have learnt to accept these interferences and control in their Democracy. The involvement of the Pakistan military has developed into such a fine art that Pakistanis have almost stopped protesting on discontentment regarding the runaway inflation and hike in food and essential utilities.

Ever since its inception, the Pakistan army has driven home the message that it is the final custodian of stability under the so-called ‘doctrine of necessity that denigrates politicians as corrupt, self-serving, and