



RAILWAY SECTOR ASSESSMENT FOR AFGHANISTAN

MARCH 2021

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Note:

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Cover design by Edith Creus.

Cover photos (left to right): Railway station in Mazar-e-Sharif, Afghanistan. The railway has provided easy transportation for oil, wood, flour, wheat, asphalt, and other important products (photo by ADB).

An Afghan worker marks the containers in the main terminal of the train station in Mazar-e-Sharif. The Asian Development Bank funded a 76-kilometer railway from the Uzbekistan border to Mazar-e-Sharif (photo by ADB).

A train laying the ballast on the track of the Hairatan to Mazar-e-Sharif Railway (photo by ADB).

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ACKNOWLEDGMENTS

This country railway sector assessment is part of an Asian Development Bank (ADB) technical assistance (TA) project on *Railway Sector Development in Central Asia Regional Economic Cooperation (CAREC) Countries*. The project has been assisting CAREC member countries to identify promising opportunities for investment in cross-border railways and develop railway commercialization and reform measures to strengthen railway performance in accordance with the *CAREC Railway Strategy* approved by CAREC ministers in 2017.

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Valuable insights and information were provided by the Afghanistan Railway Agency, other government departments, international development partners, and representatives of the private sector. Useful comments were provided by ADB staff including Ko Sakamoto.



ABBREVIATIONS

ADB	Asian Development Bank
ANDS	Afghanistan National Development Strategy
ARA	Afghanistan Railway Authority
CAREC	Central Asia Regional Economic Cooperation
CIS	Commonwealth of Independent States
CPEC	China–Pakistan Economic Corridor
EU	European Union
FCAS	fragile and conflict-affected situations
FSU	former Soviet Union
IMF	International Monetary Fund
JSC	joint stock company
MC	member country
MoPW	Ministry of Public Works
MoTCA	Ministry of Transport and Civil Aviation
PRC	People’s Republic of China
TA	technical assistance
TEU	twenty-foot equivalent
TITR	Trans-Caspian International Transport Route
UIC	International Union of Railways
UTY	O‘zbekiston Temir Yo‘llari (Uzbekistan Railways)

CURRENCY EQUIVALENTS

(as of 1 June 2020)

Currency unit	–	Afghani (AF)
AF1.00	=	\$0.013
\$1.00	=	AF76.65

INTRODUCTION AND BACKGROUND

A. Introduction

1. In 2017, the eleven Member Countries (MCs) of the Central Asia Regional Economic Cooperation (CAREC) program approved the CAREC Railway Strategy with a view to expanding the role of railway transport in the region.¹ The strategy aims to accelerate the identification, preparation, and financing of feasible railway investment projects and, at the same time, advance the commercialization and reform of railways to improve their performance (ADB 2017a).

2. In 2018, the Asian Development Bank (ADB) approved a \$2 million regional technical assistance (TA) project for CAREC Railway Sector Development to assist MCs in implementation of the CAREC Railway Strategy (ADB 2018).² The TA is intended to accelerate the sound development of the railway sector in CAREC countries by providing support for railway transport market research, project identification and preparation, knowledge sharing, and preparation of practical actions for commercialization and reform in MCs.

3. During the first part of TA implementation, the TA consultants conducted assessments of the railway sector in each MC. The purpose of these assessments was to examine the setting, characteristics, performance, and prospects of railways, and identify promising investment

opportunities, and commercialization and reform actions, that could be considered for support through the TA. This short report summarizes the findings of the railway sector assessment for Afghanistan. The report is mainly based on data from secondary sources.

B. The railway network

4. Afghanistan is a landlocked country with a population of 31.6 million in 2018 (ADB 2019a). Much of the country is mountainous. Located at the confluence of Central Asia and South Asia, it is bounded to the north and west by Turkmenistan, Uzbekistan and Tajikistan, to the west by Iran, to the south and east by Pakistan, and to the east by the People's Republic of China (PRC). The country experienced protracted conflicts for most of the past four decades—initially war with the former Soviet Union (FSU) and later civil conflict with the Taliban. As a result, parts of the country continue to face significant security risks, the institutional capacity of the government and the private sector have been depleted, and government revenues remain weak so that most infrastructure investments depend upon external financing from development partners. The United Nations classifies Afghanistan as a least-developed country. ADB classifies it as a country affected by fragile and conflict-affected situations (FCAS).

¹ The eleven CAREC Member Countries are Afghanistan, Azerbaijan, the People's Republic of China (specifically the Xinjiang Uygur Autonomous Region and the Inner Mongolia Autonomous Region), Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan.

² The TA is cofinanced by the People's Republic of China (PRC) Poverty Reduction and Regional Cooperation Fund and the United Kingdom Fund for Asia Regional Trade and Connectivity (under the Regional Cooperation and Integration Financing Partnership Facility).

5. During the 19th century, Britain built an extensive railway network in present-day India and Pakistan, while Russia built major railways in Central Asia. If a railway had been built in Afghanistan it could potentially have linked these subregional railway networks, provided improved access to sea ports on the Arabian Sea and Persian Gulf, and supported the development of mining and agriculture in Afghanistan. However, rivalry between Britain and Russia for influence in the region—and related fears of military conflict—led the two countries to treat Afghanistan as a neutral, buffer state between their rival empires, and therefore to resist any proposals for building a railway there (Frankopan 2017).

6. In the 1960s and 1980s, the FSU built two short border-crossing sections of railway lines for transport of military equipment used by Soviet troops during the Soviet–Afghan War. These were from Serhetabat (Turkmenistan) to Turghundy (less than 10 km), and across the Friendship Bridge over the Amu Darya river from Termez (Uzbekistan) to Hairatan (15 km). Both lines are Russian broad gauge (1,520 mm).

7. In 2008, the government adopted the Afghanistan National Development Strategy (ANDS) as its vision for national reconstruction and development. Among the priorities established by the ANDS was to develop a national railway network (Government of Afghanistan 2008). This recognized that efficient transport is needed to enable national development, and that railway was essential for realizing the country’s plans to develop large-scale mining for export. The railway would be developed in stages depending on economic feasibility and the availability of financing. A national railway institution would be established to oversee railway development and would initially require substantial capacity building.

8. In 2013, with support of external partners, the government developed the Afghanistan National Railway Plan (ANRP) to provide the basis for implementing the railway development directions set by the ANDS. The ANRP envisages developing a circular “ring-railway” network to connect the country’s main population centers and provide links to border-crossings with each of Afghanistan’s neighbors. The ring-shaped network would circumvent the high mountains of the central and northeastern parts of the country (Hindu Kush) which would make construction easier and less costly. The railway would generally be located near to the national highway ring road that is under construction, so that while the railway network is still being developed it would be possible to offer multimodal transport services using railway on completed sections and road transport on uncompleted sections. In addition to serving domestic, import and export traffic, the government expects the railway to be attractive for regional transit traffic, including traffic between Central Asian countries (including western PRC), between these countries and the ports of Pakistan and Iran, and between Central Asia and South Asia.

9. As shown in Figure 1.1, the planned ring-railway is comprised of four corridors:

- (i) **Central Corridor (574 km).** Between Herat and Bamyan. Much of the corridor is in mountainous terrain.
- (ii) **North–Southeastern Corridor (665 km).** Between Kunduz, Bamyan, Kabul, and the Pakistan border at Torkham. Much of the corridor is in mountainous terrain.
- (iii) **Northwestern–North–Northeastern Corridor (1,970 km).** Between the Iran border crossing near Chah-e-Sorkh, Herat, the Turkmenistan border crossings at Turghundy and Aqina, Mazir-e-Sharif, Hairatan, the Tajikistan border near Shirkhan Bandar, Kunduz, and the PRC border at Wakhan. East of Kunduz, the corridor is in mountainous terrain.

Figure 1.1: Afghanistan's Existing and Planned Railway Network

Source: ARA 2018.

(iv) **Northwestern-South-Southeastern Corridor (1,831 km).** Between Herat, the Iran border at Zaranj, the Pakistan border crossing at Baramacha, Kandahar, the Pakistan border crossings at Spinboldak and Khost, and Kabul. Parts of the corridor are in mountainous terrain. A shorter alignment option that has been discussed would cross directly from Herat to Kandahar rather than taking the longer route via Zaranj.

10. The planned network incorporates the establishing of eight dry ports to facilitate efficient cross-border movements. These will be located at Turghundy, Zaranj, Baramacha, Spinboldak, Khost, Torkham, Nayeb Abad, and Aqina. It will also include four multimodal hubs to support freight consolidation and efficient transfers between railway and road. These will be at Herat, Kandahar, Jalalabad, and Mazar-e-Sharif.

11. The first part of the railway network to be completed was between Hairatan on the northern border with Uzbekistan and Mazar-e-Sharif, northern Afghanistan's largest city (ADB 2013).

The 75 km Russian broad gauge line was completed and began operations in late 2011.³ Construction was carried out by O‘zbekiston Temir Yo‘llari (Uzbekistan Railways) (UTY). SE Sogdiana Trans, a subsidiary of UTY, was awarded a concession to initially operate and maintain the railway, with a view to Afghanistan eventually taking over once it established necessary technical and institutional capacity. The concession was originally for a period of five years but has since been extended.

12. Since 2016, two railway stations connecting with the Turkmenistan railway were also opened for traffic. These are at Aqina (station built by Turkmenistan) and Turghundy (upgrading by Turkmenistan on a built-operate-transfer basis of a station originally built in 1974),⁴ which are both located within a few kilometers of the border. In addition, Afghanistan and Iran have also been laying 62 km of track from the Iran railway at the Shamtegh border crossing to Rozanak on the way to Herat (ARA 2018).

13. With the support of development partners, Afghanistan has also conducted prefeasibility and feasibility studies for much of the proposed national railway network, with the aim of preparing feasible projects capable of attracting external financing. According to the updated ARA Strategic Plan, 2018–2023, the ARA plans to have conducted studies for a cumulative track length of 4,844 km by 2027. By 2015, it had completed studies for 2,866 km (footnote 4). The status of preparatory prefeasibility and feasibility studies is summarized in Table 1.1.

14. By consolidating Afghanistan’s aspirations for railway development, the ring-railway concept has provided a useful organizing framework for

conducting feasibility studies and dialogue on possible financing from development partners. However, in the short-to-medium term, it is unlikely there will be enough traffic to justify investment in all sections of the ring. Each feasible investment will in practice need to be designed as a self-standing corridor irrespective of the longer term idea of creating a ring-railway.

15. While future mining projects could provide an important source of future traffic, it would not be possible to transport large volumes of minerals to the ports of Iran or Pakistan without major investment to upgrade the freight-carrying capacity of their railways and provide missing links (Harral Winner Thompson Sharp Klein 2012). Moreover, some of Afghanistan’s main mining opportunities may be more profitable if the minerals are processed near the mine rather than transported over long distances. In the case of the 240 million ton copper reserves at Aynak (near Kabul), on-site smelting of copper ore into concentrate would drastically reduce the volume of end-product to be transported.⁵ In the case of coal production near Hajigak, the need for long distance transport could be eliminated if the coal is consumed near the mine (e.g., for smelting of metal ores) or used to generate electricity for sale in the domestic market or for export (footnote 5).

16. Another issue concerns whether a ring-railway is an efficient way of addressing gauge change needs. Cross-border traffic using the ring-railway would enter or leave Afghanistan on three different gauges as Iran and the PRC use standard gauge (1,435 mm), Pakistan uses Indian broad gauge (1,676 mm) and Uzbekistan, Turkmenistan, Tajikistan, and other members of the Commonwealth of Independent States (CIS) use Russian gauge (1,520 mm).

³ This line extended the original link built by the FSU between Termez and Hairatan (para. 6). A total of 107 km of railway tracks were provided inclusive of crossing loops and sidings (ADB 2013).

⁴ Turghundy station was originally built in 1974. The recent upgrading works included the station and the short line between Serhetabat and Turghundy (para. 6) that was originally built by the FSU.

⁵ The copper content within copper ore is only 1.5%–2.5% (Harral Winner Thompson Sharp Klein 2012).

Table 1.1: Status of Prefeasibility and Feasibility Study Preparation, 2018

Railway Section	Length (km)	Stage of Project	Status
1. Wakhan–Badakhshan	367	PFS	Planned
2. Badakhshan–Kunduz	199	PFS	Planned
3. Kunduz–Qala-e-Zal	55	FS	Completed
4. Shirkhan Bandar–Naibabad	123	FS	Completed
5. Hairatan–Mazar-e-Sharif	75	Operational	Operational
6. Mazar-e-Sharif–Herat (Robat-e-Parian)	656	FS	Completed
7. Aqina Station	16	Operational	Operational
8. Aqina–Andkhoy	24	Construction	Construction ongoing ^a
9. Andkhoy–Sheberghan	67	FS	Completed
10. Turghundy Station	13	Operational	Operational
11. Turghundy–Sanobar	12	FS	Completed
12. 3rd section of Khaf–Heart	62	Construction	Ongoing ^a
13. 4th section Phase 1 of Khaf–Herat	43	Construction	Ongoing ^a
14. 4th section Phase 2 of Khaf–Herat	44	Detailed design ^a	Ongoing ^b
15. Herat–Kabul	1,101	PFS	Completed
16. Zarang–Delaram	204	PFS	Planned
17. Lashkargah–Baramacha	254	PFS	Planned
18. Kandahar–Spinboldak	96	FS	Completed
19. Spinboldak–Chaman	7	FS	Completed
20. Pol-e-Alam–Khost–Ghulam Khan	175	PFS	Planned
21. Logar–Mis Aynak Copper	12	PFS	Planned
22. Kabul–Jalalabad	138	PFS	Completed
23. Jalalabad–Torkham	75	FS	Ongoing
24. Kabul–Bamyan–Kunduz	452	PFS	Planned
25. Bamyan–Ghor–Herat	574	PFS	Planned
Cumulative length of track covered by studies	4,844		

FS = feasibility study, PFS = prefeasibility study.

^a Construction financed by Iran.

^b Construction expected to be financed by Italy.

Source: ARA 2020.

So, either all traffic would have to change to a common gauge before and after using the ring-railway or gauge changes would have to take place on the ring-railway itself. If links to and from other countries were instead arranged as discrete corridors, the number of gauge changes could be minimized and in some cases avoided altogether.

The government has indicated a preference for the ring-railway to be built to standard gauge, with gauge changes on the outer spokes of the ring. However, it has also been willing to consider, for example, adopting Russian broad gauge for the Northwestern–North–Northeastern Corridor as it is used by the country’s northern neighbors in Central Asia.

In practice, it is likely that development partners will wish to revisit the gauge issue if and when they consider financing construction of further railway sections.

17. A further consideration is that construction of the ring-railway would be very costly so it would need to be spread over an extended period. Comparing with investment costs in neighboring countries, it seems unlikely the cost of railway infrastructure would be any less than Afghanistan's gross domestic product of \$19.4 billion (2018). Additionally, there would be substantial costs for acquisition of rolling stock. While neighboring countries, such as Uzbekistan, might perhaps be prepared to contribute toward financing of some sections of the network, the cost to Afghanistan would very likely exceed the present level of annual public expenditure of \$11 billion, three-quarters of which is provided as grants by development partners (World Bank 2020).⁶ Given that many other sectors have pressing needs for financing, the time frame for financing and construction of the ring-railway is unlikely to be less than two decades and could be longer.

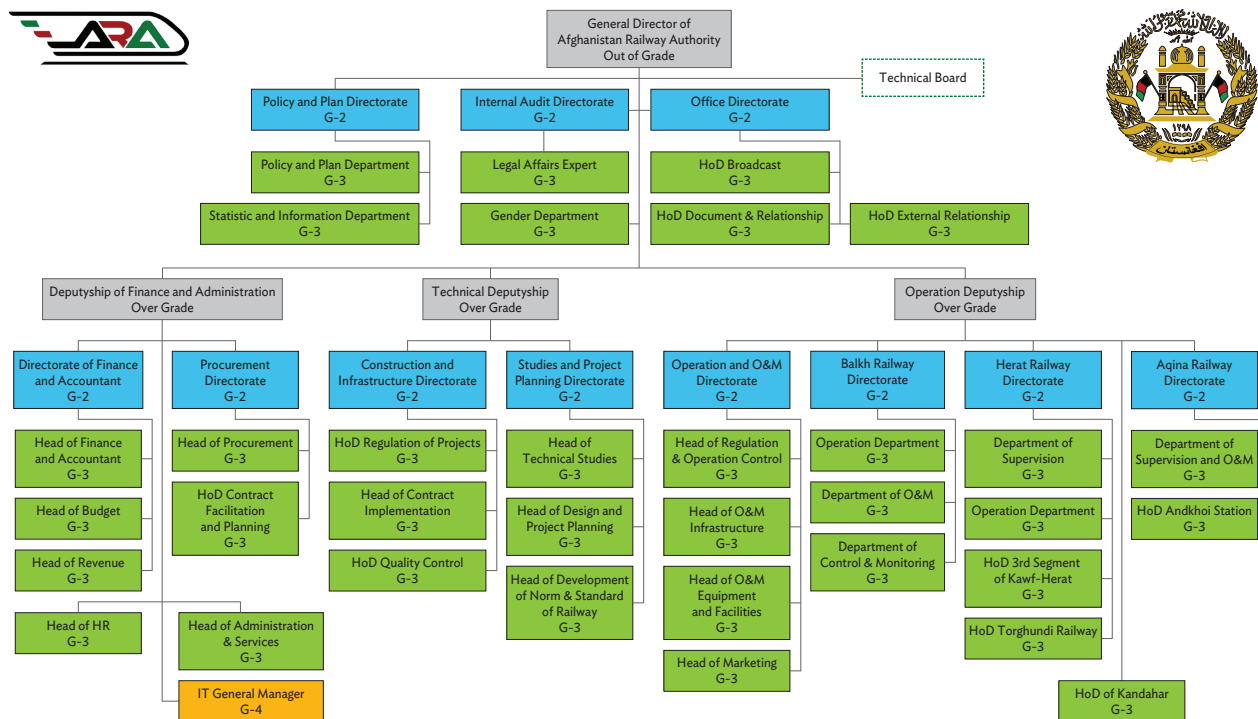
18. Since the economy is underdeveloped, and it will take time to overcome existing governance limitations and security threats, it will take time for railway traffic to build up. Development partners have therefore been advocating a two-step approach where they may consider financing new railway sections if there is a proven traffic basis or they may propose smaller investments in multimodal hubs if traffic remains uncertain, with the prospect that well-chosen hubs (located at the terminus of a railway section) can build up traffic on a multimodal basis that may eventually reach the levels needed to justify railway construction.

19. This pragmatic approach is reflected in the investment priorities of the ARA Strategic Plan. The short-term priorities are (i) construction of Mazar-e-Sharif to Herat railway line, (ii) construction of the Herat to Senghan (Iran) line, and (iii) construction of dry ports and multimodal hubs. This reflects expectations that the Northwestern–North corridor, along the country's northern border, has better prospects for attracting traffic, as well as recognition that relatively small investments in dry ports and multimodal hubs can produce immediate improvements in transport efficiency and help to build up potential railway traffic. ARA's investment priorities for the medium-to-long term focus on establishing railway connections to the Pakistan ports of Gwadar and Karachi, including construction of (i) the Mazar-e-Sharif to Kabul railway, (ii) onward connections from Kabul to Jalalabad and Peshawar (Pakistan), and (iii) further connections to Gwadar and Karachi ports (ARA 2018).

C. Institutional responsibilities for railways

20. The Afghanistan Railway Authority (ARA) was established in 2004 as a small department of the Ministry of Public Works (MoPW) responsible for leading the development of a national railway network. In 2009, it was expanded into a directorate. In 2012, ARA became an authority reporting to MoPW and in 2017 it became an independent authority reporting to the President's office. Following a Presidential decree in 2018, the Ministry of Transport and Civil Aviation (MoTCA) took over the transport responsibilities of MoPW and other agencies, including oversight of ARA. Through a further presidential decree in 2020, ARA is once more an independent authority reporting to the President's office.

⁶ Government revenue was only \$2.5 billion in 2018.

Figure 1.2: Organization Chart of the Afghanistan Railway Authority

Source: ARA 2020.

21. ARA's mission is to manage railway investment, development, design, construction, operations, and maintenance. It is also responsible for legal and regulatory policies governing rail investment, development, and operations. This includes regulatory oversight for ensuring a safe, efficient, and reliable rail network (ARA 2018). ARA's organizational structure is in Figure 1.2.

22. Afghanistan's first Railway Law was approved in October 2019. In addition to confirming the role and responsibilities of ARA, the law provides for the possibility of licensed enterprises/operators having a role in railway management, operations, and maintenance.

23. Within the ARA Strategic Plan, the main short-term priority for institutional development is to separate ARA's current functions for infrastructure development; sector regulation; operation of trains, dry ports and hubs; and maintenance of infrastructure, rolling stock and other assets. This is in line with international experience that sector policy and regulation should be separated from operational roles to avoid conflicts of interest. The strategic plan refers to establishing (i) a joint stock company (JSC) for Railway Infrastructure and Production, responsible for the building railways and associated infrastructure, (ii) a JSC for Railway Management and Operations, responsible for provision of railway services and railway maintenance; and (iii) an Institute of Railway Research, Consultancy, Education and Training, responsible for developing a skilled and capable railway workforce.

ARA is considering options for how to implement these institutional proposals, including whether to allow for possible private operators and how to incorporate them in organizational arrangements and reporting arrangements.

24. One of the greatest challenges for Afghanistan railway development is to build up sufficient human resource capacity. In 2018, ARA had a total of 326 staff positions (filled and vacant positions). Based on the ARA's 5-Year Plan, 2020–2024, this is to increase to 680 persons in the coming years (ARA 2019). Over the medium-to-long term, when the national railway network has been completed, the ANRP envisages railway employment increasing to 10,000 people, with a further 50,000 people employed indirectly (ARA 2018).

25. Since Afghanistan has no previous history of railways, most staff require specialized training to be capable of performing effectively. Between May 2016 and March 2019, 136 ARA staff took part in international railway training courses. Most of the courses were held in specialized railway training institutions in the PRC and Uzbekistan, as well as in Pakistan, Turkey, and India. The duration of courses was generally 1–3 months. Additionally, 25 staff took part in short in-country training courses. It remains to be seen how much more training will be required in future and what other methods will be needed to ensure that trained staff attain high standards of work performance, but it seems likely that extensive training and institution building will be needed for many years to come.

D. Cross-border and transit traffic routes

26. A millennium ago, the Silk Road extended from Asia to the Mediterranean. East–west routes through northern Afghanistan played an important role and enabled Afghanistan to benefit from trade

and transit traffic (Frankopan 2017). In modern times, however, Afghanistan has lacked the transport infrastructure, governance, and security needed to offer a competitive trade route, while other countries have established competing routes.

27. Unlike other CAREC Member Countries, Afghanistan has no history of serving cross-border traffic or transit traffic using railways. Data on existing trade with other countries and road traffic within Afghanistan can offer some indications about cross-border traffic segments that might potentially be attracted to railway, but this is likely to be quite speculative, particularly when considering parts of the country most affected by conflict.

28. As shown in Figure 1.3, Afghanistan is located close to a variety of existing and proposed regional railway corridors. In the south and southeast there are corridors through Pakistan, including to the ports of Karachi (including Port Qasim) and Gwadar, as well as limited onward connections through Pakistan to India. In the southwest there are corridors through Iran and its ports of Chabahar and Bandar Abbas. In the northwest there are corridors through Turkmenistan, with multimodal onward connections to Turkey and southern Europe on the Lapis-Lazuli Corridor via the Caspian and Black Seas. In the north there are links via Hairatan and Termez to the Uzbekistan railway network, providing onward connections to Kazakhstan, the Russian Federation and most Central Asian countries, and to Europe and the PRC on the multimodal Trans-Caspian International Transport Route (TITR). In the northeast there are links to Tajikistan.

29. The railway sector assessments prepared by the present TA for other CAREC countries have confirmed that across the region competition from road transport has eroded the freight market share of railways. In many countries, including Afghanistan, road transport is already the leading transport mode. While railways can potentially have cost, security, and other advantages for long distance freight, in practice the region's railways have often been unable to realize such advantages.

Figure 1.3: Regional Rail Links and Ports Serving Cross-Border and Transit Traffic

Notes: (1) Within the PRC, the map covers principal railway trunk routes used for trade between the PRC and CAREC member countries and regional railway links relevant for Inner Mongolia and Xinjiang, the two PRC regions that participate in CAREC; (2) the boundaries, colors, denominations, and any other information shown on this map do not imply, on the part of ADB, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries, colors, denominations, or information.

Source: TA consultants.

Reasons include deteriorated infrastructure and rolling stock, inefficient terminals, inflexible pricing and routing, and lack of customer orientation. There are also issues of inadequate cooperation among railways to streamline border crossings and gauge changes, offer door-to-door prices on international routes, and address customer concerns about damage to goods and insurance. So, when considering the potential of the proposed Afghanistan rail corridors, it is necessary to consider competition not only from other railway corridors but also from road transport which is the often main competitor.

30. Another issue is that oil products, coal and other bulk commodities generally account for a large proportion of railway freight, but the cost advantage of railway erodes over very long distances if multimodal transport using ocean shipping or oil pipelines are available. This is because transport costs per ton-km for shipping and pipelines are much lower than for railway.⁷ Consequently, longer distance, time-insensitive consignments will use ocean shipping if it is available. If there is no access to shipping, consignees may consider alternate sources that can use shipping or are located closer to the final destination.

⁷ Based on a world market price for non-coking coal of about \$40 per ton and a hypothetical railway transport cost of \$0.05 per ton-km, the transport cost will exceed the value of the coal for journeys beyond 800 km.

Hence, although India has a growing interest to import coal from the Russian Federation, this is likely to be transported directly from the Russian Federation to India by ocean shipping rather than incur the much higher cost of transport by railway (Economic Times 2019).

31. To compete with other railway corridors, Afghanistan will also have to drastically improve upon its present performance in border clearance. According to ADB's Corridor Performance Measurement and Monitoring (CPMM) reports, Afghanistan border clearance is very slow and involves substantial unofficial payments (ADB 2019b).

32. While trade patterns will evolve further in future, currently the main origins and destinations for Afghanistan's imports and exports are Pakistan, Iran, the PRC, Kazakhstan, Uzbekistan, and India (Table 2.1). European countries and the US are also notable trade partners. Attracting some of these trade flows to use railway will therefore be one of the starting points for establishing a viable railway in Afghanistan. A further focus will be to attract transit traffic, notably (i) between Central Asia and ports in Iran, (ii) between Central Asia and Pakistan ports, (iii) India and Central Asia via Pakistan, and (iv) between the PRC and Turkmenistan and Iran. For export, import and transit traffic, the Afghanistan railway will only be able to attract traffic away from existing modes and routes if enough of the proposed railway network is in operation to offer convenient connections to and from origins and destinations. Since initial traffic levels on much of the network could be low, a balance will need to be struck between investing in enough of the network to be capable of attracting traffic and avoiding overinvestment that would lead to heavy operating losses and debt service problems.⁸

33. Taking this into account, the likely segments of the international freight market relevant for Afghanistan over the medium and long term are summarized below:

- (i) **To and from Pakistan and India.** Since Pakistan and India are Afghanistan's near neighbors and among its leading trading partners, Afghan railway routes via Torkham and/or Spinboldak could attract traffic in future. This would depend on establishing improved cooperation with and between Pakistan and India. In particular, Pakistan would need to upgrade its railway which currently has very limited freight capacity, provide missing links to the Afghanistan border, and ease restrictions on traffic between Afghanistan and India. Depending on the gauge Pakistan adopts for upgrading and the gauge adopted by Afghanistan, a gauge change might be needed at the border. Railway would face strong competition from road transport, particularly for small consignments and exports of perishables. There is currently little trade in the types of bulk commodities that are better suited to rail.⁹ Over the medium-to-long term, some of Afghanistan's trade with India may also divert to use ocean shipping between Chabahar port and Mumbai and other Indian ports. India is currently assisting Iran to upgrade Chabahar port (Hindu Business Line 2019). If missing rail links have been provided, such traffic could route through western Afghanistan to connect with the Iran railway network at the Chah-e-Sorkh or Zaranj border crossing.

⁸ This is an important limitation of the ring-railway concept and one of the main reasons that development partners have advocated initially building limited sections of the network that can be justified by traffic, and on other sections providing multimodal hubs to facilitate efficient transfers to and from road transport.

⁹ Afghanistan's imports from India and Pakistan are mainly textiles and clothing, medical goods and small manufactured goods. Its exports to these countries are mainly fruits, vegetables, and nuts (Observatory for Economic Complexity 2020).

- (ii) **To and from Central Asia and the Russian Federation.** At present, Kazakhstan is Afghanistan's main trading partner in Central Asia on account of Kazakh exports of wheat, flour, and petroleum gas. Kazakhstan has the region's most developed railway and its export commodities are well-suited for railway transport. Trade with Uzbekistan has also grown rapidly following recent economic liberalization in Uzbekistan, and trade with other Central Asian partners also has growth potential. Most trade with Kazakhstan, Uzbekistan, the Kyrgyz Republic, and the Russian Federation might be expected to route via Kazakhstan and Uzbekistan, crossing the border at Hairatan. The Turkmenistan border crossings at Aqina and Turghundy might also attract some traffic to and from Turkmenistan and the Russian Federation, although the volume of existing trade is quite low. Within Central Asia and the Russian Federation all of the railways use Russian gauge, so no gauge changes are needed beyond Afghanistan's borders and there would be advantages if the proposed railway in northern Afghanistan also adopted Russian gauge.
- (iii) **To and from the PRC and East Asia.** Afghanistan's trade with the PRC has grown rapidly in the last few years, and is likely to grow further in future. The main existing trade is PRC exports of manufactured goods to Afghanistan. If transported by road, commonly used routes from Kashgar (PRC) are via Osh (Kyrgyz Republic) to the Fergana Valley (Uzbekistan) and through Uzbekistan to Hairatan or via Kulma Pass (Tajikistan) and along the Pamir Highway

to enter Afghanistan at Nizhny Pyanj/Shirkhan Bandar.¹⁰ These routes pass through remote, mountainous terrain and are subject to weather-related closures during winter. If transported by rail, traffic takes the TITR from the PRC through Kazakhstan and proceeds through Uzbekistan to enter Afghanistan at Hairatan. A gauge change from PRC standard gauge to Russian broad gauge takes place at the Kazakhstan–PRC border.¹¹ The competitiveness of railway between Afghanistan and the PRC would be improved if a more direct route could be introduced. One such route under consideration by respective governments is the proposed PRC–Kyrgyz Republic–Uzbekistan railway. Another proposal is to build a railway from Kashgar through Tajikistan that could connect with Afghanistan via Termez (Uzbekistan) and Hairatan or via Nizhny Pyanj (Tajikistan) and Termez. The ANRP also includes developing a direct railway connection with the PRC by extending the Northwestern–North–Northeastern Corridor eastwards to the PRC border at Wakhan. However, this would traverse mountainous terrain so the investment cost would be high, and there is little indication that traffic levels would be enough to justify investment.

- (iv) **To and from Iran and the Middle East.** Afghanistan's existing trade with Iran grew rapidly in 2018, having been modest in preceding years. This is mainly comprised of construction materials, food and oil products. Trade with Iran should grow further once Iran economic sanctions are ended and transport links are improved.¹²

¹⁰ Use of the more direct route via Irkeshtam (Kyrgyz Republic), Karamyk, and Dushanbe (both Tajikistan) is currently restricted to bilateral traffic between Tajikistan and the Kyrgyz Republic.

¹¹ In September 2019, the PRC arranged the first container block train from Hairatan to Jianxi Province using this route.

¹² Iran's existing railway freight capacity is limited by relatively low axle loads and prioritization of passenger traffic. Its freight tariffs are among the highest in the region (Harral Winner Thompson Sharp Klein 2012).

Over the medium-to-long term, the ports of Bandar Abbas and Chabahar [item (i)] are likely to become important ocean shipping outlets for the surrounding region. Having access to these ports would improve the viability of mining developments in Afghanistan. By obtaining access to liner container shipping services through these ports Afghanistan would benefit from lower shipping rates for all of its containerized trade. This could also lead to growth in freight containerization and introduction of container block train services that would further improve the competitiveness of railways compared with road transport. Iran's railway network could also provide Afghanistan with onward connections to Turkey and the Middle East without having to cross the Caspian or Black Seas.

- (v) **To and from Europe and the US.** Currently, Afghanistan's trade with Europe is relatively small. Whereas the US was previously a source of Afghanistan imports, this was mainly for military supplies and has reduced significantly now that the US is stepping down its military engagement. For lower value goods such as bulks, the most efficient route to Europe and the US is to use ocean shipping from the ports of Pakistan or Iran. Currently, transport to and from the ports is mainly by road. Once missing links are built to connect Afghanistan with these countries' railway networks, and Pakistan and Iran upgrade their networks to carry additional freight, much of the traffic could switch to rail.

For higher value goods, or if access to ports in Pakistan or Iran is restricted, Afghanistan would have several other potential railway options, although the journey cost is high. One option would be connecting through northern Afghanistan to the existing multimodal routes across the Caspian and Black Seas using either the TITR via Uzbekistan or the Lapis-Lazuli Corridor via Turkmenistan. A further option would be by rail from western Afghanistan to Iran and Turkey (this would avoid having to cross the Caspian Sea). On all of the routes to Europe, railway would also face competition from road transport for part or all of the journey.

- (vi) **Transit traffic through Afghanistan.**

Although Afghanistan has little recent experience of serving transit traffic, it could potentially attract transit traffic if its railway network is developed to offer efficient routing options. The main segments of potential transit traffic are (a) between Central Asia and Iran, (b) between Central Asia and Pakistan and India, and (c) between the PRC and Iran and the Middle East.¹³ Landlocked Central Asian countries are eager to gain access to the deep-water ports of Iran and Pakistan. Between Central Asia and Pakistan and India, routes through Afghanistan could offer shorter journey distances, but these will only be feasible if Pakistan upgrades its railway infrastructure and improves its freight operations. Prospects for serving transit traffic to and from India would depend on improvement in relations between Pakistan and India.

¹³ There could also be potential for Afghanistan to serve transit traffic using land transport between Central Asia and India, although existing trade between these countries is small.

Figure 1.5: Sections of CAREC Corridor 2 Relevant for Afghanistan



Source: CAREC Secretariat.

36. CAREC Corridor 2: Mediterranean–East Asia—Subcorridor 204 (Figure 1.5).

This corridor connects the PRC with Turkey and southern Europe via Central Asia. The southern part of Corridor 2 (Subcorridor 204) includes sections of Afghanistan’s proposed Northwestern–North–Northeastern Corridor between Shirkhan Bandar and Chah-e-Sorkh. Much of the corridor traverses sparsely populated mountainous terrain. Currently, only the sections in Iran and the PRC (as far west as Kashgar) have been built. Construction costs would be very high and there are no firm plans to build the missing sections. The route would cross multiple countries which would add to the costs and time for border crossing. While the existing sections in Iran and the PRC are standard gauge, some of the missing links might require changes of gauge since the Kyrgyz Republic, Tajikistan, Uzbekistan, and Turkmenistan all use Russian broad gauge.

37. Subcorridor 204 could potentially provide through rail services between the PRC, the Kyrgyz Republic, Tajikistan, Afghanistan, Turkmenistan, and Iran and countries beyond. It would offer a route to Turkey and southern Europe that avoids having to cross the Caspian Sea. However, it would face strong competition from the northern and southern sections of the existing TITR (Subcorridors 201 and 102)¹⁴ and potentially also from the Lapis-Lazuli corridor (Subcorridor 203). Should the countries concerned decide to build the proposed PRC–Kyrgyz Republic–Uzbekistan Railway between Kashgar and the Fergana Valley, which would complete Subcorridor 203, there would be less likelihood that countries would be willing to invest in construction of the missing links on Subcorridor 204 between Afghanistan and the PRC.

¹⁴ Subcorridor 201 covers the northern section of the TITR. Between the PRC and Shalkar, it is the same as using Subcorridors 101 and 103 (para. 25).

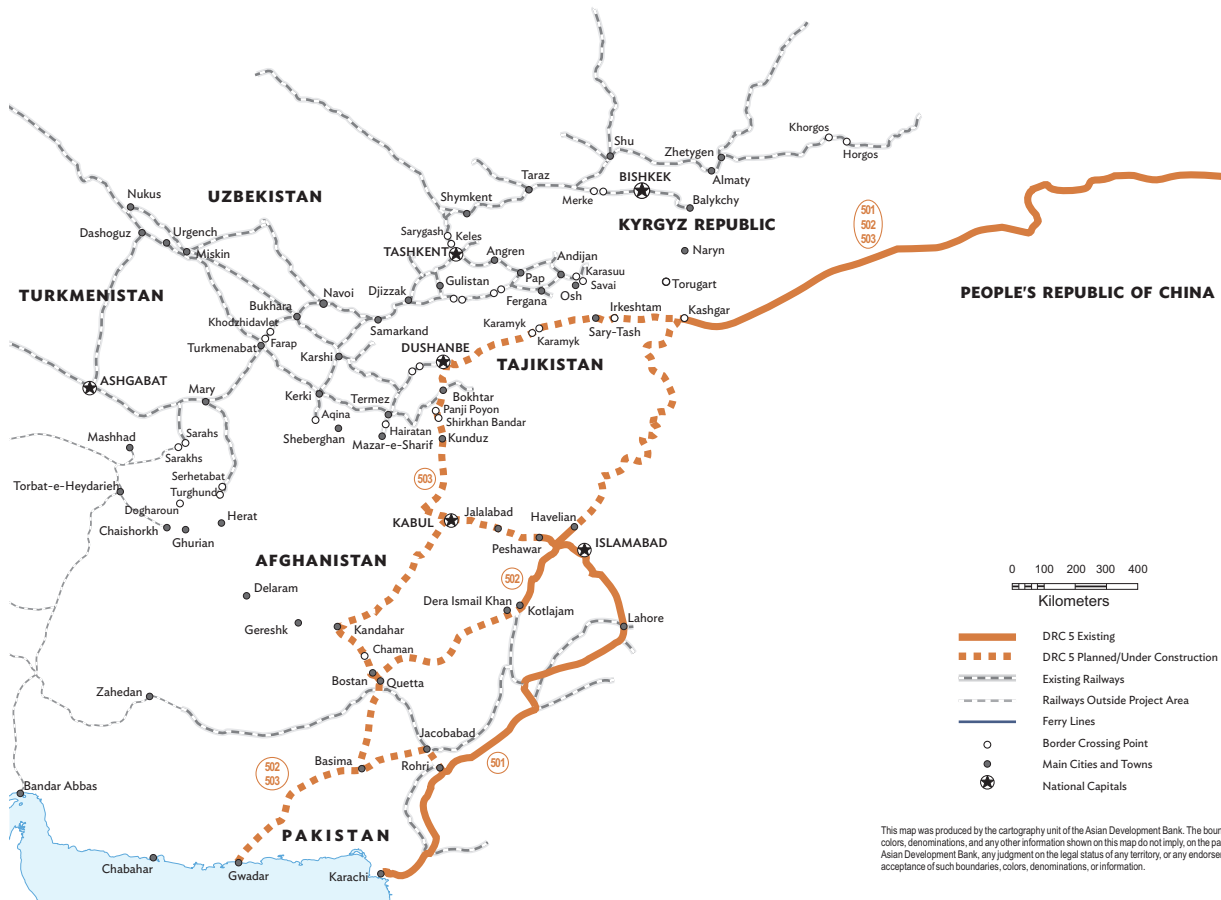
Figure 1.6: Sections of CAREC Corridor 3 Relevant for Afghanistan

Source: CAREC Secretariat.

38. CAREC Corridor 3: Russian Federation–Middle East and South Asia—Subcorridor 302 (Figure 1.6). This corridor connects the Russian Federation with Iran’s deep-water port of Bandar Abbas via Central Asia. Subcorridor 301 is the established existing rail route. It extends through the Russian Federation, Kazakhstan, Uzbekistan, Turkmenistan, and Iran. While throughputs at Bandar Abbas are currently reduced due to economic sanctions, this port was of strategic importance for landlocked Central Asia countries in the past and is likely to resume this role when sanctions end.

Subcorridor 302 provides an easterly loop to connect southern Uzbekistan and Afghanistan into Subcorridor 301. The portion within Afghanistan covers part of its proposed Northwestern–North–Northeastern Corridor between Hairatan and the Iran border at Chah-e-Sorkh, but only the short link from Hairatan to Mazar-e-Sharif has been built. The connection between Chah-e-Sorkh and the Iranian railway network is a missing link.

Figure 1.7: Sections of CAREC Corridor 5 Relevant for Afghanistan



Source: CAREC Secretariat.

39. CAREC Corridor 5: East Asia–Middle East and South Asia—Subcorridor 503 (Figure 1.7).

This corridor connects the PRC with Pakistan via the Kyrgyz Republic, Tajikistan, and Afghanistan. To the south, it provides access to Pakistan's deep-water ports of Karachi and Gwadar. To the north, it provides access to the PRC. Subcorridor 501 proceeds directly from Kashgar (PRC) to Pakistan. Within Pakistan it extends through Islamabad and Lahore to Karachi. Much of the subcorridor is similar to the proposed China–Pakistan Economic Corridor (CPEC) that Pakistan and the PRC have been considering to rehabilitate Pakistan's main railway line. The section from Kashgar to northern Pakistan passes through mountainous terrain and would be

very costly to construct. Subcorridor 502 provides a direct link within Pakistan from near Peshawar to Gwadar port. Most of this subcorridor has yet to be built. Subcorridor 503 extends Corridor 5 westwards to connect with north and eastern Afghanistan, the Kyrgyz Republic, and Tajikistan; with Karachi via Subcorridor 501; and with Gwadar via Subcorridor 502. Within Afghanistan the subcorridor passes from Shirkhan Bandar to the Torkham border with Pakistan via Kunduz, Kabul, and Jalalabad. North of Kunduz, this follows Afghanistan's proposed Northwestern–North–Northeastern Corridor. South of Kunduz, it follows the proposed North–Southeastern Corridor. None of Subcorridor 503 has yet been built.

Figure 1.8: Sections of CAREC Corridor 6 Relevant for Afghanistan

Source: CAREC Secretariat.

40. Corridor 5 is strategically important for Afghanistan as it would connect the northern and eastern parts of the country with Pakistan and India, which are its principal trading partners, and also with the PRC. Having efficient rail access to Pakistan's ports would improve Afghanistan's economic competitiveness and make it possible to serve transit traffic to the ports from Uzbekistan and other Central Asian countries.

However, a long time frame may be needed before this corridor can be built as construction costs would be very high due to the mountainous terrain.

41. CAREC Corridor 6: Europe–Middle East and South Asia—Subcorridor 605 (Figure 1.8).

This corridor connects Europe with Iran and Pakistan, and will provide hinterland cities with access to the deep-water ports of Karachi, Gwadar, and Bandar Abbas.

Subcorridor 605 connects Herat and other parts of western and southern Afghanistan with the Pakistan railway network via Kandahar, Spinboldak, and Quetta, and connects with Gwadar port and Karachi Port via Subcorridor 604. North of Herat, the subcorridor enters Turkmenistan at Turghundy and proceeds to the Russian Federation on the north coast of the Caspian Sea via Kazakhstan. The sections in Afghanistan are similar to Afghanistan's proposed Northwestern–South–Southeastern Corridor. While Subcorridors 601–604 are largely complete,¹⁵ the Afghanistan and Pakistan sections of Subcorridor 605 have yet to be built.

42. Similar to Corridor 5, this corridor is strategically important for Afghanistan as it would provide rail access to Pakistan and its ports, and make it possible to serve transit traffic from Turkmenistan, Uzbekistan, and other Central Asian countries. However, investment costs would be high and Afghanistan and Pakistan have not prioritized these links for early investment.

¹⁵ The missing link between Iran and Azerbaijan is understood to be under construction with expected completion in 2021.

TRENDS IN RAILWAY TRAFFIC

A. Introduction

43. Since railway operations only began in late-2011, and have been confined to short railway sections connecting with the northern border, Afghanistan is still at an early stage of building up railway traffic.

B. Analysis of traffic

1. Existing railway traffic

44. Based on limited available data, Afghanistan's total annual freight volume has been in the region of 1.7–4 million tons, with freight turnover of 80–200 million ton-km. Most of the traffic is on the Hairatan–Mazir-e–Sharif railway section, with smaller tonnages and very small freight turnover through the recently opened railway stations at

Aqina and Turghundy. Most of the Hairatan–Mazir-e–Sharif tonnages are imports reaching the country via the Uzbekistan railway network. There are few trains carrying export traffic in the opposite direction. The main import commodities carried by rail are oil and oil products, grain and flour, and iron and steel. The main railway export commodities are agricultural products and construction materials (Canarail-Appleton 2014, 2017).

45. Traffic on the Hairatan–Mazir-e–Sharif section has been less than originally forecast (ADB 2015). Studies have found that 55% of import traffic arriving at Hairatan by railway is transloaded into trucks instead of using the new railway. This mainly affects fuel imports. Reasons include that there are better established facilities for customs clearance, storage and transloading at Hairatan compared with at the Naibabad station near to Mazir-e–Sharif.

Table 2.1: Afghanistan Railway Traffic, 2012–2019

Railway Section	2012	2013	2014	2015	2016	2017	2018	2019
Freight volume (ton '000)								
Hairatan–Mazar-e–Sharif	3,944	3,071	3,298	3,005	1,734	1,846	2,258	2,779
Aqina Railway					8	122	236	367
Turghundy Railway							430	280
Total	3,944	3,071	3,298	3,005	1,742	1,968	2,924	3,426
Freight turnover (million ton-km)								
Hairatan–Mazar-e–Sharif	197	154	165	150	87	92	113	139
Aqina Railway ^a					0	1	2	4
Turghundy Railway ^a							3	2
Total	197	154	165	150	87	94	119	145

^a Freight turnover is very low because the length of track is only 10 km at Aqina and 8 km at Turghundy.

Source: ARA 2020.

Figure 2.1: Section of Hairatan–Mazir-e-Sharif Railway



Source: ADB.

Naibabad has no customs office or authorized bank to collect customs revenue (ADB 2017b), and only limited cargo handling facilities (Canarail-Appleton 2014). In view of these difficulties, it is often more convenient for customers to transfer cargo to road transport at Hairatan, especially if the final destination is well beyond Mazir-e-Sharif so that transfer to road would be needed anyway. Another problem noted by the ADB-financed Afghanistan Transport Sector Master Plan Update (2017–2036) is that the railway administrations on both sides of the Afghanistan–Uzbekistan border are overly bureaucratic, and cargo handling is very slow, which contributes to avoidable delays for customers (ADB 2017b).

2. Sources of future traffic

46. Several studies have considered future traffic in the event that the existing railway is extended along the proposed Northwestern–North–Northeastern Corridor. However, such studies have been quite speculative. Reasons include the limited availability of data, difficulty to conduct traffic surveys and interviews with transport users and service providers, and uncertainties about the future security situation and its effect on economic development.

47. Existing trade flows provide some indications of traffic that might be attracted to use an expanded railway. Table 2.2 provides a breakdown of Afghanistan’s annual imports by main trading partner.

Table 2.2: Afghanistan Imports by Value and Trading Partner, 2018 (\$ million)

	2014	2015	2016	2017	2018
People's Republic of China	1,038.21	1,043.99	1,237.69	1,456.30	1,165.93
India	107.67	130.63	327.73	404.37	354.28
Kazakhstan	0.00	426.84	1,170.19	1,436.42	790.75
Russian Federation	0.00	157.39	193.32	232.07	157.70
Turkmenistan	0.00	632.41	466.57	0.00	385.42
Uzbekistan	0.00	336.00	784.03	964.95	553.95
Iran	1,497.08	1,807.99	1,197.80	1,313.44	1,264.17
Pakistan	1,327.95	1,346.41	1,350.70	1,558.47	1,086.85
Other	3,733.06	1,846.53	2,023.57	2,468.07	1,647.51
Total	7,650.74	7,662.46	8,618.55	9,671.11	7,285.29

Source: IMF 2020.

Table 2.3: Afghanistan Exports by Value and Trading Partner, 2018 (\$ million)

	2014	2015	2016	2017	2018
India	159.97	188.89	236.75	281.19	359.44
Pakistan	188.43	226.56	125.20	132.72	378.24
Other	66.36	155.95	76.56	84.43	137.50
Total	414.76	571.40	438.51	498.34	875.18

Source: IMF 2020.

In 2018, the leading sources of imports were Iran (17%), the PRC (16%), Pakistan (15%), Kazakhstan (11%), and Uzbekistan (8%). The main imports are oil and oil products, wheat and flour, manufactured goods, and machinery.

48. Table 2.3 provides a breakdown of Afghanistan's annual exports by main trading partner. In 2018, the leading destinations of exports were Pakistan (43%) and India (41%). Exports mainly consist of agricultural products, rugs and carpets, and food.

49. In future, Afghanistan plans to export minerals and mineral products by railway. Much of the proposed ring-railway is located near to mineral-rich areas. Railways are well-suited for transport of ores and refined mineral products, either for direct export to receiving countries or to be transported to the nearest port.

50. Some of Afghanistan's existing imports could be attracted to railway if the network is expanded to offer transport over longer distances, railways are operated efficiently, and tariff levels are competitive compared with road transport.

Oil and oil products (e.g., from Iran), grains and flour (mainly from Kazakhstan), and iron and steel are bulk commodities that well-suited for railway transport.¹⁶ Most higher value and time-sensitive cargo, such as imports of manufactured products and machinery, are likely to continue using road transport which is faster and more responsive to customer concerns, but over the medium-to-longer term some of this traffic could be attracted to railway if containerized services are expanded, especially if it becomes feasible to operate container block trains.

51. To attract additional traffic, railways services need to be capable of competing with road transport in terms of both price and quality. Road transport is the established transport mode in Afghanistan. In 2014/2015, it transported 7.3 billion ton-km compared with only about 100 million ton-km by railway (ADB 2017b). Compared with neighboring countries, trucking rates in Afghanistan are relatively high. This reflects the poor condition of the road network and the continuing security issues. When an expanded railway begins to compete with road transport for more of the market, it is likely that road transport companies will respond by lowering truck rates.

52. Over the medium-to-long term, assuming that the security situation improves, it may be expected that Afghanistan's internal and external trade will expand considerably. This could potentially support growth in both railway and road transport. Another important factor will be whether investors go ahead with major mining developments (e.g., iron and copper ore). Some of the larger proposed mining developments could generate high volumes of bulk commodities for transport to export markets. A further possibility is that once sufficient connectivity has been established within the national railway network (inclusive of multimodal rail-road options), and links to ports in Pakistan and Iran have been built, the Afghanistan railway could potentially attract some segments of transit traffic. However, Afghanistan would face strong competition from neighboring railways.

¹⁶ The railways of neighboring Uzbekistan, Kazakhstan, and Turkmenistan transport large quantities of these commodities.

MARKET COMPETITIVENESS

A. Introduction

53. Afghanistan's freight market is dominated by road transport. Road transporters face few market entry barriers and no regulation of tariffs, so there is intense competition among truck operators. The average length of haul for freight transported by road is 289 km (ADB 2017b) which is higher than in some neighboring countries and reflects the importance of road transport for both short- and long-distance freight.

B. Market feedback

54. Various recent studies of transport and railways development in Afghanistan have included interviews with shippers, transport companies, and other market participants. Based on these studies, market feedback on the potential competitiveness of an Afghanistan national railway network is summarized in Table 3.1.

Table 3.1: Potential Rail Competitiveness of Different Freight Traffic Types Once a National Railway Network Has Been Developed in Afghanistan

If Competitive	Traffic Type	Examples	Explanation of Rail Competitiveness
Rail is competitive	Project cargo, out-of-gauge cargo	Military supplies, electricity generation and mining equipment	Rail has advantages for moving extra heavy, over-dimension cargo
	Bulk commodities	Imports of oil products grain and flour, and iron and steel	For reasons of cost, safety and security, rail is likely to be the preferred mode
	Minerals	Proposed iron ore and copper ore mines	Rail is efficient in handling bulk cargo, which often requires specialized equipment
	Chemicals	Poisonous, flammable, corrosive cargo; fertilizers and chemicals	Rail has advantages for safety and security which are prime considerations
	Long-distance containerized traffic	Higher value Afghan imports and exports to and from Central Asia, the PRC and Iran; regional transit traffic	Existing PRC–Central Asia services have demonstrated the potential for block trains to offer fast, reliable and secure transport
Rail is not competitive	Time sensitive and high value cargo	Electronics	Driver teams are better at protecting cargo from theft
	Consumer products	Small to medium sized shipments requiring door-to-door service	Road is generally less costly, faster and simpler to organize, especially for shorter trips (e.g., 100–300 km) and for origins and destinations far from the railway line
	Perishables	Imports of fresh produce	Road is faster, more reliable (including real time tracking and tracing), and better at handling problems such as mechanical failure of refrigerated units

PRC = People's Republic of China.

Source: TA consultants.

55. Once the railway network has expanded to offer greater connectivity to the main origins and destinations of traffic, it could potentially be competitive for project cargo, bulk commodities, minerals and chemicals. There could also be potential for railways to carry long distance containerized traffic if growth in containerization makes it possible to operate regular container block train services and assuming that necessary facilities and terminals on route are provided. Similarly, the Afghanistan railway could potentially attract some types of regional transit traffic (para. 33) if the railway is competitive in terms of price and service quality and border crossings operate efficiently. There would, however, be strong competition from other railways, such as UTY. Railway is unlikely to become competitive for some other categories of cargo. These include time-sensitive cargo and high value goods, consumer goods, and perishables.

56. Multimodal transport solutions can improve the competitiveness of railways compared with road transport. Afghanistan is pursuing this approach through its strategy of developing multimodal hubs to initially build up traffic on a multimodal basis (para. 18). To succeed with this strategy, the multimodal terminals will need to be efficient, modern facilities offering high quality, competitively-priced logistics services. Experience in other CAREC countries indicates that publicly-owned railway organizations often lack the commercial orientation needed to build and operate such hubs, and that this role is best done by the private sector (e.g., through a concession).

57. A higher share of containerized transport would also help to reduce the problem of gauge changes in the future network. Containers can be quickly and easily reloaded from one train onto another. This requires only minimal initial investment in transshipment equipment and such equipment is usable for all kinds of containerized goods. All of Afghanistan's existing and future import and export products could potentially be transported in containers, even mineral ores if specialized containers are used.

C. Issues affecting rail competitiveness

58. Taking into account the experience of railways in neighboring countries, Afghanistan will need to develop effective solutions to a series of common problems that can limit the competitiveness of railway transport. These are discussed below.

59. **CAREC railways need to prioritize freight services.** In many countries, railway freight operations can potentially generate financial returns whereas passenger services are loss-making and require cross-subsidy. However, some CAREC countries give operational priority to passenger services. This leads to freight trains being delayed to allow passage of passenger trains, and to passenger service investments being prioritized over those for freight. By compromising the quality and speed of freight services, this makes freight services less attractive to customers, leading to loss of traffic, revenue and profitability. To ensure the Afghanistan railway will be capable of competing for freight traffic, it should be developed primarily as a freight railway, investments in freight should be prioritized, and freight services should have operational priority over passenger services. If any provision of passenger services is considered in Afghanistan, these should be run as a separate business, with separate accounting and any subsidy provided by the government and not taken from freight earnings.

60. **Road transport is dynamic and highly competitive.** Trucks are abundant, transport by road is fast and flexible, and truck companies adjust their prices as necessary. Shippers can use trucks to serve a much larger range of origins and destinations. Empty movements are less of a problem for trucks, as road carriers respond quickly to seasonal and other changes in demand, and can triangulate to achieve loaded, profitable round-trips. In view of competition from road transport, railway should focus on market segments where use of railway can offer significant advantages to customers.

61. Any single railway has only limited control over the door-to-door prices for long distance international traffic including transit traffic.

Much of the journey distance may be within other countries on route, so Afghanistan's freight rates may have less influence on door-to-door prices than the freight rates of the other railways. This points to the need for caution about Afghanistan's ability to attract transit traffic, and also underscores the need to develop close coordination and partnership with the other railways on principal transit traffic routes, including mechanisms for offering customers all-inclusive door-to-door freight rates.

62. To attract and retain traffic a railway needs to be customer-oriented. One of the competitive advantages of road transport is that trucking companies are easy to contact, provide price quotations without delay, and are generally prepared to tailor their offering to address customer requirements. In contrast, most CAREC railways are difficult to contact, take a long time to provide price quotations, and are generally quite inflexible about customer requirements. It is also common for customers to face lengthy bureaucratic procedures and repeated requirements to be physically present to make small official or unofficial payments when obtaining a railway slot, clearing customs and collecting goods upon arrival. Customers of the Afghanistan railway have cited similar problems when dealing with both UTY and the Afghanistan railway. Very large customers can afford to devote resources to these tasks but other customers cannot and therefore prefer to use road transport. This lack of customer-orientation is an important reason why other CAREC railways have lost most of their non-bulk traffic and been unable to attract new sources of traffic. One important lesson is that all freight railways require a modern commercial department responsible for sales, marketing and customer support.

This department should play a leading role in developing, implementing, and monitoring the overall business strategy of the railway.

63. Economic regulation should focus on avoidance of monopoly while allowing railways flexibility on pricing. To compete with road transport (and other railways), the Afghanistan railway needs to be able to adjust freight rates to match market conditions. Future railway regulatory arrangements should avoid the outdated practice of requiring the railway to obtain government approval for a fixed tariff schedule, and should instead focus economic regulation on guarding against monopoly practices.

64. Need to be competitive with transport routes in neighboring countries. Since there are other existing transit routes in neighboring countries, Afghanistan will need to offer a transport logistics chain that can compete with these routes. Factors to be considered include changes of gauge, the services to be provided by multimodal hubs, and border crossing procedures. Each step in the journey should be seamlessly connected and customer-oriented to ensure a quick and efficient transit through Afghanistan. Establishing cooperation instead of competition with neighboring railways can be a key to success.

65. Improving the security situation. Continuing security risks make it difficult to attract traffic and organize efficient railway services, lead to escalation in investment costs, and limit the interest of international companies to participate. For any customer interested in rail transport, it is essential that the complete transport logistics chain, including border crossing, is secure and reliable.

RAILWAY OPERATING AND FINANCIAL PERFORMANCE

A. Introduction

66. This chapter briefly discusses the commercial orientation of the Afghanistan railway and its operating and financial performance.

B. Commercial orientation

67. Afghanistan is still at an early stage of railway development, with most of the proposed railway network yet to be built and railway services operated under a concession until sufficient national staff are trained. Significant aspects of the institutional arrangements for the railway sector have yet to be decided. These include the roles and responsibilities for (i) railway regulation, (ii) development of railway infrastructure, and (iii) operation of railway services. The approach adopted to these aspects will be an important determinant of whether the railway has the commercial orientation needed to achieve profitability and longer-term financial sustainability.



Afghanistan is still at an early stage of railway development, with most of the proposed railway network yet to be built and railway services operated under a concession until sufficient national staff are trained.

68. Based on the experiences of other CAREC railways, and drawing upon international best practices, several suggestions are provided below on how to structure future institutional arrangements to ensure a strong commercial orientation:

- **Involve capable partners in sharing risks and responsibilities.** If Afghanistan proceeds alone, the investment costs will be very high compared with its financing capacity, railway operations will be challenging as it lacks previous railway operations experience and trained staff, and market development will face significant risks over whether regional railways will provide traffic. The government should explore options to partner with other capable entities to share some of the risks and responsibilities for railway investment and operations. Potential partners could include (i) railways of neighboring countries seeking to establish routes through Afghanistan (e.g., Uzbekistan, Kazakhstan, Turkmenistan, the PRC), (ii) private mining companies that need railway for transportation of mining outputs, (iii) private freight logistics companies interested to build and operate railway terminals, stations and multimodal hubs, and (iv) private companies, including major railway users and leasing companies—that wish to acquire and manage their own rolling stock for use either in transporting their freight or leased to the railway for general use. Involvement of such entities would ensure a strong commercial orientation with infrastructure development separated from

operations, establish well-defined roles and responsibilities, and create payment mechanisms making the project more marketable to potential participants and financiers.¹⁷

■ **Separate regulation and policy, infrastructure and operations.**

International experience indicates that commercial orientation and clarity of purpose are likely to be compromised by conflicts of interest if the entity responsible for regulation and policy is also responsible for infrastructure provision or operations. Similar conflicts are likely to arise if the entity responsible for building and maintaining the railway infrastructure is also responsible for railway operations.

■ **Separate the main lines of business.**

Each of the main railway businesses should be a separate business or profit center, with separate accounts, so that Management can monitor their business performance and take steps to address problems when they arise.

■ **Adopt internationally-accepted, transparent accounting practices.**

Reliable financial information is essential for running a commercially-oriented railway business. This requires that accounts should be kept in accordance with International Accounting Standards and International Financial Reporting Standards, making realistic provision for depreciation, and subject to independent external audit.

■ **Prioritize railway freight over passengers.**

Freight operations generally have potential to be profitable but passenger operations rarely do. The Afghanistan railway should focus on serving freight. Should it be necessary to operate passenger services,¹⁸ freight should have operational priority to avoid the problem of passenger services compromising freight train schedules. Any passenger services should be operated as a separate business line, with separate accounting, and any passenger subsidies should be separately financed by the government in the form of a public service obligation.

■ **Establish a modern commercial department at the heart of the business.**

Top performing railways have a deep understanding of their existing and potential customers and their changing needs. This helps them retain existing traffic, attract new sources of traffic, and optimize revenue by adjusting charges taking into consideration customers' willingness to pay. This requires the railway to establish a strong commercial department responsible for sales, marketing, and customer support. Since attracting traffic and optimizing revenues are fundamental to business performance, this department should play a leading role in developing, implementing, and monitoring the overall business strategy of the railway.

¹⁷ A recent study proposes such an approach for structuring the proposed Mazar-e-Sharif to Herat Railway Project. According to this proposal, a regional transport company would raise infrastructure financing and oversee market development, while a railway infrastructure company would take charge of infrastructure provision and a railway operations company would provide the railway services. The ARA and the railways of Uzbekistan, Kazakhstan, and the Russian Federation would be the shareholders of the regional transport company. Each would contribute equity that would be matched by additional debt financing from development partners. The company would collect transit fees and distribute them to the infrastructure and operations companies. It would also oversee the development of cross-border traffic (e.g., exchange of traffic guarantees), coordinate regional freight movements and corridor management, formulate service level agreements and key performance indicators, and set transit tariffs for cross-border traffic. The ARA would act as concessioning authority to procure the infrastructure company which would build, operate, and maintain the railway infrastructure. ARA would also form a joint venture with a regional railway to be responsible for railway operations (including provision of rolling stock, both as equity and debt-financed). The operations company would pay track access charges to the infrastructure company (Ernst and Young 2020a).

¹⁸ Most passenger transport needs can be met by privately operated passenger bus services without need for public financing.

- **Only take on overheads that are justified by business needs.** Fixed costs are relatively high in the railway business but some CAREC railways compromised their business by taking on unnecessary overheads. For example, many railways expanded their staff size beyond levels needed to operate the business and found it difficult to reduce staffing when traffic declined. Similarly, some railways established noncore businesses—including hospitals, social facilities, hotels and factories—that were outside of their area of competence, instead of focusing on running a profitable railway.
- **Allow flexibility on railway freight tariffs.** To equip railways to compete with road transport and other railways, they need to be able to adjust freight rates to match market conditions in the same way that truck companies do. Tariff regulations should therefore avoid the outdated practice of requiring the railway to obtain government approval for a fixed tariff schedule. Economic regulation should focus on protecting customers from monopoly pricing practices (a significant degree of protection is already provided through competition from the road transport industry which is highly competitive).

C. Financial performance

69. Information on the annual operating revenues and costs of Afghanistan railway operations during 2012–2019 is summarized in Table 4.1. This suggests that initial railway operations have been profitable which is surprising since traffic levels are still quite low and railways generally require higher traffic in order to be profitable. It should be noted that ARA does not compile such financial information on the basis of International Accounting Standards and International Financial Reporting Standards. For example, no provision is included for costs of depreciation. Based on the actual investment cost of \$155.6 million for Hairatan–Mazir-e-Sharif (ADB 2013), and assuming straight line depreciation with an average asset life of 30 years, the annual cost of depreciation may be around \$5.2 million equivalent to approximately AF400 million (assuming \$1.00 = AF76.65). At this level of depreciation, annual pre-tax profits would be much reduced. Another factor is that ADB provided the financing for Hairatan–Mazir-e-Sharif on a grant basis, so there are no associated interest charges. Since the operation and maintenance of Hairatan–Mazir-e-Sharif is contracted out, a further possible explanation could be that the terms of this contract with SE Sogdiana Trans are relatively favorable to ARA.

Table 4.1: Afghanistan Railway Authority Annual Operating Revenues and Costs, 2012–2019
(AFS million)

	2012	2013	2014	2015	2016	2017	2018	2019
Income	2,642	2,026	2,209	2,043	1,296	1,377	2,105	2,638
Operating expenses ^a	(1,502)	(753)	(985)	(801)	(36)	(81)	(737)	(1,270)
Other expenses	(660)	(737)	(680)	(690)	(700)	(720)	(760)	(760)
Profit before tax	480	536	544	552	560	576	608	608

^a Includes annual cost of contract with SE Sogdiana Trans for operation and maintenance of Hairatan–Mazir-e-Sharif.

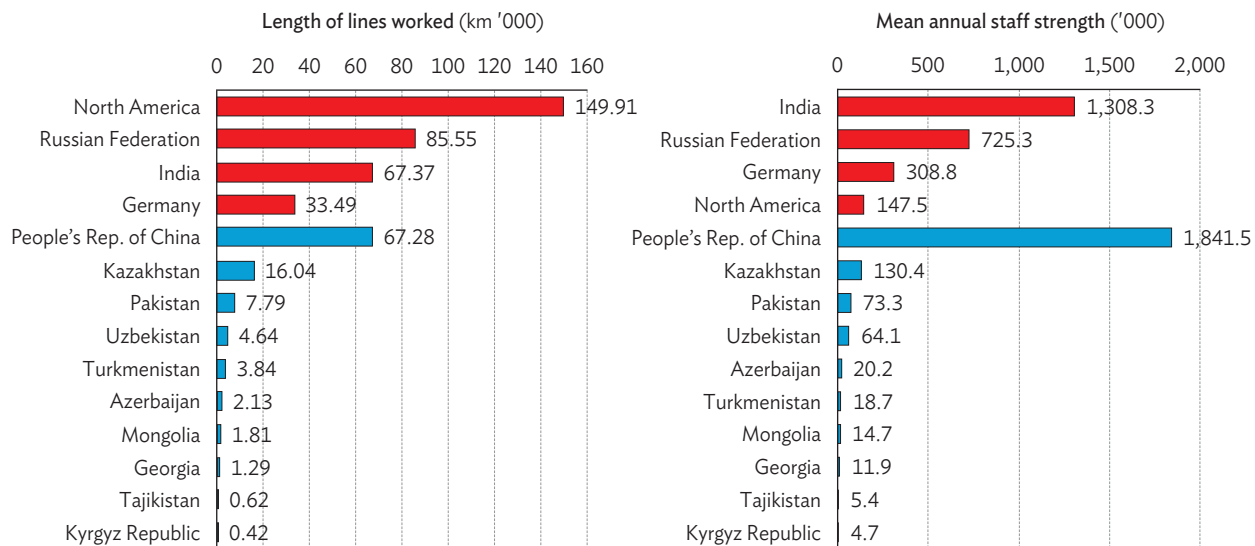
Source: ARA.

D. Operational benchmarking

70. Drawing upon railway operational data obtained from the International Union of Railways (UIC),¹⁹ aspects of the operational performance of UTY have been benchmarked in relation to other CAREC railways and leading railways from other regions (Germany, India, the Russian Federation, and North America).²⁰ In most cases the data refers to operational activities in 2017. In other cases, it refers to the most recent year for which data is available. Unfortunately, although Afghanistan became a member of UIC in 2013, its railway operational data is not yet included in the UIC database. However, benchmarking of the other CAREC railways offers some relevant insights for Afghanistan to take into account in its approach to railway development.

71. In terms of size of railway network and number of employees, the PRC has the largest CAREC railway, with over 67,000 km of lines worked and 1.84 million staff. It is followed by Kazakhstan Railways which has 16,040 km of lines worked and 130,400 staff. When completed, Afghanistan's proposed 5,040 km national railway network would be fourth largest in the CAREC region, broadly comparable with those of Uzbekistan and Turkmenistan. Afghanistan's plans for the railway to eventually employ (directly) about 50,000 persons are broadly in line with Uzbekistan which has 64,100 staff and Turkmenistan which has 18,700 staff. It is worth noting that all the CAREC railways have disproportionately high staffing levels compared with the comparator railways in advanced countries. The latter provide an indication of staffing levels when relatively efficient operating practices are adopted and overstaffing is avoided. This is shown in Figure 4.1.

Figure 4.1: Comparison of Railway Length and Staff Size in CAREC Member Countries and other Leading Railway Countries



CAREC = Central Asia Regional Economic Cooperation, km = kilometer.

Note: CAREC Member Countries shown in blue, comparators from other regions shown in red.

Source: UIC 2019.

¹⁹ The UIC database consists of data self-reported by individual railway organizations.

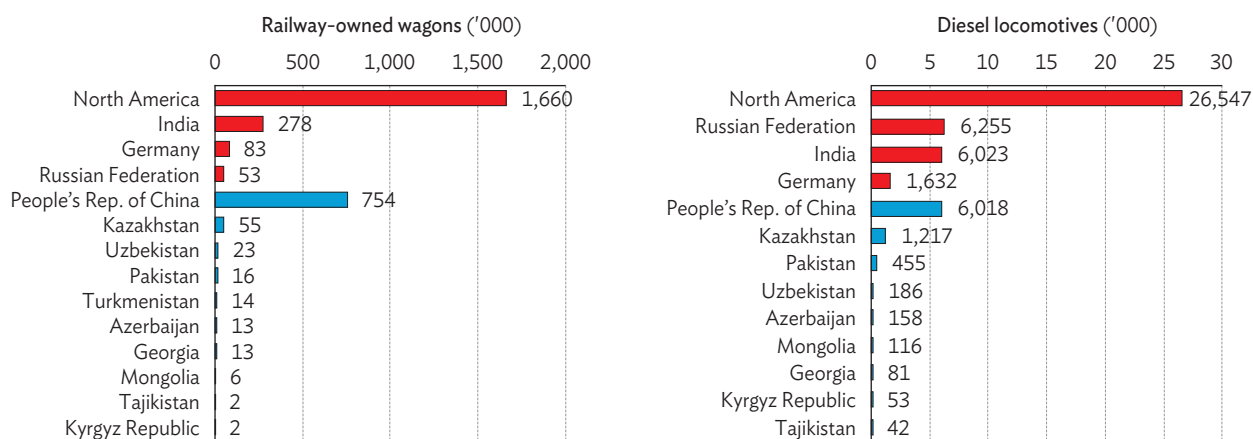
²⁰ In addition to the national railways of CAREC countries, the sample includes Indian Railways (India), Deutsche Bahn AG (Germany), Russian Railways, and the Association of American Railroads (North America) which represents the major freight railways of Canada, Mexico, and the US.

72. Among the comparator countries, the PRC and Kazakhstan have the largest rolling stock fleets. The PRC has 754,000 owned wagons and 6,018 diesel locomotives, while Kazakhstan Railways has 55,000 owned wagons and 1,217 diesel locomotives. In Kazakhstan, owned wagons are disproportionately lower than the PRC because, following reforms that began more than a decade ago, most of the wagons used are privately-owned. While Afghanistan's rolling stock requirements have yet to be determined, Uzbekistan, which has 23,000 owned wagons and 186 diesel locomotives, may offer some indications of rolling stock requirements. However, Afghanistan's wagon requirements could be higher as UTY relies to a significant extent on rolling stock borrowed from other railway administrations. On the other hand, following the example of Kazakhstan, Afghanistan may be able to significantly reduce its need to finance rolling stock if it encourages the private sector to own rolling stock and make this available on a rental/lease basis. The comparison of rolling stock fleets is shown in Figure 4.2.

73. Similarly, among CAREC MCs, the railways of the PRC and Kazakhstan have by far the highest annual freight turnover and, together with Pakistan Railways, the highest passenger traffic. Although future Afghanistan traffic levels are difficult to predict, comparison with Uzbekistan and Turkmenistan may again offer some insights. These have disproportionately lower freight turnover compared with the PRC and Kazakhstan, reflecting the short average haul distances in Uzbekistan and lower freight tonnages in Turkmenistan. The case of Pakistan Railways is also worth noting. Its freight turnover is low considering the large size of its railway network while its passenger traffic is relatively high. The prioritization of passengers over freight traffic (para. 59) has contributed to Pakistan Railways incurring heavy losses and being unable to replace its worn-out infrastructure and rolling stock. The comparison of freight and passenger traffic is in Figure 4.3.

74. Track density measures the intensity of track utilization in terms of traffic turnover per km of rail. The PRC and Kazakhstan railways are again the strongest performers, with track densities of magnitudes similar to advanced countries.

Figure 4.2: Comparison of Railway Rolling Stock Fleet in CAREC Member Countries and other Leading Railway Countries

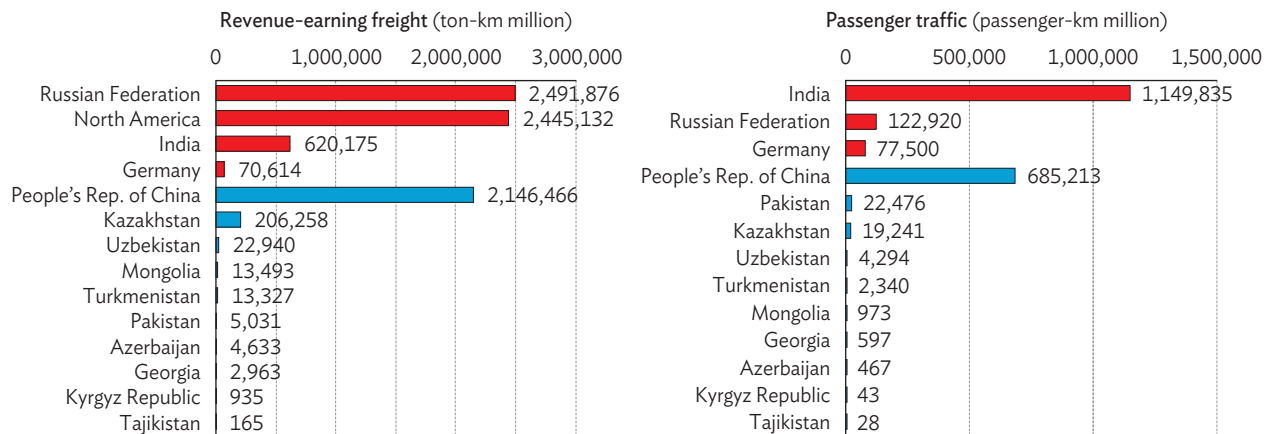


CAREC = Central Asia Regional Economic Cooperation.

Note: CAREC Member Countries shown in blue, comparators from other regions shown in red.

Source: UIC 2019.

Figure 4.3: Comparison of Annual Railway Freight and Passenger Traffic Levels in CAREC Member Countries and other Leading Railway Countries



CAREC = Central Asia Regional Economic Cooperation, km = kilometer.

Note: CAREC Member Countries shown in blue, comparators from other regions shown in red.

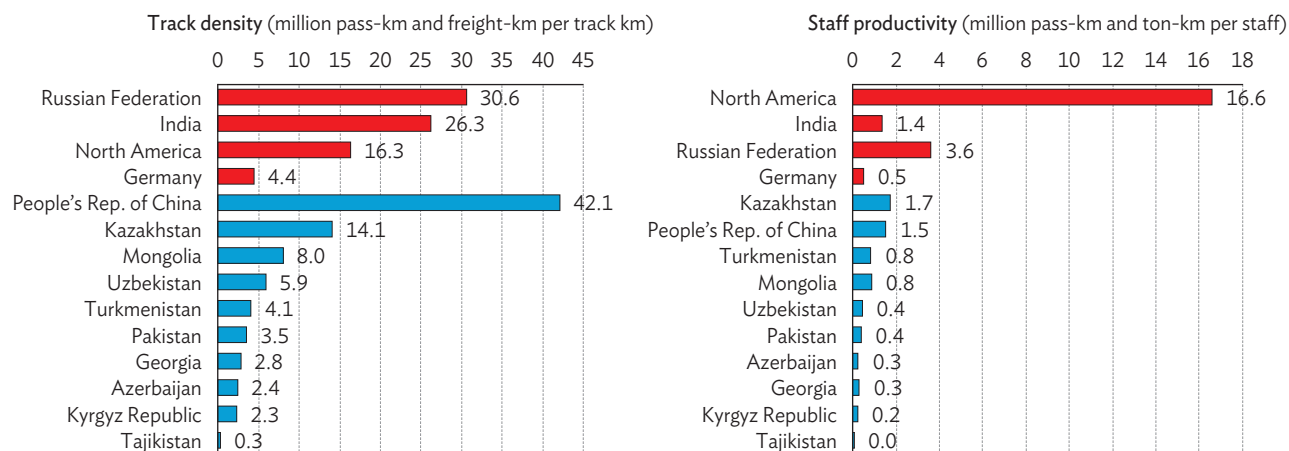
Source: UIC 2019.

Comparing with the next best CAREC railways—Mongolia, Uzbekistan, and Turkmenistan—track density is about 10 times higher in the PRC and more than 3 times higher in Kazakhstan. While it is too early to predict traffic density on the future Afghanistan network, it is useful to recognize that the region's most successful railways use their railway infrastructure and rolling stock assets much more intensively than the other railways. Staff productivity can be measured in terms of traffic turnover per staff member. Kazakhstan and the PRC are again the top performing CAREC MCs, having productivity levels similar to India, higher than Germany, but less than the Russian Federation and much less than the US. It is notable that some of the other CAREC MCs—such as Uzbekistan, Pakistan, and Tajikistan—have very much lower staff productivity. In Afghanistan's case it will be important to expand railway staffing gradually in response to traffic levels and to avoid the problems of overstaffing that make it difficult for many CAREC railways to operate profitably. This is shown in Figure 4.4.

75. A further set of productivity measures concerns rolling stock asset utilization. Locomotive productivity measures annual traffic turnover per locomotive, while wagon productivity measures annual traffic turnover per owned wagon. The PRC, Kazakhstan, Mongolia, and Uzbekistan have locomotive and wagon productivity levels that compare well with advanced country railways. In the PRC and Kazakhstan this reflects the large average haul distances for freight traffic within their extensive networks, as well as relatively efficient asset utilization practices. Wagon productivity in Kazakhstan is overstated as this measure does not adjust for the high usage of privately-owned wagons (para. 72). Among the other CAREC MCs, both locomotive and wagon productivity are considerably lower. This reflects a combination of low levels of freight traffic and the poor condition of rolling stock fleets. This is partly due to the lack of an effective sales and marketing function to address customer needs and attract new sources of traffic. Another reason is that railways have not invested enough in rolling stock acquisition and replacement in the past, so their fleets are now old and require frequent repair.²¹

²¹ The railways in CIS countries inherited relatively aged rolling stock fleets from the FSU.

Figure 4.4: Comparison of Railway Track and Staff Productivity in CAREC Member Countries and other Leading Railway Countries



CAREC = Central Asia Regional Economic Cooperation, km = kilometer.

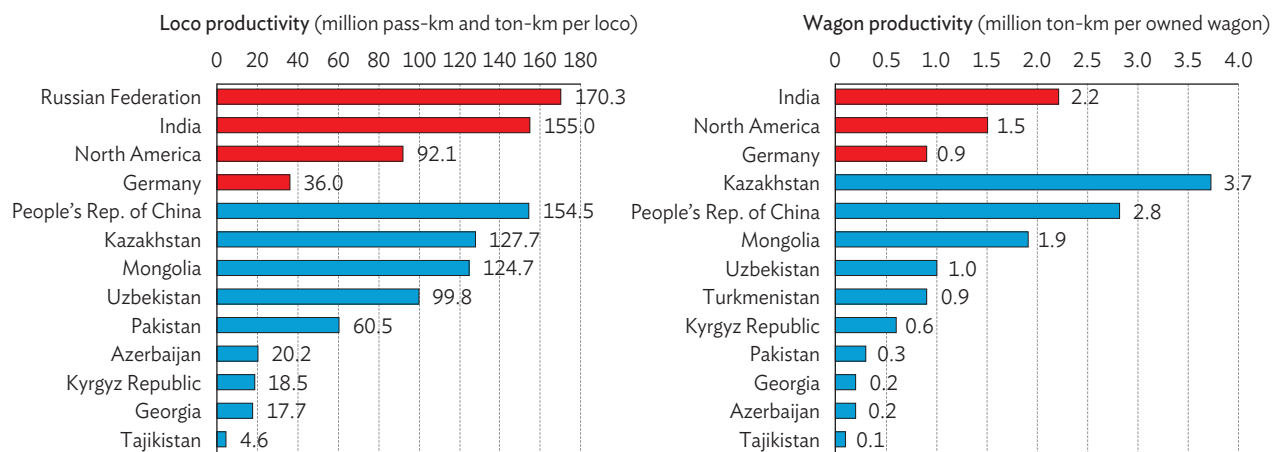
Note: CAREC Member Countries shown in blue, comparators from other regions shown in red.

Source: UIC 2019.

These are problems that Afghanistan should seek to avoid by establishing a capable sales and marketing function, making adequate financial provisions for

asset replacement, and encouraging the private sector to provide rolling stock. The comparison of rolling stock productivity is in Figure 4.5.

Figure 4.5: Comparison of Locomotive and Wagon Productivity in CAREC Member Countries and other Leading Railway Countries



CAREC = Central Asia Regional Economic Cooperation, km = kilometer.

Notes: (i) CAREC Member Countries shown in blue, comparators from other regions shown in red; (ii) productivity calculations are less accurate for countries with higher use of leased locomotives or wagons, such as Kazakhstan.

Source: UIC 2019.

PROPOSALS FOR INVESTMENT, COMMERCIALIZATION, AND REFORM

A. Introduction

76. Drawing on the previous chapters, this final chapter discusses opportunities for Afghanistan to obtain prefeasibility study support, and capacity development and knowledge-related assistance, through the present CAREC Railway Sector Development TA.

B. Policy setting

77. Since initiating railway development in 2004, Afghanistan has been making progress toward developing a national railway network to serve domestic and cross-border traffic. This has included establishing the ARA and building its capacity, approving a Railway Law, introducing initial railway operations on a limited scale, developing plans for a national railway network, conducting prefeasibility and feasibility studies, and establishing ongoing dialogue both with neighboring countries interested in having access to railway routes through Afghanistan and with development partners that are expected to be possible sources of investment financing.

78. This is a major undertaking, with an extended time frame. Compared with most other countries seeking to develop railways, Afghanistan's economy remains underdeveloped without large-scale existing traffic streams that could provide a confident starting point for railway investments. The continuing security problems exacerbate this situation, adding to the costs of doing business and discouraging private companies from engaging with the country and its railway sector.

79. To assist in advancing railway development, the government and a consortium of development partners have established an Advisory Group on Railway Development in Afghanistan. Its core objective is to provide high-level advisory services to the government, and ARA in particular, for the sound and sustainable development of the railways sector in Afghanistan. It also assists the government and development partners to ensure coordination of their respective work on supporting railway development in Afghanistan. The Advisory Group is chaired by the ARA and includes representatives of ADB, the Asian Infrastructure Investment Bank, the Embassies of Japan and the Republic of Korea, the European Union, the Italian Agency for Development Cooperation, the IMF, the US Agency for International Development, and the World Bank.

80. The present focus of the Advisory Group is on the proposed Mazar-e-Sharif to Herat Railway. This entails conducting studies to establish a robust economic rationale and financial structuring for the project. Analysis may be conducted to determine the required level of traffic and tariff levels for the project to be economically and financially viable. Options will also be developed for ARA to generate revenue from railways, including by (i) use of multimodal hubs to advance the flow of transit traffic without waiting for the full completion of the railway line, and (ii) attracting possible private investors from the mining industry. In future, the Advisory Group may extend its scope of work to cover other related projects and developments in the railway sector.

C. Proposals for support from CAREC Railway Sector Development TA

1. Prefeasibility studies

81. Afghanistan has already conducted prefeasibility or feasibility studies for several thousand kilometers of the proposed national railway network (Table 1.1) and is continuing to conduct further studies with development partner support. Since these studies already cover the priority projects adopted by the Advisory Group, as well as many other projects that could be considered for prioritization at a later stage, it may not be useful to propose further prefeasibility studies through the present TA.

2. Knowledge products and events

82. Since Afghanistan has limited experience in the railway sector, and is still developing its overall approach and institutional arrangements for railway development, it could benefit from various types of knowledge support and capacity building through the TA. The following ideas for knowledge products and events would be particularly relevant:

83. **Accounting standards and systems to enable railway commercialization.** Among the first steps needed for railways to be capable of operating on a commercial basis, is to adopt International Accounting Standards and International Financial Reporting Standards and introduce a modern railway accounting system that separately reports, in real time, on the costs and profitability of each of the railway's main lines of business.

The proposed knowledge support would compile best practices on the introduction of such railway accounting standards and systems, identify the main tasks for their introduction by interested CAREC railways, and prepare options for sequencing the transition from the existing accounting standards and systems to the new ones.

84. **Improving railway customer service orientation.** Some railway customers find it difficult to interface with railways in the CAREC region.²² Problems can include difficulty in ordering railway wagons to carry shipments; delays and add-on charges when collecting goods upon arrival, including continued reliance on paper-based clearance and payment procedures; lack of consignment tracking services; and lack of last mile delivery. The proposed knowledge support would mobilize international experts experienced in improving the customer orientation of railways. They would conduct short studies on behalf of interested MCs to benchmark railway customer orientation against top international and regional railway organizations. The experts would then identify international best practices that the respective countries could utilize to improve their customer orientation. Seminars would be held to share the results of the benchmarking studies and proposals for adoption of best practice approaches. Depending on country interest, this could be followed by the experts providing hands-on support to assist in introducing the best practice approaches.

85. **Establishing and operating a railway sales and marketing function.** The proposed knowledge product would prepare a paper documenting best practices in the setting up and operation of a railway sales and marketing function, conduct management training workshops to increase awareness among CAREC railways, and work with interested railways to prepare proposals for establishing a new or improved sales and marketing function.

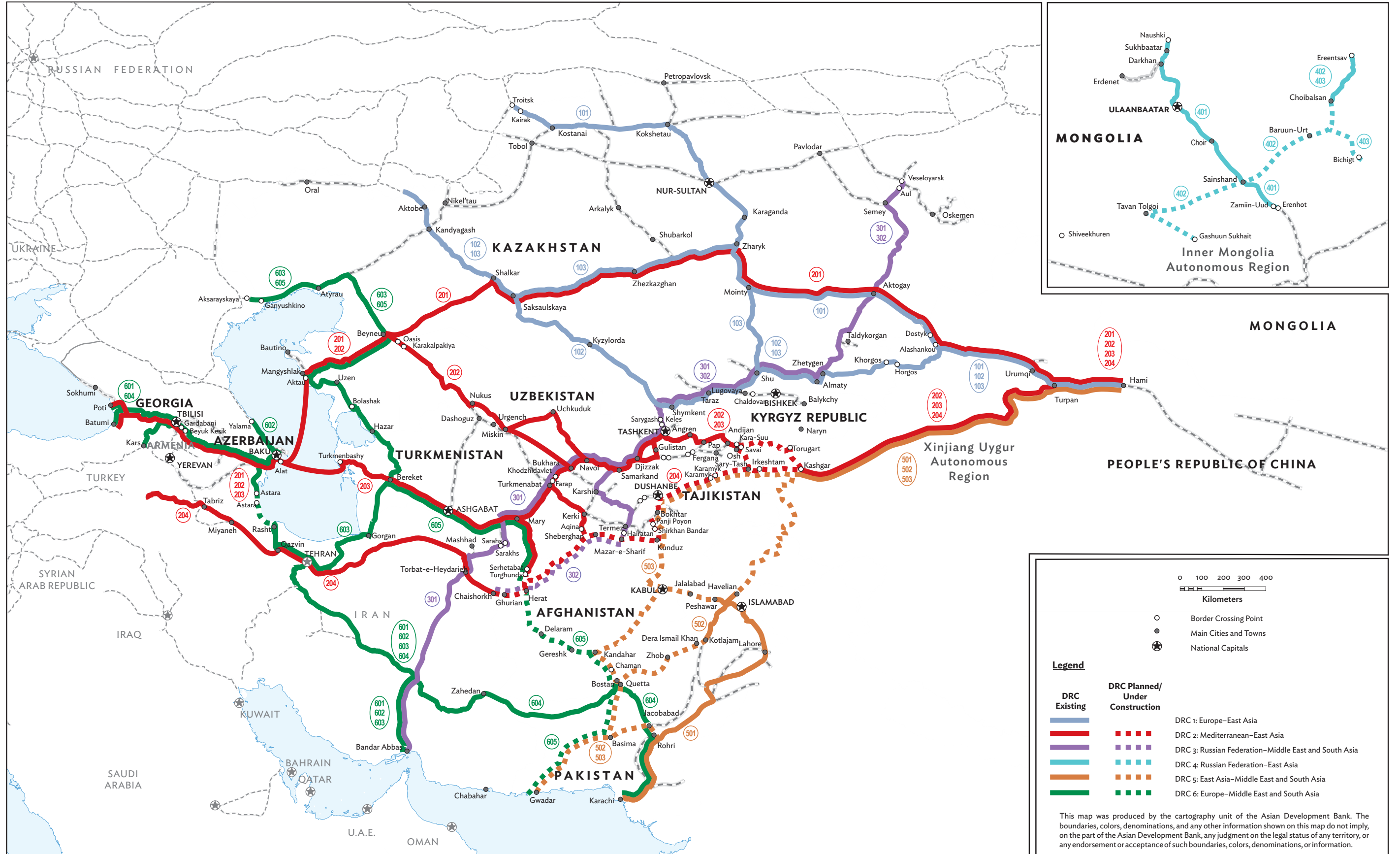
²² Customers of the Hairatan–Mazir-e-Sharif Railway have mentioned problems of this kind.

Depending on country interest, this could be followed by the experts providing support for preparing proposals on introducing a sales and marketing function to be submitted for approval by higher authorities.

86. Structuring of railway consortia and concessions. In order to proceed with proposed railway projects, it seems likely that Afghanistan will need to consider the use of project structures capable of attracting participation from neighboring railways and/or private sector partners such as mining companies (para. 68). Such structures generally establish a series of entities with interconnecting roles and responsibilities. Investment financing is provided through shareholder equity contributions, loan financing from development partners and, in some cases, private sector bank financing using project revenues as collateral. Traffic guarantees may be needed to mitigate some of the project risks. These forms of project structuring are quite complex, and require an appreciation of arrangements needed by different types of participants. The proposed knowledge support would compile leading examples of project structures adopted by successful railway consortia and concessions, identify the main types of structures that may be useful for Afghanistan and other interested CAREC railways, and conduct a training seminar to discuss these structures and their application.

87. Best practices in private sector participation in development and operation of terminals, stations and hubs. ARA recognizes the importance of terminals, stations and multimodal hubs for developing the railway market in Afghanistan. Based on experience in other countries, it is important to involve the private sector in the development and operation of these facilities because of its knowledge of the market and its know-how in providing services to address customer needs. There is scope for involving the private sector in financing investments in such facilities as well in operating and managing the facilities. Around the world, there have been a wide range of different experiences and models of private sector participation in such roles. The proposed knowledge support would provide ARA and other interested CAREC railways with advice on best practice approaches applicable to their current situation and future plans, and provide access to international experts to assist in applying such approaches in practice.

APPENDIX | CAREC DESIGNATED RAIL CORRIDORS



DRC = designated rail corridors.
Source: CAREC Secretariat.

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Railway Sector Assessment for Afghanistan

Through a technical assistance project on railway sector development, the Asian Development Bank is helping member countries of the Central Asia Regional Economic Cooperation (CAREC) region to strengthen the role and performance of railways. This report summarizes the findings of an assessment of the railway sector in Afghanistan. It examines the context, characteristics, performance and potential of railways, and identifies opportunities for future investment, commercialization, and reform.

About the Central Asia Regional Economic Cooperation Program

The Central Asia Regional Economic Cooperation (CAREC) Program is a partnership of 11 member countries and development partners working together to promote development through cooperation, leading to accelerated economic growth and poverty reduction. It is guided by the overarching vision of “Good Neighbors, Good Partners, and Good Prospects.” CAREC countries include: Afghanistan, Azerbaijan, the People’s Republic of China, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan.