



CENTRAL ASIA REGIONAL ECONOMIC COOPERATION

CAREC CPMM

CORRIDOR PERFORMANCE MEASUREMENT & MONITORING

ANNUAL REPORT

2017



Central Asia Regional Economic Cooperation Program



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This report is based on data samples gathered by national transport associations from CAREC member countries that include performance metrics on cargo transport in the region. Using time/cost-distance methodology, the exercise focuses on measuring time and costs incurred in transporting various types of goods across Central Asia. The data are aggregated to show the relative performance of each CAREC corridor in its effort to monitor and evaluate the implementation of the refined CAREC Transport and Trade Facilitation Strategy 2020.

For more information, log on to CAREC Federation of Carrier and Forwarder Association (CFCFA) website <http://cfcfa.net/> and visit the CPMM page on <http://cfcfa.net/cpmm/>.

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Note:

In this report, “\$” refers to United States dollars.

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Abbreviations

AFG	-	Afghanistan
ASYCUDA	-	Automated System for Customs Data
AZE	-	Azerbaijan
BCP	-	border-crossing point
CAR	-	Central Asian Republic
CAREC	-	Central Asia Regional Economic Cooperation
CATS	-	CAREC Advance Transit System
CFCFA	-	CAREC Federation of Carrier and Forwarder Associations
CIS	-	Commonwealth of Independent States
CPEC	-	China-Pakistan economic corridor
CPMM	-	Corridor Performance Measurement and Monitoring
EAEU	-	Eurasian Economic Union
GEO	-	Georgia
ICE	-	Information Common Exchange
JCC	-	Joint Customs Control
KAZ	-	Kazakhstan
KGZ	-	Kyrgyz Republic
km	-	kilometer
kmph	-	kilometer per hour
KTZ	-	Kazakhstan Temir Zholy
m	-	meter
MON	-	Mongolia
PAK	-	Pakistan
PRC	-	People's Republic of China
Q	-	quarter
SWD	-	speed with delay
SWOD	-	speed without delay
TAJ	-	Tajikistan
TCD	-	time/cost-distance
TEU	-	twenty-foot equivalent unit
TFI	-	trade facilitation indicator
TIR	-	Transports Internationaux Routiers (International Road Transports)
TKM	-	Turkmenistan
UZB	-	Uzbekistan
VOC	-	vehicle operating cost
WCO	-	World Customs Organization
WTO	-	World Trade Organization

Executive Summary

The Corridor Performance Measurement and Monitoring (CPMM) mechanism is an empirical tool designed by the Central Asia Regional Economic Cooperation (CAREC) Program to assess and track the time and cost of moving goods across borders and along the six CAREC corridors, spanning the 11 participating countries — Afghanistan, Azerbaijan, the People's Republic of China, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan. Data collected are analyzed and used as inputs to develop initiatives that foster seamless transport and trade facilitation within the CAREC region.

Central to CPMM's success and sustainability are (i) private sector participation; (ii) fact-based and data-driven conclusions; and (iii) adaptability to landlocked countries. The 2017 report shows that while targeted projects and cooperation among countries continue to improve the performance of transport and trade facilitation corridors, challenges remain and persist.

Road Transport

Road border-crossing time deteriorated; trucks took an average of 16.7 hours to complete border crossing procedures in 2017 (up 48% from 11.3 hours in 2016). This is largely attributed to delays encountered at border-crossing points (BCPs) in Pakistan and Afghanistan that drove up average crossing time higher. Abrupt closure of the border in early 2017, subsequent stricter border control, and inefficient layout and procedures all contributed in various degrees to longer delays at the Afghanistan and Pakistan borders.

Average border-crossing cost remained relatively unchanged. Fees incurred for customs formalities, loading and unloading, and waiting in line continued as major contributors to total cost. Unofficial payments (sums paid on top of an amount officially recognized by law) persisted; more so at high-traffic BCPs which result in longer lines and are typically encountered during (i) phytosanitary inspections, (ii) vehicle registration, (iii) customs formalities, (iv) weight standard inspections, and (v) visa and/or immigration checks.

Nevertheless, total transport cost, which averaged \$947, decreased substantially (-19%) from \$1,173 in 2016. Transport costs in Afghanistan, Mongolia, and Tajikistan remained above average, however, reflecting less developed infrastructure.

In 2017, speed without delay (SWOD) increased but speed with delay (SWD) remained flat.¹ This suggests that road infrastructure improved, although border-crossing problems continued to impede the efficient movement of goods. Trucks registered an average SWOD of 45 kmph, 8% higher than 41.7 kmph in 2016. However, progress implied by greater SWOD did not translate into gains for SWD, which remained relatively unchanged at 22.2 kmph.

Rail Transport

Trains experience longer delays than trucks at BCPs:² average border-crossing time increased to 26.8 hours in 2017. Causes of substantial delays include unavailability of wagons (25.8 hours on average), restriction on entry (21.8 hours), waiting for priority trains to pass (18.8 hours), marshalling (12.1 hours) and gauge change operations (8.8 hours). Delays for these reasons are generally longer compared to the time spent undergoing standard customs and inspection operations at rail terminals. A shortage of wagons continued to plague rail shipments.

Rail shipment cost dropped slightly to \$209 in 2017. Common cost drivers include change of railway gauge and customs inspection. Meanwhile, transport cost remained steady at an average of \$975 per 20-ton cargo per 500 km.

In 2017, trains registered an average SWOD and SWD of 37.6 kmph and 14.8 kmph, respectively — relatively unchanged compared to 2016. Trains tend to move faster along sub-corridor 1a (49.1 kmph) and along 1b (55.2 kmph). Meanwhile, trains along sub-corridor 4b moved at half the average speed, reaching an SWOD of only 20.6 kmph and SWD of 10.0 kmph. Trains along Corridor 6 also tend to move more slowly with estimated SWOD and SWD of 12.5 and 11.2 kmph, respectively along 6b, and 29.9 and 13.7 kmph along 6d.

1 The CPMM has two speed metrics: (i) speed without delay, or the average speed of vehicles while in transit; and (ii) speed with delay, which reflects time spent during stopovers and border-crossing activities. Intuitively, the quality of transport infrastructure, terrain, altitude, and seasonal patterns affect SWOD, while simplified border crossing can result in higher SWD.

2 2017 CPMM rail samples were taken from shipments along corridors 1, 4, and 6, which traverse the People's Republic of China, Kazakhstan, Mongolia, Turkmenistan, and Uzbekistan.

Country Results

Afghanistan remains severely restricted and does not reach its full potential in transit trade, despite its strategic location at the heart of four major trading blocs: Central Asia, East Asia, South Asia and Middle East. Challenges include (i) difficulty obtaining road passes for trucks and drivers' visa; (ii) lengthy delays at Torkham-Peshawar (AFG-PAK) and Spin Buldak-Chaman (PAK-AFG) borders; (iii) having to develop air corridors as an alternative, (Kabul-New Delhi and Kabul-Dubai) despite unattractive rates; and (iv) low TIR Carnet utilization .

CPMM faces difficulty in obtaining data from transport operators in **Azerbaijan** as its market lies largely to the west — beyond the CAREC region. Samples of trade transactions with Georgia reveal that (i) border crossing at Korpu could be time-consuming (5-7 hours), and (ii) river-crossing at Baku seaport is a major bottleneck (for example, waiting for the ferry took 36 hours).

The Horgos-Khorgos border between the **People's Republic of China** and Kazakhstan is the trade from the east to Central Asia. This gateway serves a unique form of 'border trade' or 'tourist' trade', characterized by small-volume high-frequency shipments, typically travelling from Urumqi to Almaty. Hence, the volume of traffic easily translates to a lengthy 8.8 hour Kazakhstan-bound average border-crossing time. Such delay, however, is due more to regulatory and documentary issues rather than capacity or equipment constraints.

Georgia's location and modernized customs and trade facilitation practices are ready to connect Central Asia to European markets. Integrated border services, customs clearance zones, risk-based management, modern customs information systems, and a simplified transit regime prove beneficial in facilitating trade with neighboring countries.

Accession to the Eurasian Economic Union (EAEU), the Belt and Road Initiative, and rapid modernization of Khorgos BCP provide much opportunity for **Kazakhstan's** transport industry. Yet high railway cost still poses serious concern, and the shortage of rolling stock is also highlighted as a major cause of delay.

The roads of **the Kyrgyz Republic** face rapid surface deterioration and contribute to low SWOD estimates due to under-maintenance, coupled with adverse weather conditions in winter, and mountainous terrain. Traders experience volatile transport prices due to the demand-supply imbalance during export season. Sanitary and phytosanitary restrictions also make it difficult to export to the EAEU.

Potential increase in trade volumes may adversely affect time

and cost performance of rail BCPs in **Mongolia**. The CPMM reveals that inbound traffic from Tianjin at Zamiin Uud took more than a day to cross the border. Waiting due to shortage of wagons (18 hours on average), marshalling (10 hours), transfer of materials (7 hours), and technical inspection (5 hours) contribute to border delay.

Pakistan's BCPs with Afghanistan prove very time-consuming, with delays at Chaman reaching 82 hours per truck in 2017 attributed mainly to delays in completing customs formalities and waiting in line. The Torkham-Peshawar border faces challenges as well: the lack of a cooperation mechanism, visa restrictions for drivers, and limited parking space for trucks on the Pakistan side. Resolving these issues requires bilateral cooperation from both border agencies.

Transit trade accounted for only 3.23% of traffic in **Tajikistan**, despite increasing use of the Kulma Pass as a transit route from the People's Republic of China to Tajikistan. Limited transport infrastructure and mountainous terrain constrains these routes. High volumes of trade with Afghanistan via Nizhni Pianj is expected to increase rapidly if bilateral border cooperation is achieved. Customs administrations of both countries agreed to implement TIR Green Lanes at BCPs to support efficient border crossing of Kabul-bound goods from Kazakhstan and the Kyrgyz Republic.

Turkmenistan serves as an important transit country for Uzbekistan operators to move goods to and from Bandar Abbas seaport in Iran. Border facilities of its neighbors are well equipped to efficiently facilitate shipment of goods. At Farap BCP, CPMM estimates the outbound border crossing average to be 5.8 hours, and inbound to be 7.9 hours. Half of these times are spent waiting in queues.

Uzbekistan is a double landlocked country which relies heavily on Kazakhstan and Turkmenistan as transit countries to access overseas markets. The country is also investing heavily in transport and logistic centers. Angren Logistics Center is one of the largest in Uzbekistan that is also designed to facilitate multimodal shipments to and from the Fergana Valley.

The 2017 CPMM report identifies key issues relating to procedure, infrastructure, equipment, regulations, and others, with the aim of informing both CAREC policy-makers and traders of current challenges that impede the smooth and rapid flow of goods and cargo across borders in the region. The report also offers preliminary recommendations intended to help address these challenges and ultimately improve intra-regional CAREC trade.

I. Introduction

Background

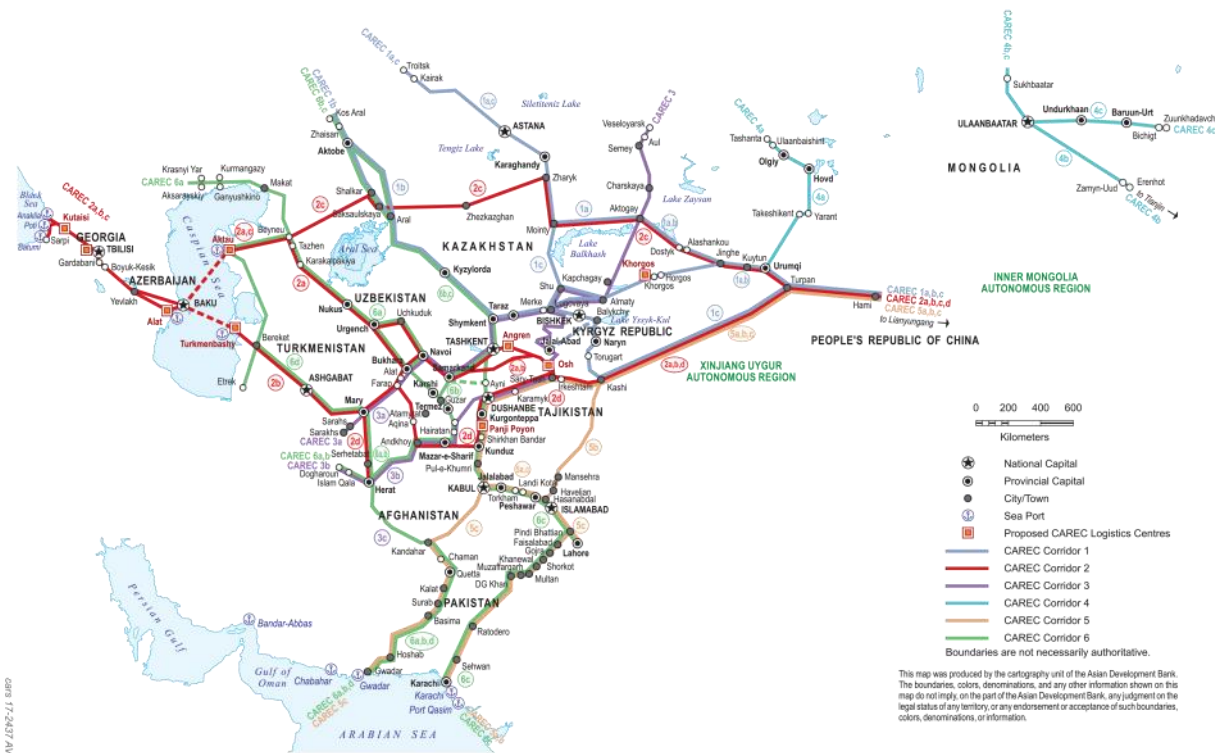
The Corridor Performance Measurement and Monitoring (CPMM) mechanism is an empirical tool designed by the Central Asia Regional Economic Cooperation (CAREC) program to assess the efficiency of its six priority transport corridors (Figure 1.1).¹ The CAREC corridors link the region's key economic hubs to each other, and connect landlocked CAREC countries to Eurasian and global markets.

The CPMM aims to (i) identify the causes of delay and unnecessary cost to cargo moving along the links and nodes of each CAREC corridor, including at border-crossing points (BCPs) and intermediate stops; (ii) help national CAREC

authorities determine how to address identified bottlenecks; and (iii) assess the impact of regional cooperation initiatives implemented along the CAREC corridors by member countries.²

Launched in 2009, the CPMM mechanism uses a methodology and data collection process that captures a range of ground-level information by measuring and recording actual cargo shipments along CAREC corridors and at 36 pairs of BCPS, identified and prioritized by CAREC member countries. The methodology comprises a four-phased approach summarized in Figure 1.2 and elaborated in Appendix 1. An established pool of national freight forwarder and transport carrier partners collects the data along the corridors and at the BCPS.³

Figure 1.1: Central Asia Regional Economic Cooperation Corridors



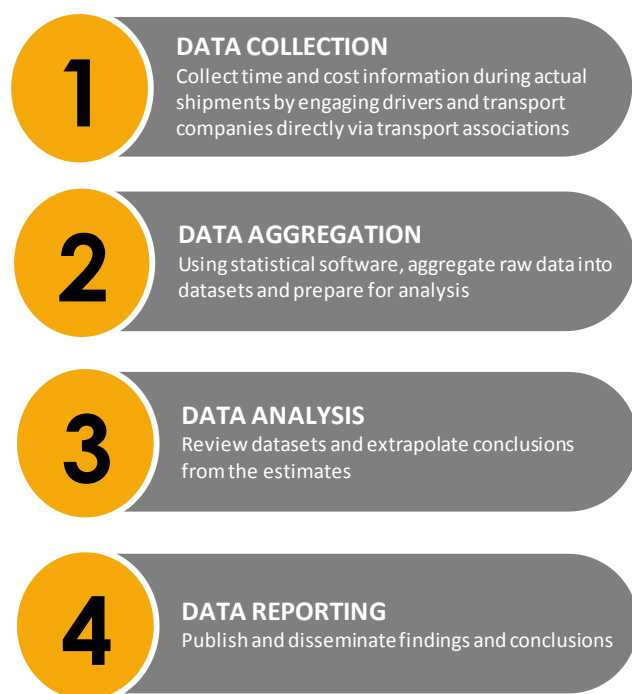
Source: Asian Development Bank

1 The CAREC Program is a partnership of 11 countries—Afghanistan, Azerbaijan, the People's Republic of China, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan, and six development partners—working together to promote development through cooperation, leading to accelerated economic growth and poverty reduction: www.carecprogram.org

2 A detailed description of the corridors is found at www.carecprogram.org/?page_id=20

3 The national forwarder and carrier partners for 2017 are listed in Appendix 2.

Figure 1.2: CPMM Methodology



Source: Asian Development Bank

A set of four trade facilitation indicators (TFIs) illustrate the overall annual performance and efficiency of the CAREC corridors.⁴ Measured over time and across corridors, the indicators provide a comparative picture that allows the assessment and validation of impacts of transport and trade initiatives in the region.

- (i) **TFI1: Time taken to clear a BCP.** This TFI refers to the average length of time (in hours) taken to move cargo across a border from the exit point of one country to the entry point of another. The entry and exit points are typically primary control centers where customs, immigration, and quarantine are handled. Along with the standard clearance formalities, this measurement includes waiting time, unloading or loading time, time taken to change rail gauges, among other indicators. The intent is to capture both the complexity and the inefficiencies inherent in the border-crossing process.
- (ii) **TFI2: Cost incurred at a BCP.** This is the average total cost, in United States (US) dollars, of moving cargo across a border from the exit point of one country to the entry

point of another. Both official and unofficial payments are included. This indicator normalizes cost per 20 tons of cargo, to allow comparability of average costs across various samples.

- (iii) **TFI3: Cost incurred to travel a corridor section.** This comprises average total costs, in US dollars, incurred for one unit of cargo traveling along a corridor section within a country or across borders. One “unit of cargo” refers to a cargo truck or wagon carrying 20 tons of goods. A “corridor section” is defined as a stretch of road 500 kilometers (km) long. Both official and unofficial payments are included.
- (iv) **TFI4: Speed to travel along CAREC corridors.** This is the average speed, in kilometers per hour (kmph), at which a unit of cargo travels along a corridor section within a country or across borders. A “unit of cargo” refers to a cargo truck or wagon carrying 20 tons of goods, and a “corridor section” refers to a stretch of road 500 km long. Speed is calculated by dividing the total distance traveled by the duration of travel. Distance and time measurements include border crossings.

Time and cost indicators are also measured by activity at CAREC BCPs and other intermediate stops, such as toll booths, security inspections and others,⁵ to help identify not only the location but also the nature of delay at stops along a given corridor.

Central to the CPMM’s success and sustainability are:

- (i) **Private Sector Participation**
National transport associations are formally engaged to train selected national transport operators or freight forwarders to use the CPMM tool and to gather and record data. Each data sample reflects a bona fide cargo movement through the CAREC transport corridors of Central Asia.
- (ii) **Fact-based and Data-driven Conclusions**
CPMM data are derived from actual transport movements, and data are submitted monthly by national transport associations in each CAREC country. The findings are aggregated and analyzed quarterly and annually. Over an extended period, the CPMM tool can show whether time and cost performances are improving or deteriorating.
- (i) **Customized for Landlocked Countries**
As most CAREC member countries are landlocked, their time and cost transport performance cannot be compared

4 The TFIs are explained in detail in Appendix 3, including statistical derivation.

5 Activities encompass all anticipated checks and procedures, both at BCPs and at intermediate stops along the transit corridor, and are elaborated in Appendix 4. A list of CAREC BCPs covered by the CPMM is included in Appendix 5.

on an equal footing against countries that have seaports. CPMM methodology focuses on road and rail transport, the two dominant transport modes in Central Asia. Particular emphasis is given to border-crossing time and cost, which are frequently identified as the main cause of delay in cross-border cargo movement. In short, the CPMM is customized to meet the physical context of CAREC member countries, aligned with the CAREC corridors.

II. 2017 Key Results and Regional Updates

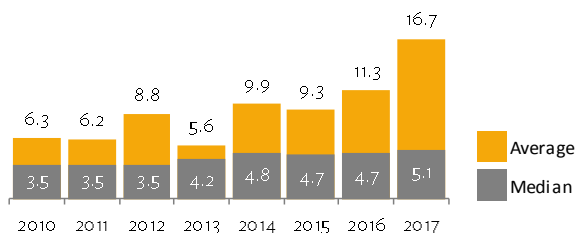
Analysis of CPMM data collected throughout 2017 has updated the four TFIs for both road and rail transport along the CAREC corridors and at selected BCP pairs, enabling assessment of efficiency and identification of impediments. Key results of the TFIs are presented in this section, together with highlighted progress in regional cooperation, corridor development, and transit regimes, which impact transport and trade facilitation.

TFI Results for 2017: Road Transport

Analysis of 2017 CPMM data for road transport indicates that road border-crossing time increased notably over the time recorded for 2016, while border-crossing cost remained steady, and total transport cost continued to decline. Speed without delay (SWOD) performance improved markedly, whereas speed with delay (SWD) was relatively constant. Detailed observations are laid out in Section 4.

TFI1: Time taken to clear a BCP (Figure 2.1). A significant jump in the average border-crossing time is attributed to the unexpected closure of BCPs in Afghanistan and Pakistan along CAREC corridors 5 and 6: the borders at Torkham-Peshawar and Chaman-Spin Buldak contended with long lines of trucks waiting to cross the border in quarter (Q) 1 2017.

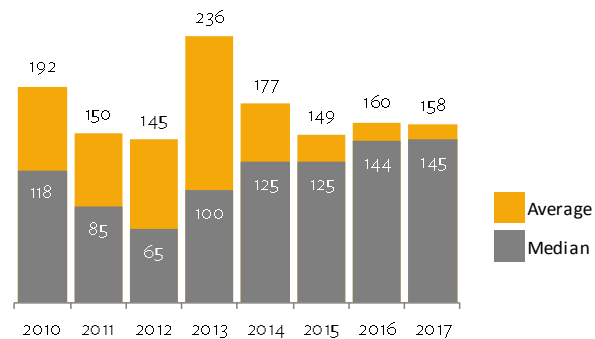
Figure 2.1: Time Taken to Clear a Border-crossing Point (Road) (hours)



Source: Asian Development Bank

TFI2: Cost incurred at Border-crossing clearance (Figure 2.2). While average border-crossing fees across all CAREC BCPs remained steady during 2017, fees at BCPs along corridor 1 and 5 were the highest. Border crossing at Horgos (PRC)⁶ also incurred higher fees, in part because of heavy traffic. Informal payments continued to be a widespread problem, particularly at BCPs where different controls and inspections involved payment of informal fees.

Figure 2.2: Cost Incurred at Border-crossing Clearance (Road) (\$)

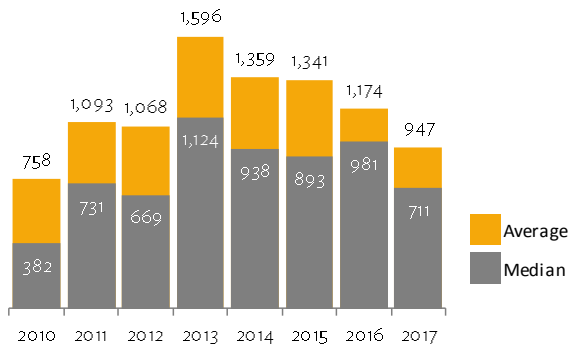


Source: Asian Development Bank

TFI3: Cost incurred to travel a corridor section (Figure 2.3). A uniform decrease in total transport cost across all six CAREC corridors in 2017 resulted in a 19% drop in the average total transport cost compared to 2016. With relatively unchanged border-crossing costs, it can be inferred that lower vehicle operating costs contributed to the improvement of TFI2. Despite significant overall cost reductions, however, transport along corridors 4, 5, and 6 still cost more than average, compared to other routes. This can be attributed to three countries – Afghanistan, Mongolia, and Tajikistan – which reported comparatively higher vehicle operating costs.

6 CPMM naming conventions identify national BCPs using the country abbreviations in parentheses directly after the BCP names, e.g., Horgos-Altynkol (PRC-KAZ) and Horgos (PRC).

Figure 2.3: Cost Incurred to Travel a Corridor Section (Road) (\$ per 500 km, per 20-ton cargo)



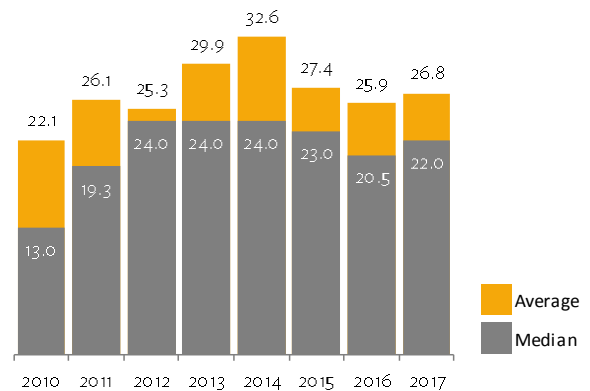
Source: Asian Development Bank

TFI Results for 2017: Rail Transport

In 2017, CPMM monitoring of railways along corridors 1, 4, and 6 demonstrated relatively stable outcomes year-on-year. Details are presented in Section 5.

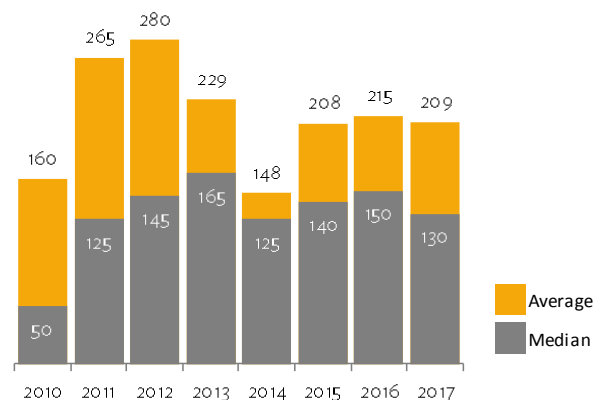
TFI1: Time taken to clear a BCP and TFI2: Cost incurred at border-crossing clearance. Estimates of average border-crossing time and cost for rail transport did not change significantly from 2016 to 2017 (figures 2.5 and 2.6), despite some key observations. Rail border crossings along corridor 1 (Kazakhstan) reported longer delays and higher fees compared to those along corridor 4 (Mongolia). The Horgos-Altynkol (PRC-KAZ) border crossing along sub-corridor 1b was more time-consuming and costlier compared to the border crossing at Alashankou-Dostyk (PRC-KAZ) along corridor 1a.

Figure 2.5: Time Taken to Clear a Border-crossing Point (Rail) (hours)



Source: Asian Development Bank

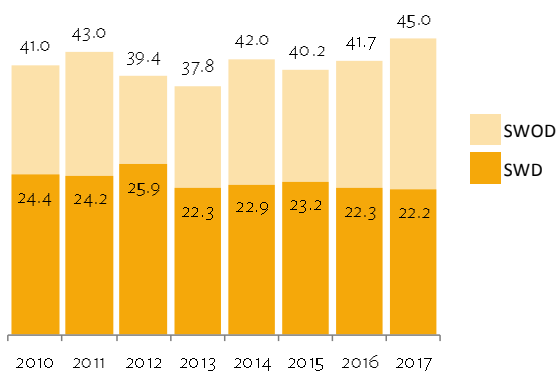
Figure 2.6: Cost Incurred at Border-crossing Clearance (Rail) (\$)



Source: Asian Development Bank

TFI4: Speed to travel on CAREC corridors (Figure 2.4). SWOD estimates followed an upward trend, which implies better road infrastructure. However, longer delays observed during border crossing led to a slight decline in SWD in 2017. Ultimately, gains in speed due to better roads were partly offset by longer border-crossing time.

Figure 2.4: Speed to Travel on CAREC Corridors (Road) (kmph)

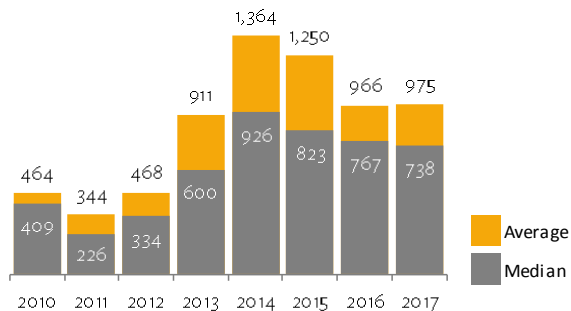


SWD = speed with delay, SWOD = speed without delay.
Source: Asian Development Bank

In summary, the combination of lower road transport cost and faster speed in 2017 was a highly desirable outcome for transport and trade facilitation in the region. Meanwhile, border-crossing time remained a primary impediment that requires serious concerted effort and resolve among CAREC members to be addressed effectively.

TFI3: Cost incurred to travel a corridor section (Figure 2.7).⁷ Modest declines in total rail transport cost along corridors 1 and 6 were offset by a substantial increase (13%) of total rail cost along corridor 4. This resulted in a relatively flat growth (by 0.9%) in TFI3 compared to 2016.

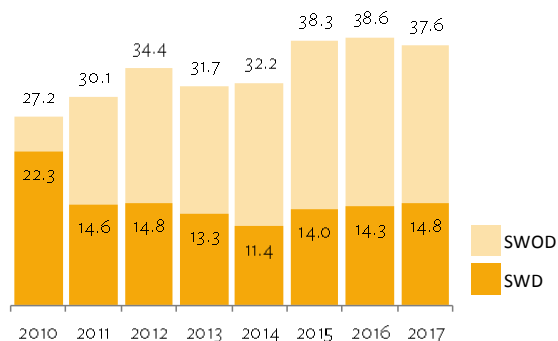
Figure 2.7: Cost Incurred to Travel a Corridor Section (Rail) (\$ per 500 km, per 20-ton cargo)



Source: Asian Development Bank

TFI4: Speed to travel on CAREC corridors (Figure 2.8). 2017 data showed faster trains speed along corridor 1b, although these gains in transport time were negated by border-crossing delays. The need to change railway gauge at the KAZ-PRC borders is routinely identified by CPMM data as the primary reason for delay on this corridor. While this is certainly an incentive to expand station capacity to handle operations at Dostyk (KAZ), this is ultimately a structural issue that cannot easily be resolved.

Figure 2.8: Speed to Travel on CAREC Corridors (Rail) (kmph)



Source: Asian Development Bank

In addition to the necessary rail gauge change, the CPMM highlighted a shortage of train wagons as another significant issue. The average time lost due to wagon shortage was greater than time lost because of change of rail gauge. Rail shipments at specific BCPs were delayed by wagon shortage: Dostyk (21.7 hours), Altynkol (25.4 hours), and Zamiin Uud (18.7 hours). Compared to delays from the change of rail gauge at Dostyk (3.4 hours), Altynkol (3.2 hours), and Zamiin Uud (1.4 hours), wagon shortage proved to be the more severe problem.

Key Regional Updates

Eurasian Economic Union

The Eurasian Economic Union (EAEU) collectively provides preferential treatment for its five member countries to access potential markets of 183 million people, along 109,100 km of railways and 1,704,500 km of roads.⁸ Since the Kyrgyz Republic's accession to the EAEU in August 2015, border crossing with Kazakhstan has been simplified. For instance, trucks crossing at Ak Zhol-Kordai (KGZ-KAZ) along corridor 1c cleared the border in less than one hour in 2016 (from 4.4 hours in 2012), helped by the removal of customs controls and the need to complete only border security control and phytosanitary inspection.

However, during the period 2013-2016, the total tonnage transported within the EAEU region exhibited a decreasing trend (annual average of -0.3%) to 12,186 million tons due to drops in oil and commodity prices, and economic sanctions imposed on Russia.

In 2016, Russia accounted for the greatest tonnage transported and freight turnover in the EAEU (66%), followed by Kazakhstan (31%).⁹ While EAEU railways hauled only 15% of the tonnage transported, they accounted for 45% of the total cargo turnover in 2016,¹⁰ due to much longer distances for rail shipments. Road transport moved 72% of the total tonnage but only 8% of the total freight turnover. However, road transport was the only mode of transport to show a steady increase in tonnage and turnover in Kazakhstan. Data for the Kyrgyz Republic showed that road transport accounted for almost 94% of the total tonnage transported and slightly more than 60% of the freight turnover. The mountainous terrain and the lack of a unified railways system indicates that road will continue as the dominant mode of transport.

⁷ Rail transport costs are set by the relevant national authorities in each CAREC country.

⁸ EAEU members include Armenia, Belarus, Kazakhstan, Kyrgyz Republic, and Russia. Unified transportation services and harmonized regulations and rules support the EAEU market structure: <http://www.eaeunion.org/?lang=en>

⁹ More information is available at http://eec.eaeunion.org/ru/act/integr_i_makroec/dep_stat/econstat/Pages/transport.aspx

¹⁰ Cargo or freight turnover is the product of a certain quantity of cargo (in tons) and the distance of the transport (in km).

■ Trans-Caspian International Transport Route

The Trans-Caspian International Transport Route was established in 2013 initially as a coordinating mechanism between the national railway authorities of Azerbaijan, Georgia, and Kazakhstan,¹¹ and has since grown in members to play an important role in facilitating railway corridor connectivity between East Asia, the Caucasus, and Europe.

In February 2018, the Turkish State Railways joined the Trans-Caspian International Transport Route mechanism. With its membership, the People's Republic of China aims to increase PRC–Europe trade via the Trans-Caspian Route to an annual 300,000 shipping containers by 2020.¹²

■ Regional Transit Regimes

1. Central Asia Regional Economic Cooperation Advanced Transit System

Effective transit regimes enable rapid movement of goods from origin to destination and to seaports, which is especially advantageous for landlocked CAREC countries. Piloting of the CAREC Advanced Transit System (CATS) – a regional transit guarantee mechanism – was endorsed by the 16th Customs Cooperation Committee (CCC) Meeting held in September 2017, in Dushanbe, Tajikistan. CATS features a risk-based comprehensive guarantee mechanism, use of a single transit document, and a common exchange of information for transit trade.

A proposed prototype is under development among Azerbaijan, Georgia, and Kazakhstan, which have agreed to pilot the regional transit mechanism under a trilateral agreement.¹³ Key prototype elements and procedures are compatible with the European Union's New Computerized Transit System and include a risk-based comprehensive guarantee mechanism, single transit document, and an information common exchange for transit (ICE).¹⁴

Although ICE will be used for a broader array of customs operations in the future, the first pilot phase will be implemented in support of the CATS single transit document. Key elements of ICE will include technical specification based

on and in conformance with the World Customs Organization (WCO) Data Model; ICE systems software will be a distributed model system with a Gateway services component to potentially provide integration with customs information systems and other ICE systems. In addition, ICE will have the potential to contribute to WCO Globally Networked Customs Utility Blocks and common transit data model.

2. Convention on International Transport of Goods Under Cover of TIR Carnets

The Convention on International Transport of Goods Under Cover of Transports Internationaux Routiers (TIR) Carnets (TIR Convention) is an international customs transit regime that simplifies customs controls for road transport, and is commonly used in Central Asia. During 2017, the People's Republic of China, India, and Pakistan prepared to sign the TIR Convention, which should facilitate transport and trade between these large regional markets, and potentially for other CAREC TIR members as well.¹⁵ Pakistan further plans to initiate use of TIR with Iran, initially permitting only cargoes in sealed containers. The People's Republic of China's use of TIR could reshape the transport corridors in the region, given its status as a major exporting center. India's accession to the TIR Convention will potentially open up multimodal transport options from the port of Mumbai, India to Central Asia, via Chabahar seaport. Impacts arising from TIR expansion are less likely to be felt in the short term, however, as new contracting parties must prepare legislation, customize IT systems and train transport operators to qualify for TIR operations.

■ Asaka-Kashi-Shenzhen Transport Route

In 2017, the CAREC Federation of Carriers and Forwarders Associations (CFCFA) worked to identify a regional route to connect the landlocked Fergana Valley with Shenzhen seaport in southern People's Republic of China. Fergana Valley's high volume of agricultural products for export to the region and global markets requires efficient and cost-effective transport options, most especially for the Kyrgyz Republic and Uzbekistan. The Eighth CFCFA Annual Meeting agreed to pilot test the Asaka-Kashi-Shenzhen route among CFCFA members,¹⁶ and assess the road-rail-ship transport potential for cargo to move to Shenzhen, from where re-export will be

11 More information on the TITR is available at <http://titr.kz/en>

12 More information is available at <https://www.freshplaza.com/article/2190170/trans-caspian-trade-route-will-open-chinese-import-markets/>

13 More information is available at www.carecprogram.org/?event=customs-cooperation-committee-meeting-sep-2017

14 The New Computerized Transit System (NCTS) is a system of electronic declaration and processing that traders must use to submit TIR declarations electronically. For more information, see <https://www.unece.org/fileadmin/DAM/trans/doc/themes/UNDAC2C/Geneva2016/Meszaros210616.pdf>

15 With the anticipated accession of the People's Republic of China and Pakistan, all CAREC member countries will be contracting parties to the TIR Convention.

16 The Eighth CFCFA Annual Meeting was held on 18 September 2017 in Dushanbe, Tajikistan. <https://www.carecprogram.org/?event=carec-federation-carrier-forwarders-associations-meeting-sep-2017>

possible to third countries, including South Korea and Japan. This initiative proposes establishing a logistics center in Asaka (UZB), from where goods would move on trucks through Karasuu BCP (UZB-KGZ), pass the city of Osh, and then cross the border at Irkeshtan (KGZ-PRC). Trucks would head to Kashi where goods would be transferred onto trains bound for Shenzhen seaport, from where they could be ferried to East Asia or Southeast Asia.

Preliminary estimates from the pilot test run indicated that trucks require one day to transport goods from Asaka to Kashi (558 km), and from Kashi to Shenzhen (5,908 km), while trains would take 3-4 days. Produce from the Fergana Valley may therefore take 5-6 days to reach Shenzhen seaport.

■ **People's Republic of China-Mongolia Bilateral Border Cooperation**

In 2017, cooperation between customs authorities from the People's Republic of China and Mongolia continued to make progress. The Eighth Working Group Meeting on Joint Customs Control (JCC) of the Customs Administrations of Mongolia and the People's Republic of China was held on 6 September 2017, in Ulaanbaatar, Mongolia.¹⁷ Discussions focused on:

- (i) Improvements made to the unified cargo manifest, its digitalization, and plans for a pilot test in 2018;
- (ii) Expanding the scope of joint inspection, including the exchange of paper unified cargo manifests to other BCPs such as Takeshiken (PRC; corridor 4a);
- (iii) Preparation work on phase 2 of JCC Mutual Recognition of Inspection Certificates, including which goods to cover, and use of smart locks on container cargo;
- (iv) Commitment to continue the project given the importance of cooperation to facilitate customs inspection and clearance.

¹⁷ The Working Group meeting and progress in Joint Customs Control is summarized at <https://www.carecprogram.org/uploads/2017-CCC-Meeting-Statement.pdf>

III. 2017 Corridor Performance Measurement and Monitoring Data

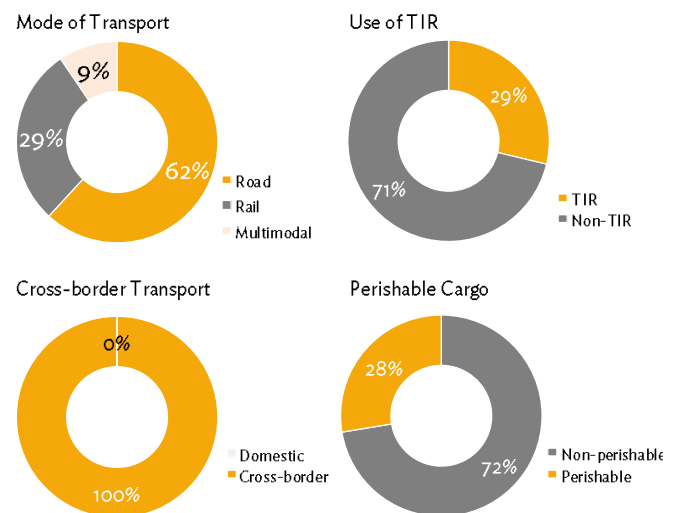
CPMM data are derived from commercial shipments that move through Central Asia. Although most of these shipments originate within CAREC member countries, some start from outside the region (for example, in Russia or Turkey). Similarly, the final destination of most monitored shipments is within Central Asia, although some continue to more distant destinations, notably Russia and Europe.

CPMM road and rail transport, and time and cost data are collected by transport operators during shipment and analyzed on a monthly basis. Data relating to time is measured in hours and collected for the (i) travel time on road, railways, or water, and (ii) border-crossing time. Likewise, data relating to cost are decomposed into (i) vehicle operating costs for trucks, or railways tariffs for trains, and (ii) border-crossing fees. The CPMM also reports on activities and locations that involve unofficial payments, such as paying additional “tea money” to border agencies at BCPs in exchange for preferential treatment.

2017 Data Profile

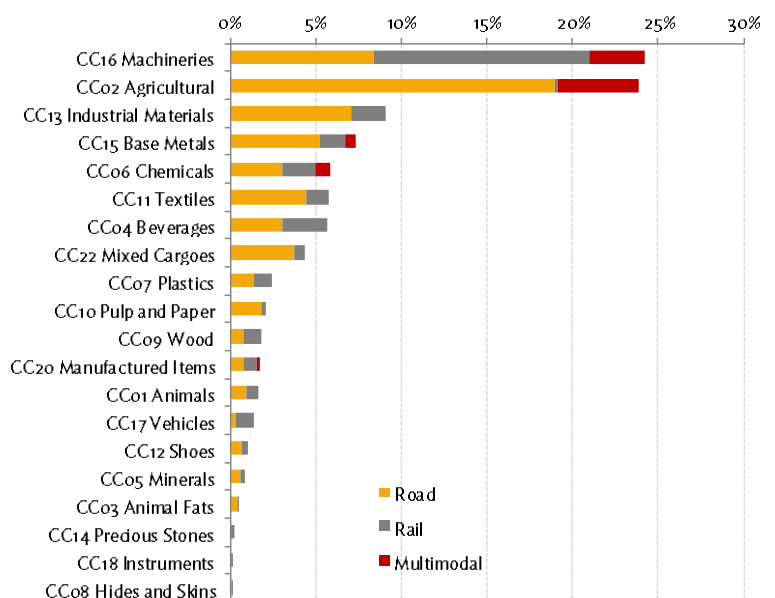
In 2017, 12 associations (Appendix 2) in 8 countries collected 2,532 samples, all of which were cross-border shipments (Figure 3.1). These shipments were transported predominantly by road (62%), followed by rail (29%), and multimodal (9%).¹⁸ Of the road samples, 29% used the TIR Carnet as a transit mechanism. Shipments carrying perishables accounted for 28% of the total, and these were mainly carried on trucks (road transport). The top five categories of goods carried (Figure 3.2) included machineries (24.2%), agricultural produce (23.9%), industrial materials (9.1%), base metals (7.3%), and chemicals (5.8%). These top five categories constituted 70% of all samples.

Figure 3.1: Sample Data Profile (%)



Source: Asian Development Bank

Figure 3.2: Type of Commodities Transported (%)



CC = commodity classification
 Commodity classification of transported goods is made according to the WCO 2007 Harmonized System nomenclature. In a case of multiple commodities, the CPMM report includes only the highest volume transported goods.
 Source: Asian Development Bank.

18 A shipment is defined as ‘multimodal’ only if two or more transport modes are used, with the road segment being at least 80 km long.

Box 3.1: CAREC Corridor Alignment and Key Border-crossing Points

The CAREC Program has identified six priority corridors (Figure 1.1) and supports their development into economic corridors through greater economic cooperation and stronger trade integration. The corridors are intended to reinforce linkages among countries in the region, with neighboring regions whose booming economies offer unique opportunities for further growth, and with global markets. These corridors were chosen on the basis of (i) traffic volume; (ii) projected traffic growth and economic potential; (iii) future capacity to link economic and population hubs; (iv) future potential to reduce transport delays; (v) economic and financial sustainability through investment in infrastructure, technology, and management; and (vi) multimodal aspects.

CPMM monitors key BCPs (Table 3.1) which connect trade and transport among member countries through data recording cargo movement along CAREC corridors.

Table 3.1: CAREC Corridor Alignment and Key Border-crossing Points

Country	CAREC Corridors	Key BCPs in CPMM
Afghanistan	2, 3, 5, and 6	Torkham, Chaman, Shirkhan Bandar, Hairatan, and Towraghondi
Azerbaijan	2	Baku (port), Red Bridge, Boyuk Kesik
People's Republic of China	1, 2, 4, and 5	Alashankou, Altynkol, Erenhot, Irkeshtan, Khorgos, Khunjerab, Kara Suu, and Torugart
Georgia	2	Red Bridge, Gardabani, Sarpi
Kazakhstan	1, 2, 3, and 6	Dostyk, Altynkol, Khorgos, Konyshaeva and Tazhen
Kyrgyz Republic	1, 2, 3, and 5	Gulistan, Irkeshtam, Karamik and Torugart
Mongolia	4	Altanbulag, Bichigt, Sukhbaatar, Yarant and Zamiin Uud
Pakistan	5 and 6	Chaman and Peshawar
Tajikistan	2, 3, 5, and 6	Dusti, Gulistan, Karamik, Kulma, and Nizhni Pianj
Turkmenistan	2, 3, and 6	Farap, Sarahs and Serkhet Abad
Uzbekistan	2, 3, and 6	Alat, Dautota, Saryasia and Yallama

Source: Asian Development Bank

Cargo Movement

Using 2017 CPMM data, cargo movement in each CAREC member country is summarized as follows:

- Afghanistan.** The CPMM captured the following types of cargo movements across Afghanistan: (i) containerized shipments from Karachi seaport, Pakistan, to Jalalabad or Kabul; (ii) containerized shipments from Karachi seaport to Kandahar; (iii) transit shipments from Peshawar to Dushanbe, Tajikistan; (iv) transit shipments from Peshawar to Tashkent, Uzbekistan; and (v) transit shipments from Quetta, Pakistan, to Ashgabat, Turkmenistan. Containerized shipments from Karachi consisted of consumer and industrial goods, while transit shipments from Pakistan to Central Asia included fruits and vegetables. Geographically, Afghanistan is strategically located to connect Central Asia and South Asia. However, regional political relations and security considerations have resulted in inefficient shipment performance.

- People's Republic of China.** CPMM samples and data reflected the high levels of export coming out of the People's Republic of China by both road and rail, heading west to Central Asia and Europe, and north to Mongolia and Russia. Road shipments included (i) exports of assorted consumer and industrial goods to Kazakhstan and the Kyrgyz Republic; (ii) exports of, particularly, construction equipment and building materials to Afghanistan and Tajikistan; (iii) exports of refined petroleum, consumer items, construction material and food commodities to Mongolia; (iv) exports of construction equipment and materials to Pakistan along corridor 5b; (v) imports of coal and minerals from Mongolia along corridor 4c; (vi) imports of Russian lumber along corridor 4b; and (vii) transit shipments of Mongolian exports to Tianjin seaport along corridor 4b. Sampled rail movements included (i) exports to Almaty and Astana in Kazakhstan along corridor 1; (ii) exports of machineries and equipment to Turkmenistan, crossing Kazakhstan and Uzbekistan; (iii) exports from Chongqing to Duisburg, Germany using container express train; and (iv) exports of glassware, beverages and automobile spare parts from Chongqing to Ulaanbaatar, Mongolia.

- **Georgia.** The Republic of Georgia formally joined the CAREC partnership in 2017. Strategically located in the Caucasus subregion, Georgia forms a link between Central Asia and Europe, and facilitates transit truck shipments from Turkey to Kazakhstan, crossing Azerbaijan and the Caspian Sea. Georgia's entry into CAREC extended corridor 2's alignment into the country's territory up to the three seaports (Poti, Batumi, and Anaklia) in the west to the Black Sea. The corridor also extends into Turkey through the Sarpi BCP, where trucks bound for the Caucasus cross.

- **Kazakhstan.** The CPMM captured the following export, import, and transit shipments during 2017: (i) imports of vehicles and industrial goods from major cities such as Shanghai and Qingdao, People's Republic of China on trains to Almaty; (ii) imports of consumer and industrial materials from Urumqi, People's Republic of China, to Almaty on trucks along corridor 1b ; (iii) imports of chemicals, equipment and machineries from Urumqi to Almaty or Astana on trains along corridors 1a or 1b; (iv) imports from the Kyrgyz Republic and Uzbekistan of fruits and vegetables on trucks; (v) transit shipments of agricultural products from the Kyrgyz Republic and Uzbekistan through Kazakhstan on trucks to Russia; and (vi) transit shipments of machineries and equipment from Urumqi to Ashgabat, Turkmenistan on trains.

- **Kyrgyz Republic.** In 2017, movement of goods mainly included (i) imports such as machineries and pharmaceuticals from Russia via Kazakhstan; (ii) imports of textiles from the People's Republic of China; (iii) exports of fresh and dried fruits, and fresh vegetables to Russia; and (iv) transit shipments of goods, such as equipment and machineries, from the People's Republic of China to Tajikistan. The country's key trading partners are the People's Republic of China, Kazakhstan, Russia, and Tajikistan, which influence and shape trade flows. Kazakhstan serves as a transit country for Kyrgyz goods to reach Russia. As members of the EAEU, there are no customs controls at the border between Kazakhstan and the Kyrgyz Republic, resulting in faster and more efficient border crossings. The Kyrgyz Republic facilitates transit of exports from the People's Republic of China's to Tajikistan. While bilateral trade between Kyrgyz Republic and Tajikistan can go through Karamik, transit goods must be cleared at Kyzyl Bel-Gulistan.

- **Mongolia.** The CPMM captures both road and rail transport data in Mongolia. For 2017, samples of rail traffic included (i) imports of containerized cargoes from Japan, South Korea, and parts of the People's Republic of China (such as Tianjin to Ulaanbaatar); (ii) exports of meat and minerals in containers from Ulaanbaatar to Tianjin for re-export; and (iii) transit shipments of Russian lumber to the People's Republic of China on conventional wagons. Road traffic samples included (i) imports of chemicals and diesel fuel from the People's Republic of China into Mongolia, and crude oil exports to the People's Republic of China, crossing Bichigt along sub-corridor 4c; (ii) imports of mixed consumer goods and foodstuff from the People's Republic of China to Ulaanbaatar, crossing Zamiin Uud along corridor 4b; (iii) imports of consumer goods and beverages from Russia to Ulaanbaatar, crossing Altanbulag along corridor 4b; and (iv) exports of coal from Mongolia to the People's Republic of China, crossing Yarant along corridor 4c. All samples were transported on non-containerized trucks.

- **Pakistan.** Cargo movements captured for 2017 include (i) exports of fruits and vegetables to Tajikistan and Uzbekistan via Afghanistan; (ii) exports of fruits and vegetables from Quetta to Ashgabat, Turkmenistan, via Afghanistan; and (iii) transit shipments of containerized cargoes to Kabul, Jalalabad, or Kandahar from Karachi. Located in South Asia, Pakistan's trade with Central Asia by necessity moves through Afghanistan and is subject to constraints arising from the current geopolitical situation: transit movements can be affected by abrupt border closures that disrupt the supply chain. The warm-water seaports of Pakistan offer a logistical advantage in providing the shortest route for trade from Central Asia to integrate with international maritime transport.

- **Tajikistan.** Cargo movements in 2017 included (i) imports of construction and building equipment from the People's Republic of China to Dushanbe in containers; (ii) imports of consumer and industrial products from Russia to Dushanbe (crossing Kazakhstan and Uzbekistan) in containers; (iii) bilateral trade with the Kyrgyz Republic via Karamik; and (iv) imports of fruits and vegetables from Pakistan via Afghanistan. CPMM data reveal robust cargo

movements from Manas, Kyrgyz Republic, to Kabul during the time international security forces were stationed in Afghanistan: the withdrawal of international forces, however, resulted in the collapse of cargo demand, adversely affecting transport operators in the Kyrgyz Republic, Tajikistan, and Afghanistan.

- **Turkmenistan.** 2017 shipment samples in Turkmenistan were limited to (i) imports of equipment and machineries from the People's Republic of China on trains; (ii) imports of fruits and vegetables from Pakistan; and (iii) transit shipments of containerized cargoes on trucks in both directions between Bandar Abbas seaport, Iran, and Uzbekistan.

- **Uzbekistan.** Cargo movements recorded in 2017 included (i) exports of agricultural products to Russia via Kazakhstan and imports of manufactured goods in the other direction; (ii) exports of fruits and vegetables to Kazakhstan; (iii) exports and imports of containerized goods between Uzbek cities and Bandar Abbas seaport via Turkmenistan; (iv) imports of fruits and vegetables from Pakistan via Afghanistan; (v) transit shipments of manufactured goods and equipment from Russia to Tajikistan; and (vi) a limited number of containerized transit shipments of consumer goods from Bandar Abbas seaport to Kazakhstan and the Kyrgyz Republic. All shipments were carried on trucks, except for the transit of equipment on trains from the People's Republic of China to Turkmenistan. The recent moves by the government to open up the economy of Uzbekistan to trade led to the signing of new agreements for Uzbekistan with Afghanistan and Kazakhstan in 2017. Previously known for its conservative policy on transit trade, the country is now preparing to liberalize restrictions, which bodes well for regional cooperation.

IV. Road Transport in 2017

2017 CPMM TFIs and relevant trendlines for road transport are detailed in tables 4.1-4.4, and in figures 4.1, 4.2, 4.5, and 4.6. Overall, CPMM data analysis for 2017 showed that:

- (i) Average border-crossing time increased from 11.3 hours in 2016 to 16.7 hours in 2017;
- (ii) Border-crossing cost decreased (from \$160 in 2016 to \$158 in 2017);
- (iii) Total transport cost also decreased (from \$1,174 in 2016 to \$947 in 2016);
- (iv) Speed with delay (SWD) at 22.2 kmph in 2017 was unchanged from 22.3 kmph in 2016.

TFI1: Average Border-Crossing Time

Table 4.1: Average Time Taken to Clear a Border-crossing Point (hours)

	2016	2017	% change
TFI1 Time taken to clear a border crossing point (hours)	11.3	16.7	47.8

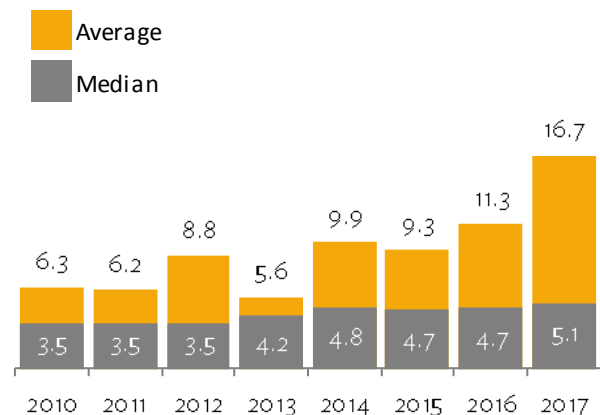
TFI = Trade Facilitation Indicator
Source: Asian Development Bank

The increase in average border-crossing time was largely due to substantially longer border-crossing times along corridors 5 and 6. For example, average time rose from 27.9 hours in 2016 to 52.6 hours in 2017 on corridor 5a; 49.2 hours to 83.5 hours on 5c; and 9.4 hours to 13.4 hours on 6c. The averages in other corridors were relatively unchanged.

These longer border-crossing times were traced to the Chaman, Peshawar, and Torkham BCPs where the following observations were made:

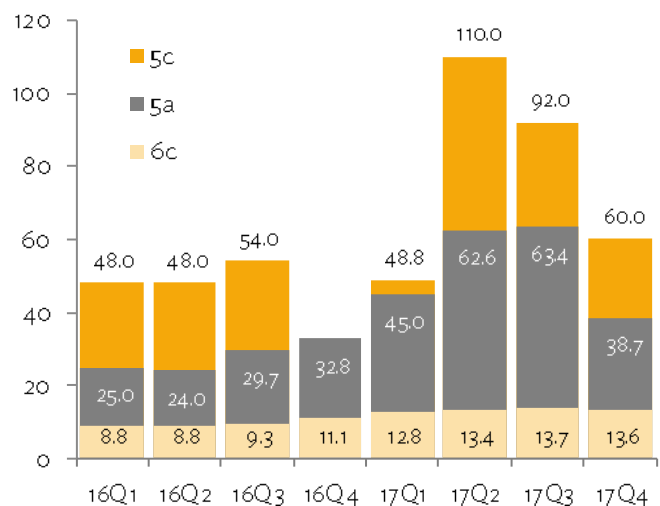
- (i) **Abrupt Border Closure:** During January-February 2017, Pakistan unilaterally closed the border with Afghanistan for security concerns. Long lines of trucks had to wait on either side before the border was re-opened in March 2017.
- (ii) **Stricter Border Controls:** After the re-opening of the border, stricter controls were imposed. At Peshawar, the time required for border crossing was estimated at 66.4

Figure 4.1: Time Taken to Clear a Border-crossing Point (Road) (hours)



Source: Asian Development Bank.

Figure 4.2: Average Border-crossing Time of Selected Road Corridors (hours)



No data on 5c (Chaman-Spin Buldak) in Q4 2016.

Source: Asian Development Bank.

hours and another 45.5 hours was needed at Torkham. Customs and security-related controls accounted for most of this time.

(iii) **Inefficient Layout and Procedure:** At these BCPs, X-ray machine malfunction was frequent due to poor maintenance. The gate at Torkham is 8m wide, permitting trucks to move in a single direction only. Unsegregated passengers and cargo traffic contributed to slow movement.

Toward the end of 2017, the average border-crossing time appeared to have improved and reverted to the value observed at the end of 2016.

TFI2: Average Border-crossing Cost (\$)

Table 4.2: Average Cost Incurred at Border-crossing Clearance (\$)

	2016	2017	% change
TFI2 Cost incurred at border crossing clearance (\$)	160	158	-1.3

TFI = Trade Facilitation Indicator
Source: Asian Development Bank

Table 4.3 illustrates the dispersion of costs incurred in CAREC corridors in 2017. Sub-corridors with the costliest border-crossing activities were 1b (\$352); 5b (\$343); and 5c (\$304), while all other routes showed average border crossing costs

below \$300.

Customs formalities, loading and unloading, and waiting in line were the major sources of fees and payments. Standard inspection operations at BCPs such as border control, customs, health and quarantine, phytosanitary and veterinary, transport and weight checks were uniform activities that incurred a fee. Customs fees were relatively higher than other fees, and especially sizeable in corridors 1 and 5. Health and quarantine in corridor 1 cost \$121. Loading and unloading incurred costs due to the need for temporary storage and/or transfer of materials between trucks. Road tolls were considerable for trucks passing through corridors 2 and 3 when they entered the territory of Turkmenistan. Waiting in line was generally a non-cost activity unless trucks parked in designated parking areas.

Analysis on unofficial costs (Table 4.4) showed that

- Unofficial payments differed widely between locations. The amount was generally higher when the BCP had heavy traffic and longer lines. Yet even at the same location, the payment may differ depending on the officer-in-charge.
- Unofficial payments were recorded at BCP and non-BCP locations such as inland customs offices, or when interacting with traffic police on the road. However, data show that unofficial payments tend to be concentrated at BCPs.

Table 4.3: Time and Cost Spent on Activities at Road Border-crossing Points

ROAD TRANSPORT	Average duration, in hours								Average cost, in \$							
	Overall	Corridors							Overall	Corridors						
		1	2	3	4	5	6	1		2	3	4	5	6		
i. Border Security/Control	0.6	0.3	0.7	0.5	0.5	0.8	0.7	19	9	14	13	27	18	18		
ii. Customs Clearance	10.9	1.6	1.3	1.4	1.4	34.2	9.0	106	203	21	27	92	204	73		
iii. Health/Quarantine	0.5	1.1	0.4	0.3	0.6	0.5	0.3	18	121	9	6	21	7	10		
iv. Phytosanitary	0.4	1.4	0.4	0.4	0.2	-	0.4	9	11	9	7	3	-	11		
v. Veterinary Inspection	0.3	0.4	0.3	0.3	0.2	-	0.3	6	10	7	6	-	-	7		
vi. Visa/Immigration	0.3	0.2	0.6	0.3	0.1	0.5	0.4	27	16	78	7	-	47	12		
vii. GAI/Traffic Inspection	0.3	0.2	0.1	0.2	0.2	0.5	0.4	7	5	-	8	-	7	7		
viii. Police Checkpoint/Stop	0.3	0.2	0.3	0.3	0.1	0.4	0.4	7	5	4	6	-	8	8		
ix. Transport Inspection	0.4	0.9	0.3	0.3	0.1	-	0.4	12	18	10	9	-	-	12		
x. Weight/Standard Inspection	0.5	0.9	0.5	0.3	0.4	-	0.5	18	10	13	15	34	-	13		
xi. Vehicle Registration	0.3	1.4	0.4	0.2	0.2	-	0.4	7	4	9	5	-	-	7		
xii. Emergency Repair	0.7	-	-	-	-	0.7	1.3	28	-	-	-	-	28	-		
xiii. Escort/Convoy	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
xiv. Loading/Unloading	2.2	3.7	3.6	1.7	1.5	3.8	2.4	104	271	-	80	116	46	98		
xv. Road Toll	0.4	0.8	0.5	0.7	0.2	0.5	0.5	39	-	160	163	13	58	8		
xvi. Waiting/Queue	10.1	2.1	2.9	4.1	0.5	23.7	10.4	35	4	-	-	9	429	-		

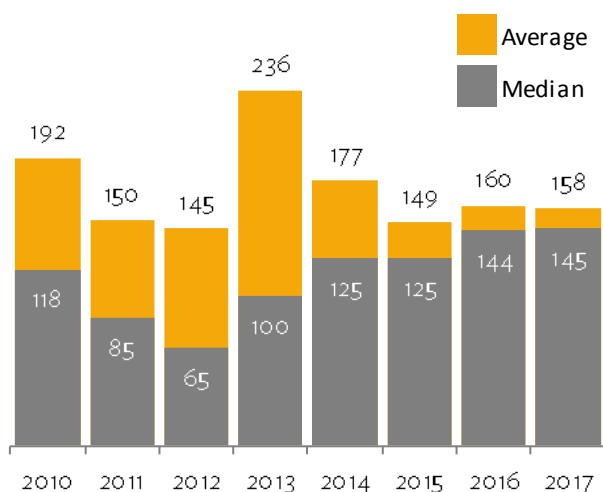
Legend: More than 1 hour

More than \$100

Source: Asian Development Bank

- (iii) Rent-seeking behaviors were observed in the following activities, ranked by likelihood of occurrence: (i) phytosanitary inspection (25%); (ii) vehicle registration (24%); (iii) customs formalities (19%); (iv) weight standard inspection (18%); and (v) visa/immigration checks (14%).
- (iv) In terms of the magnitude of unofficial payment per truck, the largest sums were taken during (i) customs formalities (\$70); (ii) loading/unloading (\$45); (iii) transport inspection (\$11); and (iv) health and quarantine (\$6) and phytosanitary inspection (\$6).

Figure 4.3: Cost Incurred at Border-crossing Clearance (Road) (\$)



Source: Asian Development Bank

Table 4.4: Likelihood of Unofficial Payments (Road) (\$)

Activity	Count	%	Average
i. Border Security/Control	2,481	7%	4
ii. Customs Clearance	4,033	19%	70
iii. Health /Quarantine	1,563	10%	6
iv. Phytosanitary	859	25%	6
v. Veterinary Inspection	471	7%	4
vi. Visa/Immigration	1,274	14%	3
vii. GAI/Traffic Inspection	1,138	0%	-
viii. Police Checkpoint /Stop	2,890	0%	-
ix. Transport Inspection	1,811	7%	11
x. Weight/Standard Inspection	1,717	18%	5
xi. Vehicle Registration	774	24%	4
xii. Emergency Repair	287	0%	-
xiii. Escort /Convoy	-	-	-
xiv. Loading /Unloading	1,512	0%	45
xv. Road Toll	2,691	10%	5
xvi. Waiting/Queue	90	0%	-

Source: Asian Development Bank

TFI3: Total Transport Cost

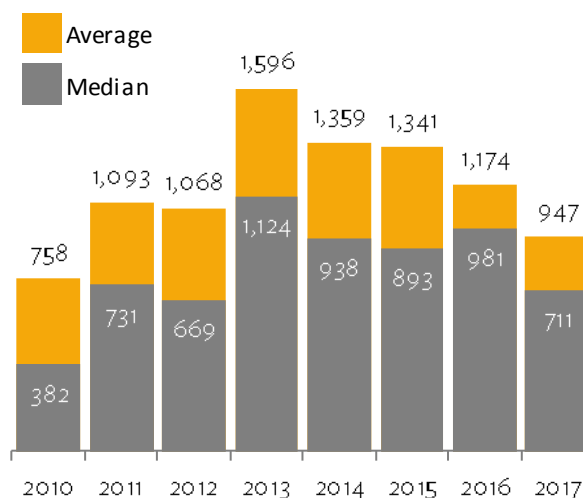
Table 4.5: Average Cost Incurred to Travel a Corridor Section (\$)

	2016	2017	% change
TFI3 Cost incurred to travel a corridor section (\$ per 500km, per 20 tons)	1174	947	-19.3

km = kilometer, TFI = trade facilitation indicator.
Source: Asian Development Bank.

In 2017, most corridors reported a TFI3 of less than \$1,000, meaning it cost less than \$1,000 for a 20-ton shipment to travel 500 km from origin to destination. The costliest corridors for overall transport were identified as 4b (\$1,422); 5a (\$1,477) 5b (\$1,004); 5c (\$2,689); and 6d (\$2,307). It is noteworthy that these corridors traverse Afghanistan, Mongolia, and Tajikistan where infrastructure may be less developed and may therefore contribute to higher overall transport costs.

Figure 4.4: Cost Incurred to Travel a Corridor Section (Road) (\$ per 500km, per 20-ton cargo)



Source: Asian Development Bank

TFI4: Speed to Travel on CAREC Corridors

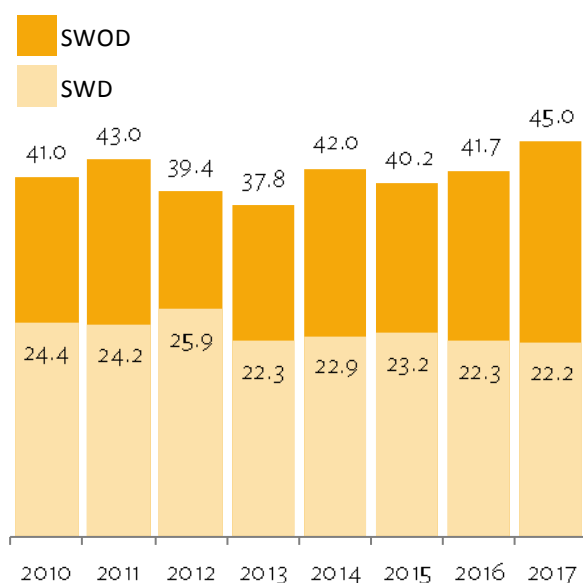
Table 4.6: Average Speed to Travel on CAREC Corridors (kmph)

	2016	2017	% change
TFI4 Speed to travel on CAREC Corridors (kmph)	22.3	22.2	-0.4
SWOD Speed without delay (kmph)	41.7	45.0	7.9

kmph = kilometers per hour, TFI = trade facilitation indicator, SWOD = speed without delay.

Source: Asian Development Bank.

Figure 4.5: Speed to Travel on CAREC Corridors (Road) (kmph)



SWD = speed with delay, SWOD = speed without delay.

Source: Asian Development Bank

Speed to travel the corridors saw improvements across the board in all corridors for SWOD,¹⁹ notably corridor 5 where all SWOD observations exceeded 40 kmph. SWD was 22.2 kmph – relatively unchanged on a year-to-year basis. Corridor 1 (53 kmph) was the fastest in 2017, followed by corridor 2 (49 kmph); corridor 3 (41 kmph) was the slowest of all corridors measured in 2017.

Progress in 2017 in terms of higher SWOD did not translate into gains for SWD. As reported earlier, TFI1 average border-crossing time increased. Thus, faster SWOD was offset by the extra time required to cross borders, resulting in a flat SWD. When the difference between SWOD and SWD was compared, it was discovered that 9 out of 17 sub-corridors reported a decrease in SWD of more than 50%. It can be inferred that border crossing stoppages were a major cause of the decline in speed and overall transport efficiency. Corridors 5a, 5c, and 6d were particularly hard-hit, with reductions of more than 80%.

Corridor Performance

Corridor 1

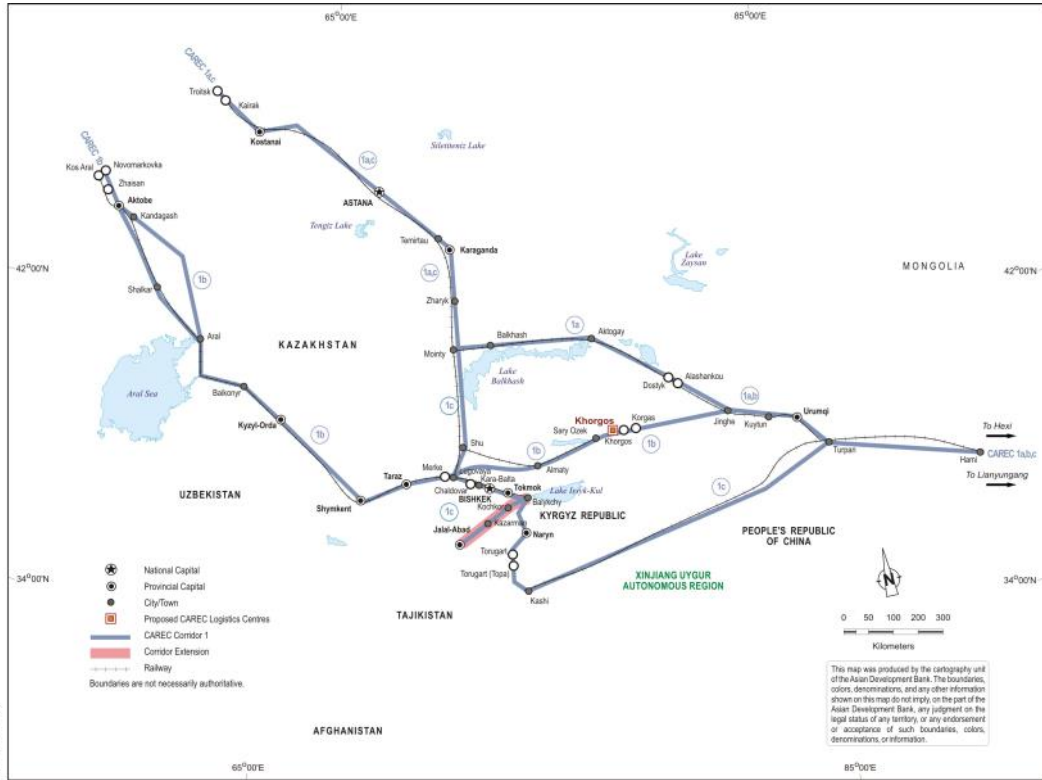
This corridor links East Asia to Europe and has three sub-corridors (Figure 4.6): (i) sub-corridor 1a predominantly facilitates railway traffic; (ii) sub-corridor 1b is active for both road and rail transport, as seen on the route between Urumqi and Almaty, which is heavily used by cargo trucks; and (iii) sub-corridor 1c which connects the Kyrgyz Republic to international highways in Kazakhstan that link to Russia. International interest in the People's Republic of China's Belt and Road Initiative as well as the aggressive investment programs of Kazakhstan and the People's Republic of China has resulted in the rapid upgrade of infrastructure along corridor 1 with the construction of new roads, railway tracks and terminals.

- (i) Of the three sub-corridors, 1b serves the most active road traffic. Trucks move from Urumqi to Horgos (PRC), where goods are unloaded and stored in temporary bonded warehouses. As People's Republic of China transport operators must have special permits to enter Kazakhstan, shippers or freight forwarders in Horgos (PRC) contact Kazakh transport operators and request drivers from Kazakhstan to collect cargoes from the People's Republic of China for onward transport to Almaty. The Kazakh drivers complete border formalities and return with the cargoes to Almaty. In Almaty, drivers report to one of the few international logistics parks for customs clearance. All goods coming from the People's Republic of China into Kazakhstan are subject to 100% physical examination.
- (ii) Horgos (PRC) is one of the busiest gateways in Central Asia. In 2017, trade turnover amounted to \$16.1 billion (+28.69% from 2016), while total tonnage handled reached 28.98 million tons (+12.48%).²⁰ Trucks took an average border-crossing time of 8.8 hours at Horgos (PRC)

19 The CPMM measures and monitors two types of speeds (Appendix 3).

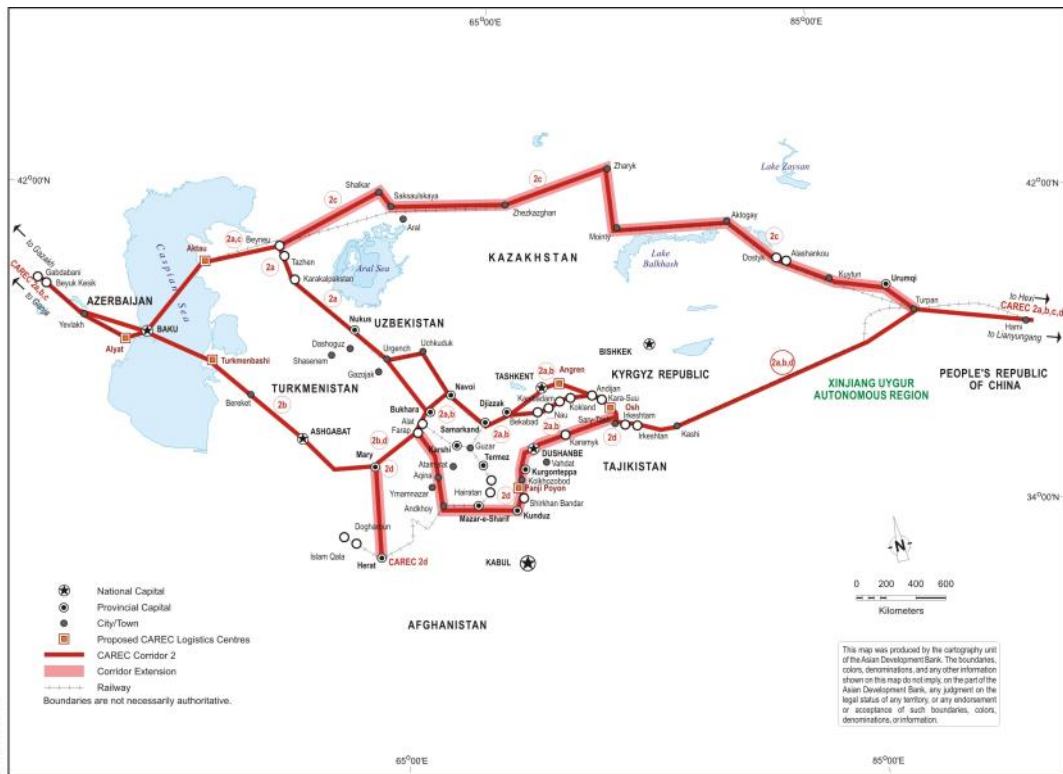
20 Cited from <http://www.chinanews.com/cj/2018/01-18/8427653.shtml> (January 18, 2018)

Figure 4.6: CAREC Corridor 1



Source: Asian Development Bank

Figure 4.7: CAREC Corridor 2



Source: Asian Development Bank

in 2017. The observed increase from 7.0 hours in 2016 is largely attributed to delays from waiting in line, which lengthened from 0.3 hours in 2016 to 2.0 hours in 2017. Cost, mostly comprised of fees for loading and unloading, customs formalities and health and quarantine, remained stable at less than \$600.

- (iii) At the Khorgos (KAZ) side, rapid development is taking place, with plans for the Khorgos “Eastern Gates” to be built as a special economic zone. Hence, border-crossing time in 2017 rose to an average of 4.1 hours from 3.3 hours in 2016 due to longer waiting times to enter the border. Meanwhile, border-crossing fees remained unchanged.

According to Khorgos (KAZ) customs, the increase in trade value and volume at the border indicates the following trends:

- (i) Increase in imports is driven by natural gas via pipelines.
- (ii) Increase in exports, mainly to Russia and the Central Asian countries is driven by (i) high-tech products and equipment, (ii) textiles and apparels, (iii) electrical appliances, and (iv) agricultural produce.

Corridor 2

Corridor 2 is a wide-ranging corridor that links Lianyungang seaport (South China Sea) in the east and the Georgian seaports (Black Sea) in the west (Figure 4.7). It connects the Caucasus region and the Mediterranean Sea to East Asia, traversing several CAREC countries. It has four sub-corridors.

Sub-corridors 2a, 2b, and 2d begin in Urumqi. Both 2a and 2b cross the Kyrgyz Republic and Uzbekistan. At Navoi, Uzbekistan, 2a continues northwards and enters Kazakhstan, reaching the Aktau seaport. Sub-corridor 2b enters Turkmenistan and travels to Turkmenbashi seaport, another key terminal in the Caspian Sea. Sub-corridor 2d diverges at Irkeshtam and passes through Tajikistan, Afghanistan, and Turkmenistan reaching Turkmenbashi. Section 2c is a separate corridor that crosses Kazakhstan and follows several major railway stations which terminate at Aktau seaport. All sub-corridors converge at Baku and continue to Azerbaijan and Georgia.

- (i) Following Georgia's formal entry into CAREC in 2017, corridor 2 has been extended through its territory up to the three seaports of Poti, Batumi, and Anaklia in the west on the Black Sea. The corridor also extends into Turkey through the Sarpi BCP, where trucks bound for the Caucasus cross.

- (ii) Sub-corridor 2b is an active corridor facilitating cargo movements, in either direction, between Uzbekistan (Fergana Valley and major Uzbek cities such as Tashkent, Navoi, Samarkand, and Bukhara) and Bandar Abbas or Turkey. Uzbekistan exports fruits and vegetables mainly in summer and fall, while durables (yarn and textiles) are transported all year round. Uzbek imports include machineries and manufactured goods from Russia, Bandar Abbas seaport, and Turkey. Along the route, truck drivers complete border procedures at Alat-Farap (UZB-TKM) and Dautota-Tazhen (UZB-KAZ) spending an average of 6-8 hours at each border post; half of the time is spent waiting in lines.
- (iii) Sub-corridor 2c links Dostyk and Aktau in Kazakhstan. In 2014, the rail line connecting Zhezkazghan to Beyneu commenced operation and shortened the travel distance by nearly 1,000 km. Efforts shall be directed to monitor this section during 2018.²¹

Corridor 3

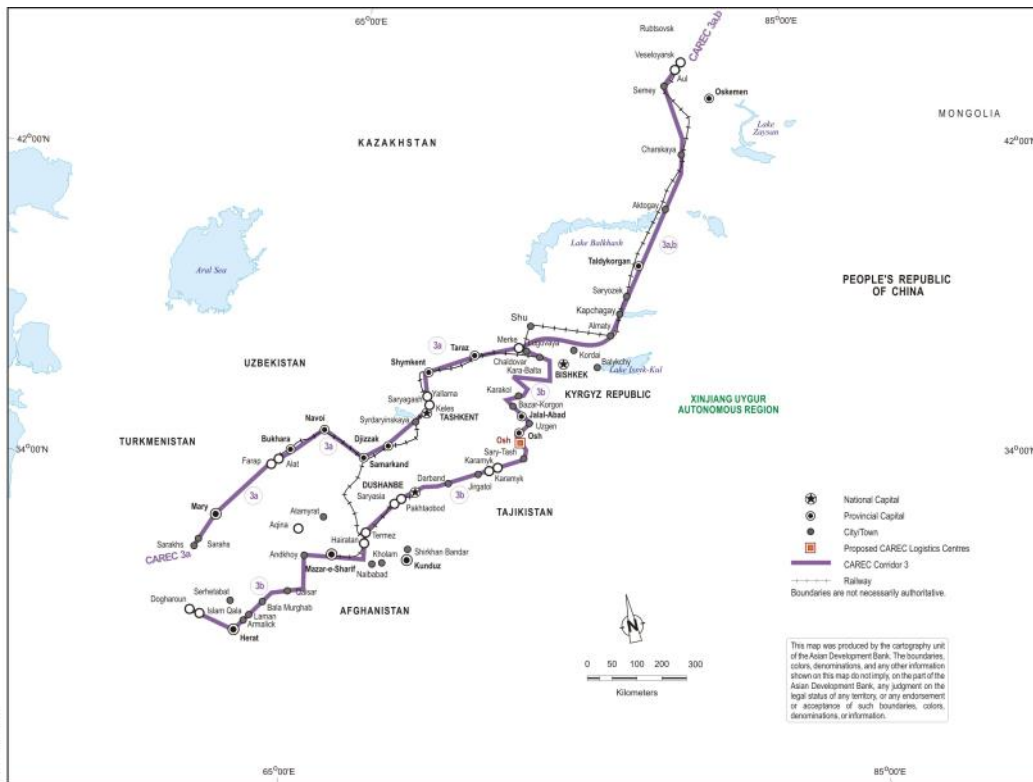
Corridor 3 is a north-south corridor linking the eastern part of Russia to the Middle East through Central Asia (Figure 4.8). The northern section resides in Kazakhstan and includes both road and railway. The corridor splits into two at Merke. Section 3a moves into Uzbekistan and Turkmenistan, ending in Iran. Section 3b heads south to the Kyrgyz Republic, Tajikistan, and Afghanistan, also ending in Iran.

The 2017 CPMM observed continuing trends, and in particular the respective limitations and strengths of sub-corridor sections 3a and 3b.

- (i) Border-crossing time in 3a continued to be longer. As shown in the TFIs, average border-crossing times were 7.1 hours (3a) versus 4.0 hours (3b).
- (ii) In 3a, the three most heavily used BCPs were Yallama-Konybaeva (UZB-KAZ), Alat-Farap (UZB-TKM) and Sarahs-Sarakhs (TKM-IRN). In 3b, the key BCPs were Karamyk-Karamyk (KGZ-TAJ), Dusti-Saryasia (TAJ-UZB) and Fotehobod-Oibek (TAJ-UZB). On average, border-crossing times in 3a were longer than those in 3b. Only Fotehobod-Oibek (TAJ-UZB) had a comparable time with BCPs in 3a.
- (iii) Karamyk cannot be used for comparison because it is a bilateral BCP between KGZ and TAJ and international transit traffic is closed to third-party countries, so border crossing time here is shorter due to simplified controls. For instance, People's Republic of China trucks must detour to Kyzyl Bel-Gulistan in the Batken region to reach

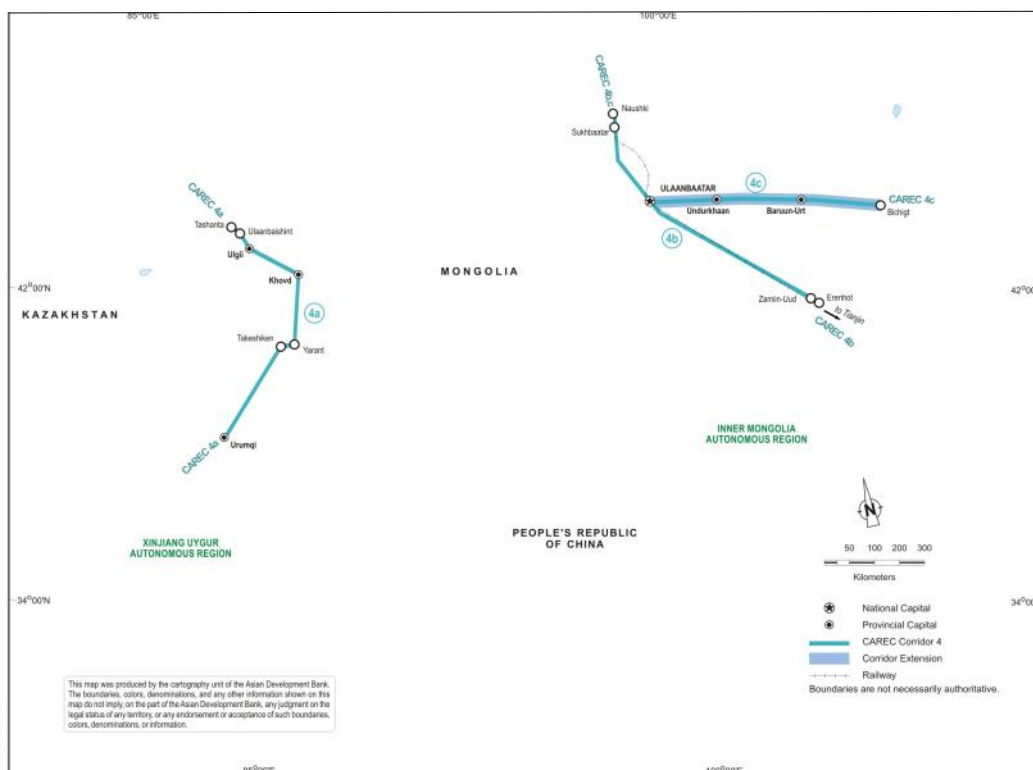
21 Kazakhstan Freight Forwarders Association re-joined CPMM in 2017. Without their contribution, CPMM faced challenges in obtaining data on railway performance within Kazakhstan.

Figure 4.8: CAREC Corridor 3



Source: Asian Development Bank

Figure 4.9: CAREC Corridor 4



Source: Asian Development Bank

Dushanbe or Shirkhan Bandar.

- (iv) Border-crossing cost for BCPs in 3a appeared to be double that of 3b. Costs in 3a were driven by two BCPs. At Farap, the estimated border crossing fee was \$300. Multiple fees were incurred for different activities, but visa fees stood out as the highest (\$79). Turkmenistan is the only country in Central Asia that imposes visa requirements on neighboring countries, which restricts drivers' movements. At Konysbaeva, the border-crossing fee was estimated at \$163, of which loading/unloading cost was \$42.
- (v) Despite these disadvantages, drivers in corridor 3a reported a lower total cost of transport. The TFI3 for 3a and 3b was \$516 and \$591 respectively. As this total cost includes border-crossing fees and it is known that 3a had higher border-crossing cost, then the higher total cost in 3b must have come from the vehicle operating costs (VOC). This implies that the fuel, driver's pay, and other incidental expenses were higher in 3b.
- (vi) Trucks in 3a also moved faster. Their SWOD reached 51 kmph, compared to 38 kmph of trucks in 3a.

Corridor 4

Corridor 4 connects the People's Republic of China, Mongolia, and the Russian Federation (Figure 4.9). This corridor has three sections – 4a, 4b, and 4c – of which 4b is the most active and a prime railway corridor, although road traffic is also developing rapidly due to road rehabilitation efforts. The other two road-only sections are 4a and 4c: 4a serves the western flank and has transit potential to link Russia with the People's Republic of China, and further to Kazakhstan; and 4c serves the eastern flank with long term plans to connect to Jinzhou seaport, to diversify away from sole reliance on Xingang/Tianjin seaport.

2017 CPMM observations for corridors 4a, 4b, and 4c include:

- (i) Section 4a had the longest border crossing time at 5.2 hours. Trucks cross Takeshiken-Yarant (PRC-MON) in both directions. People's Republic of China goods such as consumer appliances, fruits and vegetables, as well as machineries were moved to Mongolia and, in return, coal was transported to the People's Republic of China from Mongolia. PRC trucks park at Takeshiken, to wait their turn to complete border formalities. The goods are unloaded into bonded warehouses for temporary storage. Later in the day or the next day, the cargoes are collected and transported to Yarant, where the shipment crosses

the border and enters Takeshiken for further cleaning, sorting and processing, which can take up to 30 hours.

- (ii) In terms of border-crossing cost, sub-corridor 4a appeared to be the costliest. Materials transfer takes place at Takeshiken. The costliest activity was overnight storage, at a fee of \$6.45 per ton per night. Since the average payload of People's Republic of China shipments (non-containerized along this corridor) ranged between 30-35 tons, the storage cost was about \$193.50-\$225.75 per night. Loading and unloading was estimated at \$141.80 per shipment.
- (iii) Total transport cost showed a different picture. Average estimates for a 20-ton shipment over 500 km were \$472 (4a), \$1,422 (4b), and \$591 (4c). This reflects the fact that 4b is the dominant corridor with the heaviest traffic.
- (iv) Trucks moved at varying speeds along each section. SWODs were estimated to be 57 kmph (4a), 46 kmph (4b), and 37 kmph (4c). This indicates that the road infrastructure connecting Ulaanbaatar to Bichigt is not as good as the other sections. SWDs were estimated at 27 kmph (4a), 25 kmph (4b), and 21 kmph (4c). The SWDs had a narrower range despite the superior SWOD in 4a, due to longer delays at the BCPs.

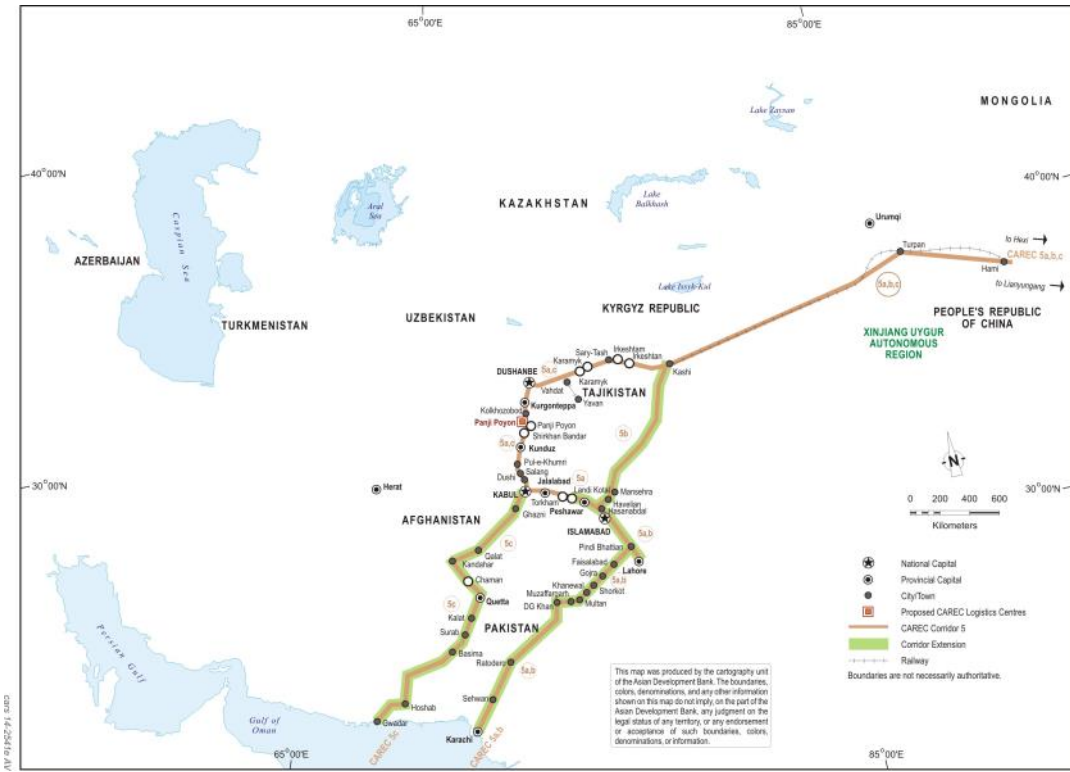
Corridor 5

Corridor 5 connect the People's Republic of China to the ports of Pakistan traversing Afghanistan, the Kyrgyz Republic, and Tajikistan (Figure 4.10). A corridor of particular strategic potential for connecting East, Central, and South Asia, progress is difficult due to geopolitical tensions, high altitude, and under-developed infrastructure. All three sub-corridors move in north-south orientation and link to blue-water seaports in Pakistan (Karachi and Gwadar). CAREC corridor 5b is aligned with the \$62 billion China-Pakistan Economic Corridor (CPEC).

Corridor 5 showed the most unfavorable results in 2017, which is consistent with results over the past years. This is not surprising, however, as the corridor passes through many of the least-developed CAREC member countries and the challenging conditions of under-developed infrastructure, difficult terrain compounded by adverse climatic conditions, and increased incidence of unexpected border closures in South Asia, are captured by and reflected in the TFIs.

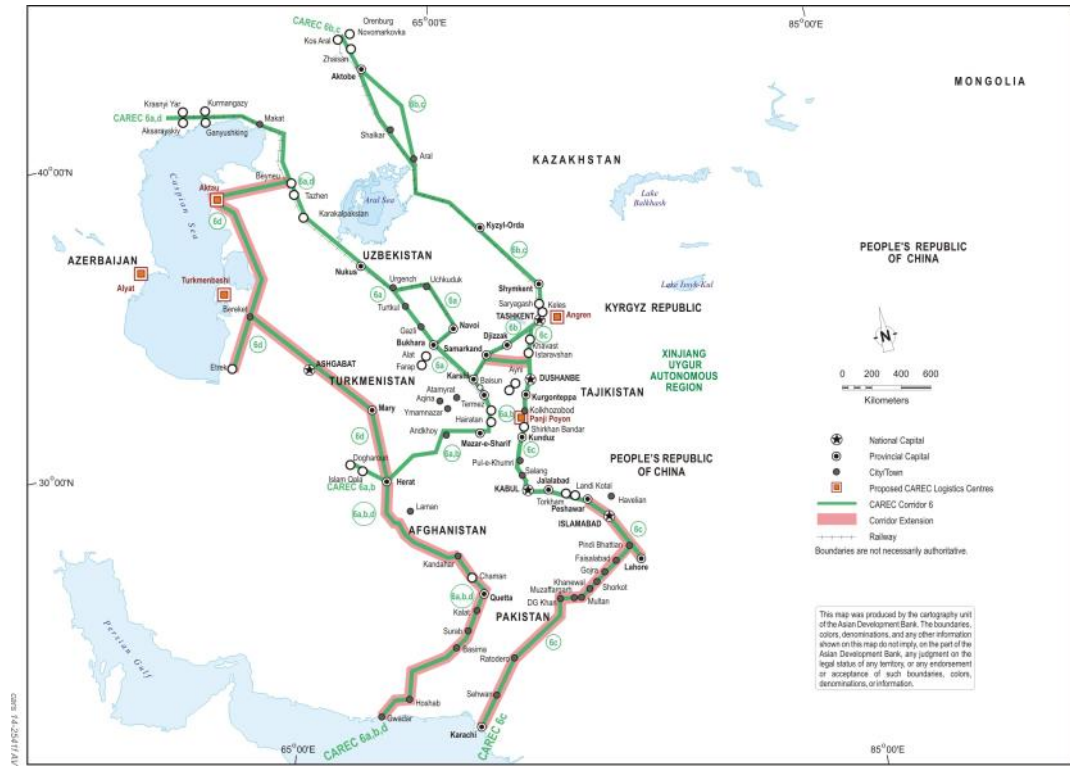
- (i) Sections 5a and 5c had the longest border crossing times in 2017, with estimates of 52 hours and 83 hours respectively. The average truck border-crossing times at

Figure 4.10: CAREC Corridor 5



Source: Asian Development Bank

Figure 4.11: CAREC Corridor 6



Source: Asian Development Bank

Torkham-Peshawar (AFG-PAK) and Spin Buldak-Chaman (AFG-PAK) caused an increase in TFI. Cargo in 40-foot containers on trucks spent 57 hours at Peshawar and 38 hours in Torkham. Peshawar is the consolidation center for traffic to and from Afghanistan. Here, customs formalities took 42 hours and waiting time in line averaged 31 hours. At Torkham, customs and waiting time averaged 28 hours and 19 hours respectively. Multiple police security checkpoints were another reason for the delays in movement between the two BCPs. In the south, crossing the border through Chaman and Spin Buldak was no easier. Trucks at Chaman spent 42 hours for customs formalities and 31 hours waiting in line. At Spin Buldak, trucks spent 32 hours on customs formalities and 19 hours waiting.

- (ii) Average border-crossing cost fared no better. Corridor 5 was the costliest place for cross-border goods in 2017. This was a result of both official costs and unofficial payments. At each point in Peshawar and Torkham, the cost of customs formalities per truck carrying a 40-foot container ranged from \$200-\$250. Additional 'facilitation fees' were paid, amounting to \$100 at Peshawar and \$85 at Torkham. The fee structure was similar at Chaman and Spin Buldak. Another problem was the many police checkpoints within Afghanistan. Some trucks reported stopping and waiting for 20-30 minutes as well as providing 'tea money' ranging from \$5-\$9 at each checkpoint (at major cities such as Kunduz, Jalalabad, Pulkhumri). Along corridor 5b, People's Republic of China trucks carried cement, cement-making machineries, road repair equipment, and apples to Pakistan, crossing Khunjerab-Sost (PRC-PAK). The non-containerized goods weighed 30-35 tons on average. Average customs fees amounted to \$335 per truck.
- (iii) Corridor 5 had the highest road transport cost of \$1,152 per 20 tons over a 500 km section. The highest estimate of \$2,689 was reported by trucks carrying equipment from Karachi to Kandahar in section 5c, partly owing to security concerns passing through the volatile Balochistan region.
- (iv) Trucks in corridor 5 moved at a respectable SWOD reaching 46 kmph. Unfortunately, when border-crossing delays were included the SWDs fell significantly to single digit levels.

Corridor 6

Corridor 6 serves as a transit route connecting Europe and Russia with the Middle East and South Asia and has considerable potential for integrating Central Asia with its neighbors (Figure 4.11). The four sub-corridors spread out from Russia or the Caspian seaports and move southward ending at Karachi or Gwadar.

2017 CPMM data showed critical challenges in border crossing along corridor 6. The sections 6c and 6d warrant attention as road border crossing is time-consuming and costly.

- (i) Along 6c, CPMM samples covered transit movements of fruits and vegetables from Pakistan to Uzbekistan. A bottleneck was determined at Hairatan-Termez (AFG-UZB) BCP, where the need to cross the Amu Darya river made for cumbersome border crossing. The trucks had to stop at Hairatan and then transfer onto barges, which ferried the products to Termez. The materials transfer (loading and unloading) took 5-6 hours at each BCP. More serious was the waiting time for the barge, which took up to 25 hours.
- (ii) Along 6d, the average border-crossing time was even longer. CPMM samples focused on trucks carrying fruits and vegetables from Quetta, Pakistan, to Turkmenistan. The trucks crossed two pairs of BCPs, at Chaman-Spin Buldak (PAK-AFG) and Towraghondi-Serkhet Abad (AFG-TKM), and completion of border crossing was long at both pairs. Trucks spent 2-3 days at the first pair, mainly due to customs formalities and waiting in line. At Towraghondi, the trucks spent one day in line, before completing the paperwork and inspection. Goods are transferred onto trains and proceed to the next BCP at Serkhet Abad.
- (iii) Border-crossing fees were also relatively costly, with section 6c exhibiting the highest amount. In general, the customs fee at Peshawar was \$232 per truck, one of the major contributors to border-crossing cost. Border security, customs, police checkpoints, traffic inspection, and weight inspection also charged fees. The fee amount was small for each activity, but a high incidence of unofficial fees was observed. Weight inspection also deserves special mention: when a truck moves across Afghanistan, weighing is required. The data, however, showed inconsistent practices and fee structures. Weight operations were conducted at BCPs such as Torkham, Kabul, Samangan, Jalalabad and others. Sometimes, a truck was only weighed once, while other samples

showed a truck undergoing multiple weighing. Almost all weight inspections included some informal payments, which suggests a high possibility of over-loaded trucks using 'tea money' to escape the official penalties imposed on over-weight shipments.

- (iv) In terms of total transport cost, corridor 6 also showed comparatively high levels. Section 6d had the highest cost estimated at \$2,307 per 20 tons per 500 km. The route passed through Quetta-Chaman-Spin Buldak—Kandahar-Herat-Towraghondi.
- (v) SWODs attained along section of 6a reached 50 kmph, while in other sections it ranged between 27 kmph to 38 kmph. SWDs, unsurprisingly, were lower by about 50%, with section 6d being worst affected by the long border-crossing times.

V. Rail Transport in 2017

2017 CPMM samples and data for rail transport showed, on a year-to-year comparison, that

- (i) TFI1 average border-crossing time rose to 26.8 hours in 2017 from 25.9 hours in 2016;
- (ii) Average border-crossing cost fell slightly to \$209 in 2017 from \$215 in 2016;
- (iii) Total cost increased to \$975 in 2017 from \$966 in 2016; and
- (iv) SWOD and SWD were notably faster at 43.0 kmph (from 38.6 kmph in 2016) and 21.9 kmph (from 14.3 kmph in 2016) respectively.

2017 CPMM rail samples were taken from the People's Republic of China, Kazakhstan, Mongolia, Turkmenistan, and Uzbekistan along corridors 1, 4, and 6:

- (i) Corridor 1: China-Kazakhstan, China-Kazakhstan-Uzbekistan-Turkmenistan, China-Europe (container express train);
- (ii) Corridor 4: Russia-Mongolia-China, Mongolia-China (covering import, transit, and export); and
- (iii) Corridor 6: Transit road-rail shipment Pakistan-Afghanistan-Turkmenistan (the train section started at the Afghanistan-Turkmenistan border).

Progress made in the TFIs for rail transport is shown in tables 5.1-5.4.

TFI1: Average Border Crossing Time

Table 5.1: Average Time Taken to Clear a Rail Border-crossing Point (Rail) (hours)

	2016	2017	% change
TFI1 Time taken to clear a border crossing point (hours)	25.9	26.8	3.5

TFI = Trade Facilitation Indicator
Source: Asian Development Bank

Delays along the rail corridors in 2017 were 34 hours (corridor 1), 19 hours (corridor 4), and 7 hours (corridor 6). Corridor 1b saw a sizeable increase in delay and reached 45 hours compared to 37 hours in 2016.

The causes of delay varied:

- (i) Two instances of delays were due to faulty equipment, causing delay of 60 hours in corridor 1 and 12 hours in corridor 4. While the probability of machine breakdown is low, the magnitude of delay is considerable.
- (ii) More frequent causes of substantial delay are ranked as follows: (i) no wagons available (25.8 hours); (ii) restriction upon entry (21.8 hours); (iii) waiting for priority trains to pass (18.8 hours); (iv) marshalling (12.1 hours); and (v) gauge change operation (8.8 hours). In general, waiting time for these was substantial compared to standard customs and inspection operations at rail terminals.
- (iii) Delays were lengthier in corridor 1 compared to corridor 4, with the exception of gauge change operations, which took 19.0 hours in corridor 4 compared to 3.2 hours in corridor 1.

TFI2: Average Border Crossing Cost

Table 5.2: Average Cost Incurred at Border-crossing Clearance (Rail) (\$)

	2016	2017	% change
TFI2 Cost incurred at border crossing clearance (\$)	215	209	-2.8

TFI = Trade Facilitation Indicator
Source: Asian Development Bank

Rail transport in CAREC countries is subject to different gauge standards that define the width of the rail track. The People's Republic of China uses 1,435 mm gauge, or international standard. Central Asian countries and Russia use 1,520 mm gauge, or broad gauge. Given the difference in gauge, cargo on trains between the People's Republic of China and Central Asian countries must stop at the border where the gauge is changed. The CPMM defines this as 'gauge change operation' and measures it as stoppage time. In 2017, gauge change operation cost \$287 in corridor 1 (from \$288 in 2016), and \$87 in corridor 4 (from \$102 in 2016).

Customs inspection is another common cost contributor,

which in 2017 cost \$128 in corridor 1, \$81 in corridor 4, and \$50 in corridor 6.²² Each BCP has a different fee and is discussed below. Corridor 1b registered the highest border-crossing cost (\$338), followed by 1a (\$261), whereas corridor 4b cost only \$86. Railway border-crossing costs in Kazakhstan were also higher than those in Mongolia.

TFI3: Total Transport Cost

Table 5.3: Average Cost Incurred to Travel a Corridor Section (Rail) (\$)

	2016	2017	% change
TFI3 Cost incurred to travel a corridor section (\$ per 500km, per 20 tons)	966	975	0.9

km = kilometer, TFI = trade facilitation indicator.
Source: Asian Development Bank.

The CPMM defines rail total transport cost as the sum of two cost components: first, the railway tariff, which is the gazette rate for a shipment published by the national railways authority. The rate may differ between time periods, but primarily depends on the nature and weight of cargoes, and the distance between origin and destination. The second is the border-crossing cost: in effect, TFI3 incorporates TFI2.

Total transport cost was highest in corridor 6d at \$1,548 from \$1,981 in 2016; followed by corridor 4 at \$1,181, from \$1,046 in 2016; 6b at \$819, from \$823 in 2016; 1a at \$752, from \$859 in 2016; and 1b at \$623, from \$803 in 2016.

TFI4: Speed to Travel on CAREC Corridors

Table 5.4: Average Speed to Travel on CAREC Corridors (Rail) (kmph)

	2016	2017	% change
TFI4 Speed to travel on CAREC Corridors (kmph)	14.3	14.8	3.5
SWOD Speed without delay (kmph)	38.6	37.6	-2.6

kmph = kilometers per hour, TFI = trade facilitation indicator, SWOD = speed without delay.
Source: Asian Development Bank.

In 2017, trains in corridor 1 tended to move fast, largely due to optimized rail equipment and assets in Kazakhstan, reaching 49.1 kmph in 1a, and 55.2 kmph in 1b. After including border-crossing time, the SWDs were 20.1 kmph in 1a, and 10.8 kmph in 1b. Trains in 4b, on the other hand, moved at half the speed of corridor 1, reaching only 20.6 kmph (SWOD) and 10.0 (SWD). Trains in corridor 6 also tend to move more slowly, so that the estimated SWODs were 12.5 kmph (6b) and 29.9 kmph (6d), and SWDs were 11.2 kmph (6b) and 13.7 kmph (6d).

Corridor Performance

Corridor 1

Conventional Trains

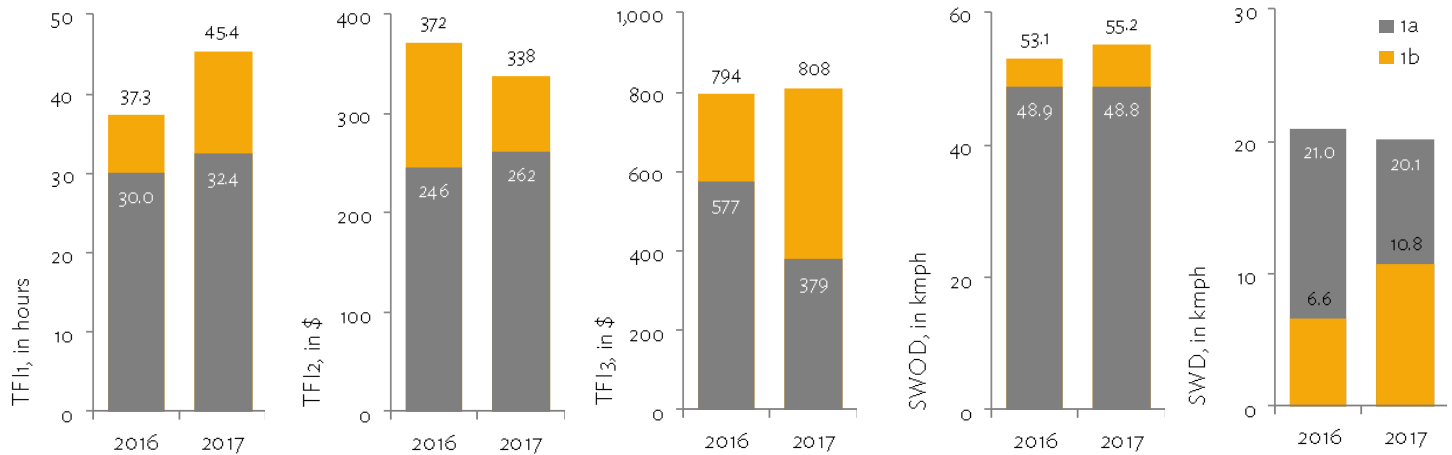
CPMM monitoring in 2017 focused on corridor 1a which crosses Alashankou-Dostyk (PRC-KAZ), and 1b which crosses Horgos-Altynkol (PRC-KAZ).

The TFIs (Figure 5.1) indicate that in corridor 1b, border-crossing time was longer and border-crossing cost was higher than in corridor 1a. Total transport cost in corridor 1b showed a rise as well. On the other hand, the SWOD of trains in corridor 1b was faster than in 1a. However, the sizeable increase in border-crossing time negatively affected SWD TFI. Delays were caused by a combination of factors.

- (i) The 'Restriction Upon Entry' initiative applies to throughput at the Horgos-Altynkol BCPs: trains are held up in Horgos when the adjacent BCP at Altynkol is working at full capacity and unable to handle more incoming trains. As a result, it took 23 hours in 2016 to cross the border, and 31.5 hours in 2017.
- (ii) An examination of throughput constraints at Altynkol revealed that loading and unloading each train took 12 hours. Wagon shortage was the most severe problem, averaging 21.7 hours to resolve. However, change of gauge was completed in only 3.4 hours compared to 19 hours when done at the PRC-MON BCPs.
- (iii) In sum, capacity constraints at Altynkol affected throughput and delayed trains at Horgos. The overall efficiency of the Horgos-Altynkol BCP could be improved by focusing policies, infrastructure, and equipment on increasing the capacity of the Altynkol rail terminal.

22 These values are average estimates based on the number of samples and BCPs in the corridor.

Figure 5.1: Trade Facilitation Indicators of Select Rail Corridors



TFI = Trade Facilitation Indicator, SWOD = speed without delay, SWD = speed with delay, kmph = kilometers per hour
Source: Asian Development Bank

Cost analysis provided the following perspective.

- (i) Very little change was seen in border-crossing cost structures in corridors 1a and 1b between samples taken in 2016 and those taken in 2017.
- (ii) The highest cost driver in both corridors 1a and 1b was the transload at gauge change point practice. As CPMM samples only included train shipments from the People’s Republic of China to Kazakhstan, the gauge change operation was done at Kazakhstan BCPs. Fees for gauge change operation depend on the type of shipment, and at Dostyk, this could cost \$400 for a conventional wagon and \$300 for a 40-foot container.
- (iii) Another significant cost driver was wagon deployment. A wagon is constantly being monitored and must be at the right place at the right time. In the past, Kazakhstan Temir Zholy (KTZ) was the national railways authority and sole owner and operator of all rolling stocks. The railways reforms of 2013 introduced privatization of rolling stocks, permitting external commercial entities to own and operate wagons. Such initiatives, while beneficial in attracting investment to enlarge the supply of wagons, caused communication and deployment problems. The relationship between KTZ, shippers, freight forwarders, consignees, and wagon owners became more complicated and the respective responsibilities became uncertain. Kazakhstan is still drafting the railways laws to address this deficiency. CPMM samples thus showed the ‘pick up and deliver wagons’ sporadically, i.e., sometimes, this activity was required at Dostyk, but at other times, it was

not. The activity took 1-2.5 hours on average per shipment and cost \$200-\$250 per container.

- (iv) A third cost driver was customs inspection. The CPMM captured cost data at Alashankou-Dostyk (PRC-KAZ), Khorgos-Altynkol (PRC-KAZ), Saryagash-Keles (KAZ-UZB), and Khodzhadavlet-Farap (UZB-TKM). The inspection fee varied depending on the type of shipment: at Dostyk it was \$350 for a conventional wagon or \$125 for a 40-foot container; and at Altynkol, it cost \$400 and \$125 respectively.

In sum, lowering the cost would require actions targeting gauge change operation, legislation and regulations on wagon deployment, and actions to streamline and simplify customs inspection.

Container Express Trains

Container express trains link the Eurasian continent and offer a rapid and economical means of transporting goods between eastern People’s Republic of China and Europe, with respective hubs in Chongqing and Duisburg, Germany. Covering a total distance of 11,179 km, this railway service starts from Chongqing and enters Xinjiang Uyghur Autonomous Region, crosses into Kazakhstan, and moves across Russia, Belarus, Poland, and Germany. This prime example of regional cooperation combines multi-agency with multilateral cooperation (between railways authority, customs agencies and others in several countries).

When the container express train service started in 2011, the total transport time was 16 days. High transport rates impeded wide acceptance of the service, and the empty backhaul (from Duisburg to Chongqing) was commercially unattractive. Although not popular in early days, the advantages of this service remained clear – an estimated 30-day decrease in time over the sea route, and 75% decrease in costs over air transport.

Based on CPMM data and the latest information from Chongqing International Freight Forwarders Association (a CPMM partner in the People's Republic of China), recent achievements include:

- (i) **Increased Frequency.** In 2011, this service operated unidirectionally once a month from Chongqing to Duisburg. In 2014, the service ran twice a month in both directions, and the return load expanded rapidly, alleviating the problem of empty backhaul. The service in 2017 was running daily in both directions.
- (ii) **Lower Cost.** While the total cost per container was \$9,600 in 2011, including railways tariffs and all border fees, by 2017 it had dropped by 14% to \$8,277. On a per TEU per km basis, this cost has decreased from \$0.86 to \$0.74 in 6 years. The service has become more competitive due to the reduced empty return haul and in turn, is attracting more European goods to eastern People's Republic of China. European exports on this service include chemical-based products, electrical machineries, and baby food.
- (iii) **Shorter Duration.** The total time for this service decreased to 12 days in 2017, with an average SWOD of

51 kmph, and SWD reaching 37 kmph. The service is comparable to trucking, and much faster than average speeds observed for conventional trains.

In sum, a combination of shorter duration and lower cost has attracted more cargoes, allowed more frequent trips, and resulted in a reinforcing cycle to become faster and more cost-effective.

Corridor 4

The distance from Tianjin to Ulaanbaatar is 1,692 km, making railways the most efficient transport mode. CCPMM data estimate that containerized cargoes moved in both directions in 2017, taking 12 days on average each way – although the full range recorded in CPMM samples revealed 8 to 18 days. The causes of this variation were two-fold: the Port of Tianjin and Erenhot-Zamiin Uud BCP.

- (i) The Port of Tianjin is the largest port in northern People's Republic of China, handling 14.5 million TEUs in 2016 and ranking among the top 10 ports in the People's Republic of China, based on annual TEU throughput. Containers bound for Mongolia experienced a dwell time of 5-7 days, accounting for half of the total duration. Port congestion and the perceived low priority accorded to moving containers bound for Ulaanbaatar were described as one cause for delay.
- (ii) The border crossing at Erenhot-Zamiin Uud (PRC-MON), where the shipment undergoes gauge change, customs controls, and reissue of transit document, can take about 1 day to complete these standard formalities. The lack of wagons and waiting time for materials transfer between trains contributes significant delay. 2017 CPMM data showed that at Zamiin Uud waiting due to shortage of wagons averaged 22 hours, and for materials transfer 14 hours, for shipments of empty glass bottles from Chongqing to Ulaanbaatar.

Corridor 6

On corridor 6, railways are used to transport fruits and vegetables originating in Pakistan and transiting through Afghanistan on trucks. At the Afghanistan-Turkmenistan border, the cargo is moved onto trains at Towraghondi (AFG) BCP. From there, the trains enter Serkhet Aba (TKM) BCP and travel 700 km to Ashgabat, taking 22.5 hours. SWOD was estimated to be 30 kmph. Border crossing at Serkhet Abad took about 6 hours. Customs formalities averaged 3 hours,

Cargo handling at Duisburg Intermodal Terminal



waiting time 2 hours, and border inspection 1 hour. At the destination (Ashgabat), the products took another 20 hours for materials transfer and clearance.

Waiting time at Towraghondi averaging 25 hours was the main problem. The trucks arrived, goods were unloaded and then remained in the customs zone, waiting for trains from Ashgabat. Afghanistan's lack of railway network and assets renders it dependent on using trains from neighboring countries.

VI. Country Updates

CPMM analysis relies on consistent and comparable data across CAREC countries, despite their inherent differences. However, the CPMM approach of monitoring and comparing the development of CAREC corridors at an aggregate level can overlook the various levels of development of a corridor that crosses more than one country. Further, solutions to address the issues of a corridor in one country may not be applicable to another country the same corridor passes through. Section VI highlights country-level developments and challenges that help policymakers from each country determine the focus of national strategies in addressing national and, eventually, regional transport, trade and trade facilitation problems.

Country-specific case studies from 2017 provide more detailed examples of specific issues and challenges (boxes 1-6).

■ Afghanistan

Afghanistan lies at the heart of four major trading blocs: East Asia, South Asia, the Middle East, and Central Asia. The trade and economic characteristics of each bloc demonstrate complementary needs. For example, East Asia and South Asia are energy and mineral deficient and could import the necessary surplus from Central Asia and South Asia. Kabul is located relatively close to major commercial centers in the region — one of the furthest, Almaty, can be reached in 5 days (on the assumption that trucks move at 50 kmph for 8 hours a day and border-crossing delays are minimal). However, Afghanistan faces a number of challenges and has still not realized its full potential as a transit hub.

The main challenges include:

- (i) Road passes for trucks and visas for drivers remain difficult to obtain for most local transport operators, forcing them to stop at the national borders. As a result, most cross-border trade shipments are conducted by foreign operators.
- (ii) Border-crossing times at Torkham-Peshawar (AFG-PAK) and Spin Buldak-Chaman (PAK-AFG) are consistently long.²³
- (iii) Given the unreliability of road transport, the government is actively working to develop air corridors, focusing on Kabul-New Delhi and Kabul-

Box 6.1: Impact of Border Closure at Afghanistan-Pakistan Border

Pakistan sealed the Torkham and Chaman border-crossing points (BCPs) on 16 February 2017, after a string of security issues in Afghanistan. These BCPs are major arteries for the \$1.5 billion in trade and commerce between these two neighboring countries. The BCPs were briefly opened on 7-8 March 2018, but then closed again until 21 March 2018, when the border points were re-opened to both passenger and cargo traffic.

Impact on Trade Routes

- (i) **Transit Trade.** Pakistan actively exports fruits and vegetables to Tajikistan and Uzbekistan via Torkham. Goods are consolidated at Peshawar and then moved by truck across the border. Pakistan exports of fruits and vegetables to Turkmenistan are shipped from the Balochistan province and through Chaman.
- (ii) **Imports.** Afghanistan relies on the Pakistan port of Karachi for imports of consumer and industrial goods, which are trucked in containers by Pakistan-bonded carriers to Kabul (via Peshawar-Torkham) and Kandahar (via Chaman-Spin Buldak). The border closure has complicated import flows and disruptions in the supply chain have led to inflation for key consumer commodities. Afghanistan Customs Department also expressed suspicion of smuggling into the country.
- (iii) **Exports.** Large volumes of agricultural products from Afghanistan are exported to India via Wagah (Pakistan's border with India). Border closure disrupted the normal flow of such trade. Border-crossing delays have created difficulty for farmers and traders of perishable fresh fruits who rely on sales to India. Furthermore, shipments from overseas of low value products bound for Karachi seaport are re-routed to Bandar Abbas due to the border closure.

Under normal circumstances, trade facilitation between Afghanistan and Pakistan is low in efficiency: for example, rent-seeking behavior is prevalent at police checkpoints along the 55-km road linking Torkham and Peshawar; and Afghan containers (inbound and outbound) are subjected to very high rates of inspection and examination by traffic police and border agencies, leading to long dwell time in Karachi and demurrage charges for shippers. Coupled with abrupt border closures, such practices could worsen and negatively affect trade volume and transit trade.

Sources: Central Statistics Organization of Afghanistan (<http://cso.gov.af/en/page/economy-statistics/6323/annual-trade>); and Afghanistan Times (<http://www.afghanistantimes.af/opinion-afghanistan-pakistan-bilateral-trade-analysis/>)

²³ Since 2012, road border crossing for shipments from Pakistan to Afghanistan takes at least 30 hours at Peshawar and Torkham, opposite sides of the PAK-AFG border. Similarly, at least 36 hours are spent at each side of the Spin Buldak-Chaman (PAK-AFG) border.

Dubai routes,²⁴ despite shipment by air being more expensive than road.

- (iv) Low TIR Carnet utilization is another sign of road transport and border-crossing difficulty. Since its re-activation in September 2014, there have been only 26 TIR Carnets used by qualified transport operators in Afghanistan.²⁵

■ Azerbaijan

The majority of Azerbaijan's destination market lies to the west of the country and outside the CAREC region, which severely restricts the opportunity to collect CPMM data from Azeri transport operators. Recorded shipments include westbound cargo movements, by truck and by train, to seaports in Georgia (Batumi and Poti) and a limited number of eastbound movements to Central Asia.

The 'Red Bridge' BCP at the Azerbaijan-Georgia border is a high-traffic BCP for trucks and passengers.²⁶ The few trade shipment samples of the country's transit trade with Georgia (originating from Turkey and bound for Kazakhstan) reveal that:

- (i) Border crossing at Korpu could be time-consuming; waiting time took 5-7 hours.
- (ii) River crossing at Baku seaport is a bottleneck, taking as long as 36 hours to wait for ferries.

More data collection along this route (corridor 2a) will formally begin in 2018. As a multimodal route it will add new insights on trade facilitation along the corridor.

■ People's Republic of China

The trade channel between the Xinjiang Uygur Autonomous Region of the People's Republic of China and Central Asia exhibits a unique form of 'border trade' or 'tourist trade', characterized by small volume, high frequency shipments from Urumqi to Almaty and not commonly found in other parts of the People's Republic of China. Understanding this is central to appreciating the role of Horgos and the persistence of its structural issues.

As the People's Republic of China's gateway for trade with Central Asia, Horgos is a high-traffic BCP. Traditionally used for road, railway operations commenced in December 2012. The CPMM identified the BCP as the most time-consuming among

PRC BCPs. In 2017, outbound shipments registered an average 8.8 hours to cross Horgos, the highest among other BCPs with Kazakhstan, Mongolia, Kyrgyz Republic, and Pakistan.

The relatively lengthy border crossing time is not due to capacity or equipment, but rather regulatory constraints. First, the restriction on PRC trucks to cross Khorgos (KAZ) prolongs the delivery of goods upon reaching the border. Second, People's Republic of China's trucking firms experience difficulty in finding backhaul cargo from destination points in Kazakhstan. Third, getting Kazakh visas and navigating through Kazakh roads and police stops pose substantial challenges. Thus, shippers prefer to transfer materials from PRC trucks to a temporary storage inside Khorgos, and then reload these onto Kazakh trucks as the latter arrive. This transloading operation takes about 3.5 hours on average and costs \$322 per truck. During this time, customs brokers apply for export permits.

The restriction on People's Republic of China trucks to cross Khorgos (KAZ) seems to have no immediate solution. Different vehicle specifications are the primary reason that deter Central Asian Republics (CARs) from allowing non-CAR trucks to enter its territory. In Kazakhstan, as in other CARs, the common maximum permissible load limit is 38-44 tons (depending on the number of axles). However, People's Republic of China trucks, due to better paved roads, are configured to carry higher loads of up to 60 tons, which in effect bars them from entering CAR territory. A small number of bonded carriers from the People's Republic of China are exempted from the restriction but the cost is prohibitive. This is likely to remain a barrier even after TIR Carnet becomes fully operational in People's Republic of China, as transport operators still need to secure permission for vehicles and visa for drivers to enter Kazakhstan.

Documentary problems also contribute to the delay. For consolidated small-volume cross-border trade at Khorgos (KAZ), mistakes in paperwork are common. Mis-matches between the declaration of People's Republic of China customs brokers and Kazakh customs' documentary requirements are likely to occur in consolidated cargoes. Such discrepancies between paperwork and physical goods delay border crossing. Checks have also become more stringent as key BCPs in Kazakhstan and the Kyrgyz Republic have become the external international BCPs of the EAEU.

In 2017, time spent by trains to cross a border (TFI1) averaged 26.8 hours. Among rail BCPs, outbound trains from Kazakhstan

24 See www.usaid.gov/afghanistan/news-information/press-releases/Jan-25-2018-USAID-Launched-One-Stop-Shop-at-HKIA.

25 Afghanistan Chamber of Commerce and Industries, TIR Department.

26 The Red Bridge BCP is formally called Korpu in Azerbaijan, and Tsiteli Khidi in Georgia.

Box 6.2: Border Trade between Kazakhstan and the People's Republic of China: An Illustration

Nurlan is a trader from Almaty, Kazakhstan, operating a small-box enterprise that retails footwear sourced from Urumqi, People's Republic of China. Urumqi is a popular destination as many Kazakh Chinese speak both Mandarin and Kazakh and can communicate easily.

Nurlan applies for and obtains a tourist visa to visit the People's Republic of China. He drives about 1,000 km from Almaty to Urumqi which takes 1-2 days, and then looks for footwear vendors at wholesale centers in Urumqi. Nurlan finds new designs from Bek, a Kazakh Chinese who lives in Urumqi and imports footwear from Guangzhou to serve a steady group of 'tourists' from Almaty who purchase goods from him. Nurlan pays Bek in cash as this is their first transaction. If all goes well and the traders build trust over the course of several transactions, payment for goods may be made only after the goods are received and sold in Almaty. In such case, the buyer signs a purchase order with the seller.

Bek then calls Han, a Chinese who runs a logistics firm. Han will collect the goods and package them according to different buyers, eventually dispatching a consolidated truckload of small shipments to Khorgos (KAZ). At Khorgos, Han unloads and transfers the goods into a bonded warehouse for temporary storage, and contacts a customs broker located in Khorgos to apply for an export permit. If the shipment does not contain any counterfeit or prohibited goods, the customs broker can use its own company as the shipper. The PRC customs broker also arranges with a Kazakh customs broker, stationed on the Kazakhstan side, to be the consignee.

A Kazakh driver and registered truck is dispatched to the PRC side to collect the goods. The Kazakh customs broker applies for an import permit from Kazakhstan customs. The truck then proceeds to Almaty, for final clearance, where Nurlan can collect the goods.

Source: Asian Development Bank.

took 34.0 hours to cross Horgos (PRC), the most time-consuming BCP for trains. Similarly, trains bound for Kazakhstan spent long border-crossing time at Alashankou, albeit at a lower average of 21.3 hours. Trains bound for Mongolia fared better crossing Erenhot at a relatively shorter time of 15.5 hours.

While these observations suggest inefficiency of rail border crossing on the People's Republic of China's side, CPMM

reveals that border procedures on the opposite side (Dostyk, Altynkol, and Zamiin Uud) suffer from even lengthier delays. Data reveal that delays on the People's Republic of China side are largely attributed to restriction from entry (Alashankou [19.1 hours], Horgos [31.5 hours] and Erenhot [19.5 hours]). Trains are often restricted from entering the adjacent BCP due to congestion and limited capacity. For instance, trains in Alashankou, after completing the formalities, had to wait inside Alashankou until the facility in Dostyk was ready to accept additional trains.

Delays at BCPs adjacent to PRC borders occurred due to gauge-change operations conducted at the inbound facility (in Kazakhstan and Mongolia). CPMM estimates showed substantial time is needed to complete the gauge change: Dostyk (3.4 hours); Altynkol (3.2 hours); and Zamiin Uud (1.4 hours). Furthermore, shortage of wagons due to trade imbalance with the People's Republic of China contributed significantly to delays, such as at Dostyk (21.7 hours); Altynkol (25.4 hours); and Zamiin Uud (18.7 hours).

■ Georgia

Georgia's entry into the CAREC partnership in 2016 provided the strategic linkage for goods to travel and be monitored under the CPMM from Lianyungang, People's Republic of China, to the Black Sea. The country's location and modernized customs and trade facilitation procedures connect Central Asia to Europe. The CPMM began preliminary information and data collection in 2017 to evaluate Georgia's transport and trade facilitation performance compared to other CAREC member countries.

Georgia has instituted many successful reforms in customs and trade facilitation.

Integration of Border Services

Border-crossing related control in Georgia is under the responsibility of two agencies: (i) Georgia Revenue Service (Tax and Customs Administration, Sanitation and Phytosanitary Border Control Agency of Georgia), Ministry of Finance; and (ii) the Patrol Police Department of the Ministry of Internal Affairs. The Patrol Police Department conducts passport control and oversees migration issues while the Georgia Revenue Service takes charge of customs procedures including phytosanitary border quarantine, veterinary border

quarantine, sanitary and quarantine procedures, as well as passport control for transport operators at BCPs.

Drivers submit relevant documents to customs officers for review and data are entered into the automated system for customs data system (ASYCUDA) to categorize shipments into green, yellow, or red channels. Customs officers also perform passport control. On average, truck drivers complete border crossing formalities in five minutes.

Customs officer performing passport control for truck drivers



Customs Clearance Zones

Georgia has established customs clearance zones to expedite clearance time and increase the efficiency of cargo movement. Prior to the introduction of this approach, transport operators were obliged to complete the following sequence for clearance of goods:

- (i) Border Security (15-30 minutes);
- (ii) Warehouse (1-2 hours);
- (iii) Broker for Declaration (45 minutes-1 hour);
- (iv) Commercial Bank for Payment (30 minutes-1 hour);
- (v) Cargo Clearance (10-30 minutes);
- (vi) Examination (for red channel) (2-3 days).

With customs clearance zones, cargo clearance is conducted in a centralized building with an electronic queuing system and

advance declaration, and completed in 30 minutes; examination under the red channel requires a few additional hours, instead of days.

Customs Clearance Zones at Poti



Adoption of Risk Based Management

Customs control is carried out with 100% automatic risk analysis and assessment-based control. The risk management system, in accordance with the standards and recommendations of the World Customs Organization,

facilitates a fast and smooth flow of goods and allows post-clearance audit and control. Risk management has led to clearance of 83% of import and 86% of export in green lanes.

Modernization of Customs Information Systems

Since 2007, customs has been using the ASYCUDA World system. Initially launched in pilot mode, ASYCUDA World fully replaced ASYCUDA+ in 2010; in 2015 the system was upgraded and has since been operating the eCustoms system, using the most recent version of ASYCUDA World.

Simplified Transit Regime

In line with Georgian legislation, transit is free of any customs duties and does not require a guarantee in the form of sureties, deposits, or other monetary or non-monetary means. This is stipulated in Article 11 on Freedom of Transit of the World Trade Organization (WTO) Trade Facilitation Agreement; the freedom of transit is ensured by Article 230 of the Tax Code of Georgia and by other secondary legislation.

Box 6.3: Case Study: Joint Customs Control (JCC)

Acknowledging a need to improve border-crossing performance, Georgia and Azerbaijan plan to collaborate through a bilateral agreement to develop joint customs control (JCC) at the Red Bridge border-crossing point. In principle, the JCC will facilitate a single stop for drivers to improve border-crossing efficiency.

At the Customs Cooperation Committee Meeting held in October 2017 in Dushanbe, Tajikistan, Georgia officially proposed the concept, which will require extensive work to align legislation and procedures between the two countries. Within the existing bilateral cooperation framework between the two countries, as well as each other's track record of institutional reform, the proposed JCC stands to succeed through careful planning and correct implementation.

Source: Asian Development Bank

■ Kazakhstan

Kazakhstan has a road network of 96,353 km. Accession to the WTO (November 2015) and the EAEU (January 2015), alignment of Kazakhstan's Bright Road Initiative and the PRC's Belt and Road Initiative, as well as the rapid modernization of the Khorgos BCP in eastern Kazakhstan all provide much opportunity for potential benefit for the Kazakh trucking industry.

Transport and logistic centers have attracted much interest in Kazakhstan. The Khorgos "Eastern Gates" special economic zone plans construction of several modern Class A warehouses. Two dry warehouses with a total area of 25,000 square meters will be built inside the special economic zone, followed by a temperature-controlled facility for storage of agricultural products.

Box 6.4:

Modern Logistics Centers and their Impact on the Supply Chain

Assylbek Kultayev is Head of the Warehouse Terminal, Continental Logistics LLP. He believes that using Transport and Logistics Centers can greatly benefit potato producers in Kazakhstan. Traditionally, agricultural producers are at a disadvantage when selling their produce: crops ripen at the same time and prices drop due to abundant supply.

In the off-peak season, however, limited supplies raise the price. For a potato producer, the profit is 10 Kazakhstan tenge (KZT) if they sell at spot rate immediately after harvest. If the producer stores the potatoes in modern logistics centers, the profit is 60 KZT even after accounting for cold storage costs. During off-season, potatoes from Belarus and Azerbaijan are imported and sold in Kazakhstan at 300 KZT.

Source: TransLogistica Kazakhstan (<https://www.transitkazakhstan.kz/en/>)

■ Kyrgyz Republic

The Kyrgyz Republic has a total road network of 34,000 km of which 18,810 km are national roads and 15,910 are classified as private or community roads. Of this, 21% or 7,228 km are paved, of which 4,969 km have an asphalt concrete surface. However, poor maintenance, coupled with adverse weather conditions in winter and mountainous terrain, causes rapid road surface deterioration, which in turn slows down SWOD. Road transport is the dominant mode in the country, accounting for more than 90% of the cargo tonnage transported.

CPMM samples for the Kyrgyz Republic cover corridors 1c, 3b, and 5a. Shipments of fruit and vegetables are carried to Almaty where they are either sold locally or transported

further to western parts of Russia via corridor 1c, or eastern parts via corridor 3b. Border-crossing performance at Aul-Veselayarsk (KAZ-RUS) varied widely: generally efficient, but at times unexpectedly long and costly when Russian border agencies tightened their controls.

Since the implementation of the pre-arrival declaration measure in 2016, no severe delays have been encountered at KAZ-KGZ borders. If shippers lodge customs declaration at least 2 hours in advance, customs is obligated to complete customs controls and release trucks/shipments within 30 minutes upon arrival.

The CPMM focuses on border-crossing issues, yet the Kyrgyz Republic faces severe behind-the-border trade facilitation problems, including:

- (i) **Volatile transport prices due to supply-demand imbalance during export season.** The Kyrgyz Republic ships fruits and vegetables by truck to Moscow and Novosibirsk in Russia at a cost of \$3000-\$4500 for a 20-ton shipment. However, refrigerated trucks are in short supply during export season when volume surges sharply. Failure to plan for such situations compels shippers to settle for the spot or market rate, which could be double the prevailing price.
- (ii) **Sanitary and phytosanitary measures.** It has become more difficult for the Kyrgyz Republic to export to the EAEU due to the unified system for certifying product quality. Suppliers are accredited and must be registered in a central vendor's database, but there are no laboratories or standards bodies in the Kyrgyz Republic that can conduct the examination and provide certification. Shippers could have the certification conducted in Russia, although at great expense (approximately \$1,340).

■ Mongolia

CAREC corridors 4a, 4b, and 4c facilitate road shipments across Mongolia to and from its neighboring countries, the People's Republic of China and Russia. In 2017, CPMM estimates show that road border crossing took less than 3 hours to complete at Mongolian BCPs, except at Takeshiken-Yarant (PRC-MON) along corridor 4a. At Takeshiken, border

crossing for imports or exports took on average 6-7 hours because of the additional time required to handle coal shipments, which differ in process to containerized goods. As a result, the lengthy border procedure is largely due to the need for special handling of goods, rather than a trade impediment.

Despite the surge in exports of coal and other minerals from Mongolia, CPMM indicators did not capture the effects of congestion at the borders with People's Republic of China. This is because CPMM only covered traffic data at the following BCPs along CAREC corridors: Takeshiken-Yarant (PRC-MON) along 4a; Khiyagt-Altanbulag (RUS-MON), Naushki-Sukhbaatar (RUS-MON), and Erenhot-Zamiin Uud (PRC-MON) along 4b; and Zuun Khataavch-Bichigt (PRC-MON) along 4c. Other BCPs that lie outside CAREC corridors such as Gashuun Sukhait-Ganqimaodu (MON-PRC) commonly cater to cross-border transfer of coal and copper from Oyu Tolgoit to Inner Mongolia.

In 2016, the People's Republic of China, Mongolia, and Russia concluded a trilateral economic partnership agreement, a key part of which seeks to improve roads and other modes of transport. The two main routes defined under the agreement are fully aligned with CAREC corridors 4a and 4b.

- (i) **Asian Highway 3 (AH3):** Ulan-Ude-Khiyagt (Russian Federation)/Altanbulag (Mongolia)-Darkhan-Ulaanbaatar-Saishand-Zamiin Uud (Mongolia)/Erenhot (People's Republic of China)-Beijing-Tianjin; and
- (ii) **Asian Highway 4 (AH4):** Novosibirsk-Barnaul-Gorno-Altaysk-Tashanta (Russian Federation)/Ulaanbaishint (Mongolia)-Hovd-Yarant (Mongolia)/Takeshiken (People's Republic of China)-Urumqi-Kashi-Honqiraf.

In 2017, the total tonnage transported by rail in Mongolia reached 22.76 million tons. Since 2013, cargo tonnage has grown modestly by 1.6% on average, due to the limited capacity of the north-south railway system. Prospects of capacity expansion remain a potentially sensitive issue because of foreign co-ownership of Mongolia Railways. Transit shipments in 2017, on the other hand, exhibited promising growth, accounting for 25% of total freight turnover and have grown by 12% every year since 2013.

Increasing trade volumes pose the risk of adversely affecting time and cost performance at BCPs in Mongolia. In 2017,

inbound shipments from Tianjin took more than a day to cross Zamiin Uud. Shortage of wagons (18 hours), marshalling (10 hours), transfer of materials (7 hours), and technical inspection (5 hours) all contributed to total delays. The Government of Mongolia recognizes the importance of Zamiin Uud and is taking steps to review its capacity and divert some traffic to other routes such as corridor 4c.

■ Pakistan

The 2017 CPMM in Pakistan covered truck samples carrying 40-foot containers from Karachi to Kabul or Kandahar along CAREC corridors 5a and 5c, respectively. Border crossing at Peshawar-Torkham (PAK-AFG) and Chaman-Spin Buldak (PAK-AFG) continued to be very time-consuming. Delays at Chaman averaged 82 hours, largely attributed to lengthy customs formalities, followed by long waiting time in lines.

The CPEC attracts significant attention in Pakistan due to the sizeable investment in road creation linking Gwadar to Kashi, which aligns with CAREC corridor 5b. Along this route, CPMM collected samples from trucks carrying air compressors, generators, and construction materials from Kashi to Khunjerab-Sost (PRC-PAK) — a distance spanning 513 km. The transport took 24 hours and cost about \$1,500 per trip. Trucks registered an average SWOD of 45 kmph.

Trade facilitation in Pakistan has undergone several enhancements. In the past, transit goods were subjected to mandatory escort by customs. However, since the implementation of tracking systems in bonded carriers, such escort and convoy procedures have been waived. Moreover, Pakistan's Federal Bureau of Revenue has deployed the Web Based One Customs (WeBOC) at Peshawar and Chaman which modernized customs administration at these BCPS. The following documentary requirements for cargo and transport operators for transit remain:

- (i) **Cargo:** (1) Goods Declaration, (2) Packing List, (3) Commercial Invoice, (4) Transit Form, (5) Certificate of Origin, (6) Form A for Sealing of Containers, (7) Bill of Lading, (8) Letter of Credit; and
- (ii) **Transport Operator:** (1) Bonded Carriers' Letter from Customs, (2) Vehicle Registration Book, (3) Driver's license, (4) Certificate of Inspection, (5) Valid passport with entry permit.

Despite the improvements, border crossing continues to be challenging, particularly at Torkham and Peshawar. These BCPS serve as the gateway for bilateral and transit trade between Afghanistan and Pakistan. Coupled with expanding volumes of traffic, border-crossing time averaged 57 hours in Peshawar and 38 hours in Torkham. A variety of solutions is available and essentially requires bilateral cooperation from both border agencies.

Lack of Cooperation Mechanism

In 2011, the United Nations Office on Drugs and Crimes established a border liaison office in both Torkham and Peshawar to improve border crossing and enforce controls to ensure safety and security. This bilateral mechanism enabled coordination and resolution of many border related issues. However, Pakistan unilaterally suspended operation of the border liaison office, which led to less effective coordination between the two border offices.

Visa Restrictions for Drivers

Afghan drivers that need to cross the border into Pakistan are subjected to cumbersome immigration requirements. Before trucks are permitted to enter border post premises, drivers must walk across the border to the Pakistan side and wait in line with other passengers to apply for a visa. Drivers then return to the Afghan side of the border and drive the truck from the parking lot to the Pakistan side. Every day, a long line of people waits at the Pakistan border to obtain visas.

Limited Parking Space for Trucks at the Pakistan side

Peshawar has limited parking space, which limits truck throughput into the facility. Drivers estimated the line of trucks waiting at the BCP to reach hundreds during the peak export season of July to September.

■ Tajikistan

In 2017, estimates report that more than 30,000 trucks crossed Nizhni Pianj, located on the Afghan border. Due to differences in vehicle standards and lack of transit trade agreements between Central Asia and Afghanistan, goods are picked up by Tajik operators at the adjacent Afghan side of border, Shirkhan Bandar, to Nizhni Pianj instead of crossing the border to qualify as transit shipment.

Meanwhile, inbound and outbound truck movement has

demonstrated strong momentum during 2016-2017. CPMM data recorded transit shipments of agricultural products from Pakistan to Tajikistan and found inefficiencies at the AFG-TAJ border crossing. While average delay for inbound shipments at Nizhni Pianj was 6.5 hours, outbound trucks spent an average of 52.6 hours at Shirkhan Bandar. The need to wait and transfer materials, together with the presence of visa and road pass restrictions inhibited the smooth flow of goods. This prompted the Government of Tajikistan to implement measures to develop this BCP.

Gulistan is another high traffic international BCP that served close to 26,000 trucks in 2017. The designation of its adjacent BCP, Kyzyl Bel, in the Kyrgyz Republic as an international BCP boosted traffic further. Prior to this, goods from the People's Republic of China passed through Karamik to enter Tajikistan. The designation closed Karamik to transit shipments and diverted traffic to Kyzyl Bel-Gulistan (KGZ-TAJ) for entry into Tajikistan, despite a detour of 250-300 km.

Traffic at Fotehobod, located at the Uzbekistan border, saw steady growth during 2015-2017. The new administration in Uzbekistan ushered in warmer relations between the two countries which could lead to a higher level of cross-border trade at Fotehobod.

Karamik is designated as a bilateral BCP and only serves shipments between Kyrgyz Republic and Tajikistan. CPMM estimates report that trucks take 7.5 hours to cross the border, half of which time is spent waiting in line. Diversion of transit traffic to Kyzyl Bel-Gulistan (KGZ-TAJ) partly explains the significant downtrend in the volume of trucks passing through the BCP from 2015 to 2017. However, the situation could evolve rapidly given EAEU plans to designate Karamik as an external international BCP.

■ Turkmenistan

Road Transport

Road transport is the most important sector in the state economy. Transport indicators show that both cargo tonnage and freight turnover are on an upward trend. Each year, the country's road transport carried about 500 million tons of cargo and 1 billion passengers. Since independence, the number of vehicles in the country more than tripled. Currently there is a widely ramified network of highways with a hard

Box 6.5: TIR Green Lanes at Nizhni Pianj Border-crossing Point

In June 2017, the Tajik Customs Service and Afghanistan Customs Department signed a cooperation mechanism to jointly implement TIR Green Lanes at the border. The recent rapid increase of border-crossing traffic at Nizhni Pianj-Shirkhan Bandar (TAJ-AFG) prompted a bilateral border cooperation initiative between Afghanistan and Tajikistan to improve efficiency.

At present, several shipments from Kazakhstan and the Kyrgyz Republic bound for Afghanistan operate under the TIR system. The lack of green lanes at the AFG-TAJ border had resulted in long lines of trucks both under and outside of TIR, defeating the purpose of the TIR system, which promises a simplified and express transit scheme.

Source: Asian Development Bank.

surface reaching municipal and local levels. In accordance with international standards, the country is building regional automobile roads, the total length of which is more than 1 thousand 700 kilometers from West to East and from North to South. The width of the country regional automobile highways is 31 meters, and each of the carriageways is 12.25 meters wide. As of March 2017, the total length of automobile roads was 13,737 km (2,280 km was classified as 'international' and 6,540 km are classified as 'national').²⁷ A 564 km toll road connecting Ashgabat to the Turkmenbashi seaport on the Caspian Sea is under construction and planned to be completed by 2018.

Railway Transport

Turkmenistan is actively developing railway transport. Currently, the country has more than 4,980 km of railways, which carries out more than 30% of all goods transportation turnover. Therefore, in recent years, much attention has been paid to the development of a network of national railways.

Water Transport (Caspian Sea)

According to the General Plan for the development of the Turkmenbashi International Seaport and the Turkmen Maritime Merchant Fleet till 2020, the following projects are planned: construction of a shipbuilding/ship repair factory, creation of a rescue service base and acquisition of environmental equipment and environmental vessels; reconstruction of a railway ferry terminal and existing oil loading piers; acquisition of port tugs; reconstruction of the

27 Information from Turkmenistan Statistics Office (<http://www.stat.gov.tm/>) and U.S. Department of Commerce (<https://www.export.gov/article?id=Turkmenistan-Transportation-Market>).

dry cargo berth at Aladzha Port; construction of additional berths and auto and passenger terminal; deepening and expansion of Turkmenbashi Port's navigation channel; construction of a new control tower to coordinate the work of the port; and creation of a logistics center, including the construction of a berth for container and dry cargo vessels with a length of 1,500 m. After the first phase of reconstruction, the capacity of Turkmenbashi Port is expected to double and it will be able to accept sea vessels and carry out cargo handling operations around the clock.

Transit Procedure

As a signatory to the TIR Convention 1975, foreign operators can transit through Turkmenistan under the TIR Convention. Without this system, transit is more complicated. The main documents required are: (i) commercial invoice; (ii) declaration; (iii) packing list; (iv) accompanying shipping (loading) documents; (v) certificate of quality, which is product-specific; (vi) license for transportation of certain types of goods such as chemical, equipment other (under local legislation); (7) TIR Carnet.

Border Crossing

Turkmenistan is an important transit country for Uzbekistan operators to move goods to and from Bandar Abbas seaport in Iran, and the 2017 CPMM covered Turkmenistan sections mainly along corridors 3 and 6. Selected BCPs covered by CPMM are described below.

Farap BCP (border with Uzbekistan)

According to 2017 CPMM data, outbound traffic averaged 5.8 hours and inbound traffic averaged 7.9 hours to complete border crossing, half of which was spent waiting in line. The Farap BCP is equipped with all necessary equipment such as X-ray scanners for passengers, weighing equipment for trucks. Further, it is connected to the newly-built regional highway (dual carriage-lane) with a paved surface linked to Turkmenabad city, which provides amenities and services such as hotels and banks for drivers. To reduce long periods waiting in line and alleviate congestion, a large truck parking space is being constructed. Farap BCP operates 24 hours a day.

Serkhet Abad BCP (border with Afghanistan)

The Serkhet Abad BCP plays an import and export role for transit goods to and from Afghanistan by automobile and railroad. It has been modernized and reconstructed and is equipped with X-ray scanners for passengers and weighing

equipment for trucks. There are banks, grocery stores and one private motel for truck drivers located in a nearby town. Two parking lots are available for cargo trucks, one a small public space adjacent to the BCP, while the other is bigger and privately operated by a local entrepreneur. However, the latter is located further away from the BCP and the access road is not well-developed. This BCP only operates during the day.

Transloading

A shipment from Afghanistan to Turkmenistan typically needs to undergo one transloading: the truck must stop at Towraghondi (AFG), and the goods are then cleared and transloaded onto trains. This process involves waiting for the train to arrive as well as materials transfer on top of the typical inspection. Thus, it takes more than a day for the goods to cross the border, after which the train enters Turkmenistan at Serkhet Abad with minimal delay and continues to Ashgabat, the final destination.

Sarabs BCP (border with Iran)

Sarabs was commissioned in February 2017. The dry port is optimally located alongside an international road and railway. Sarabs is equipped with 24-hour video surveillance and security systems. The facility has abundant space for temporary parking of vehicles, an open platform for storage of goods and containers, shops, workshops for repair of vehicles, car washes, and sanitary facilities.

■ Uzbekistan

The 2017 CPMM captured data on transport of goods across Uzbekistan along corridors 2, 3, and 6. These include shipments to Kazakhstan and Russia, as well as active traffic between the cities and Bandar Abbas seaport. Kazakhstan and Turkmenistan serve as two important transit countries for Uzbekistan to access overseas markets, since the country is double-landlocked.

Single Window

During 2014-2016, a customs modernization project introduced a unified customs information system and a single window system, in collaboration with the Korea International Cooperation Agency. An online portal was made available for foreign trade participants to file documents electronically and to obtain permits. The single window serves as a one-stop

service for government agencies responsible for issuing hygienic, veterinary, phytosanitary and other certificates and permits to traders. It is integrated with the Unified Automated Information System of Uzbekistan's State Customs Service.

Transit procedure

A consignment shipped through the territory of Uzbekistan must fulfill a number of documentary requirements. Moreover, shipments are accompanied by customs officers to the BCP, in accordance with Article 223 of the Customs Code. Although Uzbekistan is a contracting party to the TIR Convention, the CPMM has not captured TIR transit shipments of foreign operators across Uzbekistan. Ongoing reforms are beginning to open up the country, however, and potentially realize its transit potential.

Border Crossing

Yallama BCP (border with Kazakhstan)

Yallama is 68 kilometers from Tashkent: CPMM data indicate an average border crossing time of 6.5 hours, half of which is also spent waiting in line. During the peak export season, it is common to see 30-40 trucks waiting at Yallama and drivers need 1-1.5 days to complete border crossing procedures. The border check point offers no amenities, such as a canteen, hotel, or water, to drivers while waiting.

Dautota BCP (border with Kazakhstan)

Dautota is in the northwestern part of Uzbekistan, at the border with Kazakhstan. The border post operates 24 hours a day and provides proper control over the entry and exit of citizens, vehicles, and goods moving along the "Great Silk Road" (Andijan-Tashkent-Nukus-Kungrad-Beyneu) motorway, allowing access to the Commonwealth of Independent States (CIS) and Europe. It is about 320 km away from the nearest city, Kungrad. On the Kazakhstan side, the adjacent BCP Tazhen is further than the 150-meter neutral zone between the BCPs.

The 2-hectare border post houses checkpoint facilities, separate premises for in-depth inspection of cargo transport, buildings for inspection and registration of freight transport for departure, as well as administrative buildings. It is equipped with a stationary large-sized scanner for inspection of vehicles. CPMM estimates show that outbound and inbound traffic take 6.9 hours and 6.2 hours, respectively, to complete border crossing at Dautota.

Box 6.6: Angren Logistics Center

Uzbekistan is investing heavily in the development of transport and logistic centers. One of the largest in Uzbekistan, the Angren Logistics Center is designed to facilitate multimodal shipments, with links to Ablyk railway station. In January 2010, Angren Logistics Center began operations to facilitate receipt and delivery of all categories of goods to and from the Fergana Valley.

In 2017, the Angren Logistics Center contains warehouses, combined terminals, access roads and maneuvering sites, hotels, and security services. Transit-cargo terminals cover 8.6 hectares and include rail lines for loading and unloading railway wagons, with total capacity of 22 containers. Storage facilities accommodate up to 1,500 tons.

Source: Asian Development Bank.

Alat BCP (border with Turkmenistan)

Alat is in the southwestern part of Uzbekistan, on the border with Turkmenistan. Construction and renovation of the border post is being planned to expand its territory. The border post is about 100 km from the nearest city, the regional center Bukhara. Opposite Alat is Farap, separated by an 800-meter neutral zone between border crossing posts. At Alat, outbound shipments spend an average of 6.1 hours to complete border crossing, while inbound shipments spend 5.3 hours. Half of this time is spent waiting in line.

VII. Key Issues and Recommendations

This section briefly notes key issues emerging from analysis of 2017 CPMM data relating to procedure, infrastructure, equipment, regulations, and others, with the aim of informing both CAREC policy-makers and traders of current challenges that impede the smooth and rapid flow of goods and cargo across borders in the region. It also offers preliminary recommendations intended to help address the challenges and improve intra-regional CAREC trade.

Key Issues — Road Transport

Procedure

- Long dwell time in seaports.
- Need to weigh vehicles repeatedly.
- Documentation errors.

Infrastructure

- Poor access roads to BCPs.
- Lack of paved road surface.

Equipment

- Shortage of X-ray scanners.
- Shortage of laboratories and sanitary-phytosanitary instruments.

Regulations

- Unilateral or ad hoc border closure.
- Restriction on vehicles and/or drivers.
- Lack of mutual recognition of authorized economic operator programs.

Key Issues — Rail Transport

Procedure

- Gauge change at borders of the People's Republic of China.

Infrastructure

- Long gauge change at Erenhot (PRC).
- Long classification time at Alashankou (PRC), Altynkol (KAZ), and Zamiin Uud (MON).

Equipment

- Shortage of wagons in Kazakhstan and Mongolia.
- Long downtime of faulty equipment at Dostyk (KAZ).

Regulations

- Lack of clear delineations of responsibilities and obligations in shipping community (e.g., rolling stocks in Kazakhstan).

Others

- While transport and transit regulations and procedures are relatively harmonized within the five CAREC countries that are also CIS members, non-CIS CAREC countries, such as the People's Republic of China and Pakistan, can experience border-crossing friction with the five CIS member countries. For example, Afghan transport operators often bear more extensive restrictions due to perceived security concerns.
- However, cross-border trade issues persist even among the five CIS members: Turkmenistan imposes visa requirements even from neighbor countries; and accession to the EAEU has resulted in new external borders in the region. Notwithstanding, new developments such as bilateral cooperation, regional transit trade, and transport cooperation are lowering the barriers and facilitating more cross-border trade.

Recommendations

Procedure

- Dwell time of cargoes in seaports such as Karachi (PAK) and Tianjin (PRC) is lengthy. Diversifying transport routes is an option in the long term to relieve congestion and volume of traffic in larger seaports, such as the use of Chabahar seaport by Afghanistan shippers. In the medium term, electronic exchange of cargo manifest details and other technological innovation could help alleviate the problem of long dwell time at seaports.
- Many countries still adopt a specific sequence of border-crossing operations where consignments must go through different agencies one after the other. In principle, a one-stop-shop approach will streamline checks and inspections and allow faster throughput. The full risk-

based methodology adopted in Georgia streamlines border-crossing operations, reduces the number of border agencies to a minimum, and integrates controls, where possible.

Infrastructure

- Conduct an in-depth examination of BCP infrastructure to determine capacity issues.
- Improve access roads to BCPs.
- Segregate lanes for passenger and cargo traffic to relieve congestion outside and leading into BCPs.
- Assess the processing of trains during marshalling and classification: viable solutions include increasing the number of tracks for gauge change operation in the terminal.
- Develop a multimodal transport system to facilitate a shorter, more frequent, and more cost-effective cycle of shipments. Chongqing (PRC), for example, could be developed as a transport and trade hub offering a rail-road or rail-air option to the final destination. Within a four-hour radius, an aircraft can reach all the major cities in Southeast Asia. This would enable transport of a high-value light-weight product from Europe to Chongqing by railway, and then by aircraft to the ultimate destination. Faster than a sea route, this option would be far more cost-effective than full air transport. The Chongqing Jiangbei International Airport is being modernized to expand its cargo handling capacity.

Equipment

- Increase X-ray scanners and surveillance equipment as security inspections contribute to long lines.
- Provide additional material handling equipment: redundancy in the system is warranted to pre-empt long downtime resulting from malfunctions and replacement of spare parts.
- Additional supply of locomotives, wagons and other equipment can alleviate shortage problems in Kazakhstan and Mongolia. However, pick up, delivery, and deployment issues may remain even with additional wagons.
- Weighbridges are also solutions to combat overloading of trucks, which deteriorates paved road surface.
- In the case of the Kyrgyz Republic, an integrated and sustainable plan to meet EAEU sanitary-phytosanitary standards in laboratories and test equipment could be

developed in the short- to medium-term, and use of other international standards in the long-term.

Regulations

- The transloading of goods between trucks at the borders is one of the root causes of delays and cost faced in road transport. In practice, cabotage rules and different vehicle specifications prevent the liberal movement of trucks. Quota systems are also in place to limit foreign-registered trucks from crossing borders. To address this issue, one viable option is a limited form of regional authorized economic operators system, where approved operators from neighboring countries will be recognized and able to cross borders faster. However, regional authorized economic operator standards must first be harmonized and mutually recognized.
- Laws pertaining to rail transport and operations are undergoing major reform in Kazakhstan, providing opportunity to engage various stakeholders in the formulation of responsibilities and obligations. The management of rolling stock such as wagons can be patterned from best practices and operating models of advanced economies.

VIII. Conclusion

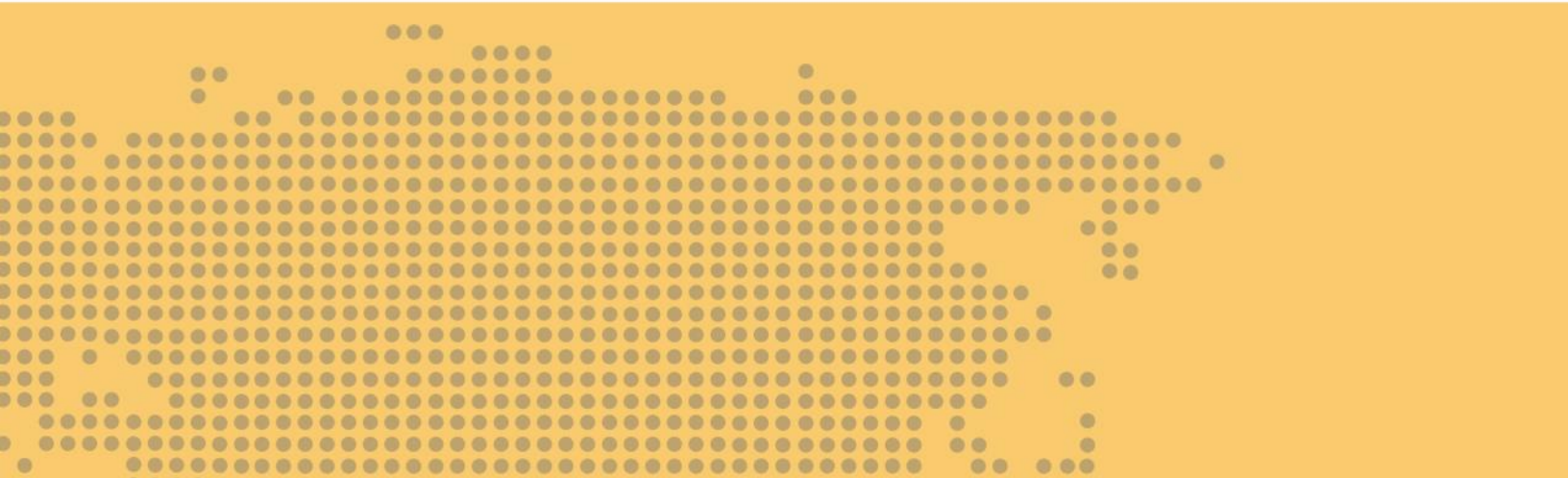
National transport associations from 8 CAREC countries gathered 2,532 CPMM data samples while travelling the length and breadth of the six CAREC corridors throughout 2017, mostly by road, followed by rail, and sometimes by multimodal transport. While analysis of the samples shows faster travel times along the corridors, indicating better physical infrastructure, and declining overall transport cost to the operator, it also noted that trade does not yet fully benefit from these improvements because of continued delays experienced in crossing borders.

Some border delays were the result of specific and time-bound events such as border closures for security reasons, yet the majority of delay was caused by recurrent procedural challenges, shortages of basic equipment such as x-ray scanners and laboratories, insufficient infrastructure, and inconsistent application of regulations in the case of road transport. Trains experienced longer delays than trucks primarily due to gauge change operations, shortages of available wagons, and faulty equipment.

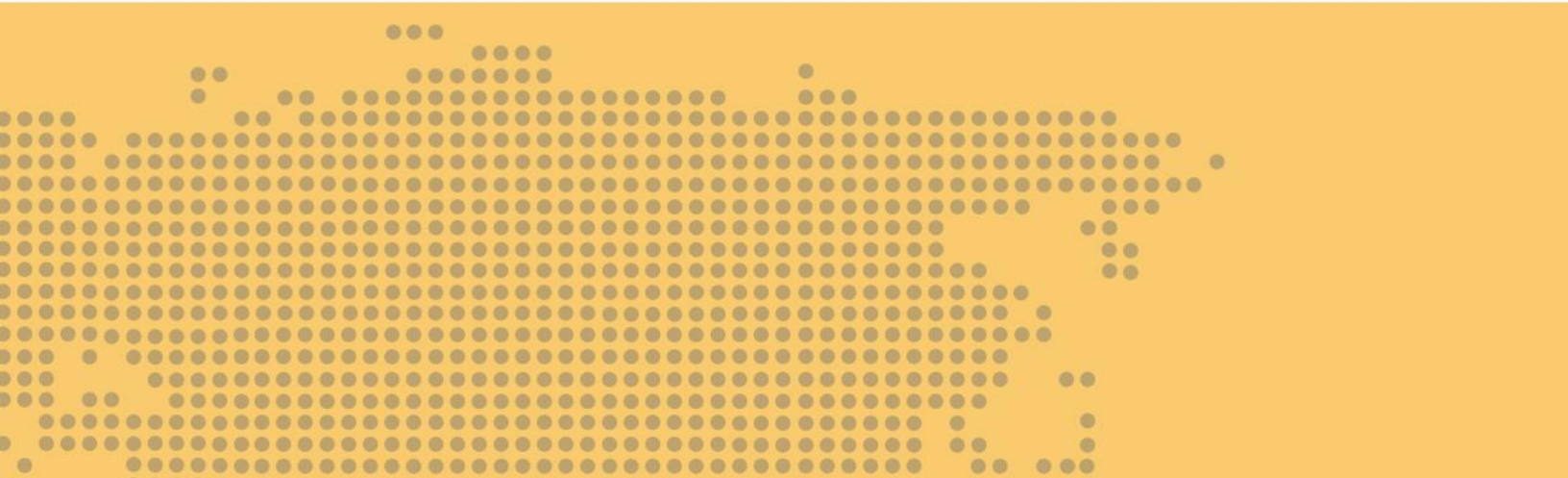
Over recent years, the advantage of rail over road transport has waned as the average cost differential between the two modes of transport is narrowing in the CAREC region, although this advantage tends to be commodity-specific. The demand for unofficial payments varied widely yet continued to drive up costs for road transport, especially related to phytosanitary inspections, vehicle registration, and customs formalities.

Not all issues apply to all border-crossing points along the six corridors and some corridors saw better overall results than others. Analysis points to corridor 1 benefiting from better physical infrastructure as it registered the fastest SWOD and SWD for both road and rail transport. Crossing road borders was fastest along corridor 4, and least expensive along corridor 3. Overall transport cost was lowest along corridor 2.

Looking forward, as the CPMM mechanism matures and continues to expand its databases, it will explore different approaches to capturing data for multimodal shipments, increasingly common throughout the CAREC region. The CPMM in 2018 also aims to gather information on services in trade logistics and better understand behind-the-border issues, working in close collaboration with its partner carrier and forwarder associations.



Appendixes



Appendix 1: Corridor Performance Measurement and Monitoring Methodology

The Corridor Performance Measurement and Monitoring (CPMM) methodology is based on a time-cost-distance (TCD) framework and involves four major stakeholders: (i) drivers; (ii) CPMM partners/coordinators; (iii) field consultants; and (iv) the Central Asia Regional economic Cooperation (CAREC) Program trade facilitation unit.

The TCD methodology developed by the United Nations Economic and Social Commission for Asia and the Pacific focuses on the time and costs involved in transportation and analyzes transport inefficiency and bottlenecks. It lays out the cost and time components of door-to-door movements of a vehicle along a transport corridor, and tracks delays at borders and other inspection points along the corridor.

Under the CAREC CPMM, coordinators of each CPMM partner every month randomly select drivers who are transporting cargoes passing through the six CAREC priority corridors to fill up the drivers' CPMM forms. The data from the drivers' forms are entered into TCD spreadsheets by the coordinators. Each partner association completes about 20-30 TCD forms a month, which are submitted to the field consultants and screened for consistency, accuracy, and completeness.

The TCD data submitted by partner associations is normalized so each TCD sheet can be summed up and analyzed at the sub-corridor, corridor, and aggregate level of reporting.

Normalization is done in terms of a 20-ton truck in the case of road transport, or a twenty-foot equivalent unit (TEU) in the case of rail traveling 500 kilometers (km). The number of border-crossing points (BCPs) for sub-corridors is also normalized for each 500-km segment.

Normalization of each TCD sheet comprises the following steps:

- (i) Each TCD is split between the non-BCP portion and BCP portion in case the shipment crossed borders.
- (ii) The time and cost figures for the non-BCP portion are normalized to 500 km by multiplying the ratio of 500 km by the actual distance traveled.
- (iii) The time and cost figures for the BCP portion are normalized based on the ratio of pre-determined number of BCPs for each 500-km segment over the actual number

of BCPs crossed.

- (iv) The TCD is reconstituted by combining the normalized non-BCP portion and the normalized BCP portion.

To measure the average speed and cost of transport for trade, the cargo tonnage or number of TEU containers are used as weights (normalized at 20 tons) in calculating the weighted averages of speed and cost for sub-corridors, corridors and for the data overall, based on normalized TCD samples.

The detailed CPMM flowchart is in Figure A1.1.

Corridor Performance Measurement and Monitoring Partners and Coordinators

CPMM partners are national transport carriers and forwarders selected to work with the CAREC trade facilitation unit in implementing the CPMM. A specific person is assigned by each partner to receive training on the CPMM mechanism, train the drivers, customize the drivers' form, and enter the data into a customized spreadsheet.

National Association Drivers

To ensure accuracy of CPMM data analysis, raw data should be collected as close to the source as possible. Drivers are asked to record how long (time) or how much (cost) it takes them to move from origin to destination. The drivers use a country-specific driver's form to record and submit data to the CPMM partners.

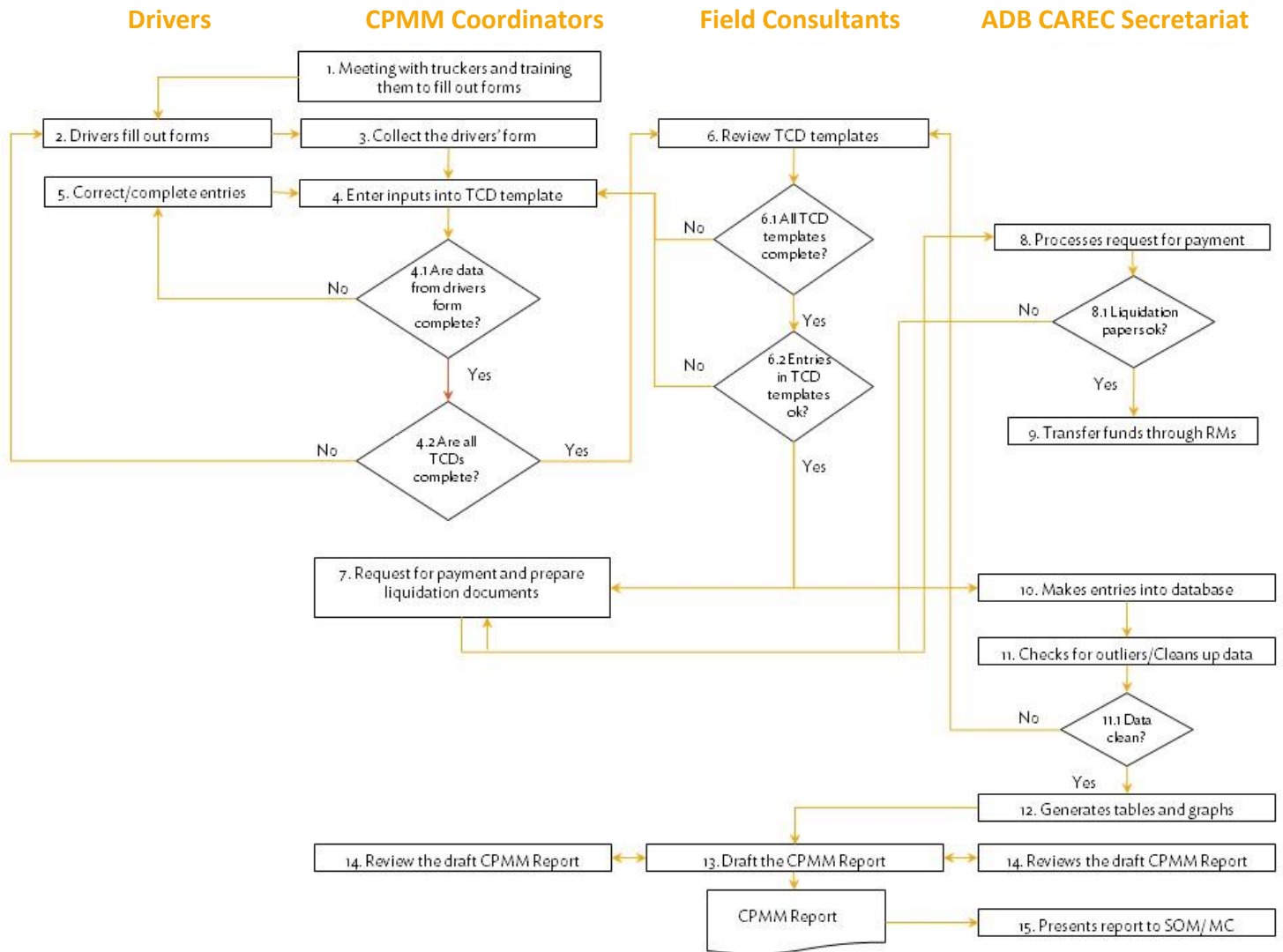
Field Consultants

Two international field consultants work with the CAREC trade facilitation team to develop the CPMM methodology, and travel to the CAREC countries to standardize implementation. They also analyze the aggregated data and draft CPMM quarterly and annual reports.

CAREC Trade Facilitation Unit

Based in the headquarters of the Asian Development Bank, Manila, the CAREC trade facilitation unit is responsible for collecting and aggregating all completed CPMM spreadsheets. Using specialized statistical software, the team constructs the charts and tables for analysis by the field consultants and assists in CPMM report preparation.

Figure A1.1: Corridor Performance Measurement and Monitoring Flowchart



ADB = Asian Development Bank, CPMM = corridor performance measurement and monitoring, RM = resident mission, TCD = time/cost-distance, SOM = Senior Officials' Meeting, MC = Ministerial Conference
 Source: Asian Development Bank.

Appendix 2: 2017 Partner Associations

Central Asia Regional Economic Cooperation (CAREC) Corridor Performance Measurement and Monitoring (CPMM) partners are national carrier and forwarder associations already established in CAREC member countries and are essential to the success of the CPMM mechanism. Trained to gather CPMM raw data, their key responsibilities include:

- (i) Act as the local focal point to collaborate with the Asian Development bank (ADB) CAREC trade facilitation team in conducting the CPMM annual exercise;
- (ii) Organize and train drivers to use customized drivers' forms for data collection;

- (iii) Review completed drivers' forms to ensure data completeness and correctness;
- (iv) Input raw data from drivers' forms into the CPMM spreadsheets; and
- (v) Submit completed CPMM files to CAREC.

The 12 CPMM partners working closely with CAREC in 2017 are listed in Table A2.1.

Table A2.1: 2017 Corridor Performance Measurement and Monitoring Partner Associations

	Country	Association	
1	Afghanistan	Association of Afghanistan Freight Forwarding Companies	AAFFCO
2	Kazakhstan	Kazakhstan Freight Forwarders Association	KFFA
3	Kyrgyz Republic	Association of the International Road Transport Operators of the Kyrgyz Republic	AIRTO
4		Kyrgyz Freight Operators Association	FOA
5	Mongolia	Mongolia Chamber of Commerce and Industry	MNCCI
6		National Road Transport Association of Mongolia	NARTAM
7	Pakistan	Pakistan International Freight Forwarders Association	PIFFA
8	People's Republic of China	Chongqing International Freight Forwarders Association	CQIFA
9		Inner Mongolia Autonomous Region Logistics Association	IMARLA
10		Xinjiang Uygur Autonomous Region Logistics Association	XUARLA
11	Tajikistan	Association of International Automobile Carriers of Tajikistan	ABBAT
12	Uzbekistan	Business Logistics Development Association	ADBL

Source: Asian Development Bank.

Appendix 3: Trade Facilitation Indicators

Recognizing the pivotal roles of trade facilitation and transport connectivity in the economic growth of the Central Asia Regional Economic Cooperation (CAREC) region, member countries jointly developed and endorsed the CAREC Transport and Trade Facilitation Strategy (TTFS) in 2007. The TTFS had an integrated approach that centered on the development of six priority CAREC corridors through transport infrastructure investments and trade facilitation initiatives. It also mandated the monitoring and periodic measurement of the performance of the six transport corridors to:

- (i) identify the causes of delays and unnecessary costs along the links and nodes of each CAREC corridor, including border-crossing points (BCPs) and intermediate stops;
- (ii) help authorities determine how to address the identified bottlenecks; and
- (iii) assess the impact of regional cooperation initiatives.

In 2008, ADB developed the CAREC Corridors Performance Measurement and Monitoring (CPMM) methodology that offers an accurate and evidence-based foundation for policies aimed at addressing these objectives. The current CPMM methodology is a result of modifications in the original United Nations Economic and Social Commission for Asia and the Pacific time-cost-distance (TCD) methodology that have optimized its ability to measure and monitor effectively the border-crossing and corridor performance of CAREC corridors over time. The methodology offers an extensive picture of the time and cost dimensions of transport and trade facilitation, particularly with regard to border crossings and other impediments along a transit corridor. Aside from time and cost, derived measures such as speed can be used to assess traffic density and road quality. With these factors, several measures and indicators can be developed for the monitoring of border-crossing and customs service efficiency, as well as road and rail infrastructure performance along corridors. When the corridors are monitored regularly, policy makers can easily pinpoint areas that need improvement and financial investment.

With data from TCD-format questionnaires, the following four trade facilitation indicators (TFIs) are monitored regularly to enable assessment of improvements made in the CAREC corridors. However, unlike other indicators, TFIs are less easy to quantify as they depend on a variety of factors such as (i) the quality and availability of physical infrastructure, (ii)

national policies and regulations for transit and trade, (iii) border-crossing procedures, and (iv) the degree of harmonization among countries.

- (i) **TFI1: Time taken to clear a BCP.** This TFI refers to the average length of time (hours) it takes to move cargo across a border from the exit point of one country to the entry point of another. The entry and exit points are typically primary control centers where customs, immigration, and quarantine are handled. Along with the standard clearance formalities, this measurement includes waiting time, unloading or loading time, and time taken to change rail gauges, among other indicators. The intent is to capture both the complexity and the inefficiencies inherent in the border crossing process.
- (ii) **TFI2: Costs incurred at a BCP.** This is the average total cost, in US dollars, of moving cargo across a border from the exit point of one country to the entry point of another. Both official and unofficial payments are included. This indicator assumes 20 tons of cargo, so that the average costs across various samples are comparable.

The CPMM mechanism also analyzes unofficial payments: these are defined as a sum paid on top of that officially recognized by law, with the aim of gaining a favor preferential treatment in return. No official receipt is given. Tracking an unofficial payment is inherently difficult due to the opaque nature of the transaction.

- (iii) **TFI3: Costs incurred while traveling along a corridor section.** This is the average total costs, in US dollars, incurred for a unit of cargo traveling along a corridor section within a country or across borders. A “unit of cargo” refers to a cargo truck or train with 20 tons of goods. A “corridor section” is defined as a stretch of road 500 kilometers (km) long. Both official and unofficial payments are included.

This indicator is the sum of border-crossing cost and vehicle operating cost (VOC). VOC is defined as the variable cost component for a shipment: including remuneration for the driver during the shipment; sustenance cost (food and drink, accommodation); fuel cost; parking fees; and minor repairs.

The cost components must be specific to the shipment. Non-specific cost items that are overheads or annual fees such as vehicle tax, insurance, depreciation and one-time vehicle overhaul are not included in the calculation of VOC. In general, the main cost drivers for VOC are driver remuneration and fuel cost.

Many factors can affect VOC, and thus influence the total transport cost. Factors such as distance, weight of cargo, quality of transport infrastructure, number of BCPs, oil price, foreign currency exchange rate, time of year of travel, empty backhaul, market competition and new legislation can exert sizeable influence on VOC. All things being equal, VOC will be primarily affected by the distance and cargo weight, as this is the basis for the carrier's quote of the shipment price.

To standardize transport cost, the CPMM adopts 500 km as a unit of distance, and 20 tons as a unit of weight. This standardized unit enables comparisons to be made between road shipments across different corridors with varying distance and weight.

- (iv) **TFI4: Speed of travel along a corridor section.** This is the average speed, in kilometers per hour (kmph), at which a unit of cargo travels along a corridor section within a country or across borders. Again, a "unit of cargo" refers to a cargo truck or train with 20 tons of goods, and a "corridor section" refers to a stretch of road 500 km long. Speed is calculated by dividing the total distance traveled by the duration of travel. Distance and time measurements include border crossings.

The CPMM uses two measures of speed: speed without delay (SWOD) and speed with delay (SWD). SWOD is the ratio of the distance traveled to the time spent by a vehicle in motion between origin and destination (actual traveling time). SWD is the ratio of distance traveled to the total time spent on the journey, including the time the vehicle was in motion and the time it was stationary. Under the CPMM, all activities that delay transit (customs clearance, inspections, loading and unloading, and police checkpoints, among others) are recorded by drivers. SWOD represents a measure of the condition of physical infrastructure (such as road and railways), while SWD is an indicator of the efficiency of BCPs along the corridors.

Statistical derivation of the TFIs

TFI1: Time taken to clear border crossing point (hour)

This indicator highlights bottlenecks at border crossing points (BCPs), which typically involve lengthy border crossing procedures and serious delays. Each component activity can be further examined to pinpoint the principal cause of delays.

Formula, per time/cost-distance (TCD) calculation

$$TFI1_i = \sum_{j=1}^a t_j$$

t_j = time spent on each activity j
 $j = 1, 2, \dots, a$ = number of activities in each border crossing
 $i = 1, 2, \dots, n$ = number of TCDs

The sum is taken from all of the activities carried out in each border crossing. However, for comparison purposes, activities recorded under "others" are not included

Aggregation, average value per corridor and per mode of transport

$$\sum_{i=1}^n TFI1_i$$

n = number of TCDs qualifying a given filter (per mode / per corridor)
 $i = 1, 2, \dots, n$ = number of TCDs

The computation of the average is straightforward: no weights are necessary

TFI2: Costs incurred at a BCP (\$)

This indicator highlights BCPs that have relatively expensive border crossing procedures, including unofficial payments. Each component activity can be further examined to pinpoint the drivers of cost.

Formula, per time/cost-distance (TCD) calculation

$$TFI2_i = \sum_{j=1}^a c_j$$

c_j = cost incurred on each activity
 j
 $j = 1, 2, \dots, a$ = number of activities in each border crossing

The sum is taken from all of the activities carried out in each border crossing. However, for comparison purposes, activities recorded under "others" are not included.

Aggregation, average value per corridor and per mode of transport

$$\sum_{i=1}^n TFI2_i$$

n = number of TCDs qualifying a given filter (per mode / per corridor)
 $i = 1, 2, \dots, n$ = number of TCDs

The computation of the average is straightforward: no weights are necessary

TFI3: Costs incurred traveling along a corridor section (\$)

This indicator provides an insight into the cost structure of a corridor and how it compares with those of other corridors. By examining each component, measures can be developed to minimize transit cost.

Formula, per time/cost-distance (TCD) calculation

$$TFI3_i = v_i + b_i + s_i$$

v_i = cost incurred during transit, per 500 km
 b_i = cost incurred during border crossing, per 500 km
 s_i = cost incurred during intermediate stops, per 500 km
 $i = 1, 2, \dots, n$ = number of TCDs

The normalized cost incurred, per 500 km and per 20 tons of cargo (road) or one 20-foot equivalent unit (rail), in traveling a corridor section is the sum of normalized vehicle-operating or railwagon-operating cost during transit and normalized cost during intermediate stops and border crossings.

Aggregation, average value per corridor and per mode of transport

$$\sum_{i=1}^n TFI3_i$$

n = number of TCDs qualifying a given filter (per mode / per corridor)
 $i = 1, 2, \dots, n$ = number of TCDs

The computation of the average is straightforward; no weights are necessary.

TFI4: Speed of travel along a corridor section (kilometers per hour, kmph)

Speed indicators provide insights into the level of infrastructure development of CAREC corridors by providing information on the speeds that cargo trucks and trains can attain while traversing specific corridor sections. Under the CPMM, speed is measured by two indicators: speed without delay (SWOD) and speed with delay (SWD).

Another factor to consider is the weighting of the observations in the aggregation. As the computed speed represents the transport of the truck or train, speed should be weighted by the tonnage of cargo to represent the weighted average of speed of the cargo itself.

Speed without delay (SWOD), in kmph. This metric considers travelling speed only, i.e., when the delivery truck is moving on the road, or when the train is moving on the tracks. When the vehicle or train is stationary, the time is not counted.

Formula, per time/cost-distance (TCD) calculation

$$SWOD_i = \frac{D_i}{T_i}$$

D = distance travelled from previous stop
 T = duration of travel
 $i = 1, 2, \dots, n$ = number of TCDs

Aggregation, average value per corridor and per mode of transport

$$\sum_{i=1}^n (w_i)SWOD_i$$

n = number of TCDs qualifying a given filter (per mode / per corridor)

$$w_i = \frac{c_i}{\sum_{i=1}^n c_i}$$

$i = 1, 2, \dots, n$ = number of TCDs

Since computation is per -TCD calculation, each TCD is normalized and treated independently. Also, speed average is not weighted by duration of travel (mathematical computation), and equal weights are given to each record. This method does not give more importance to longer trips than to shorter ones. But records should be weighted by tonnage to measure the average speed of a unit of cargo, and not of the trips.

Speed with delay (SWD), in kmph. This application of SWD considers the total time taken for the entire journey, including stoppage time due to various reasons.

Formula, per time/cost-distance (TCD) calculation

$$SWD_i = \frac{D_i}{T_i + A_i}$$

D = distance travelled from previous stop

T = duration of travel

A = duration of activities (BCP and non-BCP)

i = 1, 2, ..., n n = number of TCDs

Aggregation, average value per corridor and per mode of transport

$$\sum_{i=1}^n (w_i)SWD_i$$

n = number of TCDs qualifying a given filter (per mode / per corridor)

$$w_i = \frac{c_i}{\sum_{i=1}^n c_i}$$

i = 1, 2, ..., n n = number of TCDs

Since computation is per -TCD calculation, each TCD is normalized and treated independently. Also, speed average is not weighted by duration of travel (mathematical computation), and equal weights are given to each record. This method does not give more importance to longer trips than to shorter ones. But records should be weighted by tonnage to measure the average speed of a unit of cargo, and not of the trips.

Appendix 4: Border Crossing Activities

Under the Corridor Performance Measuring and Monitoring (CPMM) mechanism, time spent and payments made (official and unofficial) at each stop are recorded by activity. The list of activities encompasses all anticipated checks and procedures, both at border-crossing points (BCPs) and at intermediate stops along the transit corridor. However, as the CPMM focuses on BCPs, the list comprises mainly customs procedures and inspections during border crossings.

Road Transport

- (i) **Border security/control** – inspection of goods and checking of documents by security personnel (i.e. a police or military) at border crossing points. Also includes payment of fees that may be official or unofficial.
- (ii) **Customs clearance** – inspection of documents and goods entering or exiting a country by customs personnel. Similar activities are completion of customs forms and payment of fees.
- (iii) **Health/Quarantine inspection** – checking for the presence of malignant or contagious disease of a person y health authorities. Also includes filling up of health/quarantine forms, paying of fees, etc.
- (iv) **Phytosanitary inspection** – inspection of cargo for possible presence of harmful pests and plant diseases by agriculture authorities. Similar activities include filling-up of phytosanitary forms and paying of fees.
- (v) **Veterinary inspection** – inspection of cargo for possible presence of infectious animal diseases and regulation of the flow of animals and animal products to a location by veterinary authorities. Similar activities are filling-up of veterinary forms and paying of fees.
- (vi) **Visa/immigration** – checking, by immigration authorities, of visas and required activities to apply for a visa to enter and exit the country when driver has no valid visa. Also includes filling-up of immigration or visa forms and payment of fees.
- (vii) **Traffic inspection** – inspection undertaken by the Traffic Inspectorate or State Traffic Safety Inspectorate. GAI means *Gosudarstvennyya Avtomobilnaya Inspektsyya*.
- (viii) **Police Checkpoint/Stop** – Road blocks or checkpoints by traffic police along a road which also requires payment to proceed.
- (ix) **Transport Inspection** – checking of Certificate of Approval or Conformity for the Vehicles. Road pass is also checked.
- (x) **Weight/Standard Inspection** – checking of dimensions and weight of the vehicle with cargo including queuing, payment of fees, etc.
- (xi) **Vehicle Registration** – registration of the vehicle, and/or payment of applicable road use taxes and/or transit fees.
- (xii) **Emergency Repair** – Ad-hoc repairs made on vehicle that may be due to tire blow out, broken axle, etc. generally because of bad conditions of roads. This is different from planned maintenance.
- (xiii) **Escort/Convoy** – Convoy is a row of vehicles which move together. The vehicles are accompanied by escorts, which can be customs officials or traffic police to ensure that the cargoes reach their destination.
- (xiv) **Loading/Unloading** – loading of goods at point of origin or loading and unloading at intermediate stops to deconsolidate cargo (i.e. transfer goods to another vehicle) or unloading upon delivery at the destination.
- (xv) **Road toll** – fees payable when drivers use a special section of roads or highways that are intended to shorten the travel time.
- (xvi) **Waiting/Queuing** – waiting in lines at border crossing points. Note that this activity does not include other activities such as waiting in line to fill-up or submit customs clearance documents, which is recorded as part of the duration of customs clearance.

Rail Transport

- (i) **Load Cargoes** – The movement of goods from storage / warehouse to the train. If the goods are moved to a temporary storage such as the staging area or loading docks before relocating to the train, then only the time from the staging area / loading docks to the train is considered.
- (ii) **Unload Cargoes** – The movement of goods from the train to storage / warehouse. If the goods are moved to a temporary storage such as the staging area or loading docks before relocating to the warehouse, then consider only the time from the train to the staging area / loading docks.

- (iii) **Fix Cargo Shift** – This refers to the securing of cargoes inside the container or wagon. When items are stuffed into containers, workers may ‘choke’ or secure the cargoes to ensure they stay in position during transit. Automobiles for instance also need additional securing. This is to ensure cargoes stay in position during transit. Normally this is a problem related to manufactured products transported on pallets or in cartons and may not apply bulk commodities.
- (iv) **Remove Excess Cargo** – The movement of excess goods to comply with the weight requirement. This does NOT include inspection time. This activity only starts when the officer declares an ‘over-weight’ and orders a removal and ends when the excess goods are relocated from the train.
- (v) **Transload at Gauge Change Point** – This only happens at the PRC border or Polish border with a CIS country. As the CIS uses 1,520 mm gauge while non-CIS countries use 1,435 mm gauge, the cargoes need to be transloaded. This is done by changing the wheel sets or relocating the goods using forklifts.
- (vi) **Pick-up and Deliver Wagons** – The movement of loaded containers/wagons between terminals to the consignee’s premises.
- (vii) **Replace/Repair Inoperable Wagon** – This applies only if one or more train wagons is found to need service because they are damaged significantly and cannot be addressed by ‘emergency repair’. The action includes the movement from the tracks to the servicing centers, as well as the actual repair the wagon in the servicing center.
- (viii) **Emergency Repair** – Servicing of wagons on the tracks in the marshalling yard, without removing the wagon from the train. In this case the wagon is salvageable, in contrast to the more severe problem under the previous activity.
- (ix) **Trains Classification** – The internal ‘re-group’ of goods, platform, wagons and containers to form a new train. This is needed as goods are bound for different destinations and leave at different schedules. Normally this happens at major rail terminals.
- (x) **Document Errors** – This applies to a special situation when there are errors on the documents (freight bill, cargo manifest, packing list etc.). It does NOT include

normal processing time and starts only when an error is found, and action is taken to correct the error. This activity ends when the authorities confirm that the error is corrected. At borders, this correction may require substantial effort and many days to complete.

- (xi) **Reissue Transit Documents** – This typically applies to PRC rail shipments to CIS. Not all PRC railways stations can handle international shipments but there are occasions when loading/unloading is necessary in such domestic stations. Thus, a domestic document is used for movement of cargo from this station to the international terminal (such as Urumqi in XUAR), where another set of international documents is used. This is when the data is manually re-written or translated.
- (xii) **Customs Inspection** – Inspection by the customs officer to assess compliance with the customs code. The customs officers also check for any dutiable goods, forbidden items or dangerous goods.
- (xiii) **Technical Inspection** – Inspection by the engineers or technicians to ascertain cargo security and safety, as well as the condition of the train and its equipment.
- (xiv) **Sanitary/Phyto-sanitary Control** – Regular checks by the Phyto-sanitary team to observe sanitation standards of the train, as well as the acceptability of goods such as agriculture, food, meat and consumable products. This action also covers health issues, such as health certificates of the staff on-board the train.

Appendix 5: Central Asia Regional Economic Cooperation Border-crossing Points

The endorsement and implementation of the Central Asia Regional economic Cooperation (CAREC) Transport and Trade Facilitation Strategy in 2007 included the identification of six priority CAREC corridors where transport infrastructure investments and trade facilitation initiatives would be focused. The CAREC Corridor Performance Measuring and Monitoring (CPMM) mandate to identify causes of delays and unnecessary costs along the links and nodes of each CAREC corridor, including border-crossing points (BCPs) and intermediate

stops, has put emphasis on the monitoring of BCPs where shipments undergo several transactions and procedures related to trans-border trade.

Table A5.1 lists key BCP pairs for each side of the border. As of 2017, there are 6 BCP pairs along corridor 1; 12 along corridor 2; 9 along corridor 3; 5 along corridor 4; 5 along corridor 5; and 10 along corridor 6.

Table A5.1: CAREC Corridor Border Crossing Points

Corridor	BCP 1	BCP 2
1	1a, 2c	PRC Alashankou / KAZ Dostyk
2	1a, 1c	KAZ Kairak / RUS Troitsk
3	1b	PRC Horgos / KAZ Khorgos
4	1b, 6b, 6c	KAZ Zhaisan / RUS Kos Aral / Novomarkovka (Sagarchin)
5	1c	PRC Torugart / Topa / KGZ Torugart
6	1c, 3b	KAZ Merke / KGZ Chaldovar
7	2a, 2b, 2d, 5a, 5c	PRC Yierkeshitan / KGZ Irkeshitam
8	2a, 2b	KGZ Kara-Suu (Dostuk) / UZB Kara-Suu / Savay (Dustlik)
9	2a, 2b	TAJ Kanibadam / UZB Kokland
10	2a, 2b	TAJ Nau / UZB Bekabad
11	2a, 6a	KAZ Beyneu (rail) / Tazhen (road) / UZB Karakalpakstan (Daut-Ata)
12	2a, 2c	AZE Baku / KAZ Aktau
13	2a, 2b, 2c	AZE Red Bridge (road) - Beyuk Kesik (rail) / GEO Red Bridge (road) - Gabdabani (rail)
14	2b, 3a	UZB Alat / TKM Farap
15	2b	AZE Baku / TKM Turkmenbashi
16	2d, 3b, 5a, 5c	KGZ Karamyk / TAJ Karamyk
17	2d, 5a, 5c, 6c	AFG Shirkhan Bandar / TAJ Panji Poyon / Nizhni Pianj
18	3a, 3b	KAZ Aul / RUS Veseloyarsk
19	3a, 6b, 6c	KAZ Zhibek Zholy - Saryagash/Yallama / UZB Gisht Kuprik - Keles
20	3a	TKM Sarahs / IRN Sarahs
21	3b	TAJ Pakhtaabad / UZB Saryasia
22	3a, 6a, 6b	AFG Hairatan / UZB Termez / Airatom
23	3b, 6b, 6d	AFG Islam Qala / IRN Dogharoun
24	4a	MON Ulaanbaishint / Tsagaanur / RUS Tashanta
25	4a	PRC Takeshiken / MON Yarant
26	4b, 4c	MON Sukhbaatar / RUS Naushki
27	4b	PRC Erenhot / MON Zamiin-Uud
28	6a, 6d	KAZ Kurmangazy (road) / Ganyushking (rail) / RUS Krasnyi Yar (road) / Aksaraskaya (rail)
29	6c	TAJ Istaravshan / UZB Khavast
30	6d	KAZ Bolashak / TKM Serkhetyaka
31	2d	AFG Aqina / TKM Imam Nazar
32	2d, 6d	AFG Torghondi / TKM Serkhet Abad
33	5b	PRC Khunjerab / PAK Sost
34	5c, 6a, 6b, 6d	AFG Chaman / PAK Spin Buldak
35	5a, 6c	AFG Torkham / PAK Peshawar
36	4c	PRC Zuun Khatavch / MON Bichigt

AFG = Afghanistan, AZE = Azerbaijan, PRC = People's Republic of China, GEO = Georgia, IRN = Iran, KAZ = Kazakhstan, KGZ = Kyrgyz Republic, MON = Mongolia, PAK = Pakistan, RUS = Russian Federation, TAJ = Tajikistan, TKM = Turkmenistan, and UZB = Uzbekistan.

Source: Asian Development Bank.

Appendix 6: Trade Facilitation Indicators: Summary Statistics

Table A6.1 provides a brief comparison of Corridor Performance Measurement and Monitoring road and rail trade facilitation indicators for all applicable corridors during 2016 and 2017. Mean, median, and margin (or the 95%

confidence interval band around the mean) estimates are provided to describe the distribution of the sample collected.

Table A6.1: Trade Facilitation Indicator Summary Statistics

Corridor	Overall						Road						Rail					
	2016			2017			2016			2017			2016			2017		
	Mean	Median	Margin	Mean	Median	Margin	Mean	Median	Margin	Mean	Median	Margin	Mean	Median	Margin	Mean	Median	Margin
TF1	Time taken to clear a border crossing point, hr																	
Overall	14.6	5.7	± 0.5	19.1	6.4	± 0.7	11.3	4.7	± 0.5	16.9	5.1	± 0.9	25.9	20.5	± 1.2	26.2	20.3	± 1.0
1	21.5	14.5	± 1.2	26.7	22.3	± 1.3	1.8	0.4	± 0.2	5.9	2.4	± 0.6	31.0	34.5	± 1.4	32.4	38.8	± 1.3
2	6.2	6.0	± 0.1	6.4	6.0	± 0.1	6.2	6.0	± 0.1	6.4	6.0	± 0.1	-	-	-	-	-	-
3	4.6	3.4	± 0.9	4.9	3.4	± 0.7	4.6	3.4	± 0.9	4.9	3.4	± 0.7	-	-	-	-	-	-
4	8.0	2.7	± 0.8	7.7	3.3	± 0.6	2.4	2.1	± 0.1	2.9	2.7	± 0.1	19.6	12.0	± 2.1	19.1	12.0	± 1.5
5	28.4	28.0	± 1.3	50.2	36.6	± 3.2	28.4	28.0	± 1.3	50.2	36.6	± 3.2	-	-	-	-	-	-
6	10.6	6.5	± 0.7	15.0	6.8	± 1.0	10.2	6.5	± 0.7	15.4	6.5	± 1.1	18.8	28.8	-	7.4	7.3	± 0.1
TF12	Cost incurred at border crossing clearance, \$																	
Overall	171	145	± 4	168	143	± 4	160	144	± 4	159	147	± 4	215	150	± 11	202	120	± 12
1	217	130	± 12	238	190	± 13	125	22	± 20	174	37	± 29	264	300	± 13	255	190	± 15
2	173	87	± 15	194	285	± 15	173	87	± 15	194	285	± 15	-	-	-	-	-	-
3	99	81	± 6	97	81	± 5	99	81	± 6	97	81	± 5	-	-	-	-	-	-
4	103	90	± 4	108	89	± 4	104	92	± 4	113	92	± 5	95	44	± 12	87	41	± 12
5	236	231	± 8	254	250	± 8	236	231	± 8	254	250	± 8	-	-	-	-	-	-
6	169	135	± 7	137	120	± 5	168	135	± 7	144	127	± 6	178	295	-	50	50	± 0
TF13	Cost incurred to travel a corridor section, \$ per 500km, per 20-ton cargo																	
Overall	1,125	906	± 26	955	719	± 23	1,174	981	± 31	947	711	± 27	966	767	± 50	976	738	± 46
1	900	778	± 40	739	584	± 34	981	919	± 67	753	794	± 52	853	559	± 50	734	553	± 43
2	521	474	± 18	521	479	± 20	521	474	± 18	521	479	± 20	-	-	-	-	-	-
3	951	664	± 69	573	551	± 25	951	664	± 69	573	551	± 25	-	-	-	-	-	-
4	1,197	876	± 66	1,173	859	± 64	1,302	927	± 82	1,167	796	± 84	1,046	843	± 108	1,181	978	± 99
5	1,835	1,621	± 62	1,513	1,338	± 54	1,835	1,621	± 62	1,513	1,338	± 54	-	-	-	-	-	-
6	978	815	± 46	930	732	± 39	931	785	± 46	866	637	± 42	1,627	1,904	-	1,329	1,492	± 62
TF14	Speed to travel on CAREC Corridors, kmph																	
Overall	20.1	17.7	± 1.6	19.8	20.0	± 1.9	22.3	22.4	± 1.7	22.2	23.1	± 1.8	14.3	9.5	± 3.4	14.8	9.9	± 4.7
1	22.6	22.2	± 4.4	21.4	20.3	± 5.9	31.7	28.0	± 5.3	29.6	27.5	± 7.3	17.8	9.5	± 5.2	18.1	8.5	± 7.8
2	23.8	22.2	± 3.7	22.8	21.4	± 3.4	23.8	22.2	± 3.7	22.8	21.4	± 3.4	-	-	-	-	-	-
3	26.7	27.6	± 4.3	24.5	27.3	± 5.8	26.7	27.6	± 4.3	24.5	27.3	± 5.8	-	-	-	-	-	-
4	17.9	15.4	± 3.3	18.3	19.0	± 2.7	25.7	25.7	± 2.8	25.1	25.0	± 1.9	10.1	9.7	± 2.2	10.0	9.4	± 1.6
5	11.6	12.0	± 1.4	10.1	7.9	± 2.0	11.6	12.0	± 1.4	10.1	7.9	± 2.0	-	-	-	-	-	-
6	21.8	22.7	± 3.1	21.1	22.4	± 2.9	22.5	23.7	± 3.1	22.1	23.6	± 3.2	8.3	9.3	-	12.9	13.5	± 0.8
SWOD	Speed Without Delay, kmph																	
Overall	40.9	44.8	± 2.2	42.7	47.3	± 2.1	41.7	44.2	± 2.4	45.0	47.4	± 1.7	38.6	45.1	± 5.0	37.6	47.3	± 5.7
1	49.9	49.6	± 2.3	51.2	50.6	± 3.1	50.2	51.2	± 3.4	53.2	51.4	± 2.9	49.8	48.0	± 3.1	50.4	49.5	± 4.2
2	48.9	49.4	± 2.1	49.4	49.9	± 2.2	48.9	49.4	± 2.1	49.4	49.9	± 2.2	-	-	-	-	-	-
3	40.3	40.7	± 4.6	40.8	40.7	± 6.9	40.3	40.7	± 4.6	40.8	40.7	± 6.9	-	-	-	-	-	-
4	33.8	34.0	± 7.1	34.9	37.2	± 5.1	42.1	41.1	± 10.6	46.6	48.1	± 4.0	25.5	24.8	± 6.1	20.6	15.6	± 5.1
5	38.4	31.1	± 4.8	46.5	54.2	± 4.5	38.4	31.1	± 4.8	46.5	54.2	± 4.5	-	-	-	-	-	-
6	37.9	38.4	± 3.6	38.8	38.5	± 2.6	39.1	38.5	± 3.4	40.6	39.2	± 2.4	15.3	12.3	-	24.7	29.5	± 5.4

Note: Margin refers to the 95% confidence interval band around the mean estimate.
TFI = trade facilitation indicator. hr = hour, km = kilometer, kmph = kilometer per hour
Source: Asian Development Bank.

Appendix 7: Structure of Trade Facilitation Indicator 3

Table A7.1 shows the breakdown of transit and activity cost per 20 tons of cargo in relation to total transport cost incurred to travel a 500-km corridor section. Summary statistics are provided for road and rail transport, and for all applicable

corridors during 2016 and 2017. Percentage to total estimates are provided to describe distribution of the samples collected.

Table A7.1: Structure of Trade Facilitation Indicator 3

Corridor	Overall						Road						Rail					
	2016		2017		2016		2017		2016		2017		2016		2017			
	Total	Transit	Activity	Total	Transit	Activity	Total	Transit	Activity	Total	Transit	Activity	Total	Transit	Activity			
TFI3	Cost incurred to travel a corridor section, \$ per 500km, per 20-ton cargo																	
Overall	1,125	590	535	955	491	464	1,174	585	589	947	471	476	966	607	359	976	649	327
1	900	482	418	739	428	311	981	572	410	753	417	335	853	440	412	734	430	303
2	521	379	141	521	379	142	521	379	141	521	379	142	-	-	-	-	-	-
3	951	568	382	573	445	128	951	568	382	573	445	128	-	-	-	-	-	-
4	1,197	773	424	1,173	736	437	1,302	771	531	1,167	667	500	1,046	778	268	1,181	912	269
5	1,835	1,092	743	1,513	940	572	1,835	1,092	743	1,513	940	572	-	-	-	-	-	-
6	978	456	522	930	453	477	931	443	489	866	427	439	1,627	1,540	86	1,329	1,329	0
%	Percent to Total																	
Overall		52%	48%		51%	49%		50%	50%		50%	50%		63%	37%		66%	34%
1		54%	46%		58%	42%		58%	42%		55%	45%		52%	48%		59%	41%
2		73%	27%		73%	27%		73%	27%		73%	27%						
3		60%	40%		78%	22%		60%	40%		78%	22%						
4		65%	35%		63%	37%		59%	41%		57%	43%		74%	26%		77%	23%
5		60%	40%		62%	38%		60%	40%		62%	38%						
6		47%	53%		49%	51%		48%	52%		49%	51%		95%	5%		100%	0%

TFI = trade facilitation indicator, km = kilometer
Source: Asian Development Bank.

Corridor Performance Measurement and Monitoring 2017 Annual Report

Using data gathered from real-time road and rail cargo shipments, the corridor performance measurement and monitoring (CPMM) mechanism monitors and assesses the efficiency of the six Central Asia Regional Economic Cooperation (CAREC) transport corridors that link the 11 CAREC country members – Afghanistan, Azerbaijan, the People’s republic of China, Georgia, Kazakhstan, the Kyrgyz Republic, Mongolia, Pakistan, Tajikistan, Turkmenistan, and Uzbekistan. It shows where shipments are moving faster along the corridors and helping business do better, while also pinpointing where delays and blockages are hindering rapid and cost-effective trade. The CPMM provides country- and corridor-specific snapshots, and key recommendations to improve the efficiency of trade along the CAREC corridors. It informs national policy-making bodies on transport and trade blockages, and helps guide infrastructure investment and trade facilitation reform and modernization.

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.

About the Asian Development Bank

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 67 members—48 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.



CENTRAL ASIA REGIONAL ECONOMIC COOPERATION