

Performance
Evaluation
Report

Kazakhstan: CAREC Transport Corridor 1 (Zhambyl Oblast Section) [Western Europe –Western People’s Republic of China International Transit Corridor] Investment Program and Taraz Bypass Project



Independent
Evaluation



Raising development impact through evaluation

Performance Evaluation Report
September 2020

**Kazakhstan: CAREC Transport Corridor 1
(Zhambyl Oblast Section) [Western Europe—
Western People's Republic of China
International Transit Corridor] Investment
Program and Taraz Bypass Project**

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NOTES

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

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Abbreviations

ADB	–	Asian Development Bank
CAREC	–	Central Asia Regional Economic Cooperation
COR	–	Committee of Roads
DMF	–	design monitoring framework
EIRR	–	economic internal rate of return
GDP	–	gross domestic product
HDM	–	highway development and management
IED	–	Independent Evaluation Department
IsDB	–	Islamic Development Bank
ITS	–	intelligent transport system
JICA	–	Japan International Cooperation Agency
km	–	kilometer
MFF	–	multitranchise financing facility
MID	–	Ministry of Investment and Development
MOF	–	Ministry of Finance
MOTC	–	Ministry of Transport and Communications
PCR	–	project completion report
PPER	–	project performance evaluation report
PRC	–	People's Republic of China
TEU	–	twenty-foot equivalent unit
RRP	–	report and recommendation of the President
vpd	–	vehicles per day

Currency Equivalents

Currency Unit—tenge (T)

Loan 2503

		At Appraisal (15 October 2008)	At Project Completion (31 December 2013)	At Evaluation (30 September 2019)
T1.00	=	\$0.008342	\$0.006507	\$0.002579
\$1.00	=	T119.88	T153.69	T387.75

Loan 2562

		At Appraisal (15 September 2009)	At Project Completion (22 October 2015)	At Evaluation (30 September 2019)
T1.00	=	\$0.006628	\$0.003611	\$0.002579
\$1.00	=	T150.865	T276.930	T387.75

Loan 2697 and Cofinancing 8251

		At Appraisal (25 October 2010)	At Project Completion (22 April 2015)	At Evaluation (30 September 2019)
T1.00	=	\$0.00678	\$0.00538	\$0.002579
\$1.00	=	T147.5	T185.8	T387.75
			(1 August 2016)	
¥1.00		\$0.01069	\$0.01110	\$0.002579
\$1.00		¥93.5	¥90.1	T387.75

Loan 2735

		At Appraisal (14 February 2011)	At Project Completion (31 December 2014)	At Evaluation (30 September 2019)
T1.00	=	\$0.0068	\$0.0055	\$0.002579
\$1.00	=	T146.45	T182.33	T387.75

Loan 2824

		At Appraisal (17 October 2011)	At Project Completion (31 December 2015)	At Evaluation (30 September 2019)
T1.00	=	\$0.006764	\$0.002949	\$0.002579
\$1.00	=	T147.84	T339.10	T387.75

Contents

	Page
Acknowledgments	vii
Basic Data	ix
Executive Summary	xi
Chapter 1: Introduction	1
A. Evaluation Purpose and Process	1
B. Expected Impact, Outcome, and Outputs	2
Chapter 2: Design and Implementation	4
A. Rationale	4
B. Time, Cost, Financing, and Implementation Arrangements	4
C. Procurement, Construction, Consultants, and Scheduling	5
D. Environment and Social Safeguard Arrangements	6
E. Loan Covenants, Monitoring, and Reporting Arrangements	7
Chapter 3: Performance Assessment	8
A. Relevance	8
B. Effectiveness	11
C. Efficiency	16
D. Sustainability	18
Chapter 4: Other Assessments	21
A. Development Impacts	21
B. ADB Performance	22
C. Borrower and Executing Agency Performance	23
Chapter 5: Conclusions	24
A. Overall Assessment	24
B. Issues	25
C. Lessons	26
D. Recommendations	26
Appendixes	
1. Design and Monitoring Framework	29
2. Status of Compliance with Facility-Level Undertaking and Loan Covenants	34
3. Economic Analysis	46
4. Comparison of Overall Project Performance Assessment	49

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IED retains full responsibility for this report.

Basic Data

Central Asia Regional Economic Cooperation Corridor 1 (Zhambyl Oblast Section) [Western Europe—Western People's Republic of China International Transit Corridor] Investment Program and Taraz Bypass Project (Kazakhstan),
(Loans 2503; 2562; 2697 and Cofinancing 8251; 2735; and 2824)

Safeguard classification:

Environment	A: Projects 2 and 3, Taraz Bypass B: Projects 1 and 4
Involuntary Resettlement	A: Projects 1 and 2 B: Projects 3 and 4, Taraz Bypass
Indigenous Peoples	C: Projects 1, 2, 3, 4, and Taraz Bypass
Sector classification:	Transport and communications
Strategic Agenda:	Economic growth, regional integration
Borrower:	Republic of Kazakhstan
Executing Agency:	Ministry of Investments and Development

Key Project Data (\$ million)	Loan 2503 (Project 1)		Loan 2562 (Project 2)		Loan 2697 and Loan 8251 ^b (Project 3)	
	Approved	Actual	Approved	Actual	Approved	Actual
Total project cost	400.00	266.01	415.00	408.96	281.00	269.31
ADB loan amount	340.00	224.10	187.00	184.66	173.00	164.67
Counterpart and cofinancing						
Borrower	60.00	41.91	58.00	54.30	40.00	36.31
IsDB ^a			170.00	170.00		
JICA ^a					68.00 ^b	68.33 ^c

ADB = Asian Development Bank, IsDB = Islamic Development Bank, JICA = Japan International Cooperation Agency.

^a The IsDB-financed component (parallel cofinancing) was not administered by ADB.

^b Loan 8251 was cofinanced by JICA. The loan amount approved by JICA was ¥6,361 million (\$68 million equivalent at approval). The JICA-financed component was administered by ADB.

^c The actual amount was ¥6,109 million (\$68.33 million equivalent at completion).

Key Project Data (\$ million)	Loan 2735 (Project 4)		Loan 2824 (Taraz Bypass)	
	Approved	Actual	Approved	Actual
Total project cost	130.76	122.89	123.00	97.09
ADB loan amount	112.00	104.25	95.00	82.33
Counterpart financing				
Borrower	18.76	18.64	28.00	14.76

Source: Asian Development Bank.

Key Dates	Loan 2503 (Project 1)	Loan 2562 (Project 2)	Loan 2697 (Project 3)	Loan 2735 (Project 4)	Loan 8251 (Cofinance)	Loan 2824 (Taraz Bypass)
Fact-finding mission	11-24 Jun 2008		2-13 Feb 2010	22-27 Nov 2010		
Appraisal mission	26 Aug-2 Sep 2008	20-27 Feb 2009				13-17 Jun 2011
Loan negotiations	6-9 Oct 2008	28-29 Sep 2009	30 Jun 2010	9-10 Feb 2011	14 Apr 2010	28 Oct-9 Nov 2011
Board approval	30 Dec 2008	7 Oct 2009	15 Nov 2010	21 Feb 2011	31 May 2010	7 Dec 2011
Loan agreement	30 Mar 2009	3 Dec 2009	15 Dec 2010	7 Jun 2011	23 Aug 2010	19 Jun 2012
Loan effectiveness (expected)	29 May 2009	1 Feb 2010	13 Feb 2011	6 Aug 2011		18 Aug 2012
Loan effectiveness (actual)	31 Jul 2009	13 Apr 2010	15 Jun 2011	22 Dec 2011	15 Jul 2011	28 Feb 2013
First disbursement	11 Dec 2009	18 Aug 2010	13 Dec 2011	29 Mar 2012	19 Dec 2011	28 May 2013
Loan closing (expected)	31 Dec 2013	30 Jun 2015	31 Dec 2013	31 Dec 2014	15 Jul 2020	30 Jun 2015
Loan closing (actual)	20 Mar 2014	22 Oct 2015	22 Apr 2015	27 Apr 2015	1 Aug 2016	31 Dec 2015
Months (effectivity to closing)	56	67	47	41	61	35

Type of Mission	Loan 2503 (Project 1)		Loan 2562 (Project 2)		Loan 2697 (Project 3)	
	No. of Missions	No. of Person-Days	No. of Missions	No. of Person-Days	No. of Missions	No. of Person-Days
Fact-finding	1	14			1	12
Appraisal	1	32				
Loan negotiations	1	21				
Inception	1	24	1	44		
Project review	12	121	13	559	8	79
Consultation	1	7	5	91	2	13
Safeguards review			4	83	5	36
Social safeguards consultation			2	7		
Special loan administration			1	40		
Special project administration			1	12	1	8
Midterm review	1	7			1	14
Project completion review	1	18	1	10	1	12
Independent evaluation	1		1		1	

Type of Mission	Loan 2735 (Project 4)		Loan 2824 (Taraz Bypass)	
	No. of Missions	No. of Person-Days	No. of Missions	No. of Person-Days
Consultation	1	4	4	138
Inception			1	98
Fact-finding	1	4		
Special project administration	1	5	1	12
Project review	7	38	6	184
Safeguards review	4	15	1	5
Midterm review			1	30
Project completion review	1	15	1	32
Independent evaluation	1		1	

Source: Asian Development Bank.

Executive Summary

The Central Asia Regional Economic Cooperation Transport Corridor 1 (Zhambyl Oblast Section) Investment Program and Taraz Bypass Project in Kazakhstan was designed to support the development of an efficient transport system with improved road efficiency and safety in Kazakhstan's Zhambyl Oblast. The corridor is part of Kazakhstan's western Europe–western People's Republic of China international transit corridor investment program, which runs from Khorgos, through Almaty and Shymkent, to the Russian Federation's western border. The expected impact was to sustain economic development and improve international trade and regional cooperation, by reconstructing highway sections in Kazakhstan's Zhambyl Oblast and improving the road operation and maintenance system. The investment program aimed to develop an efficient transport system characterized by shorter travel times, lower freight costs, and lower road accident rates.

Overall, the evaluation assessed the program and project *successful*. They were considered *relevant, effective, efficient, and less than likely to be sustainable*. The preliminary assessment of impact was *less than satisfactory* and the performance of the Asian Development Bank (ADB) and that of the borrower and executing agency was *satisfactory*. The evaluation has three recommendations for ADB: (i) consider the applicability of new technologies such as intelligent transport systems (ITS), identify new maintenance practices to be incorporated into projects, and monitor them to determine their efficacy and sustainability; (ii) ensure that indicators and targets are properly specified in the design and monitoring framework, baseline information is accurately incorporated into the initial project framework, and the information requirements are regularly monitored as part of project review missions; and (iii) carry out frequent policy dialogue with the executing agencies to better assess the progress of the strategic requirements of the sector plan during program and project implementation.

Background

The Asian Development Bank (ADB) provided an investment loan to support the development of a sustainable transport system with improved road efficiency and safety in Kazakhstan's Zhambyl Oblast. The Central Asia Regional Economic Cooperation Transport Corridor 1 (Zhambyl Oblast Section) investment program was intended to improve existing roads and to construct new road alignments to accommodate domestic and international traffic.

The investment program was financed through a multitranche financing facility (MFF), with three tranches initially approved to improve 301.6 kilometers (km) of the project road. Tranche 1 (project 1) was approved for \$340.0 million to reconstruct 125.0 km of highway and prepare reports on developing an intelligent transport system and improving the road operation and maintenance system. Tranche 2 (project 2) was approved for \$187.0 million to reconstruct 78.9 km of highway and construct four road

maintenance depots. The Islamic Development Bank (IsDB) financed the reconstruction of 57.0 km under a parallel cofinancing arrangement. Total highway reconstruction under project 2 was 135.9 km. Tranche 3 (project 3) was approved for \$173.0 million to construct or upgrade 117.7 km of highway. The Japan International Cooperation Agency (JICA) cofinanced 20.0 km of the construction. When IsDB was unable to finance all the initially planned segments and withdrew from financing an additional 114.0 km due to financial charge issues, the government then requested ADB to use loan savings from tranche 1 to finance the unfunded segments and ADB approved tranche 4 (project 4) to improve 49.0 km of highway through the loan proceeds of \$115.9 million from the initially appraised \$400.0 million. Bearing in mind the MFF requirement that the aggregate amount should not exceed \$700.0 million for this program, ADB approved financing for the CAREC Transport Corridor 1 (Taraz Bypass) Project for \$95.0 million under a separate loan to complete a missing segment that required improvement along CAREC Transport Corridor 1.

Evaluation Purpose and Process

This project performance evaluation assessed the investment program and project for their relevance, effectiveness, efficiency, and sustainability. The evaluation also assessed development impacts and the performance of ADB and the borrower and the executing agency. The assessment was based on desk reviews of relevant documents from ADB, the government, and other development partners, and on consultations and discussions with ADB staff at ADB headquarters and the Kazakhstan resident mission.

An independent evaluation mission to Kazakhstan was prepared and conducted jointly with representatives from the IsDB operations evaluation department since a portion of the project road was funded by IsDB. A joint site visit was conducted, which included the road segments administered by ADB as well as by IsDB. Joint consultations with the executing agency, implementing agencies, and other stakeholders, including other multilateral development banks were held. A joint data request was made to the government stakeholders for the entire program segment although each institution's evaluation focused on the program segments it implemented. The joint mission assessed the program's contribution to the Zhambyl Oblast region and knowledge was exchanged between the two institutions in terms of evaluation approaches and methodologies.

Expected Impact, Outcome, and Outputs

The expected impact of the investment program was a contribution to sustainable economic development. The expected outcome was an efficient transport network in Zhambyl Oblast in the southern and western region of Kazakhstan. The program indicated two outputs which were highway sections in Zhambyl Oblast reconstructed, and the road operation and maintenance system improved.

Regarding the expected outcome, the investment program aimed to develop an efficient transport system in Kazakhstan's Zhambyl Oblast enabling higher average traffic volumes, shorter travel

times, lower freight costs, and lower road accident rates. It was anticipated that the improvements in road efficiency and safety would in turn boost international trade and regional cooperation, contributing to sustainable economic development.

The program's expected outputs were the building or reconstruction of 427.6 km of roads in Zhambyl Oblast through four tranches under the MFF program. Under a separate stand-alone loan from ADB, additional construction of a 65-km Taraz Bypass segment was approved to take the total of this continuous segment of the CAREC Transport Corridor 1 to 492.6 km. The program was expected to prepare a sustainable road operation and maintenance system and to formulate pilot projects. An intelligent transport system (ITS) strategy would be developed, and an investment plan agreed for implementation under subsequent projects, together with recommendations.

Assessment of Performance

Relevance. The proposed investment was influenced by the Road Development Plan approved in 2006, which envisaged the improvement of Kazakhstan road network with a focus on republican (national) roads and local roads. Under this plan, improvement of the western Europe to western PRC corridor was the highest priority, to strengthen Kazakhstan's role as a transit country for trade. The investment was also in line with ADB's Strategy 2020, whose primary focus was promoting sustainable economic growth. It was also in line with the ADB country partnership strategy for Kazakhstan, which emphasized support for the transport sector. One of the core activities of the investment program was to improve regional trade and transit corridors, which was consistent with CAREC efforts to encourage regional cooperation in the infrastructure sector. The investment program and project were a core element of CAREC Corridor 1 linking the PRC with Europe. The program and project also supported the government's own strategy to promote Kazakhstan's role in international trade and transit.

The program was large and the MFF modality was chosen because it provided flexibility to vary the

amount of funding and timing of ADB contributions under each tranche when readiness criteria were met. The MFF provided a framework for long-term partnership and stability of funding, the cost of borrowing to the government was reduced, fewer upfront processing tasks were required, and a greater emphasis was placed on implementation. While the use of MFF met internal efficiency and effectiveness criteria in ADB, a Ministry of Finance (MOF) representative expressed the view to the evaluation team that the MFF did not reduce processing on the government side, leading to problems in meeting the dates of loan effectiveness of the various tranches.

The program and project designs were adequate for achieving the intended physical outcomes and remained mostly unchanged between appraisal and completion.

The investment program included a physical component (road development) and a non-physical component (road operations and maintenance). Although comprehensive indicators were defined in the design and monitoring framework (DMF) for the overall project corridor (especially for the non-physical components of the program), the project completion report (PCR) only reported on the DMFs for the individual tranches and did not assess the overall corridor DMF. The non-physical components supported the policy dialogue underpinning the program. However, if the non-physical components had been reflected throughout different tranches of the program, this would have made a greater contribution to sustainability. Also, the DMF indicators for transport cost reductions and road accident rates could have been more appropriate. In addition, the impact of the investment was primarily linked to the general economy, on which the investment had relatively little effect. The DMF should have focused on the direct impact of the road and its support for regional trade with the Kyrgyz Republic and Uzbekistan as well as international trade between the PRC, the Kyrgyz Republic, and Uzbekistan.

Overall, the design was appropriate for a major arterial road primarily serving long-distance traffic. Related to the application of cement concrete pavement, the program should have

included a monitoring component to assess the pavement performance against asphalt pavements used elsewhere in the country as well as to identify any issues and problems associated with maintenance of the concrete slabs (which is different from that for asphalt pavements).

The program was consistent with the country's development strategy and plans for the transport sector and aligned with ADB's Strategy 2020, the Kazakhstan country partnership strategy and the regional CAREC program. The program was well designed and the MFF modality was appropriate. Overall, the assessment rates the program *relevant*.

Effectiveness. Based on the DMF, the program was expected to contribute to sustainable economic development. The outcome envisaged was an efficient transport network in Zhambyl Oblast. The outcomes were to be measured through the following indicators: (i) increased average traffic volume to 7,000 vehicles per day in 2015 from 4,000 vehicles per day in 2007, (ii) reduced average travel time between Almaty and Shymkent to 8 hours in 2015 from 12 hours in 2007, (iii) reduced transport cost for freight to 5% of the cargo value from 10% in 2008, and (iv) reduced road accident rate to 0.1 fatality/km from 0.3 fatality/km in 2006.

Traffic volume increased steadily along the corridor from 4,575 vehicles per day in 2007 to 8,560 vehicles per day in 2019, representing an average annual increase of 5.4%. This growth rate was broadly in line with appraisal estimates but was affected by the slowdown in growth in the economy and the significant devaluation of the currency in late 2015. Since project completion in 2016, traffic growth has averaged 2.5% per year on all road segments, which was attributable to the poor economic performance of Kazakhstan when the devaluation took place. The road improvements have shortened travel times substantially. Over the whole corridor between Almaty and Shymkent, the travel time was reduced from 12 to 8 hours. The project was also expected to reduce road haulage costs in the corridor by facilitating long hauls with consistent speeds, thereby reducing vehicle operating costs. Given that the cargo value varies considerably depending on cargo type, with freight rates set by truck capacity, a more relevant indicator would

have been the reduction in vehicle operating costs. Vehicle operating cost savings per kilometer for freight vehicles were calculated in the PCR, comparing with- and without-project scenarios. The highway development and management (HDM) model estimated vehicle operating cost savings of about 25% for heavy trucks, the main form of transport for long-distance freight haulage. This demonstrated that the improved corridor had had a significant impact on reducing road haulage costs and that the target set by the project of a reduction in transport cost to 5% of the cargo value was most likely achieved. A major impact of the road has been the substantial reduction in fatal accidents. The number of annual deaths has fallen from an estimated 196 per year in 2007 to about 45 in 2019, while the number of injuries has increased from 395 to 480 annually. Taking into account the increase in vehicle-km using the road corridor, the road is currently almost 12 times safer today than in 2007. While the number of injuries has increased in absolute terms, the road is significantly safer. The original target of a 0.1 fatality per km rate was met by 2019 when the rate decreased to 0.09.

The program had two outputs: (i) highway sections in Zhambyl Oblast reconstructed, and (ii) road operation and maintenance system improved. The outputs were to be measured through the following indicators: (i) 480 km of highway sections reconstructed on time, within budget, and meeting technical specifications with an international roughness index of less than 3 m/km (this was revised to 427.6 km in the facility administration manual in 2013), (ii) sustainable road operations and maintenance system prepared and pilot projects formulated, (iii) intelligent transport system (ITS) strategy developed and investment plan agreed for implementation under subsequent projects, (iv) recommendations for improving road operations and maintenance system implemented.

The program built or improved 427.6 km of roads in Zhambyl Oblast through four tranches under the MFF program, with an average international roughness index of less than 3 m/km. The completion of the 65 km of the Taraz Bypass section brought the length of the improved CAREC Transport Corridor 1 to 492.6 km. Observations in the field indicated a general high-

quality cement concrete pavement and structures and a project that was operating satisfactorily.

The assessment performed as part of the program related to the road operation and maintenance system provided various recommendations, including the need for an automated asset management system, potential use of performance-based contracting, and outsourcing to the private sector. An up-to-date inventory and database of the road network was subsequently incorporated under a parallel World Bank program and the system is expected to be operationalized in late 2020 or 2021. However, the intended pilot performance-based road maintenance contract has not yet been implemented. The reorganization of the institutional structure in 2014 and economic downturn in the economy in 2015 and 2016 delayed the schedule for actions on road maintenance. At the time of the evaluation, the conclusions of activities related to a road asset management system were awaited. An ITS assessment was incorporated in the government's development plans, supported by a draft ITS plan prepared by the program showing the system's architecture and the facilities required along CAREC Corridor 1 in the Zhambyl Oblast.

The corridor improvements have resulted in a modern well-designed highway system facilitating international transit and domestic travel. The evaluation found that the intent of the project had largely been met. The program was successful in that it met its outcomes and most of the outputs. Increased average traffic volume, reduced travel times, lower freight costs, and lower road accident rates were achieved as targeted. Traffic volumes increased in line with expectations. The road maintenance assessment identified the key requirements for maintaining the republican road network and the recommendations of the ITS report were used in preparing the government's medium-term plan for transport system infrastructure. Implementation is ongoing, including preparation of a road database and adoption of a road management system. Overall, the evaluation rates the corridor improvements *effective*.

Efficiency. From a process perspective, the resources provided by ADB and the cofinanciers were used efficiently. The individual loans were all implemented in a timely manner with relatively small adjustments in implementation schedules. The individual tranches were approved in line with expectations, procurement was timely, and disbursement targets were met. The process efficiency was facilitated by well-managed executing and implementing agencies and supportive timely actions by ADB supervision teams.

At the appraisal stage, the analysis used the HDM 4 model to predict average travel speeds, pavement roughness, road deterioration, and the road agency costs to keep the road suitably maintained. It also predicted road user costs and all costs were converted to economic costs using the world price numeraire, applying a standard conversion factor for non-tradable goods components. A similar approach was adopted by the PCR for the MFF investments. However, for the Taraz Bypass, the original analysis followed the same analysis as the corridor, but the PCR updated the economic analysis manually. The approach was acceptable, although it did not apply economic pricing correctly and failed to apply the consumer surplus methodology to generated traffic, which meant that economic benefits were likely overestimated.

A small number of adjustments were applied to the economic analyses used in the PCRs, primarily to reflect current traffic and future projections. For the MFF analysis, the road accident information was updated to take account of recent statistics over 2017 to 2019, which showed a substantial reduction in the number of fatalities along the corridor. For the Taraz Bypass assessment, in addition to the technical attributes, the traffic levels used recent counts provided by the road agency. As a result, the projection of truck traffic was decreased to reflect the overall growth of the whole corridor (estimated to be 4% a year) in future.

Economic internal rates of return (EIRRs) were estimated for (i) the MFF corridor (22.0%), (ii) the Taraz bypass (11.3%), and (iii) the overall corridor investment (21.5%). While the bypass showed a return below the 12% discount rate applied at appraisal, the evaluation believes this may have

been because of the quality of the data. Overall, the investment in the CAREC Transport Corridor 1 met the requirements expected for road infrastructure investment and was implemented largely on time, within budget, and incurred minimal variations in design. As a result of both their process efficiency and economic efficiency, the evaluation rates the investments *efficient*.

Sustainability. While the road has been designed and constructed to a high standard, the history of road maintenance in Kazakhstan has been affected by a chronic funding shortage for road maintenance, as revealed by the review of road maintenance systems undertaken under the road operation and maintenance component of the project. Within Zhambyl Oblast, the budget allocations for repair and maintenance of the project roads as provided by Kazavtozhol, the national highways operator, increased substantially over 2015–2019, with a doubling of the allocations (an annual increase of about 19%). In addition, the planned national allocations for capital and maintenance works over 2020–2025 are anticipated to increase by 1.5 times from 2020 to 2025. The government has also increased the total funding for road maintenance but it is not clear whether the planned budget allocation will be sufficient for road maintenance of the project corridor, since the allocation is for the planned national allocations for capital and maintenance works.

The government is considering converting the Zhambyl Oblast sections into a toll facility, to increase the revenues available for maintenance. Discussions with the COR indicated that measures are likely to be taken to resolve road maintenance financing issues once the framework for managing road assets is in place. However, the amount of toll revenue will depend on the traffic using the facility. One concern is that the traffic volume may continue to fall short of the projected rate of increase. If this trend continues, and insufficient revenue is generated from the tolls, the sustainability of the road will not be ensured, despite the government's commitment to increasing funding for operation and maintenance. The state budget

for road maintenance is still likely to be needed to complement the toll revenues. However, no detailed financial evaluation of road maintenance funding in Kazakhstan was available to determine whether financial resources with or without the tolling option would be sufficient.

Although additional efforts are being made to improve the sustainability of the corridor, including the government's commitment to provide the necessary budget allocation and plans to implement road asset management systems throughout the corridor, most of these efforts are still in progress with no specific measures being implemented or realized along the corridor. The implementation of the road operation and maintenance component was significantly delayed and only partially completed. The road asset management system is not yet functional and some of the pilot projects related to ITS (as defined in the DMF) have not been implemented either. Also, although the government has adopted a plan for the development of the country's transport infrastructure that includes some of the project's recommendations on road maintenance, it has provided no evidence of the implementation of the plan, its target timelines, or resource commitments. Several constraints resulted in limited achievements of the performance indicators per the targets as defined in the DMF for the period till 2014 for some of the related program outputs that could have further supported project sustainability. Also specific to this project, there is still lack of clarity as to whether the subsequent efforts to ensure sustainability will eventually be materialized in directly supporting the sustainability of the project corridor. Therefore, this assessment rates the CAREC Transport Corridor 1 *less than likely sustainable*.

Other Assessments

Development impact. The overall impact of the program was expected to be a contribution to sustainable economic development. This was to be measured by indicators for Kazakhstan's GDP growth and trade (export and import) growth. The target was for the economy to increase by

68% in terms of gross domestic product over the decade 2010–2020, but it achieved only 47%. The target for trade was a 30% increase in exports and a 30% increase in imports over the decade 2010 to 2020. While trade figures are available only up to 2018, the trend in both exports and imports is below expectations. The trend suggests that the expected overall impact of the program will not be met by 2020. Gross domestic product growth has been below initial forecasts and both exports and imports declined, especially during 2015 and 2016. There was also a discrepancy between the original indicators in the report and recommendation (RRP) and those in the PCR. While three detailed performance targets were defined in the RRP, there were only two in the PCR as mentioned above

The anticipated impact should have been framed in terms of supporting regional trade between southern Kazakhstan and adjacent countries. The expectations of the program were too broadly based, since the program could have only a limited impact on the economy, on overall gross domestic product growth, or on the level of exports and imports. The project was to provide mobility and accessibility to the major towns on its route and linking international traffic.

The PCR indicated that the improved roads had stimulated trade between Kazakhstan and its neighbors, but there is no consistent evidence of this. Updated statistics for recent years were not available. Without the appropriate outcome indicators such as international trade volumes at the cross-border facilities, it is difficult to accurately assess the development impact of the corridor.

Traffic using the project transport corridor over the next 15 years is projected to be below initial forecasts as the economy has slowed. In particular, the growth in truck traffic has been less than anticipated. It is difficult to conclude that the investment is making a satisfactory contribution to development impact. There is insufficient evidence that the program investment will provide major support to the regional economy or to international and domestic trade. The evaluation concludes that the impact of the corridor investment is *less than satisfactory*.

ADB performance. The evaluation concludes that the ADB performance was *satisfactory*. The headquarters team and the Kazakhstan resident mission handled issues promptly and resolved them satisfactorily. The ADB teams collaborated well with staff in MOF, MID, and COR; they responded to requests expeditiously and provided support when required. Project review missions were carried out regularly, at least two times a year, and were conducted with officials from COR headquarters as well as from Zhambyl Oblast. In addition, collaborative teamwork arrangements were established with staff of the two cofinanciers, IsDB and JICA.

Borrower and executing agency performance. The performance of the borrower, represented by MOTC (later MID) as the executing agency and COR as the implementing agency, was *satisfactory*. Although there was a change in the executing agency in 2014 as MOTC became MID, the program was not affected as the implementing agency staff remained the same and provided consistent support. MID, the executing agency, and COR, the implementing agency, provided day-to-day oversight. COR worked closely with Kazavtozhol staff in Zhambyl Oblast to deliver the project on time and to ensure it was of a satisfactory quality. The implementing agency implemented the program in accordance with ADB guidelines and policies, it facilitated the timely release of counterpart funds, and it complied with loan covenants during implementation. COR also chaired the community liaison group and was responsible for the grievance redress mechanism for all tranches and the additional loan. However, during implementation, about one-third of the original loan proceeds of tranche 1 (\$115.05 million) were cancelled due to overestimates of civil works costs and consulting services contracts, and the excessive contingencies that were allowed at appraisal. Cost estimates at appraisal could have been more accurate and realistic.

Issues

Components to assess the operational performance of the cement concrete pavement in the project design were not included, limiting the opportunity to further enhance the maintenance needs of the pavement. While concrete pavements are in widespread use in some other

countries, there is limited experience of this technology in the Asia and Pacific region. The authorities maintaining the road indicated that the road provided a smooth surface and required some routine maintenance to keep it in good condition but they also felt that the concrete pavement was more susceptible to freezing weather conditions than the asphalt pavements used on some adjoining roads. The program should have included a monitoring component to assess the performance of the concrete pavement against asphalt pavements used elsewhere. It should also have identified any issues and problems associated with maintenance of the concrete slabs and international best practices for maintenance should have been incorporated.

Inadequate monitoring indicators and lack of reliable traffic data to measure the performance of the facility mean that there was an inadequate basis for monitoring the outcomes and impacts of projects. The evaluation found that some indicators were not adequately specified or were inappropriate for an assessment of project performance. The management of road assets requires reliable traffic data to measure the performance of the road, but the data initially provided to the evaluation team from the implementing agency contained several errors.

Insufficient policy dialogues with the executing agency during the implementation reduced usefulness of the MFF. The MFF was premised on a well-developed investment plan covering the strategic requirements of the sector over the long term. However, the lack of regular policy dialogue with the executing agency during implementation meant that the benefit of utilizing the MFF modality was not fully realized. While the investment loans proceeded largely as envisaged at appraisal and implementation was smooth, review missions during project implementation do not appear to have taken the opportunity to discuss important sector issues with the road sector authorities or to develop pathways to resolve them. At the time of project appraisal, securing road maintenance funding to ensure the sustainability of the road infrastructure was identified as a core issue. Although progress is being made, funding issues still constrain the sustainability of the road infrastructure. The non-physical components should have been reflected throughout different

tranches of the program to yield the full benefit of utilizing an MFF modality.

Lessons

Innovative technologies need to be carefully assessed and monitored to determine their efficacy and sustainability. As new technologies are made available through various projects, close monitoring of their application and performance and as well as best practices should be incorporated so they can contribute to the success of the program and project. Accumulation of this knowledge and its proper dissemination within ADB will ensure it can be applied to other projects in different locations.

Well-designed road facilities and the systematic monitoring and collection of the traffic accident and volume data are critical for transport policy and for safe and sustainable transport over the long term. Road investments alone cannot ensure that sustainability objectives are achieved; complementary measures are needed to offset the adverse impacts of infrastructure provision, but for this traffic accident and count data have to be accurately collected and monitored. Also, a properly designed road that is effective in reducing the frequency and severity of road accidents, such as the road built by this project, could be used by the road authority to adopt and implement a coherent national road safety policy and program. In this project, the provision of proper rest and refueling areas every 75 km–100 km would reduce driver fatigue and enhance the safety and sustainability of the road.

The MFF is a useful modality for providing the substantial financing required for infrastructure through successive tranches but frequent policy dialogue between ADB and the executing agency would support the strategic long-term requirements of the sector. Implementation of the program demonstrated the flexibility and effectiveness of the MFF modality, for example, when an additional tranche was approved to cover a section of the corridor that was originally not envisioned for ADB finance. ADB also demonstrated its flexibility when it agreed to cover the investment shortfall in the Taraz Bypass through an additional project loan. Additional value addition could have been achieved if frequent policy dialogue with the executing

agency to assess the progress of the strategic requirements of the sector plan had taken place. This plan covered a range of institutional policy reforms and capacity development aimed at improving sector planning, strengthening governance, and involving the private sector.

Recommendations

ADB should consider the applicability of new technologies such as intelligent transport systems, identify new maintenance practices to be incorporated into projects, and monitor them to determine their efficacy and sustainability. In ensuring the long-term sustainability of the project facility, it would be beneficial to monitor the performance of the new technologies being applied, such as ITS, and also identify new maintenance practices to implement remedial measures such as concrete pavement practices that was applied to this project. When innovations or new technologies are incorporated in projects, the unique characteristics of each country should be considered.

ADB should ensure that indicators and targets are properly specified in the design and monitoring frameworks, baseline information is accurately incorporated into the initial project framework, and the information requirements are regularly monitored as part of project review missions. Indicators must reflect the project and its conditions, and an appropriate baseline must be set prior to commencement of project activities. In road projects, greater priority needs to be placed on ensuring that the traffic count data reflect usage of the road network. Such data must be carefully collected and checked to ensure that any errors and omissions are eliminated at source.

ADB should carry out frequent policy dialogue with the executing agencies to better assess the progress of the strategic requirements of the sector plan during program and project implementation. These requirements include identifying solutions to funding maintenance. Policy dialogue should be a regular part of project review missions. In the program and project evaluated here, such policy dialogue could have been used to review the progress in implementing the Road Development Plan that underpinned the MFF.

CHAPTER 1

Introduction

1. The Asian Development Bank (ADB) provided an investment loan to support the development of an efficient transport system with improved road efficiency and safety in Kazakhstan's Zhambyl Oblast. The investment program was intended to improve existing roads and to construct new road alignments so international traffic can be accommodated efficiently. ADB, the Islamic Development Bank (IsDB), and the Japan International Cooperation Agency (JICA) financed part of the Central Asia Regional Economic Cooperation (CAREC) Transport Corridor 1 (Zhambyl Oblast Section). ADB financed the investment program through a multitranche financing facility (MFF), with an aggregate amount not to exceed \$700 million from its ordinary capital resources.¹

2. The MFF included a physical component, building and upgrading roads, and a non-physical component, which included road operation and maintenance. Under the MFF, three tranches were initially approved to improve 301.6 kilometers (km) of the project road. In 2009, IsDB financed \$170.00 million for 57.0 km of road but, due to financial charge issues, withdrew from financing an additional 114.0 km. Since \$115.95 million remained from tranche 1 of the ADB program, a tranche 4 of \$112.00 million was approved on 21 February 2011 to improve 49.0 km of highway. JICA financed ¥6,361 million (\$68 million equivalent at approval) on 31 May 2010 for 20.0 km of highway—JICA financing was administered by ADB. Since the aggregate amount for the MFF was not to exceed \$700.00 million for this program, ADB financed the CAREC Transport Corridor 1 (Taraz Bypass) Project under a separate loan of \$95.00 million on 7 December 2011 to complete a missing segment that required improvement along CAREC Transport Corridor 1.²

3. This chapter outlines the purpose and process of the evaluation and summarizes the intended program impact, outcome, and outputs.

A. Evaluation Purpose and Process

4. This program performance evaluation report (PPER) was undertaken to assess the performance of the CAREC Transport Corridor 1—Zhambyl Oblast Section (Loans 2503, 2562, 2697, 2735 and Cofinancing 8251) and the Taraz Bypass Project (Loan 2824) in Kazakhstan. This corridor is part of Kazakhstan's western Europe–western People's Republic of China international transit corridor investment program, which runs from Khorgos through Almaty and Shymkent to the western border of the Russian Federation. The evaluation assessed project performance taking into account the outcome indicators. Its evaluation methods included in-depth assessments of the projects, based on evidence from documents, recent data, field visits, and interviews with stakeholders. The evaluation also identified lessons and recommendations for future ADB support for transport operations.

5. This evaluation of the CAREC Transport Corridor 1—Zhambyl Oblast Section Investment Program and the Taraz Bypass Project was based on the Independent Evaluation Department (IED) 2016 Guidelines for the Evaluation of Public Sector Operations.³ It assessed the investment program and project according

¹ ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility and Administration of Loan to Kazakhstan for the CAREC Transport Corridor 1 (Zhambyl Oblast Section) [Western Europe–Western People's Republic of China International Transit Corridor] Investment Program*. Manila.

² ADB. 2011. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to Kazakhstan for the Central Asia Regional Economic Cooperation Corridor 1 (Taraz Bypass) Project*. Manila.

³ ADB. 2016. *Guidelines for the Evaluation of Public Sector Operations*. Manila.

to their relevance, effectiveness, efficiency, and sustainability. In addition to the core evaluation criteria, it assessed the project's development impacts, and the performance of ADB and the borrower and executing agency. The PPER assessment was based on:

- (i) a desk review of ADB documents on the project, the sector, and the country; government strategies, development policies, and official socioeconomic indicators at the time of project appraisal; and related project documents from other development partners;
- (ii) discussions and interviews with ADB staff at ADB headquarters and the Kazakhstan resident mission; and
- (iii) an independent evaluation mission to the country that involved consultations with in-country stakeholders, staff from the executing agency, the implementing agency, and other stakeholders, and other multilateral development bank.

6. The evaluation mission was jointly conducted with staff members from the Operations Evaluation Department of IsDB since the portion of the project road segments (57.0 km) were funded by IsDB. The evaluation team collaborated on the mission preparation jointly with IsDB representatives. A site visit to the entire project corridor was also conducted jointly which included the road segments administered by ADB as well as IsDB. Data request was made jointly to the government stakeholders for the entire program segment, but each institution's evaluation focused on the program segments that were implement by the institution with the project performance evaluation report being prepared separately. The joint mission was performed to better assess the program's contribution on the Zhambyl Oblast region considering the proximity of the project segments implemented by the two institutions and also use the opportunity to exchange knowledge between the two institutions in terms of evaluation approaches and methodologies.⁴

7. This evaluation was built on the initial findings and recommendations of the project completion reports (PCRs) and the subsequent validation by the Independent Evaluation Department (IED) of ADB. In the PCRs, ADB assessed the investment program and the additional project loan separately and rated both *successful*. The program was deemed *relevant, effective, efficient, and likely sustainable*. IED's validation generally concurs with these assessments.

8. This PPER was finalized by IED after considering the views of concerned ADB staff, the Government of Kazakhstan, and a peer reviewer.

B. Expected Impact, Outcome, and Outputs

9. The expected impact of the investment program was a contribution to sustainable economic development and the expected outcome was development of an efficient transport system in the southern and western region of Kazakhstan and an improved capacity at the transport sector institutions. The investment program was split into several projects and reconstructed existing roads and built new ones.

10. Under the MFF, the three tranches initially approved during the appraisal phase were as follows: (i) tranche 1 for \$340 million (Loan 2503), approved on 30 December 2008; (ii) tranche 2 for \$187 million (Loan 2562), approved on 7 October 2009; and (iii) tranche 3 for \$173 million (Loan 2697), approved on 15 November 2010. Cofinancing of \$68 million (Cofinancing 8251) from JICA was approved on 31 May 2010. Tranche 4 for \$112 million (Loan 2735) was approved on 21 February 2011 through the loan

⁴ IED and IsDB's Operations Evaluation Department conducted an evaluation mission to Kazakhstan from 29 July to 2 August 2019 for the performance evaluation of the CAREC Transport Corridor 1—Zhambyl Oblast Section (Loans 2503, 2562, 2697 and Cofinancing 8251, and 2735) and the Taraz Bypass Project (Loan 2824). The evaluation mission from ADB comprised S. S. Shin, Senior Evaluation Specialist/Mission Leader; C. J. Mongcopa, Associate Evaluation Officer; and C. M. Melhuish, international consultant. Representatives from IsDB's Operations Evaluation Department comprised A. Gaye, Division Manager/Mission Leader; O. Ceylan, Senior Evaluation Specialist; A. Oduncu, Senior Economist; and R. Sabirova, international consultant.

proceeds that were saved from tranche 1. The Taraz Bypass Project (Loan 2824) for \$95 million was approved as a separate loan on 7 December 2011 (para. 2).

11. The investment program aimed to develop an efficient transport system in Kazakhstan's Zhambyl Oblast enabling higher average traffic volume, shorter travel times, lower freight costs, and lower road accident rates. It was anticipated that improvements in road efficiency and safety would in turn boost international trade and regional cooperation, contributing to sustainable economic development. The program design and monitoring framework (DMF) is in Appendix 1.

12. **Outputs.** The investment program built or improved 427.6 km of roads in Zhambyl Oblast through four tranches, labeled projects 1–4. The projects making up the program generally reconstructed existing sections of highway to four-lane divided carriageway standard, typically with a concrete pavement, although a few sections had an asphalt pavement. Under a separate stand-alone loan from ADB, the Taraz Bypass (a further 65 km) was constructed, increasing the total built or improved to 492.6 km. The Taraz Bypass project is project 5 below. The components evaluated for these five projects and their associated outputs were as follows:

- (i) **Project 1.** Physical outputs included the reconstruction of 125 km of highway between kilometer markers 404 and 483 (Kulan–Taraz, 79 km, upgraded from two lanes to four lanes of cement pavement) and kilometer marker 214–260 (Blagoveschenka–Korday, 46 km, reconstructed as two-lanes of asphalt pavement). Non-physical outputs included preparing reports on improving the road operation and maintenance system and developing an intelligent transport system (ITS).
- (ii) **Project 2.** Roadworks included reconstruction of 135.9 km of highway between kilometer markers 310.5 and 389.4 (Kulan–Blagoveschenka, 78.9 km, upgraded from two lanes to four lanes cement pavement) and between kilometer markers 536 and 593 (Taraz–Zhambyl Oblast border, 57 km, upgraded from two lanes to four lanes cement pavement). IsDB financed and administered the reconstruction of the 57 km section between kilometer markers 536 and 593 under a parallel cofinancing arrangement, while ADB financed the 78.9 km from Kulan to Blagoveschenka. Project 2 outputs also included the construction of four road maintenance depots in Otar, Merke, Akyrtoobe, and Korday.
- (iii) **Project 3.** Outputs included 117.7 km of highway that were newly constructed or upgraded between kilometer markers 162 and 260 (Otar–Blagoveschenka, 80 km, a new road constructed, of which 69.5 km was two-lane cement pavement and 10.5 km two-lane crushed stone mastic asphalt pavement), between kilometer markers 0 and 17.7 (Korday–Kyrgyzstan border at Karasu, 17.7 km, a new road constructed, of which 7.4 km was two-lane crushed stone mastic asphalt pavement and 10.3 km was reconstructed two-lane crushed stone mastic asphalt pavement to improve the existing road) and between kilometer markers 383 and 404 (Kulan Bypass, 20 km, of which 14.8 km was a new bypass road with four-lane cement pavement and 5.2 km was an upgrading of the existing road from a two-lane to a four-lane cement pavement). JICA cofinanced the Kulan Bypass work.
- (iv) **Project 4.** Outputs involved the widening of a 49-km road section between kilometer markers 261.5 and 310.5 (Blagoveschenka–Aspara, upgrading from two lanes to four lanes of cement pavement). This was the part of the original 114 km IsDB section that was not implemented. Since it was crucial to complete the entire 427.6 km of the program corridor, ADB complied with the government's request and funded the project.
- (v) **Project 5.** Outputs under the Taraz Bypass Project (Loan 2824) included an upgrading of the section between kilometer markers 483.3 and 491.0 (7.7 km road, upgraded from two lanes of asphalt pavement to four lanes of cement pavement) and a new road between kilometer marker 491.0 and 536 of bypass road section (56.7 km, new two lanes of asphalt pavement) which bypasses Taraz City.

CHAPTER 2

Design and Implementation

13. This chapter provides information on the program design, rationale, formulation, and resource assumptions. It also describes the implementation arrangements.

A. Rationale

14. Kazakhstan has a low density of population scattered across the country, so there is a high dependency on the transport system. Roads are a key element, providing accessibility and mobility for people and goods. However, much of the road network requires rehabilitation and maintenance.

15. The investment program aimed to help Kazakhstan achieve sustainable economic growth and was designed to be consistent with the government's road investment for CAREC Transport Corridor 1 as defined in its medium-term Road Development Program, 2006–2012, part of the government's overall transport strategy for 2006–2015.⁵ The program was also consistent with ADB's Strategy 2020, which identified transport infrastructure as a core area of ADB operations and with ADB's CAREC program, which emphasized regional cooperation. The program supported the road development program by reconstructing existing sections of highway to a standard four-lane divided carriageway, typically with a concrete pavement, or to a two-lane section road with asphalt pavement, as well as constructing new roadway sections.

16. An MFF was proposed as the modality for the investment program for five reasons: (i) the MFF format provides flexibility to the government; (ii) financing could be linked to technical, safeguard, legal, and other project readiness filters; (iii) an MFF would allow ADB to enter into a medium-term partnership with the government and its cofinancing partners; (iv) the individual contract packages were large and limited in number; and (v) all the conditions precedent for the use of an MFF were in place.⁶

B. Time, Cost, Financing, and Implementation Arrangements

17. The Ministry of Transport and Communications (MOTC) was the executing agency of the project at appraisal and the Committee of Roads (COR) under MOTC was the implementing agency. MOTC was responsible for overall implementation and a project director was appointed. A project management consultant was financed under tranche 1, with responsibility for the investment program. The World Bank's South West Corridor Development Program loan was intended to coordinate all the activities funded by international financial institutions (IFIs) involved in the corridor investment and to provide support for safeguard compliance, legal, and financial management.⁷ ADB's project management consultant introduced a management information system to manage the investment program. On 6 August 2014, the government established the Ministry of Investment and Development (MID), which absorbed MOTC's functions. COR remained the implementing agency and its deputy chairman was appointed project director, with assistance from COR staff with expertise in engineering, finance, legal matters, and procurement. The Zhambyl Oblast Road Department represented COR in the field sites to

⁵ ADB. 2017. *Completion Report: CAREC Transport Corridor I (Zhambyl Oblast Section) [Western Europe–Western People's Republic of China International Transit Corridor] Investment Program in Kazakhstan*. Manila.

⁶ IED. 2018. *Validation Report: Kazakhstan: MFF-CAREC Corridor 1 (Zhambyl Oblast Section) Investment Program*. Manila: ADB.

⁷ World Bank. 2011. *Kazakhstan - South West Road Project: Western Europe - Western China International Transit Corridor (CAREC-1b & 6b)*. Washington, DC.

ensure smooth program implementation. The *zhol* (road) laboratory carried out laboratory tests related to road construction. The project management consultant engaged under project 1 also managed the succeeding projects. The construction supervision consultant administered contracts and supervised the projects' progress, quality, and timeliness.

18. The KazAvtoZhol joint-stock company (JSC), established in February 2013 as the national road operator, provided technical support to COR and was responsible to the COR chairman. In 2014, its role was limited to monitoring safeguard compliance, and the *zhol* laboratory was appointed COR's representative in the field. In October 2015, the amended law on the national road operator declared KazAvtoZhol JSC the sole operator for the (i) repair and maintenance of national highways, as well as project management; and (ii) development of road infrastructure.

19. The framework financing agreement and loan covenants were all complied with and no facility-level undertakings or loan covenants were modified, suspended, or waived. Including procurement and consultant recruitment activities, the facility was approved in December 2008 and the final tranche of the facility loan 2735 was approved on 27 April 2015. Loan 8251 (cofinancing) was closed on 15 July 2020. Project 1 was estimated at appraisal to cost \$400.0 million equivalent. As indicated in the periodic financing requests, the expected cost of project 2 was \$415.0 million, The cost of project 3 was \$281.0 million, and of project 4 \$130.8 million. At completion, the facility cost was \$1.1 billion. ADB provided a total loan amount of \$700.0 million to finance the facility for projects 1 through 4.

20. Due to financial charge issues, IsDB withdrew from its earlier commitment to finance an additional 114.0 km of road amounting to \$244 million. JICA also reduced its initial commitment by \$82 million to about \$68 million equivalent (¥6,361 million) and the government reduced its commitment by \$58 million. At completion, the facility cost was \$1.1 billion, 2.6% less than the revised appraisal estimate.⁸ The details of ADB, counterpart, and cofinancing loan amounts are summarized in the Basic Data section at the beginning of this report.

C. Procurement, Construction, Consultants, and Scheduling

21. The program completion report (PCR) for the investment program reported that the contract packages for all projects were procured as planned at appraisal. Based on the advance contracting arrangements, the procurement process was initiated before ADB approved projects 2 and 3. The bidding documents were principally based on the detailed design.

22. All consultants financed by the ADB loans were recruited following ADB Guidelines on the Use of Consultants and the projects' procurement plans. ADB's quality and cost-based selection method was used, with the standard quality–cost ratio of 80:20, and full technical proposals. Seven consulting firms were engaged during the program period, one for project management, four for construction supervision (one for each project), one for road maintenance system improvement, and one for ITS development.

23. Overall, procurement under the program was undertaken in a timely manner. Procurement of works for the ADB- and JICA-financed road sections followed ADB guidelines. Works contracts over \$3 million were procured using international competitive bidding from a list of pre-qualified bidders for project 1 and post-qualified bidders for the subsequent projects. National competitive bidding was adopted for works in the road maintenance depots with contracts not exceeding \$3 million. ADB and

⁸ ADB provided \$677.6 million, IsDB provided \$170.0 million, JICA \$68.3 million, and the government the remaining \$151.2 million. Interest during construction was not included in the facility costs. ADB collected directly from the government and, as of 17 April 2017, the payments amounted to \$2.5 million for commitment charges and \$19.4 million for interest charges. JICA also billed the government directly for commitment and interest charges. During implementation, loan proceeds of \$115.1 million were cancelled from tranche 1, which reduced the loan amount to \$225.0 million. Savings resulted from lower than expected bid prices for civil works contracts and overestimation of contingencies at appraisal. Loan savings were used to finance tranche 4.

MOTC reviewed the procurement procedures for national competitive bidding to ensure consistency with ADB requirements. Due to MOTC's misinterpretation of ADB's Procurement Guidelines, the project 1 civil works contracts had to be rebid. The contracts incorporated relevant sections of ADB's Anticorruption Policy (1998, as amended to date) and Safeguard Policy Statement (2009), as well as road safety features.

24. On the performance of consultants and contractors, the PCR noted frequent replacements of staff, delays in reporting, and a lack of sufficient backstopping, resulting in project disruption. Overall, consultants carried out the key tasks indicated in the terms of reference. All roadworks contractors fulfilled the obligations under their respective contracts and completed the roadworks following the original engineering designs with technical variations. They constructed quality roads with an international roughness index (IRI) below 3 meters per km, implemented the environmental mitigation measures, and effectively implemented traffic safety management plans and campsite safety measures.

D. Environment and Social Safeguard Arrangements

25. Environmental impact assessments for the projects were prepared in accordance with ADB's Environment Policy (2002) for the initial project, the Safeguard Policy Statement (2009) for subsequent projects, the country's environmental laws and regulations, and the environmental assessment and review framework. For each project, public consultations were held during the processing stage. Of the four projects under the MFF, projects 1 and 4 were category B and projects 2 and 3 and the Taraz Bypass project were category A. Environmental management plans (EMPs), initial environmental examinations, and environment impact assessments for all projects were incorporated into contract documents for monitoring and implementing environmental impact mitigation activities. According to the EMPs prepared for the MFF's four tranches, the overall budget for environmental and mitigation costs was about \$5 million, including restoration of all borrow pits. All contractors prepared and implemented site-specific EMPs. However, the government program on tree replanting remains pending. The PCR noted that MID will launch an overall program on tree replanting in 2017 along the entire corridor (including those sections financed by other organizations and the government) once the entire corridor is completed. During the mission, representatives from the Zhambyl Oblast branch of Kazavtozhol, the national highways operator, indicated that reforestation work, including plans to plant over 2,000 trees along the project corridor, had been planned but that the exact timing would be determined by the headquarters office in Nur-Sultan.

26. During implementation of civil works as part of project 1, some residents raised complaints about noise, dust, and vibration as well as unregulated use of quarries. These issues were mainly due to the contractor's and construction supervision consultants' initially insufficient resources to implement and monitor EMPs. This was rectified after MID increased the resources for project management. It also strengthened the capacity of the construction supervision consultants to manage environmental safeguards. The PCR reported that, by project completion, all issues had been resolved, and the contractors had recultivated the borrow pits and quarries.

27. Under project 2, one issue related to land acquisition and resettlement was reported to be pending resolution after completion of the MFF program. The government representatives met during the evaluation mission reported that the matter had been resolved. The affected person lost his roadside business revenue due to the realignment of the main road at Merke village. The PCR noted previous efforts to address this issue. Beginning in 2013, COR and the Merke local administration (the *akimat*) proposed different options to compensate the owner for the losses, including a land swap, but the owner did not accept any of them. In April 2016, with ADB facilitation, a decision was reached among the owner, the *akimat*, and COR that the affected person would complete an independent valuation of his losses and property, the *akimat* would issue a resolution for acquisition of land and compensation of losses, and COR would allocate government funds for compensation.

28. All projects were classified as category C for indigenous people, as they did not affect any people falling under ADB's definition of such groups.

E. Loan Covenants, Monitoring, and Reporting Arrangements

29. The PCR indicated that the framework financing agreement and loan covenants were all complied with and that no facility-level undertakings or loan covenants were modified, suspended, or waived. Appendix 2 contains a summary of compliance with loan covenants.

CHAPTER 3

Performance Assessment

30. The evaluation criteria focused on the project's performance and development results. IED's guidelines identify four core criteria: (i) the relevance of the project to the government's and ADB's development strategies and the relevance of the design to project objectives, (ii) the effectiveness of project outputs and outcome, (iii) the efficiency of the project's utilization of resources, and (iv) the sustainability of the project outputs and outcomes. Non-core assessments were undertaken on the project's development impact and the performance of ADB and the borrower and executing agency.

A. Relevance

31. Kazakhstan is strategically placed and has traditionally played an important role in linking the People's Republic of China (PRC) to the east with Central Asian countries to the south and west. The proposed investment was influenced by the country's Road Development Plan, approved in 2006, which envisaged the physical construction and reconstruction of 7,205 km of republican (national) roads; major and minor repairs of another 18,460 km; and the construction, reconstruction, and repair of about 18,089 km of local roads.⁹ The main focus of the Road Development Plan was to provide the primary international transit corridors and to improve the quality of the arterial network that linked the major cities and population centers of Kazakhstan. Within the plan, the improvement of the western Europe–western PRC corridor, of which the Zhambyl Oblast section formed a part, was the highest priority. The Road Development Plan also incorporated a nonphysical component that covered a range of institutional policy reforms and capacity development aimed at improving sector planning, strengthening governance, and involving the private sector.

32. The assessment of the key problems and opportunities of the road sector at the time of program preparation were clearly set out in the report and recommendation of the President (RRP) and identified three broad categories of issues related to: (i) the road network, including its coverage, quality, and accessibility; (ii) road sector institutions; and (iii) the quantity of funding available for investment. A primary focus was addressing issues with the republican, rural, and urban road networks, which were in general poor condition and required substantial repairs. The intention was to improve the quality of the republican road and rural road networks (from 62% of republican roads and 51% of local roads in good condition in 2006 to 86% and 70% by 2013, respectively) and to increase the length of paved republican roads (at the time of the RRP only 40% were asphalt-surfaced). Access to the network was poor and parts were impassable during winter months. Regarding road sector institutions, the MOTC required further strengthening, particularly at the *oblast* level where greater technical experience and knowledge, outsourcing to the private sector, and higher skills in project management were all required. Skills in safeguard policies, road safety, and maintenance practices needed to be improved. Financing for the sector had been a perennial problem, with limited resources allocated for capital and maintenance works. While the government intended to obtain more external support for the capital works, additional allocations for maintenance were also planned. The government planned to introduce a road fund and to mobilize more private sector resources.

⁹ Ministry of Transport and Communications. 2006. *Road Development Program for 2006-2012*. Astana. The government road development plan for 2006–2012 has been revised as the Transport Sector Program for 2010–2014, which was approved in July 2010.

33. During the field visit, staff of Kazavtozhol in Zhambyl Oblast indicated that certain stretches of the corridor experienced limited accessibility during severe winter conditions. Following the improvements, the corridor is accessible year-round although severe snowstorms require the use of snow removal equipment and de-icing measures to keep the roads operational.

34. The investment was in line with ADB Strategy 2020¹⁰ with its primary focus on promoting sustainable economic growth and with the country partnership strategy for Kazakhstan,¹¹ which emphasized support for the transport sector. In parallel, ADB initiated a program to support CAREC efforts to encourage regional cooperation in the transport, energy, and trade facilitation sectors. One of the core goals of this program was to improve regional trade and transit corridors. The CAREC program had identified six transit corridors linking countries in the region, which were included in the CAREC Transport and Trade Facilitation Strategy endorsed by CAREC countries in 2007.¹² This strategy was updated in October 2013.¹³ The investment was a core segment of CAREC Corridor 1 linking western PRC with western Europe and was also an important component of the government's own strategy to promote its role in international trade and transit. The CAREC Transport Strategy 2030 was approved in January 2020.¹⁴ It continued the earlier approach to the road sector with regard to road asset management and road safety. Although there has been an improvement in roads and railways, the constraints at border crossings remain.

35. The MFF modality was used for a number of reasons (para. 16).¹⁵ While the overall large size and nature of the program fully met the MFF criteria and the program was appropriate from ADB's perspective, a representative from the Ministry of Finance (MOF) who was interviewed during the mission indicated that the MFF modality did not reduce processes within the government system, as internal procedures still had to be met. This was reflected in delays in meeting the dates of loan effectiveness of the various tranches.

36. The project design was adequate for achieving the intended physical outcomes and remained mostly unchanged between appraisal and completion. During implementation, only minor variations were made to improve user experience, including adding guardrails for road safety, sheltered bus stops, and underpasses for cattle and agricultural machinery. However, during the field visit, a farmer group noted that some cattle crossings were unusable during the winter periods as the ponding and freezing of water prevented both cattle and agricultural machinery from using the underpasses.

37. Overall, the design was considered appropriate and the use of a central barrier has provided significantly safer roads, evidenced by the reduction in road accidents since completion of construction. The design of junctions with adjoining crossroads prohibited direct left-turn movements. While this has increased trip distances for the traffic until the next U turn, it has resulted in safer junctions.

38. One feature of the road design was the use of cement concrete for the pavement.¹⁶ According to the PCR, Russian road design standards and policies were used and harmonized with the American Association of State Highway and Transportation Officials and British standards for concrete pavement in cold climates. It would have been better if the road design had included a monitoring component to assess the performance of the concrete pavement against asphalt pavements used elsewhere and to identify any issues and problems associated with the maintenance of the concrete slabs. Zhambyl Oblast

¹⁰ ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank, 2008-2020*. Manila.

¹¹ ADB. 2012. *Country Partnership Strategy for Kazakhstan 2012 To 2016*. Manila. There was no country strategy and program or country partnership strategy between 2006 and 2012 for Kazakhstan.

¹² Central Asia Regional Economic Cooperation. 2007. *CAREC Transport and Trade Facilitation Strategy*. Manila.

¹³ ADB. 2014. *CAREC Transport and Trade Facilitation Strategy 2020*. Manila. This was endorsed by all 10 CAREC countries at the 12th CAREC Ministerial Conference held in Astana, Kazakhstan in October 2013.

¹⁴ ADB. 2020. *CAREC Transport Strategy 2030*. Manila.

¹⁵ Footnote 1.

¹⁶ Information from discussions with Kazavtozhol staff in Zhambyl Oblast during site visit indicated that it was the first application in the country.

authorities indicated that they had had initial difficulties with maintaining the pavements, however, this was primarily due to difficulties with funding rather than with the remedial processes themselves. Nevertheless, they did express some issues related to concrete pavements being more susceptible to freezing weather conditions and generating black ice more easily than asphalt pavements.

39. Before the improvements to the corridor, the authorities were aware of the high incidence of truck overloading and resulting road damage. As a consequence, the program designed the pavement to withstand 13-ton single axle loads.¹⁷ As the corridor is the country's primary trade corridor and many international trucks use the route, the increase in the design standard was appropriate to preserve the pavement. Enforcement efforts have been strengthened as part of the institutional reforms and the incidence of overloading was reported to have been substantially reduced.¹⁸ At the time of the evaluation field visit, the road had been operating for almost 5 years and the quality appeared high with smooth surfaces and a limited number of spot failures. It appears that the pavement has not been adversely affected by overloading and is in good condition.

40. During implementation, the executing agency demonstrated strong ownership of the program by maintaining close supervision on a day-to-day basis. Kazakhstan's MOTC was the executing agency of the investment program at appraisal. On 6 August 2014, the government established MID, which absorbed MOTC's functions. COR remained the implementing agency. COR regularly monitored the progress of the contracts and visited the project site. Kazavtozhol at the Zhambyl Oblast supervised the consulting services and, following completion of construction, routine maintenance was conducted for the road to remain in a good condition.

41. The investment program included the physical component (road development) and non-physical component (road operation and maintenance). The RRP included two DMFs, one for the overall project corridor and the other for tranche 1.¹⁹ More comprehensive indicators were defined, especially for the non-physical components of the program in the DMF for the overall project corridor, but the PCR only reported on the DMFs for the tranches and did not assess the overall corridor DMF. Table A1.1 in the RRP for the overall project corridor should have been the DMF used in the PCR to evaluate the overall program's performance which was not the case. Also, several outcomes that had been identified in the RRP for the overall project corridor have not been reflected or have been revised in the PCR. Indicators for transport cost reductions and the road accident rate could have been more appropriate. In addition, the impact of the investment was primarily linked to the general economy on which the investment had relatively little effect, rather than to the direct impact of the road. It would have been better if the impact had been related to the road's role in supporting regional trade with the Kyrgyz Republic and Uzbekistan as well as international trade between the PRC, the Kyrgyz Republic, and Uzbekistan, since this uses the corridor for trade access and movement. The sustainability of the program would have been improved if the non-physical components had been spread throughout different tranches of the program, which is one of the benefits of the MFF modality. The original allocation for the non-physical components of the program appears small compared with the allocation for physical components. Given these limitations, the project design for the non-physical components of the programs could have been improved. The non-physical components included in the initial tranches of the program were support for an intelligent transport system (ITS), as defined in the PCR, and a review of road maintenance, particularly to explore the possibility of involving the private sector.

42. Overall, the assessment rates the program *relevant*. It focused on the country's primary artery linking the major urban areas of Almaty and Shymkent, including the intervening towns of Kulan, Merke, and Taraz and international links with the PRC, the Kyrgyz Republic, and Uzbekistan. The program was

¹⁷ The national legal limit is a 10-ton axle load. MID Minister Order No. 342 of 26 March 2015 on the permissible parameters of vehicles intended for movement on highways of the Republic of Kazakhstan.

¹⁸ This information was provided to the evaluation mission during the field visit, which included an automatic weigh-in-motion device located on the project road near the town of Merke.

¹⁹ Footnote 1.

consistent with the country's development strategy and plans for the transport sector and was also aligned with ADB's Strategy 2020, country partnership strategy for Kazakhstan, and the regional CAREC program. The program was well designed and used the MFF modality in an appropriate way. It was implemented largely on time, within budget, and incurred minimal variation in design to attain the program's intended outputs and objective.

B. Effectiveness

43. The use of the MFF provided flexibility and allowed the loan savings in tranche 1 to be used to support an additional tranche 4 to improve a 49-km stretch that was originally intended to be implemented through cofinancing. Following the withdrawal of IsDB, an additional loan was approved to implement the remaining works, consisting of the Taraz Bypass and a 7.7 km stretch of the corridor adjacent to Taraz. This enabled the total corridor length to be completed within the original time frame. The civil works were completed to a high standard and met the international road roughness index of 3 meters/km established for the project. The project applied a cement concrete road design and visual observation during the mission indicated that in general this was of a high quality. A few project segments experienced spot pavement failure as observed during the mission. The road operator Kazavtozhol indicated that the road provided a smooth surface and required minor routine maintenance to keep it in good condition although in winter it was prone to freezing at a faster rate than the asphalt pavement used on some adjoining roads.

44. Based on the DMF, developing an efficient transport network in Zhambyl Oblast would contribute to sustainable economic development. This was the envisaged outcome and it was to be measured through the following indicators: (i) increased average traffic volume to 7,000 vehicles per day in 2015 from 4,000 vehicles per day in 2007, (ii) reduced average travel time between Almaty and Shymkent to 8 hours in 2015 from 12 hours in 2007, (iii) reduced transport cost for freight to 5% of the cargo value from 10% in 2008, and (iv) reduced road accident rate to 0.1 fatality/km from 0.3 fatality/km in 2006.

45. Traffic volume has increased steadily along the corridor from an average of 4,575 vehicles per day in 2007 to 8,560 vehicles per day in 2019, an average annual increase of 5.4% (Table 1).²⁰ This growth rate is broadly in line with the estimates made at appraisal. However, this overall increase was affected by the slowdown in growth in recent years caused by the poor performance of the economy and the significant devaluation of the currency in late 2015.²¹ Since project completion in 2016, traffic growth has averaged only 2.5% per year on all road segments. The PCR adopted a growth scenario of 4% a year over the remainder of the evaluation period. The reduced growth along the corridor since 2016 may also be related to a general reduction in national and international trade as well as greater competition for long-distance travel between the PRC, Europe, and the Russian Federation from parallel investments in the railway corridor and the greater emphasis placed by the PRC provincial authorities on promoting the rail bridge to Europe as an alternative to sea routes.

²⁰ This evaluation used weighted average traffic volumes which were based on reported traffic flows obtained from Kazavtozhol and different from those reported in the PCR (4,000 vehicles per day in 2007 and 7,820 vehicles per day in 2016). Since the peak flow was in 2016 (7,745 vehicles per day) the average cannot be higher than this: the corrected average is 7,136 vehicles per day. These average values do not include traffic using the Taraz Bypass which was not included in the PCR for the MFF components.

²¹ GDP growth in 2015 was 1.2%; 2016, 1.1%; 2017, 4.1%; and 2018, 4.1%. The *Asian Development Outlook* reported GDP growth of 4.1% in 2018 and 4.5% in 2019 and forecast growth of 1.8% in 2020 and 3.6% in 2021. The corresponding GDP per capita growth was 2.8% in 2019, 3.1% in 2019, 0.4% in 2020 and 2.0% in 2021. ADB. 2020. *Asian Development Outlook*. Manila.

Table 1: Traffic in the CAREC Transport Corridor

Road ^a	Road Location	Project	Length (km)	Annual Average Daily Traffic				
				2007	2016	2017	2018	2019
162–260	Otar–Blagoveschenka	3	80.0	0	6,852	8,429	8,612	8,863
260–310	Blagoveschenka–Aspara	4	49.0	2,677	7,621	8,226	8,404	8,657
310–367	Aspara–Merke	2	57.0	3,525	7,621	8,226	8,404	8,657
367–389	Merke–Kulan	2	22.0	3,525	7,745	8,407	8,587	8,835
383–404	Kulan Bypass	3 (JICA)	20.0	0	7,745	8,407	8,587	8,835
404–483	Merke–Taraz	1	79.0	5,407	7,745	8,407	8,587	8,835
536–593	Taraz–Border	2 (IsDB)	57.0	5,799	6,167	7,980	8,155	8,390
483–536	Taraz Town Entry	5	7.7	...	5,500	5,910	6,045	6,231
	Taraz Bypass	5	56.7	0	2,750	2,952	3,019	3,112
214–260	Blagoveschenka–Korday	1	46.0	5,460	7,015	7,970	8,143	8,391
196–214	Karasu–Korday	3	17.7	0	4,945	5,618	5,740	5,915

^a Indicated by kilometer markers.

... = not available, IsDB = Islamic Development Bank, JICA = Japan International Cooperation Agency, km = kilometer.

Source: Government of Kazakhstan Committee of Roads.

46. The number of train services and the amount of freight on the PRC–Europe route has increased substantially since 2010. From 2010 to 2016, the number of trains increased from less than one per week to 33 per week with an increase in freight from 5,600 twenty-foot equivalent unit (TEU) per year to 100,000 TEU per year. The delivery time has been reduced from 12 to 15 days, with trains meeting timetables 99.7% of the time.²² Specialized rolling stock, such as refrigerated wagons, have been increasingly used and provincial and city authorities in the PRC subsidize one-way container rates. Plans published by the National Development and Reform Commission in the PRC suggest that the number of trains will triple by 2020 with container traffic reaching 500,000 TEU per year.²³ While the competition between road and railway is not direct (since the freight that is currently being encouraged to use the railway is likely to be new demand diverted from sea routes), the continued development of the rail corridor is expected to have some moderating impact on long-distance road freight volumes between the PRC, Europe, and the Russian Federation as well as for regional trade between the PRC, Kazakhstan, and Uzbekistan.

47. The road improvements have benefited all vehicle types. Based on 2019 data obtained from Kazavtozhol, passenger cars continue to dominate the traffic and comprise almost 75% of the flow, buses 8%, and trucks 17%. While the data are not consistent, it appears that the trend in trucks has been towards use of larger and heavier 5- and 6-axle vehicles as well as trucks with trailers. This trend is expected given that the road improvements facilitate larger and relatively cheaper road haulage.

48. A major outcome was anticipated to be a significant reduction in travel time for trips along the corridor with total trip time between Almaty and Shymkent anticipated to be reduced from an original 12 hours to 8 hours after project completion. The PCR verified that trip times had been shortened in line with expectations and the evaluation agrees with the PCR findings. Average speed generally exceeds 80 km–100 km per hour along the total length of the project road sections, and when the adjoining sections are complete a total end-to-end trip time of 8 hours will be possible. However, given the long distances and driver fatigue, a more regular time maybe 9 hours or more to allow for rest stops and refueling. In this respect, the authorities need to consider the provision of proper rest and refueling areas every 75 km–100 km to reduce driver fatigue.

49. Bypasses were implemented at several urban locations, including Blagoveschenka, Kulan, Merke, and Taraz. Although traffic data are not available for all locations, observations suggest that, for the

²² TEU is a standard measurement for a container measuring 20 feet in length.

²³ Eurasian Development Bank. 2018. *Belt and Road Transport Corridors: Barriers and Investments, Report No 50*, EDB Center for Integration Studies. Saint Petersburg.

smaller towns, the majority of through traffic uses the bypass. However, for Taraz, traffic data suggest that about one-third of the traffic uses the bypass, with the remainder entering the city either as a destination or as a rest stop, as depicted in Table 1. Given the lack of rest areas along the project segment, it is probable that the bulk of passenger vehicles enter the city as an interim stop or final destination while the heavy trucks use the bypass. Taraz is a major city with a population of 330,000 and therefore is a major source of trip generation and destination. Traffic using the bypass was more than 3,100 vehicles per day in 2019, of which approximately two-thirds consisted of private cars, the remainder being trucks and long-distance buses.

50. The project was expected to reduce road haulage costs by facilitating long hauls that could travel at consistent speeds, thereby reducing vehicle operating costs. The original indicator was an expected reduction in operating costs to 5% of cargo value from 10% in 2008. Given that the cargo value of a 30-ton container varies considerably depending on cargo type (with freight rates not set by cargo value but by truck capacity), a more relevant indicator would be the reduction in vehicle operating costs. The Highway Development and Management (HDM) vehicle operating cost model used in the project completion report stated that the cost savings for truck movements was significant, ranging from 14.9% for two-axle trucks to 24.7% for heavy articulated trucks. This demonstrated that the improved corridor significantly reduced road haulage costs and accelerated the trend from smaller to larger trucks, which are more efficient at transporting freight over long distances. While no data were available on changes in freight rates, the benefits to trucking companies were acknowledged during a meeting between the evaluation mission and representatives of the freight haulage organization, Kazlogistics, who indicated that the industry had benefited from lower operating costs following road improvements.²⁴ They also indicated that freight haulage in the project corridor was highly competitive. The shorter travel times and higher average speeds achieved through the project would most likely result in cost reductions for haulers.

51. Improving the road was also expected to reduce the accident rate on the existing alignment to 0.1 fatality per km from 0.3 in 2006. Accident statistics provided by Kazavtozhohol indicate there has been a significant drop in fatal accidents although the number of injuries has increased marginally over time. (Table 2).²⁵

Table 2: CAREC Corridor 1 Accident Data (Zhambyl Oblast)

Year	Fatalities	Injuries	Traffic Volume/km	Vehicle-km per Day	Vehicle-km per Fatality	Vehicle-km per Injury
2007	196	395	4,575	1,418,250	7,236	3,590
2016	58	412	7,136	3,207,992	55,310	7,786
2019	45	480	8,560	3,837,562	85,279	7,995

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

Source: Government of Kazakhstan Committee of Roads.

52. Discussions with the road authority indicated that the most significant change in the accident pattern has been the large reduction in head-on accidents, which have been almost eliminated due to the addition of a central concrete barrier separating traffic movements and the widening of the roadway to two lanes in each direction (Table 3). Vehicle collisions, run-off-the-road accidents, and hitting pedestrians remain the most significant causes of accidents. While the total number of incidents is variable, the statistics indicate a downward trend in the number of fatalities, from 196 in 2007 to 45 in 2019. While vehicle collision remains the main accident type, the severity of such accidents has been reduced significantly. Although traffic on the corridor has more than doubled since 2007, the fatality rate indicates that the road is almost 12 times safer than prior to the corridor improvement. The number of injuries has not reduced in the same way since many of the accidents are high-speed run-off-the-road incidents, which are probably attributable to drivers falling asleep at the wheel given the long distances typically travelled, coupled with the relatively high speeds that can now be achieved. However, despite a

²⁴ Mission meeting with representatives of Kazlogistics held in Nur-Sultan, 30 July 2019.

²⁵ It should be noted that the accident data provided by Kazavtozhohol may be subject to errors and omissions by the traffic police authorities and data are not location-specific. The analysis provides a broad indication of the trend in road accidents over time.

20% increase in the number of total injuries, the vehicle-km per injury has more than doubled from about 3,590 km per injury in 2006 to 7,995 km per injury in 2019. Overall, the improved corridor is substantially safer than the original road.

Table 3: Transport Corridor Accident Statistics, 2016 to 2018

Accident Type	No. of Accidents			Fatalities			Injuries		
	2016	2017	2018	2016	2017	2018	2016	2017	2018
Collision	81	137	113	28	26	19	213	344	280
Hitting cyclist	3	1	1	2	0	0	2	2	1
Pedestrian	23	34	22	14	18	11	13	35	18
Vehicle to vehicle	7	8	16	0	4	2	10	16	35
Animal	12	13	6	2	2	0	26	32	8
Obstacle	9	12	12	1	1	2	12	33	18
Others	3	1	7	0	0	0	10	2	17
Total	193	279	240	58	73	47	412	637	507

Source: Kazavtozhoh.

53. The original target of a 0.1 fatality per km by 2015 was not met as the 2016 figure was 0.13. However, by 2019 the target had been achieved, with the fatality rate down to 0.09. Measuring fatalities per km is not a common measure since it is relatively insensitive to small changes and does not take into account increases in traffic volume. Normally, accident impacts are either measured in terms of number of incidents per million vehicle km or number of vehicle km per incident since these measures take into account the volume of vehicle flows over time, enabling comparisons. It would be preferable if future DMFs select measurement targets that conform to international practice.

54. MID, the executing agency, and COR, the implementing agency, established appropriate organizational arrangements to oversee the program on a day-to-day basis. COR staff worked closely with Kazavtozhoh staff in Zhambyl Oblast to deliver the project, the components of which were generally delivered on time and were of a satisfactory quality. Kazavtozhoh has provided a number of rest areas along the corridor. These are primarily parking areas where drivers can rest. They have only basic toilets. There is a need to for modern rest areas with fueling and vehicle maintenance facilities, restaurants, and recreational areas where drivers can fully recover from long-distance driving. Such facilities are commonly provided in other countries and are usually supported by private sector investors. It is recommended that Kazavtozhoh should explore the development of rest areas along the corridor with the aim of locating one every 75 km–100 km.

55. The program had two outputs: (i) highway sections in Zhambyl Oblast reconstructed, and (ii) road operation and maintenance system improved. The outputs were to be measured through the following indicators: (i) 480 km of highway sections reconstructed on time, within budget, and meeting technical specifications with an international roughness index of less than 3 m/km (revised to 427.6 km in the facility administration manual in 2013), (ii) sustainable road operations and maintenance system prepared and pilot projects formulated, (iii) ITS strategy developed and an investment plan for ITS agreed for implementation under subsequent projects, (iv) recommendations for improving the road operation and maintenance system implemented.

56. The corridor improvements have resulted in a modern, well-designed highway system facilitating international transit and domestic travel. The program built or improved 427.6 km of roads in Zhambyl Oblast through four tranches under the MFF program. The projects making up the program generally comprised reconstruction of existing sections of highway to four-lane divided carriageway standard, typically with a concrete pavement, although a few sections had an asphalt pavement. The completion of the 65 km of Taraz Bypass section under a separate project increased the total road length to 492.6 km. Civil works were completed to a high standard and met the international road roughness index of 3 meters/km. The evaluation mission observed a generally high-quality cement concrete pavement and

structures and a project that was operating satisfactorily, although a few project segments experienced spot pavement failure and these were being repaired.

57. While the primary emphasis of the investment program was the improved corridor, the program's second output was an improved road operation and maintenance system. Tranche 1 included support for an intelligent transport system (ITS) and review of road maintenance, particularly with a view to involving the private sector. An assessment of the road operation and maintenance systems undertaken by the project offered several recommendations for future maintenance, including use of an automated asset management system and performance-based contracting and outsourcing to the private sector. However, the assessment noted that preparing an up-to-date inventory and database of the road network was not included as part of the program. The subsequent reorganization of the sector in 2014 and the creation of a road authority and separate road maintenance organizations delayed further discussions on these issues. Work on a road asset management system was subsequently incorporated under a parallel World Bank program and the system is currently expected to be operationalized in late 2020 or 2021. A pilot performance-based road maintenance contract has not yet been implemented. The reorganization of the institutional structure in 2014 and the economic downturn in 2015–2016 delayed the schedule for actions on road maintenance and further progress is awaiting the conclusions of a review of the road asset management system.

58. The ITS component of the program developed a draft plan indicating the system architecture and facilities required along the CAREC transport corridor, including the institutional arrangements, budgeting, and technical aspects of the hardware to be installed. The development of an ITS is important as the road network is extensive and covers vast distances between population centers. The electronic management and oversight of the network is the only viable way in which reasonable response times to occurring events such as road accidents or deteriorating weather conditions can be achieved. The COR indicated that the report provided important guidance for the State Program for Development and Integration of Transport System Infrastructure up to 2020, adopted by MOTC in November 2013. However, no details were available at the time of the evaluation mission regarding the actual implementation of the recommended ITS packages after the final report was endorsed. In December 2019, KazAvtoZhol signed a T25 billion (\$62 million) contract for the implementation of ITS and tolling of 11,000 km of the republican network over a 5-year period. Although the contract recently signed included the implementation of ITS for 45% (11,000 km) of the republican network, it is not clear whether the project corridor is included as part of this contract and if the generated toll revenue will be sufficient.

59. The program's physical outputs largely met the specifications. For the road component, the program completed the construction or upgrading of 492.7 km of roads, including the IsDB and JICA portions and the Taraz Bypass project which was funded as a separate loan. For the output performance targets, under tranche 1, a report on the operation and maintenance system provided recommendations for future operations, including an ITS to improve road safety and road operations through improved surveillance, better oversight of road operations, and information displays for drivers. As reported in the PCR, the ITS component produced a draft ITS plan and a draft long-term plan for ITS implementation. Under tranche 2, four road maintenance depots were planned to be located at Akyrtrrobe, Korday, Otar, and Merke. Of these, only that at Merke was completed under the project, while those at Akyrtrrobe and Korday were completed by the government in 2017. The Otar depot was deleted from the project scope and was to be included in a future roadworks package for the adjoining Otar to Almaty road section. The three completed depots are currently being used to maintain stretches of the corridor. These non-physical outputs were appreciated by the road authorities except for few non-physical project components that were partially met. The assessment of road maintenance identified the key requirements for addressing the road maintenance of the republican road network and the recommendations of the ITS report were used to prepare the medium-term plan for transport system infrastructure. Preparation of a road database and the adoption of a road management system are ongoing. Improving road maintenance is a core priority of the road sector and is expected to be the focus of ADB's next lending operation to the

sector. The MFF resources were used effectively to complete the CAREC Corridor 1 in Zhambyl Oblast largely as envisaged at appraisal. The loans were completed with only minor delays and within budget.

60. The program was successful in that it met its outcomes and most of the outputs. It achieved the outcome targets as set out in the DMF. The targets for traffic growth, journey time savings, vehicle operating cost savings and reductions in the road accident rate were all met. The improvements have reduced journey times, lowered road haulage costs and significantly increased road safety. Although some of the measurement indicators included in the DMF were non-standard indicators (including safety and haulage cost as a proportion of cargo value) the evaluation found that the intent of the indicators had been met with time savings that were in line with the estimate, road haulage costs reduced by up to 25% for heavy trucks, and significantly safer road conditions. The program's assessment of road maintenance and the recommendations of the ITS report were used to prepare the national medium-term plan for transport system infrastructure. Preparation of a road database and the adoption of a road management system are ongoing. Overall, the evaluation rates the corridor improvements *effective*.

C. Efficiency

61. The efficiency of the program was assessed from two standpoints. First the evaluation examined the use of the available resources. The five loans approved by ADB as well as the cofinanced loans from IsDB and JICA were all implemented in a timely manner with relatively small adjustments in implementation schedules and budgets. Second, the evaluation analyzed the efficiency of the processes. The program and project were well managed by the executing and implementing agencies with supportive timely actions by ADB supervision teams. During implementation, the second phase of IsDB, cofinancing, which was expected to cover 114 km of the corridor, did not materialize due to elements in the proposed lending terms that were not acceptable to the government. At the government's request ADB was able, at short notice, to cover part of the shortfall by approving a new tranche 4 using savings under the MFF to cover the 49 km. Since the commitment under the MFF had reached its ceiling of \$700 million, ADB approved an additional loan of \$95 million to complete the remaining 65 km sections of the Taraz Bypass. The timing and processing of these actions enabled the full corridor to be completed in line with the original time schedule.

62. The assessment of the economic efficiency of the project compared the economic benefits of the project at the time of appraisal with those at project completion, taking into account traffic growth since completion. The original assessment was based on a trade equilibrium model that projected growth in trade volumes between western Europe and western China as the principal regional trade corridor (CAREC Corridor 1). It also included other important trade routes with neighboring countries, including the Russian Federation and various Central Asian countries. The model also examined the intermodal competitiveness of road and railway for freight and passenger traffic. After estimating the expected road traffic, the HDM model was used to estimate the feasibility of the road segments of CAREC Corridor 1 linking Khorgos on the PRC border with Almaty via Shymkent and northwards to Aktobe then to the Russian Federation border.

63. The economic analysis was undertaken using the standard approach of comparing the "with" and without investment scenarios in the transport corridor. The baseline assumed that the existing road would be maintained to keep it in reasonably good operating condition through increased maintenance allocations over time as the infrastructure aged followed by periodic overlays. The analysis at the appraisal stage used HDM 4 as the analytical tool to predict average travel speeds, pavement roughness, road deterioration, and road agency costs to keep it suitably maintained, as well as road user costs comprising vehicle operating costs and passenger time savings. All costs were converted to economic costs using the world price numeraire and applied a standard conversion factor for non-tradeable goods. A similar approach was adopted in the PCR to re-estimate the economic internal rate of return (EIRR) at program completion.

64. The loan for the Taraz Bypass was a separate stand-alone facility. The RRP for this project indicates that the economic analysis for the original investment program was applied and updated. For the PCR, the economic analysis did not use HDM 4 but updated the economic analysis manually. This was an acceptable approach, but the analysis applied consumer surplus methodology to generated traffic.

65. Review of the economic analysis indicated that the main adjustments to be applied to the evaluation concern the analysis of the Taraz Bypass, which required adjustment to the economic costs and provision for valuing generated traffic as noted above and projections for the growth in traffic. For the investment program, the original forecasts at appraisal anticipated a growth in traffic of 4% a year between 2007 and 2012 and a rise to 6% a year for the remainder of the evaluation period to 2033. At the time of the PCR, actual traffic data was available for 2016, which showed that traffic growth had been substantially below the original forecast. Long-term projections for the economy suggesting a growth rate of 4% per year from 2018 onwards were also overambitious.

66. At the time of this evaluation, additional traffic counts were available for 2017–2019, and these showed that the slow growth in the economy had reduced growth in traffic to an average of 2.5% per year over the period. Given the relatively slow growth over the period and the prospects for continued growth at this level in the foreseeable future, the long-term growth in traffic is expected to be stable at around the current rate; a figure of 3%–4% annual growth was considered to be prudent. This figure also reflects the increased competition from long-distance railways, especially between western part of the PRC and western Europe, since railways have benefited from substantial investments in infrastructure, rolling stock, and logistics systems. The railway has also been promoted as a preferred transport mode for goods transport between key centers in the PRC and Europe, as well as the Russian Federation. Within the corridor, the railway link between Almaty, Khorgos, and Tashkent directly competes with corridor traffic for bulk commodities. The significant emphasis on railway development by both the PRC and Kazakhstan authorities is expected to affect the demand for long-distance road freight both in time and cost of haulage and is likely to have contributed to the decrease in traffic growth. Nevertheless, the project still had an acceptable EIRR.

67. The completed road corridor has significantly reduced the number of road accidents, particularly the number of fatalities. Although the number of injuries has risen, perhaps because of the higher vehicle speeds now attainable, the economic benefits of the road accident savings are considerable.²⁶ As noted earlier, the transport corridor is considerably safer than the original road and this has contributed positively to the economic returns of the investment.

68. The parameters used in the PCR evaluation were reasonable but, given the competition in long distance freight, the projections for road traffic are expected to remain well below expectations and PPER assumes traffic growth at 4% per year over the remainder of the evaluation period to 2033. The benefits from increased safety levels have been reflected in the economic analysis, especially over 2016–2018, when there was a significant reduction in fatalities and a slight increase in the number of injuries. The evaluation assumed that the average changes over this 3-year period would be maintained for the remainder of the evaluation period.²⁷ Although the increase in road safety has been significant, it had only a minor impact on the overall EIRR, increasing it from 21% to 22% for the investment program in the MFF corridor (Appendix 3). The project continues to be satisfactory from an economic efficiency perspective.

69. For the Taraz Bypass, the assessment reviewed the PCR findings in light of up-to-date traffic data provided by Kazavtozhol. Data for the period to 2019 indicated that the traffic using the 7.7 km road adjacent to Taraz town improved by the project was 30% lower than the figure used in the PCR analysis. The volume of traffic using the bypass was about the same as in 2016 but the growth of traffic was similar to that of the whole corridor (about 2.6% a year), and therefore lower than that estimated by the

²⁶ Accident costs were calculated in the same way as the PCR: \$412,800 for a fatality and \$51,600 for an injury incident.

²⁷ This implies an average fatality rate of 56 and injury rate of 509 persons per year.

PCR. In addition, the traffic data suggest that, while the growth in car and bus traffic is generally in line with the PCR estimates, the growth in trucks has been lower than forecast. Overall, this evaluation modified the traffic volume used in the PCR evaluation in two ways: first, a reduction in the benefits of 10% was made to reflect the generated traffic and, second, the growth of truck traffic was reduced to 4% per year, which is in line with both observed growth in recent years and overall growth in the corridor, as established in the MFF PCR. The evaluation therefore calculates an EIRR of 11.3% for the Taraz Bypass, lower than in the PCR estimate (Appendix 3). While this estimate is below the 12% discount rate used at appraisal it is above the minimum rate of 9% that ADB currently applies to infrastructure investments.

70. The evaluation estimated the EIRR for the overall investment in the CAREC Transport Corridor 1, combining the MFF supported project segments and Taraz Bypass. This economic re-evaluation is provided in Appendix 3 and indicates that the estimated combined EIRR is 21.5%, well above the minimum discount rate of 12% applied at the time of the appraisal. The evaluation therefore concludes that the overall project investments were *efficient*.

D. Sustainability

71. The road management company KazAvtoZhol JSC is responsible for the management of the republican road network, while the road maintenance works are conducted by Kazhavgodortrans. In the past, the deterioration of the national road network was largely attributable to poor maintenance during periods of economic stagnation when funding was limited. A chronic funding shortage for road maintenance was one of main issues identified by the review of road maintenance systems undertaken under the road operation and maintenance component of the project. The project roads have been designed to a high standard in cement concrete pavement and the quality of construction appears to have been high over much of its length, although in a few locations sub-base failures have occurred that required slab replacement. Nevertheless, the overall quality was good. The project roads were constructed in concrete, which at the time was thought to be more resilient to the large temperature ranges experienced in the region between extremely cold winters and hot summers as well as the large range throughout the day. While the permitted operational axle load is 10 tons, the road design used 13 tons and, as a result, the strength of the pavement is not expected to be adversely affected by loaded vehicles that meet regulatory requirements. An automatic traffic count and weigh-in-motion station is located on the project road in the vicinity of Merke and it was indicated by the KazAvtoZhol that the data gathered by the station are collected and automatically transferred through the telecommunications network to a central location of KazAvtoZhol in Nur-Sultan where analysis is undertaken. Enforcement of regulations is the responsibility of the traffic police and during the site visit patrol vehicles were observed at several locations along the corridor.

72. KazAvtoZhol representatives indicated that they had initially experienced some issues with repairing the concrete stretches that had failed because the scale of work required slab replacement. While the repair work was considered straightforward, it was difficult to secure funds because, under the current law in Kazakhstan, the government was not permitted to allocate funds for periodic repairs until 5 years had passed from the completion of construction. This regulation stems from the national requirement that all nationally funded projects have a 5-year defects liability period; in other words, during this time, all repair works are the responsibility of the contractor. However, under the subject project, the defects liability period was for 2 years and COR found it difficult to commit funds for periodic repairs that were not in line with government regulations. As a result, it initially took time to for COR to obtain the required authorization for funding periodic repairs. Given that the 5-year period has now passed, this issue will not prevent future funding maintenance allocation requirements. Despite these initial difficulties, the KazAvtoZhol representatives said that resources for the required repairs had been allocated and, in several locations, repairs had been completed. In others, ongoing works were observed during the field visit.

73. The government appears committed to improving road maintenance and to providing sufficient funding. To date, MID has allocated sufficient funding to maintain the program roads. Within Zhambyl Oblast, the budget allocations for repair and maintenance of the project roads as provided by Kazavtozhol doubled over 2015–2019, from T497 million in 2015 to over T1 billion in 2019. This represents an annual increase of about 19%. The planned national allocations for capital and maintenance works over 2020–2025 are given in Table 4. The planned allocations are anticipated to increase from T66,972 million in 2020 (\$173 million equivalent) to T100,801 million in 2025 (\$260 million equivalent). However, it is not clear whether the planned budget allocation will be sufficient for road maintenance of the project corridor, particularly considering the allocation is for the planned national allocations for capital and maintenance works.

Table 4: Planned Allocations for Repair of Republican Roads, 2020–2025

Indicators	Unit	Year					
		2020	2021	2022	2023	2024	2025
Capital repair	kilometer	49	66	245	100	115	125
Mid-term repair	kilometer	1,285	1,293	1,382	1,912	2,098	2,330
Financing							
Capital works	T (million)	27,932	27,517	32,490	38,179	44,403	49,375
Mid-term	T (million)	39,040	39,228	41,979	44,917	48,062	51,426

Source: Kazavtozhol Zhambyl Oblast.

74. COR appreciates that the funding allocations have been inadequate in the past. It is currently expecting to introduce a toll system on certain stretches of republican roads to raise funds for road maintenance. It is possible that the project corridor could be subject to this new toll system, but this is still under discussion. This means that funding would be dependent on the amount of traffic using the facility, but traffic volume may continue to fall short of the projected rate of increase. The growth in traffic volume from 2016 to 2019 was relatively steady and it seems possible this will continue. If it does, it will reduce toll revenues, meaning that the sustainability of the facility will not be assured even with the government's commitment to increase funding for the operation and maintenance of the facility. The state budget for road maintenance will probably still be needed to complement toll revenues although no detailed financial evaluation of road maintenance funding in Kazakhstan is available to enable the amount to be estimated. During discussions during the mission, the mission team suggested a maintenance levy on fuel might be an alternative approach to raising funds for maintenance. Such a levy would be significantly cheaper to implement as fuel is already taxed and thus there would be no additional costs associated with new infrastructure or revenue collection and, in addition, all road users would contribute to the maintenance of the road network.

75. Under the project, resources were allocated to support the future maintenance of the corridor. Under tranche 1, a report on the operation and maintenance system made recommendations for the future operations of the republican road network and on an ITS to improve road safety and road operations through improved surveillance. A road maintenance depot was located at Merke under the project. Road maintenance depots at Akyrtoobe and Korday were completed by the government in 2017. The three depots are currently being used to maintain stretches of the corridor.

76. To further strengthen road maintenance activities, COR, with assistance from the World Bank, is developing a road asset management system to cover the 23,500 km republican road network. Eventually this will be extended to local roads.²⁸ The system is to be managed by the National Center for the Quality of Road Assets, which was created in 2019 and charged with managing the primary road network assets. This center will be responsible for collecting the data required for the road asset management system and for undertaking analysis to provide annual and periodic road maintenance plans. The core of the road asset model uses HDM 4 to model pavement deterioration and to determine road maintenance

²⁸ G. Bonin, S. Polizzotti, G. Loprencipe, M. Folino, C. Oliviero Rossi and B.B Teltayev. Development of a Road Asset Management System in Kazakhstan. *Proceedings of the AiiT International Congress on Transport Infrastructure and Systems, Rome, Italy, 10–12 April 2017.*

needs under prescribed scenarios. The system is at an advanced stage of development and is based on well-known systems and architecture used for road asset management in other countries. If operated successfully, it should be able to optimize road user costs against maintenance costs and to determine the maintenance requirements of the network. The road asset management system will become a major component of the overall road planning and budgeting system and an important tool for future management of the road network.

77. Improvements in the road corridor have resulted in a marked improvement in road safety for all road users. The reduction in road deaths and reduced frequency of injuries indicate that the investment has resulted in more sustainable road infrastructure. This could be enhanced throughout the road network if the road authority allocated more resources to road safety auditing and greater efforts were devoted to policing enforcement of road user behavior.

78. While the initial scope of the investment program provided technical assistance to support road maintenance with additional efforts being pursued after the completion of this program to support sustainability of the physical investment, the full realization of these efforts was constrained by several factors. First, the development of the road asset management system was resourced by the World Bank. This program provided substantial assistance over several years and at the time of the evaluation mission the road asset management system was still under development. Second, as a result of the initial road maintenance assessment, it was intended to pilot test a performance-based road maintenance contract to ascertain the acceptability of the system and the use of the private sector to undertake such activity. This plan was derailed because of the reorganization of the ministry in 2014 under which the responsibilities for the road network and its maintenance were substantially changed. As a result, the anticipated steps to address road maintenance under the MFF did not progress as originally intended. These constraints resulted in limited achievements of the performance indicators per the targets as defined in the DMF for the period till 2014 for some of the related program outputs that could have further supported project sustainability. However, a road maintenance project remains a part of the ADB future lending program and the sector institutions remain interested in addressing this important issue.

79. Also, regarding the additional efforts are being made to improve the sustainability of the corridor, including the government's commitment to provide the necessary budget allocation and plans to implement road asset management systems throughout the corridor, most efforts are still in progress, with none actually being implemented or realized along the corridor. The implementation of the road operation and maintenance component was significantly delayed and only partially completed. The road asset management system is not yet functional, along with some of the earlier planned pilot projects. The subsequent phased projects related to ITS facilities as defined in the DMF have not been implemented till recently with the contract for the implementation of ITS systems and tolling of 11,000 kilometers of the Republican network which was signed in December 2019. However, it will still require to be implemented over a five-year period and it is not clear whether the contract will include the implementation of the project segments and if the toll revenue will be sufficient. Although the government adopted a plan for the development of the country's transport infrastructure that includes some of the program's recommendations on road maintenance, it has provided no evidence on the implementation of the plan, its target timelines, or resource commitments. Also specific to this project, there is still lack of clarity as to whether the subsequent efforts to ensure sustainability will eventually be materialized in directly supporting the sustainability of the project corridor. Taking all these factors into consideration, the MFF program is considered *less than likely sustainable*.

Other Assessments

A. Development Impacts

80. The completion of the road improvements under the MFF and the associated separate loan for the Taraz Bypass completed a continuous stretch of almost 500 km of CAREC Corridor 1. The investment program upgraded primary international transit corridors and linked the major Kazakhstan urban centers of Almaty in the east with Shymkent in the west. The remaining parts of the corridor covering Almaty to Otar in the east, from the Zhambyl boundary to Shymkent in the west, and from Shymkent south to Uzbekistan and north to Aktobe and the border with the Russian Federation are currently being upgraded, with work expected to be completed within the next few years. The total length of the CAREC Transport Corridor 1 is about 2,715 km, of which 2,237 km will be constructed and/or reconstructed. Once complete, the 2,237 km backbone corridor is expected to enhance the major international trade transit corridor through Kazakhstan linking to the PRC in the east, Europe in the west, and the Central Asian countries of the Kyrgyz Republic and Uzbekistan to the south and west, respectively.

81. The program was expected to contribute towards a high economic growth rate in the Kazakhstan economy and to support greater volumes of exports and imports. This has not been achieved. Gross domestic product (GDP) growth has been substantially below initial forecasts and both exports and imports declined over the period to 2020. At appraisal, growth in the economy, as measured by GDP, was expected to grow by 68% by 2020. Despite a good economic performance in the first half of the decade, substantially slower progress in the second half resulted in overall growth of 47% over the decade.²⁹ The investment program was also expected to lead to an increase in export and import trade growth by 30% over the decade for both imports and exports. After initial sharp increases in the value of exports in 2011, which continued to 2014, the succeeding 2 years witnessed a sharp drop and, although exports are trending upwards, the 2018 value is only marginally higher than the baseline figure for 2010. Imports followed a similar trend and decreased sharply in 2015 and 2016. Overall, the anticipated impact on exports and imports is unlikely to be attained by 2020 when the figures for the two remaining years are finally released.³⁰ There was also a discrepancy in the indicator applied: while three detailed performance targets were defined in the RRP, there were only two in the PCR (those discussed above).

82. The decline in economic conditions was not directly attributable to the project or the corridor, neither of which was strongly linked with overall economic growth or growth in imports and exports. The main influences on the economy were the performance of the oil and gas sector, minerals, and agriculture, particularly the production of wheat. These products are Kazakhstan's main exports but oil and gas use pipelines while minerals and bulk agriculture are primarily transported by railway rather than via the road corridor. It would have been preferable if the indicators for the program had focused on the expected impact of the corridor on trade with the neighboring countries of the Kyrgyz Republic and Uzbekistan, as well as on the international trade between the PRC, the Kyrgyz Republic, and Uzbekistan. As the road is a major CAREC corridor, it has a greater impact on regional trade than on the Kazakhstan economy as a whole.

²⁹ For annual GDP growth, see footnote 21.

³⁰ The value of exports and imports used in this assessment are those reported by ADB in ADB. 2019. *Key Indicators for the Asia Pacific 2019*. Manila.

83. Although origin–destination surveys are not available, the corridor is used for domestic and international trade. It is an important trade route serving the towns along the route and the adjacent countries of the Kyrgyz Republic and Uzbekistan. The respective capitals of Bishkek and Tashkent are large cities, and, together with the populations in their hinterlands, are major consumer markets for goods and services that are provided through the road corridor. The CAREC Corridor 1 links directly to the border crossing points with the Kyrgyz Republic at Korday and Karasu and efforts continue to be made to ease the constraints associated with border crossing processes and procedures. With the ratification of the CIS Free Trade Agreement by Kazakhstan (2012), Uzbekistan (2013), and the Kyrgyz Republic (2014), a timely boost to inter-country trade was provided as cross-border requirements were reduced, facilitating trade. The Kazakhstan and Kyrgyz Republic governments continue to pursue the vision of an Almaty–Bishkek economic corridor, which is focused on the initial stretch of the CAREC Corridor. Both the Kyrgyz Republic and Uzbekistan have the PRC as their largest trading partner and some of the bilateral trade between them passes through the CAREC Corridor 1. The PCR for the investment program indicated that the improved roads were stimulating trade between Kazakhstan and its neighbors, but the evidence for this was inconsistent. Cargo volume at the Karasu border crossing increased from 0.4 million tons in 2010 to 1.7 million tons in 2014 but then fell to 0.9 million tons in 2015. More recent statistics were not available. The opportunity to measure these impacts should have been a focus of the investment program.

84. Without appropriate outcome indicators such as international trade volumes at the cross-border facilities, it is difficult to accurately assess the development impact of the corridor. The traffic using the transport corridor over the next 15 years is projected be below initial forecasts as the Kazakhstan economy has slowed. Since the traffic volume may not meet the projected rate of increase, with lower composition and less growth in trucks traffic than forecasted that serves the international trade volume, it is difficult to conclude that the investment had a satisfactory development impact. There is also insufficient evidence to conclude that the program investment will provide major support to the regional economy or to international and domestic trade. The evaluation regards the development impact of the corridor investment to be *less than satisfactory*.

B. ADB Performance

85. The evaluation's review of program records revealed that there was a good interchange of information during implementation between staff at ADB headquarters and those in the Kazakhstan resident mission. Issues were handled promptly and resolved satisfactorily. Within headquarters, the responsible project officer was changed almost annually, but resident mission staff remained settled over the period. Despite the regular changes in staffing responsibilities, the preparation of the individual tranches and their administration was conducted diligently and efficiently. The ADB team also collaborated well with clients in MOF, MID, and COR by responding to requests promptly and providing support when required. This included the reallocation of loan proceeds when it was requested, expediting a review of contract variations, promptly uploading loan withdrawal applications to accelerate disbursement, and taking timely action to extend loan closing dates when requested. Project supervision staff provided support for government staff on important implementation topics such as ADB guidelines on procurement, consultant recruitment, contract administration, disclosure, and disbursement.

86. Review missions during project implementation do not appear to have taken the opportunity to discuss important sector issues with the road sector authorities or to develop pathways to resolve them. However, project missions to review implementation in the field were mounted regularly in conjunction with Zhambyl Oblast COR officials. In addition to the inception mission in February 2009, a total of 12 project review missions were conducted for tranche 1, 13 missions for tranche 2, eight missions for tranche 3, and seven missions for tranche 4. These project reviews were augmented by several safeguard consultations under tranches 2, 3, and 4, as well as several special project administration missions on an as-needed basis. Overall, considerable effort was undertaken to ensure that implementation continued without disruption and this contributed to the timely completion of the individual tranches as well as the

generally good quality of the completed infrastructure. The frequency of project reviews also contributed to the smooth and effective working relationship with the client and coordination between all parties.

87. Similar efforts were made for the loan for the Taraz Bypass with six project review missions over the 3-year implementation period, one special project administration mission covering social safeguards, and a mid-term review. The frequency of mission visits also helped to facilitate efficient and effective implementation. The quick processing of the additional loan to cover the construction of the Taraz Bypass facilitated its timely construction and completion in a similar timeframe to the overall corridor.

88. ADB worked closely with the executing agency and established collaborative teamwork arrangements with the cofinancing partners JICA and IsDB. JICA officials joined the consultation mission in February 2010 to discuss the cofinancing arrangements of the JICA loan after which ADB was appointed the loan administrator for all aspects relating to the loan, including project appraisal, procurement, and disbursement review. Overall, the performance of ADB was *satisfactory*.

C. Borrower and Executing Agency Performance

89. The performance of the borrower, the Government of Kazakhstan, represented by MOF, MOTC (whose functions were later absorbed into MID) as the executing agency, and COR as the implementing agency, was assessed *satisfactory* by the PCR despite the lengthy internal government procedures to declare loans effective. The government reorganization carried out in August 2014, which changed the executing agency, did not affect project implementation as COR remained the implementing agency.

90. The evaluation notes that, during implementation, about one-third of the original loan proceeds of tranche 1 (\$115.05 million) was cancelled due to overestimates of civil works costs, consulting services contracts, and the contingency provision. This implies that the cost estimates at appraisal should have been assessed more accurately. However, COR implemented the program in accordance with ADB guidelines and policies, facilitated the timely release of counterpart funds, and complied with the loan covenants during implementation. COR implemented a financial management system and maintained separate records for ADB, as well as for the IsDB and JICA cofinanced loans, and provided annual audit reports on a timely basis. COR indicated to the evaluation team that its staff had benefited from the ADB experience and the exchange of information between staff, not only in areas of project management, but also in connection with the environmental and safeguard issues associated with road development. COR chaired the community liaison group that was created in March 2011 and was responsible for the grievance redress mechanism for all tranches, as well as those for the Taraz Bypass loan. The assessment concludes that the performance of the borrower and executing agency was *satisfactory*.

CHAPTER 5

Conclusions

A. Overall Assessment

91. Overall, the investment program for the CAREC Transport Corridor 1, including the separate loan for the Taraz Bypass component, is rated *successful*. It was *relevant, effective, efficient, and less than likely sustainable*. The preliminary assessment of impact was *less than satisfactory*. The performance of ADB and the borrower and executing agency was *satisfactory*. The evaluation noted some shortcomings in the program DMF: several indicators were inadequately specified or omitted from the PCR without explanation and project records did not indicate whether the overall program DMF was formerly changed. DMFs were also prepared for each individual tranche as well as the stand-alone loan for the Taraz Bypass.

92. While the overall impact of the corridor in terms of its contribution to national growth and imports and exports has not been met, this was primarily due to the macroeconomic environment rather than to the design of the road facility. It would have been preferable if the impact had been linked to trade volumes rather than to its contribution to national growth since the Almaty–Bishkek–Shymkent–Tashkent corridor is a well-known trade route. In terms of outcomes, the investment has met key target indicators covering traffic growth, time savings, reduced transport costs, and increased safety.³¹ Table 5 summarizes the assessment of the investment program.

Table 5: Overall Assessment of Project Performance

Evaluation Criteria	Project Completion Report Assessment	Project Performance Evaluation Report Assessment	Key Reasons for Disagreements and Comments
Relevance	Relevant	Relevant	
Effectiveness	Effective	Effective	
Efficiency	Efficient	Efficient	
Sustainability	Likely sustainable	Less than likely sustainable	Although the government has adopted a plan for the development of the country's transport infrastructure that includes some of the program's recommendations on road maintenance, it has provided no evidence of the implementation of the plan, its target timelines or resource commitments. There are also several ongoing efforts, not directly related to this program being pursued to ensure sustainability of the physical investment. However, the current PPER assessment is focused during the evaluation period specific to this

³¹ These outcome indicators were established for each of the individual tranches. For the corridor as a whole, additional indicators were included covering (i) private sector participation framework operational, (ii) PPP for a pilot road transaction in place, (iii) safeguard implementation manual implemented, (iv) road maintenance system and funding improved, and (vi) ITS selectively implemented.

Evaluation Criteria	Project Completion Report Assessment	Project Performance Evaluation Report Assessment	Key Reasons for Disagreements and Comments
			program, and there is still lack of clarify if the subsequent efforts to ensure sustainability will eventually be materialized in directly supporting the sustainability of the project corridor.
Overall assessment	Successful	Successful	
Preliminary assessment of impact	Highly satisfactory	Less than likely satisfactory	This overall impact of the program has not been met as gross domestic product growth has been substantially below initial forecasts and both exports and imports declined from 2014 to 2020. The lack of information makes it difficult to ascertain the impact of the corridor. Overall, the macroeconomic performance indicators have not been met.
Performance of Asian Development Bank	Satisfactory	Satisfactory	
Performance of Borrower and Executing Agency	Satisfactory	Satisfactory	

Sources: Asian Development Bank.

93. The overall assessment also considered the findings from the project validation reports (PVRs) prepared for some of the tranches and projects related to this investment loan. The overall performance assessments are summarized in Appendix 4.

B. Issues

94. The evaluation identified three issues.

95. **Components to assess the operational performance of the cement concrete pavement in the project design were not included, limiting the opportunity to further enhance the maintenance needs of the pavement.** While concrete pavements are in widespread use in some other countries, there is limited experience of the technology in the Asia and Pacific region. The authorities maintaining the road indicated that it provided a smooth surface and required some routine maintenance to keep it in good condition but they also felt concrete pavements were more susceptible to freezing weather conditions than the asphalt pavements used on some adjoining roads. The program should have included a monitoring component to assess the performance of the concrete pavement against asphalt pavements used elsewhere. It should have identified any issues and problems associated with maintenance of the concrete slabs and incorporated international best practices for maintenance.

96. **Inadequate monitoring indicators and lack of reliable traffic data to measure the performance of the facility mean that there was an inadequate basis for monitoring the outcomes and impacts of projects.** The evaluation found that some indicators were not adequately specified and were inappropriate for an assessment of project performance. The management of road assets requires reliable traffic data to measure the performance of the road, but the data initially provided to the evaluation team from the implementing agency contained several errors.

97. **Insufficient policy dialogues with the executing agency during the implementation reduced usefulness of the MFF.** The MFF was premised on a well-developed investment plan covering the strategic requirements of the sector over the long term. However, the lack of regular policy dialogue with the executing agency during the implementation meant that the benefit of utilizing the MFF modality was not fully realized. While the investment loans proceeded largely as envisaged at appraisal and implementation was smooth, review missions during project implementation do not appear to have taken the opportunity to discuss important sector issues with the road sector authorities or to develop pathways to resolve them. At the time of project appraisal, securing road maintenance funding to ensure the sustainability of the road infrastructure was identified as a core issue. Although progress is being made, funding issues still constrain the sustainability of the road infrastructure. The non-physical components should have been reflected throughout different tranches of the program to yield the full benefit of utilizing an MFF modality.

C. Lessons

98. The evaluation identified three lessons.

99. **Innovative technologies need to be carefully assessed and monitored to determine their efficacy and sustainability.** As new technologies are made available through various projects, close monitoring of their application and performance and as well as best practices should be incorporated so they can contribute to the success of the program and projects. Accumulation of this knowledge and its proper dissemination within ADB will ensure that it can be applied to other projects in different locations.

100. **Well-designed road facilities and the systematic monitoring and collection of the traffic accident and volume data are critical for transport policy and for safe and sustainable transport over the long term.** Road investments alone cannot ensure that sustainability objectives are achieved; complementary measures are needed to offset the adverse impacts of infrastructure provision, but to support this, traffic accident and count data need to be accurately collected and monitored. Also, a properly designed roadway which is effective in reducing the frequency and severity of road accidents, such as the road built by this project, could be used by the road authority to adopt and implement a coherent national road safety policy and program. In this project, the provision of proper rest and refueling areas every 75 km–100 km would reduce driver fatigue and enhance the safety and sustainability of the road.

101. **The MFF is a useful modality for providing the substantial financing required for infrastructure through successive tranches, but frequent policy dialogue between ADB and the executing agency would support the strategic long-term requirements of the sector.** Implementation of the program demonstrated the flexibility and effectiveness of the MFF modality, for example when an additional tranche was approved to cover a section of the corridor that was originally not envisioned for ADB finance. ADB also demonstrated its flexibility when it agreed to cover the investment shortfall in the Taraz Bypass through an additional project loan. Additional value addition could have been achieved if frequent policy dialogue with the executing agency to assess the progress of the strategic requirements of the sector plan had taken place. This plan covered a range of institutional policy reforms and capacity development aimed at improving sector planning, strengthening governance, and involving the private sector.

D. Recommendations

102. The evaluation offers the following three recommendations for consideration.

103. **ADB should consider the applicability of new technologies such as intelligent transport systems, identify new maintenance practices to be incorporated into projects and monitor them to determine their efficacy and sustainability.** In ensuring the long-term sustainability of the project facility, it would be beneficial to monitor the performance of the new technologies being applied, such as ITS, and also identify new maintenance practices to implement remedial measures such as concrete pavement

practices that was applied to this project. When innovations or new technologies are incorporated in projects, the unique characteristics of each country should be considered.

104. **ADB should ensure that indicators and targets are properly specified in design and monitoring frameworks, baseline information is accurately incorporated into the initial project framework, and the information requirements are regularly monitored as part of project review missions.** Indicators must reflect the project and its conditions, and an appropriate baseline must be set prior to commencement of the project activities. In road projects, greater priority needs to be placed on ensuring that the traffic count data reflect usage of the road network. Such data must be carefully collected and checked to ensure that any errors and omissions are eliminated at source.

105. **ADB should carry out frequent policy dialogue with the executing agencies to better assess the progress of the strategic requirements of the sector plan during program and project implementation.** These requirements include identifying solutions to funding maintenance. Policy dialogue should be a regular part of project review missions. In the project evaluated here, such policy dialogue could have been used to review the progress in implementing Road Development Plan that underpinned the MFF.

Appendixes

APPENDIX 1: DESIGN AND MONITORING FRAMEWORK

Table A1.1: Design and Monitoring Framework for Loans 2503/2562/2697/8251/2735-KAZ: CAREC Transport Corridor 1 (Zhambyl Oblast Section)
[Western Europe–Western People's Republic of China International Transport Corridor]

Design Summary	Performance Targets and Indicators with Baselines	Achievements (Status at Completion) ^a		PPER Update	Assessment
		Projects 1–4	Remarks		
Impact^a Contribution to sustainable economic development	By 2020 Kazakhstan's GDP grew by 68% from 2010 Kazakhstan's export and import growth increased by 30% from 2010	GDP in Kazakhstan grew by approximately 26.1% from 2010 to 2016 Imports decreased 9.5% between 2010 and 2016 Exports decreased 28% between 2010 and 2016 (The PCR assessed the whole program.)	Government sustained policies conducive to trade expansion and economic growth and remains committed to enhanced policy reforms and regional integration. Increased overall economic efficiency after program completion, reflected in reduced travel time and deadweight losses caused by time delays, spoilage, and damage in road transport.	Not Achieved. Kazakhstan's GDP grew by 47% over the 2010 to 2020 decade. Over the 2010 to 2018 period imports were about 4.5% above 2010 levels. Exports in 2018 were marginally higher than those in 2010. While the figures for the final 2 years are still to be published, the trend suggests the targets will not be met.	It would have been preferable for the project impact to have been related to regional growth on the corridor rather than to national growth. The impact on regional trade should have been a key indicator.
Outcome^a Development of an efficient transport network in Zhambyl Oblast	By 2015 Increased average traffic volume to 7,000 vpd in 2015 from 4,000 vpd in 2007 Reduced average travel time between Almaty and Shymkent to 8 hours in 2015 from 12 hours in	Achieved The AADT ^b volume for all program roads grew substantially, reaching an average of approximately 7,820 vpd in 2016 from 4,000 vpd in 2007 Achieved Average travel time between Almaty and Shymkent reduced to 8	Increased availability and quality of transport services following improvements to investment program roads. Improved cross-border facilities and procedures at the border points between Kazakhstan and neighboring countries. COR continues constructing remaining sections of the corridor, at the same quality as those of the program.	Achieved Actual traffic has increased from 4,575 vehicles per km in 2007 to 8,560 vehicles per km in 2019. Achieved Average journey times for the route have been	Traffic volume has been recalculated in the PPER based on weighted average per km. The 7,820 vehicles per day in 2016 reported in the PCR, appears to be an error as the peak road links measured only 7,745 AADT. Actual journey time will be greater if rest and refueling stops are included.

Design Summary	Performance Targets and Indicators with Baselines	Achievements (Status at Completion) ^a		PPER Update	Assessment
		Projects 1–4	Remarks		
	<p>2007</p> <p>Reduced transport cost for freight to 5% of the cargo value from 10% in 2008</p> <p>Reduced road accident rate to 0.1 fatality/km from 0.3 fatality/km in 2006</p>	<p>hours in 2015 from 12 hours in 2007</p> <p>Achieved VOC savings per kilometer for freight vehicles^d were 14.9% (2-axle truck), 21.18% (3-axle truck), 24.76% (articulated truck), 15.81% (pickup) in 2016 compared to 2008</p> <p>Achieved The road accident rate was reduced to 0.253 fatality/km in 2016 compared with 0.3 fatality/km in 2006 assumed at appraisal for four-lane roads in Zhambyl Oblast</p>	<p>Government of Kazakhstan committed to provide adequate financial resources for road maintenance</p> <p>Adequate road safety measures</p> <p>Sufficient budget for investment</p> <p>Mitigating Measures Loan covenant ensured sufficient budget for investment and maintenance</p> <p>Road operation and maintenance component suggested appropriate funding system for road maintenance</p>	<p>reduced to 8 hours in 2019.</p> <p>Intent Achieved VOC savings for heavy trucks are estimated at about 25%.</p> <p>Achieved Road accident rate reduced to 0.09 fatality/per km.</p> <p>The road is almost 12 times safer than the original road (using an indicator based on traffic flow).</p>	<p>The original target was flawed as freight rates are affected not by value of cargo but by volume.</p> <p>The target indicator is not standard practice as it does not take increased traffic flow into account.</p> <p>The report and recommendation of the President included six additional indicators under the DMF for the “overall corridor development investment” that were not measured by the project completion report and for which no information was available for the PPER.</p>
<p>Outputs Highway sections in Zhambyl Oblast reconstructed</p>	<p>By 2014 480 km of highway sections reconstructed on time, within budget, and meeting technical specifications with IRI of less than 3 m/km (revised to 427.6 in the facility administration manual in 2013)</p>	<p>Achieved 427.6 km road sections were reconstructed through the MFF with an average IRI of less than 3 m/km</p>	<p>Timely provision of counterpart resources and support for the program</p> <p>Project management setup was effective for externally funded projects</p> <p>Mitigating Measures Project management consultant teams were recruited</p>	<p>Achieved A total of 492.1 km was improved (including the Taraz Bypass), all with an IRI of less than 3m/km at completion.</p>	

Design Summary	Performance Targets and Indicators with Baselines	Achievements (Status at Completion) ^a		PPER Update	Assessment
		Projects 1–4	Remarks		
			Anticorruption and financial management action plans were followed		
Road operation and maintenance (O&M) system improved	<p>Sustainable road O&M system prepared and pilot projects formulated</p> <p>ITS strategy developed.</p> <p>Investment plan for ITS agreed for implementation under subsequent projects</p>	<p>Achieved</p> <p>The report on the road O&M system provided various recommendations for future road sector maintenance operations. The ITS component produced (i) a draft ITS plan showing the system's architecture and installation locations along CAREC Corridor 1 in the Zhambyl Oblast; and (ii) a draft long-term plan for ITS implementation that considered the institutional arrangements, budgeting, and technical aspects of hardware to be installed on roads.</p> <p>The above exercises provided critical input for the State Program for Development and Integration of Transport System Infrastructure up to 2020, adopted by the Ministry of Transport and Communication as a framework to implement a comprehensive road</p>	<p>Assumptions</p> <p>Government is committed to further reform of the road sector</p> <p>COR is committed to improving road O&M</p>	<p>Partially Achieved</p> <p>Government is still preparing a road asset management system which is expected to be implemented by 2021.</p> <p>Government appears committed to improving road O&M and to providing sufficient funding. To date MID has allocated sufficient funding to maintain the program roads. In addition, it has also increased the total funding for road maintenance. When the road asset management system is fully operational it will provide estimates of the resources required for road maintenance. At that time, it is expected that maintenance budgets will be increased to meet needs.</p> <p>Government is discussing the possible use of tolls to augment shortfall in maintenance expenditures</p>	<p>The PPER suggests this policy action be further assessed, since a fuel levy would be easy to implement and all road users would contribute on the basis of their road use. COR acknowledges that a toll system will not raise sufficient revenues to cover maintenance needs.</p>

Design Summary	Performance Targets and Indicators with Baselines	Achievements (Status at Completion) ^a		PPER Update	Assessment
		Projects 1–4	Remarks		
		asset management system over the country's road network.			

AADT = annual average daily traffic, ADB = Asian Development Bank, COR = Committee of Roads, GDP = gross domestic product, IRI = international roughness index, ITS = intelligent transport system, km = kilometer, m = meter, MFF = multitranchise financing facility, O&M = operation and maintenance, VOC = vehicle operating cost, vpd = vehicles per day.

^a Outcome statement and indicators are for the entire investment program. Achievements at completion refer to those of the project only.

^b Raw traffic count provided by COR through its letter of October 2016.

^d Since the data on the transport cost for freight are not available, VOC savings per kilometer for freight vehicles were calculated, comparing with- and without-project scenarios.

^e The 65 km of new and reconstructed Taraz Bypass road sections (financed through a separate loan) brought the total improved road length to 492.6 km..

Note: The DMF of the original approved project, approved in 2008, was revised in 2013 to more accurately reflect the impacts and outcomes of the program.

Sources: ADB, Committee of Roads under the Ministry of Investment and Development, consultant's report on economic re-evaluation of the investment program, and Independent Evaluation Department of ADB.

Table A1.2: Design and Monitoring Framework for Loan 2824-KAZ: CAREC Transport Corridor 1 (Taraz Bypass)

Design Summary	Performance Targets and Indicators with Baselines	Achievements (Status at Completion)	PPER Update	Assessment
Impact Increased trade in Kazakhstan	By 2020 Kazakhstan's trade volume increased by 10% from 2011	Achieved Total volume was increased T3,865 trillion in 2011 to T6,556 trillion in 2015, an increase of about 69.6%.	Not Likely to be Achieved Exports were valued at \$84,335 million in 2011 and \$60,956 million in 2018. Imports in 2011 were valued at \$36,905 million and by 2018 reached \$32,533 million. Both trends are below expectations.	This indicator has little relationship to the physical works. The Taraz Bypass has no impact on the national economy as a whole. A DMF should choose targets that are related to the project scope and use. Data on imports and exports taken from ADB <i>Key Indicators</i> for 2019.
Outcome Better connectivity for the Zhambyl Oblast section of the CAREC Transport Corridor 1	By 2016 Average travel time through Zhambyl Oblast—between the southern Kazakhstan border and Otar—reduced to 7 hours, from 10 hours in 2009	Achieved Average travel time in the sections was about 7 hours.	Achieved Average travel times in the overall corridor have been achieved.	

Design Summary	Performance Targets and Indicators with Baselines	Achievements (Status at Completion)	PPER Update	Assessment
	Average traffic volume along the project road increased to 7,000 vpd, from 4,000 vpd in 2007	Achieved Traffic volume along the project roads (highway section) was about 7,555 vpd in 2016.	While average traffic in the corridor was 8,560 vehicles per km in 2019, traffic on the bypass has reached only 3,112 AADT. This is less than the original projections.	
Outputs A 65-km road section (Taraz Bypass) reconstructed	By 2015 Works on the project road from km 483–536 completed with an IRI of less than 3 m/km	Achieved The highway section (7.7 km: km 483.3–491) was rehabilitated, and the bypass section (56.7 km: km 491–536) was constructed with an IRI of less than 3 m/km.	Achieved The project facilities were constructed as designed and are fully operational.	

AADT = annual average daily traffic, CAREC = Central Asia Regional Economic Cooperation, IRI = international roughness index, km = kilometer, T = Kazakhstan tenge, m = meter, vpd = vehicles per day.

Note: This DMF the one updated when ADB extended the project completion date from 30 June 2015 to 31 December 2015.

Sources: Asian Development Bank, Committee of Roads under the Ministry of Investment and Development, and Independent Evaluation Department of ADB.

APPENDIX 2: STATUS OF COMPLIANCE WITH FACILITY-LEVEL UNDERTAKINGS AND LOAN COVENANTS

Reference in Facility Financing Agreement	Facility-Level Undertakings	Corresponding Loan Agreement Reference	Status of Compliance
Schedule 6, Para. 1	Budget Resources The Borrower will make available all counterpart funds required for timely and effective implementation of the Investment Program through annual budget allocations to the Ministry of Transport and Communication (MOTC), and will ensure that necessary resources thus required are released in a timely manner. The Borrower will cause MOTC to include the updated funding requirements for implementation of the Investment Project in its annual development program.	Schedule 5, Para. 5 (LA 2503); Para. 4 (LA 2562); Para. 7 (LA 2697, LA 2735)	Complied with For all the ADB loans, the Ministry of Finance (MOF) allocated government counterpart funds each year and released payments in a timely manner for withdrawal applications from loan proceeds from 2009 through 2015. The Ministry of Transport and Communications (MOTC)—later the Ministry of Investments and Development (MID)—annually updated its funding requirements for program implementation to facilitate payments. Final claims for works and services done on or before the loan closing date of 31 December 2014 were processed during the winding-up period.
Schedule 6, Para. 2	The Borrower will cause MOTC to allocate routine maintenance budget in accordance with the Road Development Program 2006–2012 (RDP) and that, each fiscal year after 2012, the budget is increased by no less than annual inflation rates, provided always that sound fiscal balance is maintained; Without limiting the generality of the foregoing, the Borrower will allocate and make available, on a timely basis, sufficient funds for the implementation of the RDP and shall ensure that the road sections covered by the RDP are maintained in accordance with applicable standards and best international practices. The Borrower will	Schedule 5, Para. 6 (LA 2503)	Complied with In previous years, the government budget for road maintenance was underfunded by international norms. However, in recent years, the government has provided a substantial allocation for road maintenance. During 2013 to 2015, funding for periodic maintenance was T63.2 billion, while that for routine maintenance was T37.61 billion. With respect to maintenance after the end of the defects liability period, through a statute of 27 October 2015, KazAvtoZhol JSC, a joint-stock company, was declared the sole operator for the (i) regular repair and maintenance of national highways, as well as project management; and (ii) development of road infrastructure with the budget allocated from the government.

Reference in Facility Financing Agreement	Facility-Level Undertakings	Corresponding Loan Agreement Reference	Status of Compliance
	have such expenditures audited annually and make them available to ADB upon request.		
Schedule 6, Para. 3	Construction Quality The Borrower through MOTC will ensure that the Investment Program is carried out in accordance with the applicable technical specifications and design, and that the construction supervision, quality control and project management of the Investment Program are performed in accordance with applicable standards and best international practices.	Schedule 5, Para. 7 (LA 2503); Para. 5 (LA 2562); Para. 8 (LA 2697, LA 2735)	Complied with MOTC commissioned the state design institutes—KazDorProekt Limited Liability Partnership [LLP], (ii) AstanaDorProekt LLP, KazniipiDortrans LLP, and Agency Central Asian Consultant—to prepare the road designs for the investment program. The state project examination authority, GosExpertisa, reviewed the compliance of the detailed design and cost estimates with the country’s requirements. The Agency of Construction Affairs approved the designs upon GosExpertisa’s endorsement. The design followed the Soviet construction norms and regulations (SNIIP, GOST), harmonized with the American Association of State Highway and Transportation Officials and British standards for concrete pavement in cold climates. The construction supervision consultants monitored the construction quality following contract provisions and applicable technical specifications and drawings. Staff from MOTC/MID and project management consultant staff regularly conducted site visits and quality and progress inspection meetings with the oblasts’ Road Department, construction supervision consultant, and contractors.
Schedule 6, Para. 4	Road Safety The Borrower through MOTC will ensure that civil works contracts under the Investment Program will include contractor’s obligation to comply with road safety measures. MOTC will monitor the accident rate and traffic volume after	Schedule 5, Para. 8 (LA 2503); Para. 6 (LA 2562); Para. 9 (LA 2697, LA 2735)	Complied with All civil works contracts under the investment program included contractors’ obligations to prepare and implement the road safety plan during construction. The construction supervision consultants regularly monitored the contractors’ compliance with the road safety plan, which benefited both the road users and road workers.

Reference in Facility Financing Agreement	Facility-Level Undertakings	Corresponding Loan Agreement Reference	Status of Compliance
	commencement of the operation of the Investment Program Road.		MID regularly monitors traffic volume and the police record the road accident rates during and after completing the road construction.
Schedule 6, Para. 5	<p>Anti-Corruption Measures The Borrower will comply with, and will ensure that MOTC complies with, ADB's Anticorruption Policy (1998, as amended to date). The Borrower, consistent with its commitment to good governance, accountability and transparency, agrees (a) that ADB has the right to investigate, directly or through its agents, any alleged corrupt, fraudulent, collusive or coercive practices relating to the Investment Program and (b) to cooperate fully with any such investigation and to extend all necessary assistance, including providing access to all relevant books and records, as may be necessary for the satisfactory completion of any such investigation.</p> <p>In addition, the Borrower will</p> <ol style="list-style-type: none"> conduct periodic inspections on the contractors' activities related to fund withdrawals and settlements; ensure that all contracts financed by ADB in connection with Investment Program include provisions specifying the right of ADB to audit and examine the records and accounts of all contractors, suppliers, consultants, and other service providers as they relate to the Investment Program; and 	Para. 15 (LA 2503); Para. 12 (LA 2562); Para. 16 (LA 2697, LA 2735)	<p>Complied with The MOF agreed that ADB has the right to investigate any irregularities, and to cooperate fully with any such investigation. For Project 1, ADB conducted a pre-project procurement related review (PPRR) and a PPRR in 2011 as ADB's Anticorruption Policy (1998, as amended to date) may have been violated by contractors and consultants. The findings from these two investigations resulted in a firm receiving a warning, but no violations of ADB's Anticorruption Policy were confirmed.</p> <p>There were no other investigations of corruption conducted for other projects under the investment program, as no record of any irregularities was reported during project implementation.</p> <ol style="list-style-type: none"> With the assistance of the project management consultant and construction supervision consultants, the Committee of Roads (COR) conducted periodic inspections. All contracts included provisions specifying ADB's right to audit and examine records and accounts.

Reference in Facility Financing Agreement	Facility-Level Undertakings	Corresponding Loan Agreement Reference	Status of Compliance
	c. the construction supervision consultant shall verify the contractors' payment certificates in accordance with working drawings and contract specifications. MOTC will announce the Investment Program and business opportunities associated with it, including the applicable tender process on its web site.		c. The construction supervision consultant verified and signed each contractor's payment certificate of works done vis-à-vis actual progress, works program, contract provisions, technical specifications, and working drawings. The project management consultant further verified all payment certificates before submission to COR. The COR implemented the anticorruption action plan indicated in the facility administration manual (FAM).
Schedule 6, Para. 6	<p>Policy Framework and Dialogue The Borrower will</p> <p>a. ensure compliance with the sector Roadmap which identifies the institutional development actions as set out in Table 1 of Schedule 1 (actions to implement road sector reforms included in the Road Development Program 2006–2012 and Transport Strategy for the Republic of Kazakhstan comprising good governance and accountability, sustainable financing policy and regulatory framework, institutional reform and capacity development, road safety, road sector sustainability, and road transport operations and management);</p> <p>b. maintain the Investment Program and use the Facility funds effectively and efficiently to implement the Investment Program and achieve its objectives; and</p>		<p>Complied with</p> <p>a. At appraisal, the overall design was consistent with the government's top-priority road investment for CAREC Corridor 1 as defined in the government's medium-term Road Development Program for 2006–2012,^a which was intended to address core problems in the transport sector.^b The medium-term road program is part of the government's overall transport strategy for 2006–2015.^c The program is also consistent with ADB's Strategy 2020,^d which identifies transport infrastructure as a core area of ADB operations, and with ADB's CAREC program, which emphasizes regional cooperation in transport, energy, and trade facilitation. The program focus is CAREC Corridor 1, which is one of six corridors included in the CAREC Transport and Trade Facilitation Strategy^e that CAREC member countries endorsed in 2007.</p> <p>b. The facility funds were efficiently used. Project 1 (Loan 2503) was partially cancelled and the facility fund savings were used to finance Project 4 (Loan 2735).</p>

Reference in Facility Financing Agreement	Facility-Level Undertakings	Corresponding Loan Agreement Reference	Status of Compliance
	<p>c. implement the financing plan agreed for the Investment Program.</p> <p>The Borrower will keep ADB informed in a timely manner of any changes to and progress in implementing the Roadmap, Investment Program and the financing plan.</p> <p>The Borrower will consult with ADB and other donors involved in road sector in a policy dialogue affecting any of these elements and keep them regularly informed of the progress in implementing the road sector reforms.</p>		<p>c. The financial plan agreed for the investment program was implemented.</p>
Schedule 6, Para. 7	<p>Project Selection and Implementation The Borrower will ensure that</p> <p>a. all Projects under the Investment Program meet, to the satisfaction of ADB, the criteria and procedural requirements set out in Schedule 4 of this FFA; and</p> <p>b. in the preparation and implementation of the projects, the arrangements set out in Schedule 3 to this FFA, and ADB's policies and procedures on safeguards and social dimensions (and specifically, the requirements set out in Schedule 5 to this FFA), procurement, disbursement, governance and anticorruption, and gender are complied with.</p>	<p>Article 5, Section 4.01 (LA 2503, LA 2562, LA 2697, LA 2735)</p> <p>Schedule 5, Paras. 1–4 (LA 2503); Paras. 1–3 (LA 2562); Paras. 1–2 (LA 2697, LA 2735)</p>	<p>Complied with</p> <p>Project readiness. The MOTC ensured the readiness of the projects under the investment program. Due diligence was conducted in preparation for the project, in terms of design, procurement, safeguards, and economic analysis.</p> <p>Implementation arrangements. The MOTC was assigned as the executing agency for the investment program. It has the overall responsibility in executing the investment program. It designated the COR as the implementing agency for all projects under the investment program.</p> <p>The COR appointed a project director from its staff to be responsible for the (i) implementation of the investment program, and (ii) preparation and implementation of the subsequent projects.</p>

Reference in Facility Financing Agreement	Facility-Level Undertakings	Corresponding Loan Agreement Reference	Status of Compliance
			<p>The project director was assisted by</p> <ul style="list-style-type: none"> SAI Consulting Engineers (India), the project management consultant engaged under the first project (Loan 2503), in managing the investment program and subsequent tranche projects; the construction supervision consultants engaged under each project (SMEC, Dohwa, SNC Lavalin, and Kocks), in supervising the works progress and administering contracts to ensure quality and timely completion of road construction; and COR staff responsible for road engineering, financial, legal, and procurement matters. <p>As a result of the government's reorganization on 6 August 2014, the Ministry of Investment and Development (MID) absorbed the functions of MOTC. COR remained the implementing agency under the MID.</p>
		<p>Schedule 4, Paras. 1–7 (LA 2503); Paras. 1–9 (LA 2562, LA 2697); Paras. 1–10 (LA 2735)</p>	<p>Procurement of works and consulting services</p> <p>The procurement of works followed ADB's Procurement Guidelines. Contracts of more than \$3 million were procured through an international competitive bidding procedure and those of less than \$1 million through a national competitive bidding procedure.</p> <p>The recruitment of consultants (project management, construction supervision, road maintenance, and intelligent transport system) followed ADB's Guidelines on the Use of Consultants. QCBS was used, with a Q/C ratio of 80:20.</p>
		<p>Schedule 5, Para. 12 (LA 2503); Para. 10 (LA 2562); Para. 9 (LA 2697, LA 2735)</p>	<p>Execution of contracts</p> <p>Subsequent to contract awards, a notice-to-proceed was issued to contractors for respective sections or parts of the project</p>

Reference in Facility Financing Agreement	Facility-Level Undertakings	Corresponding Loan Agreement Reference	Status of Compliance
		<p>Schedule 3, Paras. 1–5 (LA 2503, LA 2697); Paras. 1–4 (LA 2562, LA 2735)</p> <p>Schedule 5, Paras. 17–18 (LA 2503); Paras. 14–15 (LA 2562); Paras. 3–4, 6 (LA 2697, LA 2735)</p>	<p>road that complied with the applicable provisions of the LARP, IEE, and EMP.</p> <p>Disbursements The loan proceeds were disbursed according to ADB's Loan Disbursement Handbook. Reallocation between categories was applied, as needed.</p> <p>The conditions of withdrawal for Loan 2503 and Loan 2697 were fulfilled. For Loan 2503, MOTC submitted a certification that the project management consultant had been adequately staffed, including the appointment of the project director, and had become operational to implement the investment program. For Loan 2697, the JICA loan agreement (Loan 8251) was duly executed and all conditions were fulfilled. There were no conditions of withdrawal from the other two loan accounts (Loan 2562 and Loan 2735).</p> <p>Project monitoring, review, and evaluation The COR monitored and evaluated the project's performance through a project performance monitoring system (PPMS), which consisted of (i) a DMF specifying the performance targets and indicators, along with risks; (ii) project performance reports consisting of monthly and quarterly progress reports prepared by the project management consultant and the construction supervision consultant, safeguards (environment and LAR) monitoring reports, and annual financial audit reports; and (iii) a project completion report detailing the project achievements. The progress reports included updates on road and works safety.</p> <p>Data collection included (i) joint project review and safeguards missions with ADB; (ii) consultations and meetings with consultants, contractors, affected people, and other concerned</p>

Reference in Facility Financing Agreement	Facility-Level Undertakings	Corresponding Loan Agreement Reference	Status of Compliance
		Schedule 5, Paras. 9–10 (LA 2503); Paras. 7–8 (LA 2562); Paras. 11–12 (LA 2697, LA 2735)	<p>agencies; (iii) project records of COR, consultants, and contractors; and (iv) other technical road surveys.</p> <p>A midterm review mission was conducted for each project to ensure successful implementation and the achievement of objectives of the projects and the investment program.</p> <p>Environmental safeguards</p> <p>The design, road construction and O&M followed ADB's Safeguard Policy Statement (SPS), Kazakhstan's applicable environmental laws and regulations, the EARF, and EIA.</p> <p>The EMP was updated before notice-to-commence was issued.</p> <p>The works contracts incorporated applicable environmental measures identified in the EIA and the EMP.</p> <p>Construction supervision consultants supervised the contractors' preparation and implementation of the site-specific EMPs to minimize, and ideally eliminate, potential adverse environmental impacts arising from the projects.</p> <p>MOTC/MID allotted a budget of about \$1.0 million to implement, monitor and record EMP implementation for the investment program.</p> <p>MOTC/MID submitted environmental safeguards monitoring reports for each project, and these were disclosed on the ADB website after endorsement by the CWRD safeguards specialist.</p> <p>The EMRs included a progress review on implementing the EIA and EMP. Updates were also included in the monthly or quarterly project progress reports.</p>

Reference in Facility Financing Agreement	Facility-Level Undertakings	Corresponding Loan Agreement Reference	Status of Compliance
		Schedule 5, Para. 11 (LA 2503); Para. 9 (LA 2562); Paras. 13–14 (LA 2697, LA 2735)	<p>LAR safeguards</p> <p>The LARP for each project, based on the LARF, was disclosed to the affected persons. Consultations with affected persons and local authorities began during the project feasibility stage.</p> <p>Necessary lands and rights-of-way required by all projects were acquired and made available on time before civil works commenced. In the absence of an alternative land plot, affected persons received monetary compensation for lost assets following Kazakhstan legislation. Physical displacement of persons occurred and a notice-to-commence was issued after (i) the LARP was finalized, and (ii) compensation and other entitlements were provided to affected persons. The payments of all compensation to affected persons and structures was completed in 2013. Works started only after the compensation procedures had been completed.</p> <p>The MOTC/MID submitted LARP compliance internal monitoring reports, which were disclosed on the ADB website after endorsement by the CWRD safeguards specialist.</p> <p>An external or independent monitoring expert, financed by ADB, conducted the LARP verification for projects with category A and the reports were disclosed on ADB website.</p> <p>Surveys and consultations were conducted during implementation to identify new or potential affected households and a supplemental LARP was prepared, as appropriate.</p> <p>The community liaison group (CLG) mechanism was established in March 2011 for the investment program and Taraz Bypass project. The CLG coordinator was engaged under the project management consultant to monitor and regularly report any</p>

Reference in Facility Financing Agreement	Facility-Level Undertakings	Corresponding Loan Agreement Reference	Status of Compliance
		<p>Schedule 5, Para. 13 (LA 2503); Para. 11 (LA 2562);</p> <p>Paras. 10, 15 (LA 2697, LA 2735)</p>	<p>safeguard issues, and to coordinate with COR Zhambyl Oblast and KazAvtoZhol for timely resolution of the issues. The CLG coordinator maintained the grievance database of safeguards issues with corresponding actions and updates to monitor timely resolution.</p> <p>Prevention of illegal trafficking. The CSC monitored and found no illegal trafficking of humans, wildlife, endangered species, or controlled substances in the project area during project implementation.</p> <p>Health and social protection. The works contracts incorporated (i) applicable core labor laws and workplace occupational safety provisions; and (ii) provisions on no child labor, no payment differentiation between men and women for work of equal value, employment of local poor persons, and employment of skilled and unskilled women laborers; and (iii) to the extent possible, maximized employment of disadvantaged persons for project construction purposes, provided that the requirements for the job and efficiency were adequately met.</p> <p>The projects delivered benefits to all categories of travelers, including women. The new roads, with two lanes in each direction, safety barriers, and high-quality surface, attract more female drivers, who used to avoid potentially risky intercity travel, and allow them to travel more and benefit from the new economic and social opportunities. During the projects, consultants and contractors employed female managers and specialists under strict compliance with nondiscriminatory treatment of female workers.</p> <p>The CSC monitored the projects, but no outstanding issues have been identified. Contractors have signed agreements with local</p>

Reference in Facility Financing Agreement	Facility-Level Undertakings	Corresponding Loan Agreement Reference	Status of Compliance
			<p>social protection and labor authorities to employ local unemployed persons.</p> <p>Contractors conducted an orientation program for HIV/AIDS and distributed HIV/AIDS awareness materials to the local communities along the project road.</p>
Schedule 6, Para. 8	<p>Fiduciary Oversight The Borrower will ensure that each Project account is audited by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB and the audit reports will be submitted to ADB within 6 months of the end of the relevant fiscal years.</p> <p>The Borrower will further ensure the compliance with the specific accounting, auditing and reporting requirements set out in Schedule 3 of this FFA.</p>	Article IV, Section 4.05 (a) (LA 2503, LA 2562, LA 2697, LA 2735)	<p>Complied with An independent auditor audited each project account. The audit reports for FY2009 to FY2015 were submitted and all audited project financial statements (APFSs) were acceptable. The corresponding management letters were also submitted. The audit reports included a separate auditor's opinion confirming that the financial statements presented a fair view of the project's financial position and financial performance and the loan proceeds were used only for project purposes. The audit reports were uploaded to the eOps project record, as required. The APFS for the cofinanced JICA loan (Loan 8251) for its final disbursement in March 2016 was submitted on 9 August 2017 and being reviewed by ADB.</p> <p>MOF/MOTC set up and maintained separate financial records and accounts for utilizing the ADB loan, JICA loan, and Borrower's counterpart funds. The cash-based International Public Sector Accounting Standard was used in preparing the annual financial statements.</p>

ADB = Asian Development Bank, AP = affected person, APFS = audited project financial statement, CAREC = Central Asia Regional Economic Cooperation, CLG = community liaison group, COR = Committee of Roads, CSC = construction supervision consultant, CWRD = Central and West Asia Department, DMF = design and monitoring framework, DNP = defects notification period, EA = executing agency, EARF = environmental assessment and review framework, EIA = environmental impact assessment, EMR = environmental monitoring report, EMP = environmental management plan, FAM = facility administration manual, FFA = facility financing agreement, FY = fiscal year, IA = implementing agency, IEE = initial environmental examination, IFI = international financial institution, JICA = Japan International Cooperation Agency, L = loan, LA = loan agreement, LARF = land acquisition and resettlement framework, LARP = land acquisition and resettlement plan, MID = Ministry of Investment and Development, MOF = Ministry of Finance, MOTC = Ministry of Transport and Communications, O&M = operation and maintenance, PPRR = project procurement related review, PPMS = project performance monitoring system, QCBS = quality and cost-based selection, SPS = Safeguard Policy Statement.

- ^a Ministry of Transport and Communications. 2006. *Road Development Program for 2006–2012*. Astana.
 - ^b Core transport problems included poor-quality existing road assets, weak management capacity, road maintenance financing gaps, road safety issues, and poor traffic operations information systems. These are detailed in ADB. 2008. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility and Administration of Loan to Kazakhstan for the CAREC Transport Corridor 1 (Zhambyl Oblast Section) [Western Europe–Western People's Republic of China International Transit Corridor] Investment Program*. Manila.
 - ^c Decree of the President of the Republic of Kazakhstan. 2006. *Transport Sector Strategy of the Republic of Kazakhstan up to 2015*. Astana.
 - ^d ADB. 2008. *Strategy 2020: The Long-Term Strategic Framework of the Asian Development Bank, 2008–2020*. Manila.
 - ^e Central Asia Regional Economic Cooperation. 2007. *CAREC Transport and Trade Facilitation Strategy*. Manila.
- Sources: Asian Development Bank and the Committee of Roads under the Ministry of Investment and Development.

APPENDIX 3: ECONOMIC ANALYSIS

Table A3.1: Economic Re-Evaluation of the CAREC Transport Corridor 1
(\$ million, 2009 prices)

Year	Capital Cost	Maintenance Savings	VOC Savings	Time Savings	Accident Savings	Total Benefits	Net Benefits
2009	28.89	0.05	0.00	0.00	0.00	0.00	-28.94
2010	115.97	0.10	3.67	0.70	0.00	4.37	-111.70
2011	180.93	0.13	7.38	2.90	0.00	10.28	-170.78
2012	263.39	0.15	12.12	8.32	0.00	20.44	-243.10
2013	148.85	0.18	18.26	11.34	0.00	29.60	-119.43
2014	36.73	0.16	44.69	55.36	24.96	125.01	88.12
2015		-3.09	65.94	93.36	49.93	209.23	209.07
2016		-3.10	77.85	107.57	56.09	241.51	238.41
2017		-32.10	88.14	119.55	38.28	245.97	213.87
2018		-3.18	99.11	131.86	55.73	286.70	283.52
2019		-3.21	114.52	150.78	57.94	323.24	320.03
2020		-20.01	131.88	172.11	51.91	355.90	235.89
2021		-3.55	49.11	81.92	53.99	185.02	181.47
2022		-3.28	55.49	89.03	56.15	200.67	197.39
2023		-32.18	62.80	97.49	58.39	218.68	186.50
2024		-2.79	71.86	107.70	60.73	240.29	237.50
2025		-2.28	81.53	119.43	63.16	264.12	261.84
2026		-30.72	92.40	132.92	65.68	291.00	260.28
2027		8.92	195.22	149.39	68.31	412.92	404.00
2028		-3.55	33.15	96.29	71.04	200.48	196.93
2029		-32.13	38.68	101.29	73.88	213.85	181.67
2030		-3.28	45.43	107.04	76.84	229.31	226.03
2031		-2.77	52.39	113.49	79.91	245.79	243.02
2032		-31.08	60.39	121.04	83.11	264.54	233.46
2033	-282.51	1.42	69.91	129.89	86.43	286.23	567.32
EIRR =							22.05%

EIRR = economic internal rate of return, VOC = vehicle operating cost
Source: Asian Development Bank estimates.

Table A3.2: Economic Re-evaluation of the Taraz Bypass
(\$ million, 2009 prices)

Year	Costs			Benefits				Total Benefits	Net Benefits
	Capital Cost	Maintenance Cost	Total Cost	VOC Savings		Time Savings			
				Highway	Bypass	Highway	Bypass		
2013	60.14		60.14						-60.14
2014	36.58		36.58						-36.58
2015	17.07		17.07						-17.07
2016	22.92		22.92	4.61	3.78	1.20	3.62	13.21	-9.71
2017				5.04	4.37	1.22	3.79	14.42	14.42
2018		0.60	0.60	5.44	4.77	1.30	4.06	15.57	14.97
2019		0.62	0.62	5.88	5.21	1.39	4.35	16.83	16.21
2020		0.64	0.64	6.35	5.69	1.48	4.66	18.18	17.54
2021		0.66	0.66	6.72	6.09	1.54	4.87	19.22	18.56
2022		0.68	0.68	7.12	6.51	1.60	5.08	20.31	19.63
2023	7.22	0.60	7.82	7.54	6.97	1.67	5.31	21.49	13.67
2024		0.62	0.62	7.99	7.46	1.74	5.54	22.73	22.11
2025		0.64	0.64	8.47	7.98	1.81	5.78	24.04	23.40
2026		0.66	0.66	8.84	8.38	1.87	5.96	25.05	24.39
2027		0.68	0.68	9.22	8.80	1.92	6.14	26.08	25.40
2028		0.70	0.70	9.63	9.24	1.98	6.32	27.17	26.47
2029		0.72	0.72	10.05	9.71	2.04	6.51	28.31	27.59
2030	7.22	0.60	7.82	10.49	10.20	2.10	6.71	29.50	21.68
2031		0.62	0.62	10.75	10.47	2.14	6.84	30.20	29.58
2032		0.64	0.64	11.02	10.76	2.19	6.98	30.95	30.31
2033		0.66	0.66	11.30	11.06	2.23	7.12	31.71	31.05
2034		0.68	0.68	11.59	11.36	2.28	7.26	32.49	31.81
2035	13.67	0.70	-12.97	11.88	11.67	2.32	7.40	33.27	46.24
EIRR =									11.3%

EIRR = economic internal rate of return, VOC = vehicle operating cost

Source: Asian Development Bank estimates.

Table A3.3: Re-evaluation of the Overall CAREC Transport Corridor 1
(\$ million, 2009 prices)

Year	Capital Cost	Maintenance Cost	Total Cost	VOC Savings	Time Savings	Accident Savings	Total Benefit	Net Benefit
2009	28.89	-0.05	28.84	0.00	0.00	0.00	0.00	-28.84
2010	115.97	-0.10	115.87	3.67	0.70	0.00	4.37	-111.50
2011	180.93	-0.13	180.80	7.38	2.90	0.00	10.28	-170.52
2012	263.39	-0.15	263.24	12.12	8.32	0.00	20.44	-242.80
2013	208.99	-0.18	208.81	18.26	11.34	0.00	29.60	-179.21
2014	73.31	-0.16	73.15	44.69	55.36	24.96	125.01	51.86
2015	17.07	3.09	20.16	65.94	93.36	49.93	209.23	189.07
2016	22.92	3.10	26.02	86.24	112.39	56.09	254.72	228.70
2017		32.10	32.10	97.55	124.56	38.28	260.39	228.29
2018		3.78	3.78	109.32	137.22	55.73	302.27	298.49
2019		3.83	3.83	125.61	156.52	57.94	340.07	336.24
2020		20.65	20.65	143.92	178.25	51.91	374.08	353.43
2021		4.21	4.21	61.92	88.33	53.99	204.24	200.03
2022		3.96	3.96	69.12	95.71	56.15	220.98	217.02
2023	7.22	32.78	40.00	77.31	104.47	58.39	240.17	200.17
2024		3.41	3.41	87.31	114.98	60.73	263.02	259.61
2025		2.92	2.92	97.98	127.02	63.16	288.16	285.24
2026		31.38	31.38	109.62	140.75	65.68	316.05	284.67
2027		-8.24	-8.24	213.24	157.45	68.31	439.00	447.24
2028		4.25	4.25	52.02	130.27	71.04	253.33	249.08
2029		32.85	32.85	58.44	109.84	73.88	242.16	209.31
2030	7.22	3.88	11.10	66.12	115.85	76.84	258.81	247.71
2031		3.39	3.39	73.61	122.47	79.91	275.99	272.60
2032		31.72	31.72	82.17	130.21	83.11	295.49	263.77
2033	-282.51	-0.76	-283.27	92.27	139.24	86.43	317.94	501.21
2034		0.68	0.68	22.95	9.54	0.00	32.49	31.81
2035	-13.67	0.70	-12.97	23.55	9.72	0.00	33.27	46.24
EIRR =								21.5%

EIRR = economic internal rate of return, VOC = vehicle operating cost

Source: Asian Development Bank estimates.

APPENDIX 4: COMPARISON OF OVERALL PROJECT PERFORMANCE ASSESSMENT

	PCRs		PVRs						PPER
Criteria	MFF ^a	Taraz Bypass	MFF	Taraz Bypass	Tranche 1	Tranche 2	Tranche 3	Tranche 4	
Relevance	Relevant	Relevant	Relevant	...	Relevant	Relevant	Relevant	...	Relevant
Effectiveness	Effective	Effective	Effective	...	Less than effective	Effective	Effective	...	Effective
Efficiency	Efficient	Efficient	Efficient	...	Efficient	Efficient	Efficient	...	Efficient
Sustainability	Likely sustainable	Likely sustainable	Likely sustainable	...	Less than likely sustainable	Likely sustainable	Less than likely sustainable	...	Less than likely sustainable
Overall Assessment	Successful	Successful	Successful	...	Less than successful	Successful	Successful	...	Successful
Development Impact	Highly satisfactory	Satisfactory	Satisfactory	...	Moderate	Not Rated	Not Rated	...	Less than satisfactory
Borrower and Executing Agency	Satisfactory	Satisfactory	Satisfactory	...	Satisfactory	Satisfactory	Satisfactory	...	Satisfactory
Performance of ADB	Satisfactory	Satisfactory	Satisfactory	...	Satisfactory	Satisfactory	Satisfactory	...	Satisfactory

... = not available, PCR = project completion report, PVR = project validation report, PPER = project performance evaluation report,

^a Includes overall assessment for the tranches 1–4.

Sources: Asian Development Bank.