

Board of Directors

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R36-19 14 June 2019

Proposed Loan and Administration of Loans and Grant Karachi Bus Rapid Transit Red Line Project (Pakistan)

1. The Report and Recommendation of the President (RRP: PAK 47279-002) on the proposed loan and administration of loans and grant to Pakistan for the Karachi Bus Rapid Transit Red Line Project is circulated herewith.

2. This Report and Recommendation should be read with *Country Partnership Strategy: Pakistan, 2015–2019*, which was circulated to the Board on 4 August 2015 (DOC.Sec.M24-15).

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Report and Recommendation of the President to the Board of Directors

Project Number: 47279-002 June 2019

Proposed Loan and Administration of Loans and Grant Islamic Republic of Pakistan: Karachi Bus Rapid Transit Red Line Project

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Asian Development Bank

CURRENCY EQUIVALENTS

(as of 2 May 2019)

Currency unit – Pakistan rupee/s (PRe/PRs) PRe1.00 = \$0.0071

\$1.00 = PRs141.777

ABBREVIATIONS

ADB	_	Asian Development Bank
AFD	—	Agence Française de Développement
AIIB	—	Asian Infrastructure Investment Bank
BRT	—	bus rapid transit
CNG	—	compressed natural gas
GCF	—	Green Climate Fund
JICA	—	Japan International Cooperation Agency
km	_	kilometer
PAM	_	project administration manual
PDA	_	project design advance
SMTA	_	Sindh Mass Transit Authority
TA	—	technical assistance

NOTE

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

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PROJECT AT A GLANCE

1	Basic Data			Project Number: 17279-002
1.	Basic Dala Broject Nome	Karachi Rus Papid Transit Rod Lino	Department	
	Project Name	Raiachi bus napiu fransit neu Line Broiget		CWRD/CWOW
	Country (Piljetan		Cindh Maga Transit Authority
	Country	Fakislan	Executing Agency	SHULL MASS TRAISIL AUTIONITY
	Borrower	Islamic Republic of Pakislan		(SIVITA)
2	Sector	Subsector(s)		ADB Financing (\$ million)
1	Transport	Transport policies and institutional develo	onment	15 00
•	Transport	Luber public transport	opinent	115.00
		Urban public transport		115.00
		Urban roads and traffic management		105.00
			Tota	al 235.00
-				
3.	Strategic Agenda	Subcomponents	Climate Change Inf	ormation
	Inclusive economic growth	Pillar 2: Access to economic	CO ₂ reduction (tons	per annum) 78,000
	(IEG)	opportunities, including jobs, made	Climate Change imp	eact on the High
		more inclusive	Project	
	Environmentally sustainable	Eco-efficiency		
	growth (ESG)	Global and regional transboundary	ADB Financing	
		environmental concerns	Adaptation (\$ million) 5.00
		Urban environmental improvement	Mitigation (\$ million)	230.00
1				
			Cofinancing	
			Adaptation (\$ million	15.00
				i) 15.00
			Mitigation (\$ million)	234.00
4.	Drivers of Change	Components	Gender Equity and	Mainstreaming
	Governance and capacity	Institutional development	Effective gender ma	
	development (GCD)	Organizational development	(FGM)	-
	Knowledge solutions (KNS)	Application and use of new knowledge	()	
		solutions in key operational areas		
	Partnerships (PAR)	Civil society organizations		
		Official cofinancing		
	Private sector development	Promotion of private sector investment		
	(PSD)			
_				
5.	Poverty and SDG Targeting	Na	Location impact	Link
		INU No	Urban	підп
	Household Targeting			
	General Intervention on	Yes		
	Poverty	Voo		
	SDG Goals	SDG1, SDG3, SDG5, SDG9, SDG10,		
c	Diele Ostenenization.	SDG11, SDG12, SDG13		
0.	nisk Galegorization:	Complex		
7.	Safeguard Categorization	Environment: A Involuntary Res	settlement: A Indige	nous Peoples: C
8.	Financing			
-	Modality and Sources		٨٢	nount (\$ million)
	ADP		AI	
	ADB			255.00
	Sovereign Project (Regula	ar Loan): Ordinary capital resources		235.00
	Cofinancing			249.00
	Agence Francaise de Dev	veloppement - Project Ioan (Partial ADB A	dministration)	100.00
	Asian Infrastructure Invoc	tment Bank - Project Ioan (Partial ADP Ad	Iministration)	100.00
		intent Dank - 1 Toject Ioan (Faitial ADD Au		100.00
	Green Climate Fund - Pro	pject grant (Full ADB Administration)		11.80
	Green Climate Fund - Pro	ject loan (Full ADB Administration)		37.20
	Counterpart			88.00
	Government			00.00
				00.00
	Iotal			572.00
			-	
	Currency of ADB Financing:	USD		



I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the Islamic Republic of Pakistan for the Karachi Bus Rapid Transit Red Line Project. The report also describes the proposed administration of (i) a loan to be provided by each of the Asian Infrastructure Investment Bank (AIIB), Agence Française de Développement (AFD), and Green Climate Fund (GCF), and (ii) a grant to be provided by GCF, all for the Karachi Bus Rapid Transit Red Line Project, and if the Board approves the proposed loan, I, acting under the authority delegated to me by the Board, approve the administration of the loans and the grant.

2. The proposed project will help increase the use of quality public transport in Karachi by delivering the 26.6-kilometer (km) Bus Rapid Transit (BRT) Red Line corridor and associated facilities, directly benefiting 1.5 million people.¹ The project is economically justified by major time savings for BRT passengers; vehicle operating cost savings; and better air quality and reduced carbon emissions through an innovative waste-to-fuel scheme, which will improve the public health and mitigate climate change. It will also make Karachi safer, greener, and more inclusive and competitive.

II. THE PROJECT

A. Rationale

3. **Background and issues.** Karachi is Pakistan's largest city and its main seaport and economic and financial center. The population of this fast-expanding megacity was estimated at 15 million in the 2017 census, and 23 million for the metropolitan area. Karachi is one of the most densely populated cities in the world and is consistently ranked as one of the world's most unlivable cities, largely because of traffic congestion and induced air and noise pollution.² Car and motorcycle ownership is still low but fast-increasing because of a growing middle class. With other factors such as weak traffic management and inefficient public transport, rapid motorization worsens congestion and pollution.³ Karachi is one of the largest cities in the world without a formal public transport and mass transit system, and until 2015, large investments in flyovers reflected the prioritization of private road transport over public transport.⁴

4. Karachi's transport system does not deliver mobility for all and is marked by long commute times, the rise of private and paratransit modes, and the decline of public transport (Table 1). Services are provided by paratransit vehicles and about 4,000 privately owned buses, which together serve 2.8 million passengers daily. These weakly regulated services are irregular and lack designated stops and customer standards. Drivers compete and pull over to pick up passengers at will, or wait idling on the side of the road until their vehicles are full, worsening congestion and impairing safety. During peak commute times, it is common for passengers to sit on the roof or hang from the side of moving vehicles. Vehicles in this informal network tend to be old and poorly maintained, leading to increased emissions and higher operating costs. Services tend to be costly for the urban poor, as customers must pay for each transfer between modes.

¹ About 1.5 million people (10% of Karachi's population) live within 1 km of a bus rapid transit (BRT) station, including off-corridor services, and would potentially benefit from the proposed system.

² The Economist Intelligence Unit. 2018. *Global Liveability Report 2018*. London. Karachi ranks 137th out of 140 cities.

³ The project environmental impact assessment measured a 24-hour average concentration of particulate matter of fewer than 10 micrometers at 109–141 micrograms per cubic meter in six locations along the BRT corridor. The level recommended by the World Health Organization is 50 micrograms per cubic meter for a 24-hour measuring sample.

⁴ In 2015, the Government of Sindh province, supported by the federal government, started reinvesting in public transport with the BRT Green Line and Orange Line Projects, which are currently still under implementation.

Therefore, 40% of all city trips are still being made on foot. Karachi's poorest, women, children, elderly, and people with disabilities would benefit from a safe, efficient and accessible public transport system.

	Private Modes			Paratransit (Taxis		Public Transport		
	Ca	Cars Motorcycles ar		and Rickshaws)		(Buses and Minibuses)		
ltem	2008	2018	2008	2018	2008	2018	2008	2018
Total vehicles in Karachi	36.5%	31%	47.3%	53%	9.9%	13%	6.3%	3%
Total passengers transported	24.5%	21%	16.0%	33%	6.0%	12%	53.5%	34%

Table 1: Karachi's Modal Share for Motorized Trips

Sources: Japan International Cooperation Agency. 2012. *The Study for Karachi Transportation Improvement Project*. Tokyo (2008 vehicle and occupancy counts); and Government of Sindh. 2018. *Karachi BRT Project: Demand Modeling Report*. Karachi (2018 vehicle and occupancy counts, consultant's report).

5. **Project preparation.** During 2008–2012, the Government of Sindh province, with support from the Japan International Cooperation Agency (JICA), developed and approved the Karachi Transportation Improvement Project, which comprises a transport master plan that proposed a mass transit network composed of the revival of the Karachi Circular Railway, two metro rail lines, and six BRT lines; the Red, Green, and Yellow lines were prioritized for implementation.⁵ Building on this initiative, the Asian Development Bank (ADB) provided technical assistance (TA) to prepare this project.⁶ ADB also approved a \$9.7 million project design advance (PDA) loan from ADB's ordinary capital resources in September 2016.⁷

6. **Alignment with country strategy.** The project is consistent with the Government of Pakistan's Vision 2030, Framework for Economic Growth, and National Climate Change Policy. It supports priorities set out in the Karachi Strategic Development Plan 2020 and in the manifesto of the newly elected federal government, which pledges to transform Karachi into a vibrant competitive megacity, including the provision of mass transit.⁸ It aligns with ADB's Sustainable Transport Initiative; country partnership strategy for Pakistan, 2015–2019; and Strategy 2030 as it contributes to the strategy's principles and operational priorities such as promoting "livable cities",⁹ "accelerating progress in gender equality", "tackling climate change and enhancing environmental sustainability", and supporting the "use of innovative technologies".¹⁰ Coordination with development partners such as AFD, AIIB, GCF, JICA, the World Bank and the Aga Khan Trust for Culture has been ensured.

⁵ JICA. 2012. Study for Karachi Transportation Improvement Project: Final Report, Volume 1 (Master Plan). Tokyo.

⁶ ADB. 2011. Technical Assistance for the Implementation of Sustainable Transport in Asia and the Pacific. Manila. This regional cluster TA project was used to (i) review JICA's master plan; (ii) select the BRT corridor for further preparation under ADB assistance; and (iii) develop the BRT conceptual design and plans for nonmotorized transport and parking along the selected corridor, i.e., the Red Line. ADB also provided project preparatory TA for the Karachi BRT Project, which provided (i) recommendations for institutional developments; (ii) the preliminary engineering design for the BRT Red Line; and (iii) ADB standard due diligence. ADB. 2013. Technical Assistance to the Islamic Republic of Pakistan for Preparing the Karachi Bus Rapid Transit Project. Manila.

⁷ ADB. 2016. Project Design Advance to the Islamic Republic of Pakistan for the Karachi Bus Rapid Transit Project. Manila. This third phase of preparation entailed (i) preparing the detailed engineering and operational design for the BRT Red Line; (ii) assisting the provincial government in establishing and building the capacity of TransKarachi; and (iii) supporting the provincial government in advance procurement.

⁸ Government of Pakistan; Ministry of Planning, Development and Reform. 2007. Pakistan in the 21st Century: Vision 2030. Islamabad; Government of Pakistan; Ministry of Planning, Development and Reform. 2011. The Framework for Economic Growth. Islamabad; Government of Pakistan, Ministry of Climate Change. 2012. National Climate Change Policy. Islamabad; Government of Sindh. 2007. Karachi Strategic Development Plan 2020. Karachi; and Pakistan Tehreek-i-Insaf. 2018. The Road to Naya Pakistan: PTI Manifesto 2018. Islamabad.

⁹ Livable cities are defined by ADB as cities that are green, competitive, resilient, and inclusive.

¹⁰ ADB. 2010. Sustainable Transport Initiative Operational Plan. Manila; ADB. 2015. Country Partnership Strategy: Pakistan, 2015–2019. Manila; and ADB. 2018. Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific. Manila.

7. The project design incorporates lessons learned from past assistance, notably the need for (i) strong political support and consensus; (ii) a robust governance structure; (iii) thorough project preparation and readiness prior to proceeding with project approval; (iv) realistic project implementation timeline; and (v) sound construction supervision and contract management.¹¹ Private sector participation is being supported for BRT operations (para. 23) but not for construction under a public–private partnership arrangement; globally, few mass transit systems recover capital costs through revenue alone, as fares must be affordable.¹²

8. Value added by ADB assistance (para. 5):

- (i) Institutional development. ADB supported the establishment and assists in building the capacity of a special purpose vehicle called TransKarachi, incorporated in October 2018.¹³ The Sindh Mass Transit Authority (SMTA) is responsible for regulating, planning, and funding urban mobility for all cities in Sindh province. TransKarachi will implement the project and manage service contracts for BRT operations in Karachi.
- (ii) Waste-to-fuel innovation. ADB promotes environmental sustainability through the production and use of biomethane from cattle waste to fuel the BRT fleet of compressed natural gas (CNG) hybrid buses.
- (iii) **Universal accessibility and nonmotorized transport.** ADB ensures that the project design includes (a) a bicycle-sharing system, bicycle lanes, and other non-motorized transport vehicles for first and last mile connectivity; and (b) universal accessibility and other gender-friendly features in BRT stations and buses.
- (iv) Operations plan and financial sustainability. ADB promotes a third-generation BRT system using a direct service operational model, which allows BRT vehicles to travel along the BRT corridor in the busiest parts of the city and off-corridor in less congested areas. A modern fare system using smart cards to enable distancebased fares will facilitate this approach, expanding the system's reach and capacity, reducing passenger transfers, and increasing ridership and financial sustainability. The project is designed primarily to limit operational subsidies.
- (v) **Bus industry transition.** ADB emphasizes engagement with the existing bus industry and establishes a negotiation process that enables existing operators to participate in the new BRT system. The project design includes a fleet scrapping program and compensation mechanism for nonparticipating operators.
- (vi) **Climate change.** ADB assessed the project's vulnerability to climate change impacts and addresses climate risks in the project's design.

B. Impact and Outcome

9. The project is aligned with the following impact: quality of life in Karachi improved. The project will have the following outcome: use of quality public transport in Karachi increased.¹⁴

¹¹ ADB. 2005. Technical Assistance to the Islamic Republic of Pakistan for Preparing the Mega City Sustainable Development Project. Manila. From 2004 to 2008, ADB prepared this investment program for Karachi, which included BRT corridors. The Program was finally dropped in 2009 because of disagreement between the provincial government and the municipality. ADB also approved in 2017 a \$335 million regular loan for Peshawar Sustainable Bus Rapid Transit Corridor Project which is currently under implementation and stands 80% completed. ADB. 2017. Report and Recommendation of the President to the Board of Directors: Proposed Loan and Administration of a Loan to the Islamic Republic of Pakistan for the Peshawar Sustainable Bus Rapid Transit Corridor Project. Manila.

¹² Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ). 2013. <u>Financing Sustainable Urban Transport:</u> <u>International Review of National Urban Transport Policies and Programmes</u>.

¹³ TransKarachi is incorporated under the Securities and Exchange Commission of Pakistan as a Section 42 (nonprofit) public company, limited by guarantee (no share capital), and 100% owned by the Government of Sindh.

¹⁴ The design and monitoring framework is in Appendix 1.

C. Outputs

Output 1: Red Line bus rapid transit corridor and associated facilities constructed. 10. The Red Line BRT system encompasses (i) the 24.2-km Red Line main corridor; (ii) a 2.4-km section of the common corridor along which all BRT lines merge in the city-center;¹⁵ and (iii) offcorridor direct and feeder service routes connecting the corridor to nearby communities. The Red Line corridor will be restructured over its entire width (facade-to-facade), including (i) the BRT infrastructure comprising 29 stations and dedicated lanes built mainly at grade in the median; (ii) the mixed-traffic roadway with up to six lanes in each direction; (iii) the nonmotorized transport infrastructure along the corridor comprising bicycle lanes, improved sidewalks, and energyefficient street lights; (iv) on-street parking and landscaped green areas added in various locations; and (v) improved drainage to climate-proof the corridor. The BRT infrastructure will be completed with two depots, one underground staging facility, an extension of the BRT control center, and off-corridor bus stops. The common corridor section will be remodeled to create notably a 1-km mall reserved only for pedestrians and BRT buses. Facades of selected historical buildings along the common corridor will be restored, and utilities buried, providing a new landmark and quality public space for the city.

11. **Output 2: BRT operations established.** This will be done through (i) capacity building of the SMTA and TransKarachi; (ii) the design of the BRT business model and subsidy-free operations; (iii) a bus industry transition program, comprising a fleet scrapping program and compensation mechanism; (iv) effective project communication; and (v) the delivery of the BRT fleet, feeder e-vehicles, intelligent transport systems (including a distance-based fare system, a bicycle sharing system and others), and a biogas plant.¹⁶

D. Summary Cost Estimates and Financing Plan

12. The project is estimated to cost \$572 million (Table 2). Detailed cost estimates by expenditure category and financier are included in the project administration manual (PAM).¹⁷

	(\$ mmen)	
ltem		Amount ^a
Α.	Base Cost ^b	
	1. Output 1: Karachi's Red Line bus rapid transit corridor and associated facilities constructed	327.6
	2. Output 2: Bus rapid transit operations established	173.3
	Subtotal (A)	500.9
В.		50.5
C.	Financial Charges During Implementation ^d	20.6
	Total (A+B+C)	572.0
~		

Table 2: Summary Cost Estimates

^a Includes taxes and duties of \$60.32 million to be financed by the Government of Sindh, partly through exemptions and partly through cash contributions. Such amount does not represent an excessive share of the project cost.

^b In 2019 prices as of 22 January 2019. Includes a \$9.7 million project design advance.

^c Physical contingencies are computed at 10% for civil works and equipment. Price contingencies computed at average of 1.525% on foreign exchange costs and 4.825% on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

^d Includes interest, commitment charges, and other fees to be incurred under the Asian Development Bank, Asian Infrastructure Investment Bank, Agence Française de Développement, and Green Climate Fund Ioans. Source: Asian Development Bank estimates.

¹⁵ The first 2.6-km section of the common corridor is being built under the BRT Green Line Project, financed by the federal government.

¹⁶ The project design advance loan supports several activities under this output (footnote 7).

¹⁷ Project Administration Manual (accessible from the list of linked documents in Appendix 2).

13. To help finance the project, the government has requested (i) a regular loan of \$235 million from ADB's ordinary capital resources, (ii) a loan of \$100 million from AIIB, (iii) a loan of \$100 million from AFD, (iv) a loan of \$37.2 million from GCF and (v) a grant of \$11.8 million from GCF.¹⁸

14. The ADB regular loan will have a 22-year term, including a grace period of 5 years; an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; a commitment charge of 0.15% per year (the interest and other charges during construction to be capitalized in the loan); and such other terms and conditions set forth in the draft loan and project agreements. Based on the straight-line method, the average maturity is 15.97 years, and the maturity premium payable to ADB is 0.10% per year.

15. The AIIB loan is expected to have a 22-year term, including a grace period of 5 years; an annual interest rate determined in accordance with AIIB's sovereign-backed loan pricing; a commitment charge of 0.25% per year; a one-time front-end fee of 0.25% charged on the loan principal; and such other terms and conditions to be set forth in the draft loan agreement between the government and AIIB. ADB will partially administer the AIIB loan.¹⁹

16. The AFD loan is expected to have a 20-year term, including a grace period of 5 years; an annual interest rate determined in accordance with AFD's euro interbank offered rate (Euribor)-based lending facility; a one-time front-end fee of 0.25% charged on the loan principal; and such other terms and conditions set forth in the draft loan agreement between the government and AFD. ADB will partially administer the AFD loan.²⁰

17. The GCF loan and GCF grant will be fully administered by ADB as an accredited entity. The GCF loan will have a 20-year term, including a grace period of 5 years; a fixed annual interest rate of 0.75%; a commitment charge of 0.5% per year; a service fee of 0.5% per year; and such other terms and conditions set forth in the draft GCF loan agreement.²¹ The financial charges during construction under the GCF loan will be capitalized in the ADB loan.²²

18. The summary financing plan is in Table 3. The GCF grant will finance climate change adaptation measures (innovative drainage features such as bioswales), post-project emissions' monitoring activities and feeder e-vehicles. The GCF loan will finance the biogas plant and the incremental cost for the transition from basic diesel bus technology to biomethane-hybrid bus technology. ADB, AIIB, and AFD will jointly finance civil works and equipment costs (excluding components financed exclusively by GCF) on a cost-sharing basis, and related contingencies and financial charges during implementation. ADB will solely finance consulting services, the bus industry transition program, and TransKarachi's 3-year operating costs. The government will finance expenditures related to taxes and duties, relocation of utilities, and environmental and social impact (resettlement) mitigation measures. ADB will conclude cofinancing agreements with each participating organization.²³

¹⁸ The governments of Sindh province and Pakistan approved such financing plan for the project, which is mentioned in the approved PC-I, a Planning Commission pro forma form that is used for internal approvals of projects.

¹⁹ AIIB and AFD will enter into separate loan agreements with the Government of Pakistan. These terms are indicative and subject to the negotiation and conclusion of such loan agreements.

²⁰ Footnote 19.

²¹ The project was approved during the GCF 21st board meeting on 18 October 2018 and is the first transport-related initiative ever approved by GCF.

²² The interest charge, service fee and commitment charge under the GCF loan are incidental expenditures, and estimated to be 0.003% of the ADB loan amount.

²³ ADB's full administration will entail oversight with respect to procurement, safeguards, and disbursement, and partial administration will entail oversight with respect to procurement and safeguards.

	Amount	Share of Total
Source	(\$ million)	(%)
Asian Development Bank		
Ordinary capital resources (regular loan) ^a	235.0	41.08
Asian Infrastructure Investment Bank (loan) ^b	100.0	17.48
Agence Française de Développement (loan) ^b	100.0	17.48
Green Climate Fund (loan) ^c	37.2	6.50
Green Climate Fund (grant) ^c	11.8	2.08
Government of Sindh	88.0	15.38
Total	572.0	100.00

Table 3: Summary Financing Plan

^a Inclusive of a \$9.7 million project design advance.

^b Joint and contractual cofinancing to be partially administered by the Asian Development Bank.

^c Fully administered by the Asian Development Bank as an accredited entity.

Source: Asian Development Bank estimates.

19. **Climate finance.** The estimated cost for climate adaptation (innovative drainage features) is \$20 million, and the remainder of ADB and cofinanciers' financing (\$464 million) is considered mitigation finance. ADB will finance 49.6% of mitigation costs and 25% of adaptation costs. The rest will be financed by GCF, AFD and AIIB funds. Details are in the PAM (footnote 17).²⁴

E. Implementation Arrangements

20. The borrower is Pakistan, which will enter into a subsidiary loan agreement with the Government of Sindh. The SMTA's board of directors will oversee the project. The executing agency is SMTA, and the implementing agency is TransKarachi. The implementation arrangements are summarized in Table 4 and described in detail in the PAM (footnote 17).

21. All procurement (including consulting services) will be undertaken in accordance with ADB's Procurement Policy (2017, as amended from time to time) and Procurement Regulations for ADB Borrowers (2017, as amended from time to time). As AIIB, AFD, and GCF will cofinance the project and ADB will administer the cofinancing, universal procurement will apply for civil works, goods, and consulting services financed under the project.²⁵ Advance actions for procurement of consulting services and civil works have been taken under the PDA to facilitate project implementation.

Aspects	Arrangements
Implementation period	September 2019–December 2023
Estimated completion date	31 December 2023
Estimated ADB and	30 June 2024
cofinanciers loans closing date	
Management	
(i) Oversight body	SMTA board of directors Transport minister (chair) Mayors and administrators of Hyderabad, Karachi, and Sukkur (co-chairs) Transport and Mass Transit Department secretary, Finance Department secretary, Planning and Development Department secretary, Public Private Partnership Unit director general, Traffic Police deputy inspector general, Pakistan Engineering Council representative, Military Lands and Cantonments Department director, Pakistan Council of Architects and Town Planners representative, and SMTA managing director (members)

Table 4: Implementation Arrangements

²⁴ ADB. 2016. *Guidance Note on Counting Climate Finance at ADB*. Manila. The guidance note follows the approach to tracking and reporting climate finance that multilateral development banks have jointly developed and have been using since 2012. Based on this approach, the entire project is considered as climate mitigation and adaptation.
 ²⁵ ADB. 2015. *Enhancing Operational Efficiency of the Asian Development Bank*. Manila.

Aspects	Arra	ngements		
(ii) Executing agency	SMTA			
(iii) Implementing agency	TransKarachi			
(iv) Implementation units	SMTA project management unit, 10 sta	aff (estimated)		
	TransKarachi project planning and imp	lementation unit, 26 staff	proposed	
Procurement	International competitive bidding	9 contracts	\$364.00 million	
	Shopping	multiple contracts	\$0.57 million	
Consulting services	Quality- and cost-based selection	2,602 person-months	\$24.70 million ^a	
Retroactive financing and advance contracting ^b	Civil works, equipment, and operating costs are proposed for advance contracting and retroactive financing, and in the case of the ADB loan, subject to a maximum of 20% of the ADB loan amount for such expenditures incurred up to 12 months prior to the date of signing the ADB loan			
Disbursement	Proceeds of the ADB loan and administered cofinancing will be disbursed following			
	arrangements agreed between the Gov	vernment of Sindh, ADB a	and cofinanciers	

ADB = Asian Development Bank, BRT = bus rapid transit, SMTA = Sindh Mass Transit Authority.

^a Inclusive of consulting services under the \$9.7 million project design advance.

^b Detailed design was completed in May 2019. An invitation for bids for the main civil works package is expected to be advertised by the end of June 2019, demonstrating project readiness.

Source: ADB.

III. DUE DILIGENCE

A. Technical

22. The project's technical viability has been confirmed under ADB's PDA.²⁶ The 26.6 km BRT corridor alignment was carefully selected to capture major demand hubs while verifying the possibility of retrofitting the BRT infrastructure (stations and dedicated lanes) in congested and narrower sections. The BRT is at grade for 88% of its length, allowing 80 km of off-corridor service routes to enter the dedicated infrastructure. Only six underpasses with a total length of 2.43 km, and one elevated rotary of 0.85 km in length are planned for BRT to allow full segregation and maximum commercial speed at critical junctions. The mixed-traffic roadway has (i) up to 6 lanes, including service roads, in each direction in wider sections, and (ii) 16 grade-separated structures, including 3 underpasses of a total length of 1 km, 8 elevated U-turns of a total length of 3.89 km, and 5 flyovers of a total length of 2.09 km, to allow for all traffic movement while accommodating BRT at grade. Overall, the project comprises road works of a total length of 31.8 km, including 23 grade-separated structures of a total length of 10.3 km. A climate risk vulnerability assessment has also led to innovative drainage measures to climate-proof the BRT corridor from floods.²⁷

23. The BRT system was planned using a detailed methodology, including the inventory and analysis of existing services to determine current service capacity and existing demand, and a purpose-built demand model. Based on the results of this analysis, an optimized routing and network plan was developed to ensure maximum ridership and financial sustainability of the system without the need for operational subsidies. The institutional structure has been improved by the establishment of the SMTA and TransKarachi, which will manage and control the overall quality of the BRT system's operations. System quality will be enhanced by maximizing the use of private sector contracts for system operations. TransKarachi will oversee private sector

²⁶ The engineering, procurement, and construction management consultant team has conducted various surveys on the corridor's topography, hydrology, geology, and utilities. Based on the results of these surveys, the operational design and business model consultant team revisited the preliminary engineering design. ADB and the Sindh Mass Transit Authority have confirmed the feasibility of such design and instructed the engineering, procurement, and construction management consultant team to proceeded with the detailed engineering design, which has been completed in May 2019.

²⁷ Climate Change Assessment (accessible from the list of linked documents in Appendix 2).

contracts of companies for (i) bus operations; (ii) system control, encompassing the fare system, station services, and bicycle-sharing system; (iii) the financial clearinghouse; and (iv) commercial services such as property management and advertising.

24. A cost–benefit analysis of different vehicle and fuel technologies led to the choice of CNG hybrid buses for the BRT fleet, with an estimated reduction of 77,979 metric tons of carbon dioxide emissions per year.²⁸ This result will be further improved by the introduction of a waste-to-fuel scheme, which will also significantly improve the system's operational and financial results by lowering the cost at entry for CNG fuel. Locally produced biomethane from cattle waste is indeed expected to be five to eight times cheaper than market-price imported CNG, which led to the inclusion of the biogas plant as a capital subsidy under the GCF loan.

25. The waste-to-fuel scheme will also have a significant environmental benefit, as more than 7,000 tons of cattle waste is currently produced daily at farms in Karachi's Cattle Colony, and this waste is then discarded into Karachi Bay, with highly negative impact both to the local ecology and the global environment. The project will eliminate current methane emissions, as the waste will be converted into biomethane, which will be the fuel source for the BRT vehicles.

B. Economic and Financial

26. The project aims to provide a high-frequency transit service, replacing informal modes of transport traveling in mixed traffic, with fuel-efficient BRT vehicles traveling in segregated lanes at high speeds. In the first year of BRT operations, demand is expected to reach 320,000 passengers per day. By 2021, vehicle operating cost savings are expected to reach \$23 million per year, while time savings for BRT passengers and the remaining mixed traffic will reach \$54 million per year. Additional benefits from reduced fatalities and greenhouse gas emissions will reach \$16.4 million per year. The economic analysis yielded an economic internal rate of return of 20%, demonstrating the project's economic viability.²⁹ To ensure a robust result, three sensitivity tests were conducted for the following scenarios: (i) 20% capital cost overrun, (ii) 20% reduction in passenger ridership, and (iii) 2-year delay in system opening. All scenarios meet the 9% minimum economic internal rate of return required for an ADB-financed project.

27. The BRT operational plan was designed to make sure that revenue generated from the system will cover operation and maintenance costs. The BRT system generates revenue from (i) distance-based fares ranging from PRs15 to PRs55, and averaging PRs35; (ii) advertising; and (iii) rent on concession shops in stations and depots. In the absence of a cost recovery tariff, a conventional financial evaluation based on cash flow analysis leading to the computation of a financial internal rate of return was not considered appropriate.³⁰ Instead, a financial model was developed, and an analysis of the net operating cash flow was conducted to confirm that revenues will cover operating costs in various scenarios. The results showed that using locally produced biofuel significantly improves the system's financial performance. In most scenarios, the future financial position of TransKarachi confirms solid net cash flows and its financial capacity to cover recurrent costs to sustain the facilities developed under the project.

²⁸ ADB. 2018. GHG and Air Quality Impact of the BRT Karachi, and Assessment based on Technology Options for BRT Buses. Consultant's report. Manila.

²⁹ Economic and Financial Analysis (accessible from the list of linked documents in Appendix 2).

³⁰ The Government of Sindh will repay the loan from its own resources and will consider the capital investment (including the BRT infrastructure and initial fleet) as an up-front subsidy. Accordingly, TransKarachi will not need to repay the loan from the BRT system's operational revenue. Therefore, the terms and conditions of the ADB, AFD, AIIB, and GCF loans will not impact this financial analysis.

C. Governance

28. The project financial management and procurement risk assessments found *substantial* pre-mitigation risks from the newly established implementing agency.³¹ The SMTA and the Government of Sindh's Transport and Mass Transit Department agreed on an action plan to build a robust financial management system and procurement capacity within TransKarachi by engaging consultants to provide support during project implementation. The assessed risk is based on TransKarachi's (i) internal control environment, (ii) experience in implementing development projects, (iii) supervisory procedures, and (iv) financial capability.

29. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the Government of Sindh, the SMTA, and TransKarachi. The specific policy requirements and supplementary measures are described in the PAM (footnote 17).

D. Poverty, Social, and Gender

30. The project will benefit Karachi's estimated population of 15 million (75% of whom are poor or low income) through increased access to safe, reliable, and affordable public transport. About 320,000 passengers are expected to use BRT daily, with the share of female passengers reaching 15% in 2022 (first year of operation) and increasing to 20% by the end of 2023 (last year of project implementation). The low share of female passengers in public transport is mainly because of the risk of harassment that women face in overcrowded public buses. Consequently, most women prefer to walk 2 km per day on average or are forced to use more expensive private transportation, affecting their disposable income. The project will establish universal access and safety features for women, children, and people with disabilities in (i) all 29 BRT stations, including proper lighting and monitoring through closed-circuit television cameras; and (ii) buses, including segregated areas for women and staff trained to deal with harassment incidents. The project is classified effective gender mainstreaming and will encourage women's participation by ensuring that 15% of BRT operations employees and TransKarachi staff are women. Overall, the project is expected to generate 2,130 jobs directly through BRT operations, including 1,424 jobs for station services such as ticketing, security, and cleaning; 615 jobs in bus operations such as driving, conducting, and mechanics; and 81 staff jobs in TransKarachi.³²

E. Safeguards

31. In compliance with ADB's Safeguard Policy Statement (2009), the project's safeguard categories are as follows.³³

32. **Environment (category A).** The SMTA prepared (i) an environmental impact assessment (EIA) for the 24.2-km main corridor; (ii) a supplementary environmental impact assessment for the 2.4 km common corridor section; and (iii) environmental management plans; all in accordance with ADB's Safeguard Policy Statement (2009). An initial environmental examination will be completed at a later stage, in accordance with the environmental assessment and review framework, for the biogas plant whose site has yet to be finalized. During the construction phase, anticipated negative environmental impacts of the project are related to traffic disruptions and access to properties, relocation of utilities, tree cutting, air quality, community health and safety,

³¹ Financial Management Assessment Report; and Procurement Risk Assessment Report (accessible from the list of linked documents in Appendix 2).

³² Summary Poverty Reduction and Social Strategy; and Gender Action Plan (accessible from the list of linked documents in Appendix 2).

³³ ADB. <u>Safeguard Categories</u>.

noise, as well as potential vibration impacts on the sensitive receptors, including several heritage buildings located along the common corridor section. Adequate mitigation measures have been incorporated into the project design and will be implemented through the environmental management plans, which include a capacity building program for TransKarachi staff and contractors during the procurement and construction stages. During the operation phase, the project is expected to have mostly positive impacts, specifically on the acoustic environment, because of the modal shift. A computer noise model notably shows that traffic noise levels would be substantially reduced (by almost 20 A-weighted decibels) along the 1-km mall reserved for pedestrians and BRT buses, and would remain the same along other sections of the corridor where BRT buses will run in parallel with mixed vehicular traffic.³⁴ In addition, and beside its overall positive carbon footprint (para. 24 and 25), the project is expected to have a positive impact on the air quality along the corridor since BRT buses will be operating primarily on biomethane. The project complies with public disclosure and consultation requirements. Consultations with stakeholders were conducted for the main and common corridors from December 2017 to March 2019. Public hearings, attended by more than 100 stakeholders, were conducted in mid-October 2018 for the main corridor. A draft consolidated EIA report was disclosed on the ADB website on 28 February 2019.

Involuntary resettlement (category A). Civil works for the project's 24.2 km main 33. corridor and 2.4 km common corridor section will not involve acquisition of any private land. However, it will displace 774 persons and entities from the main corridor, including (i) 223 owners of small shops that will lose structure extensions; (ii) 77 public and private organizations that need to shift their minor structures and equipment within their premises; and (iii) 275 owners and 199 workers from micro businesses occupying the existing right-of-way. Temporary and permanent alternative locations for vending near the BRT corridor are being explored by the project to assist the affected micro businesses. Permanent formal vending spaces included in the project design will also be open to interested business owners including those affected by the project. The approved draft resettlement plan for the main corridor has been updated following the detailed design. An additional 139 vendors will be displaced from the common corridor section for which a draft resettlement plan has been prepared in consultation with the affected persons and relevant agencies. The proposed underground staging facility will affect the sports ground near Numaish that is leased by Karachi Metropolitan Corporation to Karachi Goan Association. Impact from the biogas plant is still to be confirmed once the site has been finalized. TransKarachi will update and implement the resettlement plans on behalf of the SMTA.

34. **Indigenous peoples (category C).** The project is in Karachi where no indigenous peoples, as defined under ADB's Safeguard Policy Statement, reside. The project will not affect any indigenous communities, and no indigenous peoples planning documents are required.

F. Summary of Risk Assessment and Risk Management Plan

35. Significant risks and mitigating measures are summarized in Table 5 and described in detail in the risk assessment and risk management plan.³⁵

³⁴ A-weighted decibels, abbreviated dBA, are an expression of the relative loudness of sounds in the air as perceived by the human ear. In the A-weighted system, the decibel values of sounds at low frequencies are reduced, compared with unweighted decibels, in which no correction is made for audio frequency. This correction is made because the human ear is less sensitive at low audio frequencies, especially below 1000 Hertz, than at high audio frequencies.

³⁵ Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Risks	Mitigation Measures
Public transport users do not	Project design advance consultants estimated demand using detailed surveys and
use BRT at projected levels.	a sophisticated model, factoring in the use of an innovative operations plan and
	communication strategy that will likely boost ridership.
Vested interests of existing	Existing operators. Consultations with existing bus operators' federations were
public transport operators,	held by operations design and business model consultants to inform operators about
shopkeepers, and others along	the project, and skilled negotiators were recruited to further discuss and develop a
the BRI corridor try to	business plan to include existing operators as much as possible in BRT operations.
implementation	the bus industry transition through pogetiations, float repoyetion, and canacity
	building to operate the BRT. The project design also includes a fleet scrapping plan
	and compensation mechanism for nonparticipating existing operators
	Shopkeepers' and traders' associations. The Government of Sindh province.
	supported by the PMCCB communication team and ADB project team, engaged
	with traders' associations and other organizations affected by the BRT corridor to
	present the project design, consider their concerns, and promote buy-in and
	ownership, so that these groups do not oppose the project or ask to change the
	project design during implementation.
Delayed operationalization of	The SMTA was established in September 2016 and has been in operation since
the SMTA and TransKarachi	then, while TransKarachi was incorporated as a Section 42 (nonprofit) public
Company fails to provide the	company in October 2018. The Government of Sindh, as part of its commitment,
necessary critical mass to	nas approved an annual allocation for SMIA operations. ADB will finance
	descriptions for key steff for both organizations were developed by the DMCCP
capacity building.	consultant who will also provide support for staff recruitment and canacity building
TransKarachi lacks staff with	ADB's prior review will be required for procurement of all contracts ADB will provide
experience in procurement	formal training in ADB procurement and consulting service procedures and
using ADB's procurement	practices. PMCCB consultants will also provide training on this aspect and will
guidelines, to efficiently carry	develop a procurement manual and a contract management manual for
out procurement activities.	TransKarachi procurement staff. ADB will closely monitor compliance.
Incomplete and inaccurate	TransKarachi will adopt the financial management manual developed by ADB and
financial reporting creates	the cost control accounting software developed by the PMCCB consultant in
implementation delays.	establishing a proper financial management system. Training by ADB will further
	enhance TransKarachi's staff capacity.
The security situation	The Government of Sindh province has committed to provide security to the project
deteriorates and impairs	site through its Home Affairs Department and local law enforcement agencies.
project implementation and	Bidders will be instructed to include provisions for staff security. The project design
BRI operations.	includes measures such as metal detectors installed in all BRT stations and the
	presence of security agents in all BRT venicles.

ADB = Asian Development Bank; BRT = bus rapid transit; PMCCB = project management, coordination, and capacity building; SMTA = Sindh Mass Transit Authority. Source: ADB.

IV. ASSURANCES

36. The Government of Pakistan, the Government of Sindh, the SMTA, and TransKarachi have assured ADB that implementation of the project shall conform to all applicable ADB policies, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the PAM and loan documents.

37. The Government of Pakistan, the Government of Sindh, the SMTA, and TransKarachi have agreed with ADB on certain covenants for the project, which are set forth in the draft loan agreement and draft project agreement.

V. RECOMMENDATION

38. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of \$235,000,000 to the Islamic Republic of Pakistan for the Karachi Bus Rapid Transit Red Line Project, from ADB's ordinary capital resources, in regular terms, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; for a term of 22 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and project agreements presented to the Board.

Takehiko Nakao President

11 June 2019

Impact the Project is Aligned with Quality of life in Karachi improved (Karachi Strategic Development Plan 2020) ^a				
Booulto Chein	Performance Indicators with Targets	Data Sources and	Diaka	
Outcome	By 2023:	Reporting mechanisms	RISKS	
Use of quality public transport in Karachi	a. Modern BRT buses operate at a maximum 6-minute headway over a 100 km-long network (2018 baseline: 0)	a–c. TransKarachi and VOCs' BRT operations annual reports		
Increased	b. 320,000 passengers use BRT daily, of which 15% are women in 2022 (first year of operation) and 20% in 2024 (2018 baseline: 0)			
	c. Average bus commercial speeds on the BRT corridor increased to 25.0 km/hour (2018 baseline: 12.2 km/hour)			
	d. The BRT system using CNG hybrid buses avoids at least 77,979 metric tons of GHG emissions (CO ₂ , methane, nitrous oxide, and halocarbons) annually (2018 baseline: 0)	d. SMTA statistics		
Outputs 1. Red Line BRT corridor and associated facilities constructed	By 2021: 1a. BRT Red Line infrastructure, including 29 stations and dedicated lanes along the 24.2 km main corridor and 2.4-km common corridor section, completed as designed and ranked as Gold according to the BRT Standard ^b (2018 baseline: 0)	1a-b. BRT Standard ^ь	Unexpected deterioration of the security situation delays project implementation.	
	1b. 100% of BRT stations and buses score maximum points on the BRT Standard for universal accessibility, and include gender-inclusive physical and operational design features ^c (2018 baseline: 0)			
	1c. Mixed-traffic lanes, sidewalks, and streetlights improved; bicycle lanes built; green areas and parking added in various places along the 26.6 km Red Line corridor (2018 baseline: Many and various) ^d	1c-f. TransKarachi quarterly project implementation progress reports		
	1d. BRT and pedestrian mall built; utilities buried; and historical facades restored along a 1.4 km stretch of the common corridor section (2018 baseline: 0)			
	1e. Two depots, one underground staging facility with commercial areas (10% reserved for businesses led by women), and one expanded BRT control center building built (2018 baseline: 0)			
	1f. At least 200 bus stops installed along 80 km of off-corridor BRT routes (2018 baseline: 0)			

DESIGN AND MONITORING FRAMEWORK

	Performance Indicators with Targets	Data Sources and				
Results Chain	and Baselines	Reporting Mechanisms	Risks			
2. BR1 operations established	By 2022: 2a. Modern CNG-hybrid BRT buses (mix of 9-, 12-, or 18-meter lengths) and feeder e-vehicles delivered (2018 baseline: 0)	2a–c. TransKarachi quarterly project implementation	Change in leadership in the Government of Sindh delays the			
	2b. A distance-based fare collection system, BRT control center, bicycle- sharing system, and other ITSs installed and commissioned by TransKarachi to operate BRT services (2018 baseline: 0)	progress reports	SMTA and TransKarachi, failing to provide the critical mass necessary to			
	2c. One biogas production plant built and operated through a DBO contract, ensuring at least 80% of the required fuel supply for the fleet (2018 baseline: 0) ^e		implement the project.			
	2d. TransKarachi and the SMTA are fully staffed (with 15% female staff), with all staff trained following gender-inclusive organizational business plans and operational procedures (2018 baseline: 0)	2d. SMTA and TransKarachi staffing plans and annual reports				
	2e. At least 80% of BRT riders surveyed indicate increased awareness of safe practices through multimedia behavior campaigns on the safety of all riders, including women, children, the elderly, and PWDs (2018 baseline: 0)	2e. TransKarachi annual passenger survey reports				
Key Activities w	ith Milestones					
 Red Line BI Prepare deta for the commination Complete land Award civil with a complete fuel 	RT corridor and associated facilities cons ailed engineering design and tender bid docu non corridor section, staging facility and BRT nd acquisition and obtain environmental clear vorks contracts for the main corridor (Q1 202 Il restructuring of the Karachi BRT Red Line of	tructed ments for the main corridor expanded control center (0 rances (Q4 2019) 0) and for the common corr corridor (Q4 2021)	r (Q2 2019) and Q2 2020) ridor (Q4 2020)			
 BRT operations established Recruit staff and prepare the business models of the SMTA and TransKarachi (Q2 2019–Q1 2020) Conduct a capacity building program for SMTA and TransKarachi staff (Q2 2020–Q2 2022) Complete the BRT operations plan, BRT business plan, and BRT communication plan (Q4 2019) Negotiate with existing private bus operators (Q2 2020–Q1 2022), and set up a compensation mechanism and fleet scrapping program for excluded operators (Q2 2021) Tender (Q4 2020) and award service contracts (Q3 2021) with VOCs to run BRT operations Tender (Q1 2020), award contract(s) (Q4 2020), and deliver (Q4 2021) the BRT fleet and e-vehicles Monitor the 3-year maintenance contract with the bus supplier(s) (Q4 2021–Q2 2024) Tender (Q4 2019), award the System Control Goods and Services contract (Q3 2020), and install ITSs (Q2 2021) as part of the BRT infrastructure Tender (Q4 2019), award the DBO contract (Q2 2020), and deliver (Q4 2021) the biogas plant 						
2.10 Tender (Q4 Property Ma	2.10 Tender (Q4 2020) and award (Q4 2021) the Fund Manager service contract, and the Advertising and Property Management service contract					

- 2.11 Train bus drivers and test BRT operations (Q4 2021-Q1 2022)
- 2.12 Begin BRT operations (Q2 2022)
- 2.13 Design (Q4 2019) and implement (Q1 2020–Q2 2022) a sound project communication strategy to manage public expectations, notably during the construction period
- 2.14 Conduct awareness campaigns on traffic rules and BRT safety (Q3 2021- Q4 2022)

2.15 Conduct socioeconomic and user perception surveys, with sex-disaggregated data (Q2 2023) 2.16 Monitor post-project implementation GHG emissions' level (Q2 2023)

Project Management Activities

Conduct all primary and baseline data surveys (Q4 2019)

Establish a project monitoring and evaluation system and a project performance management system that allow sex-disaggregated data collection, analysis, and reporting for project activities (Q4 2019)

Inputs

Asian Development Bank: \$235 million (loan)

Agence Française de Développement: \$100 million (loan)

Asian Infrastructure Investment Bank: \$100 million (loan)

Green Climate Fund: \$37.2 million (loan), and \$11.8 million (grant)

Government of Sindh province: \$88 million

Assumptions for Partner Financing

Not applicable.

BRT = bus rapid transit, CCTV = closed-circuit television, CNG = compressed natural gas, CO_2 = carbon dioxide, DBO = design-build-operate, GHG = greenhouse gas, ITS = intelligent transport system, km = kilometer, LED = light-emitting diode, PWD = person with disability, Q = quarter, SMTA = Sindh Mass Transit Authority, VOC = vehicle operating company.

^a Government of Sindh. 2007. Karachi Strategic Development Plan 2020. Karachi.

- ^b Institute for Transportation and Development Policy. 2016. *The BRT Standard*. New York. The BRT Standard is an evaluation tool for BRT corridors based on international best practices. It is also the centerpiece of a global effort by leaders in BRT design to establish a common definition of BRT and to ensure that BRT corridors more uniformly deliver world-class passenger experiences, significant economic benefits, and positive environmental impacts. The standard functions as a planning tool, scoring system, and means of achieving a common definition of BRT.
- ^c Examples of gender-inclusive design features include (i) separate queuing spaces for men and women; (ii) marked priority seating in waiting areas for the elderly, pregnant women, and PWDs; (iii) separate restrooms for men and women; and (iv) well-lit and unobstructed floor design with visible and operational CCTVs to discourage any form of harassment. Specific gender-inclusive design features and operational safety features in stations and buses are provided in the Gender Action Plan (accessible from the list of linked documents in Appendix 2 of the report and recommendation of the President).
- ^d The 2018 baseline for the main corridor: (i) deteriorated and encroached sidewalks; (ii) various number of mixedtraffic lanes, from three to six lanes per direction, encroached by illegally parked vehicles that limit capacity to two or three effective lanes per direction; and (iii) wide unused roadway median. Because of the retrofitting of the BRT infrastructure in the median and full remodeling of the corridor over its entire width, mixed-traffic lanes will be shifted to the sides and their number reduced, while keeping the same effective capacity by removing illegally parked vehicles and encroachments. Bicycle lanes will be added on both sides, sidewalks will be rebuilt and improved, green areas, on-street parking and small markets for displaced informal vendors will be added in various locations wherever space permits, and streetlights will be improved through the introduction of energy-efficient LED lighting.
- Any CNG quantity required to fuel the BRT fleet that could not be provided through the proposed biogas plant will be purchased by TransKarachi on the market, where it is in widespread use.

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=47279-002-3

- 1. Loan Agreement: ADB
- 2. Loan Agreement: Green Climate Fund
- 3. Grant Agreement: Green Climate Fund
- 4. Project Agreement
- 5. Sector Assessment (Summary): Transport
- 6. Project Administration Manual
- 7. Contribution to the ADB Results Framework
- 8. Development Coordination
- 9. Economic and Financial Analysis
- 10. Country Economic Indicators
- 11. Summary Poverty Reduction and Social Strategy
- 12. Risk Assessment and Risk Management Plan
- 13. Climate Change Assessment
- 14. Gender Action Plan
- 15. Environmental Impact Assessment
- 16. Environmental Impact Assessment: Supplementary Report
- 17. Resettlement Plan
- 18. Resettlement Plan: Supplementary Report

Supplementary Documents

- 19. Financial Management Assessment Report
- 20. Procurement Risk Assessment Report